Energy Tidbits

Is US Building the Case for Potential Strike On Houthis by Admitting Its Drones Have “Directly” Targeted US Navy Ships?

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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**	**$82**	**$83**
Retail gasoline price (dollars per gallon)	**$3.97**	**$3.53**	**$3.36**
U.S. crude oil production (million barrels per day)	**11.91**	**12.93**	**13.11**
Natural gas price at Henry Hub (dollars per million British thermal units)	**$6.42**	**$2.56**	**$2.79**
U.S. liquefied natural gas gross exports (billion cubic feet per day)	**10.6**	**11.8**	**12.4**
Shares of U.S. electricity generation			
Natural gas	39%	42%	42%
Coal	20%	17%	15%
Renewables	21%	22%	24%
Nuclear	19%	19%	19%
U.S. GDP (percentage change)	**1.9%**	**2.4%**	**1.3%**
U.S. CO_2 emissions (billion metric tons)	**4.94**	**4.80**	**4.75**

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

- **Natural gas prices.** The Henry Hub spot price in our forecast averages close to $2.80 per million British thermal units this winter (November—March), down more than 60 cents from our November *Short-Term Energy Outlook* (STEO). The downward revision reflects both a warmer-than-average start to the winter, which has reduced demand for space heating in the residential and commercial sectors, and high natural gas production. These two factors have increased natural gas storage inventories. We forecast U.S. natural gas inventories will end the winter 22% above the five-year average (2018–2022), with more than 2,000 billion cubic feet in storage.

- **Crude oil prices.** We forecast the Brent crude oil spot price will increase from an average of $78 per barrel (b) in December to an average of $84/b in the first half of 2024, partly driven by recently announced OPEC+ production cuts. Despite the announced cuts, we lowered our forecast for the Brent price in 2024. We expect the Brent spot price will average $83/b next year, down from our forecast of $93/b in last month's STEO.

- **U.S. petroleum and other liquids net exports.** We expect net exports of U.S. crude oil and petroleum products to reach a record high of almost 2.0 million barrels per day (b/d) in 2024, up from around 1.8 million b/d this year and 1.2 million b/d in 2022. This growth is primarily driven by an increase in U.S. crude oil and hydrocarbon gas liquids production.

- **Electricity generation.** We expect that the 23 gigawatts (GW) in 2023 and 37 GW in 2024 of new solar capacity scheduled to come online will help U.S. solar generation grow by 15% in 2023 and by

39% in 2024. We expect solar and wind generation together in 2024 to overtake electric power generation from coal for the first year ever, exceeding coal by nearly 90 billion kilowatthours.

Notable forecast changes

Current forecast: December 12, 2023; previous forecast: November 7, 2023	**2023**	**2024**
Henry Hub spot price (dollars per million British thermal units)	**$2.56**	**$2.79**
Previous forecast	$2.67	$3.25
Percentage change	-4.1%	-14.3%
Brent crude oil spot price (dollars per barrel)	**$82**	**$83**
Previous forecast	$84	$93
Percentage change	-1.9%	-11.4%
U.S. motor gasoline retail price (dollars per gallon)	**$3.53**	**$3.36**
Previous forecast	$3.55	$3.61
Percentage change	-0.8%	-6.8%
U.S. crude oil inventories (million barrels)	**435**	**439**
Previous forecast	416	427
Percentage change	4.7%	2.9%

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

Global Oil Markets

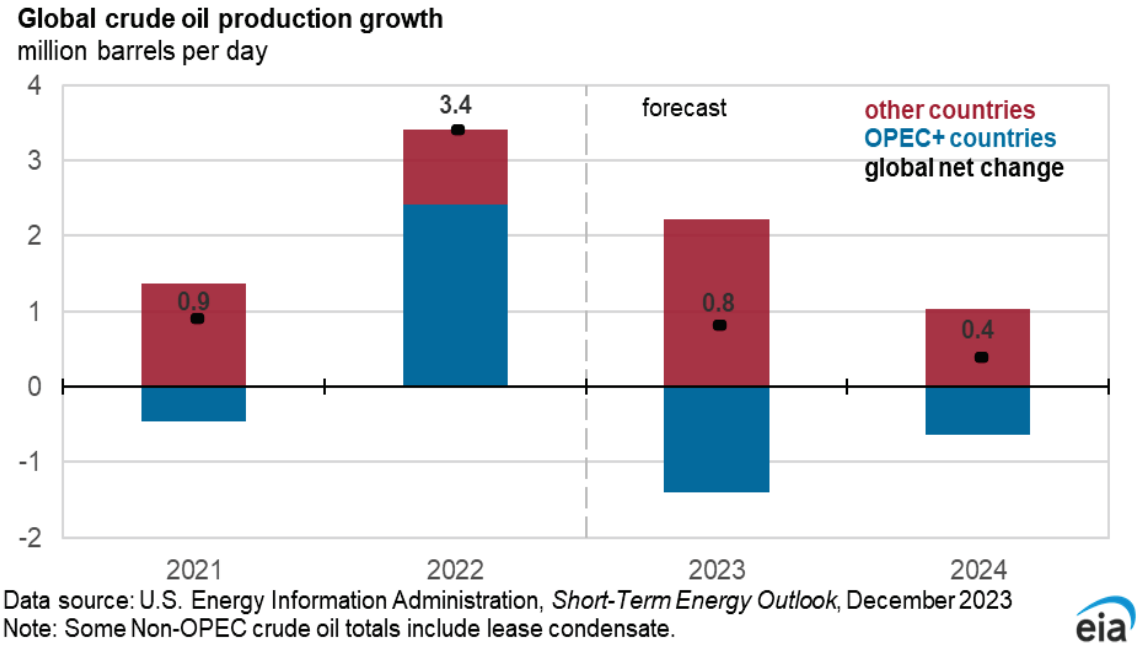
Global oil supply and oil prices

The Brent crude oil spot price averaged $83 per barrel (b) in November, a decrease of $8/b compared with October. This decrease was largely the result of ongoing concerns around global oil demand growth. Although crude oil prices declined further during the first week of December, with the Brent spot price closing close to $76/b on December 8, we expect upward crude oil price pressures in the coming months as global oil inventories decline in our forecast in the first quarter of 2024 (1Q24). The forecast decline in oil inventories is driven in part by the recently announced OPEC+ production cuts on November 30.

We forecast the Brent price will increase from an average of $78/b in December 2023 to an average of $83/b for all of 2024. Our forecast annual peak in the mid-$80/b range at the end of 1Q24, was about $10/b higher than futures contracts for delivery during that period when we closed STEO forecast runs. We expect OPEC+ production cuts will offset lower global demand growth, prevent increases in global oil inventories, and keep Brent prices above $80/b next year. Although we forecast crude oil prices to increase from the current price, we reduced our forecast for the 2024 annual average Brent price by $11/b from our November STEO.

We forecast global liquid fuels production will increase by 0.6 million barrels per day (b/d) in 2024, slowing from growth of 1.6 million b/d in 2023. We now forecast 0.4 million b/d less growth in 2024 compared with last month's STEO. The lower forecast is the mostly the result of less expected production from OPEC+ and a slight drop in expected production growth in the United States.

Growth in global crude oil supply has been limited in 2023 because of voluntary production cuts from Saudi Arabia and reduced production targets from other OPEC+ countries. We estimate countries within the OPEC+ agreement have lowered crude oil production by 1.4 million b/d in 2023, partly offsetting production growth of 2.4 million b/d by non-OPEC+ producers. We forecast OPEC+ crude oil production to fall by an additional 0.6 million b/d on average in 2024. This forecast assumes some voluntary production cuts from Saudi Arabia will be extended through 2024 and overall production from OPEC+ countries will remain below targets.

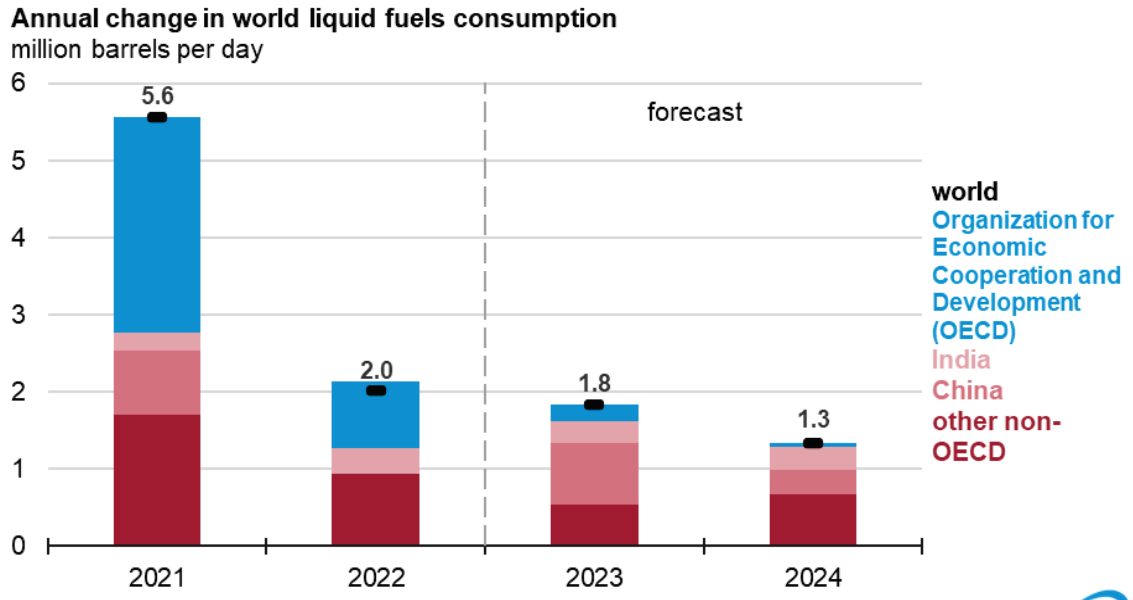


Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2023
Note: Some Non-OPEC crude oil totals include lease condensate.

Our current assessment is that global oil inventories have increased by an average of 0.6 million b/d in 2023. Inventory draws materialize in 1Q24, averaging 0.8 million b/d before the oil market returns to balance for the remainder of 2024. However, the potential for OPEC+ production to increase after the voluntary cuts expire in 1Q24 creates some downside risk for our expected oil prices.

Global oil consumption and inventories

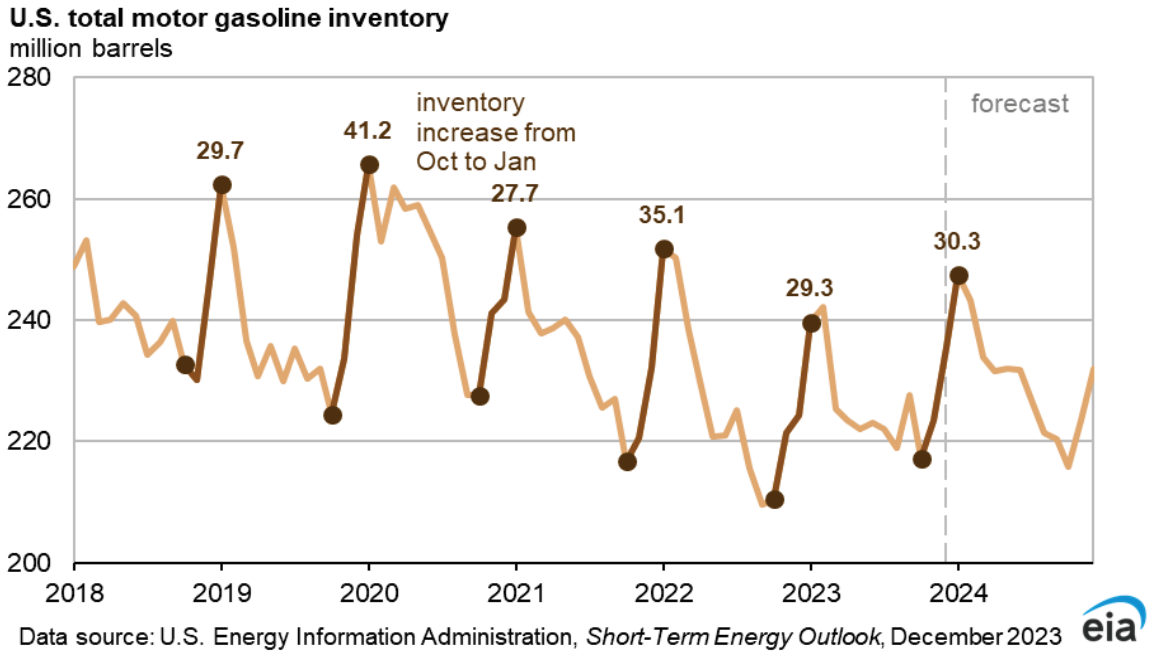
Global liquid fuels consumption in our forecast increases by 1.8 million b/d in 2023 and by 1.3 million b/d in 2024. Most of the expected growth in liquid fuels demand is in non-OECD Asia, led by China and India. We expect China's liquid fuels consumption to rise by 0.8 million b/d in 2023 and by 0.3 million b/d in 2024. India's liquid fuels consumption in our forecast increases by an average of 0.3 million b/d in both 2023 and 2024. Outside of China and India, we forecast non-OECD consumption to increase by about 0.7 million b/d on average in 2023 and 2024. This growth contrasts with OECD liquid fuels consumption, which is up only slightly over the forecast period. If expected growth in liquid fuels consumption in non-OECD countries fails to materialize, global oil prices could fall below our assumption.



Petroleum Products

U.S. motor gasoline inventories

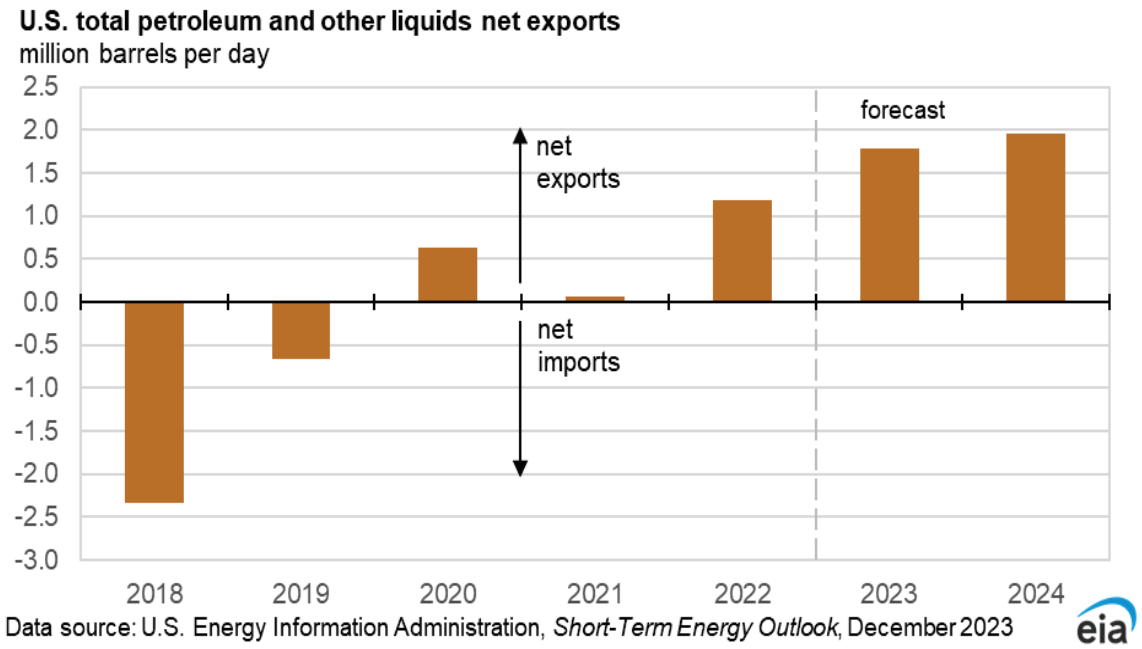
U.S. gasoline inventories typically build from the end of October to the end of January because refiners have completed scheduled maintenance and are increasing runs at a time when motor gasoline demand is at its lowest for the year. The increase in motor gasoline inventories helps smooth production and consumption when refinery maintenance increases in February and motor gasoline consumption picks up in the spring. This season, we forecast inventories will build by 30 million barrels from end-October 2023 to end-January 2024. Although we expect a below-average inventory build, U.S. gasoline inventories are now higher than this time last year, which we expect to be true in January 2024 as well.



Futures prices for RBOB, the gasoline blendstock used in many parts of the country, are higher for delivery in spring 2024 than in the upcoming winter, which encourages refiners and storage operators to increase inventories and sell when prices are higher. For the five trading days ending December 7, the RBOB futures price for April 2024 delivery averaged $2.29 per gallon (gal), compared with $2.08/gal for the RBOB futures price for January 2024. We expect more gasoline in U.S. inventories to contribute to U.S. gasoline crack spreads falling by 15 cents/gal in 2024 compared with 2023. Lower crack spreads reduce our forecast of the annual average U.S. retail gasoline price from more than $3.50/gal this year to less than $3.40/gal in 2024.

U.S. petroleum and other liquids net exports

We forecast net U.S. exports of crude oil and petroleum products (exports minus imports) to establish a new record next year. Net export growth in 2023 was driven by growth in crude oil production and field production of hydrocarbon gas liquids (HGLs). We estimate production of these HGLs—ethane, propane, butane, and natural gasoline—all grew between 6% and 10% in 2023. In 2024, growth in overall HGL next exports will slow, driven by rising U.S. HGL consumption growth. Forecast increases in refinery runs next year support increases in refined product output, contributing to slight growth in net refined product exports, mainly distillate fuel and gasoline.



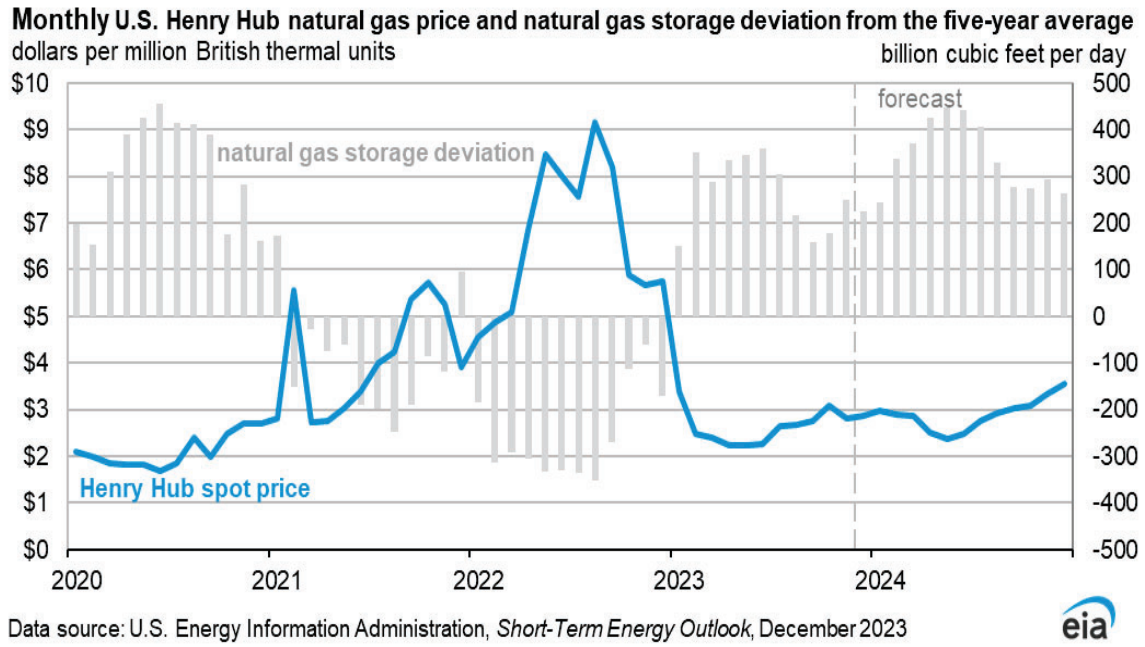
The United States will remain a net importer of crude oil next year, averaging about 2.2 million barrels per day (b/d). However, net crude oil imports will decline slightly from 2023. Growing U.S. crude oil production continues to support increased crude oil exports, which averaged more than 4.0 million b/d in 2023 through September. Although some U.S. refiners have added capacity to process additional light and sweet crude oil, such as the ExxonMobil Beaumont expansion, demand for U.S.-produced crude oil increasingly comes from refiners in Europe and Asia. Growth in refinery processing from overseas refiners means the growth in U.S. crude oil production in 2024 will mostly be exported, increasing net U.S. petroleum exports.

Natural Gas

Natural gas prices

We forecast the U.S. benchmark Henry Hub spot price to average about $2.80 per million British thermal units (MMBtu) for the rest of the winter heating season which ends in March. We lowered our forecast for natural gas prices this winter by more than 60 cents compared with our November STEO forecast. The lower price forecast is due to recent increases in natural gas production, which reduced natural gas prices in November, and high natural gas storage inventory levels.

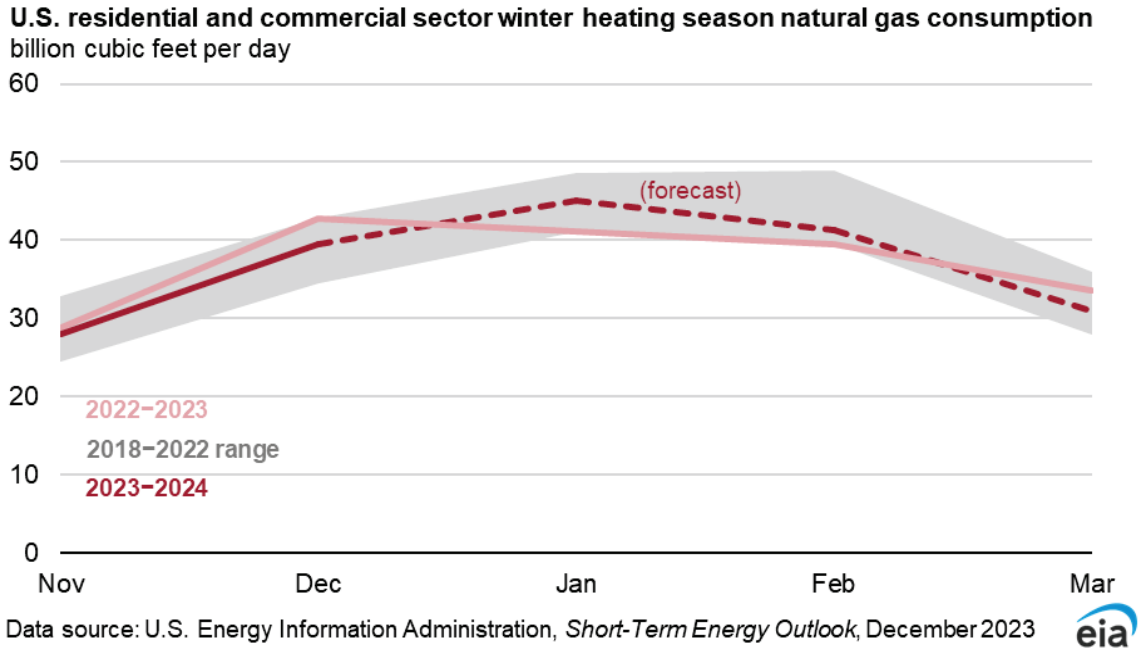
The Henry Hub spot price averaged $2.71/MMBtu in November, down 27 cents from October. Increased U.S. natural gas production in October and November 2023 contributed to the natural gas price decline in November. U.S. dry natural gas production averaged about 105 billion cubic feet per day (Bcf/d) in November, the most for any month on record. U.S. dry natural gas production averaged almost 103 Bcf/d in 1H23 and has increased in most months during 2H23. We forecast dry natural gas production to remain close to 105 Bcf/d for the rest of winter.



Increased natural gas production throughout all of 2023 contributed to more natural gas in U.S. storage to start the winter heating season. High inventories at the end of November reduced our forecast natural gas prices for this winter heating season compared with our November STEO. Storage inventories started the winter heating season at more than 3,800 billion cubic feet (Bcf), 5% more than the five-year (2018–2022) average. Mild winter weather in the United States in November reduced natural gas consumption. Less natural gas consumption along with increased natural gas production help increase storage inventories to 3,771 Bcf at the end of November, 7% more than the five-year average. We forecast natural gas storage inventories to remain above the five-year average throughout winter and for all of 2024.

Natural gas consumption

We forecast U.S. natural gas consumption in the residential and commercial sectors to average almost 40 Bcf/d for the rest of the winter heating season, 2% less than the five-year average. Our forecast of close-to-average residential and commercial sector consumption is based mostly on our winter weather forecast. For the rest of the winter heating season, we forecast close-to-normal weather with 44 fewer heating degree days (HHDs) than the five-year average. If temperatures are colder-than-forecast, the residential and commercial sectors will likely consume more natural gas than our forecast. Extreme winter weather events or prolonged cold temperatures have the potential to cause more significant disruptions to markets.



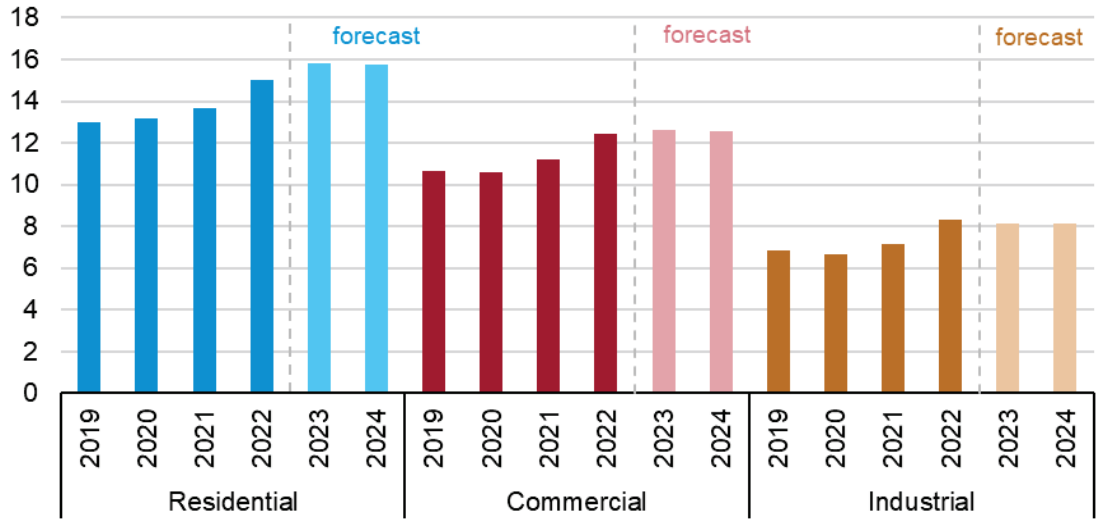
Electricity, Coal, and Renewables

Electricity prices

Wholesale power prices have fallen in recent months, suggesting lower costs, a notion that is consistent with natural gas prices that are lower than the same time last year. For example, the wholesale electricity price in the PJM (Mid-Atlantic) region averaged $39 per megawatthour during the first 10 months of 2023, less than half the average price last year. However, power prices are likely to rise as winter weather arrives. We assume a colder January 2024 than in 2023, with 26% more heating degree days in the Mid-Atlantic region, will increase the region's wholesale electricity price about 5% higher than in January last year.

Average retail electricity prices charged to ultimate customers tend to be less volatile than wholesale power prices. We forecast the price of electricity to U.S. residential customers in 2024 will average 15.8 cents per kilowatthour (kWh), about the same as in 2023, as reduced generation costs are offset by increases in distribution and transmission costs. Lower wholesale electricity prices earlier this year will likely slow future growth in retail electricity prices through 2024. Our forecast retail electricity prices in the commercial and industrial sector for 2024 are likewise relatively unchanged from this year.

U.S. average annual electricity price to ultimate customers, by sector
cents per kilowatthour

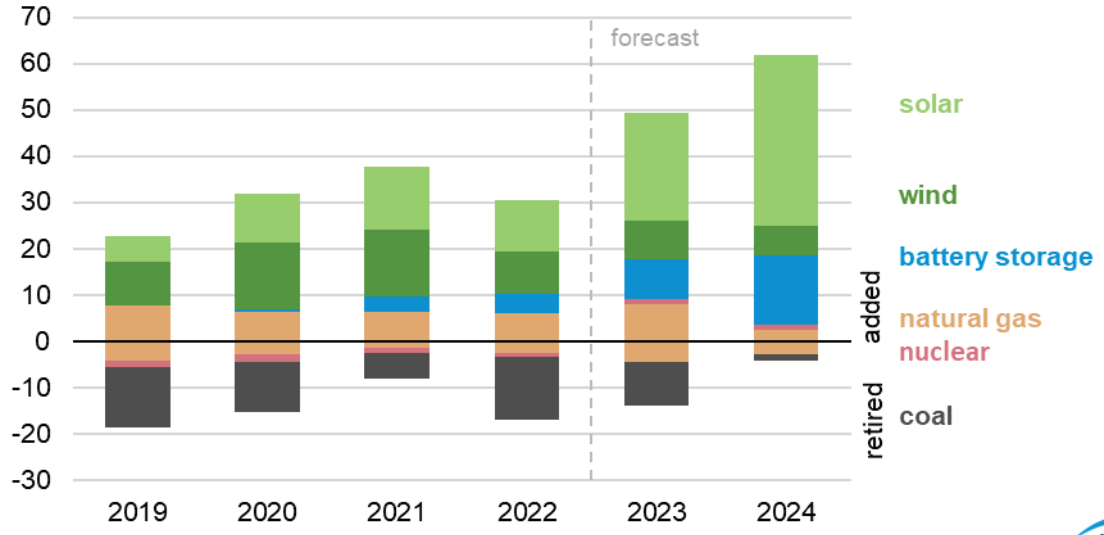


Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2023

Electricity generation

Investment in solar photovoltaic (PV) generating capacity contributes to solar being the fastest growing source of U.S. electric power generation. We expect 23 gigawatts of new solar generating will come online in 2023 (a 33% increase from 2022) and 37 GW will come online in 2024 (up 39% from 2023). This new solar generating capacity is accompanied by 9 GW of new U.S. battery storage capacity in 2023, doubling the total amount compared with what was operating at the end of 2022.

Annual change in U.S. electric power sector generating capacity by source
gigawatts

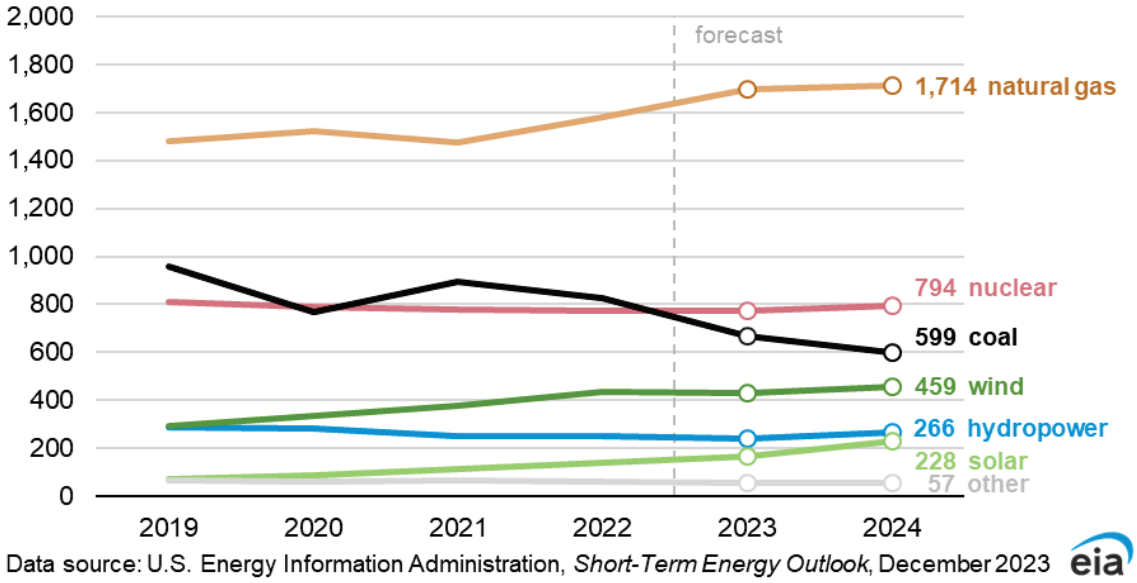


Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2023

The large increase in solar capacity will likely slow growth in electricity generation from natural gas-fired power plants, which had been the largest source of growth in recent years. After growing 7% this year from last year, we forecast U.S. natural gas generation in 2024 to grow 1% from 2023, reaching about 1,714 billion kilowatthours (kWh).

Generation from coal-fired power plants has the sharpest decline in the forecast as a result of growing renewable energy sources, low natural gas prices, and continuing retirements of coal-fired power plants. We forecast that coal-fired power plants will generate less in 2024 (599 billion kwh) than the combined generation from solar and wind (688 billion kWh) for the first time on record.

U.S. annual electric power sector generation by energy source
billion kilowatthours

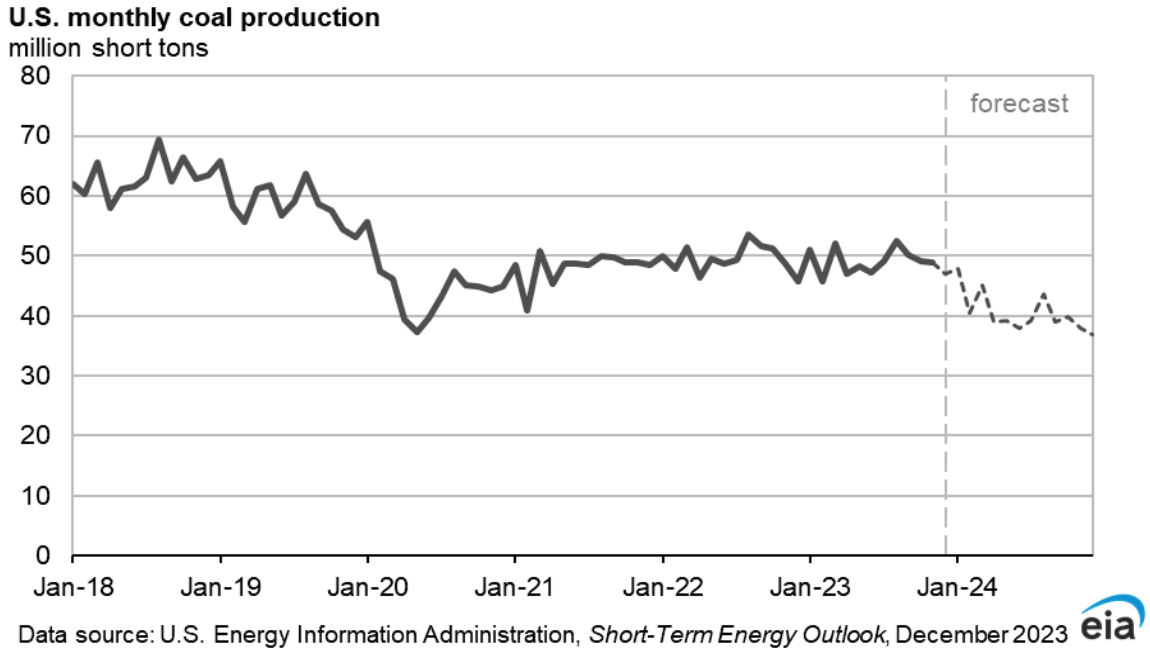


Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2023

Coal markets

We forecast U.S. coal production to fall to 486 MMst in 2024, down more than 100 MMst from 2023 and the least annual U.S. coal production since the early 1960s. The sharp decline in U.S. coal production corresponds with a 10% drop in consumption and a 12% increase in stocks. Exports offset declining domestic consumption in our forecast, increasing 17% in 2023, but falling 7% in 2024, mainly due to a 15% reduction in steam coal exports.

In our forecast, the cost of coal for electric power plants gradually falls to $2.41/MMBtu in December 2024 from $2.50 in January 2024 due to persistent weak demand compared to an increase of nearly 40 cents from January to December 2024 ($3.83/MMBtu) for the cost of natural gas for electric power generation. Coal production is becoming even less cost competitive in power markets as more renewable capacity comes online and Inflation Reduction Act policies further bolster zero-carbon generation.



