

Energy Tidbits

Norway: "We Must Further Develop Our Petroleum Sector"

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Short-Term Energy Outlook

Overview

U.S. energy market indicators	2022	2023	2024
Brent crude oil spot price (dollars per barrel)	\$101	\$79	\$74
Retail gasoline price (dollars per gallon)	\$3.97	\$3.33	\$3.09
U.S. crude oil production (million barrels per day)	11.89	12.53	12.69
Natural gas price at Henry Hub (dollars per million British thermal units)	\$6.42	\$2.91	\$3.72
U.S. liquefied natural gas gross exports (billion cubic feet per day)	10.6	12.1	12.7
Shares of U.S. electricity generation			
Natural gas	39%	40%	38%
Coal	20%	17%	16%
Renewables	22%	23%	26%
Nuclear	19%	19%	19%
U.S. GDP (percentage change)	2.1%	1.6%	1.8%
U.S. CO₂ emissions (billion metric tons)	4.96	4.83	4.81

Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023

- Weather forecast.** Beginning with the May 2023 *Short-Term Energy Outlook* (STEO), our STEO model will combine a 30-year trendline and the National Oceanic and Atmospheric Administration's forecast to create our weather forecasts. This methodology change will result in warmer forecast weather in the United States in both the winter and in the summer. The change will involve a one-time shift that will decrease our heating degree day (HDD) forecast in 2023 by 1% and in 2024 by 4%, and increase our cooling degree day (CDD) forecast by 8% in 2023 and by 12% in 2024. The shift will affect some series that use weather as an independent variable.
- Natural gas consumption.** We forecast the second most U.S. natural gas consumption for electricity generation on record this summer (May–September), behind last year, and averaging about 38 billion cubic feet per day (Bcf/d). Compared with last month's forecast, we have increased natural gas consumption for electricity generation by about 2% for 2023 and 3% for 2024 because of our methodology change which results in more CDDs, and in more U.S. electricity generation during the summer.
- Coal consumption.** We expect coal consumption in the electric power sector will fall by 13% in 2023 compared with last year due to several factors, including lower natural gas prices, more generation from renewable sources, and coal plant retirements. However, because of more overall electricity generation compared with our April STEO, our forecast for coal-fired generation is slightly higher in 2023 than we forecast last month.

- **U.S. gasoline prices.** Retail gasoline prices in our forecast average around \$3.40 per gallon (gal) during the summer 2023 driving season (April–September), a 20% decrease from the summer of 2022. Regional summer gasoline prices range from near \$3.00/gal on the Gulf Coast to about \$4.30/gal on the West Coast.
- **Supplements.** We periodically publish report and article supplements to the STEO to provide an in-depth analysis of special topics related to our forecasts. This month’s *Between the Lines* articles discuss [residential electricity bills](#) and updates to our [western hydropower forecast methodology](#).

Notable forecast changes

current forecast: May 9, 2023; previous forecast: April 11, 2023	2023	2024
Brent spot price average (dollars per barrel)	\$79	\$74
Previous forecast	\$85	\$81
Percentage change	-7.5%	-8.3%
U.S. retail diesel prices (dollars per gallon)	\$3.90	\$3.62
Previous forecast	\$4.11	\$3.87
Percentage change	-4.9%	-6.4%
U.S. electric power sector generation from natural gas (billion kilowatthours)	1,604	1,558
Previous forecast	1,568	1,514
Percentage change	2.3%	2.9%
U.S. electric power sector generation from coal (billion kilowatthours)	694	673
Previous forecast	687	704
Percentage change	0.9%	-4.3%
U.S. heating degree days	3,965	4,007
Previous forecast	4,024	4,194
Percentage change	-1.5%	-4.5%
U.S. cooling degree days	1,552	1,566
Previous forecast	1,433	1,393
Percentage change	8.3%	12.4%

Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook, May 2023*

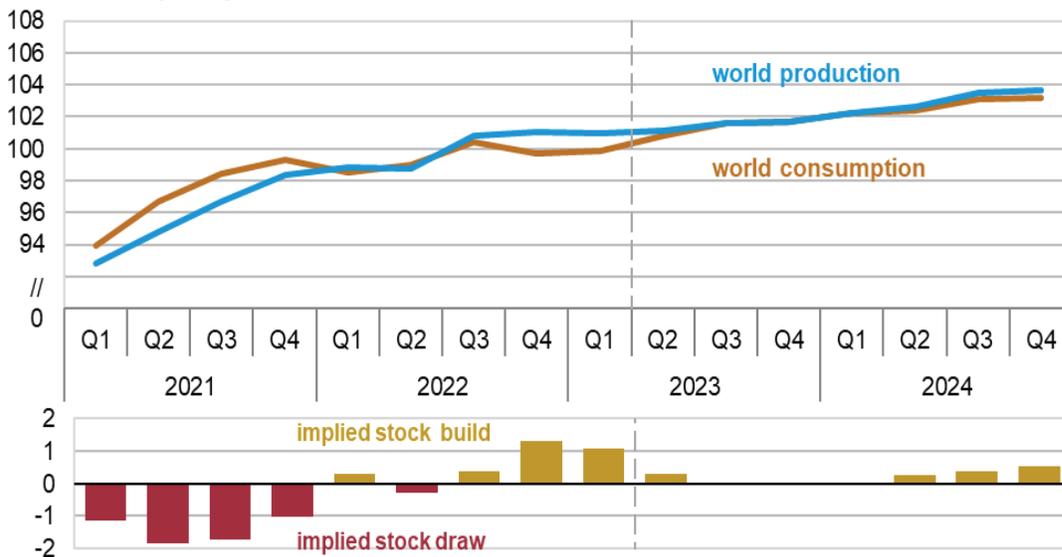
Global Oil Markets

Global oil demand and prices

The Brent crude oil spot price fell from an average of \$85 dollars per barrel (b) in April to close at \$73/b on May 4. At the beginning of April, OPEC and partner countries (OPEC+) announced a [cut to crude oil production of 1.2 million barrels per day \(b/d\)](#) through the end of 2023, which increased crude oil prices on expectations of tightening oil supplies. However, ongoing considerations about weakening global economic conditions, perceived risk around the global banking sector, and persistent inflation outweighed the initial increase in oil prices and have led to lower prices.

World liquid fuels production and consumption balance

million barrels per day



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023



Although demand growth for liquid fuels faces downside risks through the end of 2024, we expect the seasonal rise in oil consumption and a drop in OPEC crude oil production to put some upward pressure on crude oil prices in the coming months. Global liquid fuels consumption in our forecast increases by 1.6 million b/d in 2023 and by 1.7 million b/d in 2024, and most expected liquid fuels demand growth is in non-OECD Asia, led by China and India. We expect this demand growth will bring the global oil market into balance between the third quarter of 2023 (3Q23) and 1Q24 and push the Brent price from current levels back to between \$75/b and \$80/b.

Beginning in 2Q24, we expect consistent global oil inventory builds over the rest of the forecast period as global oil production outpaces global oil demand, putting downward pressure on crude oil prices. We forecast global oil inventories will grow by 0.3 million b/d in 2024, and we forecast the Brent crude oil spot price to average \$74/b in 2024, \$7/b lower than in last month's STEO.

Global oil supply

Global liquid fuels production in our forecast increases by 1.5 million b/d in 2023 compared with 2022 primarily because of [growth from non-OPEC producers](#). Excluding production from Russia, which we

forecast to fall by 0.3 million b/d in 2023, we expect that non-OPEC liquid fuels production will increase by 2.2 million b/d in 2023 and by an additional 1.1 million b/d in 2024.

We forecast Russia's crude oil and other liquid fuels production will decline from 10.9 million b/d in 2022 to 10.6 million b/d in 2023 and to 10.5 million b/d in 2024. Russia's production in March and April declined in part due to announced production cuts of 0.5 million b/d and maintenance at refineries in Russia, which we expect will end in June. Our assumption of a return to near-normal refinery operations contribute to a slight increase in Russia's liquids fuel production from 10.4 million b/d in the second quarter of 2023 to 10.5 million b/d through 2024.

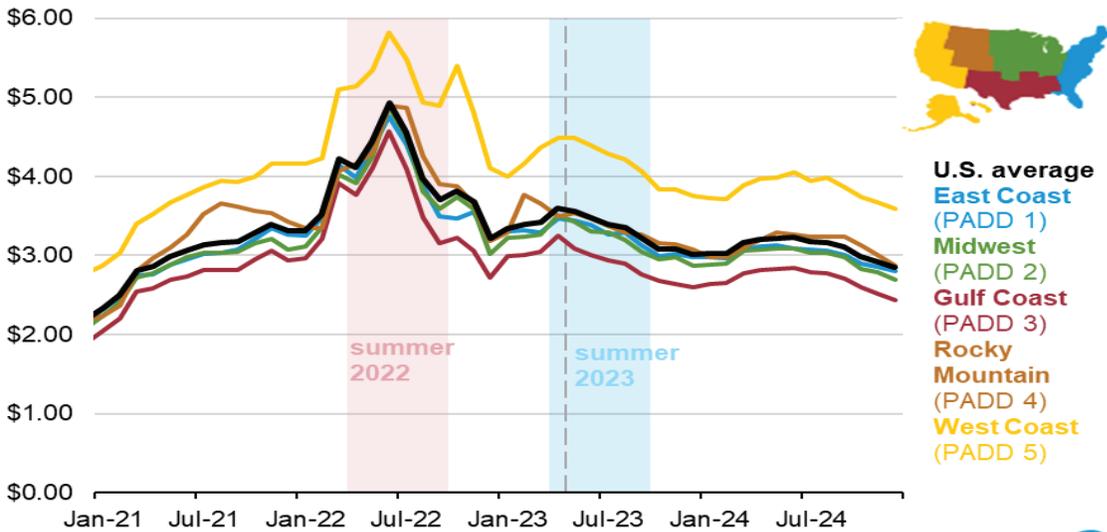
We forecast that total OPEC crude oil output will fall by 0.3 million b/d in 2023, in large part due to the April 3 OPEC+ announcement to cut production. In addition to the expected adherence to the voluntary production cuts, [recent disruptions to crude oil exports in Iraq](#) and a [force majeure limiting crude oil exports in Nigeria](#) have also reduced our near-term OPEC forecast in 2023. We forecast total OPEC liquid fuels production to increase by 0.6 million b/d in 2024 driven by the end of the current OPEC+ production cuts in 2023.

Petroleum Products

U.S. retail gasoline prices

The average U.S. regular gasoline retail price for April was \$3.60 per gallon (gal), which is higher than the \$3.53/gal we forecast in the April STEO. Inventory draws in April left U.S. gasoline inventories 3% below the five-year (2018–2022) minimum and contributed to rising retail gasoline prices. Because we reduced our crude oil price forecast in the May STEO, we now forecast gasoline prices in the summer driving months (April through September) to be slightly lower than previously expected across all regions of the United States. Overall, we expect retail gasoline prices to remain below summer 2022 prices, which reflects both lower crude oil prices this summer and lower refining margins for gasoline.

U.S. regular retail gasoline prices by PADD
dollars per gallon



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023



Regular gasoline retail prices are typically highest between the months of April and September because of more expensive summer-grade gasoline used to comply with [seasonal Reid vapor pressure \(RVP\) requirements](#) and high summer driving demand. We forecast summer 2023 retail gasoline prices to average about \$3.40/gal, which is 20% lower than the summer 2022 average of \$4.29/gal. Compared with summer 2022, when retail gasoline prices fell by more than \$1/gal from the \$4.93/gal peak in June to \$3.70/gal in September, we expect less volatility in prices in summer 2023. We forecast retail gasoline prices will fall from about \$3.60/gal in April to about \$3.20/gal in September. We expect a decrease in retail gasoline prices over the course of the summer partially because our expectation of rising refinery runs from global and U.S. refiners. U.S. refinery runs in our forecast reach their highest levels since 2019 as a result of high refinery margins and expanded capacity at [ExxonMobil’s Beaumont refinery](#) and Marathon Petroleum’s Galveston Bay refinery. Despite our expectation of rising refinery runs, U.S. gasoline supply and demand conditions remain tight, which we forecast will keep refinery margins above the five-year average.

U.S. gasoline prices vary regionally, reflecting local supply and demand conditions, different fuel specifications required by state laws, and taxes. Retail gasoline prices are usually the highest on the West Coast because of the region’s limited connections with other major refining centers, tight local supply and demand conditions, requirements for gasoline specifications that are more costly to manufacture, and higher taxes. We forecast West Coast retail gasoline prices to average more than \$4.30/gal in summer 2023, about 90 cents/gal higher than the U.S. average but almost \$1.00/gal lower than West Coast prices in summer 2022.

Regional gasoline prices are usually the lowest on the Gulf Coast, which holds about half of U.S. refining capacity and produces more gasoline than it consumes and where states generally have lower [gasoline taxes](#) than the national average. We forecast Gulf Coast retail gasoline prices to average about \$3.00/gal in summer 2023, more than 40 cents/gal lower than the U.S. average and nearly 90 cents/gal lower than

in summer 2022. We forecast the summer 2023 retail gasoline price to average close to \$3.30/gal on the East Coast and in the Midwest. Several factors present uncertainty in our retail gasoline price forecast for summer 2023. Our forecast assumes rising refinery runs and gasoline inventories that, if not realized, could leave gasoline prices higher than our forecast. In addition, changes in economic conditions and oil prices could affect retail gasoline prices.

Natural Gas

Natural gas consumption for electric power

We forecast that natural gas consumed to generate electricity in the United States during the summer of 2023 (May–September) will average 38 billion cubic feet (Bcf/d), the second most on record behind the 39 Bcf/d recorded last year. U.S. natural gas consumption for electricity generation typically peaks in the summer months as warmer temperatures lead to more air-conditioning use.

High natural gas-fired electric power generation this summer is driven by a decline in coal-fired electricity generation, relatively low natural gas prices, and more overall electricity generation due to warmer-than-normal temperatures in our forecast. More electricity generation from renewable sources in 2023 compared with 2022 is one of the main reasons we do not expect natural gas consumption to reach a new record in 2023.

In the summer of 2024, we forecast natural gas consumed for electricity generation will decline by 2% and average about 37 Bcf/d, again driven lower by more renewable electricity generation sources coming online throughout 2023 and 2024.

Natural gas consumption for electric power

billion cubic feet per day



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023



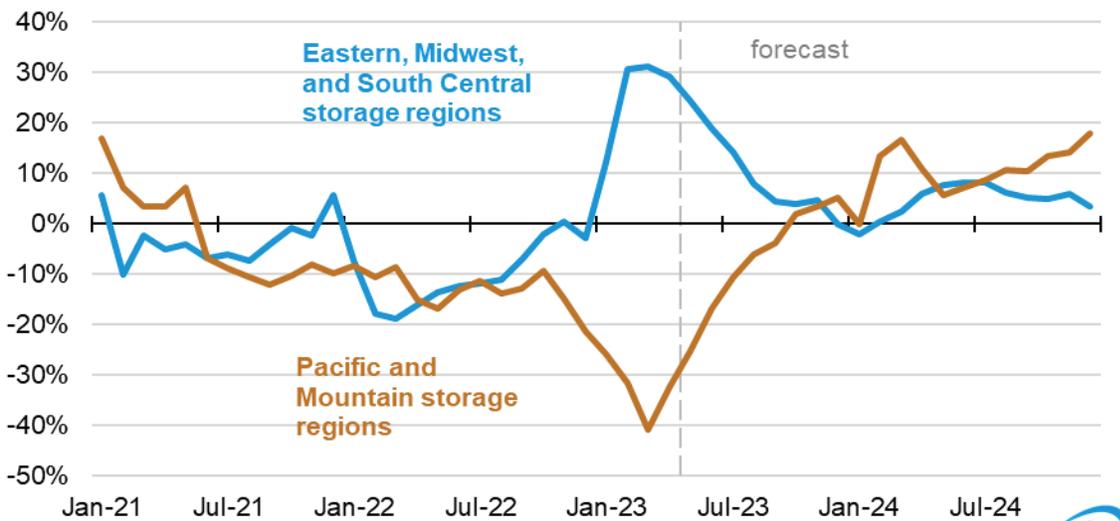
Natural gas regional storage

At the end of April, U.S. natural gas storage inventories totaled 2,114 billion cubic feet (Bcf), 19% more than the five-year (2018–2022) average. We forecast natural gas inventories will increase by 1,648 Bcf

from the end of April to reach 3,762 Bcf at the end of October, 4% more than the five-year average. Storage injections from April through October in our forecast are less than the five-year average because of high demand for natural gas in the electric power sector. We expect the U.S. benchmark Henry Hub natural gas spot price to average \$2.35 per million British thermal units (MMBtu) in May and rise to around \$3.00/MMBtu in July and August, when power demand peaks.

Above-average temperatures in the eastern and central United States this past winter and spring led to less natural gas storage withdrawals than average in those regions. In contrast, the western United States experienced colder-than-normal weather in winter and spring, which led to more natural gas storage withdrawals than average.

Regional natural gas storage inventories
percentage deviation from five-year average



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023



Natural gas storage inventories in the East, Midwest, and South Central storage regions were well above the five-year average at the end of April. Natural gas withdrawals were particularly low in the South Central storage region, leaving inventories at a surplus of almost 30% at the end of April. For all three regions, we forecast natural gas storage inventories to remain above the five-year average through the end of the injection season, ending October at a combined 120 Bcf (4%) above the five-year average.

Natural gas storage inventories in the Pacific and Mountain storage regions declined by more than is typical over the past winter, causing the deficit to the five-year average to reach more than 40% at the end of March. Colder-than-normal winter and spring weather, along with limited availability of hydropower for electricity generation in the Pacific region, reduced storage inventories. However, injections in these two regions in April were more than the five-year average, and we forecast inventories will increase by almost 300 Bcf from the end of April through the end of October, placing inventories at 2% more than the five-year average at the end of the injection season. The large increase in storage in these regions reflects inventory management by storage operators as they try to build inventories to have sufficient storage to meet winter requirements. Our expectation of high hydropower

generation in the west also reduces demand for natural gas in the power sector, which could also support natural gas storage injections.

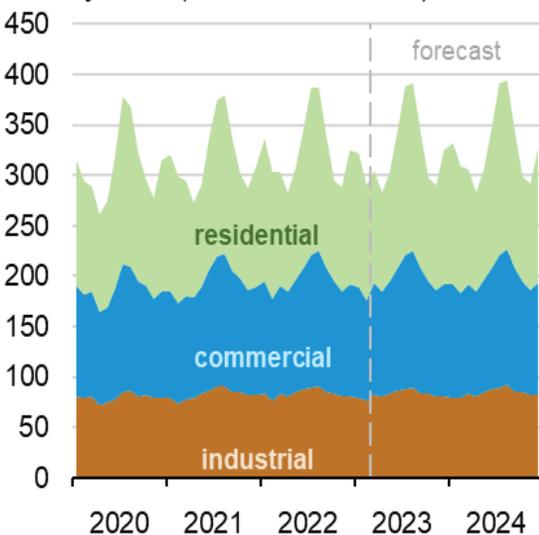
Electricity, Coal, and Renewables

Electricity consumption

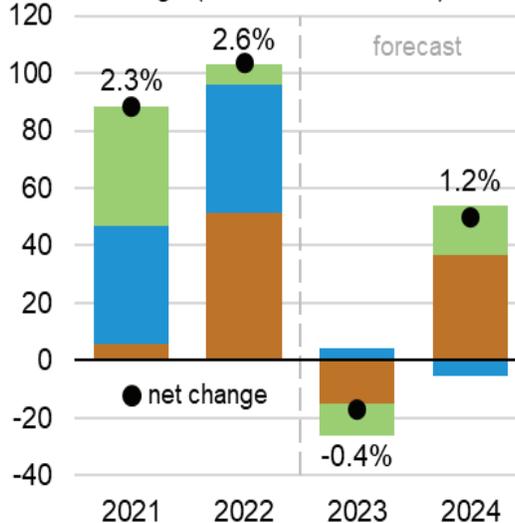
We expect total U.S. consumption of electricity in 2023 will be similar to 2022. Forecast sales of electricity to customers in the residential sector decline slightly from 2022. Residential electricity demand falls primarily because of milder winter temperatures; we forecast 7% fewer U.S. heating degree days in 2023 than last year. We expect [residential electricity demand and electricity bills](#) that are about the same or slightly higher than last summer, with slightly cooler summer temperatures offset by higher residential electricity prices.

U.S. sales of electricity to ultimate customers, by sector

monthly sales (billion kilowatthours)



annual change (billion kilowatthours)



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023

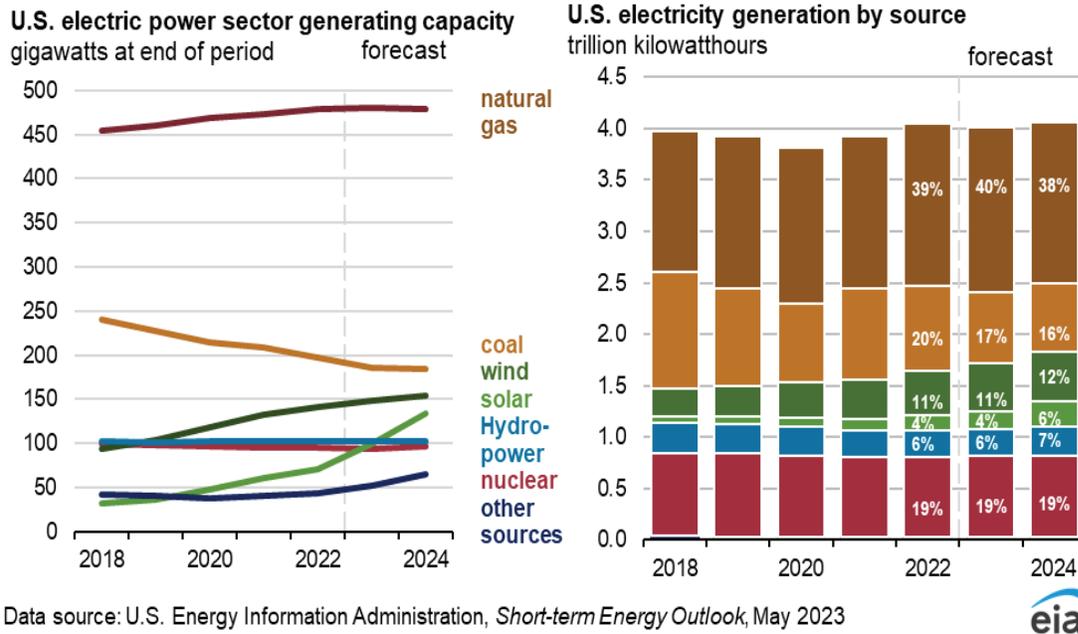


Industrial electricity demand is most affected by economic conditions. We forecast that U.S. electricity sales to industrial customers in 2023 will also be close to the same as in 2022, about 1% lower because of a 1% drop in manufacturing production in our forecast for 2023. We expect sales of electricity to the commercial sector will be almost unchanged in 2023.

Electricity generation

The forecast share of electricity generation from renewable sources rises from 22% in 2022 to 23% in 2023 and to 26% in 2024. This increase in renewable generation will reduce generation from fossil fuel-fired power plants in our forecast because renewable generators such as wind and solar have an advantage in dispatch due to their low operating costs. Improved water supply conditions should help increase hydroelectric generation over the coming months in [California and the Southwest](#).

We forecast that natural gas generation will increase slightly in the United States during 2023 in response to a significant decline in fuel costs. Natural gas’s share of U.S. generation averaged 39% in 2022, and we expect it will average 40% in 2023 before declining to 38% in 2024 as a result of the growing availability of renewable energy generating capacity and an increase of natural gas prices. Our forecast coal generation share declines from 20% last year to 17% in 2023 and 16% in 2024.



Coal markets

U.S. coal production in our forecast increases by 2% from April to May, as producers start to prepare for increased electricity generation during the summer months. After increasing in both 2021 and 2022, we expect U.S. coal production to decline by 3% from 597 million short tons (MMst) in 2022 to 577 MMst in 2023 and drop further (15%) to 491 MMst in 2024. Among the drivers of the decline in coal production is the ongoing retirement of coal-fired generating plants, low natural gas prices, and more renewable generation. About 11 gigawatts of coal-fired generating capacity is scheduled to retire in 2023, representing nearly 6% of the entire coal generating fleet. About three-quarters of the coal plant retirements will occur before July, which will limit coal-fired generation this summer.

Economy, Weather, and CO₂

U.S. macroeconomics

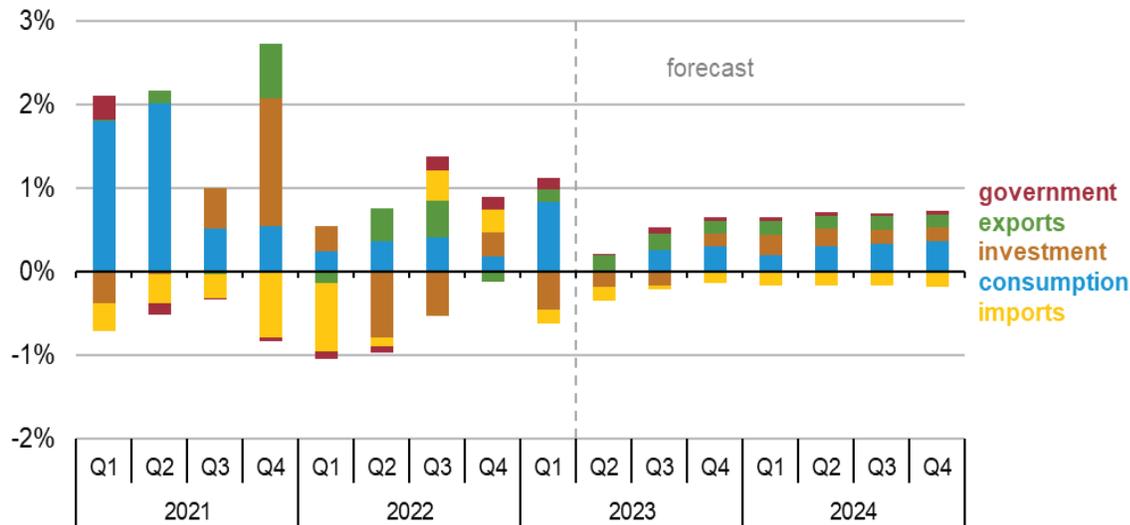
Our U.S. macroeconomic forecasts are based on S&P Global’s macroeconomic model. We incorporate STEO energy price forecasts into the model to obtain the final macroeconomic assumptions we use in the STEO.

S&P Global estimates that U.S. real GDP grew in the first quarter of 2023 (1Q23) but expects it to contract at an annualized rate of 0.2% in 2Q23. U.S. real GDP in our forecast returns to growth in 3Q23 and averages 1.6% growth throughout 2023 and 1.8% in 2024.

GDP growth largely reflects changes in real personal consumption expenditure (PCE), which grew by 1% in 1Q23 compared with 4Q22. PCE in our forecast remains flat in 2Q23. Aggregate investment is offsetting growth in PCE. As interest rates increased, borrowing costs rose and lowered residential fixed investment and private business inventories of goods. The declines in these categories cause the overall decline in aggregate investment, which is not expected to return to growth until 4Q23.

Contributions to GDP growth

weighted annualized percentage change



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2023



Emissions

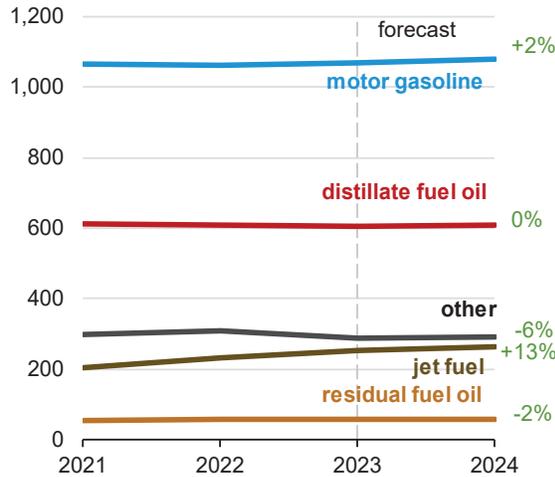
Total U.S. energy-related carbon dioxide (CO₂) emissions in our forecast decrease by 3% in 2023 and then remain flat in 2024. The largest changes in CO₂ emissions are from coal, which declines by 12% in 2023 due to less coal-fired electricity generation.

Emissions from natural gas fall slightly in both 2023 and 2024. Most 2023 reductions occur because of reduced space heating demand from residential and commercial buildings as a result of milder temperatures in 1Q23. Most 2024 reductions result from less natural gas-fired generation as the amount of generation from renewable sources grows.

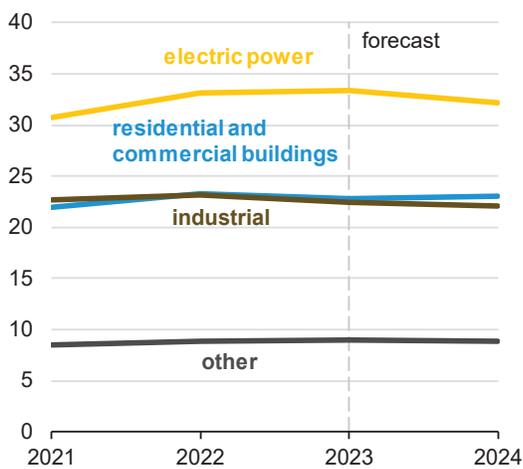
U.S. petroleum emissions remain mostly unchanged in 2023 and increase slightly in 2024. CO₂ emissions from petroleum are mostly associated with consumption of transportation fuels such as motor gasoline, diesel, and jet fuel. The consumption of both gasoline and jet fuel increases in our forecast through 2024, but the emissions from this increased consumption are offset by decreased emissions from other petroleum products in 2023.

U.S. energy-related CO₂ emissions

Petroleum emissions by product
(million metric tons)



Natural gas consumption by end use
(billion cubic feet per day)



Data source: U.S. Energy Information Administration, *Short-term Energy Outlook*, May 2023



Weather

To better reflect long-term warming trends, this month the STEO combines the 30-year trendline with the National Oceanic and Atmospheric Administration’s (NOAA) forecast to produce our weather forecasts. For the first forecast month we will continue to use data from NOAA, and for the remaining forecast period, we will use the 30-year trendline. Based on our new methodology, we now expect 1,552 cooling degree days (CDDs) in 2023 and 1,566 CDDs in 2024—an 8% increase in 2023 and a 12% increase in 2024 compared with our April 2023 STEO forecast, which was generated solely using NOAA’s 15-month forecast. Our heating degree day (HDD) forecast has been revised down from our April STEO by 1% in 2023 to 3,965 HDDs and by 4% in 2024 to 4,007 HDDs.

Table 3a. International Petroleum and Other Liquids Production, Consumption, and Inventories

U.S. Energy Information Administration | Short-Term Energy Outlook - May 2023

	2022				2023				2024				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2022	2023	2024
Production (million barrels per day) (a)															
OECD	31.62	31.88	32.54	32.97	33.34	<i>33.71</i>	<i>33.84</i>	<i>34.38</i>	<i>34.47</i>	<i>34.23</i>	<i>34.51</i>	<i>35.13</i>	32.26	<i>33.82</i>	<i>34.59</i>
U.S. (50 States)	19.44	20.12	20.60	20.67	20.93	<i>21.15</i>	<i>21.11</i>	<i>21.27</i>	<i>21.24</i>	<i>21.39</i>	<i>21.59</i>	<i>21.78</i>	20.21	<i>21.12</i>	<i>21.50</i>
Canada	5.66	5.51	5.72	5.91	5.89	<i>5.70</i>	<i>5.93</i>	<i>6.14</i>	<i>6.22</i>	<i>5.93</i>	<i>6.13</i>	<i>6.35</i>	5.70	<i>5.92</i>	<i>6.16</i>
Mexico	1.91	1.89	1.90	1.90	1.97	<i>1.97</i>	<i>1.97</i>	<i>1.95</i>	<i>1.97</i>	<i>1.96</i>	<i>1.93</i>	<i>1.89</i>	1.90	<i>1.96</i>	<i>1.94</i>
Other OECD	4.61	4.35	4.32	4.49	4.56	<i>4.89</i>	<i>4.83</i>	<i>5.01</i>	<i>5.04</i>	<i>4.95</i>	<i>4.86</i>	<i>5.11</i>	4.44	<i>4.82</i>	<i>4.99</i>
Non-OECD	67.20	66.86	68.26	68.05	67.61	<i>67.39</i>	<i>67.75</i>	<i>67.33</i>	<i>67.77</i>	<i>68.41</i>	<i>68.97</i>	<i>68.57</i>	67.60	<i>67.52</i>	<i>68.43</i>
OPEC	33.75	33.76	34.71	34.43	33.93	<i>33.75</i>	<i>33.77</i>	<i>33.58</i>	<i>34.40</i>	<i>34.42</i>	<i>34.61</i>	<i>34.35</i>	34.17	<i>33.76</i>	<i>34.45</i>
Crude Oil Portion	28.19	28.33	29.23	28.92	28.44	<i>28.39</i>	<i>28.37</i>	<i>28.14</i>	<i>28.87</i>	<i>29.02</i>	<i>29.17</i>	<i>28.87</i>	28.67	<i>28.34</i>	<i>28.99</i>
Other Liquids (b)	5.56	5.43	5.48	5.52	5.49	<i>5.36</i>	<i>5.40</i>	<i>5.44</i>	<i>5.53</i>	<i>5.40</i>	<i>5.44</i>	<i>5.48</i>	5.50	<i>5.42</i>	<i>5.46</i>
Eurasia	14.39	13.39	13.56	13.90	14.04	<i>13.46</i>	<i>13.47</i>	<i>13.55</i>	<i>13.62</i>	<i>13.61</i>	<i>13.59</i>	<i>13.67</i>	13.81	<i>13.63</i>	<i>13.62</i>
China	5.18	5.18	5.05	5.09	5.32	<i>5.24</i>	<i>5.23</i>	<i>5.28</i>	<i>5.21</i>	<i>5.24</i>	<i>5.23</i>	<i>5.27</i>	5.12	<i>5.27</i>	<i>5.24</i>
Other Non-OECD	13.89	14.53	14.94	14.63	14.32	<i>14.95</i>	<i>15.27</i>	<i>14.93</i>	<i>14.54</i>	<i>15.14</i>	<i>15.55</i>	<i>15.27</i>	14.50	<i>14.87</i>	<i>15.13</i>
Total World Production	98.83	98.74	100.80	101.02	100.95	<i>101.10</i>	<i>101.58</i>	<i>101.71</i>	<i>102.24</i>	<i>102.64</i>	<i>103.49</i>	<i>103.69</i>	99.85	<i>101.34</i>	<i>103.02</i>
Non-OPEC Production	65.08	64.98	66.09	66.58	67.02	<i>67.35</i>	<i>67.81</i>	<i>68.13</i>	<i>67.83</i>	<i>68.21</i>	<i>68.88</i>	<i>69.34</i>	65.69	<i>67.58</i>	<i>68.57</i>
Consumption (million barrels per day) (c)															
OECD	45.76	45.37	46.63	45.98	45.45	<i>45.63</i>	<i>46.44</i>	<i>46.56</i>	<i>46.15</i>	<i>45.80</i>	<i>46.62</i>	<i>46.69</i>	45.94	<i>46.02</i>	<i>46.32</i>
U.S. (50 States)	20.22	20.27	20.47	20.16	19.97	<i>20.54</i>	<i>20.72</i>	<i>20.64</i>	<i>20.51</i>	<i>20.82</i>	<i>21.00</i>	<i>20.87</i>	20.28	<i>20.47</i>	<i>20.80</i>
U.S. Territories	0.11	0.12	0.13	0.12	0.12	<i>0.12</i>	0.12	<i>0.12</i>	0.12	0.12	0.12	0.12	0.12	0.12	<i>0.12</i>
Canada	2.24	2.21	2.38	2.35	2.24	<i>2.24</i>	<i>2.34</i>	<i>2.32</i>	<i>2.30</i>	<i>2.25</i>	<i>2.35</i>	<i>2.33</i>	2.29	<i>2.28</i>	<i>2.31</i>
Europe	13.19	13.42	14.09	13.34	13.03	<i>13.44</i>	<i>13.85</i>	<i>13.61</i>	<i>13.24</i>	<i>13.39</i>	<i>13.80</i>	<i>13.56</i>	13.51	<i>13.48</i>	<i>13.50</i>
Japan	3.70	3.03	3.19	3.56	3.69	<i>3.00</i>	<i>3.11</i>	<i>3.44</i>	<i>3.55</i>	<i>2.94</i>	<i>3.04</i>	<i>3.37</i>	3.37	<i>3.31</i>	<i>3.23</i>
Other OECD	6.30	6.33	6.37	6.45	6.40	<i>6.28</i>	<i>6.31</i>	<i>6.44</i>	<i>6.43</i>	<i>6.28</i>	<i>6.30</i>	<i>6.44</i>	6.36	<i>6.36</i>	<i>6.36</i>
Non-OECD	52.78	53.66	53.78	53.72	54.43	<i>55.19</i>	<i>55.14</i>	<i>55.11</i>	<i>56.06</i>	<i>56.56</i>	<i>56.49</i>	<i>56.47</i>	53.49	<i>54.97</i>	<i>56.40</i>
Eurasia	4.28	4.43	4.73	4.65	4.29	<i>4.44</i>	<i>4.75</i>	<i>4.66</i>	<i>4.42</i>	<i>4.57</i>	<i>4.89</i>	<i>4.80</i>	4.53	<i>4.53</i>	<i>4.67</i>
Europe	0.74	0.76	0.76	0.77	0.74	<i>0.76</i>	<i>0.77</i>	<i>0.77</i>	<i>0.75</i>	<i>0.77</i>	<i>0.77</i>	<i>0.78</i>	0.76	<i>0.76</i>	<i>0.77</i>
China	15.11	15.30	14.99	15.19	15.87	<i>16.07</i>	<i>15.75</i>	<i>15.96</i>	<i>16.22</i>	<i>16.42</i>	<i>16.09</i>	<i>16.31</i>	15.15	<i>15.91</i>	<i>16.26</i>
Other Asia	13.75	13.76	13.42	13.85	14.23	<i>14.29</i>	<i>13.71</i>	<i>14.01</i>	<i>14.86</i>	<i>14.83</i>	<i>14.23</i>	<i>14.55</i>	13.69	<i>14.06</i>	<i>14.62</i>
Other Non-OECD	18.90	19.41	19.87	19.26	19.29	<i>19.64</i>	<i>20.17</i>	<i>19.71</i>	<i>19.81</i>	<i>19.97</i>	<i>20.51</i>	<i>20.04</i>	19.36	<i>19.70</i>	<i>20.08</i>
Total World Consumption	98.54	99.03	100.41	99.70	99.88	<i>100.82</i>	<i>101.58</i>	<i>101.67</i>	<i>102.21</i>	<i>102.36</i>	<i>103.11</i>	<i>103.16</i>	99.43	<i>100.99</i>	<i>102.71</i>
Total Crude Oil and Other Liquids Inventory Net Withdrawals (million barrels per day)															
U.S. (50 States)	0.81	0.51	0.45	0.41	-0.05	<i>-0.06</i>	<i>-0.19</i>	<i>0.27</i>	<i>-0.02</i>	<i>-0.37</i>	<i>-0.03</i>	<i>0.38</i>	0.54	<i>-0.01</i>	<i>-0.01</i>
Other OECD	-0.09	-0.29	-0.48	-0.26	-0.36	<i>-0.07</i>	<i>0.06</i>	<i>-0.10</i>	<i>0.00</i>	<i>0.03</i>	<i>-0.11</i>	<i>-0.29</i>	-0.28	<i>-0.12</i>	<i>-0.09</i>
Other Stock Draws and Balance	-1.00	0.06	-0.36	-1.47	-0.67	<i>-0.15</i>	<i>0.13</i>	<i>-0.21</i>	<i>-0.01</i>	<i>0.06</i>	<i>-0.24</i>	<i>-0.63</i>	-0.69	<i>-0.22</i>	<i>-0.20</i>
Total Stock Draw	-0.29	0.29	-0.39	-1.32	-1.07	<i>-0.29</i>	<i>0.00</i>	<i>-0.04</i>	<i>-0.03</i>	<i>-0.28</i>	<i>-0.38</i>	<i>-0.53</i>	-0.43	<i>-0.35</i>	<i>-0.30</i>
End-of-period Commercial Crude Oil and Other Liquids Inventories (million barrels)															
U.S. Commercial Inventory	1,154	1,180	1,215	1,222	1,227	<i>1,258</i>	<i>1,276</i>	<i>1,251</i>	<i>1,252</i>	<i>1,286</i>	<i>1,288</i>	<i>1,253</i>	1,222	<i>1,251</i>	<i>1,253</i>
OECD Commercial Inventory	2,604	2,656	2,735	2,766	2,804	<i>2,841</i>	<i>2,853</i>	<i>2,838</i>	<i>2,839</i>	<i>2,870</i>	<i>2,883</i>	<i>2,874</i>	2,766	<i>2,838</i>	<i>2,874</i>

(a) Supply includes production of crude oil (including lease condensates), natural gas plant liquids, biofuels, other liquids, and refinery processing gains.

(b) Includes lease condensate, natural gas plant liquids, other liquids, and refinery processing gain. Includes other unaccounted-for liquids.

 (c) Consumption of petroleum by the OECD countries is synonymous with "petroleum product supplied," defined in the glossary of the EIA *Petroleum Supply Monthly*,

DOE/EIA-0109. Consumption of petroleum by the non-OECD countries is "apparent consumption," which includes internal consumption, refinery fuel and loss, and bunkering.

- = no data available

OECD = Organization for Economic Cooperation and Development: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States.

OPEC = Organization of the Petroleum Exporting Countries: Algeria, Angola, Congo (Brazzaville), Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, the United Arab Emirates, Venezuela.

Notes: EIA completed modeling and analysis for this report on May 4, 2022.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

Forecasts: EIA Short-Term Integrated Forecasting System.

Table 4a. U.S. Petroleum and Other Liquids Supply, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - May 2023

	2022				2023				2024				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2022	2023	2024
Supply (million barrels per day)															
Crude Oil Supply															
Domestic Production (a)	11.47	11.70	12.06	12.31	12.54	<i>12.51</i>	<i>12.46</i>	<i>12.61</i>	<i>12.63</i>	<i>12.58</i>	<i>12.68</i>	<i>12.85</i>	11.89	<i>12.53</i>	<i>12.69</i>
Alaska	0.45	0.44	0.42	0.44	0.45	<i>0.39</i>	<i>0.41</i>	<i>0.43</i>	<i>0.43</i>	<i>0.36</i>	<i>0.39</i>	<i>0.40</i>	0.44	<i>0.42</i>	<i>0.40</i>
Federal Gulf of Mexico (b)	1.67	1.70	1.80	1.80	1.89	<i>1.92</i>	<i>1.89</i>	<i>1.92</i>	<i>1.96</i>	<i>1.94</i>	<i>1.87</i>	<i>1.92</i>	1.74	<i>1.90</i>	<i>1.92</i>
Lower 48 States (excl GOM)	9.35	9.56	9.84	10.07	10.20	<i>10.20</i>	<i>10.16</i>	<i>10.27</i>	<i>10.24</i>	<i>10.28</i>	<i>10.43</i>	<i>10.53</i>	9.71	<i>10.21</i>	<i>10.37</i>
Crude Oil Net Imports (c)	3.00	2.81	2.75	2.14	2.26	<i>2.87</i>	<i>3.36</i>	<i>2.70</i>	<i>2.52</i>	<i>3.14</i>	<i>3.02</i>	<i>2.33</i>	2.67	<i>2.80</i>	<i>2.75</i>
SPR Net Withdrawals	0.31	0.80	0.84	0.48	0.01	<i>0.28</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	0.61	<i>0.07</i>	<i>0.00</i>
Commercial Inventory Net Withdrawals	0.08	-0.03	-0.12	-0.01	-0.45	<i>0.32</i>	<i>0.16</i>	<i>-0.10</i>	<i>-0.28</i>	<i>0.11</i>	<i>0.15</i>	<i>-0.12</i>	-0.02	<i>-0.02</i>	<i>-0.03</i>
Crude Oil Adjustment (d)	0.71	0.81	0.74	0.87	0.85	<i>0.55</i>	<i>0.48</i>	<i>0.42</i>	<i>0.51</i>	<i>0.56</i>	<i>0.48</i>	<i>0.43</i>	0.78	<i>0.57</i>	<i>0.49</i>
Total Crude Oil Input to Refineries	15.56	16.09	16.26	15.80	15.21	<i>16.52</i>	<i>16.45</i>	<i>15.63</i>	<i>15.39</i>	<i>16.39</i>	<i>16.33</i>	<i>15.50</i>	15.93	<i>15.96</i>	<i>15.90</i>
Other Supply															
Refinery Processing Gain	0.95	1.07	1.05	1.01	0.99	<i>1.03</i>	<i>1.02</i>	<i>1.01</i>	<i>0.97</i>	<i>1.01</i>	<i>1.01</i>	<i>0.99</i>	1.02	<i>1.01</i>	<i>1.00</i>
Natural Gas Plant Liquids Production	5.61	5.92	6.09	5.90	5.95	<i>6.14</i>	<i>6.18</i>	<i>6.19</i>	<i>6.16</i>	<i>6.25</i>	<i>6.35</i>	<i>6.33</i>	5.88	<i>6.12</i>	<i>6.27</i>
Renewables and Oxygenate Production (e)	1.20	1.20	1.18	1.23	1.24	<i>1.25</i>	<i>1.24</i>	<i>1.24</i>	<i>1.27</i>	<i>1.32</i>	<i>1.33</i>	<i>1.38</i>	1.20	<i>1.24</i>	<i>1.33</i>
Fuel Ethanol Production	1.02	1.01	0.97	1.01	1.00	<i>1.00</i>	<i>0.99</i>	<i>0.99</i>	<i>1.01</i>	<i>1.01</i>	<i>1.00</i>	<i>1.03</i>	1.00	<i>1.00</i>	<i>1.01</i>
Petroleum Products Adjustment (f)	0.21	0.23	0.22	0.22	0.20	<i>0.22</i>	<i>0.22</i>	<i>0.22</i>	<i>0.21</i>	<i>0.22</i>	<i>0.22</i>	<i>0.22</i>	0.22	<i>0.22</i>	<i>0.22</i>
Product Net Imports (c)	-3.74	-3.99	-4.07	-3.93	-4.02	<i>-3.97</i>	<i>-4.03</i>	<i>-4.03</i>	<i>-3.75</i>	<i>-3.90</i>	<i>-4.06</i>	<i>-4.06</i>	-3.93	<i>-4.01</i>	<i>-3.94</i>
Hydrocarbon Gas Liquids	-2.14	-2.31	-2.16	-2.26	-2.46	<i>-2.52</i>	<i>-2.45</i>	<i>-2.48</i>	<i>-2.48</i>	<i>-2.58</i>	<i>-2.53</i>	<i>-2.56</i>	-2.22	<i>-2.48</i>	<i>-2.54</i>
Unfinished Oils	0.09	0.25	0.28	0.30	0.25	<i>0.28</i>	<i>0.39</i>	<i>0.20</i>	<i>0.19</i>	<i>0.25</i>	<i>0.30</i>	<i>0.19</i>	0.23	<i>0.28</i>	<i>0.23</i>
Other HC/Oxygenates	-0.09	-0.10	-0.07	-0.02	-0.06	<i>-0.04</i>	<i>-0.03</i>	<i>-0.04</i>	<i>-0.06</i>	<i>-0.04</i>	<i>-0.03</i>	<i>-0.04</i>	-0.07	<i>-0.04</i>	<i>-0.04</i>
Motor Gasoline Blend Comp.	0.40	0.60	0.48	0.40	0.41	<i>0.64</i>	<i>0.45</i>	<i>0.44</i>	<i>0.45</i>	<i>0.58</i>	<i>0.34</i>	<i>0.38</i>	0.47	<i>0.48</i>	<i>0.44</i>
Finished Motor Gasoline	-0.76	-0.73	-0.81	-0.83	-0.74	<i>-0.70</i>	<i>-0.86</i>	<i>-0.78</i>	<i>-0.82</i>	<i>-0.65</i>	<i>-0.69</i>	<i>-0.86</i>	-0.78	<i>-0.77</i>	<i>-0.76</i>
Jet Fuel	-0.04	-0.06	-0.11	-0.03	-0.03	<i>0.03</i>	<i>0.07</i>	<i>0.10</i>	<i>0.17</i>	<i>0.18</i>	<i>0.18</i>	<i>0.19</i>	-0.06	<i>0.04</i>	<i>0.18</i>
Distillate Fuel Oil	-0.81	-1.15	-1.29	-1.05	-0.77	<i>-1.01</i>	<i>-1.20</i>	<i>-1.09</i>	<i>-0.84</i>	<i>-1.17</i>	<i>-1.26</i>	<i>-1.05</i>	-1.07	<i>-1.02</i>	<i>-1.08</i>
Residual Fuel Oil	0.14	0.10	0.10	0.09	-0.01	<i>-0.01</i>	<i>0.00</i>	<i>0.04</i>	<i>0.02</i>	<i>0.07</i>	<i>0.05</i>	<i>0.14</i>	0.11	<i>0.00</i>	<i>0.07</i>
Other Oils (g)	-0.54	-0.59	-0.49	-0.53	-0.61	<i>-0.63</i>	<i>-0.40</i>	<i>-0.41</i>	<i>-0.39</i>	<i>-0.54</i>	<i>-0.43</i>	<i>-0.43</i>	-0.54	<i>-0.51</i>	<i>-0.45</i>
Product Inventory Net Withdrawals	0.42	-0.25	-0.26	-0.06	0.39	<i>-0.66</i>	<i>-0.35</i>	<i>0.38</i>	<i>0.27</i>	<i>-0.47</i>	<i>-0.18</i>	<i>0.50</i>	-0.04	<i>-0.06</i>	<i>0.03</i>
Total Supply	20.22	20.27	20.47	20.16	19.97	<i>20.54</i>	<i>20.72</i>	<i>20.64</i>	<i>20.51</i>	<i>20.82</i>	<i>21.00</i>	<i>20.87</i>	20.28	<i>20.47</i>	<i>20.80</i>
Consumption (million barrels per day)															
Hydrocarbon Gas Liquids	3.87	3.43	3.48	3.57	3.71	<i>3.43</i>	<i>3.53</i>	<i>3.83</i>	<i>3.99</i>	<i>3.50</i>	<i>3.64</i>	<i>3.88</i>	3.59	<i>3.62</i>	<i>3.75</i>
Other HC/Oxygenates	0.13	0.17	0.17	0.19	0.21	<i>0.20</i>	<i>0.20</i>	<i>0.22</i>	<i>0.22</i>	<i>0.25</i>	<i>0.27</i>	<i>0.30</i>	0.16	<i>0.21</i>	<i>0.26</i>
Unfinished Oils	0.13	0.04	0.11	0.10	0.03	<i>0.00</i>	0.09	<i>0.01</i>	<i>0.00</i>						
Motor Gasoline	8.47	9.00	8.88	8.75	8.67	<i>9.11</i>	<i>8.96</i>	<i>8.79</i>	<i>8.66</i>	<i>9.13</i>	<i>9.03</i>	<i>8.82</i>	8.78	<i>8.88</i>	<i>8.91</i>
Fuel Ethanol blended into Motor Gasoline	0.87	0.93	0.92	0.93	0.90	<i>0.96</i>	<i>0.94</i>	<i>0.92</i>	<i>0.90</i>	<i>0.96</i>	<i>0.94</i>	<i>0.95</i>	0.91	<i>0.93</i>	<i>0.94</i>
Jet Fuel	1.45	1.61	1.60	1.58	1.55	<i>1.72</i>	<i>1.79</i>	<i>1.71</i>	<i>1.66</i>	<i>1.77</i>	<i>1.82</i>	<i>1.76</i>	1.56	<i>1.69</i>	<i>1.75</i>
Distillate Fuel Oil	4.14	3.89	3.86	3.96	3.97	<i>3.94</i>	<i>3.90</i>	<i>4.00</i>	<i>4.06</i>	<i>3.97</i>	<i>3.89</i>	<i>4.01</i>	3.96	<i>3.95</i>	<i>3.98</i>
Residual Fuel Oil	0.38	0.31	0.39	0.30	0.27	<i>0.27</i>	<i>0.34</i>	<i>0.36</i>	<i>0.29</i>	<i>0.33</i>	<i>0.35</i>	<i>0.37</i>	0.34	<i>0.31</i>	<i>0.34</i>
Other Oils (g)	1.65	1.82	1.99	1.71	1.56	<i>1.87</i>	<i>2.00</i>	<i>1.73</i>	<i>1.63</i>	<i>1.86</i>	<i>2.00</i>	<i>1.73</i>	1.79	<i>1.79</i>	<i>1.81</i>
Total Consumption	20.22	20.27	20.47	20.16	19.97	<i>20.54</i>	<i>20.72</i>	<i>20.64</i>	<i>20.51</i>	<i>20.82</i>	<i>21.00</i>	<i>20.87</i>	20.28	<i>20.47</i>	<i>20.80</i>
Total Petroleum and Other Liquids Net Imports	-0.74	-1.18	-1.32	-1.79	-1.76	<i>-1.09</i>	<i>-0.67</i>	<i>-1.33</i>	<i>-1.23</i>	<i>-0.76</i>	<i>-1.04</i>	<i>-1.72</i>	-1.26	<i>-1.21</i>	<i>-1.19</i>
End-of-period Inventories (million barrels)															
Commercial Inventory															
Crude Oil (excluding SPR)	414.4	417.5	428.8	429.6	470.0	<i>441.4</i>	<i>426.9</i>	<i>436.4</i>	<i>461.6</i>	<i>451.9</i>	<i>437.8</i>	<i>448.9</i>	429.6	<i>436.4</i>	<i>448.9</i>
Hydrocarbon Gas Liquids	142.0	186.7	243.6	211.1	169.8	<i>217.5</i>	<i>258.1</i>	<i>215.9</i>	<i>174.8</i>	<i>222.7</i>	<i>261.6</i>	<i>217.1</i>	211.1	<i>215.9</i>	<i>217.1</i>
Unfinished Oils	87.9	88.8	82.3	86.1	91.1	<i>88.9</i>	<i>88.8</i>	<i>81.2</i>	<i>91.0</i>	<i>88.2</i>	<i>87.2</i>	<i>79.4</i>	86.1	<i>81.2</i>	<i>79.4</i>
Other HC/Oxygenates	34.1	29.4	27.3	31.7	33.3	<i>30.6</i>	<i>30.3</i>	<i>30.6</i>	<i>32.7</i>	<i>31.4</i>	<i>31.1</i>	<i>31.4</i>	31.7	<i>30.6</i>	<i>31.4</i>
Total Motor Gasoline	238.5	221.0	209.6	224.3	222.5	<i>229.3</i>	<i>227.9</i>	<i>242.8</i>	<i>242.4</i>	<i>239.7</i>	<i>227.7</i>	<i>236.5</i>	224.3	<i>242.8</i>	<i>236.5</i>
Finished Motor Gasoline	17.3	17.1	17.6	17.4	14.1	<i>17.8</i>	<i>20.0</i>	<i>22.8</i>	<i>19.8</i>	<i>20.1</i>	<i>21.1</i>	<i>23.2</i>	17.4	<i>22.8</i>	<i>23.2</i>
Motor Gasoline Blend Comp.	221.2	203.8	192.0	206.9	208.4	<i>211.4</i>	<i>207.9</i>	<i>220.0</i>	<i>222.7</i>	<i>219.6</i>	<i>206.5</i>	<i>213.3</i>	206.9	<i>220.0</i>	<i>213.3</i>
Jet Fuel	35.6	39.3	36.2	35.0	38.2	<i>43.3</i>	<i>43.6</i>	<i>41.8</i>	<i>42.1</i>	<i>43.8</i>	<i>44.7</i>	<i>41.2</i>	35.0	<i>41.8</i>	<i>41.2</i>
Distillate Fuel Oil	114.6	111.4	110.5	118.8	113.0	<i>121.2</i>	<i>125.6</i>	<i>126.2</i>	<i>120.8</i>	<i>123.8</i>	<i>124.8</i>	<i>124.3</i>	118.8	<i>126.2</i>	<i>124.3</i>
Residual Fuel Oil	27.9	29.2	27.3	30.7	29.6	<i>31.4</i>	<i>29.2</i>	<i>28.5</i>	<i>29.7</i>	<i>28.9</i>	<i>27.2</i>	<i>26.4</i>	30.7	<i>28.5</i>	<i>26.4</i>
Other Oils (g)	58.5	56.4	49.5	54.2	59.6	<i>54.8</i>	<i>45.9</i>	<i>47.6</i>	<i>57.0</i>	<i>55.1</i>	<i>46.0</i>	<i>47.6</i>	54.2	<i>47.6</i>	<i>47.6</i>
Total Commercial Inventory	1153.6	1179.7	1215.1	1221.6	1227.1	<i>1258.2</i>	<i>1276.2</i>	<i>1251.0</i>	<i>1252.2</i>	<i>1285.6</i>	<i>1288.2</i>	<i>1252.9</i>	1221.6	<i>1251.0</i>	<i>1252.9</i>
Crude Oil in SPR	566.1	493.3	416.4	372.0	370.9	<i>345.6</i>	345.6	345.6	345.6	345.6	345.6	345.6	372.0	<i>345.6</i>	<i>345.6</i>

(a) Includes lease condensate.

(b) Crude oil production from U.S. Federal leases in the Gulf of Mexico (GOM).

(c) Net imports equals gross imports minus gross exports.

(d) Crude oil adjustment balances supply and consumption and was previously referred to as "Unaccounted for Crude

Table 5a. U.S. Natural Gas Supply, Consumption, and Inventories
 U.S. Energy Information Administration | Short-Term Energy Outlook - May 2023

	2022				2023				2024				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2022	2023	2024
Supply (billion cubic feet per day)															
Total Marketed Production	103.27	106.18	108.27	108.90	110.70	<i>110.51</i>	<i>108.31</i>	<i>108.87</i>	<i>109.18</i>	<i>109.55</i>	<i>109.90</i>	<i>110.35</i>	106.67	<i>109.59</i>	<i>109.75</i>
Alaska	1.06	1.00	0.96	1.07	1.08	<i>0.96</i>	<i>0.86</i>	<i>0.98</i>	<i>1.00</i>	<i>0.92</i>	<i>0.84</i>	<i>0.97</i>	1.02	<i>0.97</i>	<i>0.93</i>
Federal GOM (a)	2.05	2.11	2.19	2.12	2.23	<i>2.32</i>	<i>2.23</i>	<i>2.23</i>	<i>2.24</i>	<i>2.17</i>	<i>2.03</i>	<i>2.04</i>	2.12	<i>2.26</i>	<i>2.12</i>
Lower 48 States (excl GOM)	100.16	103.07	105.12	105.71	107.39	<i>107.23</i>	<i>105.22</i>	<i>105.65</i>	<i>105.94</i>	<i>106.45</i>	<i>107.02</i>	<i>107.34</i>	103.53	<i>106.37</i>	<i>106.69</i>
Total Dry Gas Production	95.09	97.59	99.46	100.29	102.11	<i>101.93</i>	<i>99.91</i>	<i>100.42</i>	<i>100.71</i>	<i>101.05</i>	<i>101.38</i>	<i>101.80</i>	98.13	<i>101.09</i>	<i>101.24</i>
LNG Gross Imports	0.15	0.01	0.07	0.05	0.09	<i>0.04</i>	<i>0.04</i>	<i>0.06</i>	<i>0.10</i>	<i>0.04</i>	<i>0.04</i>	<i>0.06</i>	0.07	<i>0.06</i>	<i>0.06</i>
LNG Gross Exports	11.50	10.80	9.74	10.35	11.61	<i>12.32</i>	<i>12.17</i>	<i>12.33</i>	<i>12.70</i>	<i>12.60</i>	<i>12.31</i>	<i>13.30</i>	10.59	<i>12.11</i>	<i>12.73</i>
Pipeline Gross Imports	8.89	7.73	7.84	8.41	8.40	<i>6.95</i>	<i>7.07</i>	<i>7.45</i>	<i>8.18</i>	<i>6.81</i>	<i>7.04</i>	<i>7.44</i>	8.22	<i>7.46</i>	<i>7.36</i>
Pipeline Gross Exports	8.46	8.50	8.10	8.19	8.85	<i>8.44</i>	<i>8.79</i>	<i>9.20</i>	<i>9.49</i>	<i>8.88</i>	<i>9.21</i>	<i>9.64</i>	8.31	<i>8.82</i>	<i>9.31</i>
Supplemental Gaseous Fuels	0.21	0.17	0.18	0.16	0.19	<i>0.18</i>	0.18	<i>0.18</i>	<i>0.18</i>	0.18	0.18	0.18	0.18	0.18	0.18
Net Inventory Withdrawals	20.14	-10.25	-8.94	2.35	11.86	<i>-11.10</i>	<i>-6.24</i>	<i>3.79</i>	<i>14.99</i>	<i>-12.70</i>	<i>-8.10</i>	<i>3.38</i>	0.75	<i>-0.46</i>	<i>-0.62</i>
Total Supply	104.52	75.96	80.76	92.73	102.20	<i>77.25</i>	<i>80.00</i>	<i>90.36</i>	<i>101.97</i>	<i>73.90</i>	<i>79.02</i>	<i>89.92</i>	88.44	<i>87.40</i>	<i>86.19</i>
Balancing Item (b)	0.30	0.17	0.01	-0.11	0.15	<i>-0.69</i>	<i>0.80</i>	<i>0.28</i>	<i>-0.89</i>	<i>-0.15</i>	<i>0.95</i>	<i>-0.47</i>	0.09	<i>0.14</i>	<i>-0.14</i>
Total Primary Supply	104.83	76.13	80.77	92.62	102.35	<i>76.56</i>	<i>80.80</i>	<i>90.64</i>	<i>101.08</i>	<i>73.75</i>	<i>79.97</i>	<i>89.44</i>	88.53	<i>87.54</i>	<i>86.05</i>
Consumption (billion cubic feet per day)															
Residential	26.09	7.86	3.57	17.37	23.64	<i>8.27</i>	<i>4.27</i>	<i>16.64</i>	<i>24.82</i>	<i>7.86</i>	<i>4.32</i>	<i>16.64</i>	13.67	<i>13.16</i>	<i>13.39</i>
Commercial	15.61	6.67	4.74	11.69	14.33	<i>7.23</i>	<i>5.52</i>	<i>11.42</i>	<i>14.61</i>	<i>6.97</i>	<i>5.49</i>	<i>11.37</i>	9.66	<i>9.61</i>	<i>9.60</i>
Industrial	25.46	22.25	21.47	23.51	24.41	<i>21.47</i>	<i>21.05</i>	<i>23.10</i>	<i>23.84</i>	<i>20.85</i>	<i>20.66</i>	<i>22.84</i>	23.16	<i>22.50</i>	<i>22.05</i>
Electric Power (c)	28.39	30.99	42.36	30.94	30.43	<i>31.03</i>	<i>41.36</i>	<i>30.47</i>	<i>28.37</i>	<i>29.68</i>	<i>40.84</i>	<i>29.55</i>	33.20	<i>33.34</i>	<i>32.13</i>
Lease and Plant Fuel	5.26	5.41	5.51	5.55	5.64	<i>5.63</i>	<i>5.52</i>	<i>5.54</i>	<i>5.56</i>	<i>5.58</i>	<i>5.60</i>	<i>5.62</i>	5.43	<i>5.58</i>	<i>5.59</i>
Pipeline and Distribution Use	3.86	2.80	2.98	3.41	3.76	<i>2.78</i>	<i>2.95</i>	<i>3.32</i>	<i>3.72</i>	<i>2.68</i>	<i>2.91</i>	<i>3.28</i>	3.26	<i>3.20</i>	<i>3.15</i>
Vehicle Use	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	<i>0.15</i>	0.15	<i>0.15</i>	<i>0.15</i>
Total Consumption	104.83	76.13	80.77	92.62	102.35	<i>76.56</i>	<i>80.80</i>	<i>90.64</i>	<i>101.08</i>	<i>73.75</i>	<i>79.97</i>	<i>89.44</i>	88.53	<i>87.54</i>	<i>86.05</i>
End-of-period Inventories (billion cubic feet)															
Working Gas Inventory	1,401	2,325	3,146	2,927	1,857	<i>2,867</i>	<i>3,441</i>	<i>3,092</i>	<i>1,728</i>	<i>2,884</i>	<i>3,629</i>	<i>3,318</i>	2,927	<i>3,092</i>	<i>3,318</i>
East Region (d)	242	482	759	698	335	<i>638</i>	<i>849</i>	<i>712</i>	<i>307</i>	<i>623</i>	<i>865</i>	<i>754</i>	698	<i>712</i>	<i>754</i>
Midwest Region (d)	296	557	917	831	421	<i>702</i>	<i>986</i>	<i>847</i>	<i>370</i>	<i>691</i>	<i>1,027</i>	<i>900</i>	831	<i>847</i>	<i>900</i>
South Central Region (d)	587	885	1,006	1,042	921	<i>1,154</i>	<i>1,115</i>	<i>1,091</i>	<i>750</i>	<i>1,109</i>	<i>1,176</i>	<i>1,159</i>	1,042	<i>1,091</i>	<i>1,159</i>
Mountain Region (d)	90	137	184	158	80	<i>150</i>	<i>217</i>	<i>186</i>	<i>121</i>	<i>162</i>	<i>223</i>	<i>193</i>	158	<i>186</i>	<i>193</i>
Pacific Region (d)	165	240	247	169	73	<i>194</i>	<i>241</i>	<i>227</i>	<i>156</i>	<i>270</i>	<i>305</i>	<i>283</i>	169	<i>227</i>	<i>283</i>
Alaska	21	25	32	30	27	<i>29</i>	<i>34</i>	<i>31</i>	<i>25</i>	<i>28</i>	<i>33</i>	<i>29</i>	30	<i>31</i>	<i>29</i>

(a) Marketed production from U.S. Federal leases in the Gulf of Mexico.

(b) The balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

(c) Natural gas used for electricity generation and (a limited amount of) useful thermal output by electric utilities and independent power producers.

(d) For a list of States in each inventory region refer to *Weekly Natural Gas Storage Report, Notes and Definitions* (<http://ir.eia.gov/ngs/notes.html>).

- = no data available

LNG: liquefied natural gas.

Notes: EIA completed modeling and analysis for this report on May 4, 2022.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Natural Gas Monthly*, DOE/EIA-0130; and *Electric Power Monthly*, Minor discrepancies with published historical data are due to independent rounding.

Forecasts: EIA Short-Term Integrated Forecasting System.

Excerpt TC Energy Q1/23 release on Apr 28, 2023

“Over the winter construction season, the **Coastal GasLink** project progressed in line with our revised cost and schedule and is now approximately 87 per cent complete. The entire project route has been cleared, grading is approximately 99 per cent complete, welding is approximately 95 per cent complete and **we continue to target mechanical completion in late 2023**. We are pleased to announce that construction has progressed through the winter on plan and the compressor station at Wilde Lake has commenced commissioning work, including the recent introduction of natural gas as part of the transition of the facility to operations. Despite the high elevation and winter conditions, we safely completed excavation of Cable Crane Hill ahead of schedule and are now installing the final pipe through this critical path section. More than 85 per cent of all classified water crossings on the project are now complete and, in the first quarter alone, we safely completed the Clore River, Crystal, Lamprey and Owen Creek crossings. To date, over 567 km of the approximately 670 km pipeline has been backfilled with restoration activities underway in many areas. At this stage, the majority of the long-linear pipeline installation is complete and activity is shifting toward discrete work fronts with high criticality. We continue to systematically mitigate the remaining execution risks and remain focused on executing the project on time and with the highest standards of safety, quality and environmental protection. At this time there is no change to the comprehensive cost and schedule risk analysis (CSRA) described in our 2022 Annual Report.”

<https://www.coastalgaslink.com/whats-new/news-stories/2023/2023-05-09-coastal-gaslink-proactively-pauses-construction-work-in-section-3/>

May 9 2023

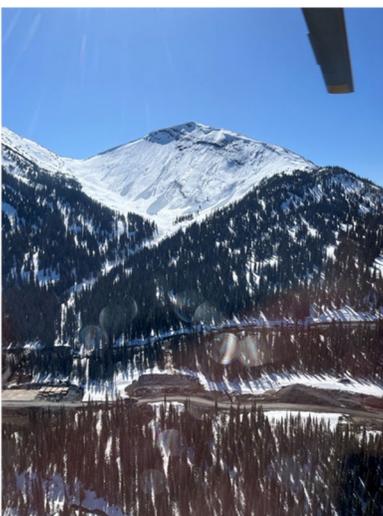
Coastal GasLink proactively pauses construction work in Section 3 ahead of stop work orders issued by B.C. EAO

Posted by Coastal GasLink

Third-party experts engaged to assess additional erosion and sediment control procedures to enhance effectiveness during accelerated spring melt

Coastal GasLink has received stop work orders from the B.C. Environmental Assessment Office (EAO) on an approximately 20-km stretch of the project route in Section 3, near the Anzac River, North of Prince George, B.C. Two weeks prior to the latest orders being issued, we halted the majority of construction in the area, so that we could enhance our erosion and sediment control measures during this challenging Spring melt season.

In addition, we have taken the added precautionary step of pausing construction across numerous project work fronts out of an abundance of caution, including non-critical construction work across Section 3. While most construction work has already been paused due to seasonal spring melt, we are dedicating additional crews to erosion and sediment control as well as critical work that would otherwise impact the environment if paused.



Mountainous terrain near the Anzac River in Section 3 of Coastal GasLink’s project route, May 2, 2023. High snow pack, intense rainfall, and steep geography are challenging erosion and sediment control on the project during spring melt.

British Columbia has some of the most challenging technical and elemental conditions in North America, with fast-changing mountain conditions in the higher elevations, and even flood events in lower valley bottoms. Like many parts of

B.C., the project route experienced high volumes of snow this winter. In Section 3, our crews hauled 5000 truckloads of snow off the project route and are working hard to protect watercourses around us. This has been made more challenging with the recent spike in temperature and exceptionally high rainfall events in the region. The complex terrain in Section 3 within the Rocky Mountains also includes high elevation and steep slopes into our work sites.

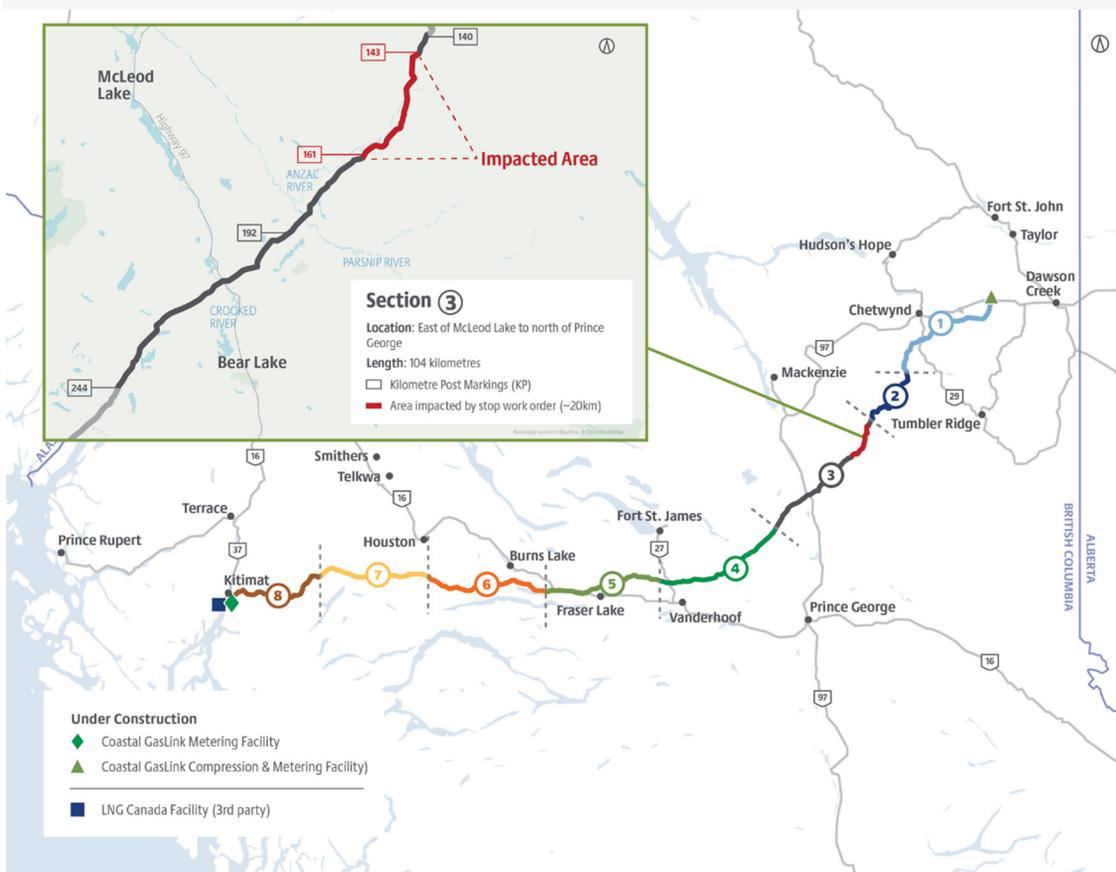
To ensure we are doing all we can during this important season, we have launched a third-party expert review of our erosion and sediment control plans and their implementation in Section 3. This review will help us identify if any additional measures are required to support our response.

We will continue to evaluate conditions and respond to water management issues if and as they arise across the project throughout the Spring melt season. We recognize that the communities and ecosystem around us rely upon the health of our watercourses. They are vitally important to us too and we are committed to doing all we can to protect them during this important season.

Construction safely progresses along select sections of the 670-km project route, with a scheduled ramp down in work during spring melt. **We continue to be on track to complete construction by the end of 2023, with approximately 67 per cent of the project complete.**

Did You Know?

Spring melt refers to the time of year when construction work, such as pipe installation, is reduced due to soft ground conditions caused by melting snow and thawing ground conditions. During this season, crews ramp down and work primarily focuses on erosion and sediment control. They ramp up again in late-May for the summer and fall construction seasons.



20-km stretch of the project route in Section 3 where construction work has halted.

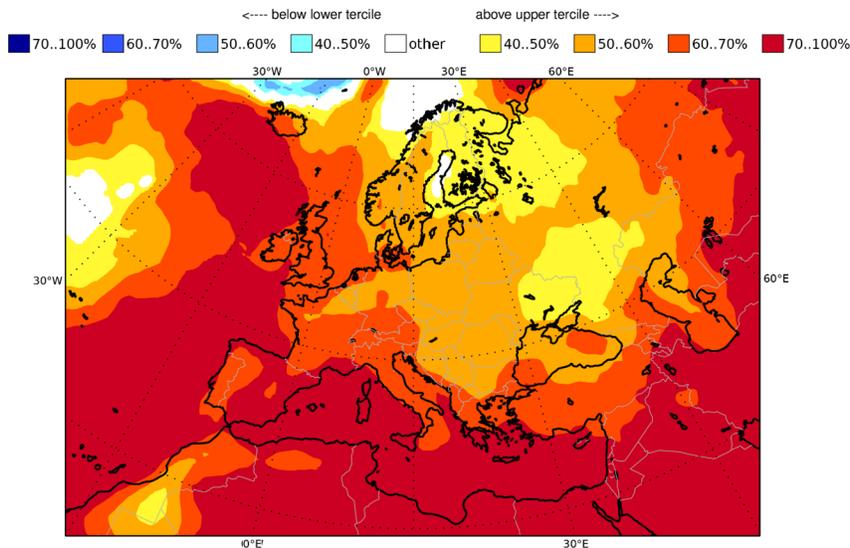
Highlights of the latest seasonal forecasts

10 MAY 2023

Forecast for European summer 2023:

- The C3S seasonal forecast initialised close to 1 May indicates enhanced probabilities for above-average rainfall over southern Europe for summer as a whole (June-August). This signal comes from the early part of the season, and is present in a few - not all - components of the C3S multi-system (see individual forecast graphs on the display page for details). The anomalies predicted - in the ensemble-mean view - are small; in reality, such amounts of rain would not make a significant difference to pre-existing drought conditions in these regions.
- For temperature, the signal is for above-average seasonal values virtually across all land areas, strongest over southern and western Europe. Both the ensemble-mean anomalies and the probabilities are lower than in the May 2022 forecast for last year's European summer, in most regions.
- Predictions for sea-surface temperature in the equatorial Pacific continue to indicate as almost certain the development of an El Niño event during the second part of this year. At the time of writing, conditions around the Tropics do not indicate an atmospheric response to these ocean conditions, which means that the basin-wide event has not yet started, and thus teleconnections (influences to areas remote from the centre of action) will be unlikely to take effect before the end of summer.

C3S multi-system seasonal forecast ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC 
Prob(most likely category of 2m temperature) JJA 2023 
Nominal forecast start: 01/05/23
Unweighted mean



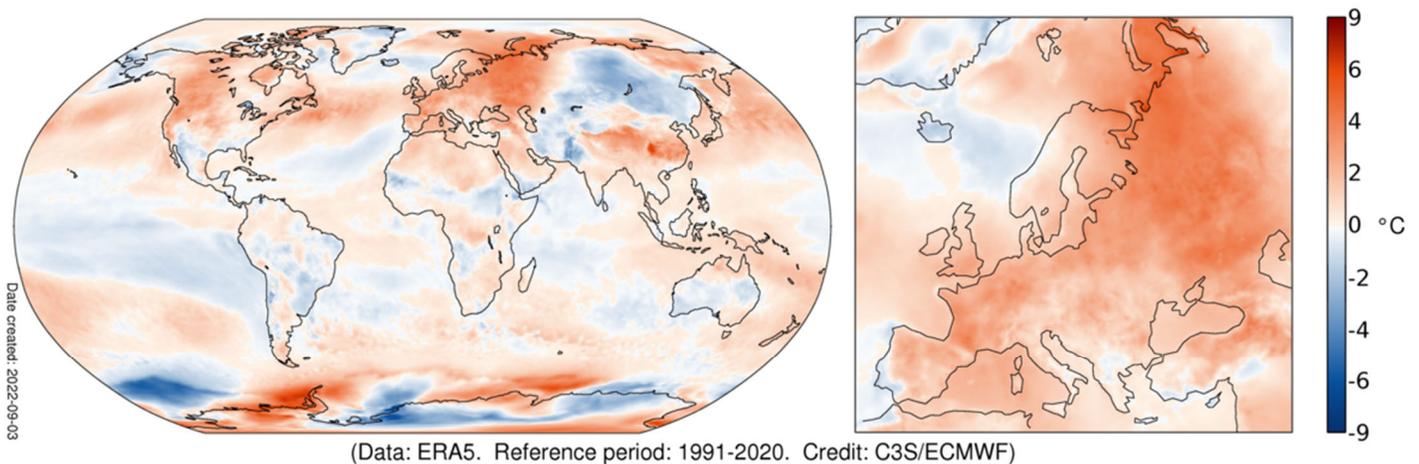
Copernicus: Summer 2022 Europe's hottest on record

DATE: 8th September 2022

Newsflash

Bonn, 08/09/2022

Surface air temperature anomaly for August 2022



PROGRAMME OF
THE EUROPEAN UNION



IMPLEMENTED BY



Surface air temperature anomaly for August 2022 relative to the August average for the period 1991-2020. Data source: ERA5. Credit: Copernicus Climate Change Service/ECMWF.

The [Copernicus Climate Change Service \(C3S\)](#), implemented by the European Centre for Medium-Range Weather Forecasts on behalf of the European Commission with funding from the EU, routinely publishes monthly climate bulletins reporting on the changes observed in global **surface air temperature**, **sea ice cover** and **hydrological variables**. All the reported findings are based on computer-generated analyses using billions of measurements from satellites, ships, aircraft and weather stations around the world.

August 2022 surface air temperature:

Globally, the average August 2022 temperature was:

- 0.3°C higher than the 1991-2020 average for the month, joint third warmest August on record

- similar to the values for August 2017 and 2021 and within about 0.1°C of the higher values reached in August 2016 and 2019

The average temperature over Europe in 2022 was:

- the highest on record for both August and summer (June – August) by substantial margins of 0.8°C over 2018 for August and 0.4°C over 2021 for summer
- European temperatures were most above average in the east of the continent in August, but were still well above average in the south-west, where they had been high also in June and July
- Heatwaves were prevalent in this part of Europe and over central and eastern China for all three summer months. North America also experienced one of its warmest summers

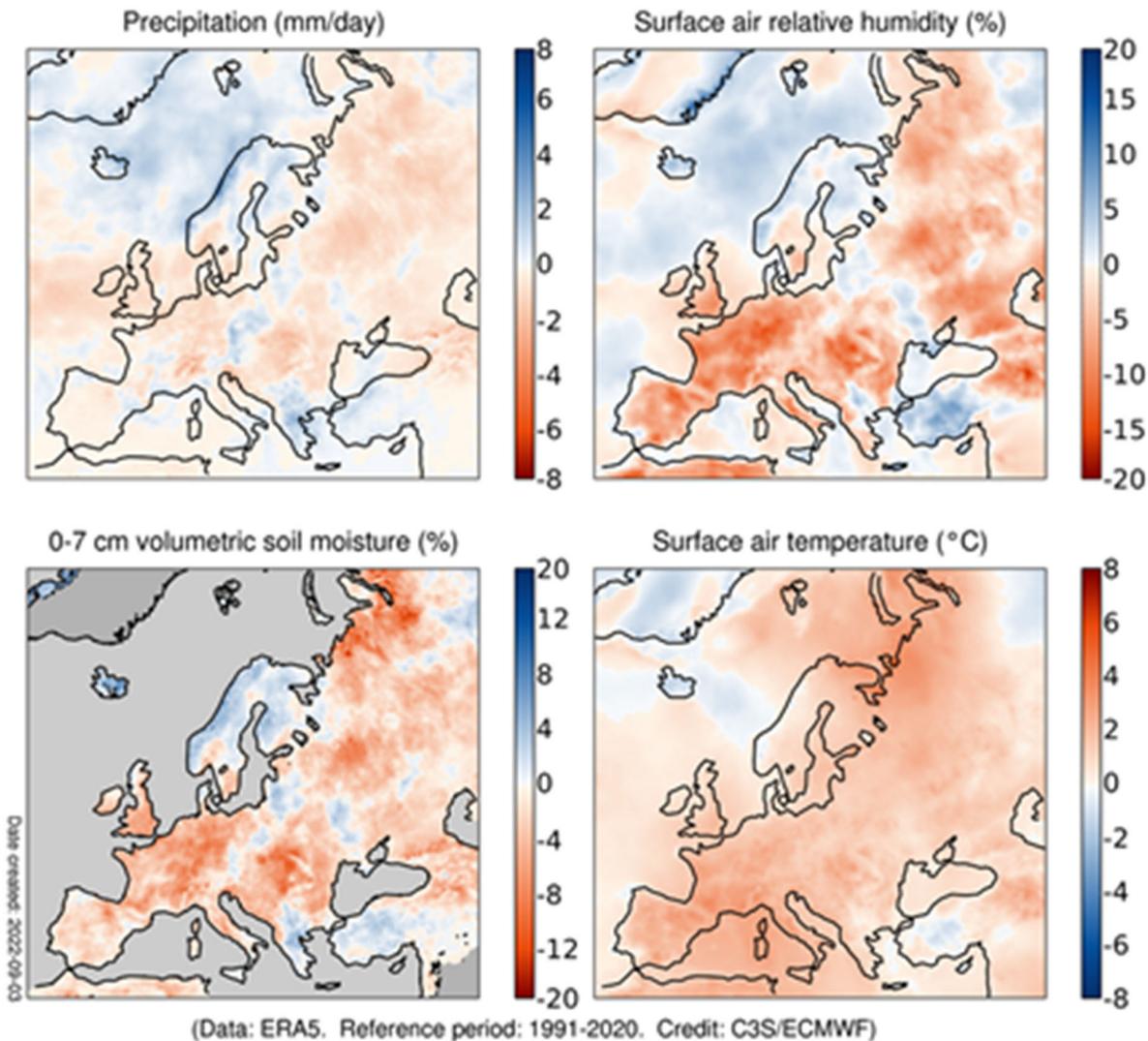
August 2022 - Hydrological conditions:

- August 2022 was generally much drier than average in much of western and parts of eastern Europe.
- Conversely, it was wetter-than average over most of Scandinavia and parts of southern and southeastern Europe. Southern regions were hit by a “derecho” storm, with extreme winds and rainfall.
- Conditions were also wetter than average in many extratropical regions of North America and Asia: in many locations heavy precipitation triggered floods and inundations. Pakistan saw particularly severe conditions with record breaking rainfall.
- Among the drier-than-average extratropical regions, parts of China experienced severe drought.

Boreal summer 2022 - Hydrological conditions:

- The summer 2022 was characterised by hot and dry conditions over much of western Europe. In much of Scandinavia, regions of central and south-eastern Europe, Greece and western Turkey, conditions were predominantly wetter than average.
- In boreal summer 2022, it was drier than average in central North and South America and across central Asia. The Horn of Africa continued to experience drought. Conditions were predominantly wetter-than-average in south Asia, particularly in Pakistan, in eastern Australia and in most of southern Africa.

Anomalies for June to August 2022



Anomalies in precipitation, the relative humidity of surface air, the volumetric moisture content of the top 7 cm of soil and surface air temperature for summer (June to August 2022) with respect to 1991-2020. The darker grey shading denotes where soil moisture is not shown due to ice cover or climatologically low precipitation. Data source: ERA5 Credit: Copernicus Climate Change Service/ECMWF.

Senior Scientist for the Copernicus Climate Change Service, Freja Vamborg, states: “An intense series of heatwaves across Europe paired with unusually dry conditions, have led to a summer of extremes with records in terms of temperature, drought and fire activity in many parts of Europe, affecting society and nature in various ways. The Copernicus Climate Change Service data shows that we’ve not only had record August temperatures for Europe but also for summer, with the previous summer record only being one year old.”

Video material accompanying the maps can be found [here](#).

More information about climate variables in August and climate updates of previous months as well as high-resolution graphics and the video can be downloaded [here](#).

Answers to frequently asked questions regarding temperature monitoring can be found [here](#).

Information about the C3S data set and how it is compiled

Temperature and hydrological maps and data are from ECMWF Copernicus Climate Change Service's ERA5 dataset.

Sea ice maps and data are from a combination of information from ERA5, as well as from the EUMETSAT OSI SAF Sea Ice Index v2.1, Sea Ice Concentration CDR/ICDR v2 and fast-track data provided upon request by OSI SAF.

Regional area average quoted here are the following longitude/latitude bounds:

Globe, 180W-180E, 90S-90N. over land and ocean surfaces.

Europe, 25W-40E, 34N-72N, over land surfaces only.

More information can be found [here](#).

Information on national records and impacts

Information on national records and impacts are based on national and regional reports. For details see the respective temperature and hydrological [C3S climate bulletin](#) for the month.

C3S has followed the recommendation of the World Meteorological Organisation (WMO) to use the most recent 30-year period for calculating climatological averages and changed to the reference period of 1991-2020 for its C3S Climate Bulletins covering January 2021 onward. Figures and graphics for both the new and previous period (1981-2010) are provided for transparency.

More information on the reference period used, can be found [here](#).

Notes to editors

Copernicus is a component of the European Union's space programme, with funding by the EU, and is its flagship Earth observation programme, which operates through six

thematic services: Atmosphere, Marine, Land, Climate Change, Security and Emergency. It delivers freely accessible operational data and services providing users with reliable and up-to-date information related to our planet and its environment. The programme is coordinated and managed by the European Commission and implemented in partnership with the Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium-Range Weather Forecasts (ECMWF), EU Agencies and Mercator Océan, amongst others.

ECMWF operates two services from the EU's Copernicus Earth observation programme: the Copernicus Atmosphere Monitoring Service (CAMS) and the Copernicus Climate Change Service (C3S). They also contribute to the Copernicus Emergency Management Service (CEMS), which is implemented by the EU Joint Research Council (JRC). The European Centre for Medium-Range Weather Forecasts (ECMWF) is an independent intergovernmental organisation supported by 35 states. It is both a research institute and a 24/7 operational service, producing and disseminating numerical weather predictions to its Member States. This data is fully available to the national meteorological services in the Member States. The supercomputer facility (and associated data archive) at ECMWF is one of the largest of its type in Europe and Member States can use 25% of its capacity for their own purposes.

ECMWF has expanded its location across its Member States for some activities. In addition to an HQ in the UK and Computing Centre in Italy, offices with a focus on activities conduct



North Dakota Department of Mineral Resources May Director's Cut and March 2023 Production Numbers

Oil Production Numbers

February	32,447,435 barrels	= 1,158,837 barrels/day (final)	RF +16%
New Mexico	48,179,691 barrels	= 1,720,703 barrels/day	+3%
March	34,803,491 barrels	= 1,122,693 barrels/day	-3% RF +12%
	1,519,037	all-time high Nov 2019	
	1,083,091 barrels/day	= 97% from Bakken and Three Forks	
	39,602 barrels/day	= 3% from Legacy Pools	

Revised Revenue Forecast **1,000,000 barrels/day**

Crude Price (\$barrel)	ND Light Sweet	WTI	ND Market
February	71.32	76.86	72.43 RF-3%
March	69.80	73.37	69.86 RF-7%
Today	65.00	70.87	67.94 RF-9%
All-time high (6/2008)	125.62	134.02	126.75
Revised Revenue Forecast			75.00

Gas Production and Capture

February - Final	85,060,275 MCF	=	3,037,867 MCF/Day	
95% Capture	80,460,378 MCF	=	2,873,585 MCF/Day	
March	94,577,637 MCF	=	3,050,892 MCF/Day	+0%
95% Capture	89,885,715 MCF	=	2,899,539 MCF/Day	
			3,179,517 all-time high 9/2022	
			3,021,655 all-time high 9/2022	

Wells Permitted	Drilling	
February	70	
March	89	
April	89	All-time high 370 in 10/2012

Rig Count		
February	46	
March	45	
April	43	
Today	39	All-time high 218 in 5/29/2012
Federal Surface	0	
New Mexico	107	

Waiting on Completions	
February	487
March	483

Inactive	
February	1,900
March	1,900

Completed		
February	96 (Preliminary)	
March	62 (Preliminary)	
April	51 (Preliminary)	RF-15%
Revised Rev Forecast	30-40-50- <u>60</u>	

Producing		
February	17,506	
March	17,650 (Preliminary)	All-time high 17,791 in 10/2022
	15,446 wells	88% are now unconventional Bakken/Three Forks Wells
	2,204 wells	12% produced from legacy conventional pools

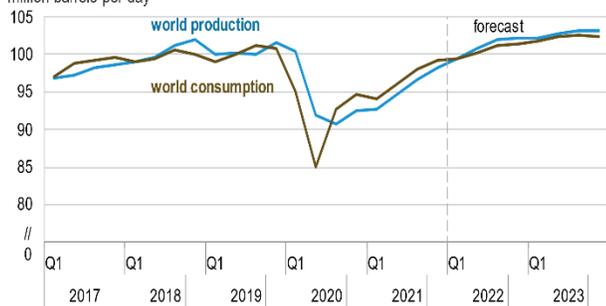
Fort Berthold Reservation Activity

	Total	Fee Land	Trust Land
Oil Production (barrels/day)	144,190	51,091	93,099
Drilling Rigs	7	3	4
Active Wells	2,641	648	1,993
Waiting on Completion	29		
Approved Drilling Permits	229	32	197
Potential Future Wells	3,911	1,116	2,795

Comments:

The drilling rig count has fallen to 39 due to road restrictions but is expected to return to the mid-forties with a gradual increase expected over the next 2 years.

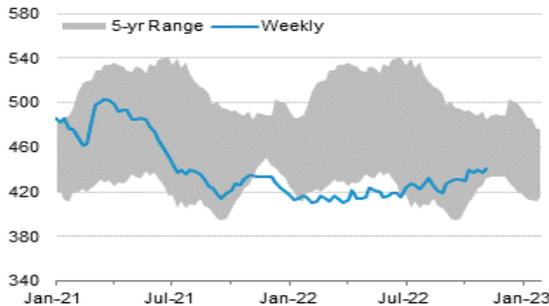
World liquid fuels production and consumption balance
million barrels per day



There are 18 frac crews currently active.

OPEC+ announced unilateral oil production cuts earlier this month amounting to 1.7 million barrels per day (bpd), bringing total cuts by the group to 3.7 million bpd until the end of the year. Russia sanctions, China economic activity, looming recessions, and shifting crude oil supply chains continue to create significant price volatility.

U.S. crude oil stocks
million barrels



Crude oil transportation capacity including rail deliveries to coastal refineries is adequate, but could be disrupted due to:

US Appeals Court for the ninth circuit upholding of a lower court ruling protecting the Swinomish Indian Tribal Community's right to sue to enforce an agreement that restricts the number of trains that can cross its reservation in northwest Washington state.

DAPL Civil Action No. 16-1534 continues, but the courts have now ruled that DAPL can continue normal operations until the

USACOE EIS is completed.

Drilling activity is expected to slowly increase with operators maintaining a permit inventory of approximately 12 months.

There are 0 active, 1 recording, 0 NDIC reclamation projects, 0 remediating, 0 permitted, 6 suspended surveys.

US natural gas storage is 18% above the five-year average. Both US and world crude oil inventories are slightly above average while the US strategic petroleum reserve is at the lowest level since 1983.

The price of natural gas delivered to Northern Border at Watford City has increased \$0.03 to \$1.78/MCF today, it is at the lowest level since 3rd quarter 2020 during the pandemic. There is currently enormous oversupply in the Midwest US and LNG prices in Europe have decreased to fourth quarter 2021 levels. Current oil to gas price ratio is 38:1. The state-wide gas flared volume from February to March decreased 12.9 MMCFD to 151.4 MMCF per day, the statewide percent flared was unchanged at 5% and Bakken gas capture percentage was unchanged at 95%. The historical high flared percent was 36% in 09/2011.

Gas capture details are as follows:

Statewide	95%
Statewide Bakken	95%
Non-FBIR Bakken	95%
FBIR Bakken	97%
Trust FBIR Bakken	97%
Fee FBIR	95%
Big Bend	93%
Deep Water Creek Bay	59%
Twin Buttes	60%
Charlson	88%

The Commission established the following gas capture goals:

74%	October 1, 2014 - December 31, 2014
77%	January 1, 2015 - March 31, 2016
80%	April 1, 2016 - October 31, 2016
85%	November 1, 2016 - October 31, 2018
88%	November 1, 2018 - October 31, 2020
91%	November 1, 2020

BLM On 1/27/21 President Biden issued an executive order that mandates a “pause” on new oil and gas leasing on federal lands, onshore and offshore, “to the extent consistent with applicable law,” while a comprehensive review of oil and gas permitting and leasing is conducted by the Interior Department. There is no time limit on the review, which means the president’s moratorium on new leasing is indefinite. The order does not restrict energy activities on lands the government holds in trust for Native American tribes.

On 7/7/21 North Dakota sued the Department of Interior (DOI), Secretary of Interior Debra Haaland, Bureau of Land Management (BLM), Director of the BLM Nada Culver, and Director of the Montana-Dakotas BLM John Mehlhoff in US District Court for the District of North Dakota. The lawsuit requested the court:

Compel the Federal Defendants to hold quarterly lease sales. Oral arguments are scheduled for 1/12/22 in Bismarck.

Prohibit the Federal Defendants from cancelling quarterly lease sales.

Enjoin the Secretary implementing a moratorium on federal lease sales.

Declare that Federal Defendants are in violation of MLA, FLPMA, NEPA, and APA.

Grant other relief sought and as the court deems proper to remedy the violations.

On 01/14/2022 Judge Traynor denied North Dakota's motion without prejudice. In the Order on Mandamus, the Court noted that "a fully developed factual record is necessary to resolve the instant dispute." The Court also held that because Federal Defendants had given the Court "assurances at the hearing the process to start Federal oil and gas leasing sales in North Dakota was imminent" mandamus relief was "unnecessary." However, the Court noted that "if the Defendants do not hold to their word and cancel any planned future sale, North Dakota may bring this action for review of the specifically cancelled sales once this Court has the benefit of a complete record.". Federal Defendants cancelled the Q1 2022 lease sale, but held a small Q2 sale.

North Dakota filed a motion for preliminary injunction on 1/6/23, a hearing on the motions was held 2/21/23 in Minot with final briefing documents filed 3/14/23. On 3/27/23 U.S. District Judge Daniel Traynor in Bismarck ordered the Bureau of Land Management (BLM) to resume conducting quarterly oil and gas lease sales in North Dakota that had been illegally cancelled by BLM.

On 6/28/22 DAKOTA RESOURCE COUNCIL, CENTER FOR BIOLOGICAL DIVERSITY, CITIZENS FOR A HEALTHY COMMUNITY, LIVING RIVERS & COLORADO RIVERKEEPER, MONTANA ENVIRONMENTAL INFORMATION CENTER, RIO GRANDE RIVERKEEPER, SIERRA CLUB, WATERKEEPER ALLIANCE, WESTERN WATERSHEDS PROJECT, and WILDEARTH GUARDIANS sued DOI to challenge leasing decisions on 173 parcels including those in North Dakota. On 8/09/2022 the U.S. District Court in DC granted North Dakota's Motion to Intervene in the NGO's challenge to the legality of BLM's quarterly lease sales in Dakota Resource Council et al. v. U.S. Department of the Interior et al., 1:22-cv-01853-CRC.

On 9/6/22 the BLM and a group of NGOs filed a proposed settlement in the District Court of Montana in which BLM agrees to not issue drilling permits on 2019 and 2020 federal leases in North Dakota, Montana and South Dakota pending the completion of revised NEPA analyses that must take into account factors such as the social cost of carbon. This illustrates the revival of the "sue and settle" litigation strategy whereby the Biden Administration settles litigation brought by NGOs in a manner that furthers the Biden Administration's policy goals. The case was filed on 1/12/2021 by the same group of NGOs involved in North Dakota's leasing cases. The proposed settlement would cover 5 lease sales that authorized the sale of 113 leases encompassing 58,617 acres in North Dakota, Montana, and South Dakota. 55 North Dakota Parcels, 9,564.347 Federal Acres in North Dakota, leases Expire in 2029 and 2030 so if permitting is delayed 7-8 years 130 wells will not be drilled, 58,329,000 barrels of oil will not be produced, GrossProductionTax + OilExtractionTax + SalesTax + PersonalIncomeTax + FedRoyaltyShare + NDTLRoyalties @ \$50/barrel = \$8,006,217 per month = \$960,746,074 in ten years.