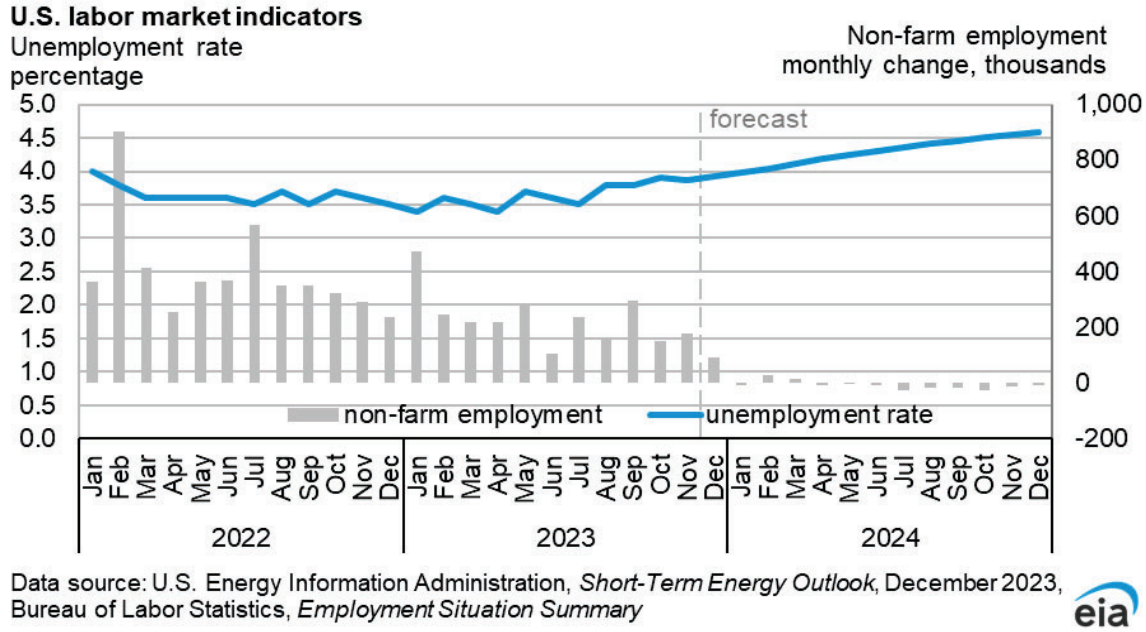
Economy, Weather, and CO_2

U.S. macroeconomics

Our forecast assumes real U.S. GDP grows by 2.4% in 2023 and 1.3% in 2024. We revised both estimates down from last month. We now assume a slightly slower quarterly GDP growth in 4Q23, at an annualized rate of 1.0%. We assume U.S. GDP growth decelerates through 2Q24 before recovering in 2H24. 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.

Additions to non-farm payroll employment totaled 150,000 jobs in October, which was less than the average monthly additions of almost 259,000 per month through the first three quarters of the year, as well as the average for all of 2022 of almost 400,000 per month. Our forecast assumes employment growth will slow further in 2023 and 2024. We expect the unemployment rate to rise to 4.3% by the end of 2024, a 0.4% increase from our November forecast. On December 8, the Bureau of Labor Statistics announced that nonfarm employment additions totaled 199,000 jobs and unemployment fell to 3.7% in November. These results have not yet been incorporated into our STEO forecast because we closed our STEO model runs on December 7.

Our labor market outlook affects our forecast of liquid fuels consumption. More employed workers generally leads to more vehicle miles traveled and, therefore, more gasoline consumption. In addition, the impact of tighter monetary policy and its eventual effect on the labor market is a source of uncertainty in our outlook. Further downward revisions to non-farm employment could lead us to revise our forecast of U.S. liquid fuels consumption lower.



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2023, Bureau of Labor Statistics, *Employment Situation Summary*

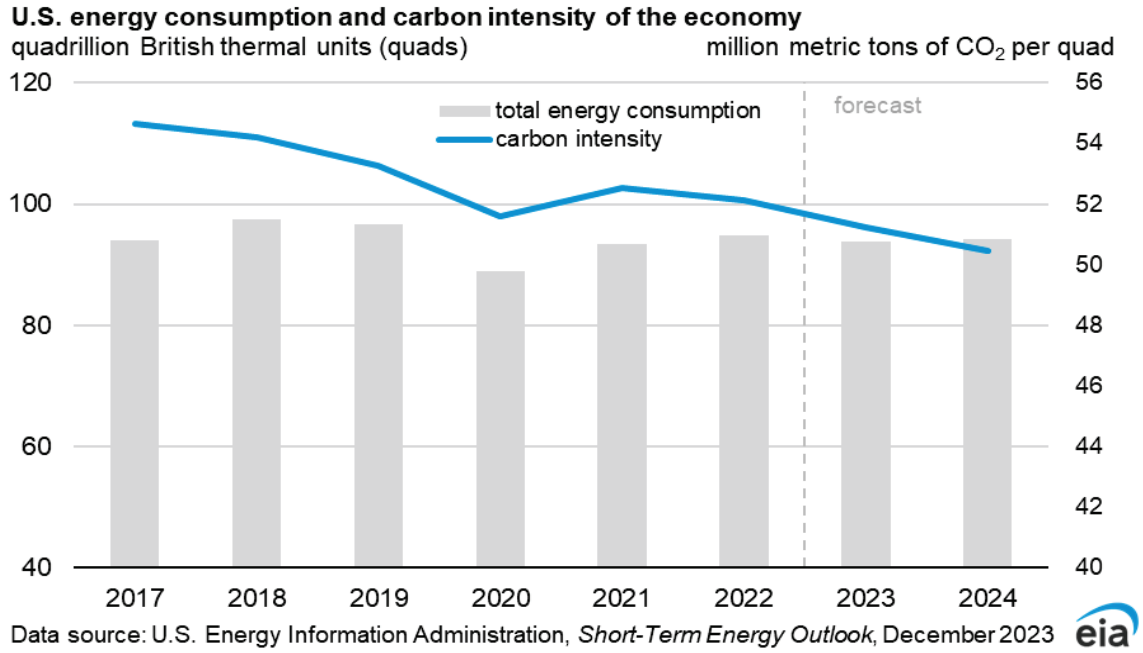
Emissions

U.S. energy-related carbon dioxide (CO_2) emissions decrease in 2023 in our forecast by 3%. Most of this reduction in CO_2 emissions is due to less use of coal, with coal-related CO_2 emissions declining by 18% from 2022. Emissions from petroleum use remain unchanged, and emissions from natural gas increase by 1% in 2023.

We expect total CO_2 emissions to fall by 1% in 2024. The decline is primarily because continued reductions in coal consumption result in a 7% decrease in coal-related emissions. Our forecast of emissions from natural gas and petroleum remain the same as in 2023.

Decreases in U.S. coal consumption in 2023 and 2024 are consistent with the downward trend in recent years. Much of the decline in coal consumption has been offset by increased natural gas consumption and renewable energy as a generation source.

Forecast decreases in coal consumption imply a reduced carbon intensity of the U.S. economy. The carbon intensity of an economy is a metric which indicates the amount of CO_2 emitted to produce a unit of electricity. Coal emits the most CO_2 per unit of energy consumed of any fossil fuel. When coal consumption decreases, so do coal-related emissions and overall carbon intensity. These reductions are most pronounced when the energy provided by coal is substituted with a non-emitting energy source, like solar or wind power, or displaced by greater energy efficiency. However, these reductions also occur to a lesser extent if the energy from coal is replaced with other fossil fuels, such as natural gas, which emit less CO_2 when combusted than coal per unit of energy consumed.



Weather

Our forecast assumes a slightly warmer December in the United States than last year. We expect an average of 725 HDDs in December, 7% fewer HDDs than in December 2022. The United States will average 3,900 HDDs in 2023, down 8% from 2022. We expect an average of around 3,230 HDDs in the United States this winter, about the same as last winter and 4% fewer than the previous 10-winter average.

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

U.S. Energy Information Administration | Short-Term Energy Outlook - December 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	**31.75**	**32.00**	**32.59**	**33.03**	**33.48**	**33.76**	**34.57**	*35.17*	*34.83*	*34.43*	*34.59*	*35.18*	**32.35**	*34.25*	*34.76*
U.S. (50 States)	**19.57**	**20.24**	**20.65**	**20.72**	**21.05**	**21.69**	**22.25**	*22.44*	*22.04*	*22.11*	*22.18*	*22.34*	**20.30**	*21.86*	*22.17*
Canada	**5.66**	**5.51**	**5.72**	**5.91**	**5.79**	**5.44**	**5.80**	*6.00*	*5.99*	*5.65*	*5.84*	*6.06*	**5.70**	*5.76*	*5.89*
Mexico	**1.91**	**1.89**	**1.90**	**1.90**	**2.07**	**2.16**	**2.11**	*2.10*	*2.09*	*2.06*	*2.04*	*2.01*	**1.90**	*2.11*	*2.05*
Other OECD	**4.61**	**4.35**	**4.32**	**4.49**	**4.56**	**4.47**	**4.41**	*4.63*	*4.70*	*4.61*	*4.52*	*4.77*	**4.44**	*4.52*	*4.65*
Non-OECD	**67.21**	**66.86**	**68.30**	**68.17**	**67.63**	**67.70**	**67.09**	*67.07*	*66.37*	*67.64*	*68.12*	*67.61*	**67.64**	*67.37*	*67.44*
OPEC	**33.75**	**33.76**	**34.71**	**34.43**	**33.95**	**33.69**	**32.85**	*33.10*	*32.60*	*33.21*	*33.39*	*33.24*	**34.17**	*33.39*	*33.11*
Crude Oil Portion	**28.19**	**28.33**	**29.23**	**28.92**	**28.46**	**28.38**	**27.50**	*27.72*	*27.11*	*27.85*	*28.01*	*27.82*	**28.67**	*28.01*	*27.70*
Other Liquids (b)	**5.56**	**5.43**	**5.48**	**5.52**	**5.49**	**5.31**	**5.35**	*5.39*	*5.49*	*5.35*	*5.38*	*5.42*	**5.50**	*5.38*	*5.41*
Eurasia	**14.39**	**13.39**	**13.59**	**14.01**	**14.11**	**13.67**	**13.45**	*13.54*	*13.63*	*13.62*	*13.60*	*13.67*	**13.84**	*13.69*	*13.63*
China	**5.18**	**5.18**	**5.05**	**5.09**	**5.32**	**5.32**	**5.19**	*5.27*	*5.27*	*5.30*	*5.29*	*5.33*	**5.12**	*5.27*	*5.30*
Other Non-OECD	**13.90**	**14.53**	**14.94**	**14.65**	**14.26**	**15.02**	**15.60**	*15.15*	*14.87*	*15.52*	*15.85*	*15.37*	**14.51**	*15.01*	*15.40*
Total World Production	**98.96**	**98.86**	**100.88**	**101.20**	**101.11**	**101.46**	**101.65**	*102.24*	*101.20*	*102.07*	*102.71*	*102.79*	**99.99**	*101.62*	*102.19*
Non-OPEC Production	**65.22**	**65.10**	**66.18**	**66.76**	**67.16**	**67.77**	**68.80**	*69.13*	*68.60*	*68.86*	*69.31*	*69.55*	**65.82**	*68.22*	*69.08*
Consumption (million barrels per day) (c)															
OECD	**45.63**	**45.11**	**46.22**	**45.68**	**45.28**	**45.71**	**46.23**	*46.32*	*45.95*	*45.49*	*46.15*	*46.21*	**45.66**	*45.89*	*45.95*
U.S. (50 States)	**20.09**	**20.00**	**20.11**	**19.85**	**19.66**	**20.38**	**20.37**	*20.15*	*20.27*	*20.46*	*20.49*	*20.35*	**20.01**	*20.14*	*20.39*
U.S. Territories	**0.11**	**0.12**	**0.13**	**0.12**	**0.12**	**0.12**	**0.12**	*0.12*	*0.11*	*0.11*	*0.11*	*0.11*	**0.12**	*0.12*	*0.11*
Canada	**2.24**	**2.21**	**2.38**	**2.35**	**2.33**	**2.47**	**2.59**	*2.34*	*2.36*	*2.31*	*2.41*	*2.39*	**2.29**	*2.43*	*2.37*
Europe	**13.19**	**13.43**	**14.04**	**13.37**	**13.10**	**13.54**	**13.72**	*13.65*	*13.17*	*13.33*	*13.73*	*13.50*	**13.51**	*13.50*	*13.43*
Japan	**3.70**	**3.03**	**3.19**	**3.57**	**3.73**	**3.10**	**3.12**	*3.49*	*3.59*	*2.98*	*3.08*	*3.41*	**3.37**	*3.36*	*3.27*
Other OECD	**6.30**	**6.33**	**6.37**	**6.43**	**6.34**	**6.10**	**6.32**	*6.57*	*6.44*	*6.30*	*6.32*	*6.45*	**6.36**	*6.33*	*6.38*
Non-OECD	**52.82**	**53.48**	**53.80**	**53.86**	**54.67**	**55.19**	**55.27**	*55.30*	*56.05*	*56.55*	*56.50*	*56.46*	**53.49**	*55.11*	*56.39*
Eurasia	**4.28**	**4.43**	**4.73**	**4.65**	**4.32**	**4.47**	**4.79**	*4.70*	*4.47*	*4.62*	*4.94*	*4.85*	**4.53**	*4.57*	*4.72*
Europe	**0.74**	**0.76**	**0.76**	**0.77**	**0.74**	**0.76**	**0.76**	*0.77*	*0.75*	*0.76*	*0.77*	*0.77*	**0.76**	*0.76*	*0.76*
China	**15.12**	**15.10**	**15.09**	**15.28**	**15.90**	**16.09**	**15.78**	*15.99*	*16.23*	*16.42*	*16.10*	*16.31*	**15.15**	*15.94*	*16.27*
Other Asia	**13.74**	**13.74**	**13.35**	**13.84**	**14.36**	**14.24**	**13.71**	*14.08*	*14.83*	*14.81*	*14.20*	*14.52*	**13.67**	*14.10*	*14.59*
Other Non-OECD	**18.95**	**19.45**	**19.86**	**19.32**	**19.34**	**19.62**	**20.22**	*19.76*	*19.77*	*19.94*	*20.49*	*20.01*	**19.39**	*19.74*	*20.05*
Total World Consumption	**98.45**	**98.59**	**100.01**	**99.53**	**99.95**	**100.90**	**101.49**	*101.62*	*102.00*	*102.04*	*102.65*	*102.67*	**99.15**	*101.00*	*102.34*
Total Crude Oil and Other Liquids Inventory Net Withdrawals (million barrels per day)															
U.S. (50 States)	**0.80**	**0.51**	**0.45**	**0.41**	**-0.08**	**-0.11**	**-0.25**	*0.37*	*-0.09*	*-0.32*	*0.00*	*0.38*	**0.54**	*-0.02*	*0.00*
Other OECD	**-0.09**	**-0.29**	**-0.48**	**-0.26**	**0.32**	**-0.45**	**0.03**	*-0.32*	*0.28*	*0.09*	*-0.02*	*-0.16*	**-0.28**	*-0.11*	*0.05*
Other Stock Draws and Balance	**-1.22**	**-0.50**	**-0.85**	**-1.80**	**-1.40**	**0.00**	**0.06**	*-0.67*	*0.61*	*0.20*	*-0.04*	*-0.35*	**-1.09**	*-0.50*	*0.10*
Total Stock Draw	**-0.51**	**-0.28**	**-0.87**	**-1.66**	**-1.16**	**-0.56**	**-0.16**	*-0.62*	*0.80*	*-0.03*	*-0.06*	*-0.12*	**-0.83**	*-0.62*	*0.15*
End-of-period Commercial Crude Oil and Other Liquids Inventories (million barrels)															
U.S. Commercial Inventory	**1,154**	**1,180**	**1,216**	**1,223**	**1,231**	**1,264**	**1,283**	*1,246*	*1,247*	*1,276*	*1,276*	*1,241*	**1,223**	*1,246*	*1,241*
OECD Commercial Inventory	**2,604**	**2,657**	**2,736**	**2,767**	**2,746**	**2,821**	**2,837**	*2,829*	*2,805*	*2,826*	*2,827*	*2,807*	**2,767**	*2,829*	*2,807*

(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, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkiye, United Kingdom, and United States.

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

Notes: EIA completed modeling and analysis for this report on December 7, 2023.

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* (https://www.eia.gov/international/data/world).

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 - December 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)	**11.52**	**11.77**	**12.05**	**12.30**	**12.63**	**12.75**	**13.06**	*13.26*	*13.09*	*13.07*	*13.07*	*13.23*	**11.91**	*12.93*	*13.11*
Alaska	**0.45**	**0.44**	**0.42**	**0.44**	**0.44**	**0.43**	**0.40**	*0.43*	*0.43*	*0.41*	*0.39*	*0.41*	**0.44**	*0.43*	*0.41*
Federal Gulf of Mexico (b)	**1.66**	**1.70**	**1.77**	**1.79**	**1.87**	**1.77**	**1.94**	*1.99*	*1.96*	*1.93*	*1.88*	*1.92*	**1.73**	*1.89*	*1.92*
Lower 48 States (excl GOM)	**9.42**	**9.63**	**9.85**	**10.06**	**10.31**	**10.55**	**10.71**	*10.84*	*10.71*	*10.73*	*10.80*	*10.90*	**9.74**	*10.61*	*10.78*
Transfers to Crude Oil Supply	**0.41**	**0.37**	**0.42**	**0.48**	**0.39**	**0.51**	**0.70**	*0.66*	*0.52*	*0.55*	*0.58*	*0.57*	**0.42**	*0.57*	*0.56*
Crude Oil Net Imports (c)	**3.06**	**2.81**	**2.75**	**2.20**	**2.27**	**2.51**	**2.61**	*1.76*	*2.04*	*2.44*	*2.44*	*1.77*	**2.71**	*2.29*	*2.17*
SPR Net Withdrawals	**0.31**	**0.80**	**0.84**	**0.48**	**0.01**	**0.26**	**-0.04**	*-0.04*	*-0.07*	*0.00*	*0.00*	*0.00*	**0.61**	*0.05*	*-0.02*
Commercial Inventory Net Withdrawals	**0.08**	**-0.04**	**-0.12**	**-0.01**	**-0.39**	**0.12**	**0.41**	*-0.19*	*-0.26*	*0.11*	*0.18*	*-0.08*	**-0.02**	*-0.01*	*-0.01*
Crude Oil Adjustment (d)	**0.20**	**0.45**	**0.38**	**0.41**	**0.34**	**0.00**	**-0.21**	*0.23*	*0.21*	*0.18*	*0.15*	*0.17*	**0.36**	*0.09*	*0.18*
Total Crude Oil Input to Refineries	**15.58**	**16.15**	**16.31**	**15.86**	**15.25**	**16.15**	**16.51**	*15.68*	*15.52*	*16.36*	*16.42*	*15.65*	**15.98**	*15.90*	*15.99*
Other Supply															
Refinery Processing Gain	**0.97**	**1.08**	**1.06**	**1.01**	**0.97**	**1.01**	**1.07**	*1.02*	*0.98*	*1.01*	*1.02*	*1.00*	**1.03**	*1.02*	*1.00*
Natural Gas Plant Liquids Production	**5.66**	**5.96**	**6.13**	**5.97**	**6.01**	**6.42**	**6.58**	*6.60*	*6.44*	*6.46*	*6.53*	*6.54*	**5.93**	*6.41*	*6.49*
Renewables and Oxygenate Production (e)	**1.20**	**1.20**	**1.18**	**1.23**	**1.24**	**1.29**	**1.31**	*1.34*	*1.33*	*1.35*	*1.35*	*1.36*	**1.20**	*1.30*	*1.35*
Fuel Ethanol Production	**1.02**	**1.01**	**0.97**	**1.01**	**1.00**	**1.00**	**1.02**	*1.03*	*1.01*	*1.00*	*1.00*	*1.01*	**1.00**	*1.01*	*1.00*
Petroleum Products Adjustment (f)	**0.22**	**0.23**	**0.22**	**0.22**	**0.20**	**0.22**	**0.23**	*0.22*	*0.21*	*0.22*	*0.22*	*0.22*	**0.22**	*0.22*	*0.22*
Petroleum Products Transfers to Crude Oil Supply	**-0.41**	**-0.37**	**-0.42**	**-0.48**	**-0.39**	**-0.51**	**-0.70**	*-0.66*	*-0.52*	*-0.55*	*-0.58*	*-0.57*	**-0.42**	*-0.57*	*-0.56*
Product Net Imports (c)	**-3.54**	**-4.02**	**-4.12**	**-3.90**	**-3.91**	**-3.71**	**-4.03**	*-4.64*	*-3.93*	*-3.95*	*-4.28*	*-4.32*	**-3.90**	*-4.08*	*-4.12*
Hydrocarbon Gas Liquids	**-2.07**	**-2.36**	**-2.25**	**-2.26**	**-2.47**	**-2.39**	**-2.42**	*-2.73*	*-2.58*	*-2.50*	*-2.50*	*-2.50*	**-2.24**	*-2.50*	*-2.52*
Unfinished Oils	**0.17**	**0.29**	**0.29**	**0.30**	**0.28**	**0.27**	**0.22**	*0.30*	*0.34*	*0.41*	*0.46*	*0.36*	**0.26**	*0.26*	*0.39*
Other HC/Oxygenates	**-0.07**	**-0.10**	**-0.06**	**-0.02**	**-0.05**	**-0.07**	**-0.04**	*-0.06*	*-0.06*	*-0.05*	*-0.04*	*-0.04*	**-0.06**	*-0.05*	*-0.05*
Motor Gasoline Blend Comp.	**0.38**	**0.60**	**0.48**	**0.40**	**0.45**	**0.67**	**0.57**	*0.37*	*0.47*	*0.66*	*0.51*	*0.40*	**0.46**	*0.52*	*0.51*
Finished Motor Gasoline	**-0.69**	**-0.75**	**-0.79**	**-0.84**	**-0.75**	**-0.58**	**-0.67**	*-0.79*	*-0.74*	*-0.65*	*-0.71*	*-0.86*	**-0.77**	*-0.70*	*-0.74*
Jet Fuel	**-0.03**	**-0.06**	**-0.10**	**-0.03**	**-0.05**	**0.01**	**-0.05**	*-0.07*	*0.01*	*-0.02*	*-0.05*	*0.00*	**-0.06**	*-0.04*	*-0.01*
Distillate Fuel Oil	**-0.74**	**-1.08**	**-1.24**	**-1.00**	**-0.76**	**-0.97**	**-1.01**	*-0.98*	*-0.70*	*-1.07*	*-1.16*	*-0.95*	**-1.02**	*-0.93*	*-0.97*
Residual Fuel Oil	**0.09**	**0.08**	**0.10**	**0.09**	**0.01**	**-0.04**	**-0.03**	*0.00*	*0.01*	*0.01*	*-0.05*	*0.03*	**0.09**	*-0.01*	*0.00*
Other Oils (g)	**-0.58**	**-0.64**	**-0.53**	**-0.54**	**-0.58**	**-0.61**	**-0.59**	*-0.68*	*-0.68*	*-0.75*	*-0.73*	*-0.76*	**-0.57**	*-0.62*	*-0.73*
Product Inventory Net Withdrawals	**0.42**	**-0.25**	**-0.26**	**-0.06**	**0.30**	**-0.49**	**-0.61**	*0.60*	*0.25*	*-0.44*	*-0.18*	*0.46*	**-0.04**	*-0.05*	*0.03*
Total Supply	**20.09**	**20.00**	**20.11**	**19.85**	**19.67**	**20.38**	**20.37**	*20.15*	*20.27*	*20.46*	*20.49*	*20.35*	**20.01**	*20.15*	*20.39*
Consumption (million barrels per day)															
Hydrocarbon Gas Liquids	**3.77**	**3.18**	**3.17**	**3.32**	**3.40**	**3.36**	**3.25**	*3.59*	*3.76*	*3.38*	*3.39*	*3.74*	**3.36**	*3.40*	*3.57*
Other HC/Oxygenates	**0.14**	**0.17**	**0.17**	**0.19**	**0.22**	**0.28**	**0.28**	*0.24*	*0.26*	*0.29*	*0.29*	*0.30*	**0.17**	*0.26*	*0.28*
Unfinished Oils	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	**0.00**	*0.00*	*0.00*
Motor Gasoline	**8.57**	**9.00**	**8.93**	**8.74**	**8.67**	**9.13**	**9.05**	*8.76*	*8.66*	*9.07*	*9.03*	*8.69*	**8.81**	*8.90*	*8.86*
Fuel Ethanol blended into Motor Gasoline	**0.88**	**0.93**	**0.92**	**0.93**	**0.90**	**0.94**	**0.94**	*0.94*	*0.90*	*0.94*	*0.94*	*0.93*	**0.91**	*0.93*	*0.93*
Jet Fuel	**1.45**	**1.61**	**1.60**	**1.58**	**1.55**	**1.67**	**1.72**	*1.66*	*1.67*	*1.75*	*1.78*	*1.74*	**1.56**	*1.65*	*1.73*
Distillate Fuel Oil	**4.22**	**3.97**	**3.91**	**4.00**	**4.01**	**3.93**	**3.90**	*3.93*	*4.12*	*3.98*	*3.89*	*3.99*	**4.03**	*3.94*	*4.00*
Residual Fuel Oil	**0.33**	**0.30**	**0.38**	**0.30**	**0.29**	**0.22**	**0.27**	*0.29*	*0.24*	*0.22*	*0.21*	*0.24*	**0.33**	*0.27*	*0.23*
Other Oils (g)	**1.61**	**1.78**	**1.94**	**1.70**	**1.53**	**1.79**	**1.89**	*1.69*	*1.56*	*1.78*	*1.90*	*1.63*	**1.76**	*1.73*	*1.72*
Total Consumption	**20.09**	**20.00**	**20.11**	**19.85**	**19.66**	**20.38**	**20.37**	*20.15*	*20.27*	*20.46*	*20.49*	*20.35*	**20.01**	*20.14*	*20.39*
Total Petroleum and Other Liquids Net Imports	**-0.48**	**-1.21**	**-1.37**	**-1.69**	**-1.64**	**-1.20**	**-1.42**	*-2.88*	*-1.90*	*-1.51*	*-1.85*	*-2.55*	**-1.19**	*-1.79*	*-1.95*
End-of-period Inventories (million barrels)															
Commercial Inventory															
Crude Oil (excluding SPR)	**414.2**	**417.8**	**429.0**	**430.1**	**465.4**	**454.7**	**417.5**	*434.9*	*459.0*	*448.6*	*431.8*	*439.1*	**430.1**	*434.9*	*439.1*
Hydrocarbon Gas Liquids	**142.1**	**186.7**	**243.7**	**211.1**	**174.3**	**225.4**	**279.1**	*230.9*	*190.4*	*236.5*	*275.5*	*230.1*	**211.1**	*230.9*	*230.1*
Unfinished Oils	**88.1**	**88.9**	**82.3**	**86.4**	**88.6**	**87.0**	**88.3**	*80.8*	*90.9*	*88.0*	*86.9*	*79.1*	**86.4**	*80.8*	*79.1*
Other HC/Oxygenates	**34.4**	**29.7**	**27.3**	**31.6**	**34.3**	**30.1**	**30.3**	*30.2*	*32.3*	*31.1*	*30.8*	*31.1*	**31.6**	*30.2*	*31.1*
Total Motor Gasoline	**238.5**	**221.0**	**209.5**	**224.4**	**225.3**	**223.2**	**227.6**	*235.5*	*234.0*	*231.8*	*220.4*	*232.1*	**224.4**	*235.5*	*232.1*
Finished Motor Gasoline	**17.3**	**17.1**	**17.6**	**17.2**	**14.7**	**17.6**	**15.3**	*18.7*	*15.9*	*16.7*	*18.4*	*19.6*	**17.2**	*18.7*	*19.6*
Motor Gasoline Blend Comp.	**221.2**	**203.9**	**191.9**	**207.2**	**210.6**	**205.6**	**212.3**	*216.8*	*218.1*	*215.1*	*202.1*	*212.5*	**207.2**	*216.8*	*212.5*
Jet Fuel	**35.6**	**39.4**	**36.5**	**35.0**	**37.7**	**42.7**	**43.5**	*36.5*	*37.2*	*36.8*	*37.2*	*33.3*	**35.0**	*36.5*	*33.3*
Distillate Fuel Oil	**114.7**	**111.3**	**110.5**	**118.9**	**112.3**	**112.6**	**119.2**	*120.2*	*115.8*	*118.2*	*119.0*	*120.4*	**118.9**	*120.2*	*120.4*
Residual Fuel Oil	**28.1**	**29.3**	**27.4**	**30.7**	**29.6**	**30.4**	**27.5**	*25.2*	*26.6*	*26.7*	*25.1*	*24.7*	**30.7**	*25.2*	*24.7*
Other Oils (g)	**58.6**	**56.3**	**49.3**	**54.3**	**63.3**	**58.3**	**50.5**	*51.8*	*60.9*	*58.7*	*49.4*	*50.7*	**54.3**	*51.8*	*50.7*
Total Commercial Inventory	**1154.2**	**1180.4**	**1215.6**	**1222.6**	**1230.8**	**1264.4**	**1283.4**	*1246.1*	*1247.0*	*1276.4*	*1276.0*	*1240.7*	**1222.6**	*1246.1*	*1240.7*
Crude Oil in SPR	**566.1**	**493.3**	**416.4**	**372.0**	**371.2**	**347.2**	**351.3**	*354.9*	*361.8*	*361.8*	*361.8*	*361.8*	**372.0**	*354.9*	*361.8*

(a) Includes lease condensate.

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

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

(d) Crude oil adjustment equals the sum of disposition items (e.g. refinery inputs) minus the sum of supply items (e.g. production).

(e) Renewables and oxygenate production includes pentanes plus, oxygenates (excluding fuel ethanol), and renewable fuels. Beginning in January 2021, renewable fuels includes biodiesel, renewable diesel, renewable jet fuel, renewable heating oil, renewable naphtha and gasoline, and other renewable fuels. For December 2020 and prior, renewable fuels includes only biodiesel.

(f) Petroleum products adjustment includes hydrogen/oxygenates/renewables/other hydrocarbons, motor gasoline blending components, and finished motor gasoline.

(g) "Other Oils" includes aviation gasoline blend components, finished aviation gasoline, kerosene, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas, and miscellaneous products.

- = no data available

SPR: Strategic Petroleum Reserve

HC: Hydrocarbons

Notes: EIA completed modeling and analysis for this report on December 7, 2023.

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: *Petroleum Supply Monthly* , DOE/EIA-0109; *Petroleum Supply Annual* , DOE/EIA-0340/2; and *Weekly Petroleum Status Report* , DOE/EIA-0208.

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

Forecasts: EIA Short-Term Integrated Forecasting System.

Table 5a. U.S. Natural Gas Supply, Consumption, and Inventories

U.S. Energy Information Administration | Short-Term Energy Outlook - December 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	**104.80**	**107.29**	**109.76**	**110.16**	**111.18**	**112.50**	**113.52**	*114.78*	*114.46*	*114.47*	*114.29*	*114.93*	**108.02**	*113.01*	*114.54*
Alaska	**1.06**	**1.00**	**0.96**	**1.07**	**1.08**	**1.01**	**0.91**	*1.03*	*1.03*	*0.95*	*0.88*	*1.00*	**1.02**	*1.01*	*0.96*
Federal GOM (a)	**2.06**	**2.10**	**2.16**	**2.12**	**2.13**	**1.89**	**2.02**	*2.12*	*2.06*	*2.01*	*1.93*	*1.96*	**2.11**	*2.04*	*1.99*
Lower 48 States (excl GOM)	**101.69**	**104.19**	**106.64**	**106.97**	**107.97**	**109.60**	**110.59**	*111.64*	*111.37*	*111.51*	*111.48*	*111.98*	**104.89**	*109.96*	*111.59*
Total Dry Gas Production	**96.63**	**98.92**	**101.20**	**101.57**	**102.27**	**103.19**	**104.03**	*105.15*	*104.84*	*104.85*	*104.68*	*105.27*	**99.60**	*103.67*	*104.91*
LNG Gross Imports	**0.15**	**0.01**	**0.07**	**0.05**	**0.09**	**0.02**	**0.02**	*0.06*	*0.10*	*0.04*	*0.04*	*0.06*	**0.07**	*0.05*	*0.06*
LNG Gross Exports	**11.50**	**10.80**	**9.74**	**10.35**	**11.45**	**11.76**	**11.40**	*12.62*	*12.51*	*11.64*	*11.82*	*13.47*	**10.59**	*11.81*	*12.36*
Pipeline Gross Imports	**8.89**	**7.73**	**7.84**	**8.41**	**8.45**	**7.32**	**7.94**	*7.71*	*8.38*	*7.02*	*7.26*	*7.50*	**8.22**	*7.85*	*7.54*
Pipeline Gross Exports	**8.46**	**8.52**	**8.13**	**8.19**	**8.93**	**8.75**	**9.19**	*9.36*	*9.54*	*8.90*	*9.22*	*9.64*	**8.32**	*9.06*	*9.32*
Supplemental Gaseous Fuels	**0.19**	**0.20**	**0.20**	**0.20**	**0.22**	**0.17**	**0.16**	*0.19*	*0.19*	*0.19*	*0.19*	*0.19*	**0.20**	*0.18*	*0.19*
Net Inventory Withdrawals	**20.63**	**-10.60**	**-9.20**	**2.54**	**11.97**	**-11.69**	**-6.41**	*2.06*	*14.04*	*-12.09*	*-6.44*	*2.80*	**0.77**	*-1.06*	*-0.43*
Total Supply	**106.53**	**76.95**	**82.24**	**94.24**	**102.62**	**78.49**	**85.15**	*93.19*	*105.50*	*79.47*	*84.70*	*92.72*	**89.94**	*89.82*	*90.59*
Balancing Item (b)	**-1.72**	**-0.93**	**-1.47**	**-1.78**	**0.29**	**-0.50**	**-1.34**	*0.09*	*-1.28*	*-1.64*	*-0.90*	*-0.07*	**-1.48**	*-0.37*	*-0.97*
Total Primary Supply	**104.81**	**76.03**	**80.76**	**92.46**	**102.91**	**77.99**	**83.81**	*93.28*	*104.22*	*77.83*	*83.79*	*92.64*	**88.46**	*89.46*	*89.62*
Consumption (billion cubic feet per day)															
Residential	**25.97**	**7.80**	**3.56**	**17.28**	**23.50**	**7.29**	**3.57**	*16.11*	*24.37*	*7.30*	*3.84*	*16.20*	**13.60**	*12.57*	*12.91*
Commercial	**15.55**	**6.65**	**4.74**	**11.61**	**14.51**	**6.43**	**4.72**	*11.23*	*14.69*	*6.52*	*5.13*	*11.37*	**9.61**	*9.20*	*9.42*
Industrial	**25.73**	**22.46**	**21.68**	**23.72**	**24.83**	**22.40**	**21.98**	*24.25*	*24.83*	*21.66*	*21.31*	*23.55*	**23.39**	*23.36*	*22.84*
Electric Power (c)	**28.11**	**30.88**	**42.50**	**30.88**	**30.71**	**33.39**	**44.79**	*32.50*	*30.70*	*33.76*	*44.70*	*32.33*	**33.13**	*35.38*	*35.39*
Lease and Plant Fuel	**5.00**	**5.12**	**5.24**	**5.26**	**5.31**	**5.37**	**5.42**	*5.48*	*5.47*	*5.47*	*5.46*	*5.49*	**5.16**	*5.40*	*5.47*
Pipeline and Distribution Use	**3.98**	**2.83**	**3.01**	**3.48**	**3.86**	**2.93**	**3.15**	*3.53*	*3.96*	*2.92*	*3.15*	*3.51*	**3.32**	*3.37*	*3.39*
Vehicle Use	**0.17**	**0.17**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**	*0.18*	*0.20*	*0.20*	*0.20*	*0.20*	**0.17**	*0.18*	*0.20*
Total Consumption	**104.81**	**76.03**	**80.76**	**92.46**	**102.91**	**77.99**	**83.81**	*93.28*	*104.22*	*77.83*	*83.79*	*92.64*	**88.46**	*89.46*	*89.62*
End-of-period Inventories (billion cubic feet)															
Working Gas Inventory	**1,401**	**2,325**	**3,146**	**2,925**	**1,850**	**2,900**	**3,490**	*3,300*	*2,023*	*3,123*	*3,715*	*3,457*	**2,925**	*3,300*	*3,457*
East Region (d)	**242**	**482**	**759**	**698**	**334**	**646**	**853**	*766*	*375*	*680*	*868*	*796*	**698**	*766*	*796*
Midwest Region (d)	**296**	**557**	**917**	**831**	**417**	**701**	**993**	*924*	*455*	*744*	*1,023*	*924*	**831**	*924*	*924*
South Central Region (d)	**587**	**885**	**1,006**	**1,042**	**919**	**1,136**	**1,092**	*1,117*	*846*	*1,207*	*1,240*	*1,213*	**1,042**	*1,117*	*1,213*
Mountain Region (d)	**90**	**137**	**184**	**158**	**79**	**171**	**239**	*207*	*126*	*166*	*227*	*196*	**158**	*207*	*196*
Pacific Region (d)	**165**	**240**	**247**	**167**	**74**	**216**	**278**	*256*	*197*	*299*	*325*	*298*	**167**	*256*	*298*
Alaska	**21**	**25**	**32**	**30**	**27**	**30**	**35**	*31*	*25*	*28*	*33*	*29*	**30**	*31*	*29*

(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 December 7, 2023.