BLM has posted for comment NEPA Number: DOI-BLM-HQ-3100-2023-0001-EA, Project Name: Supplemental Environmental Assessment Analysis for Greenhouse Gas Emissions Related to Oil and Gas Leasing in Seven States from February 2015 to December 2020, Project Type: Environmental Assessment, Project Status: In Progress - Public Review and Comment Period, Lead Office: HQ-310. Bureau of Land Management has released an updated environmental assessment for public comment. The additional review analyzes greenhouse gas emissions that may result from reasonably foreseeable development of 3,600 oil and gas leases that were sold in 74 lease sales between February 2015 and December 2020 that were the subject of litigation. The leases span approximately 3,433,615 acres in Colorado, Montana, New Mexico, Utah, Wyoming, North Dakota, and South Dakota. The environmental analysis looks at the development activity that would result in greenhouse gas emissions due to well development and production operations, as well as the end-use of the petroleum products produced from oil and gas leases. The supplemental analysis is in response to numerous court rulings and settlements. It incorporates new information and ensures

consistency with recent court decisions, Executive and Secretarial Orders, and Department of the Interior policy. This analysis of greenhouse gas emissions supplements the greenhouse gas analysis provided in the previous National Environmental Policy Act (NEPA) documents supporting the 74 lease sales. The previous environmental assessments or determinations of NEPA adequacy, decision records, and findings of no significant impacts for the 74 lease sales are listed on BLM's State Oil and Gas Lease Sale website, which contains detailed information for the lease sales in each field office. Decisions related to the affected lease sales will be made separately and will include additional analysis of impacts to other resources, as appropriate. NDIC comments are available by request at [Contact | Department of Mineral Resources, North Dakota \(nd.gov\)](#).

BLM published a new final rule 43 CFR Parts 3100, 3160 and 3170 to update and replace its regulations on venting and flaring of natural gas, effective 1/17/16. The final rule can be viewed online at <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/methane-and-waste-prevention-rule>. North Dakota, Wyoming, Montana, Western Energy Alliance, and IPAA filed for a preliminary injunction to prevent the rule going into effect until the case is settled. A hearing in Casper, Wyoming was held 1/6/17. On 1/16/17 the court denied all of the petitioners' motions for preliminary injunctions. **On 2/3/17 the US House of Representatives voted 221-191 to approve a Congressional Review Act resolution against the rule.** On 3/28/17 President Trump issued an executive order which in part directs "The Secretary of the Interior shall review the following final rules, and any rules and guidance issued pursuant to them, for consistency with the policy set forth in section 1 of this order and, if appropriate, shall, as soon as practicable, suspend, revise, or rescind the guidance, or publish for notice and comment proposed rules suspending, revising, or rescinding those rules". This rule is included in the list as item (iv). North Dakota plans to continue active participation in the litigation of this rule until the BLM takes final action eliminating the rule. **On 5/10/17 the Senate voted 51 to 49 against the CRA, allowing the rule to remain in effect.**

The Bureau of Land Management (BLM) is proposing new regulations very similar to the venting, flaring, and leaks during oil and gas production activities on Federal and Indian leases rules of 2016 that were struck down by the court. The proposed regulations would be codified in the Code of Federal Regulations and would replace the BLM's current requirements governing venting and flaring, which are more than four decades old. NDIC comments are available by request at [Contact | Department of Mineral Resources, North Dakota \(nd.gov\)](#)

BLM The Bureau of Land Management on 1/20/23 announced the North Dakota Draft Resource Management Plan and its associated draft environmental impact statement are available for public comment for a 90-day period ending April 20, 2023. The comment period has been extended to end 5/20/23. The draft resource management plan and draft environmental impact statement address management of approximately 58,500 acres of BLM-administered surface and 4.1 million acres of federal mineral estate in North Dakota for the next 20 to 30 years. Key issues raised during the public scoping period included mineral and energy resources, wildlife, recreation, water resources, air, and climate. In response to Tribal concerns, a "no surface occupancy" lease stipulation within a half mile of the Missouri River, Lake Sakakawea, and Lake Oahe has been added to the alternatives included in the documents. This stipulation is consistent with the Mandan, Hidatsa and Arikara Nation's Tribal Resolution and recognizes the regional importance of the Missouri River as a major supply of public drinking water. The drafts and additional documents associated with this project, as well as a venue to submit comments, are available on the ePlanning webpage: <https://eplanning.blm.gov>. Search using the NEPA number: DOI-BLM-MT-C030-2020-0085-RMP-EIS. Written comments related to the documents may also be submitted by mail to: North Dakota Field Office, Attention: North Dakota RMP/EIS, 99 23rd Ave. West, Suite A, Dickinson, ND 58601. The BLM will hold public meetings (in-person and/or virtual) to exchange information and collect comments. When these meetings are planned, details will be listed on the ePlanning page and announced

MONTHLY UPDATE

MAY 2023 PRODUCTION & TRANSPORTATION

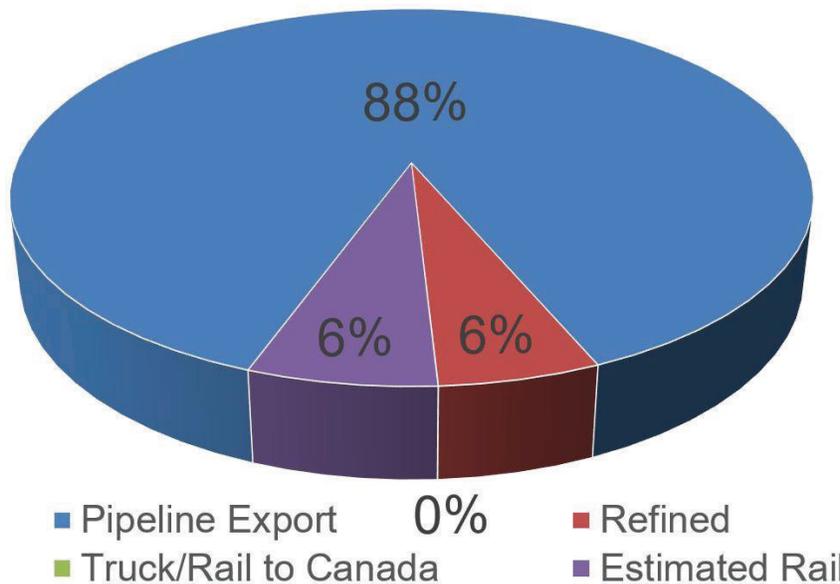
North Dakota Oil Production

Month	Monthly Total, BBL	Average, BOPD
Feb. 2023 - Final	32,447,435	1,158,837
Mar. 2023 - Prelim.	34,803,491	1,122,693

North Dakota Natural Gas Production

Month	Monthly Total, MCF	Average, MCFD
Feb. 2023 - Final	85,060,275	3,037,867
Mar. 2023 - Prelim.	94,577,637	3,050,892

Estimated Williston Basin Oil Transportation, Mar. 2023



CURRENT DRILLING ACTIVITY:

NORTH DAKOTA¹

39 Rigs

EASTERN MONTANA²

1 Rigs

SOUTH DAKOTA²

0 Rigs

SOURCE (MAY 12, 2023):

1. ND Oil & Gas Division
2. Baker Hughes

PRICES:

Crude (WTI): \$70.00

Crude (Brent): \$74.08

NYMEX Gas: \$2.20

SOURCE: BLOOMBERG
(MAY 12, 2023 1PM EST)

GAS STATS*

95% CAPTURED & SOLD

4% FLARED DUE TO
CHALLENGES OR
CONSTRAINTS ON EXISTING
GATHERING SYSTEMS

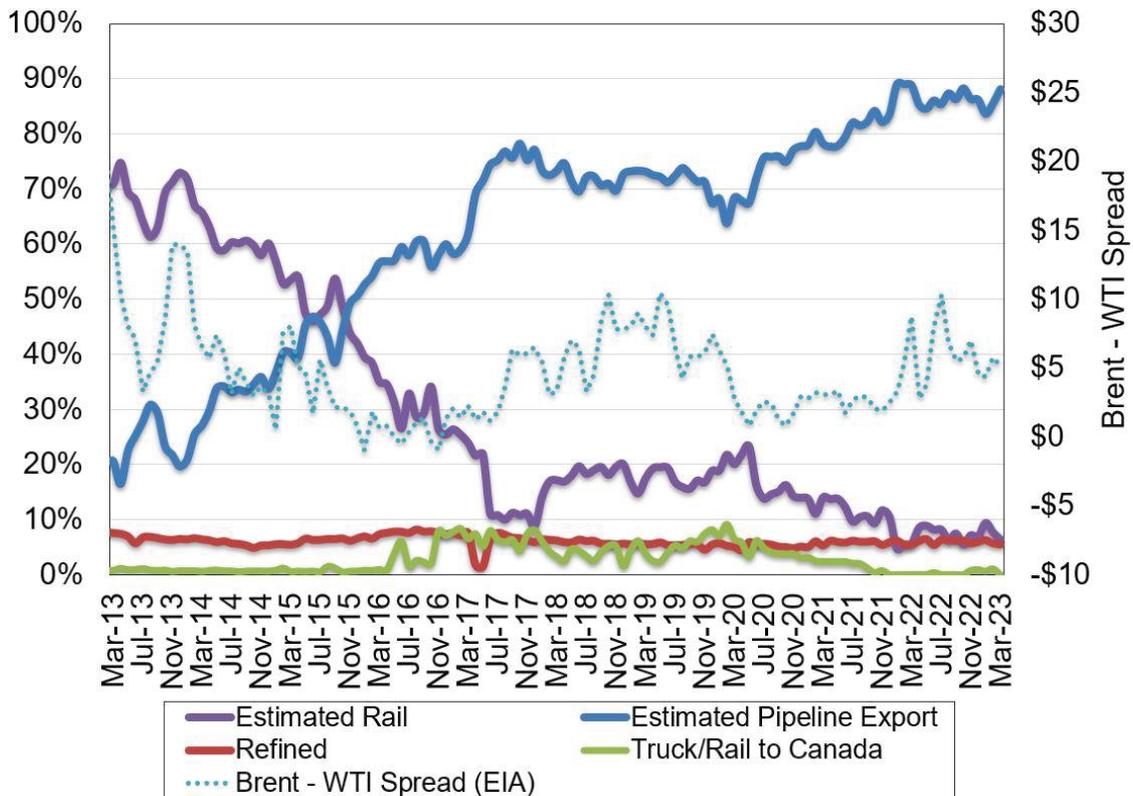
1% FLARED FROM WELL
WITH ZERO SALES

*MAR. 2023 NON-CONF DATA

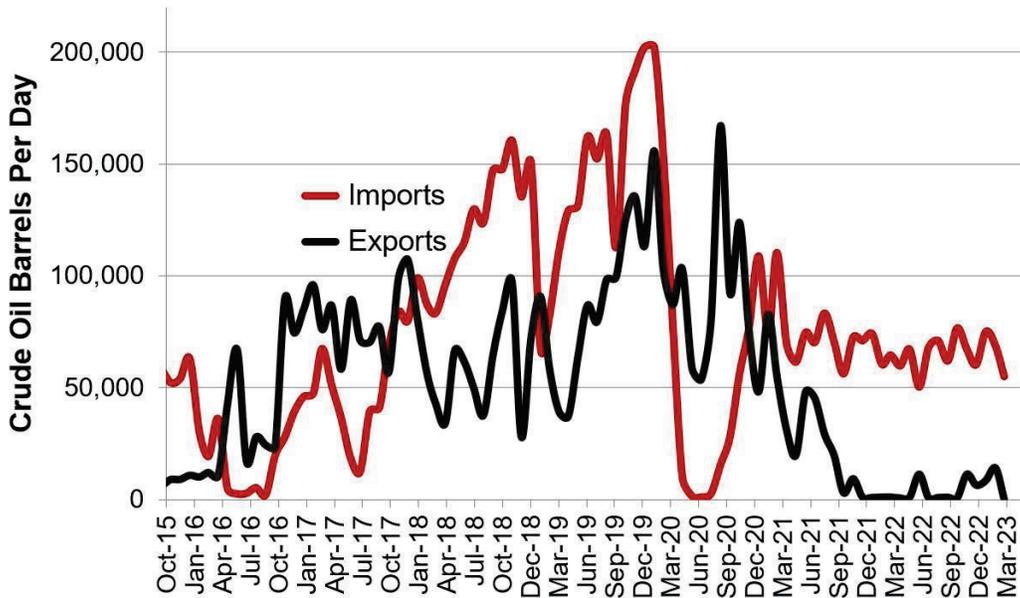
Estimated North Dakota Rail Export Volumes



Estimated Williston Basin Oil Transportation

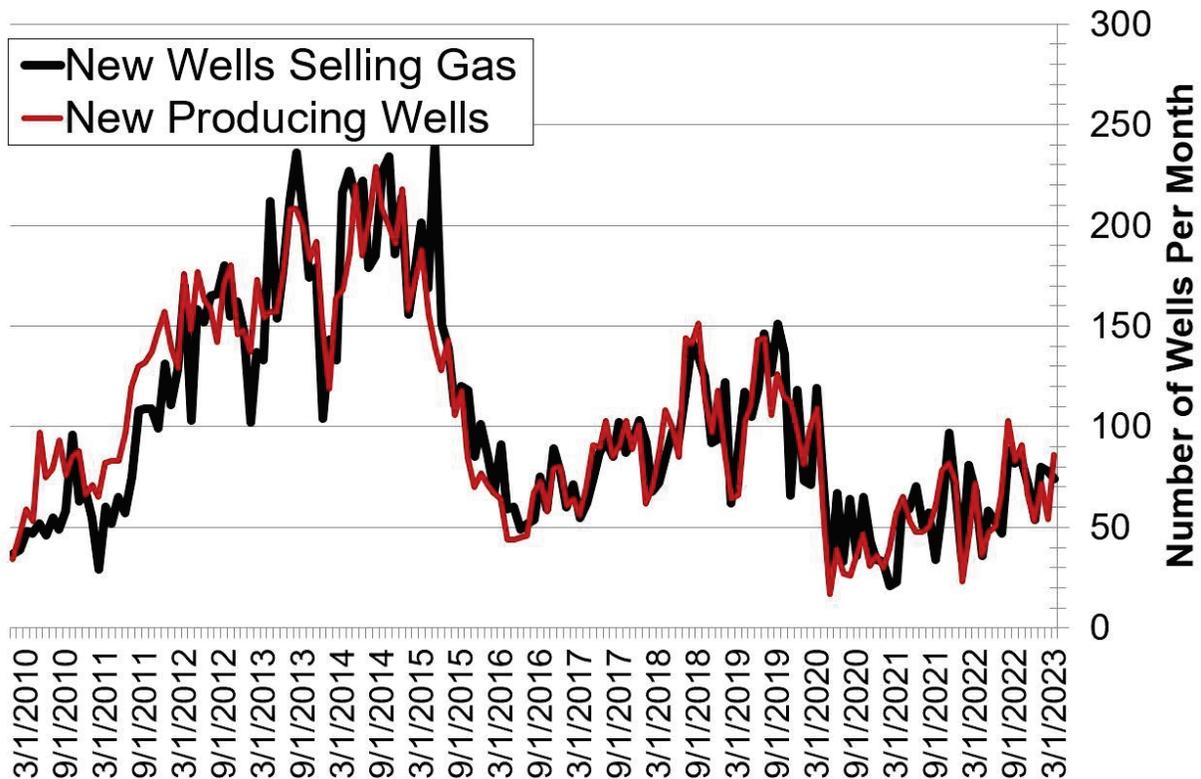


Williston Basin Truck/Rail Imports and Exports with Canada



Data for imports/exports chart is provided by the US International Trade Commission and represents traffic across US/Canada border in the Williston Basin area.

New Gas Sales Wells per Month



US Williston Basin Oil Production, BOPD

2022

MONTH	ND	EASTERN MT*	SD	TOTAL
January	1,091,931	51,895	2,709	1,146,535
February	1,095,503	51,165	2,742	1,149,410
March	1,129,936	54,580	2,709	1,187,225
April	908,697	54,118	2,338	965,153
May	1,062,228	52,545	2,648	1,117,421
June	1,099,366	63,258	2,764	1,165,388
July	1,073,624	60,604	2,774	1,137,002
August	1,075,801	60,526	2,756	1,139,083
September	1,126,138	58,110	2,679	1,186,927
October	1,122,122	54,178	2,621	1,178,921
November	1,098,415	56,582	2,682	1,157,679
December	957,864	56,715	2,199	1,016,778

2023

MONTH	ND	EASTERN MT*	SD	TOTAL
January	1,061,106	60,015	2,610	1,123,731
February	1,158,837	62,345	2,475	1,223,657
March	1,122,693			
April				
May				
June				
July				
August				
September				
October				
November				
December				

* Eastern Montana production composed of the following Counties: Carter, Daniels, Dawson, Fallon, McCone, Powder River, Prairie, Richland, Roosevelt, Sheridan, Valley, Wibaux

Warren Buffet & Charlie Munger on shale

SAF Group created transcript of comments by Warren Buffett, Charlie Munger, Greg Abel, and Ajit Jain in the Q&A of the 2023 Berkshire Hathaway annual meeting from CNBC 5hr 16 min video.

<https://www.cnbc.com/video/2023/05/06/watch-warren-buffett-and-charlie-munger-preside-over-full-2023-berkshire-hathaway-annual-meeting.html?&qsearchterm=berkshire>

Items in "italics" are SAF Group created transcript

3 hr 51:30 min mark, asked on their investments in Occidental and Chevron in light of some views that Permian oil production may have peaked.

Buffett: *"it's really interesting about oil and Charlie knows way more about oil than I do. When did you buy that royalty near Bakersfield or wherever it is. That was before I met you?"* Munger "no, it wasn't before, Yes it was, it was just before. And that goddam royalty is still paying me \$70,000 a year." Buffett *"what'd you pay for it"*. Munger *"a thousand dollars"*. Buffett *"now that's the opposite of the Permian. My dad bought a thousand or \$1,500 worth of royalties, before he died in 1964. He left them to my mother, my mother left them to her two daughters. My older sister died and my younger sister is here today and she gets these checks every month. She knows about all these different fields and what they're producing. And that's the reality of half of the oil production, or something around that in the US. And the other half is shale and, you know if you've gone to the movies and ever watched oil. You never watch the things pumping oil out in California, you'd see these gushers of oil. Well, in the Permian, this should sink in on you, in the first day, the first day when you bring in a well, it may be 12,000 barrels, it may be 15,000 barrels. It's dangerous. Occidental had one come in at 19,000 barrels or something like that. One day. And in a year, a year and a half, it becomes practically nothing. It's a different business, in effect. In the US, it's interesting, we use, what do we use maybe 11 and a fraction, we produce at 11 and a fraction million barrels of oil equivalent a day. But if shale stopped, it would drop to 6 million very fast. Well, just imagine taking 5 million barrels a day out of the production in the world. And then we're also taking down our Strategic Petroleum Reserve. Strategic Petroleum Reserve is the ultimate oil field, you don't have to drill, we've got it. And it was supposed to be Strategic, but it gets involved in politics. The oil business, different kinds of business basically. We like Occidental's position in the Permian. We wouldn't like that position if, well it got to minus one day, minus \$30 a barrel, that was crazy of course. But if oil sells at x, you do very well, if sells half of x, your costs are the same, it doesn't change the production, it doesn't work as well, but it also brings down the oil production of the US very fast. We don't know what oil prices will be, but we do very much like the Occidental position they have and that's why we financed them a few years ago when it looked like a terrible mistake. she [Occidental CEO Vicki Holub] knows what happens beneath the surface. I know the math of it. I wouldn't have the faintest idea to do if I was in an oil field. I can dig two feet down in my backyard and that's my understanding of subsoil in the world. I can't picture the field that Charlie has been collecting that monthly check from for 50+ years, 60 years roughly. Or my sister's getting at various fields where they just keep pumping and pumping and pumping. We in the US are lucky to have the ability to produce the kind of oil we've got from shale, but it is not a long-term source like you might think by watching movies about oil, or the sort. Charlie do you have anything to add".* Munger *"Yeah, it really dies fast, those shale wells. If you like quick death in your oil wells, we have them for you"*.

Buffett *"Occidental, they're doing a lot of good things."* Munger *"Yeah, they drill a lot of new wells and they're doing it at a profit but it's different kind of oil"*. Buffett *"it's just different. And that's true of almost half the oil produced in the US."* Munger *"there's a lot oil down there that nobody knows how to produce. And they've been working at it for like 50 years, but they worked at the existing shale production for about 50 years before they figured it out. And it was weirdly complicated when they were finally able to do it. There is only one type of sand that works"*. Buffett *"can you imagine a horizontal pipe maybe a mile and a half, it's just so different than what you think about"*. Munger *"it goes laterally for three miles, two miles down. How the hell do you drill two or three miles laterally when you are already two or three miles under the earth. They've mastered a lot of very tricky technology to get the oil out of these wells at all."* Buffett *"we love the position with Occidental, we love having Vicki run it."* Munger *"there is a lot more oil down there if anybody can figure out another magic trick. That's all we need is another magic trick."* Buffett *"Occidental has some other things too. The price of oil is still is incredibly important in terms of the economics of short-lived oil, no question about that. Incidentally, there is speculation about us buying control, we're not going to buy control. We don't want to run it. We've got the right management running it. We wouldn't know what to do with it."*

Prepared by SAF Group <https://safgroup.ca/news-insights/>

<https://www.reuters.com/article/usa-oil-reserve/update-1-us-could-start-buying-oil-for-reserve-after-june-sale-energy-secretary-idUSL1N3782VA>

COMMODITIES NEWS

MAY 11, 2023 12:57 PM UPDATED AN HOUR AGO

US could start buying oil for reserve after June sale, energy secretary says

By Reuters Staff

2 MIN READ

FILE PHOTO: U.S. Energy Secretary Jennifer Granholm testifies at a congressional hearing on Capitol Hill in Washington, U.S., June 15, 2021. REUTERS/Evelyn Hockstein/File Photo

WASHINGTON (Reuters) -U.S. Energy Secretary Jennifer Granholm told lawmakers on Thursday her department could start repurchasing oil for the Strategic Petroleum Reserve (SPR) after completing a congressionally mandated sale next month.

“That congressionally mandated sale of 26 million barrels will be completed by June, and it’s at that point where we will flip the switch and then seek to purchase,” Granholm told lawmakers in a hearing in the U.S. House of Representatives.

The Biden administration last year conducted the largest ever sale from the SPR of 180 million barrels. That and other sales last year have pushed the level of the reserve to about 372 million barrels, the lowest since 1983.

Granholm previously said the Energy Department could start buying back in the fourth quarter after maintenance on two of the reserve’s four sites on the coasts of Texas and Louisiana.

The administration has said it will buy oil when prices are consistently at or below \$67 to \$72 per barrel. U.S. crude prices fell more than 2% on Thursday to settle at \$70.87 a barrel. [O/R]

Granholm’s comments “reflect an intense messaging campaign likely intended to mollify Republicans angry about the big SPR draws,” said Bob McNally an energy policy analyst at Rapidan Energy. Granholm’s comments also likely seek to dissuade OPEC+, an oil production group including Saudi Arabia and Russia, from cutting supply again, he said.

OPEC+ last cut output in April a surprise move of about 1.15 million barrels per day, that the United States called inadvisable.

Reporting by Timothy Gardner; Editing by Leslie Adler, Jonathan Oatis and David Gregorio

Our Standards: [The Thomson Reuters Trust Principles.](#)

Suncor Q1/23 slides

2023 capital & production guidance^{1, 2}

CAPITAL EXPENDITURES			PRODUCTION & OPERATING COSTS		
	Capital ³ (\$ millions)	Economic Investment ⁴		Production ⁵ (boepd)	Cash Operating Costs (\$/bbl)
Oil Sands	3,625 – 3,875	30%	Oil Sands Operations	385,000 – 425,000	\$30.00 – \$33.00
E&P	725 – 775	100%	Fort Hills (68.76% WI)	85,000 – 95,000	\$33.00 – \$36.00
Downstream	1,025 – 1,100	25%	Syncrude (58.74% WI)	175,000 – 190,000	\$39.00 – \$43.00
Corporate	25 – 50	45%	E&P	50,000 – 60,000	
Total	5,400 – 5,800	40%	Total Upstream Production	740,000 – 770,000	
BUSINESS ENVIRONMENT			Refinery throughput	430,000 – 445,000	
Brent - Sullom Voe (US\$)		\$85.00	Refinery utilization	92% – 96%	
WTI - Cushing (US\$)		\$80.00	Refined product sales	550,000 – 580,000	
WCS - Hardisty (US\$)		\$61.00	PLANNED MAINTENANCE⁶		
NYH 2-1-1(US\$)		\$32.00	Upstream	Timing	Impact on quarter (kbpd)
AECO - C Spot (CDN\$/GJ)		\$2.50	Base Plant U1	Q2	~10
Exchange Rate (CAD/USD)		\$0.76	Base Plant U2	Q3/Q4	~65/70
2023 SENSITIVITIES⁷			Firebag	Q3/Q4	~10/5
	AFFO (\$mil)		Fort Hills	Q2/Q3	~10/40
+US\$1/bbl Brent	~180		Syncrude	Q2/Q3/Q4	~40/5/20
+US\$1/bbl NYH 2-1-1	~140		Hebron	Q3	~10
+\$0.01 FX (US\$/C\$)	~(200)		Buzzard	Q2	<5
+CDN\$1/GJ AECO	~(160)		Downstream		
+US\$1L/H Diff	~(25 - 30)		Edmonton	Q2/Q3/Q4	~20/5/5
+US\$1L/L Diff	~(30 - 50)		Montreal	Q2/Q3/Q4	~5/5/5
			Commerce City	Q2	~10
			Sarnia	Q2	~5

SUNCOR ENERGY

1, 2, 3, 4, 5, 6, 7 See Slide Notes & Advisories

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Suncor Q4/22 slides

2023 capital & production guidance¹

CAPITAL EXPENDITURES			PRODUCTION & OPERATING COSTS			
	Capital ² (\$ millions)	Economic Investment ³		Production ⁴ (boepd)	Cash Operating Costs (\$/bbl)	
Oil Sands	3,625 – 3,875	30%	Oil Sands Operations	385,000 – 425,000	\$30.00 – \$33.00	
E&P	725 – 775	100%	Fort Hills (68.76% WI)	85,000 – 95,000	\$33.00 – \$36.00	
Downstream	1,025 – 1,100	25%	Syncrude (58.74% WI)	175,000 – 190,000	\$39.00 – \$43.00	
Corporate	25 – 50	45%	E&P	65,000 – 75,000		
Total	5,400 – 5,800	40%	Total Upstream Production	740,000 – 770,000		
BUSINESS ENVIRONMENT			Refinery throughput	430,000 – 445,000		
Oil Prices (\$US/bbl)			Refinery utilization	92% – 96%		
Brent (Sullom Voe)		\$85.00	Refined product sales	550,000 – 580,000		
WTI (Cushing)		\$80.00	PLANNED MAINTENANCE³ (Suncor operated assets)			
WCS (Hardisty)		\$61.00	Upstream	Timing	Impact on quarter (mbpd)	
Refining Margin (\$US/bbl)			Base Plant U2	Q3/Q4	~60/75	
NYH 2-1-1		\$32.00	Fort Hills	Q3	~35	
Natural Gas Price (\$/GJ)			Syncrude	Q2/Q4	~40/20	
AECO – C Spot		\$5.00	Downstream			
Exchange Rate (CAD/USD)		\$0.76	Edmonton	Q2	~15	
			Sarnia	Q2	~10	
2023 SENSITIVITIES⁶						
AFFO (\$ millions)	~180	~140	~(200)	~(160)	~(25 - 30)	~(30 - 50)

SUNCOR ENERGY

1, 2, 3, 4, 5, 6 See Slide Notes & Advisories

12

Oil Market Highlights

Crude Oil Price Movements

In April, the OPEC Reference Basket (ORB) increased by \$5.68, or 7.2%, m-o-m to average \$84.13/b. The ICE Brent front-month contract rose by \$4.16, or 5.3%, m-o-m to \$83.37/b, and the NYMEX WTI front-month contract increased by \$6.07, or 8.3%, m-o-m to average \$79.44/b. The DME Oman front-month contract rose by \$5.13, or 6.5%, m-o-m to settle at \$83.47/b. The front-month ICE Brent/NYMEX WTI spread narrowed by \$1.91 m-o-m to average \$3.93/b. The futures forward curves of ICE Brent, NYMEX WTI and DME Oman strengthened across the month. Hedge funds and other money managers raised bullish positions in ICE Brent and NYMEX WTI in April.

World Economy

World economic growth is estimated at 3.3% for 2022 and forecast at 2.6% for 2023, both unchanged from the previous month's assessment. The global economy continues to navigate through challenges including high inflation, higher interest rates in the US and the Euro-zone, and high debt levels in many regions. The US economic growth forecast for 2023 remains unchanged at 1.2%, following growth of 2.1% for 2022. The Euro-zone's economic growth forecast for 2023 remains at 0.8%, after growth of 3.5% for 2022. Japan's economic growth forecast for 2022 remains at 1.0% for both 2022 and 2023. China's economic growth forecast remains at 5.2% for 2023, compared with 3% for 2022. India's 2022 economic growth estimate is unchanged at 6.7%, and the forecast for 2023 remains at 5.6%. Brazil's economic growth estimates for 2022 and 2023 are unchanged at 2.9% and 1.0%, respectively. Russia's growth is also unchanged across both years, with an estimated contraction of 2.1% for 2022 and a smaller forecast contraction of 0.5% for 2023.

World Oil Demand

The world oil demand estimate for 2022 remains unchanged from last month's assessment, with a growth of 2.5 mb/d y-o-y. In the OECD, oil demand was adjusted slightly downward in the 4Q22, amid data showing a demand decline in OECD Americas. This was entirely offset by a slight upward revision to the estimation for non-OECD countries. For 2023, the forecast for world oil demand growth remains broadly unchanged at 2.3 mb/d, with the OECD projected to grow by almost 0.1 mb/d and the non-OECD expected to grow by about 2.3 mb/d. Within the regions, slight downward adjustments in 1Q23 for the OECD were offset by upward revisions to the non-OECD.

World Oil Supply

Non-OPEC liquids supply is estimated to have grown by 1.9 mb/d in 2022, broadly unchanged from the previous month's assessment. The main drivers of liquids supply growth for 2022 were the US, Russia, Canada, Guyana, China and Brazil, while the largest declines were seen in Norway and Thailand. For 2023, the forecast for non-OPEC liquids production growth also remained unchanged from last month's assessment, at 1.4 mb/d, y-o-y. The main drivers of liquids supply growth are expected to be the US, Brazil, Norway, Canada, Kazakhstan and Guyana, while declines are expected primarily in Russia. Uncertainties remain, primarily related to the potential of US shale oil output and unplanned field maintenance in 2023. OPEC NGLs and non-conventional liquids are estimated to have grown by 0.1 mb/d in 2022, to average 5.39 mb/d, and are forecast to grow by 50 tb/d to average 5.44 mb/d in 2023. OPEC-13 crude oil production in April decreased by 191 tb/d m-o-m to average 28.60 mb/d, according to available secondary sources.

Product Markets and Refining Operations

Refinery margins dropped to their lowest level to date in April, following mild gains in the previous month. Product output in the Atlantic Basin rose as refinery runs recovered and the peak maintenance season approached an end. Moreover, weaker US diesel export opportunities, amid expectations of ample middle distillate arrivals into Europe, weighed on product markets and crack spreads. In Asia, softening product exports contributed to weakness across the barrel except for residual fuel, which benefitted from firm domestic requirements and lower imports. Global refinery processing rates recovered in April, gaining 918 tb/d, according to preliminary estimates.

Tanker Market

Dirty freight rates experienced a correction in April across all reported routes. Aframax saw the sharpest downturn, falling by as much as 66% on the Caribbean-to-US East Coast route. Suezmax spot freight rates were next, with rates on the US Gulf Coast-to-Europe route down 36%. VLCC rates also declined, down 24% on the Middle East-to-East route and 23% lower on the West Africa-to-East route. Clean spot freight rates showed a mix performance, with a weaker market West of Suez outweighing the strong performance East of Suez.

Crude and Refined Products Trade

Preliminary data shows US crude imports increased to 6.3 mb/d in April amid preparations for the summer driving season. US crude exports fell back from a record high to average a still strong 4.2 mb/d. In March, China's crude imports surged to a new record high of 12.4 mb/d following a wave of buying by Chinese refiners, including from long-haul sources. China's product exports declined in March from high levels to an average of 1.3 mb/d, with declines across light and middle distillates. India's crude imports fell from a 10-month high, averaging just under 4.9 mb/d in March. India's product exports strengthened further, averaging 1.5 mb/d. Japan's crude imports were 8% lower in March, averaging 2.5 mb/d. Japan's product exports, including LPG, came off a strong performance the month before to average 567 tb/d in March. Preliminary estimates for April show OECD Europe crude imports were seasonally lower, while product imports picked up from lower levels in February and March, led by diesel.

Commercial Stock Movements

Preliminary March 2023 data shows total OECD commercial oil stocks fell m-o-m by 31.7 mb. At 2,808 mb, they were 195 mb higher than the same time one year ago, but 34 mb lower than the latest five-year average and 105 mb below the 2015–2019 average. Within components, crude and product stocks decreased m-o-m by 4.9 mb and 26.8 mb, respectively. At 1,402 mb, OECD crude stocks were 119 mb higher than the same time a year ago and 2 mb higher than the latest five-year average. However, at this level, they were 60 mb lower than the 2015–2019 average. OECD product stocks stood at 1,406 mb, representing a surplus of 76 mb from the same time a year ago. Nonetheless, this was 36 mb lower than the latest five-year average and 45 mb below the 2015–2019 average. In terms of days of forward cover, OECD commercial stocks fell m-o-m by 0.6 days in March to stand at 61.7 days. This is 4.1 days above the March 2022 level, but 3.2 days less than the latest five-year average and 0.8 days lower than the 2015–2019 average.

Balance of Supply and Demand

Demand for OPEC crude in 2022 remains unchanged from last month's assessment at 28.4 mb/d. This is around 0.5 mb/d higher than in 2021. Demand for OPEC crude in 2023 also remains unchanged from the previous assessment to stand at 29.3 mb/d. This is around 0.8 mb/d higher than in 2022.

Feature Article

Non-OPEC oil supply development

In 2022, non-OPEC supply is estimated to have increased by 1.9 mb/d y-o-y. Out of this, US liquids production increased by 1.2 mb/d, mainly on the back of light tight oil production and increased NGLs output from non-conventional basins. US light tight crude production increased by 0.5 mb/d, with the Permian constituting the main source of growth, increasing by 0.6 mb/d, supported by a relatively lower breakeven price and higher drilling rig activities, while output in the Bakken and Eagle Ford declined. Liquids supply in Russia rose by around 230 tb/d. Canada, Guyana, China, Brazil and Oman also contributed to production growth in 2022. These developments were partially offset by supply declines totalling around 0.5 mb/d, mainly from Norway, Thailand and the UK.

Capital spending for oil and gas exploration and production (E&P) in non-OPEC countries increased by US\$72 bn y-o-y in 2022 to US\$431 bn. It is expected to rise by around 10% y-o-y in 2023. On a country level, E&P spending for 2023 is forecast to increase in Norway, Brazil, the US and Canada by 26%, 15%, 12%, and 8%, y-o-y, respectively.

The year 2022 proved to be an extraordinary period for the energy market, with most oil and gas companies witnessing healthy profits. However, the ratio of investment to cash from operations was exceedingly low, since many international oil companies continue to focus on capital discipline to improve their balance sheets. Overall investment levels for non-OPEC supply in 2023 are expected to be just above pre-pandemic levels. However, this is still significantly below the high of US\$747 bn in 2014.

For 2023, non-OPEC liquids supply is forecast to grow by 1.4 mb/d y-o-y. There remains substantial uncertainty, however, regarding geopolitical developments in Eastern Europe and the potential impact on Russian oil supply. Moreover, US liquids supply developments will continue to hinge on the degree of capital discipline employed by companies and the extent to which cost inflation impacts oil production.

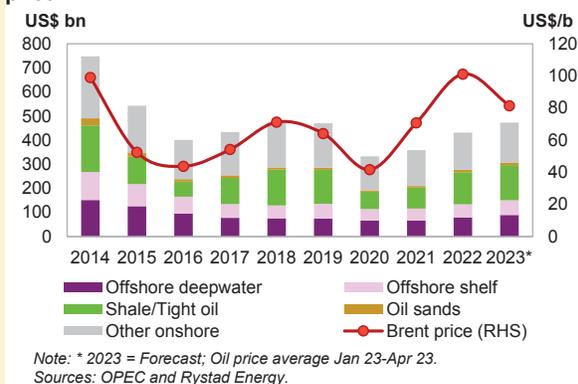
Liquids' output in the OECD is expected to increase by 1.5 mb/d y-o-y in 2023, mainly on the back of production increases in the US, Norway and Canada. US crude oil and condensate production is anticipated to grow by 0.7 mb/d, with NGLs and biofuel production also expected to rise. In the US, the oil rig count has rebounded from 490 units in January 2022 to 591 units in the last week of April 2023. Moreover, US core oil frac operations continue to stay above 1,000, on a monthly basis.

Canadian oil production, particularly Alberta's oil sands, is forecast to grow by 0.2 mb/d y-o-y in 2023. Production growth in the North Sea and OECD Europe countries is also projected at around 0.2 mb/d, mainly supported by the ramp-up of the second phase of Norway's Johan Sverdrup field development.

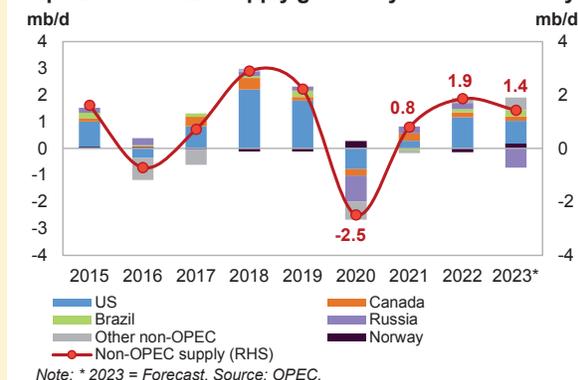
In the non-OECD region, Latin America is forecast to be the key driver for liquids supply. Output in the region is set to increase by 0.4 mb/d y-o-y in 2023, mainly from five offshore startups in Brazil and stable production at the Liza FPSOs in Guyana. Liquids output in Kazakhstan and China is also expected to rise y-o-y, by around 110 tb/d and 70 tb/d, respectively.

Uncertainties to the forecast remain large, especially given ongoing geopolitical developments in Eastern Europe. Moreover, high inflation levels, coupled with supply chain issues and monetary tightening by major central banks may also impact the cost of oil production and upstream sector investment levels. Given the uncertainties ahead, OPEC Member Countries and countries participating in the Declaration of Cooperation (DoC) will continue to closely monitor market developments over the remainder of the year, to help safeguard a stable and balanced market for the benefit of both consumers and producers.

Graph 1: Non-OPEC investment in oil and gas vs. crude price



Graph 2: Non-OPEC supply growth by selected country



World Oil Demand

The forecast for 2022 world oil demand growth remains unchanged from last month at 2.5 mb/d. Most of the downward adjustment in oil demand occurred in 4Q22, amid a slight slowdown in OECD countries towards the end of the year. This was almost entirely offset by an upward revision to oil demand growth in non-OECD countries, due to improvements in economic activity in some countries. Total world oil demand is expected to average 99.6 mb/d in 2022.

For 2023, the forecast for world oil demand growth is also the same as in the previous month's assessment at 2.3 mb/d, with the OECD increasing by 0.07 mb/d and non-OECD growth at close to 2.3 mb/d. Minor upward adjustments were made due to the better-than-expected performance in China's economy, while other regions are expected to see slight declines, due to economic challenges that are likely to weigh on oil demand. Accordingly, in 1Q23, oil demand is expected to rise by 2.13 mb/d y-o-y. Total world oil demand is anticipated to reach 101.9 mb/d in 2023. However, this forecast is subject to many uncertainties, including global economic developments and ongoing geopolitical tensions.

Table 4 - 1: World oil demand in 2022, mb/d

World oil demand	2021	1Q22	2Q22	3Q22	4Q22	2022	Change 2022/21	
							Growth	%
Americas	24.32	24.77	24.98	25.33	24.95	25.01	0.69	2.86
<i>of which US</i>	20.03	20.38	20.41	20.62	20.32	20.43	0.40	1.98
Europe	13.13	13.19	13.43	14.07	13.34	13.51	0.38	2.90
Asia Pacific	7.38	7.85	6.99	7.22	7.68	7.43	0.05	0.70
Total OECD	44.82	45.81	45.39	46.62	45.97	45.95	1.13	2.51
China	15.00	14.77	14.45	14.67	15.51	14.85	-0.15	-0.98
India	4.77	5.18	5.16	4.95	5.26	5.14	0.37	7.66
Other Asia	8.67	9.13	9.31	8.77	8.89	9.02	0.36	4.11
Latin America	6.23	6.32	6.36	6.55	6.52	6.44	0.21	3.38
Middle East	7.79	8.06	8.15	8.53	8.44	8.29	0.50	6.45
Africa	4.22	4.51	4.15	4.25	4.69	4.40	0.18	4.21
Russia	3.61	3.67	3.42	3.45	3.71	3.56	-0.05	-1.48
Other Eurasia	1.21	1.22	1.16	1.00	1.21	1.15	-0.06	-5.07
Other Europe	0.75	0.79	0.75	0.73	0.80	0.77	0.01	1.75
Total Non-OECD	52.25	53.65	52.90	52.89	55.03	53.62	1.36	2.61
Total World	97.08	99.45	98.29	99.51	101.00	99.57	2.49	2.57
Previous Estimate	97.08	99.45	98.29	99.51	101.02	99.57	2.50	2.57
Revision	0.00	0.00	0.00	0.00	-0.03	-0.01	-0.01	-0.01

Note: Totals may not add up due to independent rounding. Source: OPEC.

Table 4 - 2: World oil demand in 2023*, mb/d

World oil demand	2022	1Q23	2Q23	3Q23	4Q23	2023	Change 2023/22	
							Growth	%
Americas	25.01	24.61	25.14	25.51	25.09	25.09	0.08	0.31
of which US	20.43	20.16	20.43	20.75	20.37	20.43	0.00	-0.01
Europe	13.51	12.99	13.36	14.10	13.37	13.46	-0.05	-0.37
Asia Pacific	7.43	7.89	7.05	7.27	7.70	7.47	0.04	0.55
Total OECD	45.95	45.50	45.55	46.87	46.15	46.02	0.07	0.15
China	14.85	15.63	15.40	15.43	16.16	15.66	0.80	5.42
India	5.14	5.40	5.44	5.21	5.50	5.39	0.25	4.89
Other Asia	9.02	9.43	9.65	9.14	9.24	9.36	0.34	3.75
Latin America	6.44	6.56	6.49	6.71	6.68	6.61	0.18	2.75
Middle East	8.29	8.59	8.47	8.86	8.73	8.66	0.37	4.43
Africa	4.40	4.71	4.34	4.43	4.88	4.59	0.19	4.32
Russia	3.56	3.68	3.45	3.59	3.87	3.65	0.09	2.49
Other Eurasia	1.15	1.24	1.16	1.02	1.22	1.16	0.01	1.15
Other Europe	0.77	0.84	0.76	0.75	0.83	0.80	0.03	3.61
Total Non-OECD	53.62	56.09	55.16	55.16	57.10	55.88	2.26	4.21
Total World	99.57	101.58	100.70	102.03	103.25	101.90	2.33	2.34
Previous Estimate	99.57	101.55	100.70	102.03	103.27	101.89	2.32	2.33
Revision	-0.01	0.04	0.00	0.00	-0.03	0.00	0.01	0.01

Note: * 2023 = Forecast. Totals may not add up due to independent rounding. Source: OPEC.

OECD

OECD Americas

Update on the latest developments

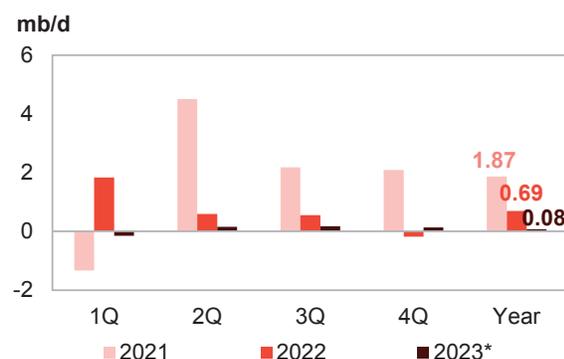
Oil demand in **OECD Americas** declined in February by 0.5 mb/d y-o-y. This is down from a lesser decline of around 50 tb/d y-o-y in January, and follows a 0.9 mb/d y-o-y drop in December.

In the **US**, **February** data indicates a decline by 0.4 mb/d y-o-y, compared to an annual decline of 0.2 mb/d, as seen in January 2023.

The ISM manufacturing PMI for February remained well in contraction territory at 47.4 points following a similar reading in January, for the fifth consecutive month.

With regard to mobility, the US Federal Highway Administration reported that the seasonally adjusted vehicle miles travelled declined slightly m-o-m by 0.6% in February, but showed an increase of 1.5% y-o-y over February 2022.

Graph 4 - 1: OECD Americas oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

At the same time, the International Air Transport Association's (IATA) Air Passenger Market Analysis reported that domestic airline activity increased by 10.6% y-o-y in February and remained above pre-pandemic levels for the second consecutive month, with traffic growing 1.2% over February 2019.

Demand for petrochemical feedstock remained subdued due to low demand and weak margins. LPG weakened by 0.3 mb/d, y-o-y, in February and January, following a y-o-y plunge of 0.5 mb/d in December. Similarly, naphtha demand remained in negative territory, for the eleventh month in a row. Diesel decelerated further by 0.2 mb/d, as weak manufacturing activity continued to weigh on diesel demand. Similarly, the 'other products' category dropped y-o-y by 0.2 mb/d. Residual fuels were unchanged y-o-y, albeit showing a slight improvement compared to the y-o-y decline of 0.1 mb/d in January.

On a positive note, on the back of improved mobility, gasoline posted y-o-y growth of 0.1 mb/d, albeit this being down from a strong 0.3 mb/d y-o-y growth recorded in January. Jet/kerosene also increased by 0.1 mb/d, y-o-y, and the same growth as was seen in January.

Table 4 - 3: US oil demand, mb/d

By product	Feb 22	Feb 23	Change Feb 23/Feb 22	
			Growth	%
LPG	4.00	3.66	-0.34	-8.5
Naphtha	0.14	0.11	-0.03	-18.2
Gasoline	8.60	8.72	0.12	1.4
Jet/kerosene	1.40	1.54	0.14	9.6
Diesel	4.18	4.02	-0.16	-3.8
Fuel oil	0.36	0.37	0.00	0.6
Other products	2.05	1.88	-0.17	-8.2
Total	20.73	20.29	-0.44	-2.1

Note: Totals may not add up due to independent rounding. Sources: EIA and OPEC.

Near-term expectations

In **2Q23**, US GDP is set to improve from the first quarter. However, continued weakening of manufacturing activity is likely to impact demand for industrial fuels. In this quarter, US oil demand is projected to grow marginally y-o-y by 20 tb/d, with jet fuel expected to be the major driver of oil demand growth. Gasoline is expected to start recovering towards the end of the quarter, on the back of the start of the driving season in May, while diesel is anticipated to remain relatively weak, due to anticipated weaker manufacturing sector activity.

In **3Q23**, inflation is expected to continue to decline, likely to support oil demand during the driving season. Similarly, overall airline activity – domestic and international flights - is approaching pre-pandemic levels, which is projected to support oil demand to improved and grow above 0.1 mb/d y-o-y in 3Q23. Transportation fuels, namely jet/kerosene and gasoline are expected to drive oil demand growth. However, the risks are still skewed to the downside, with a focus on the macroeconomic development of the US economy.

OECD Europe

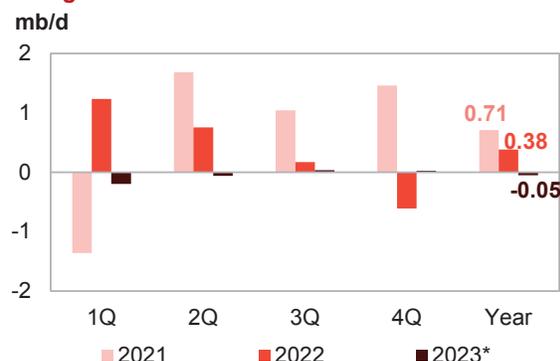
Update on the latest developments

Oil demand in OECD Europe retracted in February by 0.2 mb/d y-o-y. This compares with a similar decline in January y-o-y by 0.2 mb/d, and follows a 0.5 mb/d y-o-y plunge in December.

The region is still facing some macroeconomic headwinds, including high inflation and weak manufacturing activity. The consumer price inflation in the Euro-zone stood at 8.5% in February, marginally down from 8.6% a month earlier. The Euro-zone’s February PMI pointed to some improvement, particularly in the services sector, while manufacturing remained in contraction. The PMI for services was at 52.7 in February, up from 50.8 points in January and 49.8 points recorded in December. Meanwhile, however, the manufacturing PMI, contracted further to 48.5 points in February compared to 48.8 in January.

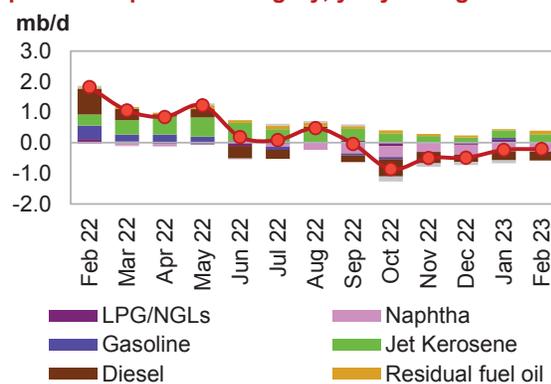
The IATA reported that the region’s airlines grew domestic revenue passenger-kilometres (RPK’s) by 24.4% y-o-y and kept passenger traffic 12.5% above February 2019 levels.

Graph 4 - 2: OECD Europe’s oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

Graph 4 - 3: OECD Europe’s oil demand by main petroleum product category, y-o-y change



Sources: IEA, JODI, OPEC and national sources.

Diesel/gasoil sustained a sixth consecutive monthly decline by 0.3 mb/d y-o-y, similar to a y-o-y decline of 0.3 mb/d in January. Likewise, demand for naphtha contracted by 0.3 mb/d, y-o-y, pressured by weak demand in the ethylene market, thin margins and volatile energy costs. LPG demand also softened by 20 tb/d y-o-y in February, down from an increase of 103 tb/d, y-o-y in January. The “other products” category also softened by 10 tb/d, y-o-y.