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.

https://www.canada.ca/en/environment-climate-change/news/2023/12/canada-introduces-framework-to-cap-greenhouse-gas-pollution-from-oil-and-gas-sector.html

Canada introduces framework to cap greenhouse gas pollution from oil and gas sector

From: Environment and Climate Change Canada

News release

December 7, 2023 – Ottawa, Ontario

Canadians are making decisions and choices today that will profoundly impact the world we leave to our children and grandchildren. Climate action pays immediate dividends in good jobs and cleaner air and water, but it also opens up more opportunities for the generations that will follow. Every sector of the economy has a part to play in cutting pollution, particularly the oil and gas sector—one of a few where greenhouse gas pollution levels continue to increase.

Today, the Honourable Steven Guilbeault, Minister of Environment and Climate Change, and the Honourable Jonathan Wilkinson, Minister of Energy and Natural Resources, introduced Canada's draft framework to cap pollution from the oil and gas sector to reduce emissions and remain competitive in a shifting global market. No sector of the economy should be allowed to emit unlimited pollution—not when we are all driving toward the same goal of net zero by 2050 to ward off the worst impacts of the climate crisis. The proposed emissions cap sets a limit on pollution, not production.

The proposed Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap was developed following extensive engagement with industry, Indigenous groups, provinces and territories, and stakeholders. It proposes to cap 2030 emissions at 35 to 38 percent below 2019 levels, while providing compliance flexibilities to emit up to a level about 20 to 23 percent below 2019 levels. The greenhouse gas pollution cap puts a limit on the amount that the sector can pollute and will be key to making sure we reduce our emissions as a country, on the road to reaching net zero by 2050.

The greenhouse gas pollution cap will spur reductions over time at a pace and scale needed to ensure the sector achieves net-zero emissions by 2050, which aligns with provincial and industry commitments. This framework comes at a

critical time for Canada, with many Canadians having seen firsthand the impacts of the climate crisis—from floods, heatwaves, and wildfires to economic loss and health impacts.

The greenhouse gas pollution cap has been designed to ensure greenhouse gas emissions from the sector decline, while providing compliance flexibilities to respond to global demand for oil and gas. Facilities will be able to buy a limited amount of carbon offset credits or contribute to a decarbonization fund, which would hold them accountable for a limited volume of emissions above the greenhouse gas pollution cap. These compliance flexibility options will both help reduce emissions—offsets will result in reductions in other sectors, and proceeds from the decarbonization fund will be reinvested to support emissions reductions within the oil and gas sector.

The proposed emissions cap is part of a suite of measures designed to help Canada's important oil and gas sector remain competitive in a global economy that is rapidly moving to net zero, supporting the talented and skilled energy workers of the sector. Alongside the introduction of the draft Regulatory Framework, Minister Wilkinson has released a Roadmap for the Decarbonization of Canada's Oil and Gas Sector that sets out the many measures being taken by the Government of Canada, provinces and territories, and the investment community to build a strong, sustainable energy resource sector that can thrive in the 21st century.

The Government of Canada will continue engaging with industry, Indigenous groups, provinces, territories, and all other stakeholders to get this system right. Written comments in response to the Framework should be submitted by February 5, 2024.

At a time when oil and gas companies are reaching record profits, this emissions cap and the suite of complementary measures will stimulate the kinds of investment needed to create and maintain good-paying jobs. The oil and gas sector has time and again proven its ability to innovate, and today marks another step forward in our shared work to keep our air clean and build a strong, thriving economy that works for everyone.

Quotes

"Every sector of Canada's economy must do its part to combat climate change and build a safe, prosperous, and healthy future for Canadians. All sectors of our economy need to reduce their emissions, and that includes oil and gas companies. The Government of Canada's plan to cap and reduce emissions from

Canada's largest emitting sector is ambitious, but practical. It considers the global demand for oil and gas—and the importance of the sector in Canada's economy—and sets a limit that is strict, but achievable. Canadians have always risen to the challenge of building a brighter future, and this greenhouse gas pollution cap will help Canada compete and succeed in a world that is moving to a clean-energy future."

– The Honourable Steven Guilbeault, Minister of Environment and Climate Change

"Today, we are moving forward on our commitment to introduce an ambitious and achievable pollution cap on oil and gas sector emissions. The pollution cap will ensure Canada's oil and gas sector does its part to reduce emissions and it will enhance the sector's competitiveness in the rapidly decarbonizing global economy. Today's announcement is a key component of our plan to decarbonize Canada's oil and gas sector. A plan which recognizes the direction the global economy is heading. A plan that collaborates with provinces and territories, industry, Indigenous peoples, workers, and international partners. And a plan that protects the planet and enhances the competitiveness of Canada's economy for decades to come."

– The Honourable Jonathan Wilkinson, Minister of Energy and Natural Resources

Quick facts

- According to the most recent *National Inventory Report*, Canada's oil and gas sector accounted for 28 percent of national emissions in 2021, making it the largest contributor to Canada's emissions, followed by the transportation sector at 22 percent.
- Capping the greenhouse gas pollution from the oil and gas sector is one of the key measures outlined in Canada's 2030 Emissions Reduction Plan (ERP), released in March 2022, that is a sector-by-sector roadmap to cut emissions to achieve 40 to 45 percent below our 2005 pollution levels in the most cost-effective way possible, while building a stronger economy for the 21st century.
- Today, the Government of Canada also published the first *Progress Report on the 2030 ERP* to provide an update on progress toward the 2030 target, based on Canada's most recent inventory of historical emissions and recently updated emissions projections. The publication is timely, as Canada participates in the 28th Conference of the Parties to the United

Nations Framework Convention on Climate Change (COP28), where ambitious mitigation action is front and centre.

- The Government of Canada proposes to implement the national cap-and-trade system through regulations to be made under the *Canadian Environmental Protection Act, 1999*. The Government is planning to publish draft regulations by mid-2024.
- Cap-and-trade is a market-based system where the regulator issues a quantity of emissions allowances, and may allow for some compliance flexibilities, that together act as a limit on emissions from covered sources.
- The cap-and-trade system would cover all direct greenhouse gas emissions, while also accounting for indirect emissions related to the production of oil and gas and carbon storage. The greenhouse gases covered would include carbon dioxide, methane, nitrous oxide, and others. Each emission allowance will be equivalent to one tonne of carbon dioxide equivalent emissions (CO2e).
- The greenhouse gas pollution cap would regulate upstream oil and gas facilities, including offshore facilities, and would also apply to liquefied natural gas facilities. These subsectors represent the majority of emissions from the oil and gas sector—the upstream subsector represented 85 percent of sector emissions in 2021. The emissions cap will cover activities such as oil sands, conventional oil production, natural gas production and processing, and production of liquified natural gas.

LNG Piles Up at Sea as Europe Gas Prices Hover Near 3-Month Low
2023-12-14 09:06:13.468 GMT

By Elena Mazneva
(Bloomberg) -- Liquefied natural gas cargoes are piling up at sea as demand stalls in key importer Europe, given milder weather and the upcoming holiday season.
Volumes of the fuel on the water for more than 20 days worldwide jumped this week to the highest seasonal level since at least 2017, data compiled by Bloomberg show. It's now roughly 70% higher than an average over the last six years.
The boost comes after benchmark gas futures in Europe dropped to the lowest in nearly three months earlier this week. Prices fell as much as 2.8% early Thursday, after a brief recovery a day before.
The continent's supply outlook is still healthy, which may "help to keep and hold" the current price level for the foreseeable future, consultancy Auxilione said in a note. Additional pressure is also possible closer to the Christmas and New Year holidays, when overall energy demand normally drops.

LNG buying has generally slipped on lower prices, though a more substantial boost in purchases would lure traders to unload their cargoes.
Read more: Asian LNG Prices Slip to Four-Month Low as Winter Buying Flops
So far, however, most weather models point to unseasonably mild conditions across Europe through the year-end, meaning capped demand for gas in heating. Together with falling gas usage in the continent's power sector and a slow recovery in fuel consumption by industries, that's keeping prices in check.
The market still remains tight after Europe lost most pipeline supplies from its former top provider, Russia, in 2022. That means overall price levels could remain well above the

historical average in 2024, Fitch Ratings said in a report this week.
Dutch front-month gas futures, Europe's benchmark, traded 1% lower at €35.45 a megawatt-hour by 10:04 a.m. in Amsterdam. The UK equivalent contract was also down 1%.
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Trafigura Ramps Up Winter LNG Buying as Asian Prices Decline

LNG Contract and Project Trends 3Q 2023: US Supply Leads

How Traders Made a Fortune Switching Off a Nation's Gas Supply
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Highlights for the month

- Indigenous crude oil and condensate production during November 2023 was 2.4 MMT. OIL registered a production of 0.3 MMT, ONGC registered a production of 1.6 MMT whereas PSC registered production of 0.5 MMT during November 2023. There is a degrowth of 0.4% in crude oil and condensate production during November 2023 as compared to November 2022.
- Total Crude oil processed during November 2023 was 21.7 MMT which is 10.7% higher than November 2022, where PSU/JV refiners processed 15.0 MMT and private refiners processed 6.7 MMT of crude oil. Total indigenous crude oil processed was 2.0 MMT and total Imported crude oil processed was 19.7 by all Indian refineries (PSU+JV+PVT). There was a growth of 3.5 % in total crude oil processed in April November FY 2023 – 24 as compared to same period of FY 2022 – 23.
- Crude oil imports decreased by 2.3% and increased by 0.4% during November 2023 and April-November 2023 respectively as compared to the corresponding period of the previous year. As compared to net import bill for Oil & Gas for November 2022 of $12.3 billion, the net import bill for Oil & Gas for November 2023 was $11.1 billion. Out of which, crude oil imports constitutes $11.5 billion, LNG imports $1.8 billion and the exports were $4.3 billion during November2023.
- The price of Brent Crude averaged $83.18/bbl during November 2023 as against $91.05/bbl during October 2023 and $91.67/bbl during November 2022. The Indian basket crude price averaged $83.46/bbl during November2023 as against $90.08/bbl during October 2023 and $87.55 /bbl during November 2022.
- Production of petroleum products was 22.8 MMT during November 2023 which is 12.4% higher than November 2022. Out of 22.8 MMT, 22.5 MMT was from refinery production & 0.3 MMT was from fractionator. There was a growth of 5.0 % in production of petroleum products in April November FY 2023 – 24 as compared to same period of FY 2022 – 23. Out of total POL production, in November 2023, share of HSD is 43.7 %, MS 15.6 %, Naphtha 6.5 %, ATF 6.2 %, Pet Coke 5.5 %, LPG 4.7% which are of major products and rest are shared by Bitumen, FO/LSHS, LDO, Lubes & others.
- POL products imports increased by 2.6% and 11.5% during November 2023 and April-November 2023 respectively as compared to the corresponding period of the previous year. Increase in POL products imports during April-November 2023 were mainly due to increase in imports of petcoke, fuel oil (FO), and bitumen.

•	Exports of POL products increased by 32.1% and 2.7% during November 2023 and April-November 2023 respectively as compared to the corresponding period of the previous year. Increase in POL products exports during April-November 2023 were mainly due to increase in exports of vacuum gas oil (VGO), motor-spirit (MS) and aviation turbine fuel (ATF).
•	The consumption of petroleum products during April-November 2023, with a volume of 152.3 MMT, reported a growth of 4.9 % compared to the volume of 145.10 MMT during the same period of the previous year. This growth was led by 6.5% growth in MS, 5.4% in HSD & 12.9% in ATF & 12.4% in Naptha consumption besides LPG, Lubes, Bitumen, Petcoke and LDO during the period. The consumption of petroleum products during November 2023 recorded a de-growth of 2% with a volume of 18.7 MMT compared to the same period of the previous year.
•	Ethanol Blending with Petrol during November 2023, the first month of the Ethanol Supply Year(ESY) 2023-24, achieved 10.24% as compared to 12.06 % during the ESY December 2022- October 2023.
•	Total Natural Gas Consumption (including internal consumption) for the month of November 2023 was 5328 MMSCM which was 6.6% higher than the corresponding month of the previous year. The cumulative consumption of 43696 MMSCM for the current financial year till November 2023 was higher by 8.5% compared with the corresponding period of the previous year.
•	Gross production of natural gas for the month of November 2023 (P) was 3041 MMSCM which was higher by 7.1% compared with the corresponding month of the previous year. The cumulative gross production of natural gas of 24081 MMSCM for the current financial year till November 2023 was higher by 5.1% compared with the corresponding period of the previous year.
•	LNG import for the month of November 2023 (P) was 2337 MMSCM which was 5.3% higher than the corresponding month of the previous year. The cumulative import of 20090(P) MMSCM for the current financial year till November 2023 was higher by 12.4% compared with the corresponding period of the previous year.

2. Crude oil, LNG and petroleum products at a glance

	Details	Unit/ Base	2021-22 (P)	2022-23 (P)	November		April-November	
					2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
1	Crude oil production in India[#]	MMT	29.7	29.2	2.4	2.4	19.6	19.6
2	Consumption of petroleum products*	MMT	201.7	223.0	19.1	18.7	145.1	152.3
3	Production of petroleum products	MMT	254.3	266.5	20.3	22.8	172.5	180.9
4	Gross natural gas production	MMSCM	34,024	34,450	2,840	3,041	22,917	24,081
5	Natural gas consumption	MMSCM	64,159	59,969	4,998	5,328	40,254	43,696
6	Imports & exports:							
	Crude oil imports	MMT	212.4	232.7	19.0	18.6	152.6	153.2
		$ Billion	120.7	157.5	12.3	11.5	113.4	87.1
	Petroleum products (POL) imports*	MMT	39.0	44.6	4.0	4.1	28.7	32.0
		$ Billion	23.7	26.9	2.2	2.2	18.4	15.4
	Gross petroleum imports (Crude + POL)	MMT	251.4	277.3	23.0	22.7	181.3	185.2
		$ Billion	144.3	184.4	14.4	13.7	131.8	102.4
	Petroleum products (POL) export	MMT	62.8	61.0	4.3	5.6	39.7	40.8
		$ Billion	44.4	57.3	3.8	4.3	40.5	31.5
	LNG imports*	MMSCM	31,028	26,304	2,219	2,337	17,875	20,090
		$ Billion	13.5	17.1	1.5	1.2	12.6	8.9
	Net oil & gas imports	$ Billion	113.4	144.2	12.2	10.5	103.9	79.7
7	Petroleum imports as percentage of India's gross imports (in value terms)	%	23.6	25.8	25.0	21.0	30.6	26.1
8	Petroleum exports as percentage of India's gross exports (in value terms)	%	10.5	12.7	12.0	12.8	15.4	12.9
9	Import dependency of crude oil (on POL consumption basis)	%	85.5	87.4	89.2	88.5	86.9	87.9

#Includes condensate; *Private direct imports are prorated for the period Sept'23 to Nov'23 for POL. LNG Imports figure from DGCIS are prorated for Oct'23 to November 2023.Total may not tally due to rounding off.

3. Indigenous crude oil production (Million Metric Tonnes)

Details	2021-22	2022-23 (P)	November			April-November		
			2022-23 (P)	2023-24 Target*	2023-24 (P)	2022-23 (P)	2023-24 Target*	2023-24 (P)
ONGC	18.5	18.4	1.5	1.6	1.5	12.4	12.9	12.1
Oil India Limited (OIL)	3.0	3.2	0.3	0.3	0.3	2.1	2.2	2.2
Private / Joint Ventures (JVs)	7.0	6.2	0.5	0.6	0.4	4.2	4.9	3.8
Total Crude Oil	**28.4**	**27.8**	**2.3**	**2.5**	**2.2**	**18.7**	**20.1**	**18.1**
ONGC condensate	0.9	1.0	0.09	0.0	0.09	0.7	0.0	0.7
PSC condensate	0.3	0.31	0.03	0.0	0.1	0.2	0.0	0.7
Total condensate	**1.2**	**1.4**	**0.12**	**0.0**	**0.2**	**0.9**	**0.0**	**1.4**
Total (Crude + Condensate) (MMT)	**29.7**	**29.2**	**2.4**	**2.5**	**2.4**	**19.6**	**20.1**	**19.6**
Total (Crude + Condensate) (Million Bbl/Day)	0.60	0.59	0.59	0.61	0.59	0.59	0.60	0.59

*Provisional targets inclusive of condensate.

4. Domestic and overseas oil & gas production (by Indian Companies)

Details	2021-22	2022-23 (P)	November		April-November	
			2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
Total domestic production (MMTOE)	63.7	63.6	5.2	5.4	42.5	43.6
Overseas production (MMTOE)	21.8	19.5	1.7	1.6	12.9	13.2

Source: ONGC Videsh, GAIL, OIL , IOCL, HPCL & BPRL

5. High Sulphur (HS) & Low Sulphur (LS) crude oil processing (MMT)

	Details	2021-22	2022-23 (P)	November		April-November	
				2022-23 (P)	2023-24 (P)	2022-23 (P)	2023-24 (P)
1	High Sulphur crude	185.0	197.9	15.0	17.4	128.7	133.7
2	Low Sulphur crude	56.7	57.4	4.6	4.3	37.6	38.4
Total crude processed (MMT)		**241.7**	**255.2**	**19.6**	**21.7**	**166.3**	**172.0**
Total crude processed (Million Bbl/Day)		4.85	5.13	4.78	5.29	5.00	5.17
Percentage share of HS crude in total crude oil processing		**76.6%**	**77.5%**	**76.4%**	**80.3%**	**77.4%**	**77.7%**

6. Quantity and value of crude oil imports			
Year	**Quantity (MMT)**	**$ Million**	**Rs. Crore**
2021-22	212.4	1,20,675	9,01,262
2022-23	232.7	1,57,531	12,60,372
April-Nov 2023-24(P)	153.2	87,065	7,19,806

7. Self-sufficiency in petroleum products (Million Metric Tonnes)							
Particulars		**2021-22**	**2022-23 (P)**	**November**		**April-November**	
				2022-23 (P)	**2023-24 (P)**	**2022-23 (P)**	**2023-24 (P)**
1	Indigenous crude oil processing	27.0	26.4	1.9	2.0	17.8	17.6
2	Products from indigenous crude (93.3% of crude oil processed)	25.2	24.7	1.8	1.9	16.6	16.4
3	Products from fractionators (Including LPG and Gas)	4.1	3.5	0.3	0.3	2.4	2.3
4	Total production from indigenous crude & condensate **(2 + 3)**	29.3	28.2	2.1	2.2	19.0	18.7
5	Total domestic consumption	201.7	223.0	19.1	18.7	145.1	152.3
% Self-sufficiency (4 / 5)		**14.5%**	**12.6%**	**10.8%**	**11.5%**	**13.1%**	**12.3%**

8. Refineries: Installed capacity and crude oil processing (MMTPA / MMT)

Sl. no.	Refinery	Installed capacity (01.04.2023) MMTPA	Crude oil processing (MMT)							
			2021-22	2022-23 (P)	November			April-November		
					2022-23 (P)	2023-24 (Target)	2023-24 (P)	2022-23 (P)	2023-24 (Target)	2023-24 (P)
1	Barauni (1964)	6.0	5.6	6.8	0.6	0.6	0.6	4.5	4.2	4.4
2	Koyali (1965)	13.7	13.5	15.6	1.3	1.2	1.3	10.4	9.4	10.1
3	Haldia (1975)	8.0	7.3	8.5	0.7	0.7	0.7	5.7	5.7	5.2
4	Mathura (1982)	8.0	9.1	9.6	0.8	0.8	0.9	6.2	6.4	6.0
5	Panipat (1998)	15.0	14.8	13.8	0.7	1.3	1.3	9.1	9.7	10.0
6	Guwahati (1962)	1.0	0.7	1.1	0.09	0.09	0.03	0.7	0.7	0.6
7	Digboi (1901)	0.65	0.7	0.7	0.06	0.02	0.07	0.5	0.4	0.4
8	Bongaigaon(1979)	2.70	2.6	2.8	0.2	0.2	0.2	1.8	1.8	2.0
9	Paradip (2016)	15.0	13.2	13.6	1.3	1.3	1.3	8.1	8.7	9.8
	IOCL-TOTAL	**70.1**	**67.7**	**72.4**	**5.8**	**6.3**	**6.3**	**47.1**	**47.0**	**48.5**
10	Manali (1969)	10.5	9.0	11.3	0.9	0.9	1.0	7.4	7.1	7.7
11	CBR (1993)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CPCL-TOTAL	**10.5**	**9.0**	**11.3**	**0.9**	**0.9**	**1.0**	**7.4**	**7.1**	**7.7**
12	Mumbai (1955)	12.0	14.4	14.5	1.2	1.2	0.9	9.2	9.1	9.7
13	Kochi (1966)	15.5	15.4	16.0	1.4	1.4	1.5	10.0	10.1	11.4
14	Bina (2011)	7.8	7.4	7.8	0.7	0.7	0.7	5.1	5.0	4.4
	BPCL-TOTAL	**35.3**	**37.2**	**38.4**	**3.3**	**3.2**	**3.1**	**24.2**	**24.2**	**25.6**
15	Numaligarh (1999)	3.0	2.6	3.1	0.2	0.2	0.3	2.1	2.1	1.4

Sl. no.	Refinery	Installed capacity (01.04.2023) MMTPA	Crude oil processing (MMT)							
			2021-22	2022-23	November			April-November		
					2022-23	2023-24 (Target)	2023-24 (P)	2022-23	2023-24 (Target)	2023-24 (P)
16	Tatipaka (2001)	0.07	0.08	0.07	0.01	0.004	0.005	0.05	0.05	0.04
17	MRPL-Mangalore (1996)	15.0	14.9	17.1	1.5	1.5	1.5	11.2	11.2	10.5
	ONGC-TOTAL	**15.1**	**14.9**	**17.2**	**1.5**	**1.5**	**1.5**	**11.3**	**11.3**	**10.5**
18	Mumbai (1954)	9.5	5.6	9.8	0.8	0.4	0.9	6.4	5.7	6.7
19	Visakh (1957)	11.0	8.4	9.3	0.8	0.8	0.8	6.0	6.0	8.0
20	HMEL-Bathinda (2012)	11.3	13.0	12.7	1.0	0.9	1.1	8.4	7.7	8.7
	HPCL- TOTAL	**31.8**	**27.0**	**31.8**	**2.6**	**2.2**	**2.8**	**20.8**	**19.3**	**23.4**
21	RIL-Jamnagar (DTA) (1999)	33.0	34.8	34.4	2.6	3.0	2.8	23.3	22.9	22.9
22	RIL-Jamnagar (SEZ) (2008)	35.2	28.3	27.9	2.7	2.5	2.2	18.0	19.4	18.4
23	NEL-Vadinar (2006)	20.0	20.2	18.7	0.0	1.7	1.7	12.0	13.5	13.5
All India (MMT)		**253.9**	**241.7**	**255.2**	**19.6**	**21.5**	**21.7**	**166.3**	**166.7**	**172.0**
All India (Million Bbl/Day)		**5.02**	**4.85**	**5.13**	**4.78**	**5.24**	**5.29**	**5.00**	**5.01**	**5.17**

Note: Provisional Targets; Some sub-totals/ totals may not add up due to rounding off at individual levels. The Inputs to Refinery includes both Crude Oil and Other Inputs (OI), however Other Inputs (OI) do not form part of the above data.

9. Major crude oil and product pipeline network (as on 01.12.2023)

Details		ONGC	OIL	Cairn	HMEL	IOCL	BPCL	HPCL	Others*	Total
Crude Oil	Length (KM)	1,284	1,193	688	1,017	5,819	937			**10,938**
	Cap (MMTPA)	60.6	9.0	10.7	11.3	53.8	7.8			**153.1**
Products	Length (KM)		654			12,235	2,600	5,123	2,399	**23,011**
	Cap (MMTPA)		1.7			70.6	22.6	35.2	10.2	**140.3**

*Others include GAIL and Petronet India. HPCL and BPCL lubes pipeline included in products pipeline data

11. Production and consumption of petroleum products (Million Metric Tonnes)												
Products	2021-22		2022-23 (P)		Nov- 2022		Nov-2023 (P)		Apr-Nov 2022		Apr-Nov 2023 (P)	
	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons	Prod	Cons
LPG	12.2	28.3	12.8	28.5	1.0	2.5	1.1	2.5	8.5	18.6	8.3	19.1
MS	40.2	30.8	42.8	35.0	3.3	2.9	3.6	3.1	27.7	23.3	29.3	24.8
NAPHTHA	20.0	13.2	17.0	12.2	1.2	0.9	1.5	1.0	11.3	7.8	11.8	8.7
ATF	10.3	5.0	15.0	7.4	1.2	0.6	1.4	0.7	9.5	4.7	11.1	5.3
SKO	1.9	1.5	0.9	0.5	0.1	0.0	0.1	0.0	0.6	0.4	0.7	0.3
HSD	107.2	76.7	113.8	85.9	8.4	7.8	10.0	7.5	73.9	56.1	76.6	59.2
LDO	0.8	1.0	0.6	0.7	0.06	0.1	0.05	0.1	0.4	0.5	0.5	0.5
LUBES	1.2	4.5	1.3	3.7	0.1	0.3	0.1	0.3	0.8	2.4	0.9	2.6
FO/LSHS	8.9	6.3	10.4	7.0	0.8	0.6	0.7	0.5	7.1	4.6	7.2	4.4
BITUMEN	5.1	7.8	4.9	8.0	0.4	0.8	0.4	0.6	3.0	4.7	3.2	5.4
PET COKE	15.5	14.3	15.4	18.3	1.1	1.5	1.3	1.4	9.9	12.0	9.9	12.7
OTHERS	30.9	12.3	31.5	15.8	2.5	1.1	2.7	0.8	19.8	10.1	21.8	9.2
ALL INDIA	**254.3**	**201.7**	**266.5**	**223.0**	**20.3**	**19.1**	**22.8**	**18.7**	**172.5**	**145.1**	**181.2**	**152.3**
Growth (%)	**-3.1%**	**-5.4%**	**4.8%**	**10.6%**	**-9.3%**	**14.3%**	**12.4%**	**-2.0%**	**5.7%**	**13.3%**	**5.0%**	**4.9%**

Note: Prod - Production; Cons - Consumption

15. LPG consumption (Thousand Metric Tonne)

LPG category	2021-22	2022-23	November			April-November		
			2022-23	2023-24 (P)	Growth (%)	2022-23	2023-24 (P)	Growth (%)
1. PSU Sales :								
LPG-Packed Domestic	25,501.6	25,381.5	2,135.6	2,222.4	4.1%	16,637.6	16,853.9	1.3%
LPG-Packed Non-Domestic	2,238.8	2,606.0	264.1	215.1	-18.6%	1,655.8	1,813.4	9.5%
LPG-Bulk	390.9	408.9	52.2	42.6	-18.4%	262.6	388.7	48.0%
Auto LPG	122.0	106.7	9.3	6.3	-32.0%	73.4	61.5	-16.2%
Sub-Total (PSU Sales)	28,253.3	28,503.1	**2,461.2**	**2,486.5**	**1.0%**	**18,629.4**	**19,117.5**	**2.6%**
2. Direct Private Imports*	0.1	0.1	0.00	0.01	-	0.02	0.06	206.0%
Total (1+2)	28,253.4	28,503.2	**2,461.2**	**2,486.5**	**1.0%**	**18,629.4**	**19,117.6**	**2.6%**

*Oct-Nov'23 DGCIS data is prorated

16. LPG marketing at a glance

Particulars (As on 1st of April)	Unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	1.12.23 (P)
LPG Active Domestic Customers	(Lakh)				1486	1663	1988	2243	2654	2787	2895	3053	3140	3180
	Growth					11.9%	19.6%	12.8%	18.3%	5.0%	3.9%	5.5%	2.9%	1.5%
LPG Coverage (Estimated)	(Percent)				56.2	61.9	72.8	80.9	94.3	97.5	99.8	-	-	-
	Growth					10.1%	17.6%	11.1%	16.5%	3.4%	2.3%	-	-	-
PMUY Beneficiaries	(Lakh)						200.3	356	719	802	800	899.0	958.6	983.1
	Growth							77.7%	101.9%	11.5%	-0.2%	12.2%	6.6%	2.7%
LPG Distributors	(No.)	11489	12610	13896	15930	17916	18786	20146	23737	24670	25083	25269	25386	25440
	Growth	9.0%	9.8%	10.2%	14.6%	12.5%	4.9%	7.2%	17.8%	3.9%	1.7%	0.7%	0.5%	0.4%
Auto LPG Dispensing Stations	(No.)	652	667	678	681	676	675	672	661	657	651	601	526	496
	Growth	7.9%	2.3%	1.6%	0.4%	-0.7%	-0.1%	-0.4%	-1.6%	-0.6%	-0.9%	-8.5%	-12.5%	-12.5%
Bottling Plants	(No.)	184	185	187	187	188	189	190	192	196	200	202	208	210
	Growth	0.5%	0.5%	1.1%	0.0%	0.5%	0.5%	0.5%	1.1%	2.1%	2.0%	1.0%	4.5%	2.4%

Source: PSU OMCs (IOCL,BPCL and HPCL)

1.Growth rates as on 01.12.2023 are with respect to figs as on 01.12.2022. Growth rates as on 1 April of any year are with respect to figs as on 1 April of previous year.

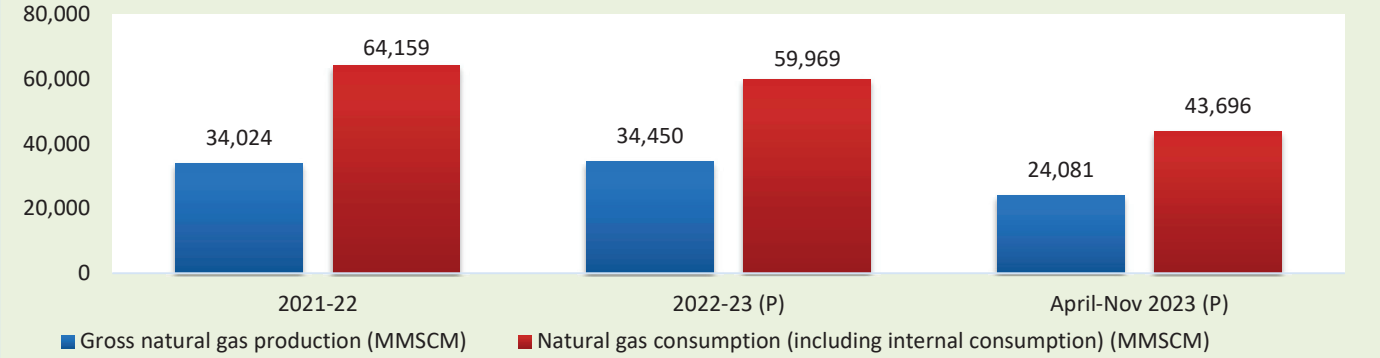
2. The LPG coverage is calculated by PSU OMCs based upon the active LPG domestic connections and the estimated number of households. The number of households has been projected by PSU OMCs based on 2011 census data. Factors like increasing nuclearization of families, migration of individuals/ families due to urbanization and reduction in average size of households etc. impact the growth of number of households. Due to these factors, the estimated no. of households through projection of 2011 census data may slightly differ from the actual no. of households in a State/UT. Further, this methodology does not include PNG (domestic) connections.

18. Natural gas at a glance

(MMSCM)

Details	2021-22 (P)	2022-23 (P)	November			April-November		
			2022-23 (P)	2023-24 (Target)	2023-24 (P)	2022-23 (P)	2023-24 (Target)	2023-24 (P)
(a) Gross production	34,024	34,450	2,840	3,262	3,041	22,917	25,092	24,081
- ONGC	20,629	19,969	1,619	1,722	1,560	13,377	13,808	12,945
- Oil India Limited (OIL)	2,893	3,041	251	265	257	2,037	2,095	2,048
- Private / Joint Ventures (JVs)	10,502	11,440	970	1,276	1,223	7,502	9,188	9,088
(b) Net production (excluding flare gas and loss)	33,131	33,664	2,779		2,991	22,379		23,606
(c) LNG import#	31,028	26,304	2,219		2,337	17,875		20,090
(d) Total consumption including internal consumption (b+c)	64,159	59,969	4,998		5,328	40,254		43,696
(e) Total consumption **(in BCM)**	64.2	60.0	5.0		5.3	40.3		43.7
(f) Import dependency based on consumption (%), {c/d*100}	48.4	43.9	44.4		43.9	44.4		45.977

November 2023 DGCIS data prorated.



19. Coal Bed Methane (CBM) gas development in India

Prognosticated CBM resources		91.8	TCF
Established CBM resources		10.4	TCF
CBM Resources (33 Blocks)		62.8	TCF
Total available coal bearing areas (India)		32760	Sq. KM
Total available coal bearing areas with MoPNG/DGH		12254*	Sq. KM
Area awarded		20,460**	Sq. KM
Blocks awarded*		36	Nos.
Exploration initiated (Area considered if any boreholes were drilled in the awarded block)		10670	Sq. KM
Production of CBM gas	April-Nov 2023 (P)	432.19	MMSCM
Production of CBM gas	Nov 2023 (P)	52.26	MMSCM

*ST CBM Block awarded & relinquished twice- in CBM Round II and Round IV -Area considered if any boreholes were drilled in the awarded block. **MoPNG awarded 04 new CBM Blocks (Area 3862 sq. km) under Special CBM Bid Round 2021 in September 2022. ***Area considered if any boreholes were drilled in the awarded block.

19a. Status of Compressed Bio Gas (CBG) projects under SATAT (as on 01.12.2023) (Provisional)

Particulars	Units	IOCL	HPCL	BPCL	GAIL	IGL	Total
No. of CBG plants commissioned and initiated sale of CBG	No. of plants	23	4	1	10	5	**43**
Start of CBG sale from retail outlet(s)	Nos.	67	4	1	0	0	**72**
Sale of CBG in 2022-23	Tons	5,822	77	6.35	5341		**11,227**
Sale of CBG in 2023-24 (up to November, 2023)	Tons	4152	117.1	27.46	6579*		**9548**
Sale of CBG in CGD network	GA Nos.				19		**19**

*Sale of CBG sourced under CBG-CGD synchronization scheme by GAIL through its own marketing channels as well as other CGDs/OMCs.