On the positive side, continued improvements in airline activity supported jet/kerosene to lead oil demand growth in the month by almost 0.3 mb/d, y-o-y compared to y-o-y growth of 0.2 mb/d posted in January and more than 0.1 y-o-y growth seen in December.

Residual fuels increased y-o-y by 0.1 mb/d, up from a y-o-y increase of 40 tb/d in January. Finally, gasoline saw slight y-o-y growth of 20 tb/d, down from an increase of 60 tb/d y-o-y, in January.

Near-term expectations

In **2Q23**, GDP of the region is projected to slow down from 1Q23, but is expected to remain positive. Oil demand growth in the quarter is anticipated to soften by 60 tb/d compared to the same quarter a year earlier, albeit showing an improvement from the y-o-y decline seen in 1Q23. Transportation fuels, most notably jet fuel, are expected to support oil demand improvements in the second quarter.

By **3Q23**, the oil demand in the region is expected to improve to show growth of 30 tb/d, y-o-y. This is projected to be mainly supported by jet fuel and gasoline requirements. The risks, however, are skewed to the downside, hinging on geopolitical developments and the possibility of an economic recession in the region.

OECD Asia Pacific

Update on the latest developments

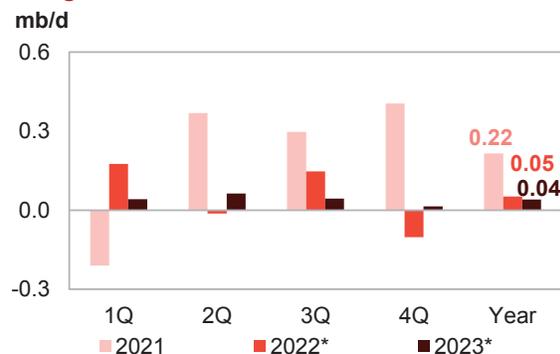
Oil demand in OECD Asia Pacific saw y-o-y growth of over 0.1 mb/d in February, up from a minor decline of 20 tb/d y-o-y in January. Oil demand was mostly driven by requirements from Australia, as the two largest oil-consuming countries of the region - Japan and South Korea - are challenged with weak macroeconomic performances and continued low manufacturing activity in the two countries. The manufacturing PMIs for both Japan and South Korea were below the expansion threshold in February.

In **Japan**, the manufacturing PMI declined to 47.7 in February, down from 48.9 points in January. The South Korean manufacturing PMI in February also stood in contraction territory at 48.5 points, level from the previous month. Nevertheless, the services sector PMI has improved further to 54 points in February. Furthermore, the annual inflation rate in Japan fell to 3.3% in February from January's 4.3%, although still a high level for the country and with the likelihood of monetary tightening by the Bank of Japan increasing.

In **South Korea**, the consumer price index rose by 4.8% in February from a year ago, decelerating from January's 5.2%.

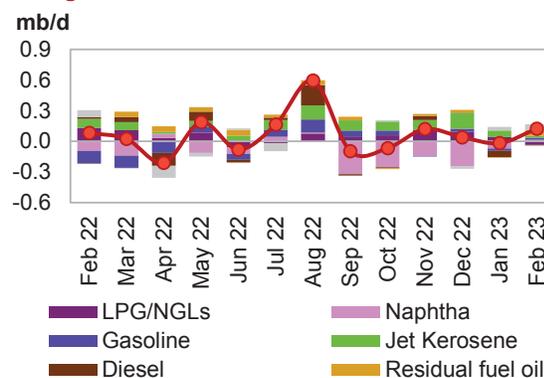
Airline activity in the **OECD Asia Pacific** region remains healthy, according to a report from the IATA, with the recovery momentum continuing in March, and approaching pre-pandemic levels.

Graph 4 - 4: OECD Asia Pacific oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

Graph 4 - 5: OECD Asia Pacific oil demand, y-o-y change



Sources: IEA, JODI, METI and OPEC.

Looking at **oil products**, residual fuels led overall demand by y-o-y growth of 60 tb/d, and the “other products” category saw y-o-y growth of 50 tb/d. Naphtha recorded y-o-y growth of 20 tb/d, showing an improvement from the y-o-y decline of 70 tb/d, in January.

World Oil Demand

Improvements in demand for naphtha can be attributed to the reopening of China. Demand for the naphtha has been volatile since February 2022, as average run rates at the major naphtha cracking centres have been declining due to the slowdown in the manufacturing and construction sectors that typically drive demand for various petrochemical products. Furthermore, on the back of improvement in mobility and air travel activity in the region, gasoline and jet kerosene saw y-o-y growth of 20 tb/d each.

Diesel demand has been hit hard by the weak manufacturing activity weighing on industrial diesel consumption in the region as Japan and South Korea's February diesel demand falls by 20 tb/d each, albeit showing a slight improvement from the previous month's larger y-o-y declines.

Near-term expectations

The region's GDP is projected to remain positive in 2023, supporting services and manufacturing activity. Furthermore, petrochemical feedstock requirements are likely to get a boost from the opening of the Chinese economy which will also support the petrochemical industry of the entire region. On the back of these expected developments, the region's oil demand is projected to grow y-o-y by 60 tb/d in **2Q23**.

By **3Q23**, oil demand growth is projected to grow by 40 tb/d y-o-y, mainly driven by jet fuel, and supported by requirements for gasoline and petrochemical feedstock.

Non-OECD

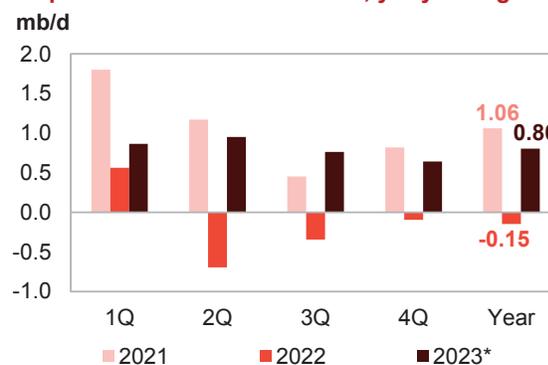
China

Update on the latest developments

China's oil demand growth surged by 1.4 mb/d y-o-y in March, up from the healthy growth of 0.9 mb/d y-o-y seen in February. The strong rebound in economic and social activity amid feedstock requirements for the petrochemical sector supported oil product demand.

The March PMI shows that the manufacturing sector declined slightly, but is still within the expansionary trajectory at 50 points, slightly below 51.56 points in February. Similarly, the March services PMI shows that the services sector is performing very well, moving up to 57.8 points in March, from 55 in February and reflecting the reopening of the country from lockdown.

Graph 4 - 6: China's oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

The mobility statistics from various government agencies shows a strong rebound of mobility in China as the airline industry's total passenger volume for domestic routes increased by 192%, y-o-y from 36% y-o-y in February and a 33.7% y-o-y increase in January. Similarly, passenger volumes for international routes rose by over 998.6% in March, up from 760% in February and about 380% in January. Furthermore, the China Association of Automobile Manufacturers (CAAM) statistics show that new vehicle sales in China increased by almost 10% to 2,451,000 units in March 2023, up from 2,234,000 in the same month of last year. Similarly, transport and communication statistics indicate that cross-border vehicle traffic in March hiked by 71.2% y-o-y to 573,022 trips, of which light automobile trips (533,227) surged by 77.2%.

In terms of oil products, naphtha was the main driver of oil demand, which increased y-o-y by a bullish 0.5 mb/d due to considerable petrochemical sector requirements. Furthermore, on the back of increasing construction and trucking activity combined with agricultural sector requirements, diesel posted y-o-y growth of 0.3 mb/d, up, from a marginal increase of 10 tb/d y-o-y in February. Strong air activity supported jet fuel to post y-o-y growth of 0.2 mb/d. The 'residual fuels' and 'other products' categories grew by 0.2 mb/d and 0.1 mb/d y-o-y. Finally, gasoline saw y-o-y growth of 0.1 mb/d, compared with an increase of 0.2 mb/d y-o-y in February.

Table 4 - 4: China's oil demand*, mb/d

By product	Mar 22	Mar 23	Change Mar 23/Mar 22	
			Growth	%
LPG	2.30	2.26	-0.03	-1.4
Naphtha	1.43	1.90	0.47	33.0
Gasoline	3.02	3.12	0.10	3.3
Jet/kerosene	0.53	0.71	0.17	32.0
Diesel	3.33	3.63	0.30	9.0
Fuel oil	0.59	0.83	0.24	39.7
Other products	2.38	2.52	0.14	6.0
Total	13.58	14.97	1.39	10.2

Note: * Apparent oil demand. Totals may not add up due to independent rounding.

Sources: Argus Global Markets, China OGP (Xinhua News Agency), Facts Global Energy, JODI, National Bureau of Statistics China and OPEC.

Near-term expectations

Looking ahead, oil demand for most products in China has been increasing. Domestic mobility and air travel are close to 80% of pre-pandemic levels. China's GDP is forecast to remain firm at 5.2% in 2023, supporting projected oil demand growth of 0.8 mb/d y-o-y.

In **2Q23**, oil demand is set to see y-o-y growth of 1.0 mb/d. Domestic and international airline activity is expected to rise as the increase in international business and tourism combines with pent-up demand. This is also providing support for the jet fuel demand to spur oil demand growth. Gasoline demand is forecast to improve, driven by a strong rebound in mobility. Similarly, the petrochemical industry has continued to operate at around full capacity. Stable demand will boost feedstock demand for light distillates. Fiscal stimulus, along with infrastructure expansion in 2023, will set the stage for a robust diesel consumption recovery.

In **3Q23**, oil demand is expected to increase y-o-y by a solid 0.8 mb/d. Jet fuel will again drive oil demand growth in this quarter as well, with millions of air passengers expected to support air travel activity for local and business travellers from and into China. Light distillates are also expected to continue rising, with the continued expansion of petrochemical industries. Increased mobility and rising construction activity will boost demand for gasoline and diesel.

India

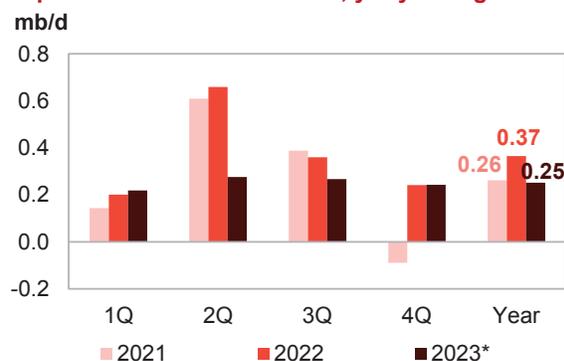
Update on the latest developments

Oil demand in India saw y-o-y growth of 0.2 mb/d in March, down slightly from around 0.3 mb/d y-o-y growth recorded in February. Healthy manufacturing and services activity supported oil demand in March.

The manufacturing PMI in India continued to expand, reaching a strong 56.4 in March, compared with 55.3 in February. Similarly, the services PMI indicated ongoing strong momentum at 57.8 in March, while it retracted somewhat from the high level reached in February, when it stood at 59.4. In addition, annual consumer inflation eased to 5.6% in March, from 6.4% in February.

According to the automotive content creator autopundit.com, vehicles sales in the Indian market in March 2023 increased by over 4% when compared to March 2022, and the industry marginally increased by 0.5% in comparison to February 2023.

Looking at products, the "Other products" category was the main driver of oil demand in March, as the product saw y-o-y growth of 0.15 mb/d. Sales of bitumen, one of the components of the "other products" category, jumped 16.5% m-o-m from February, due to increased construction activity.

Graph 4 - 7: India's oil demand, y-o-y change

Note: * 2023 = Forecast.

Source: OPEC.

World Oil Demand

On the back of healthy mobility, gasoline grew y-o-y by 50 tb/d. Stable manufacturing and agricultural activity supported diesel to see a y-o-y increase of 20 tb/d. As India's overall air passenger traffic inches closer to pre-COVID-19 levels, jet/kerosene increased y-o-y by 20 tb/d.

However, petrochemical feedstock demand remained weak, as naphtha was yet to recover from soft feedstock demand from naphtha-fed steam crackers in the wake of poor production margins. LPG also declined by 20 tb/d.

Table 4 - 5: India's oil demand, mb/d

By product	Mar 22	Mar 23	Change Mar 23/Mar 22	
			Growth	%
LPG	0.95	0.93	-0.02	-2.6
Naphtha	0.32	0.33	0.00	1.4
Gasoline	0.82	0.87	0.05	6.7
Jet/kerosene	0.19	0.21	0.02	8.1
Diesel	1.88	1.90	0.02	1.3
Fuel oil	0.17	0.17	0.00	-0.7
Other products	1.02	1.17	0.15	14.9
Total	5.34	5.57	0.22	4.2

Note: Totals may not add up due to independent rounding.

Sources: JODI, Petroleum Planning and Analysis Cell of India and OPEC.

Near-term expectations

Looking forward, with anticipated healthy economic activity and ongoing air travel recovery, India's demand for oil products is anticipated to remain strong in 2023.

In **2Q23**, oil demand is projected to rise by 0.3 mb/d y-o-y. The government's proposed increase in capital spending is expected to support consumer's purchasing power and boost the momentum of economic activity as construction and manufacturing activity accelerates. These factors, combined with a steady rise in airline activity, will support healthy oil demand growth.

In **3Q23**, oil demand is expected to remain solid at 0.3 mb/d, with transportation fuels, notably gasoline, transportation diesel and jet/kerosene expected to drive oil demand growth. Agricultural and construction activity are expected to add further support. However, in 3Q23, oil demand is anticipated to be somewhat lower due to the impact of the monsoon season from July to September.

Latin America

Update on the latest developments

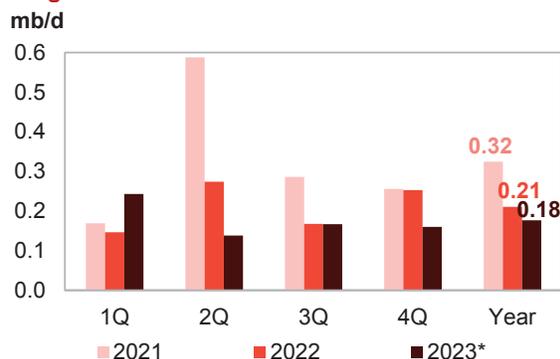
Latin America's oil demand saw a y-o-y increase of 0.3 mb/d in February, up from 0.2 mb/d y-o-y growth seen in January. Within countries of the region, oil demand in February was mostly supported by requirements from Brazil and Venezuela.

For the second consecutive month, gasoline remained the main driver of oil demand in the region, supported by a recovery in mobility.

Inflation in **Brazil** resumed its downward trend in February at 5.6%, down from January's 5.8%, but it remained above the Central Bank's 3.25% target. However, Brazil's manufacturing PMI index in February still stands in contraction territory at 49.2 points, albeit up from 47.5 points in January and 44.2 points seen in December. The services PMI declined from 50.7 points in January to 49.8 points in February.

Airline activity in **Latin America** continued to improve. According to the IATA's monthly statistics, airline activity in the region grew by 44.1% y-o-y, with domestic revenue-passenger kilometres (RPKs) in February standing at 0.2% above levels in 2019.

Graph 4 - 8: Latin America's oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

Latin America's oil demand in February was mainly driven by gasoline and residual fuels, which increased by more than 0.1 mb/d y-o-y, each. Jet/kerosene saw y-o-y growth of 40 tb/d, following a similar y-o-y increase in January. The "other products" category recorded y-o-y growth of 60 tb/d. However, diesel demand saw a further decline by 20 tb/d, down from 10 tb/d y-o-y contraction in January. In terms of petrochemical feedstock, LPG was unchanged y-o-y, while weak petrochemical activity continued to weigh on naphtha, which showed only marginal y-o-y growth in February.

Near-term expectations

In the near term, oil demand is anticipated to see y-o-y growth by more than 0.1 mb/d in **2Q23**, as GDP growth for the region in 2023 is anticipated to remain positive. Projected further mobility improvements are expected to support transportation fuels demand. Accordingly, jet fuel and gasoline are forecast to be the main drivers for oil demand growth in the quarter. Additionally, expected manufacturing activity improvements and petrochemical feedstock requirements should support demand for distillates.

In **3Q23**, the dynamics of the previous quarter are expected to continue with greater momentum to show y-o-y growth of almost 0.2 mb/d y-o-y. The outlook for oil demand growth sees transportation fuels to grow the most, supported by the continuing recovery in mobility and air travel.

Middle East

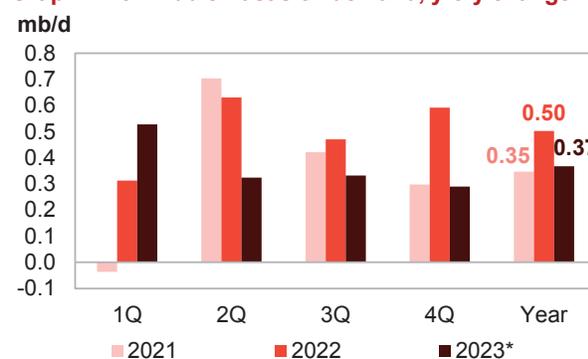
Update on the latest developments

The **Middle East** again posted strong 0.6 mb/d, y-o-y growth in February, the same as growth seen in January. Saudi Arabia and Iraq were the main drivers of oil demand in February in the region.

The purchasing managers' indices (PMIs) for February reflect the continuing acceleration in composite PMIs in the major economies of the region, suggesting strong manufacturing and services sectors. Saudi Arabia's composite PMI rose from 58.2 points in January to a near eight-year record high of 59.8 in February, and the UAE posted a strong composite PMI at above 54 points in the two consecutive months of January and February.

IATA reported that domestic airline traffic within the Middle East grew 1.0% y-o-y and continued to increase towards pre-pandemic RPKs at 95.4% of February 2019 levels. In addition, international RPKs in the region grew by 75.0% y-o-y in February, reaching 93.7% of pre pandemic levels.

Graph 4 - 9: Middle East's oil demand, y-o-y change



Note: * 2023 = Forecast.
Source: OPEC.

Looking at oil products, all categories saw y-o-y increases in February. The largest increase of 0.25 mb/d was recorded in the 'other products' category, on the back of electricity generation and industrial sector requirements. In addition, diesel posted y-o-y growth of 0.2 mb/d, at broadly the same rate for the fifth consecutive month. Steady airline activity recovery in the Middle East region boosted jet/kerosene demand to grow by 0.1 mb/d for the second consecutive month in February. Gasoline grew by 10 tb/d, down from 60 tb/d, y-o-y, as seen in January. Residual fuels also increased by 50 tb/d. Furthermore, petrochemical feedstock, LPG and naphtha, saw y-o-y growth of 60 tb/d, and 10 tb/d, y-o-y respectively.

Table 4 - 6: Saudi Arabia's oil demand, mb/d

By product	Mar 22	Mar 23	Change Mar 23/Mar 22	
			Growth	%
LPG	0.05	0.06	0.01	12.8
Gasoline	0.51	0.51	0.00	0.2
Jet/kerosene	0.07	0.14	0.07	102.1
Diesel	0.55	0.60	0.06	10.2
Fuel oil	0.46	0.55	0.08	17.7
Other products	0.42	0.43	0.01	2.3
Total	2.06	2.28	0.23	11.0

Note: Totals may not add up due to independent rounding.

Sources: JODI and OPEC.

Near-term expectations

Healthy economic and industrial activity observed in the region in 1Q23 is set to continue to support oil demand into **2Q23** and **3Q23**. In support of the expected solid economic growth, the composite PMI in Saudi Arabia shows strong momentum of 58.7 points and 59.6 points in March and April, respectively. Similarly, the UAE PMI indicator also shows a similar trend at 55.88 and 56.56 points in March and April, respectively. Furthermore, airline activity continues on a strong rebound. Accordingly, oil demand is projected to increase by 0.3 mb/d, y-o-y in both 2Q23 and 3Q23. Moreover, demand growth in the region is expected to be supported by fuel oil for electricity generation in Iraq and Saudi Arabia, particularly in the hot summer months.

World Oil Supply

Non-OPEC liquids supply in 2022 (including processing gains) is estimated to have grown by 1.9 mb/d y-o-y to average 65.8 mb/d, largely unchanged from the previous month's assessment. Total US liquids production is estimated to have increased by 1.2 mb/d y-o-y to average 19.2 mb/d in 2022. The largest increases for the year were in the US, followed by Russia, Canada, Guyana and China, which are estimated to have grown by around 0.2 mb/d y-o-y each. At the same time, production is estimated to see the largest declines in Norway and Thailand.

Non-OPEC liquids production in 2023 is forecast to grow by 1.4 mb/d y-o-y to average 67.2 mb/d, unchanged from last month. Minor downward revisions to Other Eurasia and some other countries were offset by upward revisions to liquids production in OECD Americas.

US liquids production has largely recovered after a considerable drop was seen in December 2022. US oil and gas drilling activities have been primarily stable since February 2023, remaining fundamentally above maintenance requirements. Gradual and steady growth is expected for US shale oil production throughout the year. Accordingly, the US liquids supply growth forecast for 2023 remained broadly unchanged at 1.0 mb/d. Output growth in the North Sea region remains unchanged following scheduled production ramp-ups in Norway. The main growth drivers for 2023 are anticipated to be the US, Brazil, Norway, Canada, Kazakhstan and Guyana, whereas oil production is forecast to decline primarily in Russia. Nonetheless, there are still uncertainties related to US shale oil output potential and unplanned maintenance in 2023.

OPEC NGLs and non-conventional liquids production in 2022 is forecast to have grown by 0.1 mb/d to average 5.4 mb/d, and is expected to increase by 50 tb/d to average 5.4 mb/d in 2023. OPEC-13 crude oil production in April decreased by 191 tb/d m-o-m to average 28.60 mb/d, according to available secondary sources.

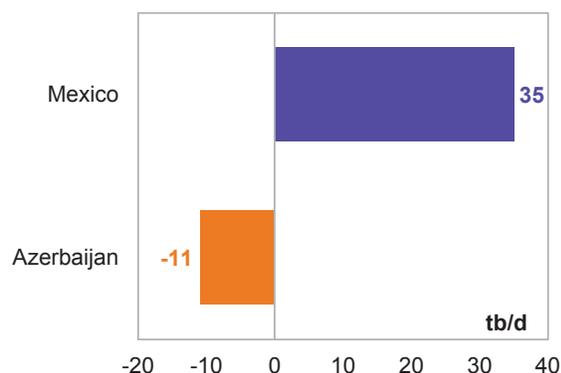
Non-OPEC liquids production in April, including OPEC NGLs, is estimated to have declined m-o-m by 0.3 mb/d to average 72.7 mb/d, but is up by 2.5 mb/d y-o-y. As a result, preliminary data indicates that April's global oil supply decreased by 0.5 mb/d m-o-m to average 101.3 mb/d, up by 2.4 mb/d y-o-y.

The **non-OPEC liquids supply estimation for 2022** remained broadly unchanged at an average of 65.8 mb/d, showing y-o-y growth of 1.9 mb/d. **Graph 5 - 1: Major revisions to annual supply change forecast in 2023*, MOMR May 23/Apr 23**

Non-OPEC liquids production in 2023 is forecast to grow by 1.4 mb/d, remained broadly unchanged compared with the previous month's assessment, following some up and down revisions in a handful of countries.

The overall **OECD supply growth** expectation for 2023 has risen slightly. While OECD Asia Pacific saw minor downward revisions, OECD Americas was slightly revised up. However, OECD Europe was broadly unchanged from the previous month's assessment.

Meanwhile, the **non-OECD supply growth** projection for 2023 has been revised down marginally and is now expected to decline by around 0.1 mb/d y-o-y in 2023.

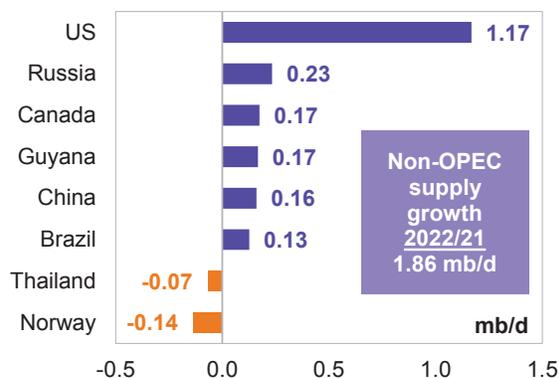


Note: * 2023 = Forecast. Source: OPEC.

Key drivers of growth and decline

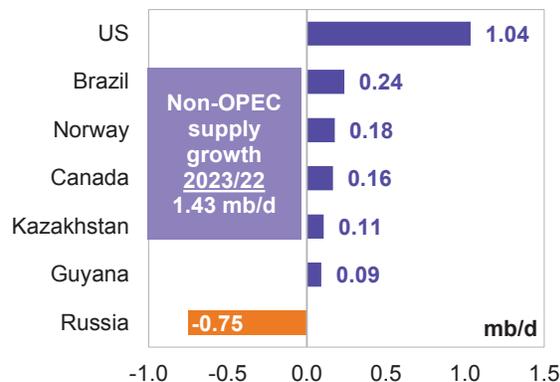
The **key drivers of non-OPEC liquids supply growth in 2022** are estimated to be the US, Russia, Canada, Guyana, China and Brazil, while oil production is expected to see the largest declines in Norway and Thailand.

Graph 5 - 2: Annual liquids production changes y-o-y for selected countries in 2022



Source: OPEC.

Graph 5 - 3: Annual liquids production changes y-o-y for selected countries in 2023*



Note: * 2023 = Forecast. Source: OPEC.

For **2023**, the key drivers of non-OPEC supply growth are forecast to be the US, Brazil, Norway, Canada, Kazakhstan and Guyana, while oil production is projected to see the largest decline in Russia.

Non-OPEC liquids production in 2022 and 2023

Table 5 - 1: Non-OPEC liquids production in 2022, mb/d

Non-OPEC liquids production	2021	1Q22	2Q22	3Q22	4Q22	2022	Change 2022/21	
							Growth	%
Americas	25.45	26.09	26.50	27.26	27.50	26.84	1.40	5.48
of which US	18.04	18.51	19.07	19.57	19.68	19.21	1.17	6.47
Europe	3.79	3.72	3.46	3.51	3.59	3.57	-0.22	-5.79
Asia Pacific	0.51	0.49	0.51	0.43	0.49	0.48	-0.03	-6.23
Total OECD	29.75	30.30	30.48	31.20	31.58	30.89	1.14	3.85
China	4.32	4.54	4.54	4.42	4.42	4.48	0.16	3.70
India	0.78	0.79	0.78	0.76	0.76	0.77	-0.01	-0.80
Other Asia	2.42	2.37	2.32	2.24	2.31	2.31	-0.11	-4.74
Latin America	5.96	6.11	6.18	6.46	6.59	6.34	0.38	6.35
Middle East	3.20	3.25	3.29	3.32	3.30	3.29	0.09	2.85
Africa	1.35	1.33	1.31	1.32	1.29	1.31	-0.03	-2.49
Russia	10.80	11.33	10.63	11.01	11.17	11.03	0.23	2.15
Other Eurasia	2.93	3.04	2.76	2.59	2.92	2.83	-0.10	-3.34
Other Europe	0.11	0.11	0.11	0.10	0.10	0.11	-0.01	-6.36
Total Non-OECD	31.87	32.85	31.92	32.23	32.87	32.47	0.60	1.89
Total Non-OPEC production	61.62	63.15	62.40	63.44	64.45	63.36	1.75	2.84
Processing gains	2.29	2.40	2.40	2.40	2.40	2.40	0.11	4.90
Total Non-OPEC liquids production	63.90	65.55	64.80	65.83	66.85	65.76	1.86	2.91
Previous estimate	63.90	65.57	64.81	65.83	66.82	65.76	1.86	2.90
Revision	0.00	-0.02	-0.01	0.00	0.04	0.00	0.00	0.00

Note: Totals may not add up due to independent rounding. Source: OPEC.

Table 5 - 2: Non-OPEC liquids production in 2023*, mb/d

Non-OPEC liquids production	2022	1Q23	2Q23	3Q23	4Q23	2023	Change 2023/22	
							Growth	%
Americas	26.84	27.72	27.89	28.23	28.52	28.09	1.25	4.66
of which US	19.21	19.87	20.18	20.36	20.56	20.24	1.04	5.39
Europe	3.57	3.68	3.74	3.79	3.92	3.78	0.21	5.88
Asia Pacific	0.48	0.45	0.49	0.49	0.48	0.48	0.00	-0.78
Total OECD	30.89	31.85	32.12	32.51	32.91	32.35	1.46	4.71
China	4.48	4.62	4.61	4.49	4.49	4.55	0.07	1.62
India	0.77	0.76	0.78	0.78	0.78	0.78	0.00	0.52
Other Asia	2.31	2.34	2.39	2.34	2.37	2.36	0.05	2.21
Latin America	6.34	6.70	6.66	6.70	6.79	6.71	0.37	5.91
Middle East	3.29	3.26	3.29	3.30	3.31	3.29	0.00	0.02
Africa	1.31	1.30	1.33	1.34	1.33	1.33	0.01	0.84
Russia	11.03	11.23	10.18	9.85	9.90	10.28	-0.75	-6.81
Other Eurasia	2.83	3.00	2.97	2.94	2.98	2.97	0.14	5.04
Other Europe	0.11	0.10	0.10	0.10	0.10	0.10	0.00	-2.83
Total Non-OECD	32.47	33.31	32.30	31.85	32.05	32.37	-0.10	-0.30
Total Non-OPEC production	63.36	65.15	64.43	64.35	64.97	64.72	1.36	2.14
Processing gains	2.40	2.47	2.47	2.47	2.47	2.47	0.07	2.96
Total Non-OPEC liquids production	65.76	67.62	66.90	66.82	67.44	67.19	1.43	2.17
Previous estimate	65.76	67.58	66.71	66.90	67.57	67.19	1.43	2.17
Revision	0.00	0.04	0.18	-0.08	-0.13	0.00	0.00	0.00

Note: * 2023 = Forecast. Totals may not add up due to independent rounding. Source: OPEC.

OECD

OECD liquids production in 2022 is estimated to have increased y-o-y by 1.1 mb/d to average 30.9 mb/d. This is primarily unchanged compared with a month earlier.

For 2023, oil production in the OECD region is forecast to grow by 1.5 mb/d to average 32.4 mb/d. This was revised up by 29 tb/d, mainly due to changes in OECD Americas.

Growth is expected to be led by OECD Americas, which will expand by 1.2 mb/d to average 28.1 mb/d. This was revised up by 36 tb/d compared with last month's assessment, due to higher expected growth in Mexico. Yearly liquids production in OECD Europe is anticipated to grow by 0.2 mb/d to average 3.8 mb/d, steady compared with the previous month. OECD Asia Pacific is expected to remain largely unchanged to average 0.5 mb/d.

Graph 5 - 4: OECD quarterly liquids supply, y-o-y changes



Note: * 1Q23-4Q23 = Forecast. Source: OPEC.

OECD Americas

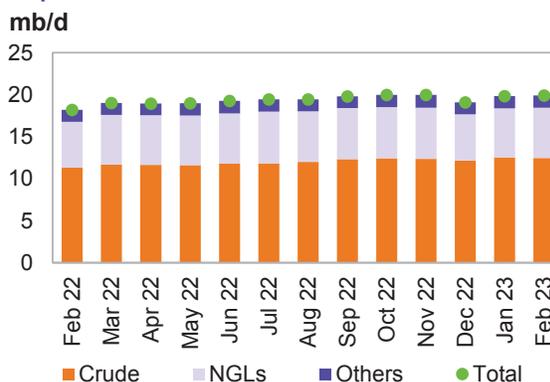
US

US liquids production in February jumped m-o-m by 57 tb/d to average 19.9 mb/d, following a recovery from disruptions that took place in December 2022. It was up by 1.7 mb/d compared with February 2022.

Crude oil and condensate production declined m-o-m by 53 tb/d in **February 2023** to average 12.5 mb/d, up by 1.2 mb/d y-o-y.

In terms of **crude and condensate production breakdown by region (PADDs)**, production increased mainly in the Midwest, rising by 71 tb/d to average 1.8 mb/d. On the other hand, production in the US Gulf Coast (USGC) region fell by 104 tb/d to 9.1 mb/d. While the East Coast remained broadly unchanged m-o-m, output in the Rocky Mountain and West Coast areas declined by 10 tb/d. Onshore production growth in the main regions was primarily driven by a strong recovery after weather-related issues affected production in December 2022, mainly in North Dakota.

Graph 5 - 5: US monthly liquids output by key component



Sources: EIA and OPEC.

NGLs production was up by 111 tb/d m-o-m to average 6.0 mb/d in February. This was higher by 0.5 mb/d y-o-y. Production of **non-conventional liquids** (mainly ethanol) remained chiefly unchanged m-o-m at an average of 1.5 mb/d, according to the US Department of Energy (DoE). Preliminary estimates see non-conventional liquids averaging around 1.5 mb/d in March, roughly unchanged compared with the previous month.

GoM production dropped m-o-m by 79 tb/d in February to average 1.8 mb/d, with normal production seen in most Gulf Coast offshore platforms, except for a reduction in Mars due to Vito oil field tie-in processes. In the **onshore Lower 48**, crude and condensate production increased m-o-m by 28 tb/d to average 10.2 mb/d in February.

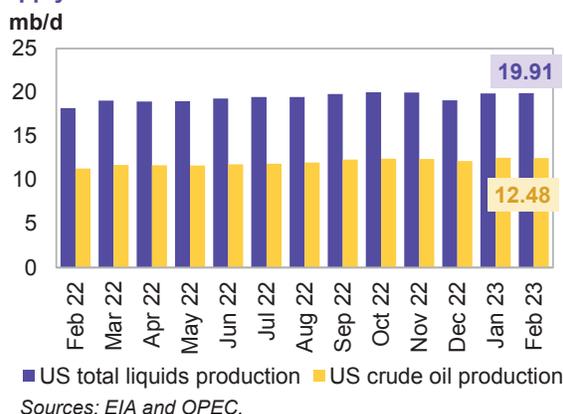
Table 5 - 3: US crude oil production by selected state and region, tb/d

State	Feb 22	Jan 23	Feb 23	Change	
				m-o-m	y-o-y
Texas	4,821	5,289	5,264	-25	443
Gulf of Mexico (GOM)	1,615	1,911	1,832	-79	217
New Mexico	1,401	1,808	1,807	-1	406
North Dakota	1,074	1,047	1,124	77	50
Alaska	450	448	446	-2	-4
Oklahoma	387	432	421	-11	34
Colorado	430	418	407	-11	-23
Total	11,316	12,536	12,483	-53	1,167

Sources: EIA and OPEC.

Looking at **individual states**, New Mexico's oil production remained steady, averaging 1.8 tb/d, which is 406 tb/d higher than a year ago. Production from Texas was down by 25 tb/d to average 5.3 mb/d, which is 443 tb/d higher than a year ago. In the Midwest, North Dakota's production jumped m-o-m by 77 tb/d to average 1.1 mb/d, up by 50 tb/d y-o-y, but Oklahoma's production was down m-o-m by 11 tb/d to average 0.4 mb/d. Production in Alaska remained broadly stable, while output in Colorado declined by 11 tb/d, m-o-m.

Graph 5 - 6: US monthly crude oil and total liquids supply



US tight crude output in February is estimated to have risen by 63 tb/d m-o-m to average 8.3 mb/d, according to the latest estimate by the US Energy Information Administration (EIA). This was 0.7 mb/d higher than in the same month of the previous year.

The m-o-m increase from shale and tight formations using horizontal wells came mainly from Permian shale production in Texas and New Mexico, where output rose by 50 tb/d to average 5.1 mb/d. This was up by 705 tb/d y-o-y.

In North Dakota, Bakken shale oil output was broadly stable m-o-m, averaging 1.1 mb/d. This is still down by 38 tb/d y-o-y. Tight crude output at Eagle Ford in Texas increased by a minor 9 tb/d to average 0.9 mb/d, which is down by 36 tb/d y-o-y. Production in Niobrara-Codell in Colorado and Wyoming was unchanged at an average of 0.4 mb/d.

US liquids production in 2022, excluding processing gains, is estimated to have expanded y-o-y by 1.2 mb/d to average 19.2 mb/d. This is broadly unchanged from the previous assessment. Tight crude is assessed to have grown by 0.5 mb/d in 2022 to average 7.9 mb/d. In addition, NGLs (mainly from unconventional basins) are estimated to have grown by 0.5 mb/d to average 5.9 mb/d, and production in the Gulf of Mexico (GoM) is estimated to have increased by a minor 36 tb/d. Non-conventional liquids and crude from conventional reservoirs are assessed to have expanded by 76 tb/d to average 1.4 mb/d and by 59 tb/d to average 2.3 mb/d, respectively.

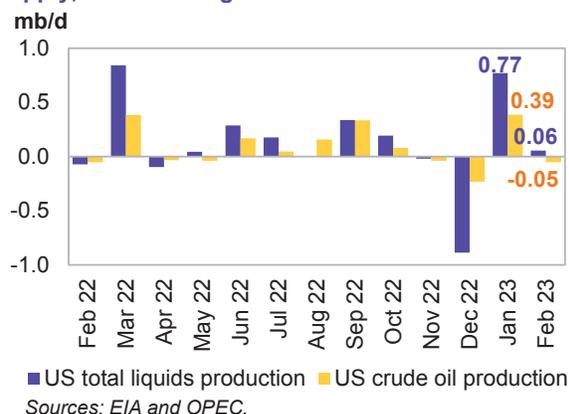
US crude oil and condensate production is estimated to grow by 0.6 mb/d y-o-y to average 11.9 mb/d in 2022.

US liquids production in 2023, excluding processing gains, is forecast to expand y-o-y by 1.0 mb/d to average 20.2 mb/d, largely unchanged from the previous assessment. Higher-than-expected output anticipated in the first quarter was compensated by a lower forecast for the rest of the year. Better drilling activity and fewer supply chain/logistical issues in the prolific Permian, Eagle Ford and Bakken shale sites are still assumed for the rest of 2023.

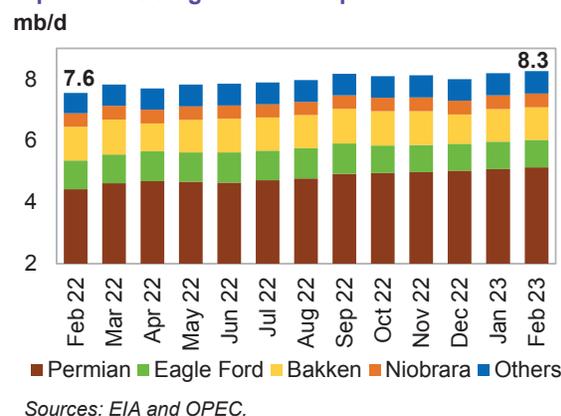
Given a sound level of oil field drilling and well completions, crude oil output is anticipated to increase by 0.7 mb/d y-o-y to average 12.6 mb/d.

Average tight crude output in 2023 is forecast at 8.6 mb/d, up by 0.7 mb/d y-o-y.

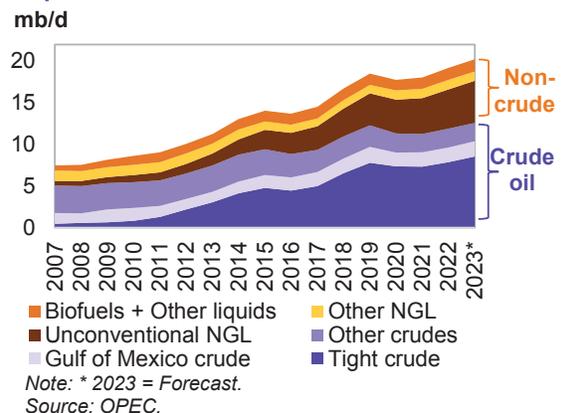
Graph 5 - 7: US monthly crude oil and total liquids supply, m-o-m changes



Graph 5 - 8: US tight crude output breakdown



Graph 5 - 9: US liquids supply developments by component



At the same time, NGLs production and non-conventional liquids, particularly ethanol, are forecast to increase y-o-y by 0.3 mb/d and 40 tb/d, to average 6.2 mb/d and 1.5 mb/d, respectively.

The 2023 forecast assumes ongoing capital discipline, less inflationary pressure, as well as moderate supply chain issues and oil field service constraints (labour and equipment). Tightness in the hydraulic fracking and professional labour market is expected to remain a challenge for US upstream producers this year.

Table 5 - 4: US liquids production breakdown, mb/d

US liquids	Change		Change		Change	
	2021	2021/20	2022	2022/21	2023*	2023/22
Tight crude	7.34	-0.02	7.88	0.54	8.57	0.69
Gulf of Mexico crude	1.71	0.04	1.74	0.04	1.83	0.09
Conventional crude oil	2.20	-0.09	2.26	0.06	2.17	-0.09
Total crude	11.25	-0.06	11.89	0.63	12.57	0.69
Unconventional NGLs	4.31	0.23	4.74	0.43	5.10	0.36
Conventional NGLs	1.12	0.02	1.14	0.02	1.09	-0.05
Total NGLs	5.42	0.25	5.88	0.46	6.19	0.30
Biofuels + Other liquids	1.36	0.10	1.44	0.08	1.48	0.04
US total supply	18.04	0.28	19.21	1.17	20.24	1.04

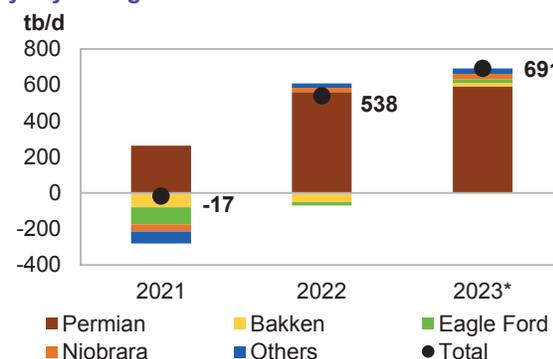
Note: * 2023 = Forecast. Sources: EIA, OPEC and Rystad Energy.

US tight crude production in the Permian in 2022 is estimated to have increased y-o-y by 0.6 mb/d to 4.7 mb/d. It is forecast to grow by 0.6 mb/d y-o-y to average 5.3 mb/d in 2023.

The **Bakken** shale production decline that occurred in 2020 and 2021 continued in 2022. Tight crude production in the Bakken is estimated to have dropped by 50 tb/d in 2022 to average 1.1 mb/d. This is much lower than the pre-pandemic average output of 1.4 mb/d.

In addition to several weather-related outages, drilling activity in **North Dakota** is expected to be lower than levels required to substantially revive output. In 2023, growth is forecast to resume at just 21 tb/d to average 1.1 mb/d.

Graph 5 - 10: US tight crude output by shale play, y-o-y changes



Note: * 2023 = Forecast. Sources: EIA and OPEC.

The **Eagle Ford** in Texas saw output of 1.2 mb/d in 2019, followed by declines in 2020, 2021 and 2022, when it fell by an estimated 20 tb/d to average 0.94 mb/d. Growth of around 19 tb/d is forecast for 2023, to average just under 0.96 mb/d.

Niobrara production is estimated to have grown y-o-y by 24 tb/d in 2022 to average 437 tb/d and is forecast to increase by 30 tb/d in 2023 to average 466 tb/d. Other shale plays are expected to show marginal increases of 24 tb/d and 30 tb/d in 2022 and 2023, respectively, given current drilling and completion activities.

Table 5 - 5: US tight oil production growth, mb/d

US tight oil	Change		Change		Change	
	2021	2021/20	2022	2022/21	2023*	2023/22
Permian tight	4.18	0.26	4.74	0.56	5.33	0.59
Bakken shale	1.12	-0.08	1.07	-0.05	1.09	0.02
Eagle Ford shale	0.96	-0.10	0.94	-0.02	0.96	0.02
Niobrara shale	0.41	-0.04	0.44	0.02	0.47	0.03
Other tight plays	0.67	-0.07	0.70	0.02	0.73	0.03
Total	7.34	-0.02	7.88	0.54	8.57	0.69

Note: * 2023 = Forecast. Source: OPEC.

US rig count, spudded, completed, DUC wells and fracking activity

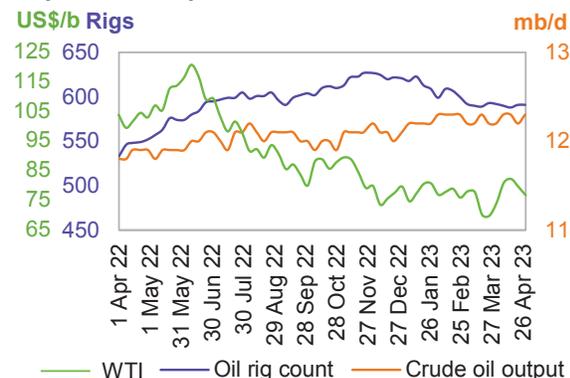
Total **active US drilling rigs** rose by two to 755 in the week ending 28 April 2023, according to Baker Hughes. This was up by 57 rigs compared with a year ago. The number of active offshore rigs remained steady w-o-w at 20. This was higher by six compared with the same month a year earlier. Onshore oil and gas rigs were higher by one w-o-w to stand at 733 rigs, up by 49 rigs y-o-y, with two rigs in inland waters.

The **US horizontal rig count** fell by two w-o-w to 685, compared with 643 horizontal rigs a year ago. The number of drilling rigs for oil remained unchanged w-o-w at 591. At the same time, gas-drilling rigs were up by two to 161.

The Permian's rig count rose by three w-o-w to 361 rigs. However, rig counts dropped by one in Eagle Ford and Williston to 67 and 40, respectively. The rig count fell by two w-o-w in Cana Woodford to 31 and remained steady in DJ-Niobrara at 17.

Two operating oil rigs remained in the Barnett basin since 6 April 2023, unchanged w-o-w.

Graph 5 - 11: US weekly rig count vs. US crude oil output and WTI price



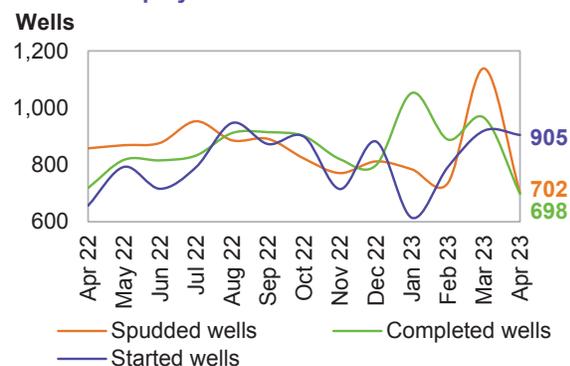
Sources: Baker Hughes, EIA and OPEC.

Drilling and completion (D&C) activities for spudded, completed and started oil-producing wells in all US shale plays, based on EIA-DPR regions, included 1,138 horizontal wells spudded in March (as per preliminary data). This is up by 400 m-o-m, and 38% higher than in March 2022.

March preliminary data indicates a higher number of completed wells at 966, which is up by 21% y-o-y. Moreover, the number of started wells was estimated at 920, which is 8% higher than a year earlier.

Preliminary data for April 2023 estimates 702 spudded, 698 completed and 905 started wells, according to Rystad Energy.

Graph 5 - 12: Spudded, completed and started wells in US shale plays

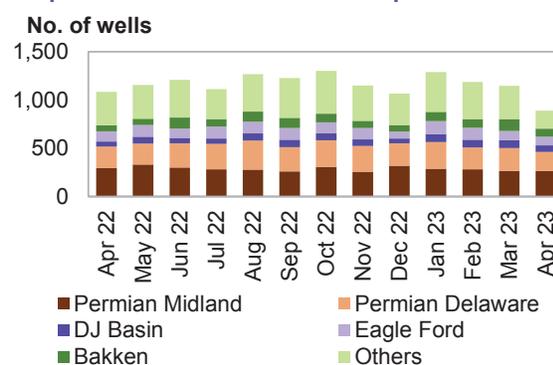


Note: Mar 23-Apr 23 = Preliminary data.
Sources: Rystad Energy and OPEC.

In terms of identified **US oil and gas fracking operations by region**, Rystad Energy reported that 1,186 wells were fracked in February 2023. In March and April, it stated that 1,146 and 889 wells began fracking, respectively. Preliminary numbers are based on analysis of high-frequency satellite data.

Preliminary March data showed that 268 and 234 wells were fracked in the Permian Midland and Permian Delaware, respectively. Compared with February, there was a decline of 14 wells in the Midland and a jump of 9 in the Delaware. Data also indicated that 84 wells were fracked in the DJ Basin, 94 in Eagle Ford and 123 in Bakken over March.

Graph 5 - 13: Fracked wells count per month



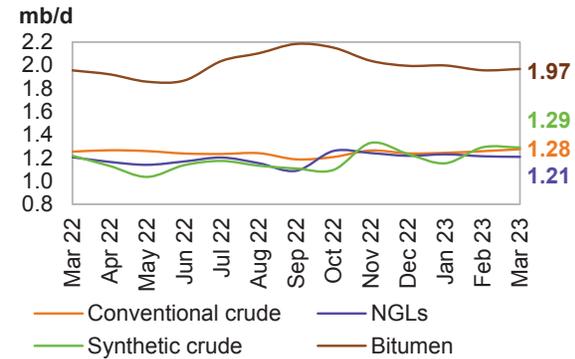
Note: Mar 23-Apr 23 = Preliminary data.
Sources: Rystad Energy Shale Well Cube and OPEC.

Canada

Canada's liquids production in March is estimated to have risen m-o-m by 21 tb/d to average 5.8 mb/d, the highest output seen since December 2022, driven by a recovery in oil sand basins.

Conventional crude production increased m-o-m by 17 tb/d to average 1.3 mb/d, while NGLs output decreased marginally by 5 tb/d to average 1.2 mb/d. Crude bitumen production output rose m-o-m by 11 tb/d in March, while synthetic crude remained basically unchanged. Taken together, crude bitumen and synthetic crude production increased by a minor 9 tb/d to 3.3 mb/d.

Graph 5 - 14: Canada's monthly liquids production development by type



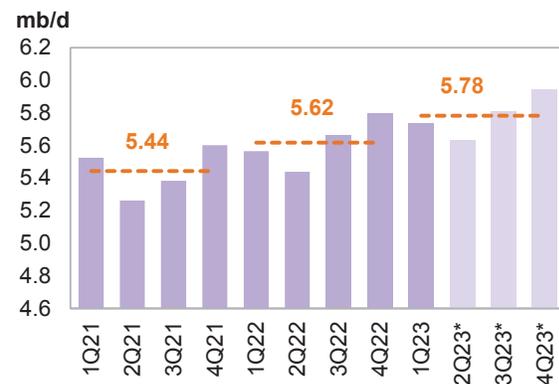
Sources: Statistics Canada, Alberta Energy Regulator and OPEC.

Canada's liquids supply in 2022 is estimated to have expanded by 0.2 mb/d to average 5.6 mb/d, broadly unchanged from the previous assessment. Oil sands output, mainly from Alberta, saw growth of 60 tb/d y-o-y to average 3.2 mb/d in 2022.

Canada's production in 1Q23, especially in January, was under pressure due to freezing weather and lower synthetic crude oil production.

For 2023, Canada's liquids production is forecast to increase at a pace similar to 2022, rising by 0.2 mb/d to average 5.8 mb/d. This is broadly unchanged compared with the previous assessment. Incremental production will come through oil sand project ramp-ups and debottlenecks, alongside conventional growth.

Graph 5 - 15: Canada's quarterly liquids production and forecast



Note: * 2Q23-4Q23 = Forecast. Source: OPEC.

Scheduled maintenance programmes during 2Q23 to 3Q23 are expected to soften output, however oil sands are projected to be the main driver of Canada's production through to the end of the year, driven by Kearn debottlenecking and CNRL Horizon optimization. Additionally, the Terra Nova Floating Production Storage and Offloading unit (FPSO) is expected to restart production in mid-2023.

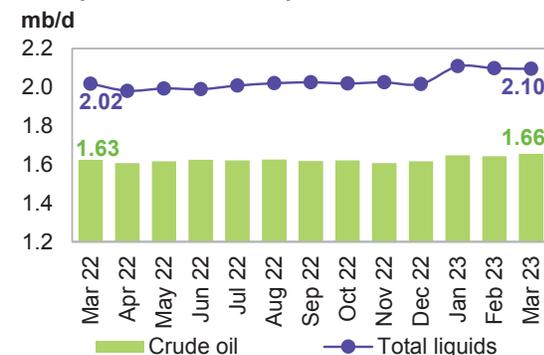
Mexico

Mexico's crude output increased by 12 tb/d m-o-m in March to average 1.7 mb/d, while NGLs output dropped by 15 tb/d. Mexico's total March liquids m-o-m output remained broadly unchanged at an average of 2.1 mb/d, according to the Comisión Nacional de Hidrocarburos (CNH). This was higher than expected, mainly due to the quick ramp-up of Pemex's priority fields.

For 2022, Mexico's liquids production is estimated to have averaged 2.0 mb/d, broadly unchanged from the previous month's assessment. Growth of 50 tb/d is estimated for 2022.

For 2023, liquids production is now forecast to rise by 50 tb/d to average 2.1 mb/d, which is up by 35 tb/d from the previous assessment, due to higher output in 1Q23 and better expectations for the rest of the year.

Graph 5 - 16: Mexico's monthly liquids and crude production development



Sources: Mexico Comisión Nacional de Hidrocarburos (CNH) and OPEC

In its latest investor presentation, Pemex highlighted the importance of its priority fields (mainly condensate and light crude) to achieve its production goal. However, it is expected that declines from mature fields could start offsetting monthly gains from new fields again starting in 2Q23. Moreover, foreign-operated crude production started to grow again after stagnating for the past several months.

OECD Europe

Norway

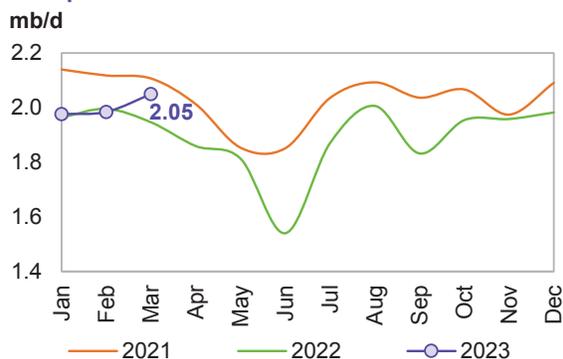
Norwegian liquids production in March increased by 66 tb/d m-o-m to average 2.1 mb/d, quite in line with Johan Sverdrup phase-2 ramp-up expectations.

Norway's crude production rose by 52 tb/d m-o-m in March to average 1.8 mb/d, higher by 84 tb/d y-o-y. Monthly oil production was 0.1% higher than the Norwegian Petroleum Directorate's (NPD) forecast.

At the same time, production of NGLs and condensates rose by 14 tb/d m-o-m to average 0.2 mb/d, according to NPD data.

For **2022**, production in the Norwegian Continental Shelf is estimated to have declined by around 140 tb/d y-o-y to average 1.9 mb/d, reflecting poor performance in Norwegian fields.

Graph 5 - 17: Norway's monthly liquids production development



Sources: The Norwegian Petroleum Directorate (NPD) and OPEC.

For **2023**, Norwegian liquids production is forecast to expand by 0.2 mb/d, remaining unchanged compared with the previous month, averaging 2.1 mb/d.

A number of small-to-large projects are scheduled to begin in 2023. The Johan Sverdrup ramp-up is projected to be the main source of growth following its Phase 2 start-up in December 2022. However, it seems that field underperformance will remain an issue throughout the year. Equinor announced that Bauge reached first oil this month. The Bauge satellite project, targeting 50 million barrels equivalent of mostly recoverable oil, came onstream 8 April, after more than a year of delays. The field is tied back to the Njord complex. Hyme, another tie-back to the Njord, has been also shut in since 2016, but resumed operations this month.

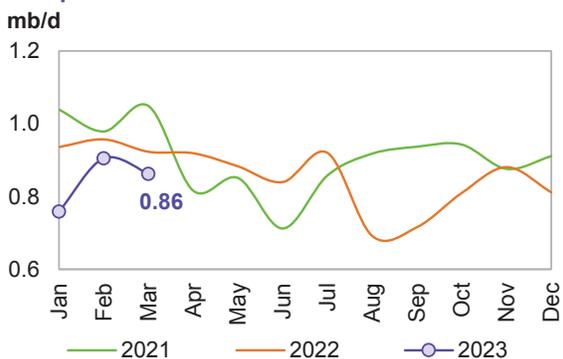
UK

UK liquids production fell m-o-m in March by 43 tb/d to average 0.9 mb/d. Crude oil output dropped by 49 tb/d m-o-m to average 0.7 mb/d, which was lower by 55 tb/d y-o-y, according to official data. NGLs output increased by a minor 6 tb/d to an average of 85 tb/d. UK liquids output in March was down by 6.6% from the same month a year earlier, mainly due to natural declines and other outages.

For **2022**, UK liquids production is estimated to have dropped by 51 tb/d to average 0.9 mb/d. This is chiefly unchanged from the previous assessment.

For **2023**, UK liquids production is forecast to increase by 28 tb/d to average 0.9 mb/d, also broadly unchanged from the previous assessment.

Graph 5 - 18: UK monthly liquids production development

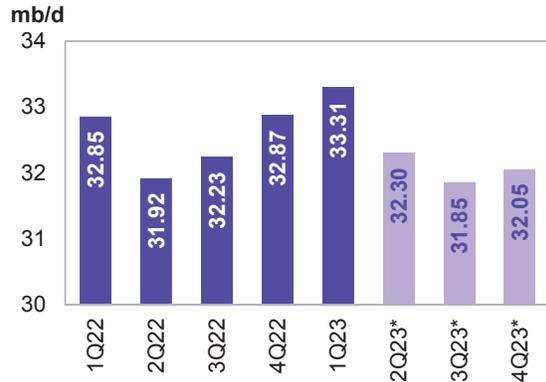


Sources: UK Department for Business, Energy and Industrial Strategy and OPEC.

A number of new fields, including Seagull, the Penguins Redevelopment, Captain EOR and Saturn Banks phase 1 will help offset base declines in 2023. However, project sanctioning will be essential to maintain future oil and gas output, as UK production has been in long-term decline. In addition, UK offshore workers demanding better pay and conditions voted in favour of a series of short strikes over the coming months. While the impact to production remains unclear, it is likely that the involved companies and unions will reach a deal before output is interrupted.

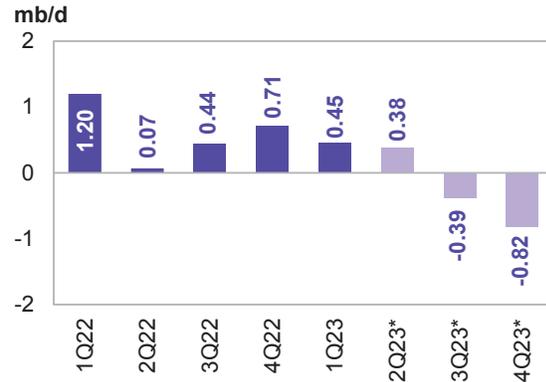
Non-OECD

Graph 5 - 19: Non-OECD quarterly liquids production and forecast



Note: * 2Q23-4Q23 = Forecast. Source: OPEC.

Graph 5 - 20: Non-OECD quarterly liquids supply, y-o-y changes

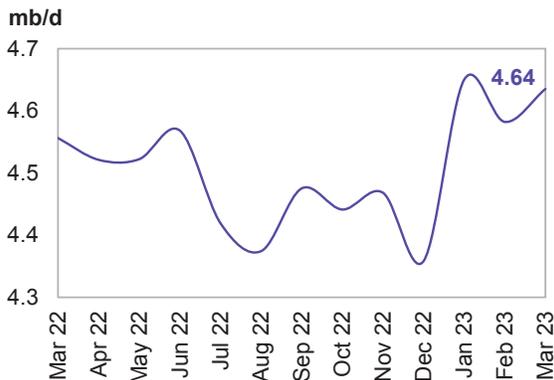


Note: * 2Q23-4Q23 = Forecast. Source: OPEC.

China

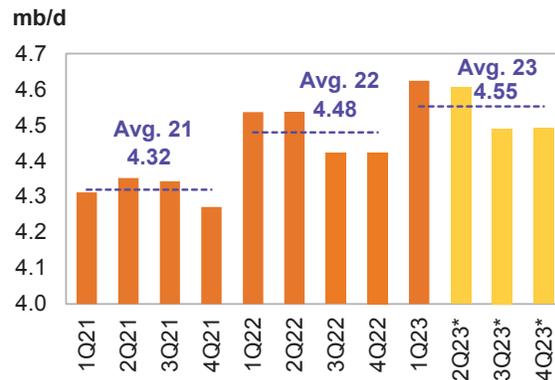
China's liquids production rose m-o-m in **March** by 53 tb/d to average 4.6 mb/d, which is a jump of 79 tb/d y-o-y, according to official data. Crude oil output in March averaged 4.2 mb/d, up by 53 tb/d compared with the previous month, but higher y-o-y by 76 tb/d. NGLs and condensate production was largely stable m-o-m, averaging 48 tb/d.

Graph 5 - 21: China's monthly liquids production development



Sources: CNPC and OPEC.

Graph 5 - 22: China's quarterly liquids production and forecast



Note: * 2Q23-4Q23 = Forecast. Sources: CNPC and OPEC.

For **2022**, growth of 160 tb/d is estimated to average 4.5 mb/d. This remained unchanged from the previous assessment and higher by 3.6% y-o-y.

For **2023**, y-o-y growth of about 73 tb/d is forecast for an average of 4.6 m/d, roughly unchanged from last month's assessment. Natural decline rates are expected to be offset by additional growth through more infill wells and enhanced oil recovery (EOR) projects amid efforts by state-owned oil companies to safeguard their energy supply.

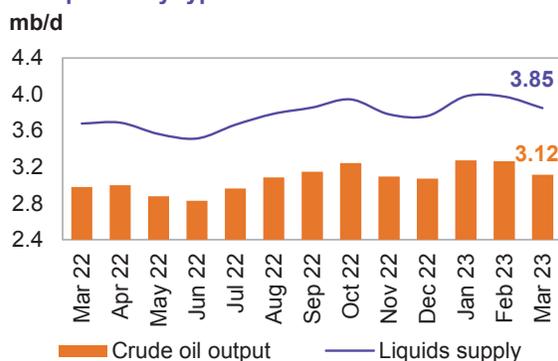
New offshore discoveries, the development of remote onshore basins and more investment in advanced EOR projects are expected to offset the declining output of mature fields. Upstream investment is expected to remain structurally elevated, considering initial 2023 capex announcements by Chinese major oil and gas companies. With a better domestic outlook, the China National Offshore Oil Corporation (CNOOC) has signaled it will scale back investments overseas and forecasts the share of production outside China to fall. Accordingly, nine new projects are planned for commissioning by CNOOC in 2023.

Latin America

Brazil

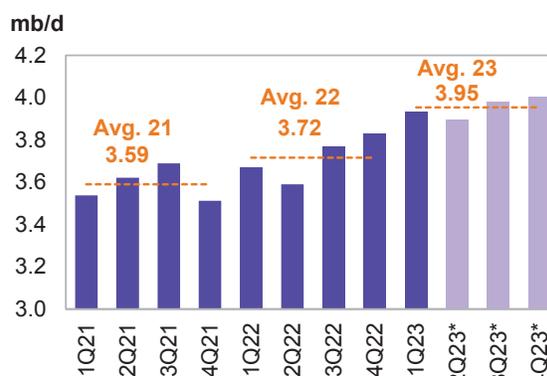
Brazil's crude output in March dropped m-o-m by 147 tb/d to average 3.1 mb/d. However, NGLs production was up by 10 tb/d to average 90 tb/d and is expected to remain flat in April. Biofuels output (mainly ethanol) rose by 10 tb/d in March to an average of 644 tb/d, with preliminary data showing a steady trend in April. The country's total liquids production decreased by 127 tb/d in March to average 3.8 mb/d, slightly lower than the highest production rate on record in January 2023, due to maintenance in some pre-salt fields.

Graph 5 - 23: Brazil's monthly liquids production development by type



Sources: Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP) and OPEC.

Graph 5 - 24: Brazil's quarterly liquids production



Note: * 2Q23-4Q23 = Forecast. Sources: ANP and OPEC.

For **2022**, Brazil's liquids supply, including biofuels, is estimated to have increased by 0.1 mb/d y-o-y to average 3.7 mb/d, primarily unchanged from the previous assessment.

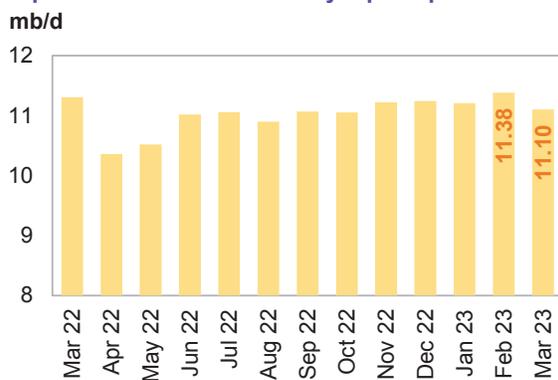
For **2023**, Brazil's liquids supply, including biofuels, is forecast to increase by 0.2 mb/d y-o-y to average 4.0 mb/d, revised down by a minor 8 tb/d from the previous forecast due to lower production rates in March.

Crude oil output is set to increase through production ramp-ups in the Buzios (Franco), Mero (Libra NW), Tupi (Lula), Peregrino, Sepia, Marlim and Itapu (Florim) fields. However, offshore maintenance is expected to cause some interruptions in major fields. The 70 tb/d Anna Nery FPSO in Marlim field and the 150 tb/d Almirante Barroso FPSO in Buzios field are expected to be on track to start production in 2Q23, as growth drivers for 2023.

Russia

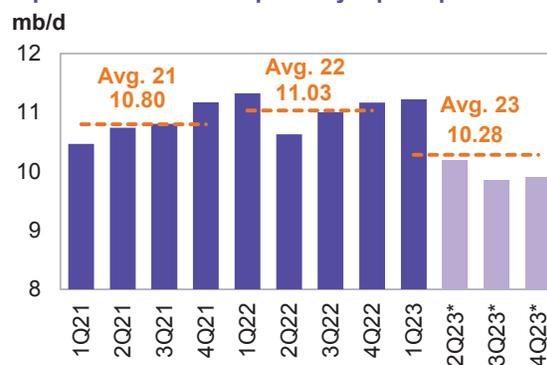
Russia's liquids production in March decreased m-o-m by 282 tb/d to average 11.1 mb/d. This includes 9.7 mb/d of crude oil and 1.4 mb/d of NGLs and condensate.

Graph 5 - 25: Russia's monthly liquids production



Sources: Nefte Compass and OPEC.

Graph 5 - 26: Russia's quarterly liquids production



Note: * 2Q23-4Q23 = Forecast. Sources: Nefte Compass and OPEC.

Russian liquids output in **2022** is estimated to have increased y-o-y by 0.2 mb/d to average 11.0 mb/d. This is broadly unchanged from the previous month's assessment.

For **2023**, Russian liquids production is forecast to drop by 0.75 mb/d to average 10.28 mb/d, unchanged from the previous month's assessment. It is worth noting that the expected contraction takes into account recently announced voluntary production adjustments to the end of 2023. A number of start-ups are planned this year by Lukoil, Gazprom, Novatek, Sigma Energy and others.

Caspian

Kazakhstan & Azerbaijan

Liquids output in Kazakhstan decreased by a minor 5 tb/d m-o-m to average 2.0 mb/d in **March**. Crude production was down by a minor 6 tb/d m-o-m to average 1.6 mb/d, while NGLs and condensate remained roughly unchanged m-o-m to average 0.4 mb/d.

Kazakhstan's liquids supply for **2022** is forecast to have declined by 44 tb/d y-o-y to average 1.8 mb/d. This is broadly unchanged compared with the previous month's assessment.

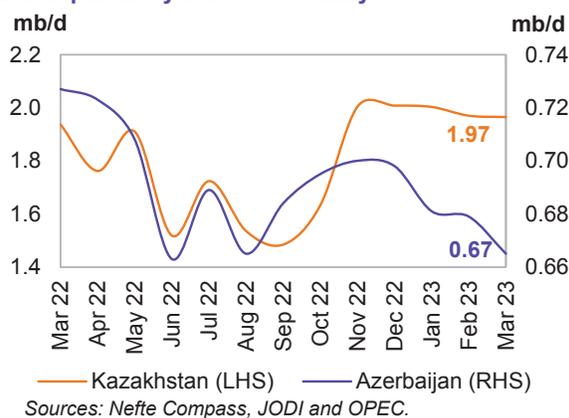
For **2023**, liquids supply is forecast to increase by 0.1 mb/d, down by a minor 7 tb/d compared with the previous forecast. The Caspian Pipeline Consortium (CPC) has halted operations at its crude export terminal near Russia's Black Sea port of Novorossiysk for an unspecified period of planned maintenance in April. However, CPC blend oil loadings are assumed to resume in mid-April after scheduled maintenance.

Azerbaijan's liquids production decreased slightly by 14 tb/d m-o-m in **March**, averaging 0.7 mb/d, which is a drop of 62 tb/d y-o-y. Crude production averaged 515 tb/d, with NGLs output at 150 tb/d, according to official sources.

For **2022**, liquids supply in Azerbaijan is estimated to have declined y-o-y by 40 tb/d to average 0.7 mb/d.

Azerbaijan's liquids supply for **2023** is forecast to rise by 37 tb/d to average 0.7 mb/d. This is a downward revision of a minor 11 tb/d, due to lower-than-expected production in major oil fields in 1Q23. The main declines in legacy fields are expected to be offset by ramp-ups in other fields. Growth is forecast to come mainly from the Shah Deniz and Absheron gas condensate projects. The Azeri-Chirag-Guneshli (ACG) oil fields have seen a steady decline since 2010. However, production is expected to rise after the start-up of the Azeri Central East flank project in 4Q23, operated by oil major BP.

Graph 5 - 27: Caspian monthly liquids production development by selected country



OPEC NGLs and non-conventional oils

OPEC NGLs and non-conventional liquids in 2022 are estimated to have grown by 0.1 mb/d to average 5.4 mb/d, unchanged from the previous assessment.

NGLs output in 1Q23 is expected to have averaged 5.34 mb/d, while OPEC non-conventional output remained steady at 0.1 mb/d. Taken together, 5.45 mb/d is expected for March, according to preliminary data.

OPEC NGLs and non-conventional liquids are forecast to expand by around 50 tb/d in **2023** to average 5.4 mb/d. NGLs production is projected to grow by 50 tb/d to average 5.3 mb/d, while non-conventional liquids are projected to remain unchanged at 0.1 mb/d.

Graph 5 - 28: OPEC NGLs and non-conventional liquids quarterly production and forecast

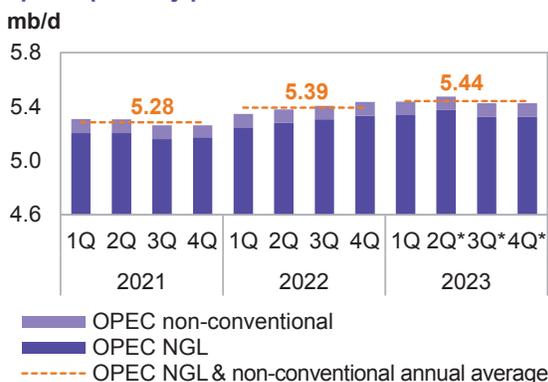


Table 5 - 6: OPEC NGL + non-conventional oils, mb/d

OPEC NGL and non-conventional oils	Change		Change		Change					
	2021	21/20	2022	22/21	1Q23	2Q23	3Q23	4Q23	2023	23/22
OPEC NGL	5.18	0.12	5.29	0.11	5.34	5.37	5.33	5.33	5.34	0.05
OPEC non-conventional	0.10	0.00	0.10	0.00	0.10	0.10	0.10	0.10	0.10	0.00
Total	5.28	0.12	5.39	0.11	5.44	5.47	5.43	5.43	5.44	0.05

Note: 2023 = Forecast. Source: OPEC.

OPEC crude oil production

According to secondary sources, total **OPEC-13 crude oil production** averaged 28.60 mb/d in April 2023, lower by 191 tb/d m-o-m. Crude oil output increased mainly in Saudi Arabia, Angola and IR Iran, while production in Iraq and Nigeria declined.

Table 5 - 7: OPEC crude oil production based on secondary sources, tb/d

Secondary sources	2021	2022	3Q22	4Q22	1Q23	Feb 23	Mar 23	Apr 23	Change Apr/Mar
Algeria	913	1,017	1,040	1,030	1,015	1,017	1,013	1,005	-8
Angola	1,122	1,140	1,155	1,084	1,071	1,072	1,006	1,085	79
Congo	263	261	265	252	268	278	271	263	-8
Equatorial Guinea	98	84	90	63	54	61	47	59	11
Gabon	182	197	201	199	196	196	202	205	2
IR Iran	2,392	2,554	2,565	2,567	2,570	2,574	2,582	2,630	48
Iraq	4,046	4,439	4,522	4,505	4,374	4,368	4,342	4,139	-203
Kuwait	2,419	2,704	2,801	2,712	2,682	2,676	2,678	2,652	-26
Libya	1,143	981	976	1,153	1,157	1,163	1,159	1,135	-24
Nigeria	1,373	1,204	1,063	1,171	1,342	1,371	1,350	1,180	-170
Saudi Arabia	9,114	10,529	10,891	10,603	10,354	10,361	10,405	10,500	95
UAE	2,727	3,066	3,168	3,094	3,043	3,046	3,038	3,028	-11
Venezuela	553	678	662	667	693	690	700	724	24
Total OPEC	26,345	28,856	29,400	29,100	28,820	28,873	28,794	28,603	-191

Notes: Totals may not add up due to independent rounding, given available secondary sources to date. Source: OPEC.

Table 5 - 8: OPEC crude oil production based on direct communication, tb/d

Direct communication	2021	2022	3Q22	4Q22	1Q23	Feb 23	Mar 23	Apr 23	Change Apr/Mar
Algeria	911	1,020	1,050	1,030	1,011	1,014	1,008	999	-9
Angola	1,124	1,140	1,151	1,076	1,046	1,064	972	1,063	91
Congo	267	262	261	261	278	273	285	277	-8
Equatorial Guinea	93	81	83	56	51	50	48	49	1
Gabon	181	191	198	183	201	207	190	197	7
IR Iran	..	..	..	..	..	..	..	..	..
Iraq	3,971	4,450	4,632	4,505	4,288	4,339	4,200	3,938	-262
Kuwait	2,415	2,707	2,799	2,721	2,676	2,676	2,676	2,676	0
Libya	1,207	..	..	..	..	..	..	..	..
Nigeria	1,323	1,143	999	1,145	1,277	1,306	1,268	999	-270
Saudi Arabia	9,125	10,591	10,968	10,622	10,456	10,450	10,464	10,461	-3
UAE	2,718	3,064	3,170	3,093	3,041	3,041	3,045	3,041	-4
Venezuela	636	716	673	693	731	704	754	810	56
Total OPEC	..	..	..	..	..	..	..	..	..

Notes: .. Not available. Totals may not add up due to independent rounding. Source: OPEC.

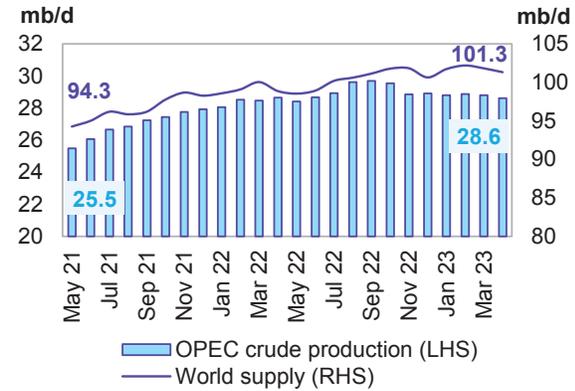
World oil supply

Preliminary data indicates that **global liquids production in April** decreased by 0.5 mb/d to average 101.3 mb/d compared with the previous month.

Non-OPEC liquids production (including OPEC NGLs) is estimated to have decreased m-o-m in April 2023 by 0.3 mb/d to average 72.7 mb/d. This was higher by 2.5 mb/d y-o-y. Preliminary estimated production rises in April were mainly driven by Other Asia and Latin America and were more than offset by decreases in Russia and Canada.

The **share of OPEC crude oil in total global production** remains unchanged to stand at 28.2% in April, compared with the previous month. Estimates are based on preliminary data for non-OPEC supply, OPEC NGLs and non-conventional oil, while assessments for OPEC crude production are based on secondary sources.

Graph 5 - 29: OPEC crude production and world oil supply development



Source: OPEC.

Commercial Stock Movements

Preliminary March 2023 data shows total OECD commercial oil stocks fell m-o-m by 31.7 mb. At 2,808 mb, they were 195 mb higher than the same time one year ago, but 34 mb lower than the latest five-year average and 105 mb below the 2015–2019 average. Within components, crude and product stocks fell m-o-m by 4.9 mb and 26.8 mb, respectively.

At 1,402 mb, OECD crude stocks were 119 mb higher than the same time a year ago and 2 mb higher than the latest five-year average. However, this was 60 mb lower than the 2015–2019 average. OECD product stocks stood at 1,406 mb, representing a surplus of 76 mb from the same time a year ago, though they were 36 mb lower than the latest five-year average and 45 mb below the 2015–2019 average.

In terms of days of forward cover, OECD commercial stocks fell m-o-m by 0.6 days in March to stand at 61.7 days. This is 4.1 days above the March 2022 level, but 3.2 days less than the latest five-year average and 0.8 days lower than the 2015–2019 average.

Preliminary data for April 2023 showed that total US commercial oil stocks rose m-o-m by 8.0 mb to stand at 1,234.3 mb. This is 80.8 mb higher than the same month in 2022, but 29.8 mb below the latest five-year average. Crude stocks fell by 10.3 mb, while product stocks rose by 18.3 mb.

OECD

Preliminary **March 2023** data sees **total OECD commercial oil stocks** down m-o-m by 31.7 mb. At 2,808 mb, they were 195 mb higher than the same time one year ago, but 34 mb lower than the latest five-year average and 105 mb below the 2015–2019 average.

Within the components, crude and product stocks fell m-o-m by 4.9 mb and 26.8 mb, respectively. Within OECD regions, total commercial oil stocks in March dropped in all regions.

OECD commercial **crude stocks** stood at 1,402 mb in March. This was 119 mb higher than the same time a year ago and 2.4 mb above the latest five-year average. However, the level was 60 mb lower than the 2015–2019 average.

M-o-m, OECD Americas and OECD Asia Pacific saw crude stock draws of 2.4 mb and 3.7 mb, respectively, while stocks in OECD Europe rose by 1.2 mb.

Total product inventories fell by 26.8 mb in March to stand at 1,406 mb. This is 76 mb above the same time a year ago, but 36 mb lower than the latest five-year average and 45 mb below the 2015–2019 average. M-o-m, OECD Americas witnessed a product stock draw of 20.2 mb, while product stocks in OECD Asia Pacific and OECD Europe fell by 3.0 mb and 3.6 mb, respectively.

Table 9 - 1: OECD commercial stocks, mb

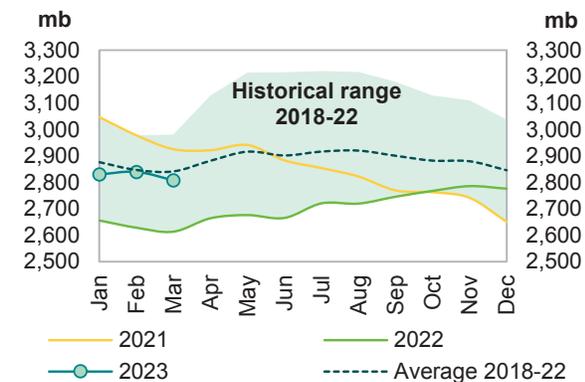
OECD stocks	Mar 22	Jan 23	Feb 23	Mar 23	Change Mar 23/Feb 23
Crude oil	1,283	1,380	1,407	1,402	-4.9
Products	1,330	1,450	1,433	1,406	-26.8
Total	2,613	2,830	2,840	2,808	-31.7
Days of forward cover	57.6	61.4	62.3	61.7	-0.6

Note: Totals may not add up due to independent rounding.

Sources: Argus, EIA, Euroilstock, IEA, METI and OPEC.

In terms of **days of forward cover**, OECD commercial stocks fell m-o-m by 0.6 days in March to stand at 61.7 days. This is 4.1 days above the March 2022 level, but 3.2 days lower than the latest five-year average and 0.8 days less than the 2015–2019 average.

Graph 9 - 1: OECD commercial oil stocks



Sources: Argus, EIA, Euroilstock, IEA, METI and OPEC.

Commercial Stock Movements

All three OECD regions were below the latest five-year average: the Americas by 3.5 days at 60.2 days; Asia Pacific by 1.7 days at 48.2 days; and Europe by 3.8 days at 71.4 days.

OECD Americas

OECD Americas' total commercial stocks fell by 22.6 mb m-o-m in March to settle at 1,513 mb. This is 106 mb higher than the same month in 2022 and 5.2 mb above the latest five-year average.

Commercial **crude oil stocks** in OECD Americas dropped m-o-m by 2.4 mb in March to stand at 805 mb, which is 79 mb higher than in March 2022 and 29 mb above the latest five-year average. The monthly crude stock draw came on the back of higher US crude runs, which increased m-o-m by 380 tb/d to stand at 16.07 mb/d.

Total product stocks in OECD Americas also fell m-o-m, decreasing by 20.2 mb in March to stand at 709 mb. This is 27 mb higher than the same month in 2022, but 24 mb below the latest five-year average. Higher consumption in the region was behind the product stock draw.

OECD Europe

OECD Europe's total commercial stocks fell m-o-m by 2.4 mb in March to settle at 955 mb. This is 65 mb higher than the same month in 2022, but 21 mb below the latest five-year average.

OECD Europe's **commercial crude stocks** rose m-o-m by 1.2 mb to end March at 419 mb. This is 19 mb higher than one year ago, but 12 mb below the latest five-year average. The build in crude oil inventories came on the back of lower refinery throughput in the EU-14, plus the UK and Norway dropping m-o-m by around 380 tb/d to stand at 9.46 mb/d.

By contrast, Europe's **product stocks** fell m-o-m by 3.6 mb to end March at 536 mb. This is 46 mb higher than a year ago at the same time, but 9 mb below the latest five-year average.

OECD Asia Pacific

OECD Asia Pacific's total commercial oil stocks fell m-o-m by 6.7 mb in March to stand at 340 mb. This is 24 mb higher than the same time a year ago, but 18 mb below the latest five-year average.

OECD Asia Pacific's **crude inventories** fell m-o-m by 3.7 mb to end March at 179 mb. This is 21 mb higher than one year ago, but 14 mb below the latest five-year average.

OECD Asia Pacific's **product inventories** fell by 3.0 mb m-o-m to end March at 161 mb. This is 3 mb higher than one year ago, but 4 mb below the latest five-year average.

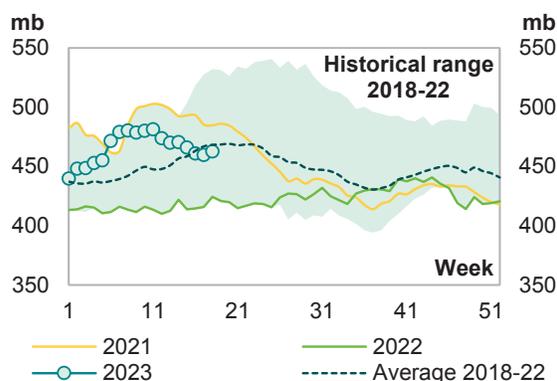
US

Preliminary data for **April 2023** showed that **total US commercial oil stocks** rose m-o-m by 8.0 mb to stand at 1,234.3 mb. This is 80.8 mb, or 7.0%, higher than the same month in 2022, but 29.8 mb, or 2.4%, below the latest five-year average. Crude stocks fell by 10.3 mb, while product stocks rose by 18.3 mb.

US commercial **crude stocks** in April stood at 459.6 mb. This is 40.5 mb, or 9.7%, higher than the same month of 2022, but 9.1 mb, or 1.9%, less than the latest five-year average. The monthly drop in crude oil stocks can be attributed to higher crude runs, which increased by around 300 tb/d to 16.37 mb/d.

By contrast, **total product stocks** rose in April to stand at 774.6 mb. This is 40.2 mb, or 5.5%, higher than April 2022 levels, but 20.7 mb, or 2.6%, lower than the latest five-year average. The product stock build could be attributed to lower product consumption.

Graph 9 - 2: US weekly commercial crude oil inventories



Sources: EIA and OPEC.

Gasoline stocks rose m-o-m by 0.3 mb in April to settle at 222.9 mb. This is 7.2 mb, or 3.1%, lower than the same month of 2022; and 16.8 mb, or 7.0%, below the latest five-year average.

Residual fuel oil stocks rose m-o-m by 2.9 mb in April. At 32.3 mb, this was 2.9 mb, or 9.9%, higher than a year earlier, and 0.6 mb, or 1.8%, above the latest five-year average

Jet fuel stocks rose m-o-m by 3.6 mb, ending April at 41.6 mb. This is 3.9 mb, or 10.5%, higher than the same month in 2022 and 1.6 mb, or 3.9%, above the latest five-year average.

By contrast, **distillate stocks** fell m-o-m, dropping by 2.7 mb in April to stand at 110.3 mb. This is 3.9 mb, or 3.6%, higher than the same month of 2022, but 18.4 mb, or 14.3%, below the latest five-year average.

Graph 9 - 3: US weekly gasoline inventories

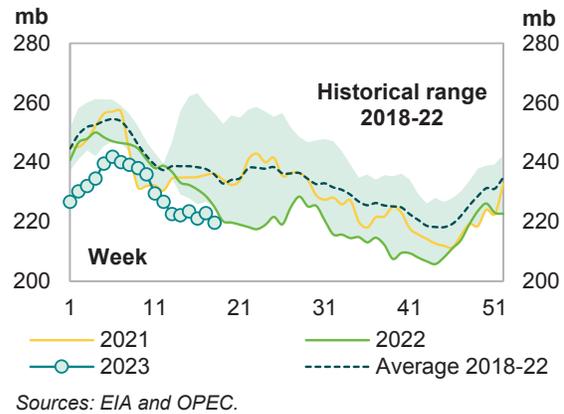


Table 9 - 2: US commercial petroleum stocks, mb

US stocks	Apr 22	Feb 23	Mar 23	Apr 23	Change Apr 23/Mar 23
Crude oil	419.1	472.4	470.0	459.6	-10.3
Gasoline	230.1	242.3	222.6	222.9	0.3
Distillate fuel	106.4	124.8	113.1	110.3	-2.7
Residual fuel oil	29.4	31.3	29.4	32.3	2.9
Jet fuel	37.7	37.5	38.0	41.6	3.6
Total products	734.4	794.4	756.3	774.6	18.3
Total	1,153.5	1,266.7	1,226.3	1,234.3	8.0
SPR	547.9	371.6	371.2	364.9	-6.2

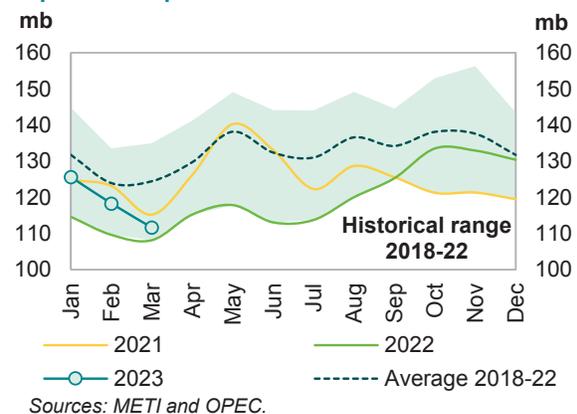
Sources: EIA and OPEC.

Japan

In **Japan**, **total commercial oil stocks** in **March** fell m-o-m by 6.7 mb to settle at 111.7 mb. This is 3.2 mb, or 3.2%, higher than the same month in 2022, but 12.8 mb, or 10.3%, below the latest five-year average. Crude and product stocks fell m-o-m by 3.7 mb and 3.0 mb, respectively.

Japanese **commercial crude oil stocks** fell m-o-m by 3.7 mb in March to stand at 62.0 mb. This is 2.0 mb, or 4.2%, higher than the same month of 2022, but 4.1 mb, or 7.7%, lower than the latest five-year average. This crude stock draw came on the back of lower crude imports, which declined m-o-m by around 220 tb/d, or 8.1%, to stand at 2.51 mb/d.

Graph 9 - 4: Japan's commercial oil stocks



Japan's **total product inventories** fell m-o-m by 3.0 mb to end March at 49.6 mb. This is 2.0 mb, or 4.2%, above the same month in 2022, but 4.12 mb, or 7.7%, below the latest five-year average.

Gasoline stocks fell m-o-m by 0.5 mb to stand at 10.0 mb in March. This was 0.2 mb, or 1.8%, above a year earlier, but 0.9 mb, or 8.3%, lower than the latest five-year average. The drop came on the back of higher domestic sales, which increased by 15.3% m-o-m.

Distillate stocks fell m-o-m by 2.0 mb to end March at 19.3 mb. This is in line with the same month of 2022, but 2.8 mb, or 12.8%, below the latest five-year average. Within distillate components, jet fuel, kerosene and gasoil stocks dropped by 20.5%, 1.5% and 10.9%, respectively.

Commercial Stock Movements

Total residual fuel oil stocks fell m-o-m by 0.1 mb to end March at 11.4 mb. This is 1.4 mb, or 13.6%, higher than in the same month of 2022, but 0.1 mb, or 1.1%, below the latest five-year average. Within the components, fuel oil A stocks remained unchanged m-o-m, while fuel oil B.C stocks fell by 1.1%.

Table 9 - 3: Japan's commercial oil stocks*, mb

Japan's stocks	Mar 22	Jan 23	Feb 23	Mar 23	Change Mar 23/Feb 23
Crude oil	60.5	67.2	65.7	62.0	-3.7
Gasoline	9.9	11.2	10.5	10.0	-0.5
Naphtha	8.4	9.7	9.2	8.9	-0.4
Middle distillates	19.3	26.4	21.3	19.3	-2.0
Residual fuel oil	10.1	11.1	11.5	11.4	-0.1
Total products	47.6	58.4	52.6	49.6	-3.0
Total**	108.2	125.6	118.3	111.7	-6.7

Note: * At the end of the month. ** Includes crude oil and main products only.

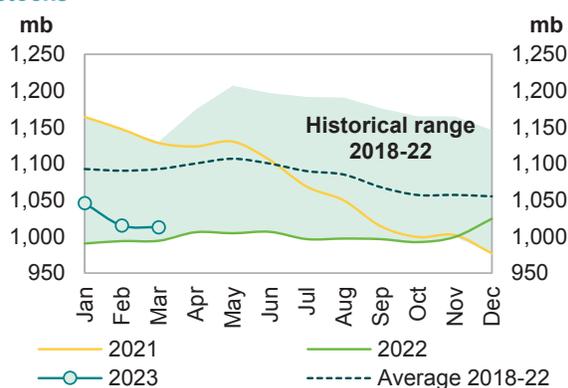
Sources: METI and OPEC.

EU-14 plus UK and Norway

Preliminary data for **March** showed that **total European commercial oil stocks** fell m-o-m by 2.4 mb to stand at 1,012.8 mb. At this level, they were 18.5 mb, or 1.9%, above the same month of 2022, but 80.0 mb, or 7.3%, lower than the latest five-year average. Crude stocks rose m-o-m by 1.2 mb, while product stocks fell by 3.6 mb.

European **crude inventories** rose in March to stand at 434.6 mb. This is 5.1 mb, or 1.2%, higher than the same month in 2022, but 36.3 mb, or 7.7%, below the latest five-year average. The build in crude oil inventories came on the back of lower refinery throughput in the EU-14, plus the UK and Norway dropping m-o-m by around 380 tb/d to stand at 9.46 mb/d.

Graph 9 - 5: EU-14 plus UK and Norway total oil stocks



Sources: Argus, Euroilstock and OPEC.

By contrast, **total European product stocks** fell by 3.6 mb m-o-m to end March at 578.1 mb. This is 13.4 mb, or 2.4%, higher than the same month of 2022, but 43.7 mb, or 7.0%, below the latest five-year average.

Gasoline stocks fell m-o-m by 0.1 mb in March to stand at 109.3 mb. At this level, they were 1.9 mb, or 1.7%, lower than the same time in 2022 and 7.7 mb, or 6.6%, below the latest five-year average.

Middle distillate stocks fell m-o-m by 1.6 mb in March to stand at 376.7 mb. This is 11.2 mb, or 3.1%, higher than the same month in 2022, but 31.5 mb, or 7.7%, lower than the latest five-year average.

Residual fuel stocks dropped m-o-m by 1.5 mb in March to stand at 61.6 mb. This is 2.8 mb, or 4.8%, higher than the same month in 2022, but 3.5 mb, or 5.4%, below the latest five-year average.

Naphtha stocks fell m-o-m by 0.4 mb in March, ending the month at 30.5 mb. This is 1.3 mb, or 4.5%, higher than the March 2022 level, but 1.1 mb, or 3.5%, below the latest five-year average.

Table 9 - 4: EU-14 plus UK and Norway's total oil stocks, mb

EU stocks	Mar 22	Jan 23	Feb 23	Mar 23	Change Mar 23/Feb 23
Crude oil	429.6	432.4	433.5	434.6	1.2
Gasoline	111.2	112.0	109.4	109.3	-0.1
Naphtha	29.2	30.7	30.9	30.5	-0.4
Middle distillates	365.5	409.4	378.3	376.7	-1.6
Fuel oils	58.8	61.3	63.1	61.6	-1.5
Total products	564.7	613.4	581.7	578.1	-3.6
Total	994.3	1,045.8	1,015.2	1,012.8	-2.4

Sources: Argus, Euroilstock and OPEC.

Singapore, Amsterdam-Rotterdam-Antwerp (ARA) and Fujairah

Singapore

In **March**, **total product stocks in Singapore** rose m-o-m by 2.9 mb to reach 48.0 mb. This is 6.5 mb, or 15.7%, higher than the same month in 2022 and 0.4 mb, or 0.9%, above the latest five-year average.

Middle distillate stocks rose m-o-m by 2.3 mb in March to stand at 9.6 mb. This is 2.6 mb, or 37.1%, higher than a year earlier, but 1.4 mb, or 12.6%, lower than the latest five-year average.

Residual fuel oil stocks rose m-o-m by 2.0 mb, ending March at 22.9 mb. This is 2.0 mb, or 9.6%, higher than March 2022, and 0.9 mb, or 4.2%, above the latest five-year average.

By contrast, **light distillate stocks** fell m-o-m by 1.4 mb in March to stand at 15.5 mb. This is 1.9 mb, or 14.0%, higher than the same month of 2022 and 0.9 mb, or 6.2 %, above the latest five-year average.

ARA

Total product stocks in ARA rose m-o-m by 0.7 mb in **March**. At 46.5 mb, they were 7.3 mb, or 18.6%, higher than the same month in 2022 and 2.9 mb, or 6.7%, higher than the latest five-year average.

Gasoline stocks in March rose by 0.2 mb m-o-m to stand at 12.4 mb. This is 0.6 mb, or 5.3%, higher than the same month of 2022 and 1.7 mb, or 15.8%, above the latest five-year average.

Fuel oil stocks also rose by 0.6 mb m-o-m in March to stand at 8.0 mb, which is 2.4 mb, or 42.1%, higher than in March 2022 and 0.5 mb, or 6.6%, higher than the latest five-year average

Jet oil stocks rose by 1.1 mb m-o-m to stand at 6.5 mb. This is 1.0 mb, or 13.9%, lower than levels of March 2022, but higher by 0.7 mb, or 11.6 %, when compared with the latest five-year average.

By contrast, **gasoil stocks** fell by 1.3 mb m-o-m, ending March at 17.6 mb. This is 5.8 mb, or 49.6%, higher than March 2022 and 0.9 mb, or 5.3%, above the latest five-year average.

Fujairah

During the week ending 1 May 2023, **total oil product stocks in Fujairah** fell w-o-w by 0.27 mb to stand at 19.69 mb, according to data from Fed Com and S&P Global Commodity Insights. At this level, total oil stocks were 2.81 mb higher than at the same time a year ago.

Light distillate stocks fell w-o-w by 0.11 mb to stand at 6.76 mb, which is 2.70 mb higher than a year ago.

Middle distillate stocks fell w-o-w by 0.45 mb to stand at 2.98 mb, which is 1.42 mb higher than the same time last year.

By contrast, **heavy distillate stocks** rose by 0.30 mb w-o-w to stand at 9.69 mb, which is 1.31 mb lower than the same period a year ago.