20. Common Carrier Natural Gas pipeline network as on 30.09.2023

Nature of pipeline		GAIL	GSPL	PIL	IOCL	AGCL	RGPL	GGL	DFPCL	ONGC	GIGL	GITL	Others*	Total
Operational	Length	11,007	2,716	1,479	143	107	304	73	42	24	0	0	0	**15,895**
	Capacity	167.2	43.0	85.0	20.0	2.4	3.5	5.1	0.7	6.0				-
Partially commissioned#	Length	4,714	0	0	1,040	0	0	0	0	0	1,285	0	365	**7,403**
	Capacity	55.0	0.0	0.0	84.7	0.0	0.0	0.0	0.0	0.0	122.5	0.0	0.0	-
Total operational length		**15,720**	**2,716**	**1,479**	**1,183**	**107**	**304**	**73**	**42**	**24**	**1,285**	**0**	**365**	**23,298**
Under construction	Length	3,955	100	0	456	0	0	0	0	0	916	220	4,361	**10,009**
	Capacity	26.3	3.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	-
Total length		**19,676**	**2,816**	**1,479**	**1,639**	**107**	**304**	**73**	**42**	**24**	**2,201**	**220**	**4,726**	**33,307**

Source: PNGRB; Length in KMs ; Authorized Capacity in MMSCMD (Arithmetic sum taken for each entity -capacity may vary from pipeline to pipeline); *Others-APGDC, , IGGL, IMC,GTIL,HPPL Consortium of H-Energy. Total authorized Natural Gas pipelines including Tie-in connectivity, dedicated & STPL is 33,307 Kms (P),however total operational and Under Construction Pipeline length is 35,483Kms (P)

21. Existing LNG terminals

Location	Promoters	Capacity as on 01.12.2023	% Capacity utilisation (April-Oct 2023)
Dahej	Petronet LNG Ltd (PLL)	17.5 MMTPA	95.1
Hazira	Shell Energy India Pvt. Ltd.	5.2 MMTPA	37.1
Dabhol	Konkan LNG Limited	*5 MMTPA	34.3
Kochi	Petronet LNG Ltd (PLL)	5 MMTPA	19.5
Ennore	Indian Oil LNG Pvt Ltd	5 MMTPA	16.8
Mundra	GSPC LNG Limited	5 MMTPA	12.2
Dhamra	Adani Total Private Limited	5 MMTPA	26.0
Total Capacity		**47.7 MMTPA**	

* To increase to 5 MMTPA with breakwater. Only HP stream of capacity of 2.9 MMTPA is commissioned

22. Status of PNG connections and CNG stations across India (Nos.), as on 31.10.2023(P)				
State/UT (State/UTs are clubbed based on the GAs authorised by PNGRB)	CNG Stations	PNG connections		
		Domestic	Commercial	Industrial
Andhra Pradesh	169	2,63,922	460	36
Andhra Pradesh, Karnataka & Tamil Nadu	42	4,113	1	6
Assam	7	53,440	1,380	452
Bihar	113	1,15,542	100	4
Bihar & Jharkhand	6	7,663	3	0
Bihar & Uttar Pradesh	14	0	0	0
Chandigarh (UT), Haryana, Punjab & Himachal Pradesh	27	26,354	143	33
Chhattisgarh	10	0	0	0
Dadra & Nagar Haveli (UT)	7	11,724	57	60
Daman & Diu (UT)	5	5,169	60	45
Daman and Diu & Gujarat	15	3,562	17	0
Goa	12	11,514	23	35
Gujarat	1,000	31,57,238	23,045	5,772
Haryana	361	3,67,025	939	2,074
Haryana & Himachal Pradesh	10	10	0	0
Haryana & Punjab	26	629	0	0
Himachal Pradesh	11	6,712	4	0
Jharkhand	83	1,15,267	18	3
Karnataka	332	4,10,921	554	342
Kerala	116	53,578	29	18
Kerala & Puducherry	9	454	0	0
Madhya Pradesh	257	2,20,862	417	481
Madhya Pradesh and Chhattisgrah	7	0	0	0
Madhya Pradesh and Rajasthan	34	594	0	0
Madhya Pradesh and Uttar Pradesh	16	0	0	2
Maharashtra	802	31,29,438	4,736	936
Maharashtra & Gujarat	60	1,87,645	8	28
Maharashtra and Madhya Pradesh	13	0	0	0
National Capital Territory of Delhi (UT)	481	14,94,562	3,753	1,858

State/UT (State/UTs are clubbed based on the GAs authorised by PNGRB)	CNG Stations	PNG connections		
		Domestic	Commercial	Industrial
Odisha	71	95,613	6	0
Puducherry	2	0	0	0
Puducherry & Tamil Nadu	8	249	0	0
Punjab	213	78,337	510	271
Punjab & Rajasthan	12	0	0	0
Rajasthan	267	2,39,225	152	1,612
Tamil Nadu	248	12,852	4	11
Telangana	164	1,94,739	95	107
Telangana and Karnataka	4	0	0	0
Tripura	18	60,566	506	62
UT of Jammu and Kashmir	0	0	0	0
Uttar Pradesh	859	14,72,406	2,437	2,959
Uttar Pradesh & Rajasthan	42	19,219	45	348
Uttar Pradesh and Uttrakhand	26	12,993	0	0
Uttrakhand	32	71,189	81	92
West Bengal	77	2,077	3	1
Total	**6,088**	**1,19,07,403**	**39,586**	**17,648**

Source: PNGRB

Note: 1. All the GAs where PNG connections/CNG Stations have been established are considered as Operational, 2. Under normal conditions. Operation of any particular GA commences within around one year of authorization. 3. State/UTs wherever clubbed are based on the GAs authorised by PNGRB.

23. Domestic natural gas price and gas price ceiling (GCV basis)

Period	Domestic Natural Gas price in	Gas price ceiling in US$/MMBTU
November 2014 - March 2015	5.05	-
April 2015 - September 2015	4.66	-
October 2015 - March 2016	3.82	-
April 2016 - September 2016	3.06	6.61
October 2016 - March 2017	2.5	5.3
April 2017 - September 2017	2.48	5.56
October 2017 - March 2018	2.89	6.3
April 2018 - September 2018	3.06	6.78
October 2018 - March 2019	3.36	7.67
April 2019 - September 2019	3.69	9.32
October 2019 - March 2020	3.23	8.43
April 2020 - September 2020	2.39	5.61
October 2020 - March 2021	1.79	4.06
April 2021 - September 2021	1.79	3.62
October 2021 - March 2022	2.9	6.13
April 2022 - September 2022	6.1	9.92
October 2022 - March 2023	8.57	12.46
1 April 2023 - 7 April 2023	9.16	12.12

Period	Domestic Gas calculated price in US$/MMBTU	Domestic Gas ceiling price for ONGC/OIL in US$/MMBTU	Period	HP-HT Gas price ceiling in US$/MMBTU
8 April 2023 - 30 April 2023	7.92	6.50	April 2023 - September 2023	12.12
1 May 2023 - 31May 2023	8.27	6.50		
1 June 2023 - 30 June 2023	7.58	6.50		
1 July 2023 - 31 July 2023	7.48	6.50		
1 Aug 2023 - 31 Aug 2023	7.85	6.50		
1 Aug 2023 - 31 Aug 2023	7.85	6.50		
1 Oct 2023 - 31 Oct 2023	9.20	6.50	October'2023 - March 2024	9.96
1 Nov 2023 - 30 Nov 2023	9.12	6.50		
1 Dec 2023 - 31 Dec 2023	8.47	6.50		

Natural Gas prices are on GCV basis

24. CNG/PNG prices

City	CNG (Rs/Kg)	PNG (Rs/SCM)	Source
Delhi	75.59	48.59	IGL website (12.12.2023)
Mumbai	76.00	47.00	MGL website (12.12.2023)

Indian Natural Gas Spot Price for Physical Delivery

IGX Price Index Month	Avg. Price		Volume (MMSCM)	Source
	INR/MMBtu	$/MMBtu		
`Nov 2023	1131	13.60	200.00	As per IGX website: www.igxindia.com

*Prices are weighted average prices|$1=INR 83.29| 1 MMBtu=25.2 SCM (Data Excluding Ceiling Price Gas)

Cooperative Republic of Guyana

MINISTRY OF LEGAL AFFAIRS
& the Chambers of the Attorney General

https://mola.gov.gy/joint-statement-approved-all-those-present-high-level-dialogue-st-vincent-and-grenadines

Friday, December 15, 2023
https://www.facebook.com/AnilNandlallppp

THE JOINT DECLARATION OF ARGYLE FOR DIALOGUE AND PEACE BETWEEN GUYANA AND VENEZUELA

On Thursday, December 14, 2023, in Argyle, Saint Vincent and the Grenadines, His Excellency Irfaan Ali, President of the Co-operative Republic of Guyana and His Excellency Nicolas Maduro, President of the Bolivarian Republic of Venezuela held discussions on matters consequential to the territory in dispute between their two countries.

These discussions were facilitated by the Prime Minister of Saint Vincent and the Grenadines and Pro-Tempore President of the Community of Latin American and Caribbean States (CELAC) Dr. The Honourable Ralph E. Gonsalves, and the Prime Minister of the Commonwealth of Dominica and Chairman of the Caribbean Community (CARICOM), the Honourable Roosevelt Skerrit. Prime Ministers Gonsalves and Skerrit, together with H.E. Mr. Celso Amorim, Special Adviser and Personal Envoy of H.E. Luiz Inácio Lula da Silva, President of the Federative Republic of Brazil, acted as principal Interlocutors. Also present were Honourable Prime Ministers of the Caribbean Community, namely: the Honourable Philip Davis, Prime Minister of The Bahamas; the Honourable Mia Amor Mottley, Prime Minister of Barbados; the Honourable Dickon Mitchell, Prime Minister of Grenada; the Honourable Philip J. Pierre, Prime Minister of Saint Lucia; Honourable Terrence Drew of Saint Kitts and Nevis and Dr. The Honourable Keith Rowley, Prime Minister of the Republic of Trinidad and Tobago.

Attending as Observers on behalf of His Excellency António Guterres, Secretary-General of the United Nations were Their Excellencies Earle Courtenay Rattray, Chef de Cabinet of the Office of the Secretary-General of the United Nations, and Miroslav Jenca, Under-Secretary-General of the United Nations Department of Political and Peacebuilding Affairs. In addition, His Excellency Alvaro Leyva Durán, Minister of Foreign Affairs of the Republic of Colombia and Mr. Gerardo Torres Zelaya, Vice-Minister of Foreign Affairs of the Republic of Honduras, in his capacity as CELAC Troika, also participated.

All parties attending the meeting at Argyle, Saint Vincent and the Grenadines reiterated their commitment to Latin America and the Caribbean remaining a Zone of Peace.

Guyana and Venezuela declared as follows:

1. Agreed that Guyana and Venezuela, directly or indirectly, will not threaten or use force against one another in any circumstances, including those consequential to any existing controversies between the two States.

2. Agreed that any controversies between the two States will be resolved in accordance with international law, including the Geneva Agreement dated February 17, 1966.

3. Committed to the pursuance of good neighborliness, peaceful coexistence, and the unity of Latin America and the Caribbean.

4. Noted Guyana's assertion that it is committed to the process and procedures of the International Court of Justice for the resolution of the border controversy. Noted Venezuela's assertion of its lack of consent and lack of recognition of the International Court of Justice and its jurisdiction in the border controversy.

5. Agreed to continue dialogue on any other pending matters of mutual importance to the two countries.

6. Agreed that both States will refrain, whether by words or deeds, from escalating any conflict or disagreement arising from any controversy between them. The two States will cooperate to avoid incidents on the ground conducive to tension between them. In the event of such an incident the two States will immediately communicate with one another, the Caribbean Community (CARICOM), the Community of Latin America and the Caribbean (CELAC), and the President of Brazil to contain, reverse and prevent its recurrence.

7. Agreed to establish immediately a joint commission of the Foreign Ministers and technical persons from the two States to address matters as mutually agreed. An update from this joint commission will be submitted to the Presidents of Guyana and Venezuela within three months.

8. Both States agreed that Prime Minister Ralph E. Gonsalves, the Pro-Tempore President of CELAC, Prime Minister Roosevelt Skerrit, the incumbent CARICOM Chairman, and President Luiz Inacio Lula da Silva of Brazil will remain seized of the matter as Interlocutors and the UN Secretary-General, Antonio Guterres as Observer, with the ongoing concurrence of Presidents Irfaan Ali and Nicolas Maduro. For the avoidance of doubt, Prime Minister Gonsalves' role will continue even after Saint Vincent and the Grenadines ceases to be the Pro-Tempore President of CELAC, within the framework of the CELAC Troika plus one; and Prime Minister Skerrit's role will continue as a member of the CARICOM Bureau.

9. Both States agreed to meet again in Brazil, within the next three months, or at another agreed time, to consider any matter with implications for the territory in dispute, including the above-mentioned update of the joint commission.

10. We express our appreciation to Prime Ministers Gonsalves and Skerrit, to President Lula and his Personal Envoy Celso Amorim, to all other CARICOM Prime Ministers present, to the officials of the CARICOM Secretariat, to the CELAC Troika and to the Head of the CELAC PTP Secretariat in Saint Vincent and the Grenadines, His Excellency Dr. Douglas Slater, for their respective roles in making this meeting a success.

11. We express our appreciation to the Government and people of Saint Vincent and the Grenadines for their kind facilitation and hospitality at this meeting.
Dated this 14th day of December, 2023.

- ‹ Previous Article

Russia's Crude Flows Surge as Black Sea Port Rebounds From Storm

2023-12-12 11:50:52.779 GMT

By Julian Lee

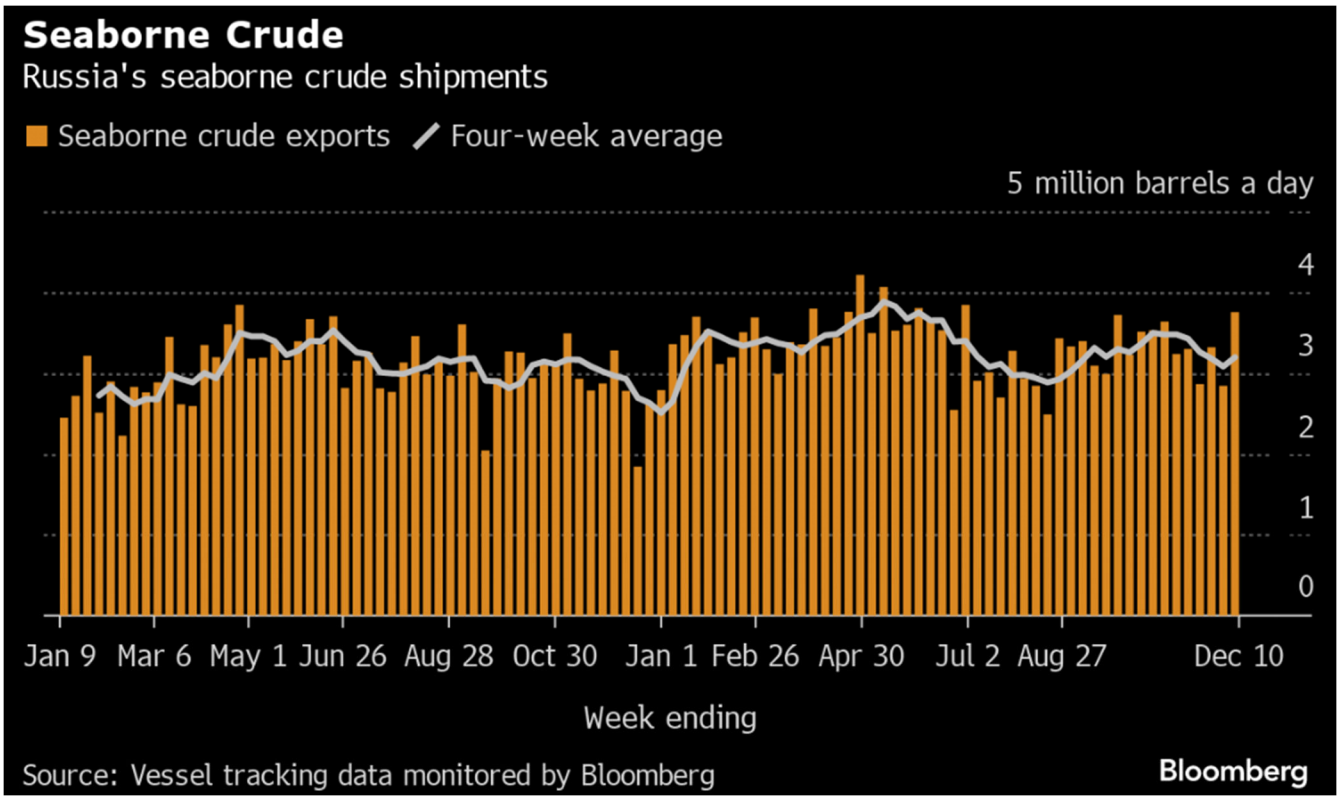
(Bloomberg) -- Russia’s seaborne crude exports climbed on a four-week average basis, driven by a big jump in weekly flows after storms that disrupted Black Sea shipments finally abated. Loadings soared at the port of Novorossiysk, with a full week of uninterrupted activity.

About 3.2 million barrels a day of crude were shipped from Russian ports in the four weeks to Dec. 10, tanker-tracking data monitored by Bloomberg show. That was up by 114,000 barrels a day from the revised figure for the period to Dec. 3. The more volatile weekly average leaped to the highest since early July.

While still depressed by the very low flows seen from the Black Sea during the recent storms, four-week average crude shipments were about 385,000 barrels a day below their May-June level — the baseline used by Moscow for the export reduction it has pledged to its partners in the OPEC+ group.

Russia will deepen its oil export cuts to 500,000 barrels a day below the May-June average during the first quarter of next year, after Saudi Arabia said it would prolong its unilateral one-million-barrel-a-day supply reduction and several other members of the group agreed to make further output cuts.

The Russian cut will be shared between crude shipments, which will be reduced by 300,000 barrels a day, and refined products, according to Deputy Prime Minister Alexander Novak. For the rest of 2023, the reduction is set at 300,000 barrels a day, spread across both crude and refined products in undefined proportions. That complicates assessments of whether Russia is meeting its commitment to its OPEC+ partners.



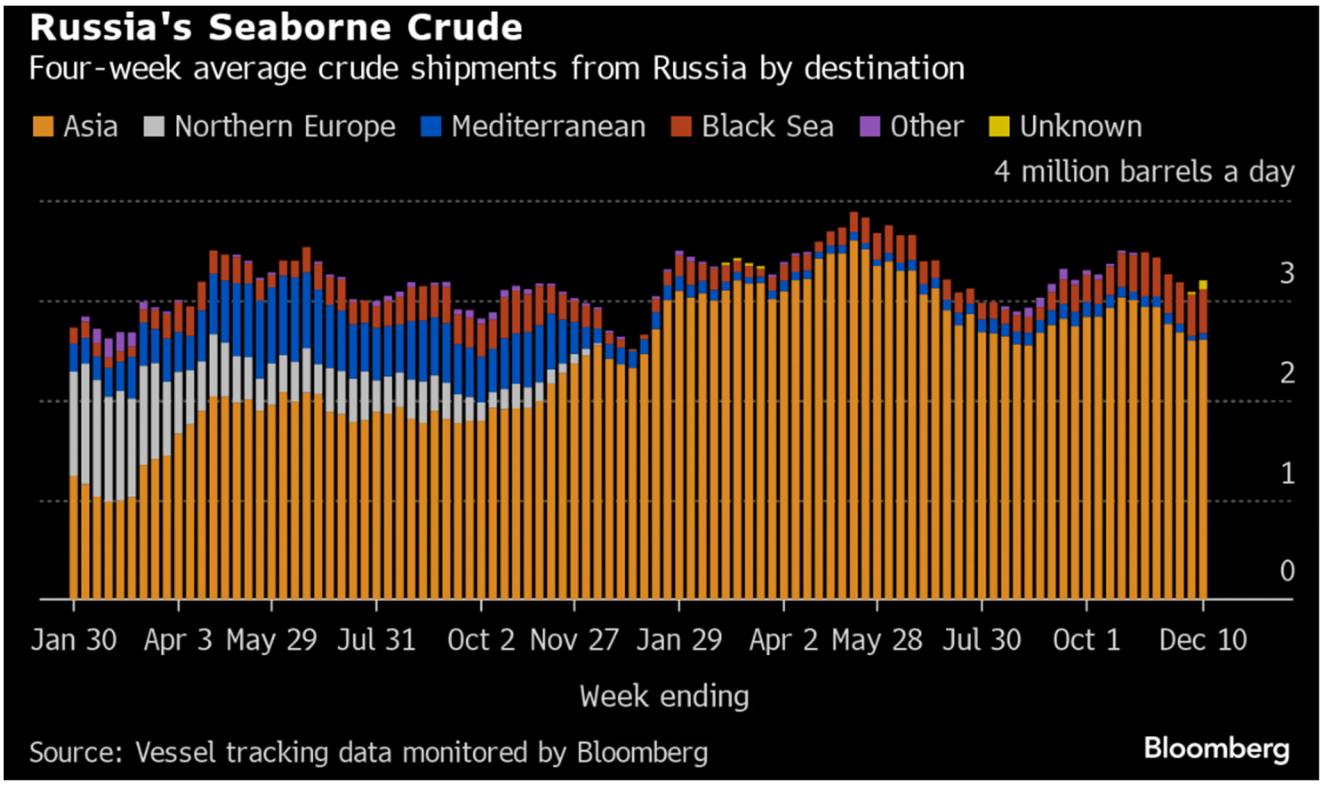
The figure for weekly flows rose sharply. Using this measure, shipments soared to 3.76 million barrels a day, up by about 910,000 barrels a day from the revised figure for the period to Dec. 3. Weekly shipments were the highest in more than five months.

Russia's oil processing fell to a seven-week low in the first days of December as logistical constraints weighed on refineries. The recent storms in the Black Sea, a key route for fuel exports, hampered shipments from the plants, forcing them to cut runs.

The Kremlin's weekly revenues from oil export duties jumped to the highest level for the year, driven by the surge in shipments. From January, Russia's oil producers are set to pay a higher output tax to fund increased downstream subsidies, which were reinstated in October after being halved the previous month.

Flows by Destination

Russia's seaborne crude flows in the four weeks to Dec. 10 rose to 3.2 million barrels a day. That was up from a revised 3.08 million barrels a day in the period to Dec. 3. Shipments were about 385,000 barrels a day below the average seen in volumes in May and June.



All figures exclude cargoes identified as Kazakhstan's KEBCO grade. Those are shipments made by KazTransoil JSC that transit Russia for export through Novorossiysk and the Baltic port of Ust-Luga and are not subject to European Union sanctions or a price cap.

The Kazakh barrels are blended with crude of Russian origin to create a uniform export grade. Since Russia's invasion of Ukraine, Kazakhstan has rebranded its cargoes to distinguish them from those shipped by Russian companies.

*** Asia**

Observed shipments to Russia's Asian customers, including those showing no final destination, rose to 2.7 million barrels a day in the four weeks to Dec. 10, up from a revised 2.63 million barrels a day in the period to Dec. 3.

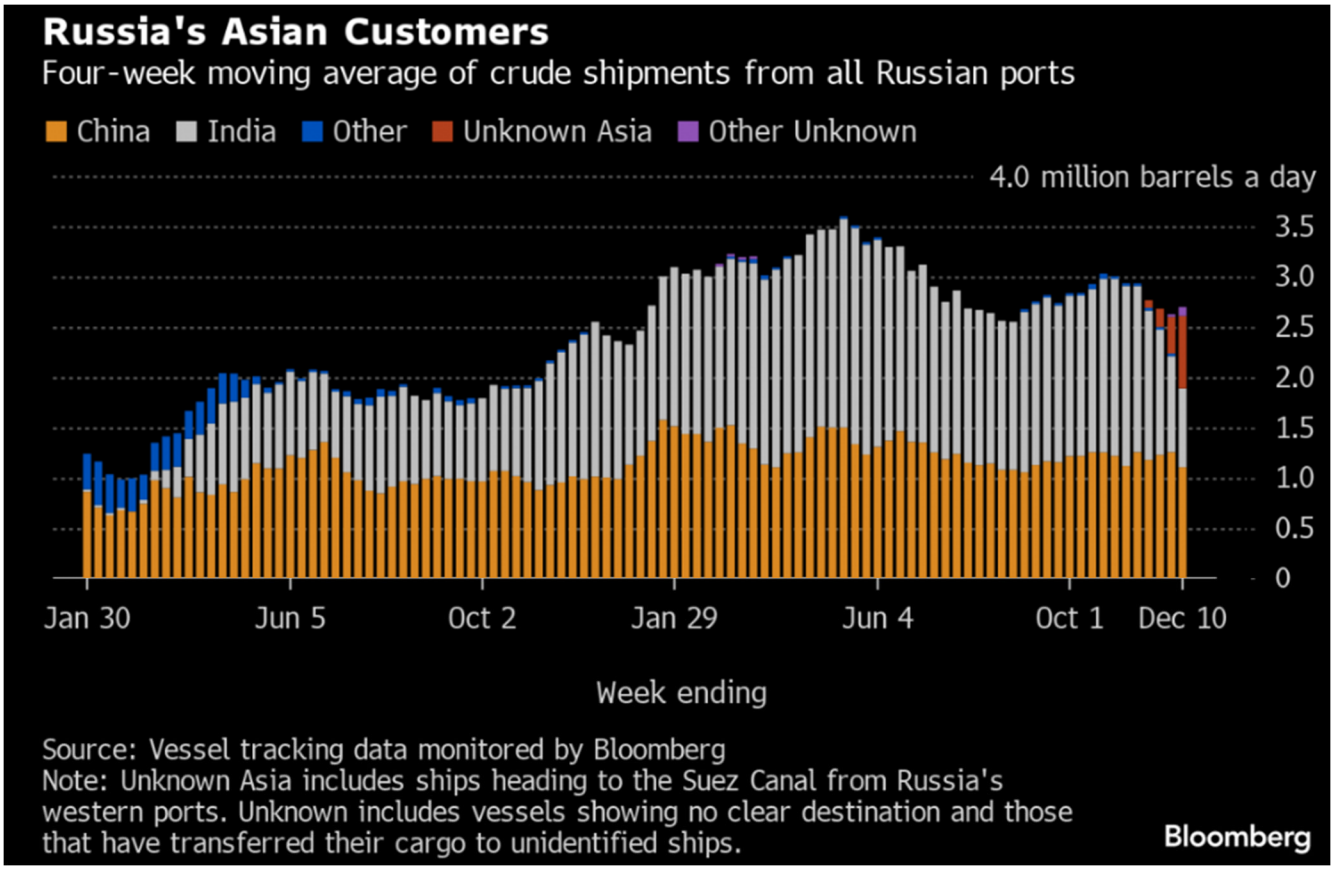
About 1.11 million barrels a day of crude was loaded onto tankers heading to China in the four weeks to Dec. 10. China's seaborne imports are supplemented by about 800,000 barrels a day of crude delivered directly from Russia by pipeline, either directly, or via Kazakhstan.

Flows on ships signaling destinations in India averaged about 780,000 barrels a day in the four weeks to Dec. 10. Both the Chinese and Indian figures will rise as the discharge ports become clear for vessels that are not currently showing final destinations.

The equivalent of about 720,000 barrels a day was on vessels signaling Port Said or Suez in Egypt, or are expected to be transferred from one ship to another off the South Korean

port of Yeosu. Those voyages typically end at ports in India or China and show up in the chart below as “Unknown Asia” until a final destination becomes apparent.

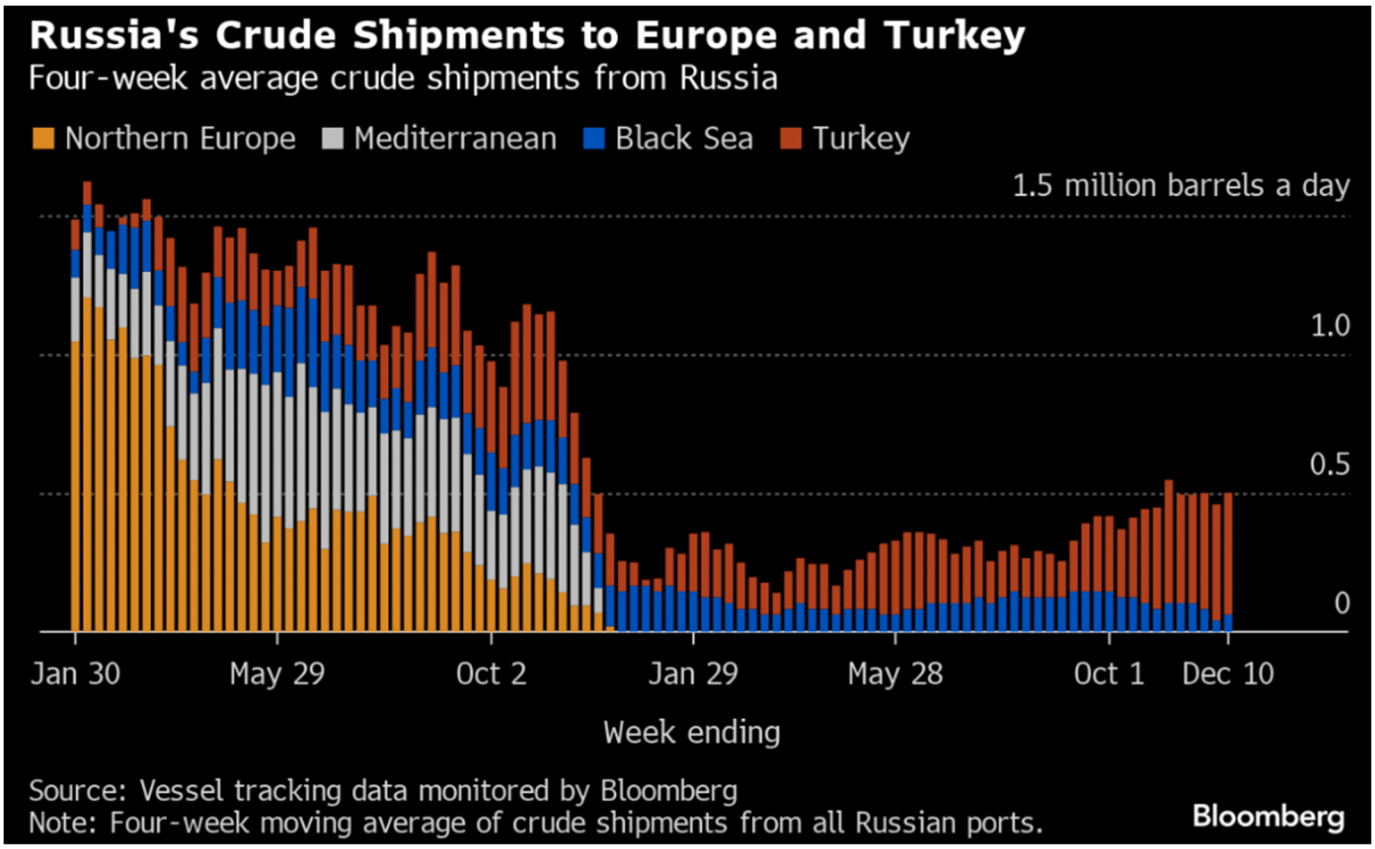
The “Other Unknown” volumes, running at about 90,000 barrels a day in the four weeks to Dec. 10, are those on tankers showing no clear destination. Most of those cargoes originate from Russia’s western ports and go on to transit the Suez Canal, but some could end up in Turkey. Others could be moved from one vessel to another, with most such transfers now taking place in the Mediterranean, off the coast of Greece.



*** Europe and Turkey**

Russia’s seaborne crude exports to European countries have collapsed since Moscow’s troops invaded Ukraine in February 2022. A market that consumed about 1.5 million barrels a day of short-haul seaborne crude, coming from export terminals in the Baltic, Black Sea and Arctic has been lost almost completely, to be replaced by long-haul destinations in Asia that are much more costly and time-consuming to serve.

Combined flows to Turkey and Bulgaria, Russia’s only two remaining buyers close to its western ports, have stabilized at about 500,000 barrels a day, tanker tracking data show.



Exports to Turkey were also up, rising to about 440,000 barrels a day in the four weeks to Dec. 10. They are now more than three times as high as the lows they hit in July and August.

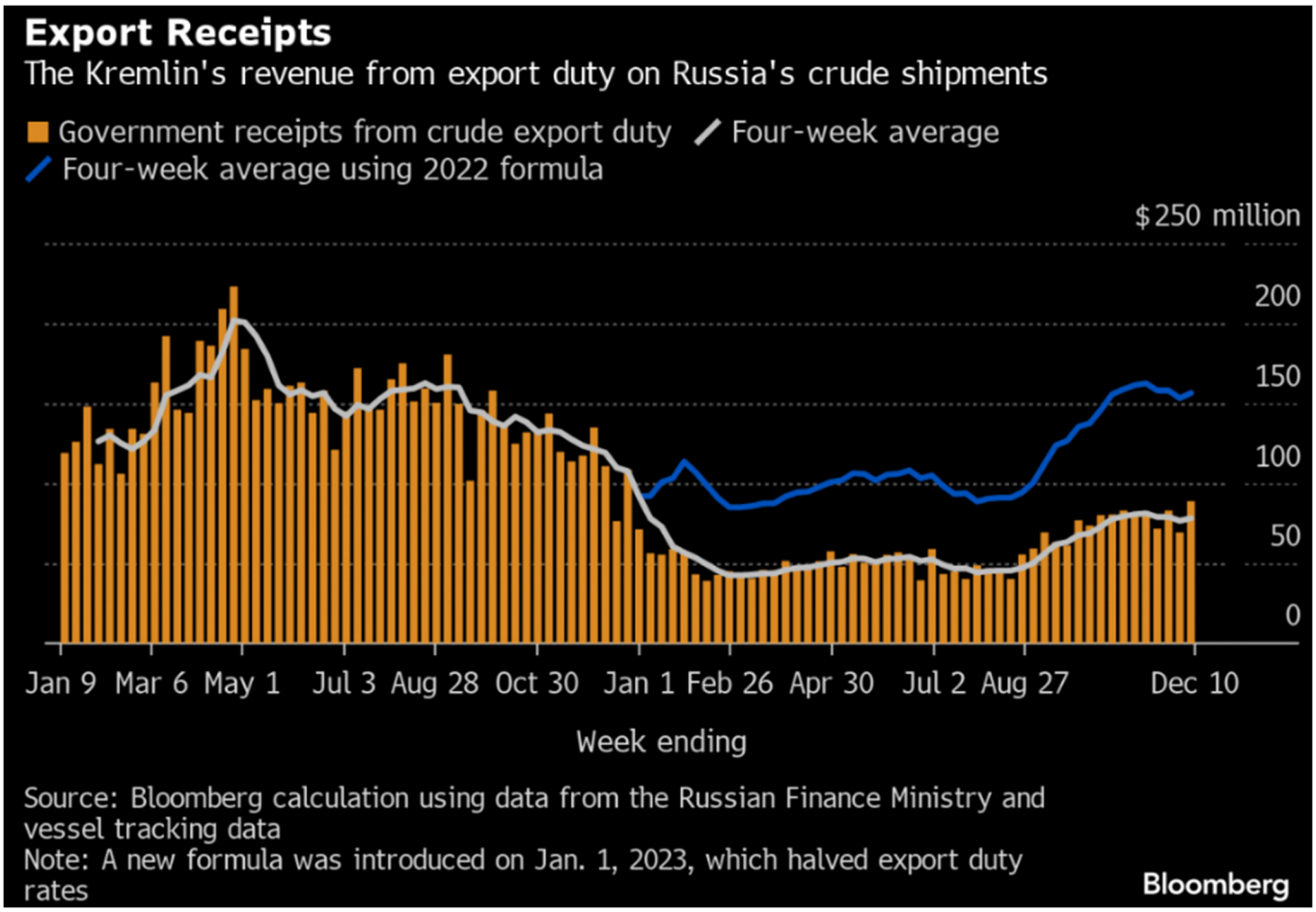
Flows to Bulgaria, now Russia's only European market for crude, rose to about 63,000 barrels a day in the most recent four-week period. Flows are recovering from the disruption at Novorossiysk, though the halt to shipments from the port continues to affect the average.

No Russian crude was shipped to northern European countries, or those in the Mediterranean in the four weeks to Dec. 10.

Vessel-tracking data are cross-checked against port agent reports as well as flows and ship movements reported by other information providers including Kpler and Vortexa Ltd.

Export Revenue

Inflows to the Kremlin's war chest from its crude-export duty rebounded to $89 million in the seven days to Dec. 10. That's the highest weekly figure for this year. Meanwhile four-week average income also rose, increasing by $2 million to $78 million.



The rate for December is $3.37 a barrel, based on an average Urals price of $79.23 during the calculation period between Oct. 15 and Nov. 14. That was about $9.39 a barrel below Brent over the same period.