Table 11 - 1: World oil demand and supply balance, mb/d

World oil demand and supply balance	2019	2020	2021	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023
World demand													
Americas	25.40	22.45	24.32	24.77	24.98	25.33	24.95	25.01	24.61	25.14	25.51	25.09	25.09
of which US	20.58	18.35	20.03	20.38	20.41	20.62	20.32	20.43	20.16	20.43	20.75	20.37	20.43
Europe	14.31	12.41	13.13	13.19	13.43	14.07	13.34	13.51	12.99	13.36	14.10	13.37	13.46
Asia Pacific	7.95	7.17	7.38	7.85	6.99	7.22	7.68	7.43	7.89	7.05	7.27	7.70	7.47
Total OECD	47.66	42.03	44.82	45.81	45.39	46.62	45.97	45.95	45.50	45.55	46.87	46.15	46.02
China	13.81	13.94	15.00	14.77	14.45	14.67	15.51	14.85	15.63	15.40	15.43	16.16	15.66
India	4.99	4.51	4.77	5.18	5.16	4.95	5.26	5.14	5.40	5.44	5.21	5.50	5.39
Other Asia	9.06	8.13	8.67	9.13	9.31	8.77	8.89	9.02	9.43	9.65	9.14	9.24	9.36
Latin America	6.59	5.90	6.23	6.32	6.36	6.55	6.52	6.44	6.56	6.49	6.71	6.68	6.61
Middle East	8.20	7.45	7.79	8.06	8.15	8.53	8.44	8.29	8.59	8.47	8.86	8.73	8.66
Africa	4.44	4.08	4.22	4.51	4.15	4.25	4.69	4.40	4.71	4.34	4.43	4.88	4.59
Russia	3.57	3.39	3.61	3.67	3.42	3.45	3.71	3.56	3.68	3.45	3.59	3.87	3.65
Other Eurasia	1.19	1.07	1.21	1.22	1.16	1.00	1.21	1.15	1.24	1.16	1.02	1.22	1.16
Other Europe	0.76	0.70	0.75	0.79	0.75	0.73	0.80	0.77	0.84	0.76	0.75	0.83	0.80
Total Non-OECD	52.62	49.16	52.25	53.65	52.90	52.89	55.03	53.62	56.09	55.16	55.16	57.10	55.88
(a) Total world demand	100.27	91.19	97.08	99.45	98.29	99.51	101.00	99.57	101.58	100.70	102.03	103.25	101.90
Y-o-y change	1.08	-9.09	5.89	5.17	2.58	1.78	0.49	2.49	2.13	2.41	2.52	2.25	2.33
Non-OPEC liquids production													
Americas	25.88	24.87	25.45	26.09	26.50	27.26	27.50	26.84	27.72	27.89	28.23	28.52	28.09
of which US	18.53	17.76	18.04	18.51	19.07	19.57	19.68	19.21	19.87	20.18	20.36	20.56	20.24
Europe	3.74	3.92	3.79	3.72	3.46	3.51	3.59	3.57	3.68	3.74	3.79	3.92	3.78
Asia Pacific	0.52	0.52	0.51	0.49	0.51	0.43	0.49	0.48	0.45	0.49	0.49	0.48	0.48
Total OECD	30.15	29.31	29.75	30.30	30.48	31.20	31.58	30.89	31.85	32.12	32.51	32.91	32.35
China	4.05	4.16	4.32	4.54	4.54	4.42	4.42	4.48	4.62	4.61	4.49	4.49	4.55
India	0.83	0.78	0.78	0.79	0.78	0.76	0.76	0.77	0.76	0.78	0.78	0.78	0.78
Other Asia	2.75	2.53	2.42	2.37	2.32	2.24	2.31	2.31	2.34	2.39	2.34	2.37	2.36
Latin America	6.09	6.02	5.96	6.11	6.18	6.46	6.59	6.34	6.70	6.66	6.70	6.79	6.71
Middle East	3.16	3.15	3.20	3.25	3.29	3.32	3.30	3.29	3.26	3.29	3.30	3.31	3.29
Africa	1.51	1.41	1.35	1.33	1.31	1.32	1.29	1.31	1.30	1.33	1.34	1.33	1.33
Russia	11.51	10.54	10.80	11.33	10.63	11.01	11.17	11.03	11.23	10.18	9.85	9.90	10.28
Other Eurasia	3.07	2.91	2.93	3.04	2.76	2.59	2.92	2.83	3.00	2.97	2.94	2.98	2.97
Other Non-OECD	0.12	0.12	0.11	0.11	0.11	0.10	0.10	0.11	0.10	0.10	0.10	0.10	0.10
Total Non-OECD	33.08	31.64	31.87	32.85	31.92	32.23	32.87	32.47	33.31	32.30	31.85	32.05	32.37
Total Non-OPEC production	63.23	60.95	61.62	63.15	62.40	63.44	64.45	63.36	65.15	64.43	64.35	64.97	64.72
Processing gains	2.37	2.16	2.29	2.40	2.40	2.40	2.40	2.40	2.47	2.47	2.47	2.47	2.47
Total Non-OPEC liquids production	65.60	63.11	63.90	65.55	64.80	65.83	66.85	65.76	67.62	66.90	66.82	67.44	67.19
OPEC NGL + non-conventional oils	5.21	5.17	5.28	5.35	5.38	5.41	5.43	5.39	5.44	5.47	5.43	5.43	5.44
(b) Total non-OPEC liquids production and OPEC NGLs	70.82	68.28	69.19	70.90	70.18	71.24	72.29	71.15	73.06	72.37	72.25	72.86	72.63
Y-o-y change	2.14	-2.54	0.91	2.74	1.30	2.07	1.77	1.97	2.16	2.19	1.01	0.58	1.48
OPEC crude oil production (secondary sources)	29.36	25.72	26.34	28.33	28.58	29.40	29.10	28.86	28.82				
Total liquids production	100.18	94.00	95.53	99.23	98.75	100.64	101.38	100.01	101.88				
Balance (stock change and miscellaneous)	-0.09	2.81	-1.54	-0.22	0.46	1.13	0.39	0.44	0.30				
OECD closing stock levels, mb													
Commercial	2,894	3,037	2,651	2,613	2,665	2,746	2,777	2,777	2,808				
SPR	1,535	1,541	1,484	1,442	1,343	1,245	1,217	1,217	1,220				
Total	4,429	4,578	4,134	4,055	4,009	3,991	3,994	3,994	4,028				
Oil-on-water	1,033	1,148	1,202	1,231	1,304	1,407	1,399	1,399	1,437				
Days of forward consumption in OECD, days													
Commercial onland stocks	69	68	58	58	57	60	61	60	62				
SPR	37	34	32	32	29	27	27	26	27				
Total	105	102	90	89	86	87	88	87	88				
Memo items													
(a) - (b)	29.46	22.91	27.89	28.55	28.11	28.27	28.71	28.41	28.52	28.34	29.78	30.38	29.26

Note: Totals may not add up due to independent rounding.

Source: OPEC.

Saudi Arabia Budget Slips into Deficit as Spending Accelerates 2023-05-07 15:52:54.849 GMT

By Mirette Magdy

(Bloomberg) -- Saudi Arabia reported a deficit of 2.91 billion riyals (\$770 million) in the first quarter of the year as the government increased spending on salaries and economic diversification projects.

Government income rose in the first quarter, driven by higher non-oil revenues, but was outpaced by a nearly 30% rise in spending, according to a budget report from the Ministry Of Finance published Sunday. The government "maintains a great ability to continue the expansionary fiscal policy and consider accelerating projects," according to a separate statement on the official Saudi Press Agency.

Oil revenues fell by 3% to 179 billion riyals in the first three months of the year on lower crude prices.

Non-oil revenues, which the government has focused on growing as it looks to move away from boom-bust cycles of the past, rose by 9%. That was driven by receipts from taxes on income, profit and capital gains rising by 75%.

While Saudi Arabia is predicting another budget surplus this year, after surging oil prices helped the budget back into the black for the first time in nearly a decade last year, other forecasters are predicting a deficit. The International Monetary Fund hiked the oil price Saudi Arabia needs to balance its budget this year to over \$80 a barrel. The kingdom doesn't reveal an oil price assumption in its budget.

Read: Saudi Arabia Needs Pricier Oil to Balance Its Budget, IMF Says

The Washington-based lender forecasts the kingdom will run a budget deficit of 1.1% of gross domestic product this year, a view that's at odds with the government's expectation for a second straight surplus it last estimated at 16 billion riyals (\$4.3 billion).

The Saudi economy was the fastest growing in the Group of 20 last year, but it expanded at a slower pace in the first three months of this year to 3.9% vs 5.5% the previous quarter, as the oil sector grew at its lowest rate in more than a year, preliminary data released by the General Authority for Statistics showed Sunday.

Read: Saudi Arabia Says Fiscal Expansion to Balance Out Fed Hikes (1)

The data also showed:

- * Public debt shrank to 962 billion riyals at end of the first quarter from 990 billion riyals at the start of the year
- * Debt servicing costs increased 50%
- * Social benefits spending rose by 52%
- * Government reserves rose to 415 billion riyals and the government current account dropped to 35 billion riyals from 145

billion riyals at the end of 2022

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Table 3. Oil Exporters: Real Oil and Non-Oil GDP Growth*(Year-over-year percent change)*

	Average	2020	2021	2022	Projections	
	2000–19				2023	2024
REAL NON-OIL GDP GROWTH						
Oil exporters	5.6	-3.7	5.8	4.0	3.7	3.5
Algeria	4.7	-4.1	2.1	3.2	3.0	2.7
Azerbaijan	7.9	-2.9	7.2	9.0	4.2	3.6
Bahrain	6.4	-5.6	3.3	5.5	3.6	4.5
Iran ¹	3.9	2.9	4.3	2.5	2.0	2.0
Iraq	10.0	-20.2	21.1	3.2	2.8	4.2
Kazakhstan	6.8	-2.0	5.5	4.6	3.4	3.3
Kuwait	5.2	-7.5	3.4	3.9	3.4	3.5
Libya	3.2	-19.4	5.9	-5.1	13.6	8.5
Oman	5.1	-4.5	3.2	1.2	2.0	2.5
Qatar ²	10.3	-4.5	2.8	5.4	2.7	2.5
Saudi Arabia	5.6	-3.0	5.7	4.8	4.9	4.2
Turkmenistan	4.7	-1.8	1.7	2.3	2.2	2.3
United Arab Emirates	5.7	-5.4	5.8	6.0	3.8	3.9
CCA oil and gas exporters	7.0	-2.1	5.3	5.2	3.4	3.2
MENA oil exporters	5.5	-3.9	5.9	3.8	3.7	3.5
Memorandum						
Arab World oil exporters	6.0	-6.1	6.4	4.2	4.2	3.9
GCC	5.9	-4.1	5.2	4.9	4.2	3.9
MENA oil exporters excl. conflict-affected countries and Iran	5.6	-4.6	4.8	4.3	4.4	3.9
REAL OIL GDP GROWTH						
Oil Exporters	2.6	-3.7	4.4	7.3	2.4	2.9
Algeria	-0.7	-10.2	10.5	1.7	0.7	1.7
Azerbaijan	9.7	-6.4	2.8	-3.3	0.5	0.3
Bahrain	0.3	-0.1	-0.3	-1.8	0.1	0.1
Iran ¹	-0.4	8.8	10.5	2.9	2.1	2.1
Iraq	10.3	-12.6	-0.7	11.9	4.3	2.4
Kazakhstan	6.0	-4.7	-0.6	-1.7	7.6	10.7
Kuwait	2.7	-9.8	-0.3	11.6	-0.9	2.0
Libya	7.8	-35.5	45.0	-17.0	20.0	8.3
Oman	1.5	-0.9	2.4	9.6	1.1	9.5
Qatar ²	7.5	-2.0	-0.3	2.3	1.9	0.7
Saudi Arabia	1.8	-6.6	0.2	15.3	0.4	1.3
Turkmenistan	...	-8.8	20.1	-0.6	2.9	1.2
United Arab Emirates	2.3	-3.8	-0.7	11.1	2.8	3.8
CCA oil and gas exporters	7.4	-5.6	2.8	-1.9	5.6	7.4
MENA oil exporters	2.3	-3.5	4.6	8.6	1.9	2.3
Memorandum						
Arab World oil exporters	3.1	-7.5	2.7	10.3	1.9	2.4
GCC	2.3	-5.4	0.0	12.4	1.0	2.2
MENA oil exporters excl. conflict-affected countries and Iran	2.3	-6.9	3.1	10.2	1.6	2.4

Sources: National authorities; and IMF staff estimates and projections.

¹ Iran's data reflect the recently published national accounts by the Central Bank of Iran based on 2016 constant prices. Data prior to 2011 are extrapolated by staff to harmonize the base year.² Qatar's data reflect the recently-published national accounts based on 2018 constant prices. Data prior to 2011 are extrapolated by staff to harmonize the base year and will be revised once official data are released.

Table 4. Crude Oil and Natural Gas Production
(Millions of barrels per day or millions of barrels of oil equivalent per day)

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
CRUDE OIL PRODUCTION						
Oil exporters	26.92	26.03	27.22	29.80	30.13	30.96
Algeria	1.13	0.95	0.92	0.98	0.98	0.97
Azerbaijan	0.69	0.69	0.69	0.66	0.65	0.65
Bahrain	0.20	0.19	0.19	0.19	0.19	0.19
Iran	3.48	2.02	2.48	2.58	2.62	2.65
Iraq	2.81	4.00	3.97	4.44	4.63	4.74
Kazakhstan	1.44	1.76	1.76	1.73	1.86	2.05
Kuwait	2.52	2.44	2.43	2.71	2.68	2.73
Libya	1.25	0.30	1.21	1.00	1.20	1.30
Oman	0.88	0.95	0.97	1.06	1.07	1.20
Qatar	0.71	0.55	0.55	0.55	0.55	0.55
Saudi Arabia	9.12	9.22	9.13	10.57	10.49	10.59
Turkmenistan	0.22	0.18	0.18	0.18	0.18	0.18
United Arab Emirates	2.56	2.77	2.74	3.14	3.04	3.15
CCA oil and gas exporters	2.25	2.64	2.63	2.56	2.68	2.88
MENA oil exporters	24.67	23.39	24.58	27.24	27.44	28.08
<i>Memorandum</i>						
Arab World oil exporters	21.19	21.37	22.10	24.65	24.82	25.43
GCC	16.00	16.12	16.00	18.23	18.01	18.41
MENA oil exporters excl. conflict-affected countries and Iran	18.38	17.37	18.13	20.21	20.19	20.68
NATURAL GAS PRODUCTION						
Oil exporters	11.01	17.03	18.16	18.71	19.31	19.75
Algeria	1.53	1.50	1.86	1.83	1.86	1.91
Azerbaijan	0.33	0.62	0.79	0.83	0.88	0.92
Bahrain	0.29	0.44	0.45	0.45	0.45	0.45
Iran	2.46	4.24	4.33	4.46	4.60	4.73
Iraq	0.00	0.00	0.00	0.00	0.00	0.00
Kazakhstan	0.00	0.00	0.00	0.00	0.00	0.00
Kuwait	0.23	0.26	0.26	0.28	0.29	0.29
Libya	0.18	0.10	0.18	0.15	0.18	0.19
Oman	0.56	0.77	0.84	0.98	1.04	1.04
Qatar	2.57	4.56	4.56	4.70	4.82	4.85
Saudi Arabia	1.77	2.28	2.34	2.48	2.57	2.65
Turkmenistan	1.13	1.16	1.44	1.43	1.48	1.50
United Arab Emirates	0.90	1.10	1.09	1.12	1.16	1.19
CCA oil and gas exporters	0.95	1.78	2.24	2.26	2.37	2.42
MENA oil exporters	10.06	15.24	15.92	16.45	16.95	17.33
<i>Memorandum</i>						
Arab World oil exporters	7.60	11.00	11.59	11.99	12.35	12.60
GCC	5.96	9.41	9.55	10.01	10.31	10.49
MENA oil exporters excl. conflict-affected countries and Iran	7.60	11.00	11.59	11.99	12.35	12.60

Sources: National authorities; and IMF staff estimates and projections.

Table 5. Crude Oil and Natural Gas Exports
(Millions of barrels per day or millions of barrels of oil equivalent per day)

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
CRUDE OIL EXPORTS						
ME&CA Oil Exporters	19.74	18.81	19.40	21.52	22.03	22.69
Algeria	0.66	0.36	0.37	0.38	0.38	0.38
Azerbaijan	0.57	0.56	0.56	0.53	0.52	0.52
Bahrain	0.16	0.15	0.15	0.15	0.15	0.15
Iran	1.81	0.40	0.75	0.85	0.89	0.92
Iraq	2.50	3.43	3.44	3.65	3.89	4.04
Kazakhstan	1.20	1.45	1.35	1.34	1.45	1.63
Kuwait	1.70	1.83	1.78	1.91	1.91	1.97
Libya	0.98	0.24	0.98	0.81	0.98	1.06
Oman	0.77	0.78	0.78	0.94	0.96	0.97
Qatar	0.65	0.47	0.48	0.50	0.51	0.51
Saudi Arabia	6.89	6.63	6.23	7.58	7.44	7.48
Turkmenistan	0.07	0.07	0.07	0.07	0.06	0.06
United Arab Emirates	2.31	2.42	2.45	2.81	2.88	3.01
CCA oil and gas exporters	1.82	2.09	1.98	1.93	2.03	2.20
MENA oil exporters	17.93	16.72	17.42	19.59	20.00	20.49
<i>Memorandum</i>						
Arab World oil exporters	16.12	16.32	16.66	18.73	19.11	19.56
GCC	12.48	12.29	11.87	13.89	13.86	14.09
MENA oil exporters excl. conflict-affected countries and Iran	14.12	12.89	13.22	15.09	15.22	15.52
NATURAL GAS EXPORTS						
ME&CA Oil Exporters	4.20	5.60	6.23	6.18	6.32	6.40
Algeria	1.19	0.92	1.19	1.07	1.08	1.08
Azerbaijan	0.15	0.28	0.36	0.39	0.44	0.47
Bahrain	0.00	0.00	0.00	0.00	0.00	0.00
Iran	0.13	0.31	0.32	0.32	0.33	0.34
Iraq	0.00	0.00	0.00	0.00	0.00	0.00
Kazakhstan	0.00	0.00	0.00	0.00	0.00	0.00
Kuwait	0.13	0.17	0.18	0.19	0.19	0.20
Libya	0.07	0.02	0.09	0.07	0.09	0.09
Oman	0.20	0.25	0.25	0.27	0.26	0.26
Qatar	1.61	2.62	2.61	2.61	2.63	2.64
Saudi Arabia	0.00	0.00	0.00	0.00	0.00	0.00
Turkmenistan	0.62	0.59	0.79	0.76	0.81	0.81
United Arab Emirates	0.43	0.44	0.45	0.48	0.50	0.52
CCA oil and gas exporters	0.67	0.86	1.15	1.16	1.25	1.28
MENA oil exporters	3.76	4.74	5.08	5.02	5.08	5.12
<i>Memorandum</i>						
Arab World oil exporters	3.64	4.42	4.76	4.70	4.75	4.79
GCC	2.37	3.49	3.49	3.56	3.58	3.61
MENA oil exporters excl. conflict-affected countries and Iran	3.64	4.42	4.76	4.70	4.75	4.79

Sources: National authorities; and IMF staff estimates and projections.

Table 6. Breakeven Oil Prices*(U.S. dollars per barrel)*

	Average				Projections	
	2000–2019	2020	2021	2022	2023	2024
FISCAL BREAKEVEN OIL PRICE¹						
Oil exporters						
Algeria	102.1	89.6	111.4	85.7	112.4	111.9
Azerbaijan	51.9	66.3	57.9	63.6	77.0	78.2
Bahrain	83.2	113.7	134.8	133.6	126.2	129.1
Iran	85.6	546.5	259.4	278.3	351.7	375.4
Iraq	75.8	56.6	53.3	66.3	75.8	76.4
Kazakhstan	...	192.1	183.5	95.5	99.8	83.9
Kuwait ²	46.8	76.2	62.4	63.2	70.7	66.3
Libya	71.7	141.7	52.0	85.1	64.4	62.2
Oman	69.1	86.4	76.7	62.1	72.2	66.4
Qatar	45.1	49.3	46.5	44.7	44.8	41.5
Saudi Arabia	80.4	76.3	83.6	85.8	80.9	75.1
Turkmenistan	...	40.5	32.3	37.3	38.1	40.0
United Arab Emirates	49.9	51.7	53.1	55.1	55.6	54.8
EXTERNAL BREAKEVEN OIL PRICE³						
Oil exporters						
Algeria	85.2	80.2	79.4	75.2	74.2	83.5
Azerbaijan	57.4	64.8	69.5	85.9	60.4	63.1
Bahrain	52.5	84.6	34.6	39.4	40.5	45.7
Iran	40.4	36.7	44.5	48.8	47.2	44.1
Iraq	65.3	53.7	56.1	75.7	67.4	76.5
Kazakhstan	86.7	80.5	123.9	65.8	102.4	96.2
Kuwait	37.8	37.1	33.0	43.4	45.1	46.2
Libya	54.3	58.0	57.2	86.0	61.5	55.5
Oman	71.3	75.6	75.7	85.1	64.1	62.2
Qatar	50.6	43.5	43.4	46.3	40.2	42.7
Saudi Arabia	55.4	50.8	57.1	52.7	54.7	57.0
Turkmenistan	...	25.9	21.7	31.4	30.7	31.8
United Arab Emirates	45.7	18.5	16.8	36.8	39.4	35.3

Sources: National authorities; and IMF staff estimates and projections.

¹ The oil price at which the fiscal balance is zero.² Kuwait's fiscal breakeven oil price is calculated using the fiscal balance before the 10 percent revenue transfer to the Future Generations Fund and includes investment income.³ The oil price at which the current account balance is zero.

Table 7. Consumer Price Inflation
(Year-over-year percent change)

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
Middle East and Central Asia	7.2	10.4	12.8	14.3	15.9	12.0
Oil Exporters	6.7	8.7	11.0	13.6	12.1	8.7
Algeria	3.9	2.4	7.2	9.3	8.1	7.7
Azerbaijan	6.2	2.8	6.7	13.8	11.3	8.0
Bahrain	1.8	-2.3	-0.6	3.6	2.2	2.2
Iran	17.9	36.4	40.1	49.0	42.5	30.0
Iraq	9.5	0.6	6.0	5.0	6.6	1.6
Kazakhstan	8.3	6.8	8.0	15.0	14.8	8.5
Kuwait	2.9	2.1	3.5	3.9	3.3	2.6
Libya	7.9	1.5	2.9	4.5	3.4	2.9
Oman	2.1	-0.9	1.5	2.8	1.9	2.4
Qatar	3.5	-2.5	2.3	5.0	3.0	2.7
Saudi Arabia	1.8	3.4	3.1	2.5	2.8	2.3
Turkmenistan	6.5	6.1	19.5	11.5	6.7	10.7
United Arab Emirates	3.2	-2.1	-0.1	4.8	3.4	2.0
Emerging Market and Middle-Income Countries	7.1	8.2	7.8	11.5	21.5	17.1
Armenia	3.5	1.2	7.2	8.7	7.1	5.0
Egypt	9.9	5.7	4.5	8.5	21.6	18.0
Georgia	5.0	5.2	9.6	11.9	5.9	3.2
Jordan	3.2	0.4	1.3	4.2	3.8	2.9
Lebanon	2.7	84.9	...	...	...	...
Morocco	1.5	0.6	1.4	6.6	4.6	2.8
Pakistan	7.4	10.7	8.9	12.1	27.1	21.9
Syrian Arab Republic	...	...	...	...	...	...
Tunisia	...	5.6	5.7	8.3	10.9	9.5
West Bank and Gaza	2.8	-0.7	1.2	3.7	3.2	2.7
Low-Income Developing Countries	13.9	38.9	67.0	38.1	24.7	19.4
Afghanistan	8.3	5.6	...	...	...	...
Djibouti	...	1.8	1.2	5.5	3.2	3.2
Kyrgyz Republic	7.1	6.3	11.9	13.9	11.3	7.8
Mauritania	4.8	2.4	3.6	9.6	9.5	7.0
Somalia	...	4.3	4.6	6.8	4.2	3.8
Sudan	21.2	163.3	359.1	138.8	71.6	51.9
Tajikistan	11.5	8.6	9.0	6.6	5.4	6.5
Uzbekistan	14.0	12.9	10.8	11.4	11.8	9.9
Yemen	14.6	19.6	26.0	29.1	16.8	17.3
CCA	8.9	7.4	9.6	13.0	11.8	8.5
CCA oil and gas exporters	7.7	5.9	9.2	14.3	13.0	8.7
CCA oil and gas importers	11.0	9.9	10.3	11.0	10.0	8.1
CCA emerging market and middle-income countries	4.3	3.5	8.6	10.5	6.4	4.0
CCA low-income developing countries	13.0	11.7	10.7	11.1	11.0	9.3
MENA	7.1	10.9	13.9	14.8	14.8	11.1
MENA oil exporters	6.6	9.0	11.3	13.5	12.0	8.7
MENA oil importers	8.5	15.2	20.5	18.0	22.0	17.1
MENA emerging market and middle-income countries	7.1	6.8	7.1	11.2	19.1	14.9
MENA low-income developing countries	17.1	92.1	175.9	83.2	45.9	35.0
Memorandum						
Regional groups						
Arab World	4.8	6.1	9.1	8.9	9.9	7.7
Arab World oil exporters	3.0	1.3	3.2	4.2	3.9	2.8
GCC	2.3	1.3	2.2	3.3	2.9	2.3
MENA excl. fragile and conflict-affected states	6.8	8.4	9.6	12.6	13.9	10.8
MENA oil exporters excl. conflict-affected countries and Iran	2.6	1.4	2.8	4.1	3.6	3.0
MENAP	7.1	10.8	13.2	14.4	16.4	12.5
MENAP oil importers	8.0	13.5	16.3	15.9	23.7	18.8
North Africa	7.7	11.3	15.8	13.9	17.9	14.7
Fragile and conflict-affected states	9.1	29.4	52.4	33.5	22.4	13.6
Conflict-affected countries	8.1	3.3	8.1	7.5	7.6	3.2

Sources: National authorities; and IMF staff estimates and projections.

Table 13. Oil Exporters: General Government Non-Oil Fiscal Balance*(Percent of non-oil GDP)*

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
ME&CA Oil Exporters	-36.8	-31.0	-29.0	-31.1	-29.9	-28.0
Algeria ¹	-35.7	-25.9	-24.5	-24.4	-29.5	-25.4
Azerbaijan ²	-28.8	-32.3	-24.9	-17.5	-21.1	-20.1
Bahrain ¹	-29.6	-28.9	-27.8	-24.3	-22.6	-22.0
Iran ³	-10.9	-6.4	-5.9	-5.9	-7.3	-7.6
Iraq ¹	-84.2	-61.7	-59.8	-72.7	-72.0	-69.0
Kazakhstan	-8.8	-12.1	-11.5	-9.4	-9.7	-8.3
Kuwait ⁴	-58.4	-72.1	-64.8	-66.2	-72.9	-68.3
Libya	-87.4	-33.2	-146.6	-197.1	-170.6	-163.8
Oman ¹	-50.9	-54.7	-44.4	-40.4	-39.2	-36.4
Qatar	-72.6	-33.9	-31.0	-30.4	-28.2	-25.5
Saudi Arabia ¹	-47.9	-34.9	-29.8	-31.2	-27.8	-26.3
Turkmenistan ⁵	-6.3	-4.4	-2.7	-3.4	-3.4	-3.2
United Arab Emirates ⁶	-21.9	-18.5	-16.0	-16.4	-16.2	-15.8
CCA oil and gas exporters	-13.1	-13.8	-12.0	-9.7	-10.4	-9.3
MENA oil exporters	-39.1	-33.4	-31.2	-33.8	-32.5	-30.6
<i>Memorandum</i>						
Arab World oil exporters	-46.9	-36.3	-34.7	-37.4	-36.0	-33.9
GCC	-43.2	-34.4	-30.1	-31.0	-29.1	-27.3
MENA oil exporters excl. conflict-affected countries and Iran	-44.5	-33.6	-32.0	-33.5	-31.9	-29.9

Sources: National authorities; and IMF staff estimates and projections.

¹ Central government.² General government includes state budget, Nakhchevan AR, State Oil Fund of Azerbaijan (SOFAZ), and State Social Protection Fund.³ Central government including Targeted Subsidy Organization.⁴ Central government and Social Security Fund.⁵ State budget.⁶ Consolidated accounts of the federal government and the emirates, including extra-budgetary funds.

Table 18. Current Account Balance*(Billions of U.S. dollars)*

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
Middle East and Central Asia	139.4	-102.9	130.3	360.9	167.5	99.1
Oil Exporters	169.9	-64.1	179.5	426.6	218.7	151.6
Algeria	4.1	-18.7	-4.6	14.0	1.6	-5.8
Azerbaijan	5.7	-0.2	8.3	21.3	13.5	13.0
Bahrain	0.7	-3.2	2.6	4.0	2.3	1.8
Iran, Islamic Republic of	16.4	-0.7	11.1	16.7	6.7	7.2
Iraq	1.2	-18.4	16.0	31.4	11.8	-7.1
Kazakhstan	-1.0	-7.6	-7.9	6.3	-4.7	-5.1
Kuwait	30.5	4.2	32.4	52.6	32.4	27.7
Libya	8.1	-4.0	2.9	1.2	5.6	6.7
Oman	0.8	-12.3	-4.3	3.7	2.2	1.5
Qatar	18.3	-2.9	26.5	58.6	42.1	33.6
Saudi Arabia	59.5	-22.8	44.3	152.8	66.0	38.9
Turkmenistan	-3.2	1.4	4.2	4.4	3.8	2.6
United Arab Emirates	27.6	21.1	48.0	59.6	35.3	36.6
Emerging Market and Middle-Income Countries	-28.0	-30.1	-38.2	-56.5	-37.1	-38.5
Armenia	-0.6	-0.5	-0.5	0.0	-0.4	-0.8
Egypt	-4.2	-11.2	-18.4	-16.6	-10.9	-11.6
Georgia	-1.2	-2.0	-1.9	-0.8	-1.1	-1.3
Jordan	-2.0	-2.5	-3.7	-3.6	-3.1	-2.8
Lebanon	-7.8	-3.7	...	...	...	...
Morocco	-3.3	-1.4	-3.2	-6.0	-5.2	-5.1
Pakistan	-4.7	-4.4	-2.8	-17.4	...	...
Syrian Arab Republic	...	...	...	...	...	...
Tunisia	-2.6	-2.5	-2.8	-4.0	-3.5	-2.9
West Bank and Gaza	-1.4	-1.9	-1.5	-2.3	-2.3	-2.3
Low-Income Developing Countries	-2.5	-8.6	-10.9	-9.2	-14.1	-14.0
Afghanistan	2.4	2.2	...	...	...	...
Djibouti	...	0.4	0.0	-0.2	-0.1	-0.1
Kyrgyz Republic	-0.5	0.4	-0.7	-3.0	-1.2	-1.2
Mauritania	-0.6	-0.6	-0.8	-1.5	-0.8	-1.0
Somalia	...	-0.7	-1.3	-1.4	-1.4	-1.4
Sudan	-3.5	-6.0	-2.5	-3.1	-3.4	-3.5
Tajikistan	-0.4	0.3	0.7	0.7	-0.2	-0.3
Uzbekistan	0.9	-3.0	-4.8	1.2	-3.3	-3.8
Yemen	-0.5	-1.6	-1.5	-2.0	-3.7	-2.8
CCA	1.2	-11.2	-2.6	30.1	6.3	3.1
CCA oil and gas exporters	3.0	-6.4	4.6	32.0	12.5	10.5
CCA oil and gas importers	-1.8	-4.8	-7.3	-1.9	-6.2	-7.4
CCA emerging markets and middle-income countries	-1.8	-2.5	-2.5	-0.8	-1.6	-2.1
CCA low-income developing countries	0.0	-2.3	-4.8	-1.2	-4.7	-5.3
MENA	140.8	-89.5	135.8	348.2	169.2	104.9
MENA oil exporters	166.9	-57.7	174.9	394.6	206.2	141.0
MENA oil importers	-26.1	-31.8	-39.1	-46.4	-36.9	-36.1
MENA emerging markets and middle-income countries	-21.4	-23.2	-33.0	-38.3	-27.5	-27.4
MENA low-income developing countries	-4.7	-8.6	-6.1	-8.1	-9.4	-8.7
Memorandum						
Regional groups						
Arab World	124.4	-88.8	124.6	331.5	162.5	97.7
Arab World oil exporters	150.5	-57.0	163.7	377.9	199.4	133.8
GCC	137.4	-15.9	149.4	331.4	180.5	140.0
MENA excl. fragile and conflict-affected states	145.2	-53.1	127.0	330.3	165.1	117.9
MENA oil exporters excl. conflict-affected countries and Iran	149.5	-38.6	147.7	346.5	187.7	140.9
MENAP	138.2	-91.7	133.0	330.8	161.2	95.9
MENAP oil importers	-28.6	-34.0	-41.9	-63.8	-44.9	-45.1
North Africa	-1.9	-44.0	-29.5	-16.1	-16.8	-23.2
Fragile and conflict-affected states	-2.3	-34.1	8.8	17.9	4.1	-13.0
Conflict-affected countries	2.3	-18.5	13.3	28.1	6.7	-11.2

Sources: National authorities; and IMF staff estimates and projections.

Table 20. Gross Official Reserves

(Billions of U.S. dollars)

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
Middle East and Central Asia	907.8	1083.7	1130.8	1177.0	1198.4	1204.5
Oil Exporters	789.6	893.0	941.3	1009.1	1022.5	1018.2
Algeria	103.1	46.9	45.4	59.8	63.2	59.1
Azerbaijan	5.4	6.4	7.1	9.0	9.2	9.4
Bahrain	3.3	2.2	4.7	4.5	5.2	5.6
Iran ¹	70.5	13.8	17.7	25.4	23.2	21.4
Iraq	45.6	54.4	64.2	97.0	99.4	93.1
Kazakhstan	19.9	35.7	34.4	35.2	37.1	36.3
Kuwait	21.5	48.3	45.1	46.4	54.5	57.9
Libya	67.4	69.3	77.7	79.1	83.6	87.5
Oman	11.0	15.0	19.7	17.6	20.5	21.4
Qatar	19.0	40.9	42.2	47.3	50.4	52.2
Saudi Arabia ²	379.4	453.7	455.4	459.9	445.6	436.7
Turkmenistan	...	...	...	...	...	...
United Arab Emirates ³	50.5	106.5	127.8	127.8	130.6	137.5
Emerging Market and Middle-Income Countries	93.1	136.3	142.1	119.5	124.9	134.8
Armenia	1.5	2.6	3.2	4.1	4.1	4.1
Egypt	23.7	37.2	39.4	31.5	36.1	42.9
Georgia	1.8	3.9	4.3	4.9	4.8	5.0
Jordan	10.3	17.0	19.0	18.0	18.4	18.0
Lebanon ⁴	25.4	17.7	...	...	...	...
Morocco	19.4	36.0	35.6	31.8	32.7	33.0
Pakistan	9.5	12.2	17.3	9.8	11.0	11.7
Syrian Arab Republic	...	...	...	...	...	...
Tunisia	6.2	9.1	8.7	7.9	9.1	10.1
West Bank and Gaza	0.5	0.7	0.9	0.9	...	...
Low-Income Developing Countries	25.1	54.3	47.4	48.4	51.0	51.5
Afghanistan	...	9.8	...	...	...	...
Djibouti	0.2	0.7	0.6	0.5	0.6	0.6
Kyrgyz Republic ⁵	1.3	2.6	2.8	2.5	2.2	2.0
Mauritania	0.5	1.5	2.3	1.9	2.1	2.2
Somalia	...	...	...	...	...	...
Sudan ⁶	1.4	1.6	2.3	2.1	1.9	1.8
Tajikistan	0.4	2.2	2.5	3.7	4.4	4.8
Uzbekistan	14.0	34.9	35.1	36.4	39.1	39.3
Yemen	4.2	1.0	1.7	1.3	0.7	0.8
CCA	44.4	88.3	89.4	95.8	101.0	100.9
CCA oil and gas exporters	25.2	42.0	41.5	44.2	46.3	45.7
CCA oil and gas importers	19.1	46.3	47.9	51.6	54.6	55.2
CCA emerging markets and middle-income countries	3.3	6.5	7.5	9.0	8.9	9.1
CCA low-income developing countries	15.8	39.8	40.4	42.6	45.7	46.1
MENA	851.0	973.4	1024.1	1071.3	1086.4	1091.9
MENA oil exporters	764.4	851.0	899.9	964.9	976.1	972.5
MENA oil importers	86.6	122.4	124.3	106.5	110.3	119.4
MENA emerging markets and middle-income countries	80.3	117.6	117.3	100.7	105.1	114.0
MENA low-income developing countries	6.3	4.8	7.0	5.8	5.2	5.4
Memorandum						
Regional groups						
Arab World	780.4	959.6	1006.4	1045.9	1063.3	1070.5
Arab World oil exporters	693.8	837.2	882.1	939.4	953.0	951.1
GCC	484.6	666.6	694.9	703.4	706.8	711.3
MENA excl. fragile and conflict-affected states	718.5	828.7	863.7	880.4	892.0	898.6
MENA oil exporters excl. conflict-affected countries and Iran	655.1	782.8	817.9	842.4	853.6	858.0
MENAP	863.5	995.3	1041.4	1081.2	1097.4	1103.6
MENAP oil importers	99.1	144.4	141.6	116.3	121.3	131.1
North Africa	221.9	202.4	212.1	214.7	229.3	237.2
Fragile and conflict-affected states	156.1	154.4	160.4	191.0	194.4	193.3
Conflict-affected countries	...	65.1	...	...	...	...

Sources: National authorities; and IMF staff estimates and projections.

¹ In line with the Balance of Payments Manual (paragraph 6.75), the series of Gross International Reserves has been amended to reflect the amount of external assets that is readily available and controlled by the monetary authorities after the re-introduction of financial sanctions. Staff estimates that only 10 percent of the previously reported gross international reserves other than Iran's SDR holdings and reserve position at the Fund were readily available for BOP purposes in 2019. Starting from 2020, gross international reserves are assumed to accumulate or decumulate with the estimated BOP surpluses or deficits, and from 2021 with the new SDR allocation approved in August 2021. For instance, in 2021, total gross reserves are estimated at about \$122 bn, while total usable reserves are estimated at \$17.7 bn.

² Saudi Arabia Monetary Agency gross foreign assets.

³ Central bank only. Excludes overseas assets of sovereign wealth funds.

⁴ Excludes gold and encumbered assets.

⁵ Gross international reserves exclude reserve assets in non-convertible currencies.

⁶ Gross international reserves include a large portion of unreconciled claims.

Table 22. Gross Official Reserves*(In months of next year's imports)*

	Average				Projections	
	2000–19	2020	2021	2022	2023	2024
Middle East and Central Asia	9.6	9.1	7.8	8.0	7.8	7.4
Oil Exporters	11.0	10.3	8.9	9.4	9.0	8.4
Algeria	25.4	12.7	11.3	13.4	13.1	11.7
Azerbaijan	4.6	4.7	4.6	6.6	6.5	6.4
Bahrain	2.2	1.0	1.8	1.7	1.8	1.9
Iran ¹	10.9	2.2	2.6	3.9	3.5	3.2
Iraq	8.1	9.0	7.3	11.0	9.6	8.8
Kazakhstan	5.6	8.7	7.0	7.1	7.3	6.9
Kuwait	6.6	12.9	9.4	9.2	10.3	10.5
Libya	...	...	...	...	...	...
Oman	5.0	4.9	4.8	4.5	5.2	5.3
Qatar	5.0	8.0	7.1	8.0	8.0	7.9
Saudi Arabia ²	24.7	25.6	21.6	20.3	18.3	16.6
Turkmenistan	...	...	...	...	...	...
United Arab Emirates ³	2.9	4.0	3.9	3.9	3.9	3.8
Emerging Market and Middle-Income Countries	5.4	5.5	4.5	4.0	4.1	4.2
Armenia	4.1	5.1	3.8	4.1	3.9	3.8
Egypt	5.8	5.5	4.6	3.7	4.1	4.5
Georgia	2.8	4.2	3.3	3.6	3.4	3.2
Jordan	6.9	8.7	7.7	7.5	7.8	7.5
Lebanon ⁴	10.6	12.1	...	...	...	...
Morocco	6.7	7.2	5.8	5.5	5.4	5.3
Pakistan	2.9	2.3	2.5	1.7	1.7	1.7
Syrian Arab Republic	...	...	...	...	...	...
Tunisia	3.5	4.5	3.6	3.4	3.9	4.2
West Bank and Gaza	1.0	0.8	0.9	0.9	...	...
Low-Income Developing Countries	6.4	7.9	6.9	6.5	6.3	5.8
Afghanistan	...	...	...	...	...	...
Djibouti ⁵	...	1.6	1.3	1.1	1.0	1.0
Kyrgyz Republic ⁶	4.3	5.3	3.8	3.7	3.1	2.7
Mauritania	1.9	4.3	4.6	4.5	5.2	5.1
Somalia	...	...	...	...	...	...
Sudan	2.1	2.1	2.7	2.3	2.0	1.9
Tajikistan	1.7	6.3	5.9	7.6	8.3	8.5
Uzbekistan	11.2	15.1	12.0	11.0	10.2	8.9
Yemen	6.4	1.1	1.7	1.1	0.6	0.7
CCA	5.8	8.8	7.1	7.3	7.2	6.7
CCA oil and gas exporters	5.3	7.7	6.4	7.0	7.2	6.8
CCA oil and gas importers	6.5	10.1	7.7	7.6	7.2	6.6
CCA emerging markets and middle-income countries	3.3	4.5	3.5	3.8	3.6	3.4
CCA low-income developing countries	8.3	12.6	9.9	9.5	9.0	8.0
MENA	10.3	9.5	8.2	8.4	8.2	7.8
MENA oil exporters	11.4	10.5	9.0	9.5	9.1	8.6
MENA oil importers	5.9	5.9	4.9	4.3	4.5	4.6
MENA emerging markets and middle-income countries	6.2	6.5	5.2	4.6	4.9	5.0
MENA low-income developing countries	4.0	1.9	2.5	2.0	1.7	1.7
Memorandum						
Regional groups						
Arab World	10.3	10.0	8.5	8.7	8.4	8.0
Arab World oil exporters	11.6	11.2	9.6	10.0	9.5	8.9
GCC	10.7	11.4	9.7	9.6	9.2	8.8
MENA excl. fragile and conflict-affected states	10.7	9.7	8.4	8.5	8.2	7.8
MENA oil exporters excl. conflict-affected countries and Iran	11.9	11.4	9.8	9.9	9.5	8.9
MENAP	9.9	9.1	7.8	8.1	7.8	7.5
MENAP oil importers	5.4	5.2	4.4	3.8	3.9	4.0
North Africa	10.6	7.0	5.9	5.9	6.1	5.9
Fragile and conflict-affected states	7.6	7.5	6.1	8.3	7.7	7.2
Conflict-affected countries	8.0	7.9	6.7	9.9	8.8	8.0

Sources: National authorities; and IMF staff estimates and projections.

¹ In line with the Balance of Payments Manual (paragraph 6.75), the series of Gross International Reserves has been amended to reflect the amount of external assets that is readily available and controlled by the monetary authorities after the re-introduction of financial sanctions. Staff estimates that only 10 percent of the previously reported gross international reserves other than Iran's SDR holdings and reserve position at the Fund were readily available for BOP purposes in 2019. Starting from 2020, gross international reserves are assumed to accumulate or decumulate with the estimated BOP surpluses or deficits, and from 2021 with the new SDR allocation approved in August 2021. For instance, in 2021, total gross reserves are estimated at about \$122 bn, while total usable reserves are estimated at \$17.7 bn.

² Saudi Arabia Monetary Agency gross foreign assets.

³ Central bank only. Excludes overseas assets of sovereign wealth funds.

⁴ Gold and encumbered assets are excluded.

⁵ The ratio of reserves to total imports understates the reserve coverage since a large part of imports reflect re-export activities.

⁶ Reserve assets in non-convertible currencies are excluded.

Libya will produce more than 1.5 million barrels of oil per day in 2023: AGOCO chairman

Provision of budget, continued and fast development, stability in Libya and oil sector - all contributing factors

by [Ibrahim Senusi](#) [February 14, 2023](#)



AGOCO chairman Gatrani said Libya can increase production to 1.5 million bpd this year (Photo: AGOCO).

The continuation of the Arabian Gulf Oil Company's (AGOCO) development operations at this pace will inevitably lead to Libya reaching a production rate of more than 1.5 million barrels of oil per day in 2023, AGOCO chairman Salah Gatrani said in an exclusive statement to *Libya Herald*.

He said this was because of the stability witnessed by the country in general, and by the oil sector in particular. Therefore, he continued, the Gulf Company has developed its own plan within the efforts of the National Oil Corporation (NOC). Libya has been unable to maintain production beyond 1.2 million bpd.

Gatrani was commenting to *Libya Herald* following Sunday's AGOCO's meeting on developing reserves and increasing oil production in the sector companies, attended by relevant AGOCO and NOC management.

The AGOCO chairman said that his company has already begun to implement the plan prepared by the NOC to raise production and increase reserves.

Training, localising and developing new techniques

He said AGOCO had actually delayed several projects to raise the efficiency of the employees in the company, including a cooperation project with KAMCO Oil Services Company to raise the efficiency

of employees, localize and develop technology in the company, and keep pace with global updates in the fields of drilling oil wells and extracting crude oil.

Gatrani referred to the conclusion of a training course for workers in the Nafoura field in the field of production engineering on the use of new techniques of electrical narratives and their applications to evaluate rock layers in oil-producing wells as well as water injection wells.

NOC is providing finance after securing it from government

He commended the NOC for supporting its oil companies financially, especially after allocating a good budget to the sector from the Abd Alhamid Aldabaiba government, which positively affected the entire oil sector, as several oil wells have returned to production and the completion of preparations in several new wells.

At the meeting Gatrani referred to the speech by NOC chairman Farhat Bengdara at a previous expanded meeting on the NOC's strategic plan to raise production and develop reserves. He pointed to the importance of this plan, which he said requires concerted efforts to achieve it and provide the necessary capabilities that would ensure access to the target smoothly. The most important of these capabilities, he said, is the steady cash flow as well as overcoming and developing all the problems that hinder the productive process.

AGOCO expected to increase most production

Speaking at the meeting, Khalifa Abdul Sadig, NOC board member, said that this meeting is very important and strategic to increase production and develop reserves in AGOCO, which, he said, constitutes the largest percentage of this plan. He said the NOC is counting on AGOCO to increase production, develop reserves, and counting on it for the success of the NOC's increased production plan. He admitted that the challenges are great, but with a strong will and wise management, Libya will be able to achieve the goals and results.

Tags: [AGOCO Arabian Gulf Oil Company](#)



Air Passenger Market Analysis

March 2023

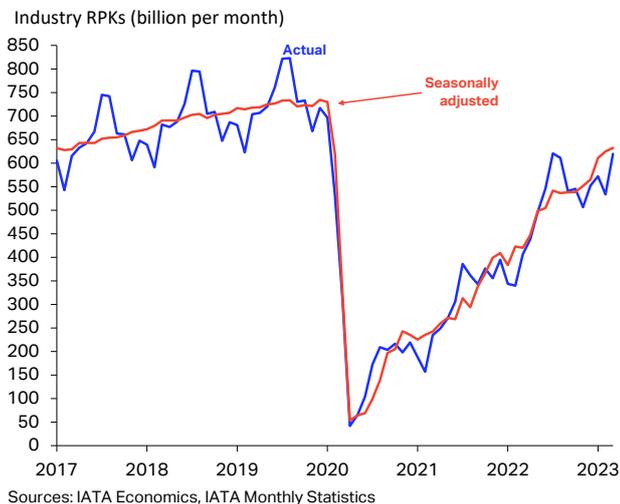
Another month of solid growth, capping a robust first quarter

- Global passenger traffic exhibited strong growth in March, with industry-wide revenue passenger-kilometers (RPKs) increasing by 52.4% year-on-year (YoY) and reaching 88.0% of March 2019 levels.
- Domestic RPKs were almost fully recovered, only 1.1% below pre-pandemic levels after growing 34.1% YoY.
- The annual growth in international RPKs was 68.9%, demonstrating resilient demand for air travel. International load factors also climbed to 80.7%, slightly higher than their pre-pandemic level.
- The reopening of China and easing of travel restrictions has accelerated the recovery of domestic and international traffic. Asia Pacific carriers experienced the fastest annual growth in total RPKs at 158.9%, with a significant increase in international passengers between the region and the rest of the world.

Demand and capacity growth continued in March...

The strong recovery in global passenger traffic continued in March with industry-wide revenue-passenger kilometers (RPKs) increasing 52.4% year-on-year (YoY) and 1.2% month-on-month (MoM) in seasonally-adjusted terms (**Chart 1**). The slowdown in the latest MoM trend is consistent with deceleration observed in the annual growth rate for passenger traffic over the past two months. Still, based on the latest data, global RPKs are only within 12.0% of their 2019, pre-crisis level.

Chart 1 – Global air passengers, revenue-passenger kilometers (RPKs), billions



Compared to a year ago, available seat-kilometers (ASKs) grew by 41.2% in March, which increased the industry-wide load factor by 5.9 percentage points

Air passenger market overview - March 2023

	<i>World</i>	March 2023 (% year-on-year)				March 2023 (% ch vs the same month in 2019)			
	<i>share</i> ¹	RPK	ASK	PLF (%-pt) ²	PLF (level) ³	RPK	ASK	PLF (%-pt) ²	PLF (level) ³
TOTAL MARKET	100.0%	52.4%	41.2%	5.9%	80.7%	-12.0%	-10.5%	-1.4%	80.7%
International	57.9%	68.9%	48.0%	10.1%	81.3%	-18.4%	-18.8%	0.4%	81.3%
Domestic	42.1%	34.1%	32.8%	0.8%	79.8%	-1.1%	4.1%	-4.3%	79.8%

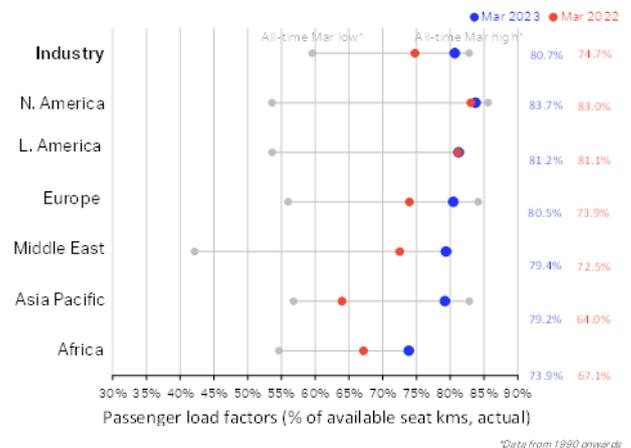
¹% of industry RPKs in 2022

²Change in load factor

³Load factor level

(ppts) to reach 80.7%. These load factor improvements were broad based and pushed the industry load factor close to its all-time high for the month of March. Load factors reached 79.2% for Asia Pacific carriers, leading the regions with a 15.3ppts increase from last year's levels (**Chart 2**). While carriers from all regions continued to grow their passenger traffic and seat capacity, the global recovery is now primarily being driven by airlines registered in the Asia Pacific region.

Chart 2 – Passenger load factors, by airline region of registration

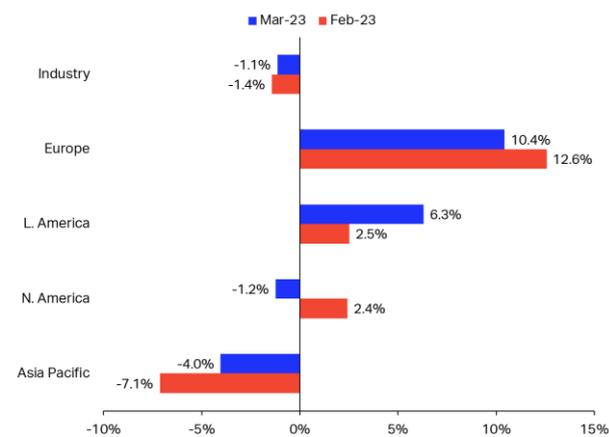


... and total domestic traffic approached full recovery

Total domestic RPKs were only 1.1% below pre-covid levels in March, after rising 34.1% over the previous year's levels (**Chart 3**). Domestic seat capacity, measured in ASKs, exceeded those of March 2019 by

4.1% while the passenger load factor remained 4.3ppts lower.