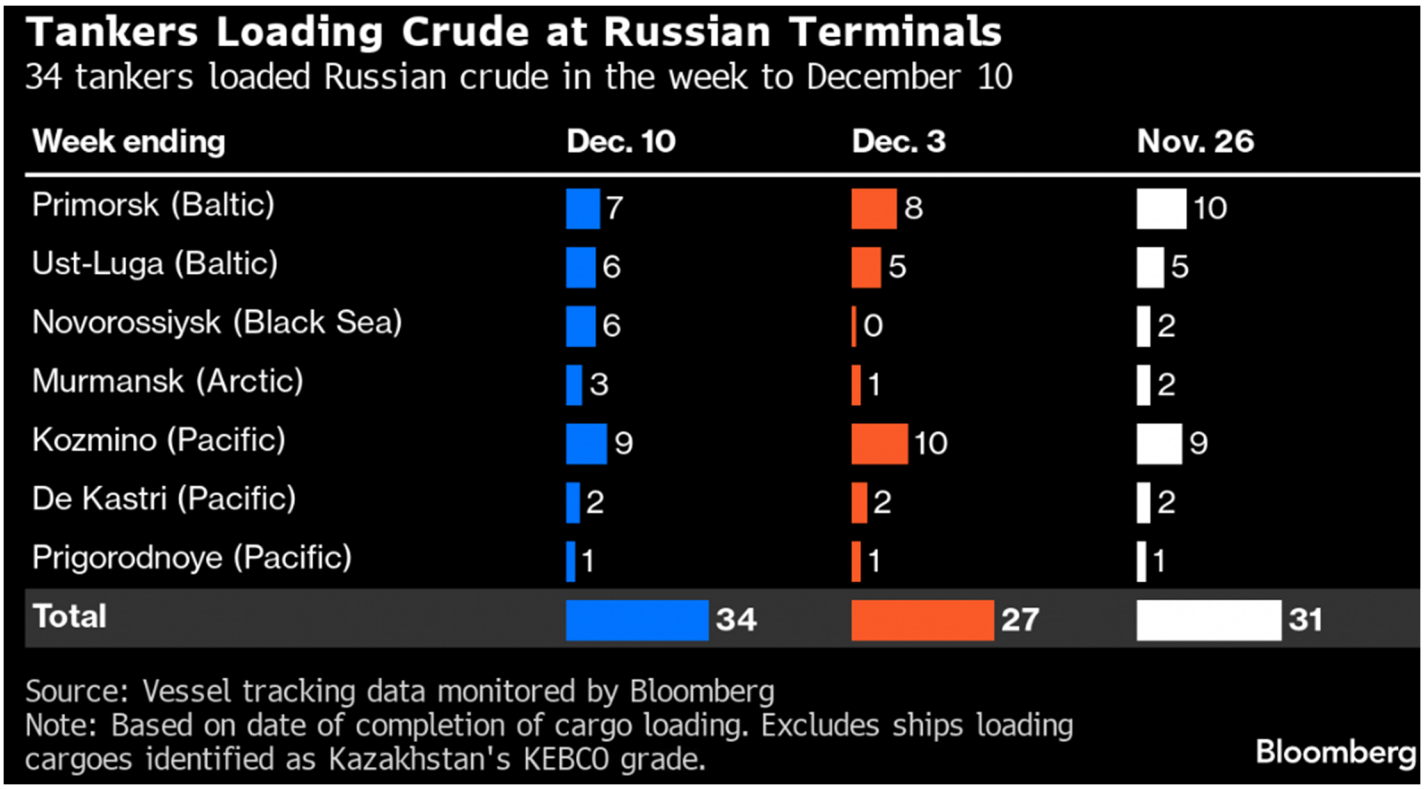
Export duty is set to be abolished at the end of this year as part of Russia's long-running tax reform plans.

Origin-to-Location Flows

The following table shows the number of ships leaving each export terminal.

A total of 34 tankers loaded 26.3 million barrels of Russian crude in the week to Dec. 10, vessel-tracking data and port agent reports show. That's up by about 6.4 million barrels from the revised figure for the previous week.

There were six shipments from Novorossiysk, with storms that had hampered activity at the port finally abating to allow a full week of uninterrupted operations at the port.



All figures exclude cargoes identified as Kazakhstan's KEBCO grade. Two cargoes of KEBCO were loaded at Novorossiysk during the week.NOTES

Note: This story forms part of a weekly series tracking shipments of crude from Russian export terminals and the export duty revenues earned from them by the Russian government. Weeks run from Monday to Sunday. The next update will be on Tuesday, Dec. 19.

Note: All figures exclude cargoes owned by Kazakhstan's KazTransOil JSC, which transit Russia and are shipped from Novorossiysk and Ust-Luga as KEBCO grade crude.

If you are reading this story on the Bloomberg terminal, click here for a link to a PDF file of four-week average flows from Russia to key destinations.

--With assistance from Sherry Su.

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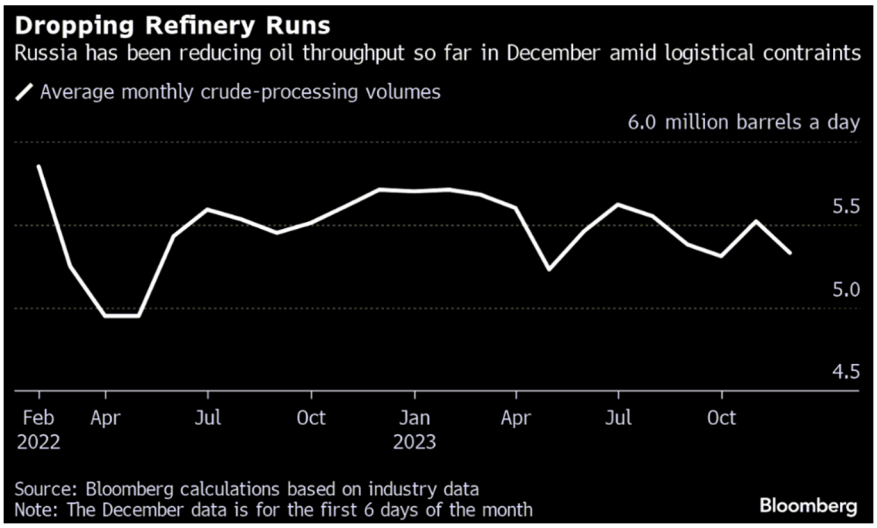
Russian Oil Processing Shrinks Further on Logistical Constraints
2023-12-11 14:30:39.449 GMT

By Bloomberg News
(Bloomberg) -- Russia's oil processing in early December fell to a seven-week low as logistical constraints weighed on refineries.
The nation's plants processed 5.33 million barrels of crude a day in the first six days of the month, down about 81,000 barrels a day from the prior week's average, according to a person with knowledge of industry data. That's a second week of decline and the lowest rate since the second half of October, Bloomberg calculations show.



Several major refineries in three areas — southern and central Russia and the Volga region — led the downturn, the person said, asking not to be identified as the information isn't public.
Declines were noted at Rosneft PJSC's Tuapse, Ryazan and Saratov plants, at Lukoil PJSC's Volgograd, Nizhny Novgorod and Perm facilities and at Surgutneftegas PJSC's Kirishi site, the person said. Cuts were mainly due to logistical constraints that were aggravated by a recent storm in the Black Sea, a key route for fuel exports, the person said.
Those companies, and the press service for Russia's Energy Ministry, didn't immediately respond to requests for comment.
Read More:Black Sea Storms Batter Russian Crude Exports to Three-Month Low
Traders and analysts scrutinize refining rates as one of the key remaining gauges — together with seaborne crude exports — to assess Russia's oil production after Moscow classified official output data amid Western sanctions.
The country's seaborne oil shipments in the week to Dec. 3 dropped to 2.74 million barrels a day amid Black Sea storms. That's down by about 500,000 barrels a day from the revised figure for the week to Nov. 26, according to tanker-tracking data monitored by Bloomberg. Shipments were the lowest in 15 weeks.

Russia has pledged to cut its combined crude and petroleum-product exports by 300,000 barrels a day through year-end in a move to stabilize the global energy market.
In the first quarter of next year, the nation is set to deepen those curbs to 500,000 barrels a day in a step coordinated with the Organization of Petroleum Exporting Countries and its allies. Russia will start implementing those reductions this month and reach pledged volumes in January, Deputy Prime Minister Alexander Novak told state news agency Tass last week.

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Oil Market Highlights

Crude Oil Price Movements

In November, the OPEC Reference Basket (ORB) fell by $6.86, or 7.5%, m-o-m to average $84.92/b. Oil futures prices trended lower amid increased volatility, with the ICE Brent front-month contract dropping by $6.67, or 7.5%, m-o-m to $82.03/b, and the NYMEX WTI front-month contract dropping by $8.09, or 9.5%, to average $77.38/b. The DME Oman front-month contract dropped by $6.25, or 7.0%, m-o-m to settle at $83.06/b. The front-month ICE Brent/NYMEX WTI spread widened by $1.42 in November to average $4.65/b. The market structure weakened, with the front end of the ICE Brent and DME Oman futures forward curves flattening, while the nearest NYMEX WTI timespreads flipped into contango. Over the month, hedge funds and other money managers substantially reduced bullish positions, contributing to increased price volatility and exerting downward pressure on futures prices.

World Economy

The forecast for world economic growth is revised up slightly to 2.9% for 2023, but remains unchanged at 2.6% for 2024. US economic growth is revised up to 2.4% for 2023 and 1.0% for 2024. Eurozone economic growth remains unchanged at 0.2% for 2023 and 0.5% for 2024. Japan's economic growth is revised down to 1.7% for 2023 and 0.9% for 2024. China's forecast remains unchanged at 5.2% for 2023 and 4.8% for 2024. India's growth forecast is revised up to 6.5% for 2023, while growth for 2024 remains unchanged at 5.9%. Brazil's forecast also remains unchanged at 2.5% for 2023 and 1.2% for 2024. Russia's economic growth forecast is revised up to 2.2% for 2023 and 1.3% for 2024.

World Oil Demand

The world oil demand growth forecast for 2023 remains unchanged from last month's estimate at 2.5 mb/d. Downward revisions in the OECD Europe and Asia Pacific in 3Q23 and 4Q23 are offset by upward revisions in OECD Americas. Similarly, in the non-OECD, downward adjustments to the Middle East and Africa in 3Q23 and 4Q23 were offset by upward revisions in China, Other Asia, and Latin America. Oil demand in the OECD is expected to grow by around 0.1 mb/d in 2023 and by 2.4 mb/d in the non-OECD. For 2024, world oil demand is expected to grow by a healthy 2.2 mb/d, unchanged from the previous month's assessment. The OECD is expected to expand by about 0.3 mb/d, with OECD Americas contributing the largest increase. The non-OECD is expected to increase by around 2.0 mb/d, led by growth in China, India, the Middle East, and Other Asia.

World Oil Supply

The non-OPEC liquids supply growth forecast remains unchanged at 1.8 mb/d for 2023. The main drivers of liquids supply growth in 2023 include the US, Brazil, Kazakhstan, Norway, Guyana, Mexico and China. For 2024, non-OPEC liquids production is expected to expand by 1.4 mb/d, broadly unchanged from the previous month's assessment. The main drivers for liquids supply growth next year are expected to be the US, Canada, Guyana, Brazil, Norway and Kazakhstan. The largest declines are anticipated in Mexico and Malaysia. OPEC NGLs and non-conventional liquids are forecast to grow by around 50 tb/d to average 5.4 mb/d in 2023 and by another 65 tb/d in 2024 to average 5.5 mb/d. OPEC-13 crude oil production in November dropped by 57 tb/d m-o-m to average 27.84 mb/d, according to available secondary sources.

Product Markets and Refining Operations

In November, refinery margins decreased in the US Gulf Coast (USGC) as losses were seen across the barrel, except gasoil. US gasoline crack spreads continued to drop seasonality. This, coupled with rising refinery product output following the conclusion of heavy maintenance turnarounds, weighed on USGC refining economics. In Rotterdam and Singapore, margins remained under pressure, although slight improvements were seen m-o-m as refining margins were supported by lower feedstock prices and a positive performance at the top section of the barrel, backed by planned stock builds ahead of the year-end holiday season. Suppressed product exports from China also helped to sustain margins, particularly in Southeast Asia. Global refinery intakes witnessed a recovery in November, with a 1.7 mb/d rise to average 80.2 mb/d. Y-o-y, global intakes were 817 tb/d higher. In the coming months, with refineries back online, intakes are expected to be supported, although weakening margins may limit the upside.

Tanker Market

Dirty freight rates recovered further in November, on tightening availability, although they remained below the volatile levels seen in the same month last year. VLCC spot freight rates saw healthy gains, with rates on the Middle East-to-East route rising by 30% m-o-m. Suezmax rates saw a more measured increase, building on a spike in rates the month before. Suezmax rates on the USGC-to-Europe route increased by 9% m-o-m. Aframax rates rose, although gains were more muted East of Suez. Around the Mediterranean, Aframax rates rose by around 17% m-o-m. Clean rates saw mixed movement, with East of Suez rates falling by 24% m-o-m, while West of Suez rates rose 28%.

Crude and Refined Products Trade

Preliminary data shows US crude imports broadly stable at an average of 6.3 mb/d in November, while crude exports increased to 4.8 mb/d, the highest since March 2022. Meanwhile, China's crude imports recovered some of the previous month's decline, averaging 11.6 mb/d in October, a gain of almost 4% m-o-m. China's product exports slipped a further 8% m-o-m, with drops driven by gasoline, naphtha, and other products category. Following seven months of declines dating back to February 2023, India's crude imports increased, averaging 4.4 mb/d in October. India's product imports were the second-highest on record, driven by gains in LPG, naphtha and gasoline. Japan's crude imports declined by about 12% in October to average 2.3 mb/d. Product exports, including LPG, dropped from a seven-month high in September to average 494 tb/d. Declines were seen across most major products, except gasoline. Preliminary estimates show OECD Europe crude imports increasing slightly in November, while product imports are also seen gaining momentum.

Commercial Stock Movements

Preliminary data for October 2023 shows total OECD commercial oil stocks down by 12.8 mb, m-o-m. At 2,818 mb, they were 128 mb below the 2015–2019 average. Within the components, crude stocks rose by 11 mb, m-o-m, while products stocks fell by 23.8 mb, m-o-m. OECD commercial crude stocks stood at 1,342 mb in October, which is 112 mb lower than the 2015–2019 average. Total product stocks stood at 1,476 mb, which is 16 mb below the 2015–2019 average. In terms of days of forward cover, OECD commercial stocks in October remained unchanged, m-o-m, to stand at 61.7 days. This is 0.7 days less than the 2015–2019 average.

Balance of Supply and Demand

Demand for OPEC crude in 2023 remains unchanged from the previous month's assessment to stand at 29.1 mb/d. This is around 0.6 mb/d higher than in 2022. Demand for OPEC crude in 2024 also remains unchanged from the previous month's assessment to stand at 29.9 mb/d, which is 0.8 mb/d higher than the estimated level in 2023.

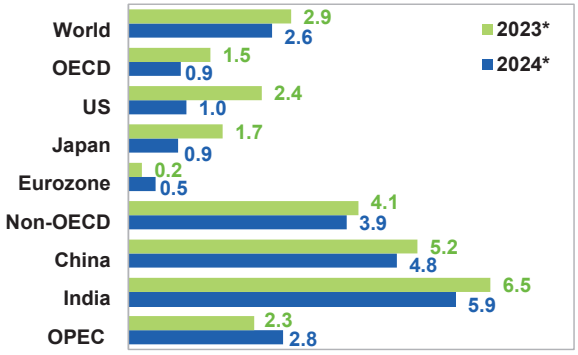
Feature Article

Review of 2023 and outlook for 2024

Economic growth seen in the first three quarters this year in most key economies had been better than expected. With this, the global economic forecast for 2023 is expected at 2.9%. As this robust economic growth is expected to extend into 2024, the global economic growth is forecasted at 2.6% for the year 2024.

In OECD economies, the robust growth observed in the US during 1H23 and 3Q23 is expected to moderate slightly, with a steady trajectory anticipated in 4Q23 and throughout 2024. The Eurozone that witnessed lower-than-anticipated growth up to 3Q23 is expected to see a slight pickup in 4Q23 and in 2024. Japan's economic growth exceeded its potential in 1H23, with a projected normalization in 2H23 and throughout 2024. In the non-OECD group, India, Brazil and Russia exhibited robust economic growth surpassing expectations up to 3Q23, with this trend expected to persist in 4Q23 and throughout 2024. In China, prudent government measures supported the country in achieving its 2023 growth target, with a marginal slowdown expected in 2024. Global economic challenges in 2024 remain with some upside potential, including an improved global macro environment driven by accommodative monetary policies and a more favourable geopolitical landscape.

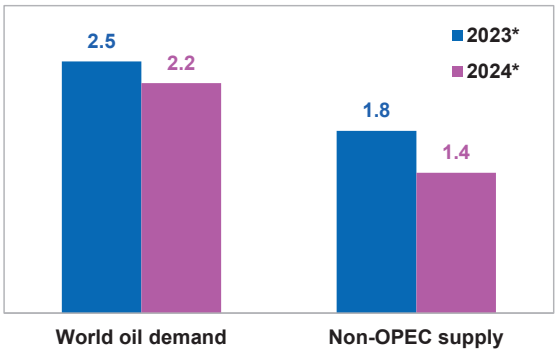
Graph 1: 2023–2024 real GDP growth in key countries and regions (%)



*Note: * 2023 and 2024 = Forecast. Source: OPEC.*

Expectations for economic growth in 2023 and 2024 are expected to play a defining role in shaping global oil demand. The forecast for y-o-y global oil demand growth in 2023 is 2.5 mb/d, primarily driven by the non-OECD at a robust 2.4 mb/d, y-o-y, expansion. China's economic rebound is a major driver, following the relaxation of COVID restrictions, contributing to a leading, y-o-y, growth of 1.2 mb/d. Within the OECD region, OECD Americas is expected to expand by 0.1 mb/d, y-o-y, driven by steady jet fuel recovery, coupled with robust gasoline requirements. Conversely, OECD Europe and Asia Pacific demand remains weak. Looking ahead to 2024, global oil demand is forecast to rise by a healthy 2.2 mb/d, y-o-y. OECD oil demand is expected to increase by 0.3 mb/d, predominantly in OECD Americas, with other regions also showing some growth. In the non-OECD, a 2.0 mb/d, y-o-y, increase is projected, with China and the Middle East leading the way, supported by Other Asia and India. This forecast centres on sustained economic and petrochemical activity across major consumer nations, which fosters demand for transportation fuels and distillates in 2024.

Graph 2: World oil demand and non-OPEC supply growth in 2023–2024 (mb/d)



*Note: * 2023 and 2024 = Forecast. Source: OPEC.*

On the supply side, non-OPEC supply growth is forecasted at 1.8 mb/d in 2023. Notably, the US is expected to account for around 70% of this expansion, with a, y-o-y, liquids production increase of 1.3 mb/d. Other key contributors to this growth include Brazil, Kazakhstan, Norway, Guyana, Mexico and China. As for 2024, non-OPEC supply is forecast to expand, y-o-y, by 1.4 mb/d. Growth drivers include US tight oil output, offshore start-ups in Latin America and the North Sea, and the expansion of oil sands projects in Canada. The US is projected again to lead the growth, comprising about 44% of the total, followed by Canada, Guyana, Brazil, Norway and Kazakhstan. Non-OPEC upstream sector investment is estimated at around $487 billion in 2023, up 11%, y-o-y, but this is forecast to drop slightly to around $482 billion in 2024.

As 2023 draws to an end, the OPEC Secretariat remains cautiously optimistic about the fundamental factors affecting oil market dynamics in 2024. In response to the broad spectrum of uncertainties that continues to surround the global oil market, many countries participating in DoC announced in November 2023 additional voluntary adjustments in 1Q24 to help maintain stability and balance in global oil markets. Indeed, countries participating in DoC will continue on these commitments to achieve and sustain a stable oil market and provide long-term guidance for the market.

World Oil Demand

The forecast for world oil demand growth in 2023 remains unchanged from last month's assessment at 2.5 mb/d. Oil demand was adjusted lower in 3Q22 and 4Q23 in the OECD Europe and Asia Pacific. This was offset by an upward revision in OECD Americas, due to better-than-expected growth, mainly from Canada. In non-OECD countries, downward revisions to the Middle East and Africa in 3Q23 and 4Q23 were offset by upward revisions in China, Other Asia, and Latin America. Total world oil demand is expected to average 102.1 mb/d in 2023, primarily driven by requirements from non-OECD countries.

In 2024, world oil demand growth is forecast at 2.2 mb/d for an average of 104.4 mb/d, unchanged from the previous assessment. Oil demand is expected to be supported by resilient global GDP growth, amid continued improvements in economic activity in China. The OECD is expected to grow by 0.3 mb/d to reach 46.1 mb/d. Oil demand in the OECD is not expected to surpass 2019 consumption levels. OECD Americas is seen as leading growth, while OECD Europe and Asia Pacific are expected to recover from their 2023 contraction, primarily supported by transportation fuels, particularly gasoline and jet/kerosene. In non-OECD, oil demand is projected to grow by a healthy 1.9 mb/d, at 58.3 mb/d. Continuous improvements in economic activity, steady manufacturing, and transportation activity mostly in China, Other Asia, and the Middle East, as well as in India and Latin America, are expected to account for the bulk of oil consumption.

In terms of oil products, transportation fuels – jet/kerosene, gasoline, and diesel – are expected to drive demand growth. Petrochemical feedstock is also expected to support oil demand in the non-OECD region. However, the forecast is subject to global economic developments, particularly uncertainties about the OECD's manufacturing and petrochemical sectors.

Table 4 - 1: World oil demand in 2023*, mb/d

							Change 2023/22	
World oil demand	2022	1Q23	2Q23	3Q23	4Q23	2023	Growth	%
Americas	24.87	24.52	25.21	25.47	24.94	25.04	0.17	0.68
of which US	*20.16*	*19.92*	*20.50*	*20.47*	*20.05*	*20.24*	*0.08*	*0.38*
Europe	13.51	13.10	13.54	13.67	13.34	13.41	-0.09	-0.70
Asia Pacific	7.38	7.81	6.96	7.07	7.65	7.37	-0.01	-0.12
Total OECD	**45.75**	**45.43**	**45.71**	**46.20**	**45.93**	**45.82**	**0.07**	**0.14**
China	14.95	15.73	16.06	16.27	16.37	16.11	1.16	7.75
India	5.14	5.40	5.40	5.17	5.50	5.37	0.23	4.48
Other Asia	9.06	9.33	9.48	9.12	9.18	9.28	0.22	2.37
Latin America	6.44	6.60	6.70	6.75	6.68	6.68	0.25	3.83
Middle East	8.30	8.63	8.32	8.82	8.73	8.63	0.33	3.98
Africa	4.40	4.59	4.24	4.27	4.83	4.48	0.08	1.85
Russia	3.70	3.83	3.59	3.74	4.01	3.79	0.09	2.40
Other Eurasia	1.15	1.24	1.21	1.02	1.23	1.17	0.02	2.03
Other Europe	0.77	0.79	0.77	0.75	0.83	0.79	0.02	2.29
Total Non-OECD	**53.90**	**56.15**	**55.76**	**55.92**	**57.35**	**56.29**	**2.39**	**4.44**
Total World	**99.66**	**101.57**	**101.47**	**102.12**	**103.28**	**102.11**	**2.46**	**2.47**
Previous Estimate	99.66	101.58	101.47	102.11	103.28	102.11	2.46	2.47
Revision	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	0.00

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

Source: OPEC.

Table 4 - 2: World oil demand in 2024*, mb/d

World oil demand	2023	1Q24	2Q24	3Q24	4Q24	2024	Change 2024/23 Growth	Change 2024/23 %
Americas	25.04	24.70	25.38	25.67	25.10	25.22	0.18	0.72
of which US	*20.24*	*20.06*	*20.64*	*20.62*	*20.19*	*20.38*	*0.14*	*0.70*
Europe	13.41	13.16	13.60	13.74	13.38	13.47	0.06	0.41
Asia Pacific	7.37	7.84	6.97	7.10	7.65	7.39	0.02	0.29
Total OECD	**45.82**	**45.70**	**45.96**	**46.51**	**46.13**	**46.08**	**0.26**	**0.56**
China	16.11	16.30	16.52	16.89	17.04	16.69	0.58	3.60
India	5.37	5.63	5.64	5.40	5.69	5.59	0.22	4.10
Other Asia	9.28	9.60	9.73	9.48	9.54	9.59	0.31	3.34
Latin America	6.68	6.79	6.88	6.97	6.84	6.87	0.19	2.84
Middle East	8.63	8.91	8.76	9.38	8.98	9.01	0.38	4.40
Africa	4.48	4.70	4.42	4.44	4.96	4.63	0.15	3.35
Russia	3.79	3.89	3.70	3.89	4.08	3.89	0.10	2.65
Other Eurasia	1.17	1.27	1.24	1.08	1.28	1.22	0.04	3.77
Other Europe	0.79	0.81	0.78	0.77	0.84	0.80	0.01	1.75
Total Non-OECD	**56.29**	**57.90**	**57.68**	**58.29**	**59.25**	**58.28**	**1.99**	**3.53**
Total World	**102.11**	**103.60**	**103.64**	**104.80**	**105.38**	**104.36**	**2.25**	**2.20**
Previous Estimate	102.11	103.60	103.64	104.79	105.38	104.36	2.25	2.20
Revision	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	0.00

*Note: * 2024 = Forecast. Totals may not add up due to independent rounding.*
Source: OPEC.

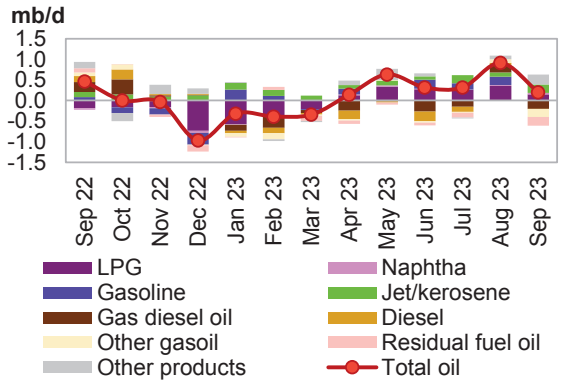
OECD

OECD Americas

Update on the latest developments

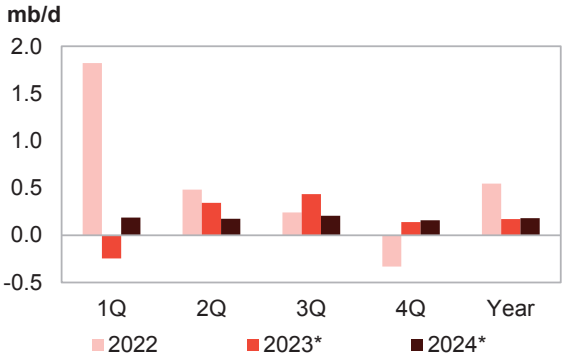
Oil demand in OECD Americas increased by 202 tb/d, y-o-y, in September. The increase in demand is almost entirely from Canada, as US oil demand softened marginally by 40 tb/d, y-o-y. Details of the contribution of various products show that the 'other products' category led demand growth in the region with 238 tb/d, y-o-y. On the back of healthy air travel demand, jet kerosene increased by 207 tb/d, y-o-y. In terms of petrochemical feedstock requirements, LPG posted 147 tb/d y-o-y growth and naphtha increased 35 tb/d. However, diesel and residual fuels declined by 197 tb/d and 212 tb/d, respectively, in September and gasoline demand remained flat.

Graph 4 - 1: OECD Americas oil demand by main petroleum product category, y-o-y change



Sources: IEA, JODI, OPEC and national sources.

Graph 4 - 2: OECD Americas oil demand, y-o-y change



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

Oil demand in the **US** softened marginally by 40 tb/d, y-o-y, in September. Oil demand was subdued amid large declines in diesel and residual fuels.

Data from the Federal Highway Administration shows that miles travelled on all roads increased by 0.9%, y-o-y in September. However, the seasonally adjusted vehicle miles travelled for September declined by 0.30% (0.8 billion vehicle miles) compared with August 2023.

In terms of air travel, American Airlines' domestic revenue passenger-kilometres (RPKs) grew by 5.5% y-o-y and by 6.1% over the pre-COVID levels in September 2019 according to a report from the International Air Travel Association (IATA). Regarding airline capacity, available seat kilometres (ASKs) climbed by 9.6% y-o-y, while revenue passenger-kilometres (RPKs) increased by 11.2% y-o-y.

Residual fuels and diesel sustained declines of 244 tb/d and 166 tb/d, y-o-y, respectively, and gasoline softened by 15 tb/d.

On the positive side, oil demand growth was led by the 'other products' category, growing by 194 tb/d. On the back of healthy air travel activity, jet/kerosene expanded by 159 tb/d, y-o-y, up from 58 tb/d y-o-y growth seen in the previous month. In terms of petrochemical feedstock requirement, naphtha demand increased 23 tb/d, y-o-y, and LPG saw 12 tb/d y-o-y growth.

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

By product	Sep 22	Sep 23	Change Growth	Sep 23/Sep 22 %
LPG	3.16	3.17	0.01	0.4
Naphtha	0.13	0.15	0.02	17.8
Gasoline	8.85	8.83	-0.01	-0.2
Jet/kerosene	1.54	1.70	0.16	10.3
Diesel	4.09	3.92	-0.17	-4.1
Fuel oil	0.47	0.22	-0.24	-52.5
Other products	2.19	2.39	0.19	8.8
Total	**20.42**	**20.38**	**-0.04**	**-0.2**

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

Sources: EIA and OPEC.

Near-term expectations

In **2024**, economic activity in the US is expected to remain healthy, supported by private household consumption.

In 1Q24, the US GDP growth is forecast to continue to bolster oil demand. Specifically, further improvements in air travel are expected to support jet/kerosene demand. Heating fuels are also expected to see an uptick due to seasonal winter demand. However, industrial output has been on a prolonged downward trend, and road transportation is expected to soften during the winter season, thus dampening diesel and gasoline demand. Nevertheless, oil demand is projected to increase by about 135 tb/d y-o-y in 1Q24, mostly supported by demand for jet/kerosene and LPG.

Overall, US oil demand in 2024 is expected to expand by 143 tb/d, mostly supported by transportation fuels and light distillates.

OECD Europe

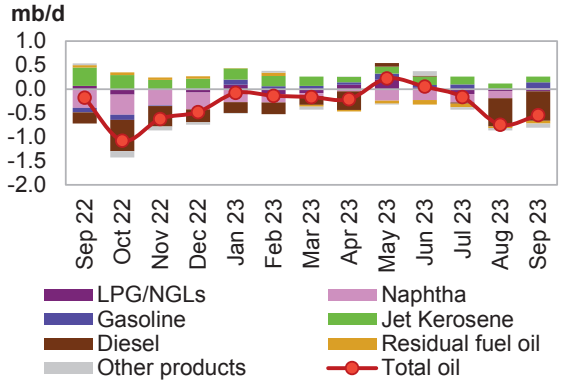
Update on the latest developments

Oil demand in OECD Europe remained under pressure from weak manufacturing and petrochemical activity in the region. Oil demand declined for the third consecutive month by 542 tb/d, y-o-y, in September, albeit an improvement from a 743 tb/d decline seen in August. Manufacturing activity in the big economies of the region remains sluggish.

The German economy has the weakest outlook. The country's manufacturing PMI has seen fifteen consecutive months of contraction and was at 39.6 points in September. Similarly, France's PMI has been in contraction for eight months. In September, the country's PMI fell to 44 points. Other countries in the region, such as Italy, Spain, and the UK, have all experienced similar weaknesses in their manufacturing sectors in recent months.

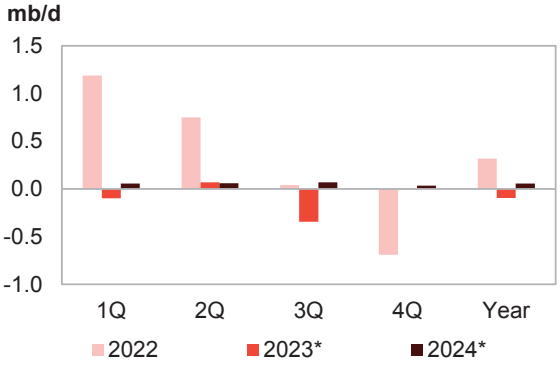
In addition, persistently high core inflation in the region compounded the problem. Eurozone annual inflation stood at 4.3%, y-o-y, in September, albeit an improvement from 5.2% seen in the previous month. Despite this, inflation remains above the 2% target set by the ECB. The services PMI in the region was also below expansion territory at 48.6 points in September.

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



Sources: IEA, JODI, OPEC and national sources.

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



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

Subdued by weak manufacturing activity in the region, diesel demand recorded the largest contraction of 616 tb/d, y-o-y, compared with a 586 tb/d decline in the previous month. Prolonged deceleration in petrochemical activities weighed on LPG, which declined by 44 tb/d, y-o-y. Nevertheless, naphtha has recovered by 19 tb/d, from an annual decline of 150 tb/d in August. Furthermore, demand for the 'other product' category and residual fuels softened by 80 tb/d and 61 tb/d, respectively, y-o-y.

On the positive side, healthy transportation activity supported transportation fuels demand to remain steady. Gasoline surged further by 123 tb/d, y-o-y, from 13 tb/d growth in the previous month. Jet/kerosene also expanded by 120 tb/d, y-o-y, up from 106 tb/d recorded in August.

Near-term expectations

Looking ahead to **2024**, the region's economy is expected to show a gradual recovery. Furthermore, activity in the manufacturing sector is expected to see some improvement. Oil demand is projected to see growth of 57 tb/d, y-o-y, in 1Q24, mainly supported by regional jet/kerosene and gasoline consumption on the back of air and road travel and transportation activity. However, ongoing weak manufacturing and petrochemical activity are anticipated to weigh on industrial fuels and petrochemical feedstock.

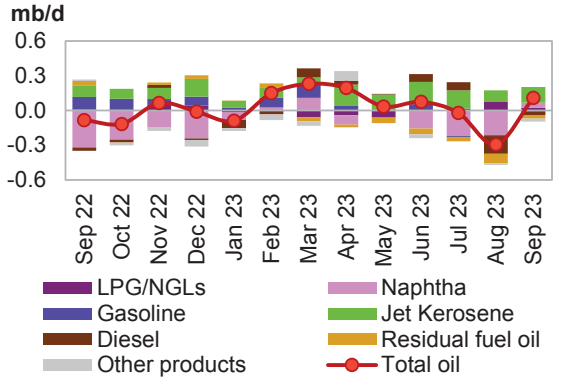
For the year, the region is expected to see growth of 55 tb/d, y-o-y, mostly supported by transportation fuels. Moreover, an expected gradual recovery in manufacturing activity is expected to bolster diesel demand in the region.

OECD Asia Pacific

Update on the latest developments

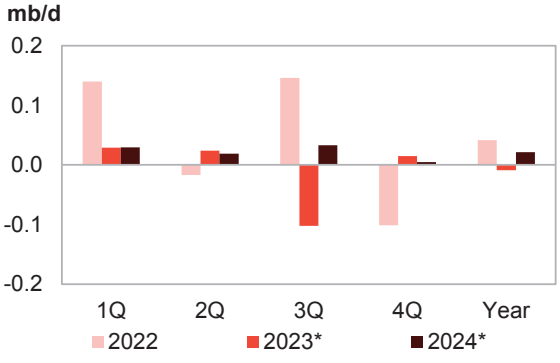
Oil demand in OECD Asia Pacific recovered by 108 tb/d, y-o-y, in September after two successive months of decline. The demand recovery was supported by jet/kerosene which grew by 25%, y-o-y. Similarly, healthy petrochemical feedstock requirements also supported demand.

Graph 4 - 5: OECD Asia Pacific oil demand by main petroleum product category, y-o-y change



Sources: IEA, JODI, METI and OPEC.

Graph 4 - 6: OECD Asia Pacific oil demand, y-o-y change



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

According to a report by IATA, the international revenue passenger-kilometres (RPKs) in the Asia Pacific region surged 93% y-o-y in September. This brought traffic for the region's carriers within 20% of their 2019 levels.

Jet/kerosene led September oil demand growth by 137 tb/d, y-o-y, up from 98 tb/d observed in the previous month. The demand for jet/kerosene was healthy across all three major consuming countries in the region. After a long dismal performance, petrochemical feedstock demand in the region has shown signs of recovery, with naphtha growing by 43 tb/d, y-o-y from the decline of 212 tb/d seen in August. Similarly, LPG inched up by 24 tb/d, y-o-y albeit slowing from 77 tb/d growth observed in August.

However, gasoline demand in the region softened by 12 tb/d, although South Korea and Japan saw an increase in gasoline demand of 11 tb/d and 13 tb/d, respectively. Similarly, diesel also saw an annual decline of 26 tb/d, albeit an improvement from the 127 tb/d decline in the previous month. The decline in diesel demand was in Australia and Japan, as South Korea posted 12 tb/d, y-o-y, growth. Finally, residual fuels and the 'other products' category saw annual declines of 26 tb/d and 32 tb/d, respectively.

Near-term expectations

Looking ahead to **2024**, the region's economy is expected to grow modestly, albeit with variations among the region's countries. The forward-looking indicators – services and manufacturing PMIs – have also been in variance among the major oil-consuming countries of the region.

Despite being in the expansionary zone for over a year, Japan's service PMI slightly retracted to 51.6 points in October, from 53.2 points in September. The GDP of Japan is also forecast to slightly decelerate. The manufacturing PMI has also been below an expansionary trajectory for a prolonged period.

Similarly, services and manufacturing PMIs in Australia were in contraction in both September and October. Nevertheless, the South Korean manufacturing PMI saw an uptick. It rose from 50.5 in October to 51.2 in November.

Steady air traffic recovery amid healthy driving activity and petrochemical industry operations are anticipated to support oil demand to grow by 30 tb/d y-o-y in 1Q24. Moreover, following expected temperature declines during the winter season, extended government energy subsidies in Japan are also expected to support oil demand.

Despite the expected slowdown in economic momentum in the region, a healthy air travel dynamic and recovering petrochemical sector requirements are expected to support oil demand growth. As a result, OECD Asia Pacific is expected to grow by 22 tb/d, y-o-y, in 2024.

Non-OECD

China

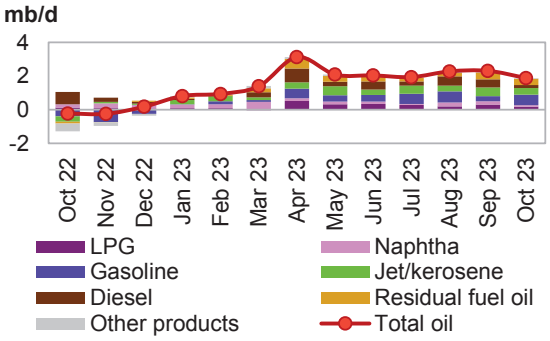
Update on the latest developments

Oil demand in China remained firm at about 2.0 mb/d, y-o-y, growth in October. Incremental demand was almost the same as in the previous month. The growth was partly supported by a weak baseline comparison and healthy economic activity amid a steady petrochemical feedstock requirement.

The forward-looking indicators show that China's services PMI was at 50.4 points in October, slightly above the 50.2 points seen in September. Manufacturing PMI retracted to 49.5 points in October, from 50.6 in September. Transportation activity in China surged during the Golden Week public holiday. According to China's National Bureau of Statistics, passenger traffic in terms of 100 million person-kilometres recorded 23.5% y-o-y growth in October, up from 20.9% seen in September. Similarly, according to the China Association of Automobile Manufacturers (CAAM), Chinese vehicle sales increased by 13.8%, y-o-y, in October.

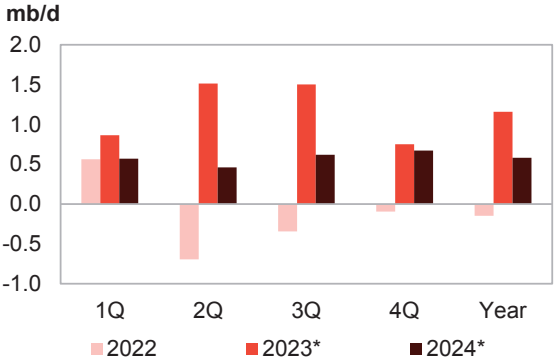
Furthermore, air travel activity also remained healthy. According to a report by China's Civil Aviation Authority, activities on domestic routes jumped 220% y-o-y in October, while international routes recorded a 78% increase. The significant rise in traffic in early October was due to a surge in international travels during the Golden Week public holiday, as passengers travelling out of or into China jumped by 85% compared to the same period in 2019 and almost three times that of a year ago, data from the National Immigration Administration (NIA) showed.

Graph 4 - 7: China's oil demand by main petroleum product category, y-o-y change



Sources: Chinese Petroleum Data Monthly, Chinese National Bureau of Statistics, JODI, Non-OECD Energy Statistics, Argus Global Markets, Argus China, and OPEC.

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



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

On the back of surging transportation activity amidst a low baseline, gasoline demand increased 618 tb/d, y-o-y, in October, up from growth of 383 tb/d in the previous month. Meanwhile, jet/kerosene saw growth of 392 tb/d, y-o-y, supported by the low baseline, but was below the 520 tb/d recorded in September. Since mid-October, domestic flights have fallen back to 2019 levels after rising by as much as 20% above these during the end-September to early-October holiday week.

Residual fuels increased by 370 tb/d, y-o-y. Diesel demand grew by 186 tb/d, y-o-y, below September's growth of 478 tb/d. In terms of petrochemical feedstock, LPG posted 183 tb/d y-o-y, growth, down from 310 tb/d in the previous month, and naphtha increased by 88 tb/d, y-o-y, down from 190 tb/d the month before. Finally, the 'other products' category increased by 40 tb/d, y-o-y, with growth subdued by a high baseline comparison.

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

By product	Oct 22	Oct 23	Change Growth	Oct 23/Oct 22 %
LPG	2.62	2.80	0.18	7.0
Naphtha	1.87	1.95	0.09	4.7
Gasoline	3.23	3.84	0.62	19.2
Jet/kerosene	0.39	0.78	0.39	100.6
Diesel	4.67	4.86	0.19	4.0
Fuel oil	0.62	0.99	0.37	59.5
Other products	2.18	2.21	0.04	1.8
Total	**15.57**	**17.45**	**1.88**	**12.1**

*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

Despite the current healthy economic and services sector activity, recent Chinese economic indicators have highlighted a slowing trend in industrial production. Accordingly, the momentum of oil demand is anticipated to slow from the strong growth experienced in 4Q23. Nevertheless, growing petrochemical capacity in China's Shandong-based Yulong Petrochemical plant – which should start its 400 tb/d refining complex in 1Q24 – is expected to strengthen petrochemical feedstock demand, boosting demand for naphtha in the near term. Additionally, China's jet fuel demand is expected to increase on the prospect of rising air transportation demand. Forward-looking indicators also point towards a healthy oil demand in the near term, with services PMI inching up from 50.4 points in October to 51.5 points in November. Similarly, manufacturing PMI rose from 49.5 points in October to 50.7 points in November. Accordingly, oil demand in China is anticipated to grow by a healthy 571 tb/d, y-o-y, in 1Q24.

Overall, in **2024**, despite an expected easing in the momentum of China's GDP growth compared to 2023, oil demand is expected to be supported by sustained healthy services sector activity, a recovery in manufacturing activity, and petrochemical sector requirements. Moreover, a further surge in international air travel is expected as China has lifted the ban on overseas group tours. This could encourage more people to travel abroad. Furthermore, demand for light distillates is also expected to continue rising on the back of a sustained expansion of the petrochemical industry. Increased transportation activity is expected to boost demand for gasoline and diesel. For the year, China's oil demand is anticipated to expand by 580 tb/d, y-o-y.

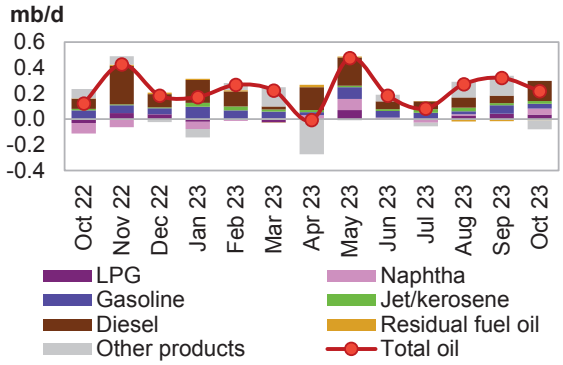
India

Update on the latest developments

Oil demand in India in October was firm at 218 tb/d, y-o-y, growth, slightly below the 320 tb/d growth recorded in the previous month. Diesel was the main driver of growth in October.

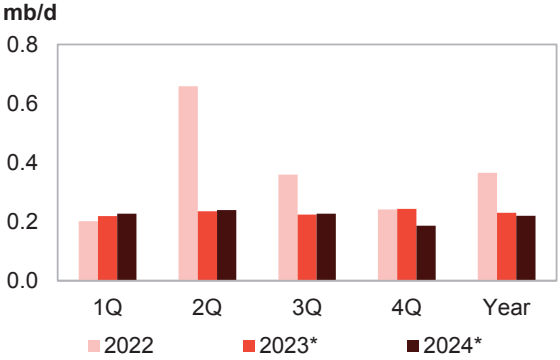
A report from the Ministry of Statistics and Program Implementation shows industrial production in India climbed 5.9%, y-o-y, in September 2023. Similarly, India's annual retail inflation eased to a four-month low of 4.9% in October from 5.0% in September. According to the Federation of Automobile Dealers Association, vehicle sales in India also increased by 12% in October, up from 3.5% recorded in September 2023. Indian domestic air traffic stood above pre-pandemic levels for the seventh consecutive month, as revenue passenger-kilometres (RPKs) increased 6.7% in September over 2019 levels. In October, India's services PMI stood at 58.4 points and manufacturing PMI was at 55.5 points.

Graph 4 - 9: India's oil demand by main petroleum product category, y-o-y change



Sources: PPAC, JODI, Non-OECD Energy Statistics and OPEC.

Graph 4 - 10: India's oil demand, y-o-y change



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

In terms of oil products, diesel oil demand grew by 157 tb/d, y-o-y, in October. Diesel consumption increased 14.8%, m-o-m, supported by rising industrial activity and the onset of the festival season amid the sowing of winter crops. Furthermore, trucking activities also increased in October due to the need to transport goods along the supply chain as sellers stocked up to meet the rising demand for goods during the festival season. In terms of petrochemical sector requirements, naphtha saw 45 tb/d, y-o-y, growth from a decline of 32 tb/d in the previous month. LPG increased by 36 tb/d, y-o-y, in October, from 43 tb/d in September. LPG slightly declined by 5% m-o-m after the government raised LPG cylinder prices in October. Higher demand during the Diwali festival season, amid increased economic activity, supported gasoline and jet/kerosene to grow by 39 tb/d, y-o-y, and 19 tb/d, y-o-y. However, the 'other products' category and residual fuels declined by 71 tb/d and 8 tb/d, respectively.

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

By product	Oct 22	Oct 23	Change Growth	Oct 23/Oct 22 %
LPG	0.90	0.94	0.04	4.0
Naphtha	0.28	0.32	0.05	16.4
Gasoline	0.82	0.86	0.04	4.8
Jet/kerosene	0.17	0.18	0.02	11.6
Diesel	1.70	1.85	0.16	9.3
Fuel oil	0.12	0.11	-0.01	-6.9
Other products	1.09	1.02	-0.07	-6.5
Total	**5.07**	**5.29**	**0.22**	**4.3**

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

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

Near-term expectations

In the near term, ongoing strong economic activity combined with robust manufacturing activity, amid the Indian government's proposed increase in capital spending on construction, are expected to support India's oil demand in 1Q24. Moreover, the post-monsoon harvesting season and construction activity are also expected to provide additional support to demand growth. Furthermore, forward-looking indicators show healthy manufacturing and services PMIs, suggesting strong prospects for oil demand in the near term.

In 1Q24, oil demand is projected to grow by a healthy 227 tb/d, y-o-y. Distillates are expected to be the driver of oil demand growth, supported by harvesting, construction and manufacturing activities. Additionally, annual traditional festivities and the influx of travellers are expected to support transportation activity and boost gasoline and jet/kerosene demand. Overall, in **2024**, India is expected to see a healthy oil demand growth of 220 tb/d, y-o-y.

Latin America

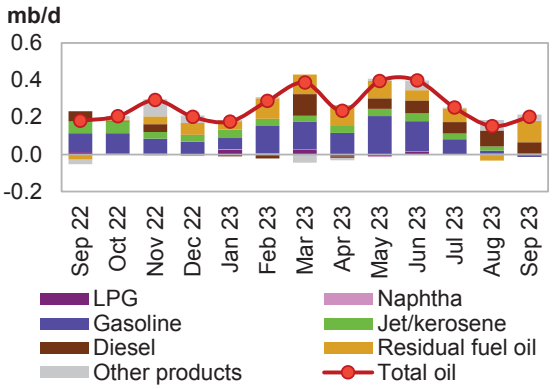
Update on the latest developments

Oil demand in Latin America expanded by 201 tb/d, y-o-y, in September from 152 tb/d growth in August. Oil demand in the region was led by diesel requirements from Brazil for the second consecutive month.

The Brazilian services PMI retracted to 48.7 points in September, following 50.6 points in August. At the same time, the Brazilian manufacturing PMI retracted to 49 points in September from 50.1 points in August.

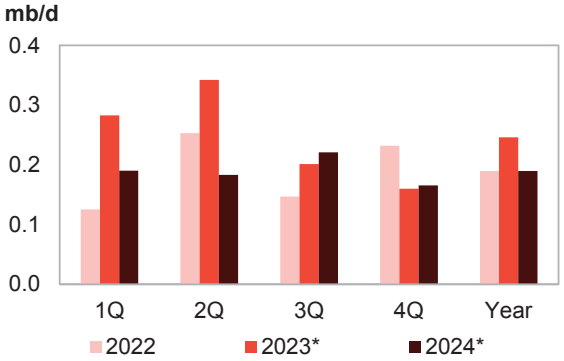
In terms of air travel, according to IATA, Latin American carriers expanded their recovery beyond pre-COVID levels in September, with a remarkable 26.8% annual growth in international RPKs.

Graph 4 - 11: Latin America's oil demand by main petroleum product category, y-o-y change



Sources: JODI, Non-OECD Energy Statistics and OPEC.

Graph 4 - 12: Latin America's oil demand, y-o-y change



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

In terms of specific product demand, residual fuel was the main driver of demand in September with y-o-y growth of 114 tb/d, up from 33 tb/d in August. Diesel grew by 61 tb/d, y-o-y, slightly below the 84 tb/d growth seen in the previous month. In addition, the ´other products´ category expanded by 34 tb/d, y-o-y, from 57 tb/d growth in August. Jet/kerosene saw 5 tb/d growth, y-o-y, down from 23 tb/d growth recorded a month earlier. However, gasoline softened by 10 tb/d, y-o-y, from the 14 tb/d growth in August. Finally, in terms of petrochemical feedstock, the demand for both LPG and naphtha has remained broadly flat for three consecutive months.

Near-term expectations

Looking ahead, in the near term, oil demand in the region is expected to remain relatively strong amid projected healthy economic growth, a steady recovery in air travel, and ongoing support from the services and manufacturing sectors. These are anticipated to support regional oil demand to grow by 190 tb/d, y-o-y, in 1Q24.

Overall, in **2024**, continued healthy economic activity combined with improvements in both manufacturing activity and air travel are expected to support oil demand to expand by 190 tb/d, y-o-y. The outlook for oil demand growth sees transportation fuel demand expanding the most, followed by diesel and petrochemical feedstock.

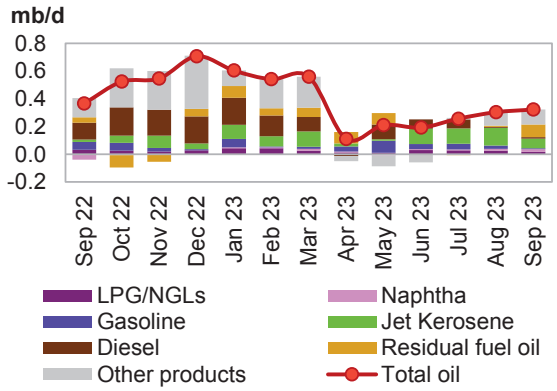
Middle East

Update on the latest developments

Oil demand in the Middle East in September expanded by 323 tb/d, y-o-y. The growth was mostly supported by demand for the ´other products´ category from Iraq and Saudi Arabia.

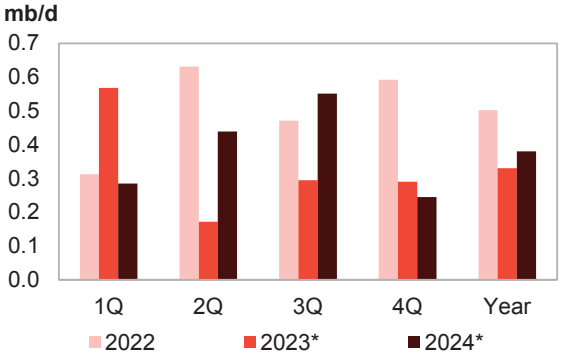
Ongoing strong oil demand in the region is supported by healthy economic activity. The composite PMIs in Saudi Arabia and the UAE have been consistently on an expansionary trajectory for more than one year. In September, the composite PMI in Saudi Arabia and the UAE were at 57.1 points and 56.6 points. Moreover, in terms of air travel, IATA reported that Middle Eastern carriers saw 26%, y-o-y, growth in international RPKs in August, and traffic levels are only 5% below a full recovery.

Graph 4 - 13: Middle East's oil demand by main petroleum product category, y-o-y change



Sources: JODI, Non-OECD Energy Statistics and OPEC.

Graph 4 - 14: Middle East's oil demand, y-o-y change



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

In terms of specific product demand, the 'other products' category led demand growth by 109 tb/d y-o-y, which was higher than the 100 tb/d seen in the previous month. Residual fuels posted 91 tb/d growth, y-o-y, from zero growth seen last month. On the back of healthy air travel activity, jet/kerosene recorded 68 tb/d, y-o-y growth, slightly below 131 tb/d growth seen the previous month. In terms of petrochemical feedstock, LPG posted 17 tb/d growth, y-o-y, and naphtha saw growth of 20 tb/d, y-o-y. Finally, gasoline expanded by 8 tb/d, y-o-y.

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

By product	Oct 22	Oct 23	Change Growth	Oct 23/Oct 22 %
LPG	0.06	0.07	0.00	7.6
Naphtha	0.00	0.01	0.01	890.6
Gasoline	0.19	0.20	0.01	4.6
Jet/kerosene	0.01	0.04	0.03	227.9
Diesel	0.17	0.17	0.00	0.1
Fuel oil	0.22	0.30	0.08	37.2
Other products	0.18	0.17	-0.01	-7.0
Total	**0.83**	**0.95**	**0.12**	**14.4**

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

Sources: JODI and OPEC.

Near-term expectations

Looking ahead, the current momentum of economic activity in the region is expected to be sustained into the 1Q24. In addition, strong international air traffic is expected to continue. Accordingly, these factors are expected to support oil demand growth in the region, which is forecast to expand by 285 tb/d y-o-y in 1Q24. Moreover, composite PMIs in Saudi Arabia and UAE point to healthy economic and business activity in the near term. The Composite PMI in Saudi Arabia increased to 59 points in October, up from 57 points in September. In the UAE, the Composite PMI rose from 56.5 in September to 58.4 in October, respectively.

Overall, in **2024**, the economic activity in the region is expected to remain healthy. GDP growth rates are forecast to surpass those of 2023. In addition, transportation activity is expected to remain healthy, supporting gasoline, transportation diesel and jet/kerosene. Accordingly, the Middle East is expected to see an average growth of 380 tb/d, y-o-y. The bulk of demand growth is expected to come from Iraq, Saudi Arabia, and the UAE.

World Oil Supply

Non-OPEC liquids production in 2023 is expected to grow by 1.8 mb/d, y-o-y, reaching 67.6 mb/d. Upward revisions to the forecasts for Latin America offset downward revisions to Other Asia, the UK and Other Eurasia.

US crude and condensate production as well as NGL output continue to reach new highs. Total US liquids output reached a record 21.6 mb/d in September due to persistent outperformance of onshore and offshore production. Accordingly, US liquids supply growth for 2023 is forecast at 1.3 mb/d. In addition to the US, the other main growth drivers for 2023 are expected to be Brazil, Kazakhstan, Norway, Guyana, Mexico and China. Nonetheless, there are still uncertainties with regard to weather-related disruptions and unplanned offshore maintenance for the rest of the year.

Non-OPEC liquids production in 2024 is forecast to grow by 1.4 mb/d to average 69.0 mb/d (including 50 tb/d in processing gains). OECD liquids supply is forecast to increase by 0.9 mb/d to average 33.4 mb/d, while non-OECD liquids supply is seen growing by 0.4 mb/d to average at 33.1 mb/d. The main drivers for the expected growth are the US, Canada, Guyana, Brazil, Norway and Kazakhstan. In addition to the US shale basins, accounting for about 48% of expected non-OPEC liquids supply growth, offshore project ramp-ups are expected to substantially support growth next year. At the same time, production is forecast to see the largest declines in Mexico and Malaysia.

OPEC NGLs and non-conventional liquids production in 2023 is forecast to grow by about 50 tb/d to average 5.4 mb/d and to increase by 65 tb/d to average 5.5 mb/d in 2024. OPEC-13 crude oil production in November decreased by 57 tb/d, m-o-m, to average 27.84 mb/d, according to available secondary sources.

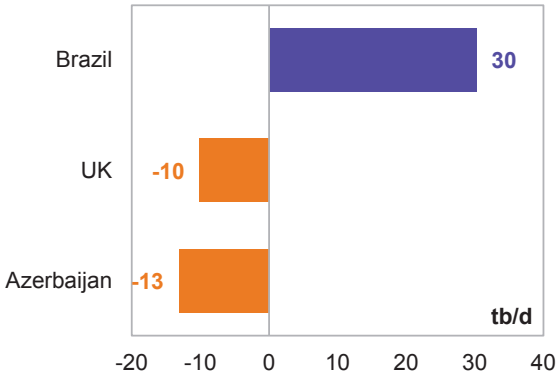
Non-OPEC liquids production in November, including OPEC NGLs, is estimated to have decreased by 0.4 mb/d, m-o-m, to average 73.9 mb/d. This represents an increase of 0.9 mb/d, y-o-y. As a result, preliminary data indicates that November's global oil supply was down by 0.43 mb/d, m-o-m, averaging 101.74 mb/d, and decreased by 0.15 mb/d, y-o-y.

Non-OPEC liquids production in 2023 is forecast to expand by 1.8 mb/d. This is broadly unchanged from the previous month's growth assessment.

Overall **OECD supply growth** for 2023 is marginally revised up. While OECD Europe sees a downward revision due to the UK, OECD Americas is revised up. OECD Asia Pacific's output growth is expected to remain largely unchanged.

The **non-OECD supply growth** forecast for 2023 remained broadly unchanged at 0.2 mb/d y-o-y. Latin America is expected to be the main growth driver in the non-OECD region followed by Other Eurasia and China.

Graph 5 - 1: Major revisions to annual supply change forecast in 2023*, MOMR Dec 23/Nov 23

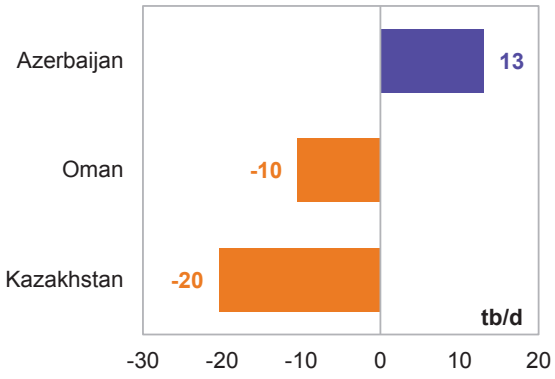


*Note: * 2023 = Forecast. Source: OPEC.*

The **non-OPEC liquids production** growth forecast in **2024** remains broadly unchanged compared with the previous month's assessment at 1.4 mb/d.

Downward revisions to the supply forecasts of Kazakhstan and Oman primarily offset by upward revisions to a few other countries.

Graph 5 - 2: Major revisions to annual supply change forecast in 2024*, MOMR Dec 23/Nov 23

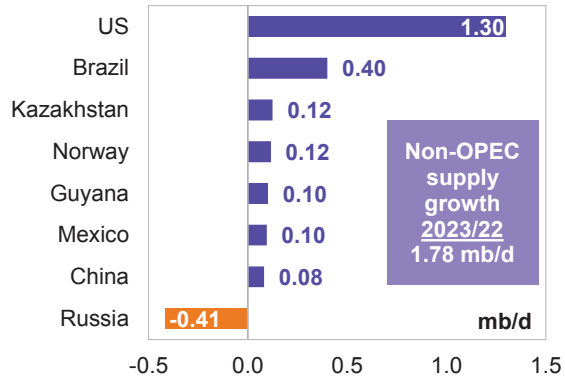


*Note: * 2024 = Forecast. Source: OPEC.*

Key drivers of growth and decline

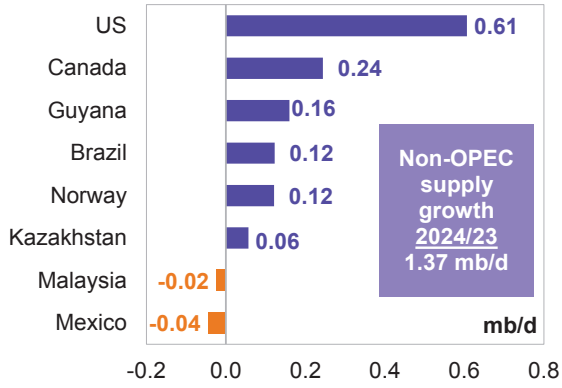
The **key drivers of non-OPEC liquids supply growth in 2023** are projected to be the US, Brazil, Kazakhstan, Norway, Guyana, Mexico and China, while oil production is forecast to see the largest decline in Russia.

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



*Note: * 2023 = Forecast. Source: OPEC.*

Graph 5 - 4: Annual liquids production changes y-o-y for selected countries in 2024*



*Note: * 2024 = Forecast. Source: OPEC.*

For **2024**, the key drivers of non-OPEC supply growth are forecast to be the US, Canada, Guyana, Brazil, Norway and Kazakhstan, while oil production is projected to see the largest declines in Mexico and Malaysia.

Non-OPEC liquids production in 2023 and 2024

Table 5 - 1: Non-OPEC liquids production in 2023*, mb/d

Non-OPEC liquids production	2022	1Q23	2Q23	3Q23	4Q23	2023	Change 2023/22 Growth	Change 2023/22 %
Americas	26.91	27.90	28.18	29.02	28.24	28.34	1.42	5.29
of which US	*19.28*	*20.10*	*20.70*	*21.20*	*20.33*	*20.58*	*1.30*	*6.74*
Europe	3.58	3.69	3.65	3.54	3.69	3.64	0.06	1.72
Asia Pacific	0.48	0.45	0.45	0.44	0.47	0.45	-0.02	-4.95
Total OECD	**30.97**	**32.04**	**32.28**	**33.01**	**32.40**	**32.43**	**1.46**	**4.72**
China	4.48	4.63	4.63	4.49	4.49	4.56	0.08	1.82
India	0.77	0.76	0.78	0.78	0.77	0.77	0.00	0.05
Other Asia	2.30	2.31	2.25	2.24	2.27	2.27	-0.03	-1.41
Latin America	6.34	6.69	6.76	7.06	7.04	6.89	0.55	8.73
Middle East	3.29	3.27	3.29	3.27	3.29	3.28	-0.01	-0.25
Africa	1.29	1.24	1.27	1.27	1.28	1.27	-0.03	-2.04
Russia	11.03	11.19	10.86	10.78	9.66	10.62	-0.41	-3.75
Other Eurasia	2.83	2.99	2.93	2.82	2.95	2.92	0.10	3.37
Other Europe	0.11	0.11	0.10	0.10	0.10	0.10	0.00	-2.73
Total Non-OECD	**32.44**	**33.21**	**32.88**	**32.82**	**31.86**	**32.69**	**0.25**	**0.76**
Total Non-OPEC production	63.41	65.25	65.15	65.83	64.26	65.12	1.71	2.69
Processing gains	2.40	2.47	2.47	2.47	2.47	2.47	0.07	2.96
Total Non-OPEC liquids production	**65.81**	**67.72**	**67.62**	**68.29**	**66.73**	**67.59**	**1.78**	**2.70**
Previous estimate	65.81	67.72	67.63	68.11	66.92	67.59	1.78	2.70
Revision	0.00	0.00	0.00	0.19	-0.19	0.00	0.00	0.00

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

Source: OPEC.

Table 5 - 2: Non-OPEC liquids production in 2024*, mb/d

Non-OPEC liquids production	2023	1Q24	2Q24	3Q24	4Q24	2024	Change 2024/23 Growth	Change 2024/23 %
Americas	28.34	28.80	28.84	29.31	29.62	29.14	0.81	2.84
of which US	*20.58*	*20.85*	*21.07*	*21.33*	*21.50*	*21.19*	*0.61*	*2.95*
Europe	3.64	3.85	3.73	3.68	3.82	3.77	0.13	3.48
Asia Pacific	0.45	0.46	0.43	0.44	0.43	0.44	-0.01	-2.92
Total OECD	**32.43**	**33.11**	**33.00**	**33.43**	**33.87**	**33.35**	**0.92**	**2.83**
China	4.56	4.59	4.58	4.55	4.54	4.56	0.00	0.07
India	0.77	0.79	0.79	0.79	0.78	0.79	0.01	1.70
Other Asia	2.27	2.25	2.23	2.21	2.21	2.22	-0.05	-2.08
Latin America	6.89	7.10	7.13	7.26	7.33	7.21	0.31	4.57
Middle East	3.28	3.29	3.32	3.31	3.31	3.31	0.03	0.86
Africa	1.27	1.26	1.26	1.31	1.35	1.30	0.03	2.16
Russia	10.62	10.49	10.65	10.66	10.66	10.62	0.00	-0.03
Other Eurasia	2.92	2.93	3.00	2.99	3.03	2.99	0.07	2.26
Other Europe	0.10	0.10	0.10	0.10	0.10	0.10	0.00	-1.15
Total Non-OECD	**32.69**	**32.79**	**33.07**	**33.17**	**33.32**	**33.09**	**0.40**	**1.23**
Total Non-OPEC production	65.12	65.90	66.07	66.60	67.18	66.44	1.32	2.03
Processing gains	2.47	2.52	2.52	2.52	2.52	2.52	0.05	2.03
Total Non-OPEC liquids production	**67.59**	**68.42**	**68.59**	**69.12**	**69.70**	**68.96**	**1.37**	**2.03**
Previous estimate	67.59	68.48	68.47	69.12	69.81	68.97	1.38	2.04
Revision	0.00	-0.06	0.12	0.00	-0.11	-0.01	-0.01	-0.02

*Note: * 2024 = Forecast. Totals may not add up due to independent rounding.*

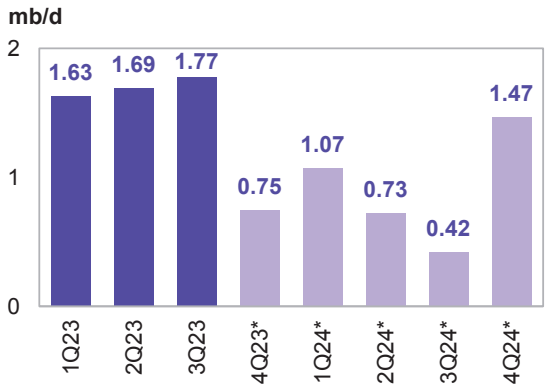
Source: OPEC.

OECD

OECD liquids production in 2023 is expected to expand by 1.5 mb/d to average 32.4 mb/d. A minor upward adjustment was applied following revisions in OECD Americas.

Growth is set to be led by OECD Americas, which is forecast to expand by 1.4 mb/d to average 28.3 mb/d. This remains broadly unchanged compared with the previous month's assessment. Yearly liquids production in OECD Europe is expected to grow by 0.1 mb/d to average 3.6 mb/d. This is largely unchanged compared with the previous assessment. OECD Asia Pacific is expected to decline by about 24 tb/d, y-o-y, to average 0.5 mb/d.

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



*Note: * 4Q23-4Q24 = Forecast. Source: OPEC.*

For **2024**, OECD liquids production is likely to grow by 0.9 mb/d to average 33.4 mb/d. Growth will once again be led by OECD Americas, with an expected increase of 0.8 mb/d for an average of 29.1 mb/d. Yearly liquids production in OECD Europe is expected to grow by 0.1 mb/d to average 3.8 mb/d, while OECD Asia Pacific is expected to decline by 13 tb/d, y-o-y, to average 0.4 mb/d.

OECD Americas

US

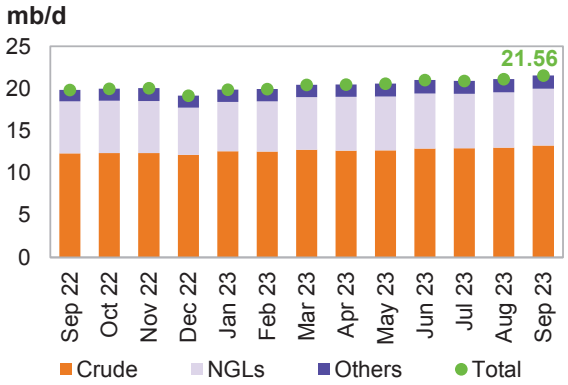
US liquids production in **September** jumped by 452 tb/d, m-o-m, to average 21.6 mb/d, the highest level on record. This was up by 1.7 mb/d compared with September 2022.

Crude oil and condensate production rose by 224 tb/d, m-o-m, to average 13.2 mb/d in **September**. This was up by 0.9 mb/d, y-o-y.

In terms of **crude and condensate production breakdowns by region (PADDs)**, production increased on the US Gulf Coast (USGC) by about 121 tb/d to average 9.5 mb/d. Production in the Midwest and West Coast regions rose by 83 tb/d and 19 tb/d, respectively. Output on the East Coast and Rocky Mountain remained broadly unchanged, m-o-m.

Production growth in the main regions was primarily driven by robust output in the offshore Gulf of Mexico (GoM), North Dakota and New Mexico producing wells, while output in other main producing basins was broadly stable.

Graph 5 - 6: US monthly liquids output by key component



Sources: EIA and OPEC.

NGL production was up by about 205 tb/d, m-o-m, for an average of 6.8 mb/d in September. This was higher by 0.6 mb/d, y-o-y. According to the US Department of Energy (DoE), the production of **non-conventional liquids** (mainly ethanol) rose by 23 tb/d, m-o-m, to average 1.6 mb/d. Preliminary estimates see non-conventional liquids averaging about 1.6 mb/d in October, broadly unchanged m-o-m.

GoM production rose by 108 tb/d, m-o-m, to average 2.0 mb/d in September, and was highly supported by new project ramp-ups. GoM production was higher in September due to the Shenzi North subsea tie-back project, the return of Mars volumes, and the continued ramp-up of Mad Dog Phase 2. In the **onshore Lower 48**, crude and condensate production increased by 97 tb/d, m-o-m, to average 10.8 mb/d in September.

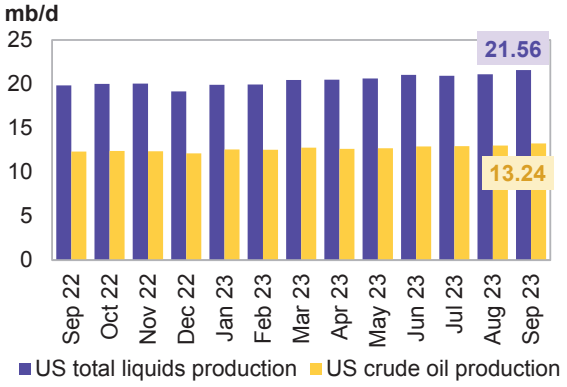
Table 5 - 3: US crude oil production by selected state and region, tb/d

State	Sep 22	Aug 23	Sep 23	Change m-o-m	Change y-o-y
Texas	5,211	5,579	5,573	*-6*	*362*
Gulf of Mexico (GOM)	1,824	1,892	2,000	*108*	*176*
New Mexico	1,686	1,798	1,818	*20*	*132*
North Dakota	1,112	1,225	1,304	*79*	*192*
Colorado	438	462	459	*-3*	*21*
Oklahoma	417	428	424	*-4*	*7*
Alaska	430	396	415	*19*	*-15*
Total	**12,325**	**13,012**	**13,236**	***224***	***911***

Sources: EIA and OPEC.