Chart 3 – Domestic RPK growth by airline region of registration, YoY% change versus 2019



Looking at traffic by carrier region of registration, domestic RPKs for Asia Pacific airlines continued to trend towards full recovery in March, while carriers registered in Europe and Latin America maintained RPKs above pre-pandemic levels. Compared with 2019 levels, the performance of domestic traffic for airlines registered in North America, however, was weaker than in February (**Chart 3**).

Europe’s carriers continued to lead in terms of annual traffic growth compared to 2019. Domestic RPKs stood above pre-pandemic levels for the 11th consecutive month with 10.4% growth over March 2019 RPKs.

Growth picked up for Asia Pacific carriers

Carriers from the Asia Pacific region have seen significant improvements in domestic markets over the past three months. This trend continued in March, pushing the region’s traffic even closer to pre-crisis levels. Domestic RPKs accounted for 96.0% of March 2019 levels this month and doubled compared to last year, growing 103.7% YoY.

... with triple-digit growth for China

The sustained recovery of domestic traffic in China continues to influence the traffic patterns for the wider Asia Pacific region’s airlines. Growing from a low base in 2022, domestic passenger traffic for China’s airlines nearly tripled in March, rising 195.2% YoY and recovering to 96.7% of pre-pandemic levels (**Chart 4**).

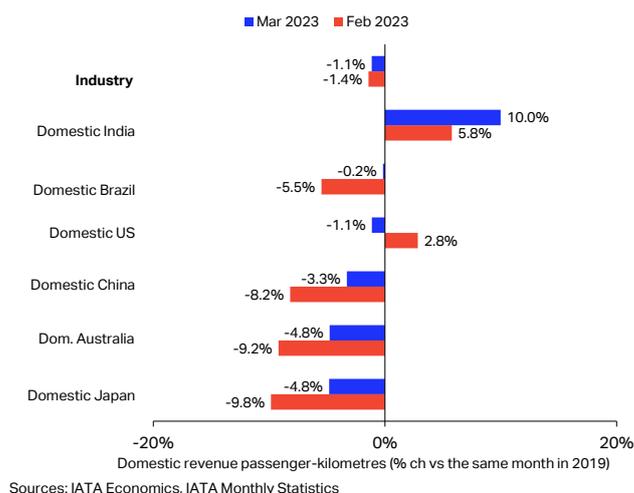
... followed by Japan, Australia, and India

Japan and Australia nearly fully recovered their domestic RPKs in March, after traffic for their registered airlines increased 61.1% and 44.7%, respectively, over the past year. Domestic RPKs for India’s airlines have also been following a positive recovery trend since November 2022. Growing

another 20.3% YoY in March, they reached 10.0% above pre-pandemic levels.

Carriers in the US have mostly recovered their domestic traffic, while Brazil’s airlines made significant progress in March, leaving them 0.2% below March 2019 levels. In general, accounting for nearly 75% of total domestic RPKs, the key domestic markets we follow have experienced strong growth in recent months. They have continued to drive the recovery of total domestic RPKs (**Chart 4**).

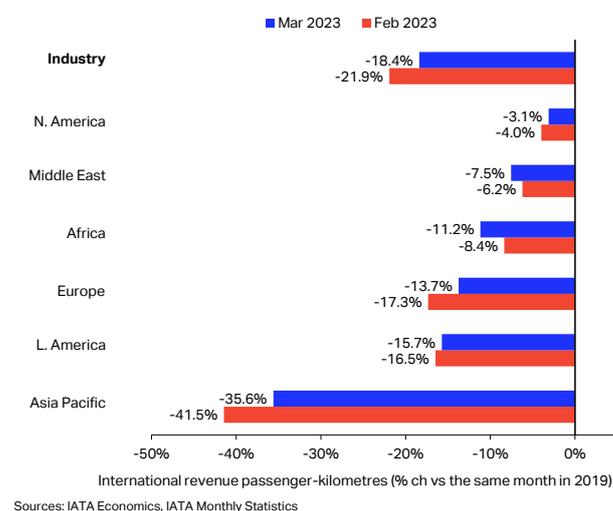
Chart 4 – Domestic RPK growth by airline region of registration, YoY% change versus 2019



International traffic growth was broad based in March

International RPKs rose 68.9% YoY in March and stood 18.4% below 2019 levels (**Chart 5**). The annual increase in international ASKs was 48.0%, which recovered load factors to be 0.4ppts higher than pre-pandemic levels. All regions, except for Europe, achieved higher load factors compared to March 2019. For airlines registered in Europe, the recovery in seat capacity continued to outpace their passenger traffic recovery.

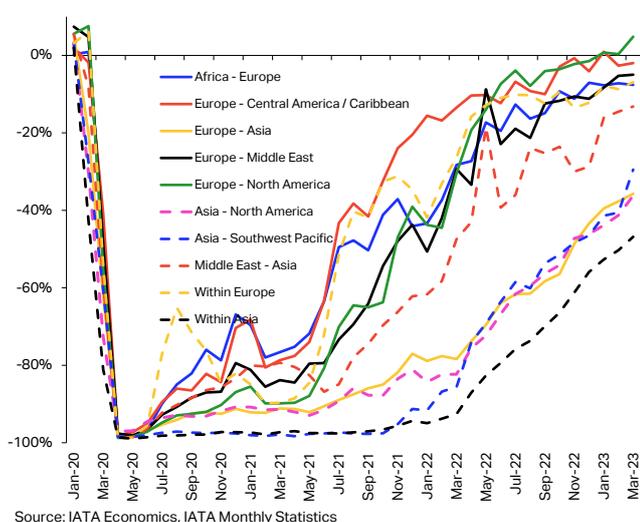
Chart 5 – International RPK growth by airline region of registration, YoY% change versus 2019



Asia Pacific's carriers experience three-digit growth in international traffic, aided by China's recovery

Reflecting positive developments in China's travel policies, Asia Pacific carriers continued to show strong signs of recovery in March, with an annual growth of 283.1% in international RPKs. Over the same period, the region's airlines saw their RPKs increase from 16.8% to 64.4% of 2019 levels (**Chart 5**). International traffic flows from and within the region have continued to see recovery and growth. Within Asia Pacific, traffic reached 53.1% of pre-pandemic levels (**Chart 6**).

Chart 6 – International RPKs, YoY% change versus 2019 – Top 10 route areas in 2019, ranked by performed traffic level



International traffic grew in Europe despite headwinds...

European airlines carried 38.5% more international passenger traffic in March compared with the previous year and 13.7% less than in 2019 for the same period. Within the region, RPKs have been stable even though their growth has slowed in recent months due to various economic headwinds. International RPKs reached to 93.1% of their pre-covid level this month (**Chart 6**).

... with more recovery in the Americas, Middle East, and Africa

In March, international RPKs for airlines registered in North America and Latin America grew 51.6% and 36.5% YoY, respectively. Traffic on international route areas between Europe and the Americas continued to trend near pre-pandemic levels (**Chart 6**).

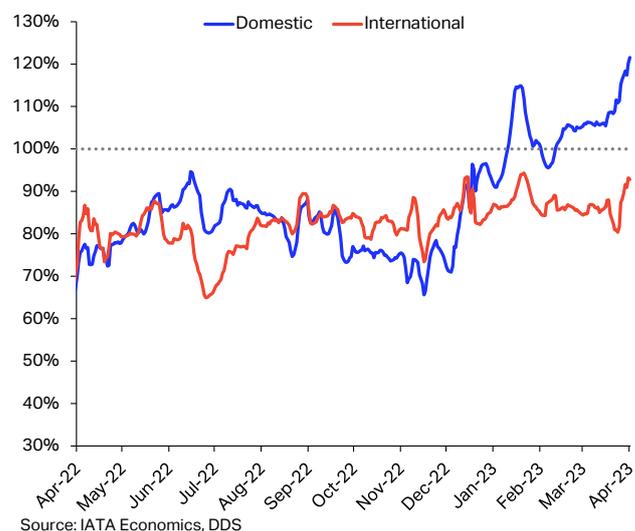
International RPKs performed by Middle East carriers grew 43.1% YoY, recovering to 92.5% of 2019 levels. Meanwhile, airlines registered in Africa achieved 71.7% annual growth in RPKs, with their traffic rising to 88.8% of pre-crisis levels.

Domestic and International ticket sales suggest further recovery

Following the peak in total ticket sales driven by the Lunar New Year celebrations, bookings for domestic air travel continued to increase and surpassed their 2019 level by 20% globally in mid-April. This recovery reflected the accelerating growth in domestic RPKs we have observed since the reopening announcement of China. International ticket sales on the other hand have maintained a stable sideways trend (**Chart 7**).

With domestic RPKs having nearly reached their pre-pandemic levels in March, the strong growth in ticket sales suggest that a full and sustained recovery is around the corner. The recovery in international RPKs has also demonstrated resilience and continues to be supported by healthy ticket sales and positive developments in the Asia Pacific region.

Chart 7 – Passenger ticket sales by purchase date, % share of the same day in 2019, 7-day average



Air passenger market in detail - March 2023

	<i>World</i>	March 2023 (% year-on-year)				March 2023 (% ch vs the same month in 2019)			
	<i>share</i> ¹	RPK	ASK	PLF (%-pt) ²	PLF (level) ³	RPK	ASK	PLF (%-pt) ²	PLF (level) ³
TOTAL MARKET	100.0%	52.4%	41.2%	5.9%	80.7%	-12.0%	-10.5%	-1.4%	80.7%
Africa	2.1%	66.1%	51.0%	6.7%	73.9%	-10.6%	-12.7%	1.7%	73.9%
Asia Pacific	22.1%	158.9%	109.0%	15.3%	79.2%	-21.6%	-19.1%	-2.5%	79.2%
Europe	30.7%	37.0%	25.9%	6.5%	80.5%	-11.1%	-7.4%	-3.4%	80.5%
Latin America	6.4%	19.9%	19.8%	0.1%	81.2%	-5.4%	-4.9%	-0.4%	81.2%
Middle East	9.8%	40.4%	28.3%	6.9%	79.4%	-7.4%	-14.0%	5.7%	79.4%
North America	28.9%	16.9%	15.9%	0.7%	83.7%	-1.9%	0.3%	-1.9%	83.7%
International	57.9%	68.9%	48.0%	10.1%	81.3%	-18.4%	-18.8%	0.4%	81.3%
Africa	1.8%	71.7%	56.2%	6.5%	72.2%	-11.2%	-12.3%	0.9%	72.2%
Asia Pacific	8.9%	283.1%	161.5%	26.8%	84.5%	-35.6%	-38.8%	4.1%	84.5%
Europe	26.3%	38.5%	27.0%	6.6%	79.4%	-13.7%	-8.3%	-5.0%	79.4%
Latin America	2.9%	36.5%	33.4%	1.9%	82.8%	-15.7%	-16.8%	1.1%	82.8%
Middle East	9.4%	43.1%	30.5%	7.0%	79.4%	-7.5%	-14.3%	5.8%	79.4%
North America	8.7%	51.6%	34.0%	9.8%	84.8%	-3.1%	-4.2%	1.0%	84.8%
Domestic	42.1%	34.1%	32.8%	0.8%	79.8%	-1.1%	4.1%	-4.3%	79.8%
Dom. Australia ⁴	1.0%	44.7%	25.9%	10.7%	82.5%	-4.8%	-8.4%	3.1%	82.5%
Domestic Brazil ⁴	1.5%	8.0%	8.7%	-0.6%	78.6%	-0.2%	2.8%	-2.3%	78.6%
Dom. China P.R. ⁴	6.4%	195.2%	153.0%	10.3%	72.3%	-3.3%	13.6%	-12.7%	72.3%
Domestic India ⁴	2.0%	20.3%	15.4%	3.5%	85.6%	10.0%	11.4%	-1.1%	85.6%
Domestic Japan ⁴	1.2%	61.1%	14.2%	23.0%	79.0%	-4.8%	-8.8%	3.3%	79.0%
Domestic US ⁴	19.3%	4.4%	8.4%	-3.2%	82.9%	-1.1%	3.3%	-3.7%	82.9%

¹% of industry RPKs in 2022

²Change in load factor

³Load factor level

⁴Note: the six domestic passenger markets for which broken-down data are available account for approximately 31.4% of global total RPKs and 74.5% of total domestic RPKs

Note: The total industry and regional growth rates are based on a constant sample of airlines combining reported data and estimates for missing observations. Airline traffic is allocated according to the region in which the carrier is registered; it should not be considered as regional traffic.

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 04 May 2023

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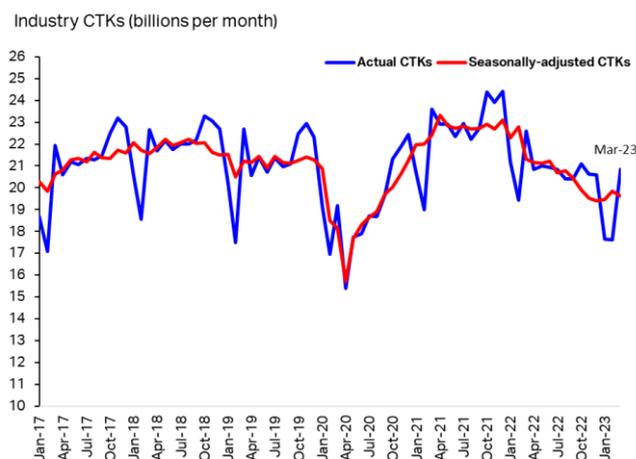
Air cargo decline continues to moderate

- Global air cargo demand decreased in March, but at a slower rate than in February and January, with cargo tonne-kilometers (CTKs) falling by 7.7% year-on-year (YoY). This reflects a continued trend of improvement compared to the steep annual decline of -16.8% observed in January and double-digit decreases in earlier months.
- Air cargo capacity grew 9.9% YoY, primarily due to the increasing belly-hold capacity from passenger aircraft. As a result, cargo load factors fell to 46.2%, 8.8 percentage points (ppts) lower than last year's load factors.
- The diminished strength of fundamental air cargo drivers, such as trade and manufacturing exports, continued to dampen potential gains in air cargo traffic, as global new export orders remained weak for a full year.
- While China's reopening has helped its economic outlook and cargo traffic on Asia Pacific trade lanes, its new export orders retreated in March after a slight improvement in February. Other major economies we track also saw contractions in their new export orders in March compared to February.

Air cargo demand remained weak in March

Industry-wide cargo tonne-kilometers (CTKs) continued to slow their annual decline in March. The year-on-year (YoY) contraction of CTKs narrowed further from -9.4% in February to -7.7% in March, which is a substantial improvement from the -16.8% fall in January (Chart 1). Compared with the pre-pandemic period, industry CTKs decreased by 8.1% over March 2019 levels. Although monthly CTKs were higher in March compared to the previous month, seasonally adjusted (SA) CTKs declined by 1.1% month-over-month (MoM) from the February level.

Chart 1 Global Industry CTKs (billions per month)



Sources: IATA Economics, IATA Monthly Statistics

Global cargo traffic trends are primarily determined by international cargo tonne-kilometers (CTKs), which make up over 85% of the industry's total cargo demand. Although there was an 8.1% decline in

Air cargo market overview - March 2023

	World share ¹	March 2023 (% year-on-year)				March 2023 (% ch vs the same month in 2019)			
		CTK	ACTK	CLF (%-pt) ²	CLF (level) ³	CTK	ACTK	CLF (%-pt) ²	CLF (level) ³
TOTAL MARKET	100.0%	-7.7%	9.9%	-8.8%	46.2%	-8.1%	-1.0%	-2.2%	46.2%
International	86.8%	-8.1%	8.3%	-9.5%	53.1%	-9.0%	-4.9%	-0.8%	53.1%

¹% of industry CTKs in 2022

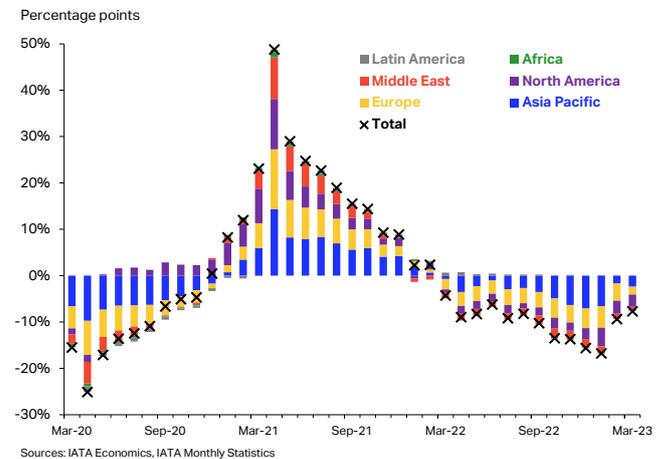
²Change in load factor

³Load factor level

international CTKs in March, the industry-wide CTKs only decreased by 7.7%, indicating strong performance from domestic CTKs during the month.

Consistent with last month's results, annual contractions of cargo demand were exhibited by carriers registered in all regions (Chart 2). The decline in CTKs for Asia Pacific airlines, however, expanded in March, while carriers registered in Europe and other regions improved their performance.

Chart 2 Regional contributions to YoY CTK growth



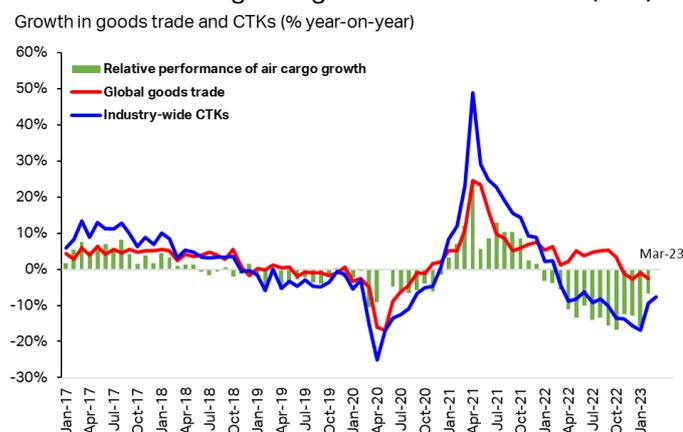
Global trade conditions continued to underperform

The air cargo industry has experienced volatility in recent months, which can be attributed to different economic and operational challenges that have hindered global trade. Even with record low unemployment rates, the global economy continues to decelerate due to a combination of factors such as tightening global financial conditions, high levels of

global debt, and supply chain problems including those linked to the war in Ukraine.

As of March, industry-wide air cargo CTGs have maintained their annual decline for 13 consecutive months. Global trade has also continued to fall since November 2022, providing diminished support for the air cargo industry (Chart 3). On a positive note, the pace of the annual decline in air cargo CTGs has moderated over the past two months, suggesting some level of stabilization. This development is reinforced by the fact that global goods trade has been holding steady just below the level attained a year ago.

Chart 3 Growth in global goods trade and CTGs (YoY)



Manufacturing, supply chains gave mixed signals

The new export order manufacturing Purchasing Managers Index (PMI) moves in step with global air cargo demand (Chart 4). Historical data for this PMI have shown strong correlation with the growth rate of global air cargo demand. Therefore, we have been closely monitoring manufacturing PMI at a global level and for major economies.

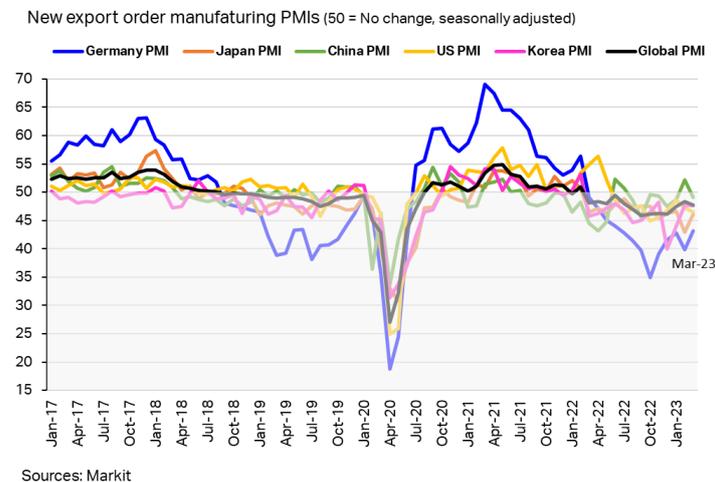
Chart 4 CTK growth, global new export orders (YoY)



In line with the weakening global trade, the PMIs for new export orders at the global level remained below the 50-critical line for a full year as of March. China's PMI retreated to below the 50-mark in March, following a slight improvement observed in February. Other

major economies, including Germany, Japan, US, and Korea, all registered contraction in March from February. It is worth noting, however, the slight upticks in the PMIs of Germany and Japan, which suggests a slowdown in the speed of their contractions (Chart 5).

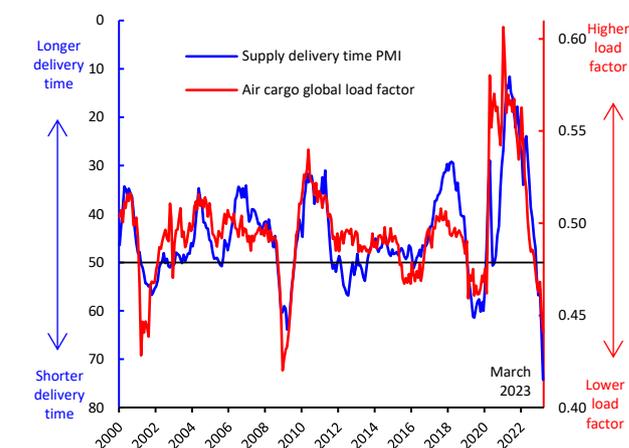
Chart 5 Global new export orders, component of the manufacturing PMI (50 = no change, SA)



Meanwhile, supplier delivery times continued to shorten, particularly in the US and Germany, pushing the global supplier delivery times PMI to an all-time high of 76 in March, up from its historic low of 11 observed in May 2022 (Chart 6). The key 50-mark for this indicator implies there are no changes in supplier delivery times, while a higher PMI signals a higher share of shorter delivery times, compared to the previous month. A continuous increase in the PMI indicates an accelerated pace of shortening delivery times.

With the sharp move to shorter delivery times in less than a year, air cargo load factors also fell to 46.2% in March. The decline in air cargo load factors can be attributed to the increase in belly-hold capacity from passenger flights and weakening demand for air cargo. This contraction in global demand during recent months has also relieved some pressure from supply chains.

Chart 6 Air cargo load factors and supplier delivery times PMIs (50 = no change)



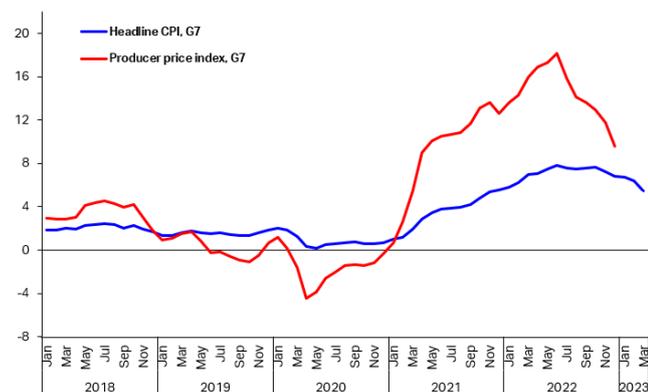
As displayed in **Chart 6**, there is a strong interdependence between global trade and the air cargo industry, as both sectors continue to grapple with supply chain challenges in the current economic climate. During periods of relative stability, the trajectories of these two indicators converge more closely.

Headline inflation slowed further in March

The G7 countries have experienced relief from the downward trend of the global oil price, resulting in a decrease in annual inflation rates. The headline Consumer Price Index (CPI) is a clear indicator of this, as it has dropped from its peak of 7.8% in June 2022 to 5.4% in March. Based on our latest data, the Producer Price Index (PPI), which measures changes in producer prices and serves as a leading indicator of CPI, had come down from its June 2022 peak and was recorded at 9.6% in December (**Chart 7**).

Chart 7 G7 headline CPI and PPI inflation (YoY)

Inflation in G7 countries (year-on-year)



Source: Refinitiv Eikon

Stripping out food and energy prices, the core inflation for Japan and Euro area continued to trend upwards in March, reaching 3.8% and 7.5%, respectively. Inflation rates stabilized in the US and UK, slightly coming down from their peak rates in September.

Following refinery capacity adjustments and shifts in demand, the jet fuel crack prices continued to ease from USD 33 per bbl in February to USD 28 per bbl in March, with the downward trend persisting. As a result, jet fuel prices averaged USD 107 per bbl in March.

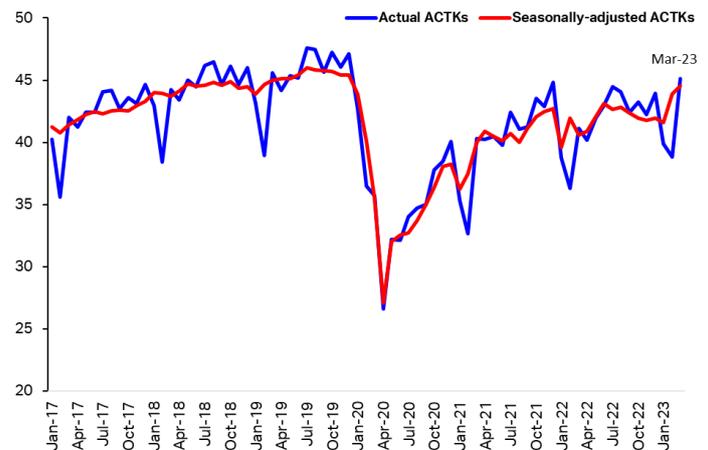
Growth in capacity persisted, despite fall in CTKs

Industry air cargo capacity – measured by available cargo tonne-kilometers (ACTKs) – continued to grow by 9.9% YoY in March (**Chart 8**), driven by the return of belly-hold cargo capacity of passenger carriers. The annual increase in international capacity was 8.3%, slightly lower than the growth of industry-wide capacity. With the broad-based fall in CTKs, the growth in ACTKs from the passenger segment of the industry led to a decline in cargo load factors to 46.2% in March, which was 8.8 ppts lower than the previous

year. Still, the load factor increased 0.6 ppts higher than the February level.

Chart 8 Global ACTKs (billions per month)

Industry ACTKs (billions per month)



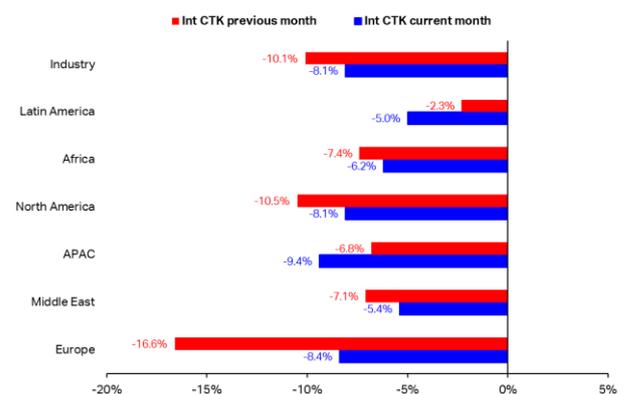
Sources: IATA Economics, IATA Monthly Statistics

Declines in international CTKs moderated across all regions except Latin America and Asia Pacific

International cargo demand has experienced volatility in recent months and CTKs have remained lower than last year's levels across all regions through March. Still, most carriers have managed to improve their international cargo performance compared with the previous month's levels and YoY growth. Consistent with trends in the global air cargo market, international CTKs contracted by 8.1% from a year before and slightly improved from their annual decline of 10.1% recorded in February. This performance improvement was achieved by carriers registered in all regions except in Latin America and Asia Pacific (**Chart 9**).

Chart 9 Growth in international CTKs by region (YoY)

International CTK growth (airline region of registration)



Sources: IATA Economics, IATA Monthly Statistics

Compared to February, several regions have shown signs of resilience. Europe's airlines saw the most substantial improvement in their demand from February to March 2023, slowing the annual rate of decline in their international CTKs from -16.6% to -8.4%. Carriers registered in North America, Africa and the Middle East

also moderated the downward trend in their cargo traffic in March.

The deterioration in the annual CTK growth for Asia Pacific carriers suggests air cargo traffic in this region has not stabilized yet, following China's reopening in January. The impacts of production moving out of China and the associated changes to the supply chain are also possible factors behind this contraction.

International CTKs for Latin America carriers have been trending downward since April 2022, and for the second consecutive month they are below the previous year's levels. Despite the recent decline in air cargo traffic, the region's overall performance has not been significantly impacted.

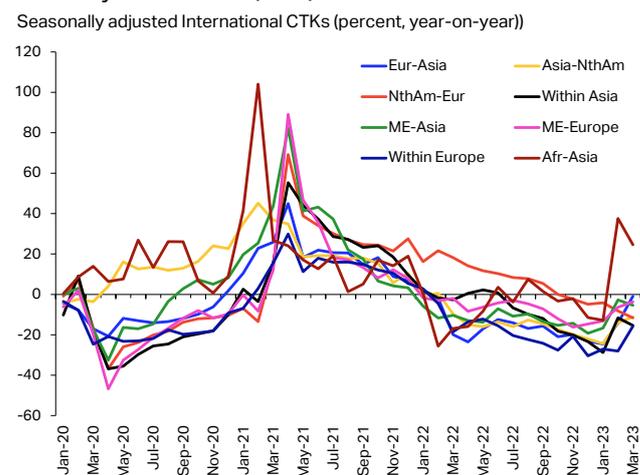
Asia trade lanes continued to buck the trend

The annual growth of international air cargo slowed down gradually on various trade lanes in the second half of 2021. Cargo traffic then declined YoY across most route areas in 2022, while routes connecting North America and Europe sustained growth for most of the year.

In 2023, among all major routes, Africa-Asia was the only route area that registered positive growth in air cargo traffic compared to a year before, while other routes continued to perform weaker on a YoY basis.

Despite its robust performance in 2022, the Trans-Atlantic route between North America and Europe has seen declining traffic on an accelerated pace through March. In contrast, for Middle East-Europe routes, the annual growth rate has been trending upward in recent months. In March, as observed last month, most routes areas connecting Asia to other regions continued to exhibit improvement in their growth trends. The main driver behind this trend is the reopening of China, which has stimulated economic activity and trade in the region. (Chart 10).

Chart 10 Seasonally adjusted growth of international CTKs by route area (YoY)



Source: IATA Economics, IATA Monthly Statistics by Route

Air cargo market in detail - March 2023

	World share ¹	March 2023 (% year-on-year)				March 2023 (% ch vs the same month in 2019) ³			
		CTK	ACTK	CLF (%-pt) ²	CLF (level) ³	CTK	ACTK	CLF (%-pt) ²	CLF (level) ³
TOTAL MARKET	100.0%	-7.7%	9.9%	-8.8%	46.2%	-8.1%	-1.0%	-3.6%	46.2%
Africa	2.0%	-6.2%	-4.1%	-1.1%	48.9%	9.7%	-13.3%	10.3%	48.9%
Asia Pacific	32.4%	-7.3%	23.6%	-16.2%	48.5%	-13.7%	-1.3%	-6.9%	48.5%
Europe	21.8%	-7.8%	8.8%	-10.3%	57.0%	-17.4%	-18.5%	0.7%	57.0%
Latin America	2.7%	-5.3%	12.9%	-7.0%	36.6%	-5.6%	-10.7%	1.9%	36.6%
Middle East	13.0%	-5.5%	9.7%	-7.3%	45.6%	-6.8%	0.5%	-3.6%	45.6%
North America	28.1%	-9.4%	0.4%	-4.2%	39.3%	7.3%	14.1%	-2.5%	39.3%
International	86.8%	-8.1%	8.3%	-9.5%	53.1%	-9.0%	-4.9%	-2.4%	53.1%
Africa	2.0%	-6.2%	-4.7%	-0.8%	49.9%	11.0%	-11.6%	10.2%	49.9%
Asia Pacific	29.7%	-9.4%	12.0%	-13.6%	57.2%	-11.8%	-4.0%	-5.1%	57.2%
Europe	21.5%	-8.4%	8.1%	-10.6%	59.0%	-18.1%	-19.4%	1.0%	59.0%
Latin America	2.3%	-5.0%	16.2%	-9.5%	42.7%	-4.7%	-6.1%	0.6%	42.7%
Middle East	13.0%	-5.4%	10.0%	-7.5%	46.0%	-6.7%	0.5%	-3.6%	46.0%
North America	18.4%	-8.1%	3.2%	-6.0%	49.1%	5.3%	8.9%	-1.7%	49.1%

¹% of industry CTKs in 2022

²Change in load factor

³Load factor level

Note: the total industry and regional growth rates are based on a constant sample of airlines combining reported data and estimates for missing observations. Airline traffic is allocated according to the region in which the carrier is registered; it should not be considered as regional traffic. Historical statistics are subject to revision.

IATA S&E Economics
economics@iata.org
 03 May 2023

Get the data

Access data related to this briefing through IATA's Monthly Statistics publication:

www.iata.org/monthly-traffic-statistics

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Revised national budget

The petroleum industry contributes large revenues to the community

Press release | Date: 11/05/2023

The government's estimate for the state's net cash flow from the petroleum industry in 2023 is estimated in the revised national budget at NOK 1,015 billion. This is a very high level historically. By comparison, the average in the previous decade was around NOK 360 billion a year.

"The income from the petroleum industry is unique for the country and makes an important contribution to the financing of the welfare state for current and future generations," says Oil and Energy Minister Terje Aasland.

The expected income is lower than the income in 2022. The decrease mainly comes from lower estimates of oil and gas prices compared to last year. At the same time, it is expected that oil production will increase in 2023, while gas production is expected to remain at the same high level as in 2022.

Total petroleum production in 2023 is estimated at around 239 million standard cubic meters of oil equivalent, which is an increase of around 3 per cent compared to 2022.

— As the largest oil and gas producer in Europe, and the only net exporter, Norway and the companies on the Norwegian continental shelf play a decisive role in the energy supply in Europe. **This is a role we can also have in the future, and then we must further develop our petroleum sector, says Aasland.**

Expect increased investments in the coming years

Investments on the NCS have gradually decreased in recent years, but are expected to increase somewhat towards the mid-2020s. Investments in the petroleum industry in 2023 are estimated in the revised national budget at NOK 194 billion, or about 17 per cent of the total real investments in Norway.

— The development projects that the governing authorities received in the period 2020-2022 now give large, necessary assignments to the Norwegian-based supplier industry. These development projects mean that we retain important cornerstone companies across the country and that we take care of central expertise that we can build on in the future, says Aasland.

Warren Buffett and Greg Abel on Transmission

SAF Group created transcript of comments by Warren Buffett, Charlie Munger, Greg Abel, and Ajit Jain in the Q&A of the 2023 Berkshire Hathaway annual meeting from CNBC 5hr 16 min video.

<https://www.cnbc.com/video/2023/05/06/watch-warren-buffett-and-charlie-munger-preside-over-full-2023-berkshire-hathaway-annual-meeting.html?&qsearchterm=berkshire>

Items in “italics” are SAF Group created transcript

At 1 hr 10:20 min mark. on the energy transition and the challenge to get electricity transmission for renewable energy sources to markets. Buffett “... *but it is not easy when you cross state lines. Different jurisdictions, we should, this country should be ahead of where it is in terms of transmission. WE have been the biggest factor in helping that, but why don't you tell them about that.*

Abel “*there is no question there is energy transformation going on around the globe and as Warren touched on, in the US and in some ways in the US, I would hope it would be we'd at least have a clear plan across the nation as to where approach that. But the reality is that it is state by state with some exceptions. So as a result, when you think of Berkshire Hathaway Energy, we own three US utilities there, and they will participate in multipole states. But they're developing plans state by state and try to integrate them across the various states. The opportunities are significant because there is a transformation going on. We've outlined our goal on where we are going relative to carbon at BHE, where they'll, by 2030, reduce our carbon footprint by 50% relative to 2005 so that's the Paris Accord and the standard they want to hold utilities industry and the utility company to. But to achieve it is a true journey. O've often talked to Warren, we bought Pacific Corp back in the mid 2000's, we immediately recognized to build a lot of renewable energy like we've been doing in the Midwest in Iowa but that was basically in a single state. Now Pacific Corp, we're in six states. we started that in the mid 2000's, here we are and we laid out a great transmission plan, here's how we're going to build it, here's how we're going to effectuate it, all the benefits to our customers over that period of time. Here we are in 2023 and we have a little more than 1/3 of that, at the time it was \$6 billion transmission project. Today, we have a little more than 1/3 of it built and we've spent probably closer to \$7 billion. It's the right outcome. It's still a great outcome for our customers, but that transmission is part of the transformation. You absolutely have to build it to move all that renewable energy and that's sort of the complexity Warren was highlighting. It is a, you can't just wake up one day and solve this problem. You start with transmission and you build the resources. At this same company and if we look at what we are doing across BHE Energy in that energy transformation, we have \$70 billion of known projects that are really required to properly serve our customers and achieve that type of energy transformation across those utilities and that's in the coming ten years. So we have a team that is absolutely up to the challenge. They are delivering on their commitment. And it's a very good business opportunity for each of our companies and our shareholders. As we deploy that capital, we are obviously in a return on equity of it. But it will be a long journey. It will happen over an extended period of time and the further you get out there, the more dependent upon the evolution of a variety of technologies that are progressing but not there yet.*

Buffett “.. *I want to just take an extra minute as this is very important. I don't really know if our form of government is ideal at all in terms of solving the problem you have described. We have solved it one time. In World War II, we took a country that was semi limping along, and we found ourself in a world war. What we did in a world war is we bought a bunch of people to Washington at a dollar and year. And whether it was Sidney Weinburg of Goldman Sachs to actually name them, and we gave them enormous power to reorient the resources of the US to face the problem that they faced, which was to create a war machine. What they did was they found Henry Kaiser and told him to build ships. They went to the Ford Motor Company and said you build tanks and some airplanes. They reordered the industrial enterprise of the US in a way that was unbelievable because they had the power of the federal government and they had the ingenuity of American business and they had the facilities of American business. And it led to a very successful outcome. But can we do that in a peace time where you've got 50 states and you have to get them to cooperate and you don't have anyone. You can issue orders, but you can't designate where the capital goes at the other end. We try to do it with tax incentives*

and all that sort of thing. We haven't created the unity of purpose in the machinery that worked in World War II where essentially everybody felt that one job was to win the war and we figured out how to use our industrial capacity to, in effect, defeat the Axis powers. How do you recreate that? The present democratic system, I am not sure I know the answer, but I sure know the problem. If you've got an emergency, need to re-engineer the energy system of the US, I don't think you can do it without something resembling the machinery, the urgency, whatever. The capital is there, the people are there, the objective is obvious. We just don't seem to be able to do it in peace time where we're used to follow a given set of procedure and. China has got one country and we've got 50 states. And we got a whole different set of government. We should be up to the test but so far, it hasn't worked,"

Prepared by SAF Group <https://safgroup.ca/news-insights/>

By Matthew Martin and Fahad Abuljadayel
(Bloomberg) -- Saudi Aramco is weighing exports of liquefied natural gas instead of blue hydrogen, as talks with potential buyers of the latter fuel prove tough. The world's biggest oil company is investing billions of dollars in gas production. It's priority is to meet rising demand within Saudi Arabia and then convert what's left over into blue hydrogen, a fuel seen as important for the energy transition because the carbon emitted when it's made is meant to be captured.

Yet existing technology means blue hydrogen could cost the equivalent of around \$250 a barrel of oil, Aramco's chief executive officer said on Tuesday.

"It is very difficult to identify any off-take agreement in Europe" for blue hydrogen, Amin Nasser said on a call with analysts on Tuesday. "Even the customers in Japan and Korea are waiting for government incentives. Until they get these incentives, it'll be costly for them to pursue that blue hydrogen."

The company won't make a final investment decision to build hydrogen export facilities without first signing supply deals, he said. It's so far sent test shipments in the form of ammonia to South Korea and Japan.

"This is a very expensive program," Nasser said. "It's a lot of capital and you need customers. So we will not sanction a project without securing an off-take agreement."

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Read more:

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Europe's Hunt for Clean Energy in the Mideast Has a Dirty Secret
Aramco Sees Oil Demand Picking Up on China, Aviation Rebound
Aramco Says Hydrogen Talks With Japan, South Korea Are Advancing

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The kingdom has some of the world's biggest gas reserves but barely exploited them in the past. Demand for gas has boomed recently, especially since Russia invaded Ukraine and cut supplies to Europe in retaliation against sanctions.

Much of Saudi Arabia's additional gas will come from Jafurah, one of the world's largest untapped fields. It aims to spend tens of billions of dollars developing it and has started discussions with investors in midstream projects such as pipelines, said Nasser.

Sinopec and TotalEnergies SE are among companies considering investing in those projects, Bloomberg reported this month.

Nasser spoke shortly after Aramco reported a net profit of \$31.9 billion for the first quarter and announced a plan to increase its \$76 billion annual dividend.

It had decided to prioritize blue hydrogen because it's seen as a cleaner fuel than LNG, Nasser said.

Still, even if Aramco doesn't export LNG from Saudi Arabia, it's keen on investing in foreign terminals, including in the US and Australia.

"We have started discussions with our partners globally on LNG opportunities," he said, confirming a Bloomberg report from March.

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To view this story in Bloomberg click here:

<https://blinks.bloomberg.com/news/stories/RUFPLVDWX2PS>

Ola Borten Moe is Minister of Research and Higher Education since 2021. Previously, he also served as Minister of Petroleum and Energy from 2011 to 2013.

<https://www.facebook.com/SPolabortenmoe/posts/pfbid02FhTrNJAApZa6m392J41EgiRbFzG6ffgq12n3JAwqYQVL3cR7p9ztixMQiR1wG6qXI>



Ola Borten Moe

January 6 · 🌐

Det er stadig mer åpenbart at vi alt for lenge har oppført som om det er ubegrenset tilgang på fornybar og rimelig strøm i Norge. Faktum er enkelt og greit at det er mangel på energi i kraftsystemene våre. Svært høye priser og frykt for forsyningsikkerheten dokumenterer dette. Vi må derfor selvsagt få et langt mer realistisk forhold til hva vi bruker energi på. Og vi må få et bevist forhold til enkle faktorer som ressurseffektivitet og virkningsgrad. Hydrogen er sikkert bra til mye, men faktum er at det er et høyeksplosivt lagringsmedium med store energitap i begge ender av prosessen. Om du bruker 100 kwh strøm til å produsere hydrogen vil du sitte igjen med en energimengde i hydrogen tilsvarende 50 kwh. Halvparten av energien er med andre ord tapt. Om du videre skal bruke dette hydrogenet i en brenselcelle taper du ytterligere 50%. Om du kjører det i en turbin for å produsere strøm taper du 70%. Med andre ord får du en utnyttelsesgrad i en bil på ca 25% eller 25 kwh av de opprinnelige 100 kwh pga energitap i prosessene. I en enkel turbin er tapet enda større. Denne strømmen/energien kunne alternativt blitt brukt direkte all den tid den tas fra nettet i Norge med en utnyttelsesgrad til for eksempel oppvarming, produksjon eller transport på 90-100%! Om Statkraft sammen med NEL lykkes med å etablere 2 gw elektrolyse av hydrogen i Norge tilsvarer det en energimengde på ca 17,5 twh, eller om lag 12-13% av all kraftproduksjon i Norge. Med 75% energitap er det 14 twh, eller 10% av all norsk kraftproduksjon rett i dass. Det er etter mitt skjønns lysår unna å være forsvarlig eller fornuftig. Vi trenger all den energien vi har og får til langt mer fornuftige ting enn å fyre for kråka.



STATKRAFT.NO
Nel og Statkraft legger grunnlaget for en verdikjede for grønt hydrogen i Norge
Hydrogenteknologiselskapet Nel og Europas største leverandør av fornybar energi, Statkraft, signerte nylig en kontrakt for leveranse av 40 MW elektrolyseutstyr og vil dermed samarbeide om å skape en sterk verdikjede...

👍 505

161 comments 108 shares

Google Translate of Moe's above Facebook posting

It is increasingly obvious that for far too long we have acted as if there is unlimited access to renewable and affordable electricity in Norway. The fact is plain and simple that there is a lack of energy in our power systems. Very high prices and fears about security of supply document this. **We must therefore of course have a far more realistic relationship with what we use energy for.** And we must have a proven relationship with simple factors such as resource efficiency and effectiveness. **Hydrogen is certainly good for many things, but the fact is that it is a highly explosive storage medium with large energy losses at both ends of the process. If you use 100 kwh of electricity to produce hydrogen, you will be left with an amount of energy in hydrogen corresponding to 50 kwh. In other words, half of the energy is lost. If you are going to use this hydrogen in a fuel cell, you lose a further 50%. If you run it in a turbine to produce electricity, you lose 70%. In other words, you get a utilization rate in a car of about 25% or 25 kwh of the original 100 kwh due to energy loss in the processes. In a simple turbine, the loss is even greater. Alternatively, this current/energy could have been used directly all the time it is taken from the grid in Norway with a utilization rate for, for example, heating, production or transport of 90-100%! If Statkraft together with NEL succeeds in establishing 2 gw electrolysis of hydrogen in Norway, this corresponds to an energy quantity of approximately 17.5 twh, or approximately 12-13% of all power production in Norway. With a 75% energy loss, that's 14 twh, or 10% of all Norwegian power production right there. It is, in my opinion, light years away from being justifiable or reasonable. We need all the energy we have and can do for far more sensible things than fighting for the crow.**

Google Translate of Statkraft's press release [\[LINK\]](#) linked in Moe Facebook posting

NEWS 2023

NEL AND STATKRAFT LAY THE FOUNDATION FOR A VALUE CHAIN FOR GREEN HYDROGEN IN NORWAY

Nel and Statkraft are laying the foundations for a value chain for green hydrogen in Norway

06 JAN., 2023

The hydrogen technology company Nel and Europe's largest supplier of renewable energy, Statkraft, recently signed a contract for the delivery of 40 MW electrolyser equipment and will thus work together to create a strong value chain for the production of green hydrogen in Norway.

Press releases

- We are determined to contribute to making Norway a leading producer of green hydrogen and establish an ecosystem of equipment suppliers, including the production of electrolysers, say Nels CEO Håkon Volldal and CEO of Statkraft, Christian Rynning-Tønnesen.

The announcement came in connection with German Vice-Chancellor Robert Habeck's visit to Nel's fully automatic electrolyser factory on Herøya. Industry Minister Jan Christian Vestre also joined the delegation together with his colleague, Energy and Energy Minister Terje Lien Aasland. The ministers are enthusiastic about the two companies' plans for a value chain for green hydrogen in Norway.

- It is gratifying that leading Norwegian players such as Nel and Statkraft are planning value chains for green hydrogen in Norway. This is an important step in the right direction to achieve our ambitions to build a coherent value chain for hydrogen and facilitate the production of hydrogen with no or low emissions to cover the national demand for hydrogen, says Oil and Energy Minister Terje Aasland .

From left: Habeck, Volldal, Rynning-Tønnesen, Aasland and Vestre Statkraft has recently signed a contract for the supply of 40 MW electrolyser equipment from Nel. The electrolysers will be manufactured at Nel's factory on Herøya and used for the production of green hydrogen in some of Statkraft's many hydrogen projects. As Europe's largest supplier of renewable energy, Statkraft has ambitions to reach an annual development rate of 4 GW of new power production and to have 2 GW of renewable hydrogen production in place by 2030. In Norway, Statkraft will strengthen its investment in developing new renewable power production and flexibility in hydropower and wind power both on- and offshore.

- The contract with Nel is the first important step towards realizing our ambitions of 2 GW of green hydrogen and securing production capacity for several of our hydrogen projects, says Rynning-Tønnesen. Volldal is very happy to have Statkraft on its customer list.

- Statkraft is Europe's largest supplier of renewable energy and a well-reputed and highly knowledgeable renewable company with an ambitious growth agenda, and we are very proud that they have chosen us as a supplier of green hydrogen technology, says Volldal.

- With this and other orders, Nel strengthens its position as a leading supplier and exporter of hydrogen equipment, which is crucial for the green shift in Europe and internationally, and for the development of new green jobs in Norway, says Volldal.

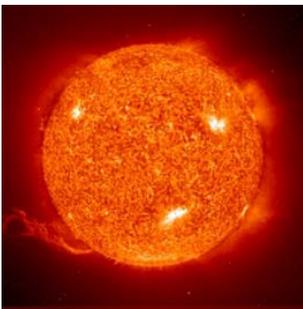


Hydrogen explained

What is hydrogen?

Hydrogen is the simplest element. Each atom of hydrogen has only one proton. Hydrogen is also the most abundant element in the universe. Stars such as the sun consist mostly of hydrogen. The sun is essentially a giant ball of hydrogen and helium gases.

Hydrogen occurs naturally on earth only in compound form with other elements in liquids, gases, or solids. Hydrogen combined with oxygen is water (H₂O). Hydrogen combined with carbon forms different compounds—or hydrocarbons—found in natural gas, coal, and petroleum.



The sun is essentially a giant ball of hydrogen gas undergoing fusion into helium gas. This process causes the sun to produce vast amounts of energy.

Source: [NASA](#) (public domain)

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Hydrogen is the lightest element. Hydrogen is a gas at normal temperature and pressure, but hydrogen condenses to a liquid at minus 423 degrees Fahrenheit (minus 253 degrees Celsius).

Hydrogen is an energy carrier

Energy carriers allow the transport of energy in a usable form from one place to another. Hydrogen, like electricity, is an energy carrier that must be produced from another substance. Hydrogen can be produced—separated—from a variety of sources including water, fossil fuels, or biomass and used as a source of energy or fuel. Hydrogen has the highest energy content of any common fuel by weight (about three times more than gasoline), but it has the lowest energy content by volume (about four times less than gasoline).