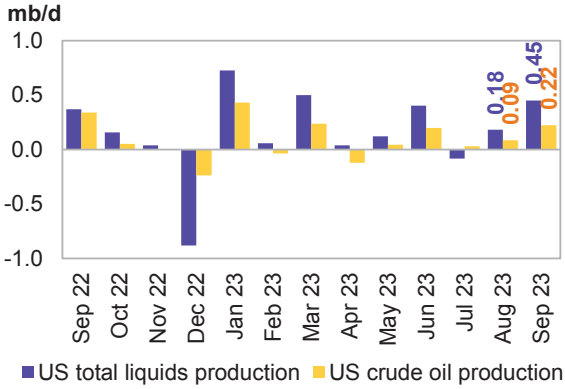
Looking at **individual US states**, New Mexico's oil production rose by 20 tb/d to average 1.8 mb/d, which is 132 tb/d higher than a year ago. Production from Texas was down by 6 tb/d to average 5.6 mb/d, which is 362 tb/d higher than a year ago. In the Midwest, North Dakota's production rose by 79 tb/d, m-o-m, to average 1.3 mb/d, up 192 tb/d, y-o-y, while Oklahoma production dropped by a minor 4 tb/d, m-o-m, to average 0.4 mb/d. Production in Alaska rose by 19 tb/d, while output in Colorado remained broadly unchanged m-o-m.

Graph 5 - 7: US monthly crude oil and total liquids supply



Sources: EIA and OPEC.

Graph 5 - 8: US monthly crude oil and total liquids supply, m-o-m changes



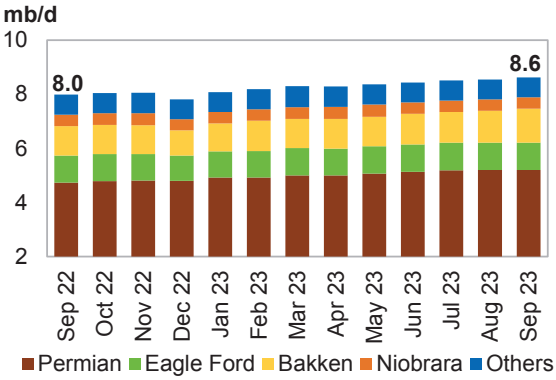
Sources: EIA and OPEC.

US tight crude output in **September** is estimated to have risen by 76 tb/d, m-o-m, to average 8.6 mb/d, according to the latest estimates. This was 0.6 mb/d higher than in the same month last year.

The m-o-m increase from shale and tight formations using horizontal wells came mainly from Bakken shale production in North Dakota, where output rose by 78 tb/d for an average of 1.3 mb/d. This was up by 174 tb/d, y-o-y.

In Texas and New Mexico, Permian shale oil output remained largely unchanged m-o-m averaging 5.2 mb/d, up by 468 tb/d, y-o-y. Tight crude output at Eagle Ford in Texas dropped by a minor 3 tb/d to average 1.0 mb/d, up by 7 tb/d, y-o-y. Production at Niobrara-Codell in Colorado and Wyoming was unchanged at an average of 422 tb/d.

Graph 5 - 9: US tight crude output breakdown

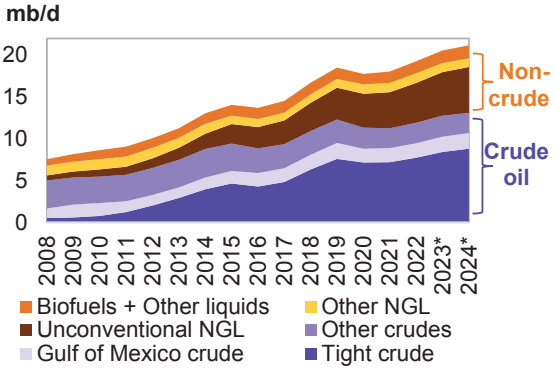


Sources: EIA and OPEC.

US liquids production in **2023**, excluding processing gains, is forecast to expand by 1.3 mb/d, y-o-y, to average 20.6 mb/d. This is largely unchanged compared with last month's assessment, however supported by stronger-than-expected output in recent months. Despite declining drilling activity since the start of this year, well productivity and operational efficiency as well as drilled-but-uncompleted wells' usage have helped boost production. In addition, it is assumed there will be fewer supply chain/logistical issues in major prolific shale sites for the remainder of 2023.

Given a sound level of oil field drilling and well completions, **crude oil and condensate** output is expected to increase by 0.8 mb/d, y-o-y, to average 12.8 mb/d. Average tight crude output in 2023 is forecast at 8.4 mb/d, up by 0.7 mb/d, y-o-y.

Graph 5 - 10: US liquids supply developments by component



*Note: * 2023 and 2024 = Forecast.*
Source: OPEC.

At the same time, NGL production and non-conventional liquids, particularly ethanol, are forecast to increase by 0.4 mb/d and 71 tb/d, y-o-y, to average 6.3 mb/d and 1.5 mb/d, respectively.

US liquids production in **2024**, excluding processing gains, is expected to grow by 0.6 mb/d, y-o-y, to average 21.2 mb/d, assuming a modest level of drilling activity and less supply chain issues at the prolific Permian, Bakken and Eagle Ford shale sites. Crude oil and condensate output is expected to jump by 0.3 mb/d, y-o-y, to average 13.1 mb/d. At the same time, NGL production and that of non-conventional liquids, particularly ethanol, are projected to increase by 0.2 mb/d and 30 tb/d, y-o-y, to average 6.5 mb/d and 1.5 mb/d, respectively.

Average tight crude output in 2024 is expected to reach 8.8 mb/d, up by 0.4 mb/d, y-o-y. The 2024 forecast assumes ongoing capital discipline and less inflationary pressure, as well as moderating supply chain issues and oil field service constraints (labour and equipment).

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

US liquids	2022	Change 2022/21	2023*	Change 2023/22	2024*	Change 2024/23
Tight crude	7.73	0.55	8.43	0.70	8.83	0.40
Gulf of Mexico crude	1.73	0.02	1.82	0.09	1.85	0.03
Conventional crude oil	2.45	0.07	2.51	0.06	2.42	-0.09
Total crude	**11.91**	**0.64**	**12.76**	**0.85**	**13.10**	**0.34**
Unconventional NGLs	4.78	0.47	5.22	0.44	5.47	0.26
Conventional NGLs	1.15	0.04	1.10	-0.05	1.07	-0.03
Total NGLs	**5.93**	**0.51**	**6.32**	**0.38**	**6.55**	**0.23**
Biofuels + Other liquids	1.44	0.08	1.51	0.07	1.54	0.03
US total supply	**19.28**	**1.23**	**20.58**	**1.30**	**21.19**	**0.61**

*Note: * 2023 and 2024 = Forecast.*

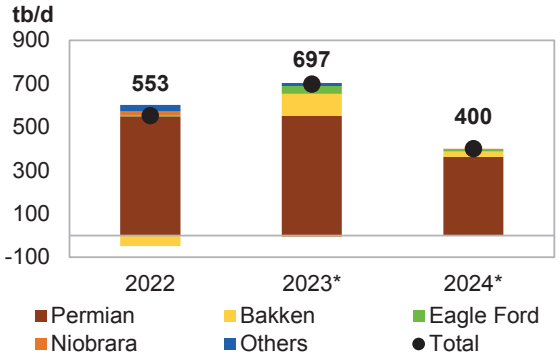
Sources: EIA, OPEC and Rystad Energy.

US tight crude production in the **Permian** during 2023 is expected to increase by 0.6 mb/d, y-o-y, to average 5.1 mb/d, while in 2024, it is forecast to grow by 0.4 mb/d, y-o-y, to average 5.5 mb/d.

In North Dakota, **Bakken** shale production is still expected to remain below the pre-pandemic average of 1.4 mb/d. In 2023, growth is forecast at 0.1 mb/d for an average of 1.1 mb/d. Growth of just 25 tb/d is expected for 2024 for an average of 1.2 mb/d, demonstrating signs of maturity in the basin.

The **Eagle Ford** in Texas saw output of 1.2 mb/d in 2019, followed by declines in 2020 and 2021 and no growth in 2022. With an expected growth of about 37 tb/d for 2023, output rests at an average of 1.0 mb/d. At the same time, minor growth of 10 tb/d is expected for 2024.

Graph 5 - 11: US tight crude output by shale play, y-o-y changes



*Note: * 2023 and 2024 = Forecast.*
Sources: EIA and OPEC.

Niobrara's production is expected to remain largely unchanged y-o-y in 2023 with an average of 428 tb/d. Meanwhile, no growth is expected for 2024. With a modest pace of drilling and completion activities, production in other tight plays is expected to show an increase of 13 tb/d in 2023, then remain steady in 2024.

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

US tight oil	2022	Change 2021/20	2023*	Change 2023/22	2024*	Change 2024/23
Permian tight	4.57	0.55	5.12	0.55	5.49	0.36
Bakken shale	1.03	-0.05	1.13	0.10	1.16	0.02
Eagle Ford shale	0.96	0.00	1.00	0.04	1.01	0.01
Niobrara shale	0.43	0.02	0.43	-0.01	0.43	0.00
Other tight plays	0.73	0.03	0.74	0.01	0.74	0.00
Total	**7.73**	**0.55**	**8.43**	**0.70**	**8.83**	**0.40**

*Note: * 2023 and 2024 = Forecast.*

Source: OPEC.

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

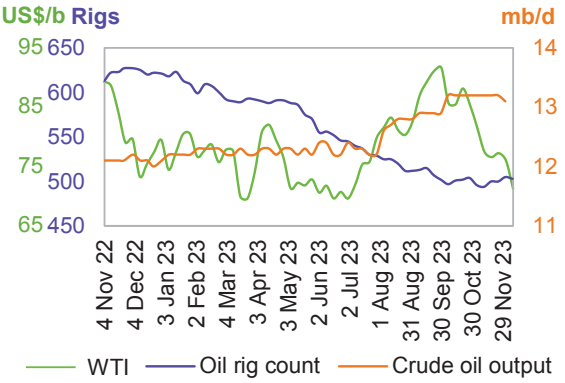
Total **active US drilling rigs** in the week ending 1 December 2023 rose by 3 to 625, according to Baker Hughes. This was 159 rigs less than a year ago. The number of active offshore rigs remained unchanged, w-o-w, at 21. This was higher by 3 compared with the same month a year earlier. Onshore oil and gas rigs were higher by 3, w-o-w, to stand at 603, with just 1 rig in inland waters. This is down by 160 rigs, y-o-y.

The **US horizontal rig count** rose by 5, w-o-w, to 559, compared with 711 horizontal rigs a year ago. The number of drilling rigs for oil increased by 5, w-o-w, to 505, while the number of gas-drilling rigs fell by 1, w-o-w, to 116.

The Permian's rig count rose by 3, w-o-w, to 314. Rig counts remained unchanged in Williston, Eagle Ford and Niobrara at 33, 50 and 14, respectively, while the number of rigs rose by 3, w-o-w, in Cana Woodford to 18.

Only 1 operating oil rig has been reported in the Barnett Basin since 17 November.

Graph 5 - 12: US weekly rig count vs. US crude oil output and WTI price



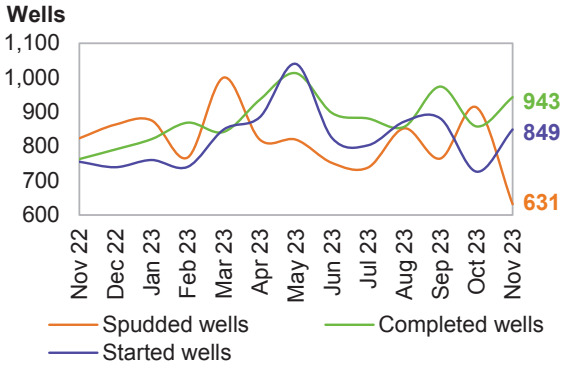
Sources: Baker Hughes, EIA and OPEC.

Drilling and completion (D&C) activities for spudded, completed and started oil producing wells in all US shale plays included 913 horizontal wells spudded in October (as per preliminary data), based on EIA-DPR regions. This is up by 149, m-o-m, and 3% higher than in October 2022.

Preliminary data for October indicates a lower number of completed wells at 858, up by 6%, y-o-y. The number of started wells is estimated at 726, which is 15% lower than a year earlier.

Preliminary data for November 2023 saw 631 spudded, 943 completed, and 849 started wells, according to Rystad Energy.

Graph 5 - 13: Spudded, completed and started wells in US shale plays

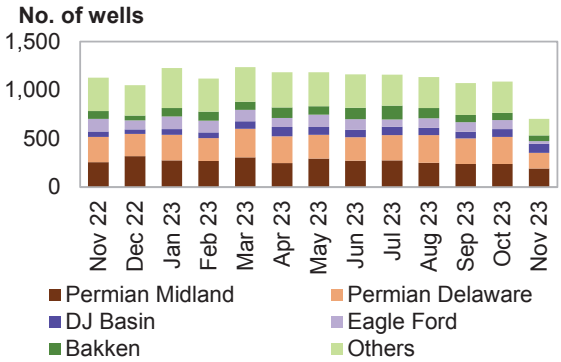


Note: Oct 23-Nov 23 = Preliminary data.
Sources: Rystad Energy and OPEC.

In terms of identified **US oil and gas fracking operations by region**, Rystad Energy reported that 1,073 wells were fracked in September. In October and November, it stated that 1,087 and 704 wells began fracking, respectively, according to preliminary numbers which are based on the analysis of high-frequency satellite data.

In regional terms, preliminary October data shows that 240 and 277 wells were fracked in Permian Midland and Permian Delaware, respectively. Compared with September, there was an increase of 2 wells in the Midland region and a rise of 12 in Delaware. Data also indicates that 80 wells were fracked in the DJ Basin, 94 in Eagle Ford and 75 in Bakken during October.

Graph 5 - 14: Fracked wells count per month



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

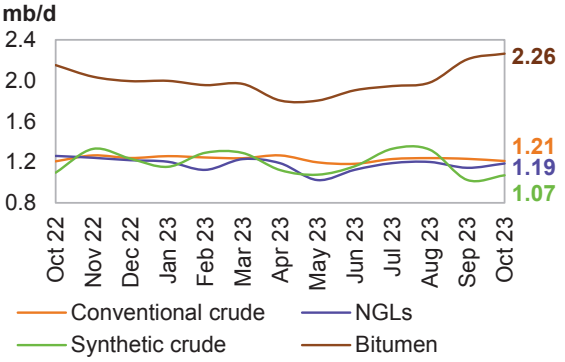
Canada

Canada's liquids production in **October** is estimated to have risen by 122 tb/d, m-o-m, to average 5.8 mb/d, as oil sands producers finished off maintenance work.

Conventional crude production dropped by 21 tb/d, m-o-m, in October to average 1.2 mb/d, while NGL output increased by 42 tb/d to average 1.2 mb/d.

Crude bitumen production output rose in October by 56 tb/d, m-o-m, while synthetic crude increased by 45 tb/d, m-o-m. Taken together, crude bitumen and synthetic crude production rose by 101 tb/d to 3.3 mb/d.

Graph 5 - 15: Canada's monthly liquids production development by type



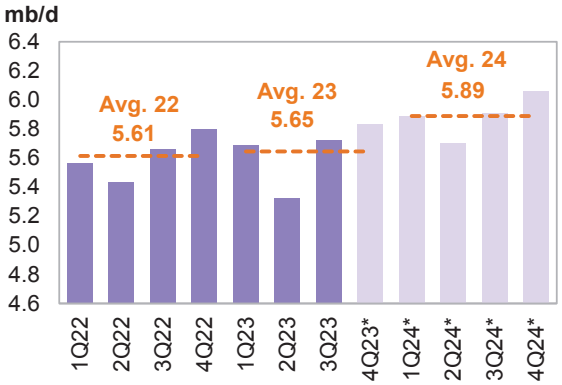
Sources: Statistics Canada, Alberta Energy Regulator and OPEC.

For **2023**, Canada's liquids production is forecast to increase by about 30 tb/d to average 5.6 mb/d. This is unchanged compared with the previous month's assessment.

In 3Q23, mining production increased with the completion of turnaround and maintenance activities. Within the large in situ projects, CNRL's Primrose and Kirby projects had significant production increases as new well pads came online earlier than anticipated.

For **2024**, Canada's liquids production is forecast to increase at a much faster pace compared with 2023, rising by 0.2 mb/d to average 5.9 mb/d. Incremental production is expected to come through oil sands project ramp-ups and debottlenecking in areas like Montney, Kearl and Fort Hills, in addition to some conventional field growth.

Graph 5 - 16: Canada's quarterly liquids production and forecast



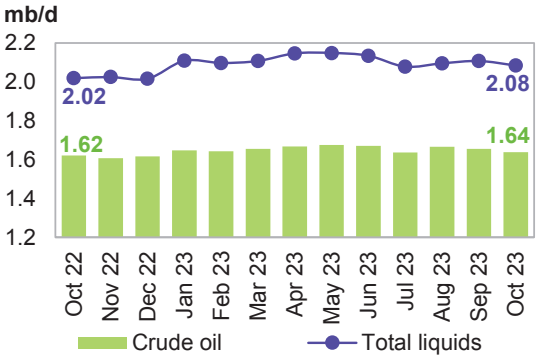
*Note: * 4Q23-4Q24 = Forecast. Source: OPEC.*

Mexico

Mexico's crude output decreased by 17 tb/d, m-o-m, in **October** to average 1.6 mb/d, and NGL output declined by a minor 6 tb/d. Mexico's total October liquids output dropped by 23 tb/d, m-o-m, to average 2.1 mb/d, according to the Comisión Nacional de Hidrocarburos (CNH). This was practically in line with previous expectations as production from Pemex's priority fields declined and private operators reported lower output.

For **2023**, liquids production is forecast to rise by about 0.1 mb/d for an average of 2.1 mb/d. This is broadly unchanged from the previous month's assessment. Declines from mature fields are expected to continue offsetting monthly gains from new fields in the coming months.

Graph 5 - 17: Mexico's monthly liquids and crude production development



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

For **2024**, liquids production is forecast to decline by 45 tb/d to average 2.1 mb/d. In general, any gains from new projects are expected to be offset by declines from mature fields. Pemex's total crude production decline in mature areas like Ku-Maloob-Zaap and Integral Yaxche-Xanab is forecast to outweigh production ramp-ups in Area-1 and El Golpe-Puerto Ceiba, and from a few start-ups, namely TM-01, Paki and AE-0150-Uchukil.

OECD Europe

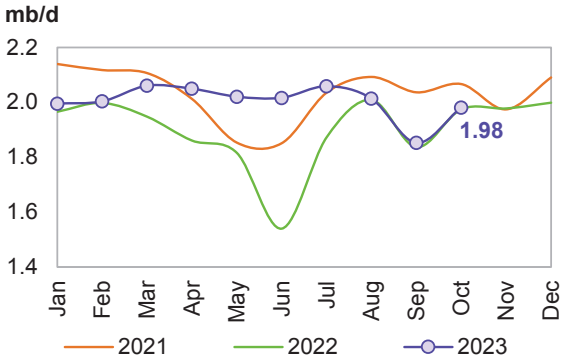
Norway

Norwegian liquids production in **October** rose by 129 tb/d, m-o-m, to average 2.0 mb/d due to the recovery from unplanned shutdowns and equipment failures on a number of platforms in September.

Norway's crude production increased by 101 tb/d, m-o-m, in October to average 1.8 mb/d, higher by 27 tb/d, y-o-y. Monthly oil production was 3.7% lower than the Norwegian Petroleum Directorate's (NPD) forecast.

Production of NGLs and condensate, meanwhile, rose by 28 tb/d, m-o-m, to average 0.2 mb/d, according to NPD data.

Graph 5 - 18: Norway's monthly liquids production development



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

In **2023**, Norwegian liquids production is forecast to expand by 0.1 mb/d, remaining broadly unchanged compared with last month's forecast, for an average of 2.0 mb/d. Technical challenges, operational irregularities and periodical shut-downs have been the main causes of output declines in Norwegian fields. Norway's Aker BP recently announced a production start-up ahead of schedule from the Alvheim tie-in of projects Kobra East and Gekko (KEG), which hold an estimated 40 million boe in place.

For **2024**, Norwegian liquids production is forecast to grow by 120 tb/d to average 2.1 mb/d. Some small-to-large projects are scheduled to ramp up in 2024. At the same time, start-ups are expected at the Balder/Ringhorne, Eldfisk, Kristin, Alvheim FPSO, Hanz, Skarv Aasgard FPSO and PL636 offshore projects. Drilling continues for the Hanz project, a tieback to the Ivar Aasen platform in the Utsira High region of the North Sea, along with topside commissioning of the reception facilities. First oil should follow from Hanz in 1Q24, according to Aker BP. However, Johan Castberg is projected to be the main source of output increases next year, with first oil planned to be produced in 4Q24.

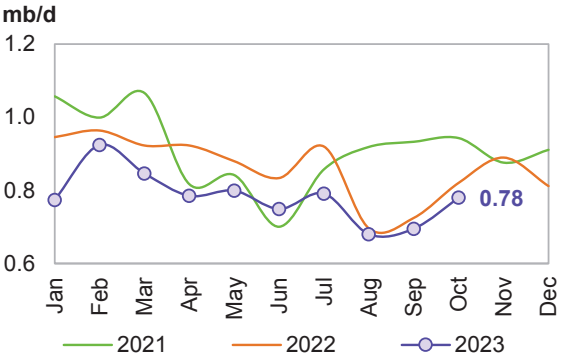
UK

In **October**, **UK liquids production** rose by 85 tb/d, m-o-m, to average 0.8 mb/d. Crude oil output increased by 87 tb/d, m-o-m, to average 0.6 mb/d, lower by 40 tb/d, y-o-y, according to official data. NGL output remained largely unchanged to average 68 tb/d. UK liquids output in October was down by 5% compared with October 2022, mainly due to natural declines.

For **2023**, UK liquids production is forecast to drop by almost 70 tb/d to average 0.8 mb/d, down by about 10 tb/d from the previous month's assessment, mainly due to lower-than-expected October output.

For **2024**, UK liquids production is forecast to stay steady at an average of 0.8 mb/d. Production ramp-ups will be seen at the ETAP and Clair sites, as well as at the Anasuria and Captain enhanced oil recovery (EOR) start-up projects. The Penguins FPSO is currently in the final stages of commissioning and is due to be towed out to the UK North Sea field in 1Q24.

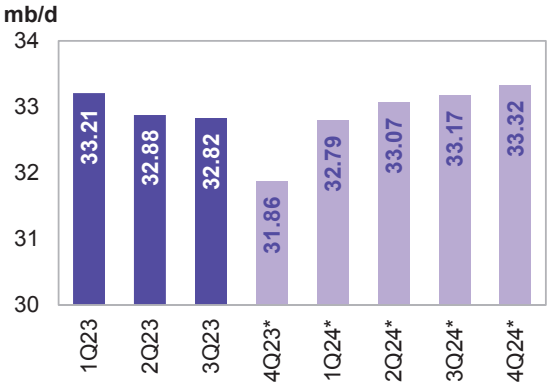
Graph 5 - 19: UK monthly liquids production development



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

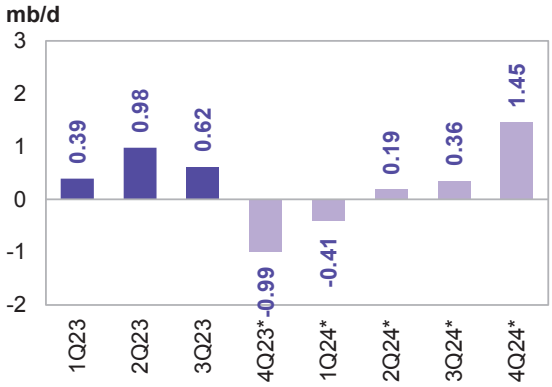
Non-OECD

Graph 5 - 20: Non-OECD quarterly liquids production and forecast



*Note: * 4Q23-4Q24 = Forecast. Source: OPEC.*

Graph 5 - 21: Non-OECD quarterly liquids supply, y-o-y changes

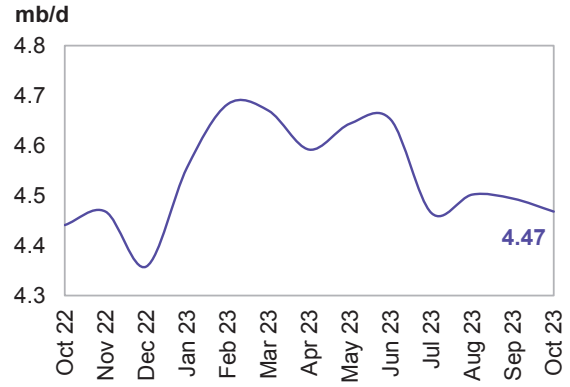


*Note: * 4Q23-4Q24 = Forecast. Source: OPEC.*

China

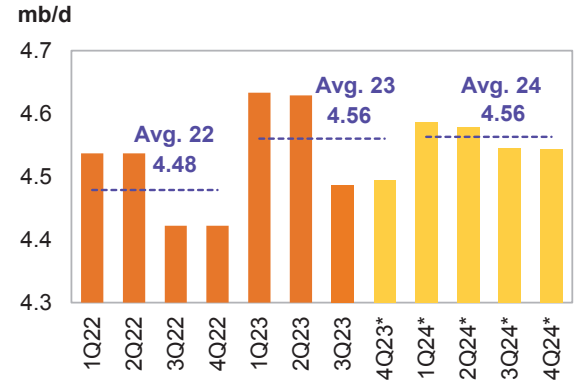
China's liquids production fell by 26 tb/d, m-o-m, to average 4.5 mb/d in **October**. This is up by 27 tb/d, y-o-y, according to official data. Crude oil output in October averaged 4.1 mb/d, down by 26 tb/d compared with the previous month, and higher by 59 tb/d, y-o-y. NGL and condensate production was largely stable, m-o-m, averaging 48 tb/d.

Graph 5 - 22: China's monthly liquids production development



Sources: CNPC and OPEC.

Graph 5 - 23: China's quarterly liquids production and forecast



*Note: * 4Q23-4Q24 = Forecast. Sources: CNPC and OPEC.*

For **2023**, y-o-y growth of about 80 tb/d is forecast for an average of 4.6 mb/d. This is roughly unchanged from the previous month's assessment. Natural decline rates are expected to be offset by additional growth through more infill wells and EOR projects amid efforts made by state-owned oil companies to safeguard energy supplies. Production from Weizhou 5-7 is expected to start up this year, and Lufeng 12-3, Enping 18-6, Penglai 19-3 and Bozhong 28-2 are all expected to continue ramping up in the coming months.

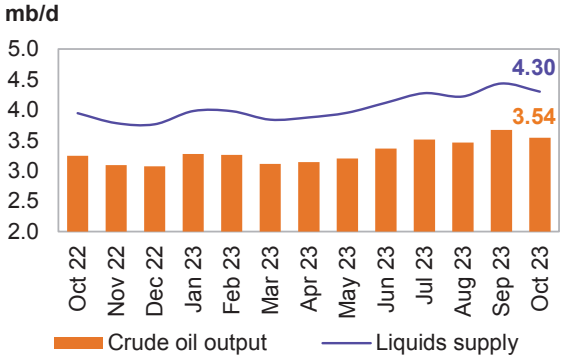
For **2024**, Chinese liquids production is expected to remain steady, y-o-y, and is forecast to average 4.6 mb/d. For next year, Lingshui 17-2, Lufeng, Liuhua 11-1, Xi'nan, Shayan and Liuhua 4-1 (redevelopment) are planned to come on stream by CNOOC, PetroChina and Sinopec. At the same time, key ramp-ups are expected from Changqing, Kenli 10-2, Wushi 17-2 and Kenli 6-4.

Latin America

Brazil

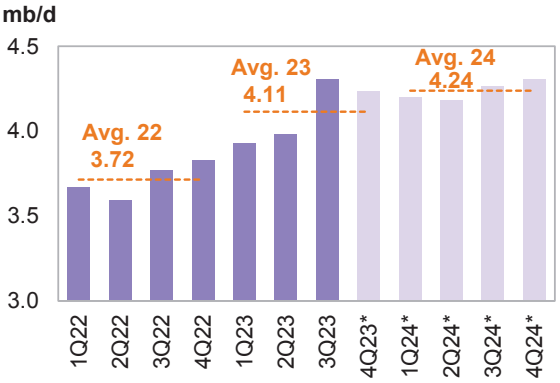
Brazil's crude output in **October** fell by 131 tb/d, m-o-m, to average 3.5 mb/d. NGL production, however, was broadly unchanged at an average of 80 tb/d and was expected to remain flat in November. Biofuel output (mainly ethanol) remained mostly unchanged at an average of 678 tb/d, with preliminary data showing a stable trend in November. The country's total liquids production decreased by 134 tb/d in October to average 4.3 mb/d. The October production level was still strong as Brazil reached its second-highest liquids output on record.

Graph 5 - 24: Brazil's monthly liquids production development by type



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

Graph 5 - 25: Brazil's quarterly liquids production



*Note: * 4Q23-4Q24 = Forecast. Sources: ANP and OPEC.*

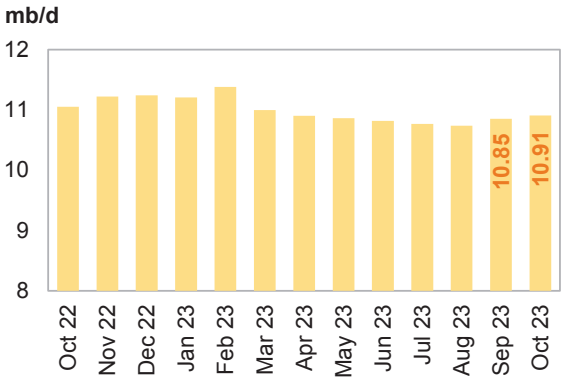
For **2023**, Brazil's liquids supply, including biofuels, is forecast to rise by 0.4 mb/d, y-o-y, to average 4.1 mb/d, revised up by 30 tb/d from the previous month's assessment due to stronger-than-expected output in October and higher than expected production in 4Q23. Higher production bases this year have been due to the ramp-ups of new units, improving performances of existing assets, and fewer maintenance events.

For **2024**, Brazil's liquids supply, including biofuels, is forecast to increase by about 120 tb/d, y-o-y, to average 4.2 mb/d. Crude oil output is expected to increase through production ramp-ups in the Buzios (Franco), Mero (Libra NW), Tupi (Lula), Peregrino and Itapu (Florim) fields. Oil project start-ups are expected at the Atlanta, Pampo-Enchova Cluster and Vida sites.

Russia

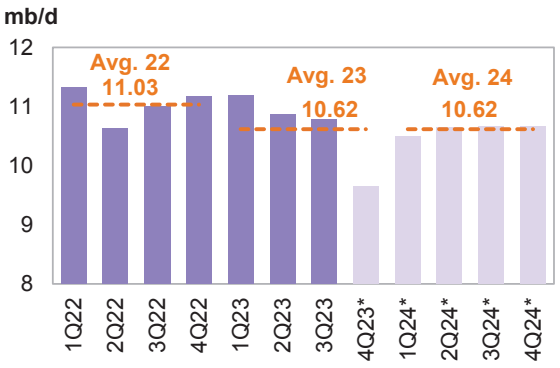
Russia's liquids production in October rose by about 55 tb/d, m-o-m, to average 10.9 mb/d. This includes 9.5 mb/d of crude oil and 1.4 mb/d of NGLs and condensate.

Graph 5 - 26: Russia's monthly liquids production



Sources: Nefte Compass and OPEC.

Graph 5 - 27: Russia's quarterly liquids production



*Note: * 4Q23-4Q24 = Forecast.*
Sources: Nefte Compass and OPEC.

For **2023**, Russian liquids production is forecast to drop by 0.4 mb/d for an average of 10.6 mb/d, broadly unchanged from the previous month's assessment. It is worth noting that this takes into account all announced production adjustments of the countries in the DoC to the end of 2023 and 2024.

For **2024**, Russian liquids production is forecast to remain steady with the previous year, averaging 10.6 mb/d. In addition to project ramp-ups from several oil fields, there will be start-ups by Rosneft, Russneft, Lukoil, Gazprom, Neftisa and TenderResurs. However, overall additional liquids production is expected to be offset by declines at mature fields.

Caspian

Kazakhstan & Azerbaijan

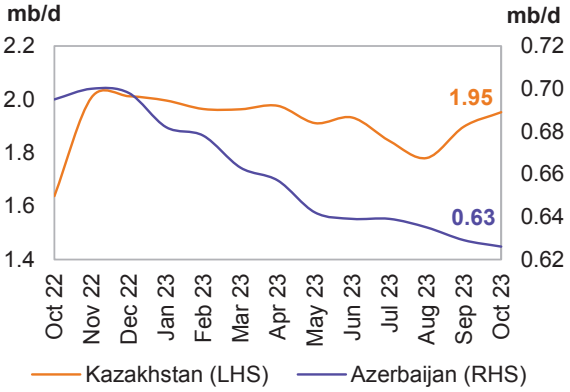
Liquids output in Kazakhstan rose by 54 tb/d, m-o-m, to average 2.0 mb/d in **October**. Crude production was up by 37 tb/d, m-o-m, to average 1.6 mb/d. NGL and condensate output rose by 17 tb/d, m-o-m, to average 0.3 mb/d.

For **2023**, the liquids supply is forecast to increase by 0.1 mb/d for an average of 1.9 mb/d, revised up by a minor 3 tb/d from the previous forecast.

Kazakh oil production slumped in late November as storms near the Russian port of Novorossiysk affected supplies to a major export pipeline. However, the Caspian Pipeline Consortium (CPC) resumed oil loadings at its Black Sea terminal in less than a week.

For **2024**, the liquids supply is forecast to increase by about 60 tb/d to average 2.0 mb/d, revised down by 20 tb/d compared with the previous assessment following the recently announced voluntary adjustment for 1Q24. The growth is expected mainly from production ramp-ups in the Tengiz oil field through an expansion at the Tengizchevroil Future Growth Project (FGP) and wellhead pressure management project. In the latest update, Chevron announced that due to delays and more intensive commissioning, the project will produce about 50 tb/d less as it comes online over 2024 and 2025.

Graph 5 - 28: Caspian monthly liquids production development by selected country



Sources: Nefte Compass, JODI and OPEC.

Oil production in the Kashagan field and gas condensate output in the Karachaganak field are also expected to rise marginally.

Azerbaijan's liquids production in **October** remained largely unchanged, m-o-m, averaging 0.6 mb/d, which is a drop of 69 tb/d, y-o-y. Crude production averaged 489 tb/d, with NGL output at 137 tb/d, according to official sources.

Azerbaijan's liquids supply for **2023** is forecast to drop by about 30 tb/d to average 0.7 mb/d. This is a downward revision of about 13 tb/d stemming from lower-than-expected production at major oil fields in October. The majority of declines in legacy reservoirs, like the Azeri-Chirag-Guneshli (ACG) oil fields, are expected to be primarily offset by ramp-ups in other fields this year.

Azerbaijan's liquids supply for **2024** is forecast to remain broadly stable at an average of 0.7 mb/d. Growth is forecast to come partly from the Shah Deniz, Absheron and Umid-Babek gas condensate projects. Production in Azerbaijan's ACG oil fields should also get a boost next year with a seventh ACG platform. However, the overall decline is expected to offset the planned ramp-ups.