It takes more energy to produce hydrogen (by separating it from other elements in molecules) than hydrogen provides when it is converted to useful energy. However, hydrogen is useful as an energy source/fuel because it has a high energy content per unit of weight, which is why it is used as a rocket fuel and in [fuel cells](#) to produce electricity on some spacecraft. Hydrogen is not widely used as a fuel now, but it has the potential for greater use in the future.

EVs Fall Short of EPA Estimates by a Much Larger Margin Than Gas Cars in Our Real-World Highway Testing

While internal-combustion cars often match or exceed their EPA highway fuel economy numbers, a new paper using data from *C/D*'s highway tests show that EVs are far worse at meeting expectations.



BY [CALEB MILLER](#) PUBLISHED: APR 21, 2023



TESLA

- **SAE International has just published a paper co-authored by *Car and Driver's* testing director, Dave VanderWerp, showing that, in our testing, EVs are far worse at matching EPA estimates than gas-powered vehicles.**
- **The paper compares EPA fuel-economy and range estimates to the results of *C/D*'s real-world highway tests, with EVs failing to meet the EPA's range figures on average.**
- **The authors propose solutions like more standardized testing procedures and the inclusion of both city and highway range figures on new vehicles' Monroney price stickers.**

A new paper [published by SAE International](#) uses *Car and Driver's* real-world highway test data to show that electric vehicles underperform on real-world efficiency and range relative to the EPA figures by a much greater margin than internal-combustion vehicles. While the latter typically meet or exceed the EPA-estimated highway fuel economy numbers, EVs tend to fall considerably short of the range number on the window sticker. The paper, written by *Car and Driver's* testing director, Dave VanderWerp, and Gregory Pannone, was presented this week at SAE International's annual WCX conference. It points to a need for revised testing and labeling standards for EVs moving forward.

"Basically we've taken a look at how vehicles perform relative to the values on the window sticker, looking at the difference between what the label says and what we actually see in

our real-world highway test," explained VanderWerp. "We see a big difference in that gap between gas-powered vehicles and the performance of EVs. The real question is: When first-time customers are buying EVs, are they going to be pleasantly surprised or disappointed by the range?"

On [Car and Driver's 75-mph highway test](#), more than 350 internal-combustion vehicles averaged 4.0 percent better fuel economy than what was stated on their labels. But the average range for an EV was 12.5 percent worse than the price sticker numbers.



LUCID MOTORS

One reason the paper suggests for why EVs fail to match expectations is how the range is calculated. While separate city and highway range figures are computed behind closed doors, only a combined number is presented to consumers. The combined rating is weighted 55 percent in favor of the city figure, where EVs typically perform better. This inflates the range estimates, making it harder to match in real-world highway driving. The paper proposes publishing both city and highway range figures—as with fuel-economy estimates for gas-powered vehicles—to give shoppers a more holistic sense of a vehicle's abilities.

The way the tests are conducted also skews the reported range figure. Unlike *Car and Driver's* real-world test—carried out at a constant 75 mph—the EPA's cycle is variable, with the speed increasing and decreasing over the course of the test. While this is detrimental to the results for gas vehicles, which tend to be most efficient at a steady rpm, the ability to regenerate energy under braking leads to higher range results for EVs, which are shifted even higher by the slight bias towards the city results in the combined rating.

The EPA's highway cycle is conducted at significantly lower speeds than *Car and Driver's* 75-mph test, with the initial EPA results then multiplied by a reduction factor to simulate the effect of higher speeds. Automakers can choose between running a two-cycle test—where the data is multiplied by a standard 0.7 adjustment factor—or carrying out a five-cycle test in an attempt to earn a smaller reduction factor, making the label figure higher. That means range figures aren't perfectly comparable across different vehicles.

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"There's a balance," explained VanderWerp. "The marketing team wants to tout a big range number, but to customers you want to be conservative." This leads to different approaches from various brands. The German automakers—BMW, Mercedes, Audi, and Porsche—typically provide a relatively conservative range figure, allowing us to meet or even at times exceed the range numbers in *Car and Driver's* real-world tests. Tesla, meanwhile, pursues an impressive figure for its window stickers, and ends up returning real-world results that are on average two times as far off the label value as most EVs. A range discrepancy between EVs from different companies might not be as extreme as the numbers would suggest. "400 miles of stated range for a Tesla and 300 miles for a Porsche is pretty much the same number at real highway speeds," VanderWerp said.

The paper recommends that the EPA shift the reduction factor closer to 0.6, which would result in range estimates that closely correlate with the results of the real-world efficiency test. But having the same test procedure for all cars is also crucial.

"Every automaker could aggressively use the five-cycle test and get a better reduction factor, but then more people end up being disappointed in the numbers," VanderWerp said. "They should all be tested the same, and it should be closer to the real world than it is now." The paper can be [found in full at SAE's website](#).

Calgary



Spring 2023

Calgary and Region Economic Outlook

2023-2028



Executive Summary

3. Strong population and labour force growth would help address high job vacancies with economy-wide earnings boosting consumption and offsetting investment decline

The City of Calgary's estimate for the local population as of April 1, 2023, is 1,389,200. The annual rate of population increase was about 40,600 people or 3.0 per cent, which is an acceleration from 2.0 per cent in 2022. The implication is that population growth has created the platform for a 3.0 per cent growth in personal consumption spending before accounting for inflation. Personal consumption spending is the main contributor to local GDP growth representing about three out of every five dollars of economic activity in Calgary.

The 'real' growth in personal consumption spending should lag behind population growth because of high inflation. Although Calgary's population increased at a record pace between April 2022 and April 2023, the annual inflation rate was at a 40-year high. High inflation dissuades expenditures on large ticket items and should reduce inflation-adjusted consumer spending.

Calgary's population should increase by 108,400 people between 2023 and 2028. The number of elementary and pre-elementary school-aged children (zero to nine years) should achieve a forecast horizon peak of 162,600 in 2024 before declining to 161,700 by 2028. It is due to declining birth rates in Calgary. In contrast, the number of high school youth and graduates eligible for post-secondary education (aged 15 to 19) should increase from 78,300 in 2023 to 87,800 in 2028. That's an annual average 2.3 per cent growth rate. It suggests benefits from a focus on Calgary youths.

By 2028, the number of seniors aged 65 to 79 should increase by 39,800 from 141,600 in 2023. That's a rapid annual average growth rate of 5.1 per cent attributable to the baby boomers. It means that Calgary will continue to experience population aging. By 2028, the average age in Calgary should rise to 39.9 years, compared to 38.6 years in 2023. Similarly, the proportion of seniors (65 years and older) in the total population should increase to 15.5 per cent by 2028, compared to 13.1 per cent in 2023. It will increase the share of the retiring population and put downward pressure on the effective size of the labour force.

The Fall 2022 Economic Outlook forecasted that the CER labour force should hit one million people sometime in 2023. That expectation is sustained. The size of the CER workforce should rise to a full-year average of 1,027,800 people in 2023. Significant net migration, especially of people aged 35 to 49 years, has been crucial for labour force growth. However, for the first time, the cohort aged 65 to 69 would experience more additions than any other cohort over the five years from 2023 to 2028. As a result, the labour force participation rate would decline from 71 per cent in 2023 to 70 per cent by 2028.

Job creation should slow to 3.1 per cent in 2023 after a blistering 7.3 per cent pace in 2022. That represents an addition of 28,600 net new jobs in the CER in 2023. The slowdown in job creation is the result of a shift from getting workers to getting the right match between job seekers and employers. More workers alongside real wage growth should increase economy-wide earnings and boost consumer spending in 2023. In line with investment growth, the two industries that should experience the fastest pace of job growth are the manufacturing and the professional, scientific, and technical services industries. The growth in manufacturing industry jobs is from a small base (3.9 per cent of CER workers in 2022), which would make it less prominent in upcoming labour force survey releases. Between 2024 and 2028, the average annual rate of job growth should decelerate to 2.2 per cent.

The average annual unemployment rate should stay above 6.0 per cent until 2026. That's because job growth over the next few years would only slightly exceed labour force growth. As a result, the CER unemployment rate should exceed the Canadian average without new policy developments that encourage faster job growth.

4. Divergence across four inflation categories in 2023 – declining average house prices, decelerating consumer price inflation, positive wage inflation, and significant construction inflation

There are five generally accepted significant drivers of global inflation from 2020 to 2022:

Five-Year Population Growth

+108,400 (2023 to 2028)



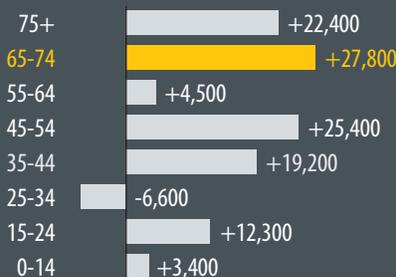
Calgary's population should increase by 108,400 between 2023 and 2028, down from 121,900 between 2018 and 2023. The slowdown is due to **the inability to repeat record 2022-23 net migration and slightly lower birth rates.**

+ 121,900 (2018 to 2023)



Population Increase by Cohort

The 10-year **cohort of seniors** ages 65 to 74 should experience the most substantial increase over the next five years from 2023 to 2028, outpacing the growth in the larger cohorts ages 35 to 44 and 45 to 54 years.



Five-Year Job Growth

Strong pace of **job creation** in the regional economy.

2018-2023
+34.9 thousand



2018
863 thousand total jobs

2018-2023
+99.5 thousand



2023
963 thousand total jobs

2023-2028
+107.6 thousand



2028
1,070 thousand total jobs

Non-Residential Construction Price Inflation – Impact on City Costs

Increased costs, particularly for inputs like steel, have driven up non-residential construction costs in Calgary. Steel-finished building materials like rebar, framing and commercial plumbing pipes face significant impacts. Rising energy costs and interest rates have also factored into increasing building costs. Due to fixed price contracts with multi-year terms, not all the cost increases of recent years show up in current data, and those increases will continue to make their way into contracts in 2023.

Softer wholesale prices for steel construction materials should make their way to market later this year, but wage pressures will likely offset that relief as record non-residential construction activities in British Columbia and Ontario compete with Alberta for workers in 2023 and for some time beyond. Beyond 2023, construction costs should increase at a pace slightly higher than pre-pandemic as a result of sustained higher interest rates.

Residential Activity – Building Investment and Expansion of the Residential Tax Base

The residential real estate market had been on a tear in the first half of 2022 before pulling back in the later half of the year. Despite historical employment and population gains, the culprit was the Bank of Canada’s higher overnight policy rate to combat high inflation. Total housing starts reached a historic high of 14,800 in 2022. The average annual number of housing starts between 1990 and 2022 was 9,300. Over the last ten years, the historical average was 10,600 housing starts. So, despite the higher interest rate environment, builders responded positively to more substantial net migration and employment growth in 2022.

For 2023 and beyond, the challenge of homebuyer affordability will sustain the shift in the distribution of housing starts toward multi-family units. The share of multi-family housing starts was at a record high of 64.0 per cent in 2022. A higher share of multi-family dwelling units should persist for the forecast period between 2023 and 2028. The primary driver is that homebuyers have signalled an appetite for more affordable housing products, favouring multi-family units over single-family units, whether rented or purchased. As a

result, the total housing starts should decrease to 13,100 in 2023 and return to an annual average of 10,300 housing starts between 2024 and 2028.

Residential building construction permits reflect building construction investment intentions. In 2022, the total value of residential building construction investment intentions was \$4.0 billion, just shy of the \$4.1 billion all-time high recorded in 2014. Strong net migration and employment growth aided growth in residential construction investment in 2022. Even after adjusting for inflation, residential building construction investment intentions in 2022 exceeded annual values between 2015 and 2021. The total building construction investment intentions in 2022 was \$5.7 billion, with \$3 out of every \$4 going to residential investment.

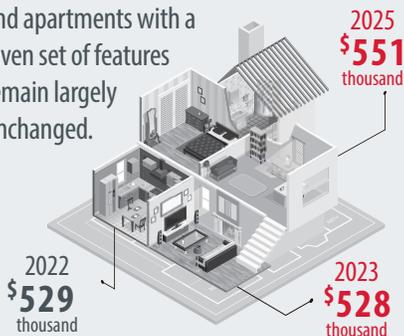
For 2023, total building construction investment intentions should remain steady at \$5.7 billion as residential investment holds steady despite higher construction inflation and interest rates, while other investment categories decline. Nevertheless, building construction investment intentions should gradually increase between 2024 and 2028, averaging \$6.0 billion annually, as solid population growth and slightly lower borrowing costs emerge over the forecast horizon.

The average house price growth slowed to 4.9 per cent in 2022 from 7.6 per cent in 2021, subdued by a higher interest rate despite solid population and employment growth. The shift to relatively more affordable housing-structure purchases, which experienced slower price appreciation, also explains some of the slower growth. For the benchmark house price, which is less sensitive to sales volume, price growth slowed marginally from 12.8 per cent in 2021 to 12.4 per cent in 2022.

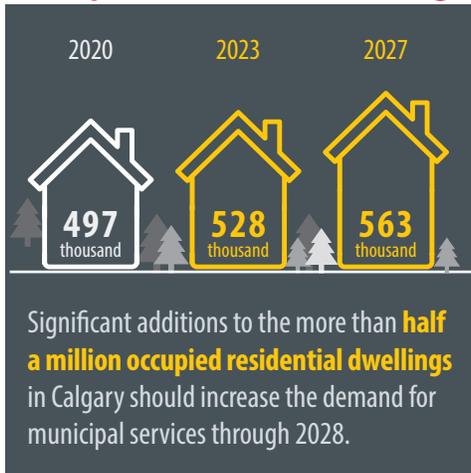
House price appreciation should slow down further in 2023 as higher interest rates continue to weigh on household debt obligations and also because of an increase in new housing supply. Given the assumption of lower borrowing costs in 2024 and beyond relative to 2023, average house price appreciation should average 2.6 per cent between 2024 and 2028, while the benchmark house price appreciation averages 2.3 per cent. The convergence between average and benchmark house price growth is due to an expected rebalancing of housing-type sales and pricing.

Benchmark House Price

The benchmark house price should be effectively flat as single-family detached, single semi-detached, row house and apartments with a given set of features remain largely unchanged.

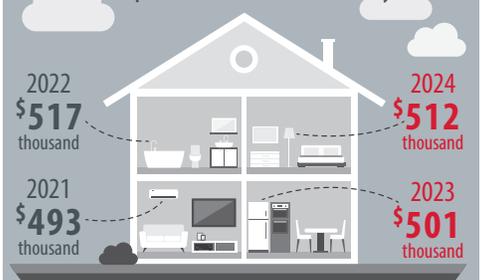


Occupied Residential Dwellings



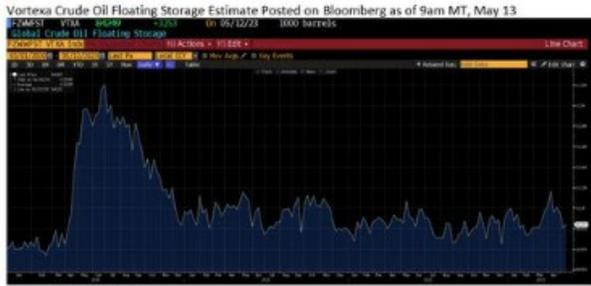
Average Residential MLS Price

House price depreciation should occur after two years of price appreciation as higher borrowing costs sustains a shift to multi-family units that are lower priced and more consistent with market practices when affordability wanes.



SAF

Dan Tsubouchi @EnergyTidbits · 22h
#Vortexa crude #Oil floating storage at May 12 est 84.25 mmb, -3.25 mmb WoW vs revised up May 5 of 81.00 mmb. See table, -32.11 mmb vs 04/07, is this Iran selling floating storage, RUS oil being rerouted after being transferred? Thx @Vortexa @business. #OOTT



Source: Bloomberg, Vortexa

Posted May 13, 9am MT				May 6, 9am MT				Apr 29, 9am MT			
ID	30	1H	YTD	ID	30	1H	YTD	ID	30	1H	YTD
05/12/2023	04249			05/05/2023	72541			04/20/2023	67301		
05/05/2023	80996			04/28/2023	93503			04/21/2023	96620		
04/28/2023	95522			04/21/2023	96627			04/14/2023	94491		
04/21/2023	100,753			04/14/2023	95425			04/07/2023	116,596		
04/14/2023	96272			04/07/2023	117,039			03/31/2023	102,661		
04/07/2023	116,357			03/31/2023	100,406			03/24/2023	97293		
03/31/2023	100,983			03/24/2023	96042			03/17/2023	87009		
03/24/2023	97478			03/17/2023	86070			03/10/2023	88922		
03/17/2023	86636			03/10/2023	80467			03/03/2023	81681		
03/10/2023	80804			03/03/2023	81210			02/24/2023	79295		
03/03/2023	81531			02/24/2023	80599			02/17/2023	72622		

Source: Bloomberg, Vortexa

Region	Original Posted		Recent Peak	
	May 12/23	May 5/23	May 5/23	Apr 7/23
Asia	40.95	44.50	-3.55	40.70
Europe	10.31	7.52	2.79	6.97
Middle East	7.70	3.71	3.99	3.71
West Africa	7.92	4.91	3.01	4.94
US Gulf Coast	0.39	0.29	0.10	0.23
Other	16.88	20.07	-3.09	15.96
Global Total	84.25	81.00	3.25	72.54

Vortexa crude oil floating storage posted on Bloomberg 9am MT on May 13
Source: Vortexa, Bloomberg

2 1 1,474

SAF

Dan Tsubouchi @EnergyTidbits · May 13
looks like the local #Canmore deer came back for breakfast feed by the Bow River. always great to look over your screen and see the wildlife

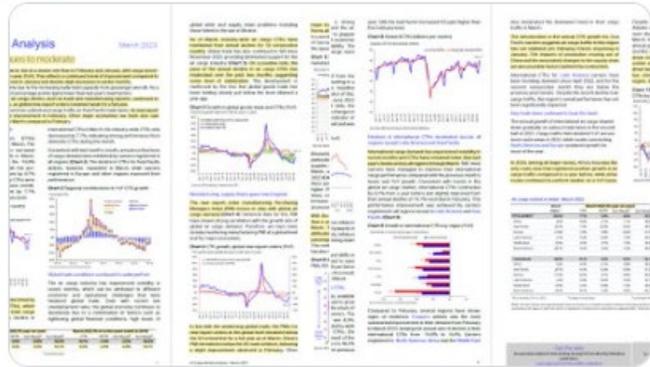


1 9 1,374

SAF **Dan Tsubouchi** @Energy_Tidbits · May 12
ICYMI. Good monthly read for state of the global economy - @IATA Air Cargo data for March.

"industry-wide air cargo CTKs have maintained their annual decline for 13 consecutive mth pace of the annual decline in air cargo CTKs has moderated over the past 2 mth"

#OOTT



2 2 1,895

SAF **Dan Tsubouchi** @Energy_Tidbits · May 12
Coming soon!

Surely #AI and #Automation will give regulators the< at the press of button< tool to deal with #JamieDimon concern re short selling, tweeting, etc on all sectors, not just banks.

See @flacqua clip.

#OOTT



1 1 1,015

Dan Tsubouchi @Energy_Tidbits · May 12
Reminders from @BloombergNEF on China #LNG vs #NatGas Vs #Coal fundamentals.

Pipeline gas is cheaper than LNG & doesn't have same price spikes.

Even in big 2022 LNG price spike, gas pipeline supply capacity limits substitution.

Coal power is way cheaper than LNG power.

#OOTT





Dan Tsubouchi  @Energy_Tidbits · May 11



Hmmm!

US to seek to purchase for #SPR in June says @SecGranholm "That congressionally mandated sale of 26 million barrels will be completed by June, and it's at that point where we will flip the switch and then seek to purchase" reports @TimoGard

#OOTT



reuters.com

UPDATE 1-US could start buying oil for reserve after June sale - ener...
U.S. Energy Secretary Jennifer Granholm told lawmakers on Thursday her department could start repurchasing oil for the Strategic ...



5



5



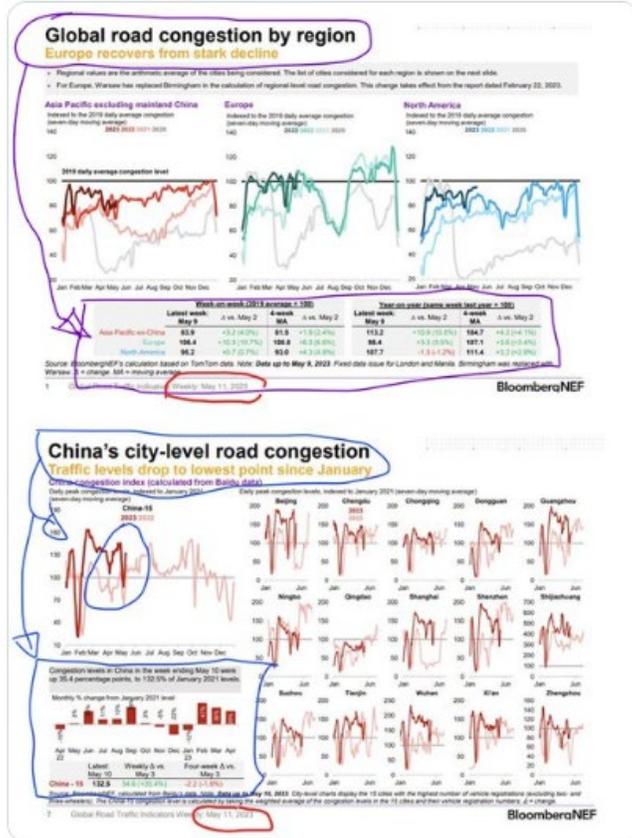
1,904



Dan Tsubouchi @EnergyTidbits · May 11
 China's city traffic congestion +35.4% WoW, 5-day holiday was over so people back to cities to work.

Asia Pacific Ex China +4.0% WoW, still well <2019
 EU +10.7% WoW, back >2019
 NA +0.7% WoW, close to 2019

Thx @BloombergNEF Global Road Traffic Indicators
 #OOTT





Dan Tsubouchi @Energy_Tidbits · May 11
ICYMI. See earlier tweet on Norway's clear statement.



Norway needs more #Oil & #NatGas to pay the social bills for current and future "GENERATIONS".
Plural!

The demise of #Oil and #NatGas will take a lot longer than expected.

#OOTT

🗨️ Dan Tsubouchi @Energy_Tidbits · May 11
Greta may not like it, but Norway knows reality that #Oil #NatGas pays the social bills & more production is needed for future generations.

"we must further develop our petroleum sector"
"income from petroleum industry ... makes an important contribution to the financing of the... [Show more](#)

Google Translate of <https://www.regjeringen.no/no/aktuelt/petroleumsinntekter/id2875995/>



Regjeringa.no

Revised national budget

The petroleum industry contributes large revenues to the community

Press release | Date: 11/05/2023

The government's estimate for the state's net cash flow from the petroleum industry in 2023 is estimated in the revised national budget at NOK 1,015 billion. This is a very high level historically. By comparison, the average in the previous decade was around NOK 380 billion a year.

"The income from the petroleum industry is unique for the country and makes an important contribution to the financing of the welfare state for current and future generations," says Oil and Energy Minister Terje Aasland.

The expected income is lower than the income in 2022. The decrease mainly comes from lower estimates of oil and gas prices compared to last year. At the same time, it is expected that oil production will increase in 2023, while gas production is expected to remain at the same high level as in 2022.

Total petroleum production in 2023 is estimated at around 239 million standard cubic meters of oil equivalent, which is an increase of around 3 per cent compared to 2022.

— As the largest oil and gas producer in Europe, and the only net exporter, Norway and the companies on the Norwegian continental shelf play a decisive role in the energy supply in Europe. This is a role we can also have in the future, and then we must further develop our petroleum sector, says Aasland.

Expect increased investments in the coming years

Investments on the NCS have gradually decreased in recent years, but are expected to increase somewhat towards the mid-2020s. Investments in the petroleum industry in 2023 are estimated in the revised national budget at NOK 194 billion, or about 17 per cent of the total real investments in Norway.

— The development projects that the governing authorities received in the period 2020-2022 now give large, necessary assignments to the Norwegian-based supplier industry. These development projects mean that we retain important cornerstone companies across the country and that we take care of central expertise that we can build on in the future, says Aasland.

🗨️ 11 🔄 5 ❤️ 30 📊 6,875 📤

SAF Dan Tsubouchi @Energy_Tidbits · May 11
#OPEC

As @globaloilrisks said to @gulf_intel pre-MOMR, Venezuela says produced 810 kbd in Apr 2023. Been 3 yrs since they were >800 kbd.

And #Chevron expects to keep increasing its VEN oil production/exports even without big investment approach. Low hanging fruit!

#OOTT

Table 6-6: OPEC NGL + non-conventional oils, mmbd

	Change		Change		1Q23		2Q23		3Q23		4Q23		2023		23Q2	
OPEC NGL and non-conventional oils	2021	21Q2	2022	22Q2	1Q23	2Q23	3Q23	4Q23	2023	23Q2	23Q1	23Q4	23Q3	23Q2	23Q1	23Q4
OPEC NGL	5.10	0.12	5.29	0.11	5.34	5.37	5.33	5.33	5.34	0.05	0.00	0.10	0.10	0.10	0.10	0.00
OPEC non-conventional	0.10	0.00	0.10	0.00	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.10	0.10	0.10	0.10	0.00
Total	5.20	0.12	5.39	0.11	5.44	5.47	5.43	5.43	5.44	0.05	0.00	0.20	0.20	0.20	0.20	0.00

Note: 2023 = Forecast. Source: OPEC.

OPEC crude oil production

According to secondary sources, total OPEC-13 crude oil production averaged 28.80 mmbd in March 2023, lower by 86 tbbd m-o-m. Crude oil output increased mainly in Saudi Arabia, while production in Angola, Iraq and Nigeria declined.

Table 7: OPEC crude oil production based on secondary sources, tbbd

Secondary sources	2021	2022	3Q22	4Q22	1Q23	Jan 23	Feb 23	Mar 23	Change Mar/Feb
Algeria	913	1,017	1,040	1,030	1,015	1,016	1,017	1,013	-4
Angola	1,122	1,140	1,155	1,084	1,072	1,136	1,072	1,007	-64
Congo	263	261	265	252	268	257	278	270	-8
Equatorial Guinea	98	84	90	63	54	55	61	48	-12
Gabon	182	197	201	199	196	190	195	203	7
Iran	2,392	2,554	2,565	2,567	2,565	2,554	2,574	2,567	-8
Iraq	4,046	4,439	4,522	4,505	4,381	4,410	4,375	4,358	-18
Kuwait	2,419	2,704	2,801	2,712	2,682	2,692	2,676	2,678	2
Libya	1,143	981	976	1,153	1,157	1,148	1,163	1,161	-2
Nigeria	1,373	1,204	1,063	1,171	1,344	1,308	1,371	1,354	-17
Saudi Arabia	9,114	10,529	10,891	10,603	10,354	10,295	10,361	10,405	44
UAE	2,727	3,065	3,168	3,094	3,043	3,046	3,046	3,038	-8
Venezuela	553	678	662	667	693	691	692	696	2
Total OPEC	26,345	28,856	29,400	29,100	28,824	28,798	28,883	28,797	-86

Note: Totals may not add up due to independent rounding over 2020/21 secondary sources to date. Source: OPEC.

Table 8: OPEC crude oil production based on direct communication, tbbd

Direct communication	2021	2022	3Q22	4Q22	1Q23	Jan 23	Feb 23	Mar 23	Change Mar/Feb
Algeria	911	1,020	1,060	1,030	1,011	1,012	1,014	1,008	-6
Angola	1,124	1,140	1,151	1,076	1,046	1,105	1,054	972	-82
Congo	267	262	261	261	278	275	273	285	12
Equatorial Guinea	93	81	83	66	51	55	50	48	-2
Gabon	181	191	198	183	201	206	207	190	-16
Iran	2,392	2,554	2,565	2,567	2,565	2,554	2,574	2,567	-8
Iraq	3,971	4,450	4,532	4,505	4,288	4,331	4,339	4,200	-139
Kuwait	2,415	2,707	2,799	2,721	2,676	2,676	2,676	2,676	0
Libya	1,207	981	976	1,153	1,157	1,148	1,163	1,161	-2
Nigeria	1,323	1,143	999	1,144	1,374	1,256	1,306	1,264	-38
Saudi Arabia	9,125	10,691	10,968	10,622	10,456	10,453	10,450	10,454	74
UAE	2,718	3,064	3,170	3,093	3,041	3,038	3,041	3,045	4
Venezuela	636	716	673	693	731	732	704	754	50
Total OPEC	26,345	28,856	29,400	29,100	28,824	28,798	28,883	28,797	-86

Note: Not available. Totals may not add up due to independent rounding. Source: OPEC.

Dan Tsubouchi @Energy_Tidbits · May 11

Chevron Impact on Venezuela #Oil production should show up in #OPEC MOMR May.

@globaloilrisks: Chevron's VEN right now 140 kbd, PDVSA data Apr was averaging 800 kbd. ...

1 4 8 4,011

SAF

Dan Tsubouchi @Energy_Tidbits · May 10

...

Not impossible but with the @MapleLeafs win just now, a lot more precedents for NHL teams coming back from being down 3-1.

@puckreport lists 31 teams have done it, BUT that is only 10% of the times the down 3-1 team went on to win.

Go Leafs Go!

puckreport.com/2009/04/nhl-pl...

advanced (Edmonton, Colorado [2]) and one went home (Pittsburgh). While a 3-1 lead is always a good thing, it's never a sure thing.



Through 2022, teams have trailed 3-1 in a best-of-seven series 325 times. Only 31 times has the trailing team comeback to win the series. Put another way, the team with a 3-1 series lead wins 90% of the time with the down-and-nearly-out team recovering only 10% of the time.

The chart below describes all 31 comebacks by year, team and round.

Year	Matchup	Round
1942	Toronto over Detroit	Final
1975	New York* over Pittsburgh	Preliminary
1987	New York* over Washington	Preliminary
	Detroit over Toronto	Quarterfinal
1988	Washington over Philadelphia	Quarterfinal
1989	Los Angeles over Edmonton	Preliminary
1990	Edmonton over Winnipeg	Preliminary
1991	St. Louis over Detroit	Preliminary
1992	Detroit over Minnesota^	Preliminary
	Vancouver over Winnipeg	Preliminary
	Pittsburgh over Washington	Preliminary
1994	Vancouver over Calgary	Preliminary
1995	Pittsburgh over Washington	Preliminary
1998	Edmonton over Colorado	Preliminary
1999	St. Louis over Phoenix	Preliminary
2000	New Jersey over Philadelphia	Semifinal
2003	Minnesota^^ over Colorado	Preliminary
	Vancouver over St. Louis	Preliminary
	Minnesota^^ over Vancouver	Quarterfinal
2004	Montreal over Boston	Preliminary
2009	Washington over New York**	Preliminary
2010	Montreal over Washington	Preliminary
	Philadelphia over Boston	Quarterfinal
2011	Tampa Bay over Pittsburgh	Preliminary
2013	Chicago over Detroit	Quarterfinal
2014	Los Angeles over San Jose	Preliminary

re Dan Tsubouchi @Energy_Tidbits · May 10

Not impossible for @MapleLeafs but only 4 teams have come back from 0-3 to win a playoff series.

1942 Leafs beat Wings to win the cup
1975 Islanders beat Penguins in quarterfinals...

🗨️ 1 ❤️ 3 📊 2,434 📤

SAF Dan Tsubouchi [@Energy_Tidbits](#) · May 10
545 days to go until nov 5, 2024 presidential election means 545 more days of #BigOil being the #1 villain for #Biden. #OOTT



1 2 2,270

SAF Dan Tsubouchi [@Energy_Tidbits](#) · May 10
For those who aren't near their laptop, [@EIAgov](#) just released its #Oil #Gasoline #Distillates inventory as of May 5. Table below compares EIA data vs [@business](#) expectations and vs [@APIenergy](#) yesterday. Prior to release, WTI was \$72.53. #OOTT

Oil/Products Inventory May 5: EIA, Bloomberg Survey Expectations, API (million barrels)	EIA	Expectations	API
Oil	2.95	-2.50	-3.94
Gasoline	-3.17	-1.50	0.40
Distillates	-4.17	-1.00	-1.00
	-4.39	-5.00	-4.54

Note: Oil is commercial so builds in a draw of 2.9 mmb in SPR for the May 5 week
Note: Included in the oil data, Cushing had a 0.40 mmb build for May 5 week
Source EIA, Bloomberg
Prepared by SAF Group <https://safgroup.ca/news-insights/>

8 1,313

SAF Dan Tsubouchi @Energy_Tidbits · May 10
#NatGas #LNG markets hoping the new @CopernicusECMWF summer Europe forecast for a hot summer is right.

#OOTT

<https://climate.copernicus.eu/seasonal-forecasts>

Highlights of the latest seasonal forecasts

10 MAY 2023

Forecast for European summer 2023:

- The C3S seasonal forecast initialised close to 1 May indicates enhanced probabilities for above-average rainfall over southern Europe for summer as a whole (June-August). This signal comes from the early part of the season, and is present in a few - not all - components of the C3S multi-system (see individual forecast graphs on the display page for details). The anomalies predicted - in the ensemble-mean view - are small; in reality, such amounts of rain would not make a significant difference to pre-existing drought conditions in these regions.
- For temperature, the signal is for above-average seasonal values virtually across all land areas, strongest over southern and western Europe. Both the ensemble-mean anomalies and the probabilities are lower than in the May 2022 forecast for last year's European summer. In most regions.
- Predictions for sea-surface temperature in the equatorial Pacific continue to indicate as almost certain the development of an El Niño event during the second part of this year. At the time of writing, conditions around the Tropics do not indicate an atmospheric response to these ocean conditions, which means that the basin-wide event has not yet started, and thus teleconnections (influences to areas remote from the centre of action) will be unlikely to take effect before the end of summer.

C3S multi-system seasonal forecast | ECMWF Met Office/Météo-France/CMC/Météo-Canada/NCEP/NOAA/ECMWF
Probability category of 2m temperature | 1 Jul 2023
Season forecast for 2023
Ensemble-mean

Legend for 2m temperature anomalies (Probability category):

- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- 80-90%
- 90-100%

Logos: European Commission, Copernicus, ECMWF, and other partners.

4 4 2,116

SAF Dan Tsubouchi @Energy_Tidbits · May 10
Not impossible for @MapleLeafs but only 4 teams have come back from 0-3 to win a playoff series.

1942 Leafs beat Wings to win the cup
1975 Islanders beat Penguins in quarterfinals
2010 Flyers beat Bruins in quarterfinals
2014 Kings beat Sharks in 1st round

Go Leafs Go!

1 2 3 3,339

SAF Dan Tsubouchi  @Energy_Tidbits · May 10 ...
Big difference in what cohorts highlight as the goal of @AIMforClimate summit to @morningmika.

US @SecVilsack. "to accelerate innovation. #Agriculture has the opportunity globally to be the 1st industry to a net zero future"

UAE @mariamalmheiri. "what it comes down to is...[Show more](#)

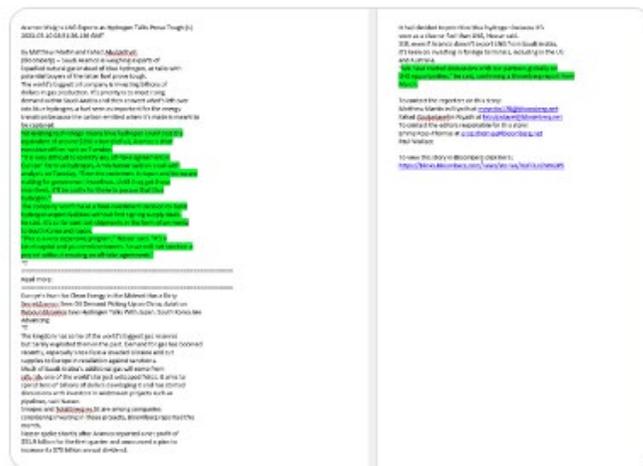


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SAF Dan Tsubouchi  @Energy_Tidbits · May 10 ...
#NatGas #LNG will be needed for a very long time.

#SaudiAramco CEO, #BlueHydrogen cost ~\$250/boe! "very difficult to identify any off-take agreement in EU" "Even the customers in Japan and Korea are waiting for government incentives"

Thx @MattMartin128 @faaj22
#OOT



  13  13  12.5K 

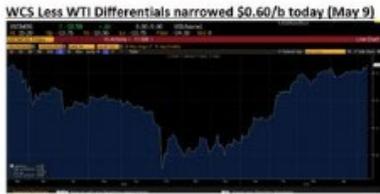
SAF Dan Tsubouchi @Energy_Tidbits · May 9
 #Suncor expanded upstream maintenance schedule shuts in more production.

Q4/22 planned, shuts in. Q2 40 kbd. Q3 115 kbd. Q4 75 kbd.

Q1/23 planned, shuts in. Q2 65 kbd. Q3 130 kbd. Q4 95 kbd.

WCS less WTI differentials narrowed \$0.60/b today.

#OTT



Source: Bloomberg

Suncor Q1/23 slides

2023 capital & production guidance^{1, 2}

CAPITAL EXPENDITURES		OPERATIONS & MAINTENANCE COSTS		PRODUCTION ³		CASH OPERATING COSTS	
(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)
Oil Sands	3,625 - 3,875	57%	Oil Sands Operations	85,000 - 87,000	85,000 - 87,000	85,000 - 87,000	85,000 - 87,000
Refining	700 - 775	20%	Processors (incl. Ref.)	8,000 - 8,500	8,000 - 8,500	8,000 - 8,500	8,000 - 8,500
Production	1,000 - 1,100	29%	Specialty (incl. Ref.)	175,000 - 180,000	175,000 - 180,000	175,000 - 180,000	175,000 - 180,000
Chemicals	20 - 50	0%	Other	500 - 550	500 - 550	500 - 550	500 - 550
Total	5,345 - 5,800	46%	Total Upstream Production	188,500 - 191,000	188,500 - 191,000	188,500 - 191,000	188,500 - 191,000
BUSINESS ENVIRONMENT		PLANNED MAINTENANCE		OPERATIONS		SHUTS IN QUARTER END	
Oil Sands (incl. Ref.)	850.00	Oil Sands	100	Oil Sands	100	Oil Sands	100
Refining (incl. Ref.)	850.00	Refining	100	Refining	100	Refining	100
Production (incl. Ref.)	850.00	Production	100	Production	100	Production	100
Chemicals (incl. Ref.)	850.00	Chemicals	100	Chemicals	100	Chemicals	100
Other (incl. Ref.)	850.00	Other	100	Other	100	Other	100
Total	3,400.00	Total	400	Total	400	Total	400

Suncor Q4/22 slides

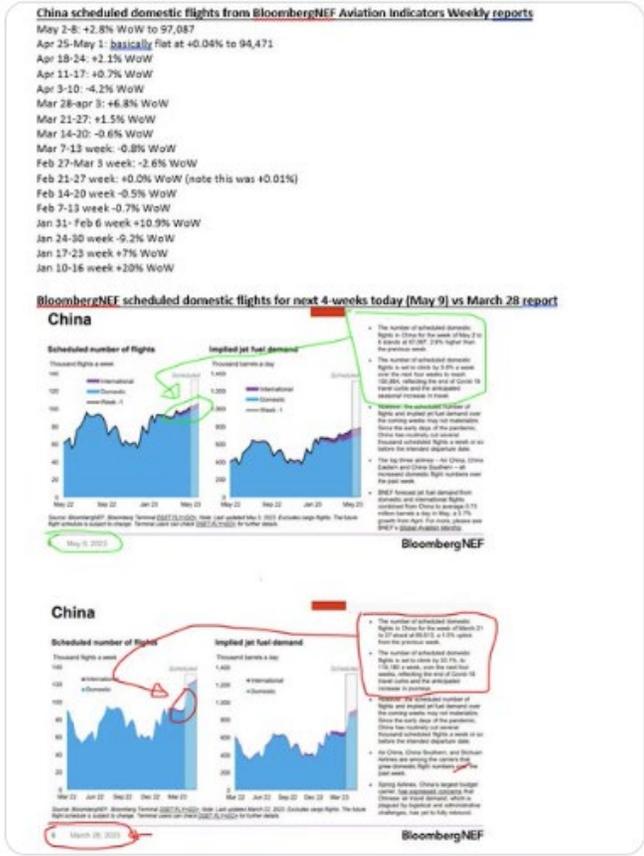
2023 capital & production guidance^{1, 2}

CAPITAL EXPENDITURES		OPERATIONS & MAINTENANCE COSTS		PRODUCTION ³		CASH OPERATING COSTS	
(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)	(\$ millions)
Oil Sands	3,625 - 3,875	57%	Oil Sands Operations	85,000 - 87,000	85,000 - 87,000	85,000 - 87,000	85,000 - 87,000
Refining	700 - 775	20%	Processors (incl. Ref.)	8,000 - 8,500	8,000 - 8,500	8,000 - 8,500	8,000 - 8,500
Production	1,000 - 1,100	29%	Specialty (incl. Ref.)	175,000 - 180,000	175,000 - 180,000	175,000 - 180,000	175,000 - 180,000
Chemicals	20 - 50	0%	Other	500 - 550	500 - 550	500 - 550	500 - 550
Total	5,345 - 5,800	46%	Total Upstream Production	188,500 - 191,000	188,500 - 191,000	188,500 - 191,000	188,500 - 191,000
BUSINESS ENVIRONMENT		PLANNED MAINTENANCE		OPERATIONS		SHUTS IN QUARTER END	
Oil Sands (incl. Ref.)	850.00	Oil Sands	100	Oil Sands	100	Oil Sands	100
Refining (incl. Ref.)	850.00	Refining	100	Refining	100	Refining	100
Production (incl. Ref.)	850.00	Production	100	Production	100	Production	100
Chemicals (incl. Ref.)	850.00	Chemicals	100	Chemicals	100	Chemicals	100
Other (incl. Ref.)	850.00	Other	100	Other	100	Other	100
Total	3,400.00	Total	400	Total	400	Total	400

Much slower increase in China domestic flights than expected at end of Mar.

China scheduled domestic flights +2.8 WoW for May 2-8 to 97,087.

Schedule for next 4-weeks is increasing to 100,864. BUT that is 18.5% below 119,180 flights that were scheduled on Mar 28 for Apr.... Show more



SAF

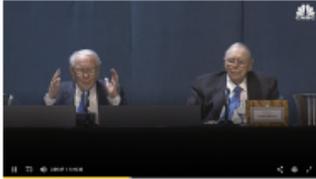
Dan Tsubouchi  @Energy_Tidbits · May 8
#Berkshire2023

...

Lots in this one short [#CharlieMunger](#) answer. See  SAF transcript

not easy to have a vast plethora of good opportunities that are easily identified

some people can't tell their best ideas from their worst and in deciding that an investment idea is already... [Show more](#)



Watch Warren Buffett and Charlie Munger preside over full 2023 Berkshire Hathaway annual meeting

SAF Group created transcript of comments by Warren Buffet and Charlie Munger in the Q&A of the 2023 Berkshire Hathaway annual meeting from CNBC 5hr 16 min video. <https://www.cnbc.com/video/2023/05/06/watch-warren-buffett-and-charlie-munger-preside-over-full-2023-berkshire-hathaway-annual-meeting.html?searchterm=berkshire>

Items in "italics" are SAF Group created transcript

At 2hr 6:10 min mark, *Munger* "I think one of the *inane things* that is taught in modern university education is that a *vest diversification* is absolutely mandatory in investing in common stocks. *That is an insane idea. It's not that easy to have a vast plethora of good opportunities that are easily identified. if you only got three, I'd rather it be invest in my best idea not my worst. Now some people can't tell their best ideas from their worst and in deciding that an investment idea is already good, they get to thinking it's better than it is. I think we make fewer mistakes like that than other people. And that is a blessing to us. We're not so smart but we kind of know where the edge of our smartness is. That is a very important part of practical intelligence. A lot of people who are geniuses on IQ tests think they are a lot smarter than they are and what they are is dangerous. But if you know the edge of your own ability pretty well, you should ignore most of the notions of our experts about what I call de-maximization of portfolios*".

Prepared by SAF Group <https://safgroup.ca/news-insights/>



1



2



1,400



SAF Dan Tsubouchi  @Energy_Tidbits · May 8 ...
Another reminder why The Man, Saudi Energy Minister Abdulaziz will keep the market in balance.

See 📌 05/03 tweet, #IMF KSA fiscal breakeven price is \$80.90 in 2023.

KSA Q1 fiscal deficit of \$0.77b, spending nearly +30% YoY reports @MiretteMagdy7

#OTT

🗨 Dan Tsubouchi  @Energy_Tidbits · May 3
#IMF fiscal Breakeven #Oil price.

Saudi declining \$85.80 in 22, \$80.90 in 23, \$75.10 in 24 with push on non-oil sectors.

Iran \$351.70 in 23!

Many other great tables in Appendix ie. current account balance.

#OTT



  4  7  3,389 

SAF

Dan Tsubouchi @Energy_Tidbits · May 8

...

Here are links

Alberta wildfire map. arcgis.com/apps/dashboard...

BC wildfire maps. wildfiresituation.nrs.gov.bc.ca/map

Big thanks to firefighters, police, emergency support & everyone involved in fighting fires & getting people to safety.

#OOTT

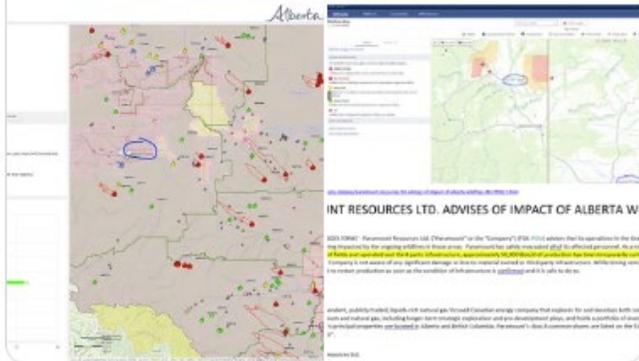
— Dan Tsubouchi @Energy_Tidbits · May 8

More Out of Control wildfires W/NW of Edmonton.

Paramount shuts-in 50,000 boed for safety precaution. Will be many more shut-ins as wildfires paths can quickly change depending on wind.

Hope forecasts are right for reasonable chance of showers this PM

Stay safe!
#OOTT #NatGas



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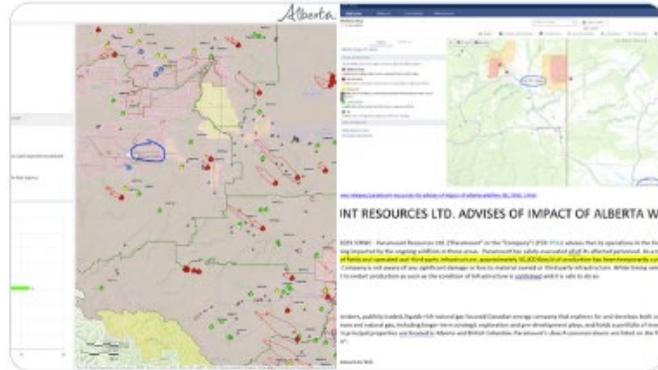
Dan Tsubouchi @Energy_Tidbits · May 8
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Stay safe!
#OOTT #NatGas



1 6 9 7,737



Dan Tsubouchi @Energy_Tidbits · May 7
ICYMI from Thurs morning.



US nonfarm labor productivity in Q1/23 was -0.9% YoY. 1st time, 4-quarter change has remained negative for 5 consecutive quarters since data started in Q1/48.

#OOTT

NEWS RELEASE

BUREAU OF LABOR STATISTICS

U.S. DEPARTMENT OF LABOR

Transmission of material in this release is embargoed until 8:30 a.m. (ET) Thursday, May 4, 2023 USDL 23-0870

Technical information: (202) 691-5606 • Productivity@bls.gov • www.bls.gov/productivity
Media contact: (202) 691-5902 • PressOffice@bls.gov

PRODUCTIVITY AND COSTS

First Quarter 2023, Preliminary

Nonfarm business sector labor productivity decreased 2.7 percent in the first quarter of 2023, the U.S. Bureau of Labor Statistics reported today, as output increased 0.2 percent and hours worked increased 3.0 percent. (All quarterly percent changes in this release are seasonally adjusted annual rates.) From the same quarter a year ago, nonfarm business sector labor productivity decreased 0.9 percent, reflecting a 1.3-percent increase in output and a 2.3-percent increase in hours worked. (See chart 1 and table A1.) The 0.9-percent productivity decline is the first time the four-quarter change series has remained negative for five consecutive quarters; this series begins in the first quarter of 1948.

Chart 1. Labor productivity, nonfarm business, 2019Q1 – 2023Q1

Chart 2. Unit labor costs, nonfarm business, 2019Q1 – 2023Q1

Unit labor costs in the nonfarm business sector increased 6.3 percent in the first quarter of 2023, reflecting a 3.4-percent increase in hourly compensation and a 2.7-percent decrease in productivity. Unit labor costs increased 5.8 percent over the last four quarters. (See chart 2 and tables A1 and 2.)

BLS calculates unit labor costs as the ratio of hourly compensation to labor productivity. Increases in hourly compensation tend to increase unit labor costs and increases in productivity tend to reduce them. Real hourly compensation, which takes into account consumer prices, decreased 0.3 percent in the first quarter of 2023, and declined 1.0 percent over the last four quarters.

Labor productivity, or output per hour, is calculated by dividing an index of real output by an index of hours worked by all persons, including employees, proprietors, and unpaid family workers. During the current business cycle, starting in the fourth quarter of 2019, labor productivity has grown at an annual rate of 1.1 percent, reflecting a 1.9-percent rate of growth in output and a 0.8-percent rate of growth in

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