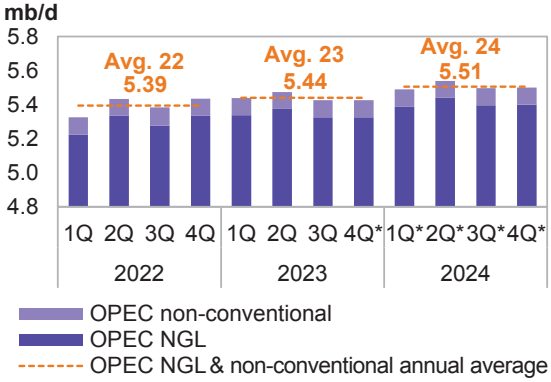
OPEC NGLs and non-conventional oils

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

Preliminary data shows NGL output in 3Q23 averaging 5.33 mb/d, while non-conventional output is forecast to remain steady at 0.1 mb/d. Taken together, 5.41 mb/d is expected for October, according to preliminary data.

The preliminary **2024** forecast indicates combined growth of 65 tb/d for an average of 5.5 mb/d. NGL production is projected to grow by 65 tb/d to average 5.4 mb/d, while non-conventional liquids are projected to remain unchanged at 0.1 mb/d.

Graph 5 - 29: OPEC NGLs and non-conventional liquids quarterly production and forecast



*Note: * 4Q23-4Q24 = Forecast. Source: OPEC.*

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

OPEC NGL and non-coventional oils	2022	Change 22/21	2023	Change 23/22	1Q24	2Q24	3Q24	4Q24	2024	Change 24/23
OPEC NGL	**5.29**	*0.11*	**5.34**	*0.05*	5.39	5.44	5.40	5.40	**5.41**	*0.07*
OPEC non-conventional	**0.10**	*0.00*	**0.10**	*0.00*	0.10	0.10	0.10	0.10	**0.10**	*0.00*
Total	**5.39**	***0.11***	**5.44**	***0.05***	**5.49**	**5.54**	**5.50**	**5.50**	**5.51**	***0.07***

Note: 2023 and 2024 = Forecast.

Source: OPEC.

OPEC crude oil production

According to secondary sources, total **OPEC-13 crude oil production** averaged 27.84 mb/d in November 2023, lower by 57 tb/d, m-o-m. Crude oil output increased mainly in Venezuela, Libya and Kuwait, while production in Iraq, Angola and Nigeria decreased.

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

Secondary sources	2021	2022	1Q23	2Q23	3Q23	Sep 23	Oct 23	Nov 23	*Change* Nov/Oct
Algeria	913	1,017	1,013	979	953	960	965	962	*-2*
Angola	1,123	1,140	1,058	1,104	1,135	1,118	1,168	1,130	*-37*
Congo	263	260	269	264	259	249	257	258	*2*
Equatorial Guinea	98	84	53	59	59	50	56	56	*0*
Gabon	182	197	194	206	205	204	217	218	*2*
IR Iran	2,392	2,554	2,572	2,698	3,003	3,082	3,121	3,128	*7*
Iraq	4,046	4,439	4,371	4,135	4,287	4,317	4,355	4,278	*-77*
Kuwait	2,419	2,704	2,684	2,585	2,560	2,577	2,552	2,571	*19*
Libya	1,138	981	1,157	1,168	1,160	1,177	1,157	1,178	*21*
Nigeria	1,373	1,204	1,348	1,234	1,273	1,407	1,388	1,370	*-17*
Saudi Arabia	9,114	10,531	10,357	10,150	8,993	9,020	8,987	8,998	*12*
UAE	2,727	3,066	3,045	2,941	2,912	2,929	2,918	2,909	*-9*
Venezuela	553	680	694	751	764	745	757	780	*23*
Total OPEC	**26,341**	**28,858**	**28,817**	**28,276**	**27,562**	**27,837**	**27,895**	**27,837**	***-57***

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	1Q23	2Q23	3Q23	Sep 23	Oct 23	Nov 23	*Change* Nov/Oct
Algeria	911	1,020	1,011	971	951	960	961	960	*-1*
Angola	1,124	1,137	1,046	1,098	1,131	1,113	1,147	1,084	*-63*
Congo	267	262	278	280	269	252	265	253	*-12*
Equatorial Guinea	93	81	51	59	58	55	54	53	*-1*
Gabon	181	191	201	203	..	..	..	..	..
IR Iran	..	..	..	..	..	..	..	..	..
Iraq	3,971	4,453	4,288	3,959	4,101	4,138	4,189	4,093	*-96*
Kuwait	2,415	2,707	2,676	2,590	2,548	2,548	2,548	2,548	*0*
Libya	1,207	..	1,195	1,181	1,187	1,196	1,188	1,206	*19*
Nigeria	1,323	1,138	1,277	1,144	1,201	1,347	1,351	1,250	*-100*
Saudi Arabia	9,125	10,591	10,456	10,124	8,969	8,975	8,940	8,818	*-122*
UAE	2,718	3,064	3,041	2,941	2,904	2,924	2,892	2,894	*2*
Venezuela	636	716	731	808	797	762	786	801	*15*
Total OPEC	..	..	..	..	..	..	..	..	..

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

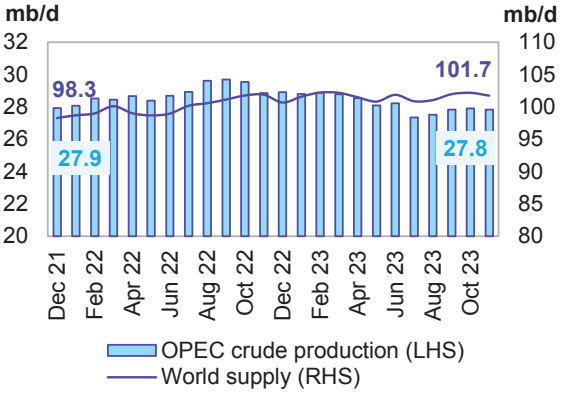
World oil supply

Preliminary data indicates that **global liquids production in November** decreased by 0.4 mb/d to average 101.7 mb/d compared with the previous month.

Non-OPEC liquids production (including OPEC NGLs) is estimated to have decreased by 0.4 mb/d, m-o-m, in November to average 73.9 mb/d. This is higher by 0.9 mb/d, y-o-y. Preliminary estimated production decreases in November were mainly seen in Russia and Kazakhstan and were partially offset by rises in Other Asia, Canada and Other Eurasia.

The **share of OPEC crude oil in total global production** in November, increased by 0.1 pp to stand at 27.4% 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 - 30: OPEC crude production and world oil supply development



Source: OPEC.

Commercial Stock Movements

Preliminary October 2023 data show total OECD commercial oil stocks down by 12.8 mb, m-o-m. At 2,818 mb, they were 45 mb higher than the same time one year ago, but 66 mb lower than the latest five-year average and 128 mb below the 2015–2019 average. Within the components, crude stocks rose by 11.0 mb, while product stocks fell 23.8 mb, m-o-m.

OECD commercial crude stocks stood at 1,342 mb in October. This was 15 mb lower than the same time a year ago, 57 mb below the latest five-year average and 112 mb lower than the 2015–2019 average.

Total product stocks fell by 23.8 mb in October to stand at 1,476 mb. This is 61 mb above the same time a year ago, but 9 mb lower than the latest five-year average and 16 mb below the 2015–2019 average.

In terms of days of forward cover, OECD commercial stocks remained unchanged, m-o-m, in October, standing at 61.7 days. This is 0.6 days above the October 2022 level, but 1.4 days lower than the latest five-year average and 0.7 days less than the 2015–2019 average.

Preliminary data for November 2023 showed that total US commercial oil stocks rose by 6.8 mb, m-o-m, to stand at 1,269 mb. This is 42.5 mb, or 3.5%, higher than the same month in 2022, but 8.7 mb, or 0.7%, below the latest five-year average. Crude stocks rose by 23.1 mb, while product stocks fell by 16.4 mb, m-o-m.

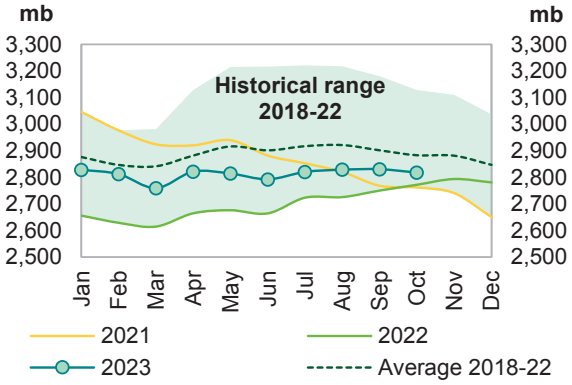
OECD

Preliminary **October 2023** data show **total OECD commercial oil stocks** down by 12.8 mb, m-o-m. At 2,818 mb, they were 45 mb higher than the same time one year ago, but 66 mb lower than the latest five-year average and 128 mb below the 2015–2019 average.

Within the components, crude stocks rose by 11.0 mb, while product stocks fell by 23.8 mb, m-o-m. Within the OECD regions, total commercial oil stocks in October fell in OECD Americas, while they increased in OECD Europe and OECD Asia Pacific.

OECD commercial **crude stocks** stood at 1,342 mb in October. This was 15 mb lower than the same time a year ago, 57 mb below the latest five-year average and 112 mb lower than the 2015–2019 average. M-o-m, OECD Americas and OECD Asia Pacific saw crude stock builds of 4.4 mb and 6.1 mb, respectively, while crude stocks in OECD Europe rose by 0.5 mb.

Graph 9 - 1: OECD commercial oil stocks



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

Total product stocks fell by 23.8 mb in October to stand at 1,476 mb. This is 61 mb above the same time a year ago, but 9 mb lower than the latest five-year average and 16 mb below the 2015–2019 average. M-o-m, product stocks in OECD Americas witnessed draws of 26.7 mb, while OECD Europe and OECD Asia Pacific product stocks rose by 0.5 mb and 2.4 mb, respectively.

Table 9 - 1: OECD commercial stocks, mb

OECD stocks	Oct 22	Aug 23	Sep 23	Oct 23	Change Oct 23/Sep 23
Crude oil	1,357	1,343	1,331	1,342	*11.0*
Products	1,415	1,486	1,500	1,476	*-23.8*
Total	**2,772**	**2,829**	**2,831**	**2,818**	***-12.8***
Days of forward cover	**61.0**	**61.7**	**61.6**	**61.7**	***0.0***

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 remained unchanged, m-o-m, in October, standing at 61.7 days. This is 0.6 days above the October 2022 level, but 1.4 days lower than the latest five-year average and 0.7 days less than the 2015–2019 average.

Within the OECD regions, OECD Americas stood 2.1 days and OECD Europe 0.4 days below the latest five-year average, at 60.8 days and 71.8 days, respectively. OECD Asia Pacific was 1.1 days below the latest five-year average, standing at 47.3 days.

OECD Americas

OECD Americas' total commercial stocks fell by 22.3 mb, m-o-m, in October to settle at 1,505 mb. This is 14 mb higher than the same month in 2022, but 40 mb below the latest five-year average.

Commercial **crude oil stocks** in OECD Americas rose by 4.4 mb, m-o-m, in October to stand at 736 mb, which is 23 mb lower than in October 2022 and 35 mb below the latest five-year average.

By contrast**, total product stocks** in OECD Americas fell m-o-m, dropping by 26.7 mb in October to stand at 770 mb. This is 37 mb higher than the same month in 2022, but 5 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 rose by 1.0 mb, m-o-m, in October to settle at 940 mb. This is 24 mb higher than the same month in 2022, but 10 mb below the latest five-year average.

OECD Europe's **commercial crude stocks** increased by 0.5 mb, m-o-m, to end October at 416 mb. This is 0.8 mb above one year ago and 7.0 mb less than the latest five-year average.

By contrast, Europe's **product stocks** rose by 0.5 mb, m-o-m, to end October at 523 mb. This is 23 mb above the same time a year ago, but 3.3 mb below the latest five-year average.

OECD Asia Pacific

OECD Asia Pacific's total commercial oil stocks rose by 8.5 mb, m-o-m, in October to stand at 373 mb. This is 7.3 mb higher than the same time a year ago, but 14.9 mb below the latest five-year average.

OECD Asia Pacific's **crude stocks** rose by 6.1 mb, m-o-m, to end October at 190 mb. This is 6.9 mb higher than one year ago, but 14.5 mb below the latest five-year average.

OECD Asia Pacific's **product stocks** increased by 2.4 mb, m-o-m, to end October at 183 mb. This is 0.4 mb higher than one year ago, but 0.4 mb below the latest five-year average.

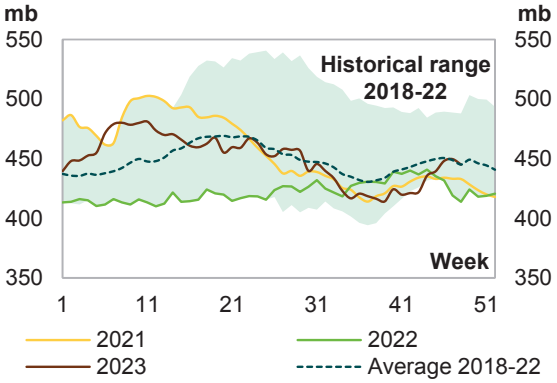
US

Preliminary data for **November 2023** showed that **total US commercial oil stocks** rose by 6.8 mb, m-o-m, to stand at 1,269 mb. This is 42.5 mb, or 3.5%, higher than the same month in 2022, but 8.7 mb, or 0.7%, below the latest five-year average. Crude stocks rose by 23.1 mb, while product stocks fell by 16.4 mb, m-o-m.

US commercial **crude stocks** in November stood at 445.0 mb. This is 28.4 mb, or 6.8%, higher than the same month of 2022 and 4.2 mb, or 0.9%, below the latest five-year average. The monthly build in crude oil stocks came despite a 450 tb/d m-o-m increase in crude runs to a level of 16.09 mb/d.

By contrast, **total product stocks** fell in November to stand at 824.3 mb. This is 14.1 mb, or 1.7%, higher than November 2022 levels, but 4.6 mb, or 0.5%, lower than the latest five-year average. The product stock draw can be attributed to higher product consumption.

Graph 9 - 2: US weekly commercial crude oil inventories



Sources: EIA and OPEC.

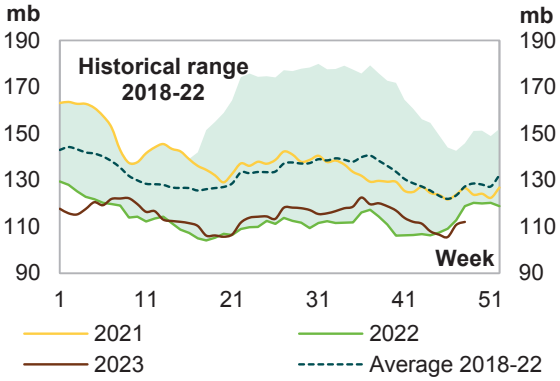
Gasoline stocks rose by 0.1 mb, m-o-m, in November to settle at 223.6 mb. This is 2.3 mb, or 1.0%, higher than the same month of 2022 and 5.8 mb, or 2.5%, less than the latest five-year average.

Distillate stocks increased by 0.8 mb, m-o-m, in November to stand at 112.0 mb. This is 8.6 mb, or 7.1%, lower than the same month of 2022, and 20.4 mb, or 15.4%, below the latest five-year average.

Jet fuel stocks dropped by 2.5 mb, m-o-m, ending November at 38.0 mb. This is 0.1 mb, or 0.4%, higher than the same month in 2022, and 0.5 mb, or 1.3%, less than the latest five-year average.

Residual fuel oil stocks fell by 1.4 mb m-o-m in November. At 26.1 mb, they were 3.3 mb, or 11.1%, lower than a year earlier and 4.1 mb, or 13.5%, below the latest five-year average.

Graph 9 - 3: US weekly distillate inventories



Sources: EIA and OPEC.

Table 9 - 2: US commercial petroleum stocks, mb

US stocks	Nov 22	Sep 23	Oct 23	Nov 23	Change Nov 23/Oct 23
Crude oil	**416.6**	**417.5**	**421.9**	**445.0**	***23.1***
Gasoline	221.4	227.6	223.5	223.6	*0.1*
Distillate fuel	120.6	119.2	111.3	112.0	*0.8*
Residual fuel oil	29.4	27.5	27.5	26.1	*-1.4*
Jet fuel	37.8	43.5	40.5	38.0	*-2.5*
Total products	**810.2**	**865.9**	**840.7**	**824.3**	***-16.4***
Total	**1,226.8**	**1,283.4**	**1,262.6**	**1,269.3**	***6.8***
SPR	**388.4**	**351.3**	**351.3**	**351.9**	***0.6***

Sources: EIA and OPEC.

Japan

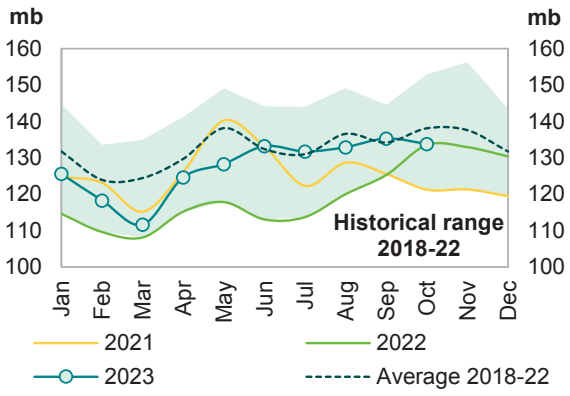
In **Japan**, **total commercial oil stocks** in **October** fell by 1.5 mb, m-o-m, to settle at 133.8 mb. This is 0.3 mb, or 0.2%, higher than the same month in 2022 but 4.3 mb, or 3.1%, below the latest five-year average. Crude stocks fell by 3.9 mb m-o-m, while product stocks rose by 2.4 mb.

Japanese **commercial crude oil stocks** fell by 3.9 mb, m-o-m, in October to stand at 68.4 mb. This is 3.1 mb, or 4.4%, lower than the same month of 2022 and 5.3 mb, or 7.2%, less than the latest five-year average.

Gasoline stocks rose by 0.4 mb m-o-m to stand at 10.4 mb in October. This is 0.6 mb, or 6.0%, higher than a year earlier, but 0.4 mb, or 4.1%, lower than the latest five-year average. The build came on the back of lower domestic gasoline sales, which declined by 2.4%, m-o-m.

Distillate stocks also rose by 1.3 mb, m-o-m, to end October at 31.8 mb. This is 1.9 mb, or 6.5%, above the same month of 2022 and 0.2 mb, or 0.7%, higher than the latest five-year average.

Graph 9 - 4: Japan's commercial oil stocks



Sources: METI and OPEC.

Within distillate components, kerosene stocks rose by 13.5%, while jet fuel and gasoil stocks fell by 9.8% and 6.1%, respectively.

By contrast, **total residual fuel oil stocks** fell m-o-m by 0.4 mb to end October at 13.0 mb. This is 0.7 mb, or 5.4%, higher than the same month of 2022 and 0.4 mb, or 3.3%, above the latest five-year average. Within the components, fuel oil A and fuel oil B.C stocks fell by 1.8% and 3.7%, m-o-m, respectively.

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

Japan's stocks	Oct 22	Aug 23	Sep 23	Oct 23	Change Oct 23/Sep 23
Crude oil	71.6	69.7	72.4	68.4	-3.9
Gasoline	9.8	9.7	10.0	10.4	0.4
Naphtha	9.9	10.8	9.0	10.1	1.1
Middle distillates	29.8	28.7	30.5	31.8	1.3
Residual fuel oil	12.4	14.1	13.4	13.0	-0.4
Total products	61.9	63.2	63.0	65.4	2.4
Total**	133.5	132.9	135.3	133.8	-1.5

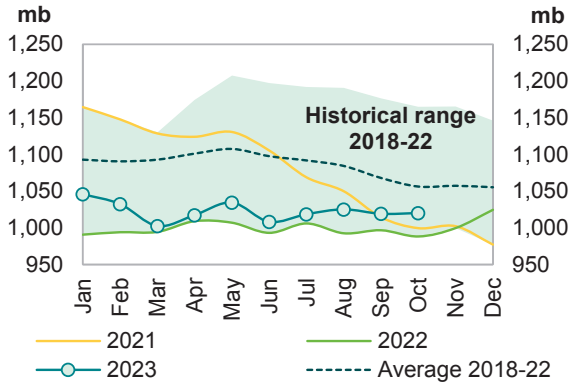
*Note: * At the end of the month. ** Includes crude oil and main products only.*
Sources: METI and OPEC.

EU-14 plus UK and Norway

Preliminary data for **October** showed that **total European commercial oil stocks** rose by 1.0 mb m-o-m to stand at 1,020 mb. At this level, they were 31.9 mb, or 3.2%, above the same month of 2022, but 36.1 mb, or 3.4%, lower than the latest five-year average. Crude and product stocks rose m-o-m each by 0.5 mb.

European **crude stocks** stood at 435.0 mb in October. This is 1.2 mb, or 0.3%, higher than the same month in 2022, but 24.8 mb, or 5.4%, below the latest five-year average. The build in crude oil stocks came on the back of lower refinery throughput in the EU-14, plus the UK and Norway, which fell by around 740 tb/d, m-o-m, to stand at 9.13 mb/d.

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



Sources: Argus, Euroilstock and OPEC.

Total European product stocks rose by 0.5 mb, m-o-m, to end October at 585.0 mb. This is 30.7 mb, or 5.5%, higher than the same month of 2022, but 11.3 mb, or 1.9%, below the latest five-year average. The build could be attributed to lower demand in the region.

Middle distillate stocks rose by 1.1 mb, m-o-m, in October to stand at 392.7 mb. This is 32.2 mb, or 8.9%, higher than the same month in 2022, but 6.9 mb, or 1.7%, lower than the latest five-year average.

Naphtha stocks also rose by 0.3 mb, m-o-m, in October, ending the month at 27.8 mb, which is in line with the same time in 2022 levels and is 0.9 mb, or 3.5%, higher than the latest five-year average.

By contrast, **gasoline stocks** fell by 0.3 mb, m-o-m, in October to stand at 108.0 mb. At this level, they were 3.1 mb, or 2.9%, higher than the same time in 2022, but 0.5 mb, or 0.5%, lower than the latest five-year average.

Residual fuel stocks also fell by 0.6 mb, m-o-m, in October to stand at 56.4 mb. This is 4.6 mb, or 7.5%, lower than the same month in 2022 and 4.8 mb, or 7.9%, below the latest five-year average.

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

EU stocks	Oct 22	Aug 23	Sep 23	Oct 23	Change Oct 23/Sep 23
Crude oil	433.8	445.1	434.5	435.0	0.5
Gasoline	105.0	103.6	108.3	108.0	-0.3
Naphtha	27.9	28.1	27.5	27.8	0.3
Middle distillates	360.5	389.3	391.6	392.7	1.1
Fuel oils	61.0	59.0	57.1	56.4	-0.6
Total products	554.3	580.0	584.5	585.0	0.5
Total	988.1	1,025.0	1,019.0	1,020.0	1.0

Sources: Argus, Euroilstock and OPEC.

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

Singapore

In **October**, **total product stocks in Singapore** fell by 1.2 mb m-o-m to stand at 40.9 mb. This is 0.3 mb, or 0.6%, lower than the same month in 2022 and 2.4 mb, or 5.6%, below the latest five-year average.

Light distillate stocks fell by 0.8 mb, m-o-m, in October to stand at 12.1 mb. This is 2.7 mb, or 18.0%, lower than the same month of 2022, and 0.2 mb, or 1.7%, below the latest five-year average.

Middle distillate stocks fell by 0.3 mb, m-o-m, in October to stand at 9.3 mb. This is 2.5 mb, or 36.1%, higher than in October 2022, but 1.3 mb, or 12.3%, lower than the latest five-year average.

Residual fuel oil stocks fell by 0.1 mb, m-o-m, ending October at 19.5 mb. This is 0.1 mb, or 0.4%, lower than in October 2022 and 0.9 mb, or 4.5%, below the latest five-year average.

ARA

Total product stocks in ARA in October fell by 0.3 mb, m-o-m. At 40.1 mb, they were 0.5 mb, or 1.2%, above the same month in 2022, but 1.8 mb, or 4.2%, lower than the latest five-year average.

Gasoil stocks fell by 1.5 mb, m-o-m, ending October at 13.2 mb. This is 0.3 mb, or 2.2%, higher than in October 2022, but 3.9 mb, or 22.6%, below the latest five-year average.

Jet oil stocks also fell by 0.5 mb, m-o-m, to stand at 5.5 mb. This is 1.2 mb, or 17.7%, lower than in October 2022 and 1.2 mb, or 18.3%, below the latest five-year average.

By contrast, **gasoline stocks** in October rose by 0.8 mb, m-o-m, to stand at 12.2 mb. This is 1.7 mb, or 16.6%, higher than the same month of 2022, and 3.6 mb, or 42.1%, higher than the latest five-year average.

Fuel oil stocks also increased by 0.8 mb, m-o-m, in October to stand at 7.5 mb, which is 0.4 mb, or 5.9%, higher than in October 2022, and 0.5 mb, or 6.7%, above the latest five-year average.

Fujairah

During the week ending 4 December 2023, **total oil product stocks in Fujairah** fell by 1.26 mb, w-o-w, to stand at 18.66 mb, according to data from FEDCom and S&P Global Commodity Insights. At this level, total oil stocks were 4.19 mb lower than at the same time a year ago.

Light distillate stocks fell by 0.46 mb, w-o-w, to stand at 4.78 mb, which is 2.35 mb lower than a year ago.

By contrast, **heavy distillate stocks** rose by 1.17 mb, w-o-w, to stand at 10.69 mb, which is 1.87 mb below the same period a year ago.

Middle distillate stocks also rose w-o-w, increasing by 0.54 mb to stand at 3.20 mb, which is 0.04 mb higher than the same time last year.

Balance of Supply and Demand

Demand for OPEC crude in 2023 remains unchanged from the previous assessment to stand at 29.1 mb/d. This is around 0.6 mb/d higher than in 2022.

According to secondary sources, OPEC crude production averaged 28.8 mb/d in 1Q23, which is 0.4 mb/d higher than demand for OPEC crude. In 2Q23, OPEC crude production averaged 28.3 mb/d, which is 0.1 mb/d lower than demand for OPEC crude. In 3Q23, OPEC crude production averaged 27.6 mb/d, which is 0.8 mb/d lower than demand for OPEC crude.

Demand for OPEC crude in 2024 also remains unchanged from the previous month's assessment to stand at 29.9 mb/d, which is 0.8 mb/d higher than the estimated level in 2023.

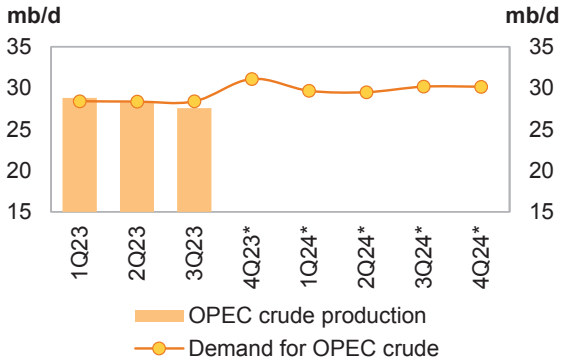
Balance of supply and demand in 2023

Demand for OPEC crude in 2023 remains unchanged from the previous assessment to stand at 29.1 mb/d. This is around 0.6 mb/d higher than in 2022.

Compared with the previous month's assessment, 3Q23 is revised down by 0.2 mb/d, while 4Q23 is revised up by 0.2 mb/d, respectively. Meanwhile, both 1Q23 and 2Q23 remain unchanged compared to last month's assessment.

Compared with the same quarters in 2022, demand for OPEC crude in 2Q23, 3Q23 and 4Q23 is estimated to be higher by 0.2 mb/d, 0.2 mb/d and 2.4 mb/d, respectively. Demand for OPEC crude in 1Q23 is estimated to be down by 0.3 mb/d.

Graph 10 - 1: Balance of supply and demand, 2023–2024*



*Note: * 4Q23-4Q24 = Forecast.*
Source: OPEC.

According to secondary sources, OPEC crude production averaged 28.8 mb/d in 1Q23, which is 0.4 mb/d higher than demand for OPEC crude. In 2Q23, OPEC production averaged 28.3 mb/d, which is 0.1 mb/d lower than demand for OPEC crude. In 3Q23, OPEC production averaged 27.6 mb/d, which is 0.8 mb/d lower than demand for OPEC crude.

Table 10 - 1: Supply/demand balance for 2023*, mb/d

	2022	1Q23	2Q23	3Q23	4Q23	2023	Change 2023/22
(a) World oil demand	**99.66**	**101.57**	**101.47**	**102.12**	**103.28**	**102.11**	***2.46***
Non-OPEC liquids production	65.81	67.72	67.62	68.29	66.73	67.59	*1.78*
OPEC NGL and non-conventionals	5.39	5.44	5.47	5.43	5.43	5.44	*0.05*
(b) Total non-OPEC liquids production and OPEC NGLs	**71.21**	**73.15**	**73.10**	**73.72**	**72.16**	**73.03**	***1.82***
Difference (a-b)	**28.45**	**28.42**	**28.37**	**28.40**	**31.12**	**29.08**	***0.63***
OPEC crude oil production	**28.86**	**28.82**	**28.28**	**27.56**			
Balance	**0.41**	**0.40**	**-0.10**	**-0.84**			

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

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

World oil demand and supply balance	2020	2021	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24	3Q24	4Q24	2024
World demand													
Americas	22.49	24.32	24.87	24.52	25.21	25.47	24.94	25.04	24.70	25.38	25.67	25.10	25.22
of which US	*18.35*	*20.03*	*20.16*	*19.92*	*20.50*	*20.47*	*20.05*	*20.24*	*20.06*	*20.64*	*20.62*	*20.19*	*20.38*
Europe	12.41	13.19	13.51	13.10	13.54	13.67	13.34	13.41	13.16	13.60	13.74	13.38	13.47
Asia Pacific	7.16	7.34	7.38	7.81	6.96	7.07	7.65	7.37	7.84	6.97	7.10	7.65	7.39
Total OECD	**42.06**	**44.85**	**45.75**	**45.43**	**45.71**	**46.20**	**45.93**	**45.82**	**45.70**	**45.96**	**46.51**	**46.13**	**46.08**
China	13.94	15.10	14.95	15.73	16.06	16.27	16.37	16.11	16.30	16.52	16.89	17.04	16.69
India	4.51	4.77	5.14	5.40	5.40	5.17	5.50	5.37	5.63	5.64	5.40	5.69	5.59
Other Asia	8.13	8.67	9.06	9.33	9.48	9.12	9.18	9.28	9.60	9.73	9.48	9.54	9.59
Latin America	5.90	6.25	6.44	6.60	6.70	6.75	6.68	6.68	6.79	6.88	6.97	6.84	6.87
Middle East	7.45	7.79	8.30	8.63	8.32	8.82	8.73	8.63	8.91	8.76	9.38	8.98	9.01
Africa	4.08	4.22	4.40	4.59	4.24	4.27	4.83	4.48	4.70	4.42	4.44	4.96	4.63
Russia	3.39	3.62	3.70	3.83	3.59	3.74	4.01	3.79	3.89	3.70	3.89	4.08	3.89
Other Eurasia	1.07	1.21	1.15	1.24	1.21	1.02	1.23	1.17	1.27	1.24	1.08	1.28	1.22
Other Europe	0.70	0.75	0.77	0.79	0.77	0.75	0.83	0.79	0.81	0.78	0.77	0.84	0.80
Total Non-OECD	**49.16**	**52.38**	**53.90**	**56.15**	**55.76**	**55.92**	**57.35**	**56.29**	**57.90**	**57.68**	**58.29**	**59.25**	**58.28**
(a) Total world demand	**91.22**	**97.23**	**99.66**	**101.57**	**101.47**	**102.12**	**103.28**	**102.11**	**103.60**	**103.64**	**104.80**	**105.38**	**104.36**
Y-o-y change	***-9.13***	***6.01***	***2.43***	***1.90***	***3.01***	***2.73***	***2.18***	***2.46***	***2.03***	***2.17***	***2.68***	***2.10***	***2.25***
Non-OPEC liquids production													
Americas	24.87	25.46	26.91	27.90	28.18	29.02	28.24	28.34	28.80	28.84	29.31	29.62	29.14
of which US	*17.76*	*18.06*	*19.28*	*20.10*	*20.70*	*21.20*	*20.33*	*20.58*	*20.85*	*21.07*	*21.33*	*21.50*	*21.19*
Europe	3.92	3.79	3.58	3.69	3.65	3.54	3.69	3.64	3.85	3.73	3.68	3.82	3.77
Asia Pacific	0.52	0.51	0.48	0.45	0.45	0.44	0.47	0.45	0.46	0.43	0.44	0.43	0.44
Total OECD	**29.31**	**29.77**	**30.97**	**32.04**	**32.28**	**33.01**	**32.40**	**32.43**	**33.11**	**33.00**	**33.43**	**33.87**	**33.35**
China	4.16	4.32	4.48	4.63	4.63	4.49	4.49	4.56	4.59	4.58	4.55	4.54	4.56
India	0.78	0.78	0.77	0.76	0.78	0.78	0.77	0.77	0.79	0.79	0.79	0.78	0.79
Other Asia	2.53	2.42	2.30	2.31	2.25	2.24	2.27	2.27	2.25	2.23	2.21	2.21	2.22
Latin America	6.02	5.96	6.34	6.69	6.76	7.06	7.04	6.89	7.10	7.13	7.26	7.33	7.21
Middle East	3.15	3.19	3.29	3.27	3.29	3.27	3.29	3.28	3.29	3.32	3.31	3.31	3.31
Africa	1.41	1.34	1.29	1.24	1.27	1.27	1.28	1.27	1.26	1.26	1.31	1.35	1.30
Russia	10.54	10.80	11.03	11.19	10.86	10.78	9.66	10.62	10.49	10.65	10.66	10.66	10.62
Other Eurasia	2.91	2.93	2.83	2.99	2.93	2.82	2.95	2.92	2.93	3.00	2.99	3.03	2.99
Other Europe	0.12	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Non-OECD	**31.64**	**31.85**	**32.44**	**33.21**	**32.88**	**32.82**	**31.86**	**32.69**	**32.79**	**33.07**	**33.17**	**33.32**	**33.09**
Total Non-OPEC production	60.95	61.61	63.41	65.25	65.15	65.83	64.26	65.12	65.90	66.07	66.60	67.18	66.44
Processing gains	2.16	2.29	2.40	2.47	2.47	2.47	2.47	2.47	2.52	2.52	2.52	2.52	2.52
Total Non-OPEC liquids production	**63.11**	**63.90**	**65.81**	**67.72**	**67.62**	**68.29**	**66.73**	**67.59**	**68.42**	**68.59**	**69.12**	**69.70**	**68.96**
OPEC NGL + non-conventional oils	5.17	5.28	5.39	5.44	5.47	5.43	5.43	5.44	5.49	5.54	5.50	5.50	5.51
(b) Total non-OPEC liquids production and OPEC NGLs	**68.27**	**69.18**	**71.21**	**73.15**	**73.10**	**73.72**	**72.16**	**73.03**	**73.91**	**74.13**	**74.61**	**75.20**	**74.47**
Y-o-y change	***-2.54***	***0.91***	***2.03***	***2.21***	***2.78***	***2.50***	***-0.18***	***1.82***	***0.76***	***1.03***	***0.89***	***3.04***	***1.43***
OPEC crude oil production (secondary sources)	25.72	26.34	28.86	28.82	28.28	27.56							
Total liquids production	94.00	95.52	100.07	101.97	101.37	101.28							
Balance (stock change and miscellaneous)	2.78	-1.71	0.41	0.40	-0.10	-0.84							
OECD closing stock levels, *mb*													
Commercial	3,037	2,651	2,781	2,759	2,792	2,831							
SPR	1,541	1,484	1,214	1,217	1,206	1,210							
Total	**4,578**	**4,135**	**3,995**	**3,976**	**3,998**	**4,041**							
Oil-on-water	1,148	1,202	1,399	1,413	1,302	1,220							
Days of forward consumption in OECD, *days*													
Commercial onland stocks	68	58	61	60	60	62							
SPR	34	32	26	27	26	26							
Total	**102**	**90**	**87**	**87**	**87**	**88**							
Memo items													
(a) - (b)	**22.95**	**28.05**	**28.45**	**28.42**	**28.37**	**28.40**	**31.12**	**29.08**	**29.68**	**29.51**	**30.19**	**30.18**	**29.89**

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

Source: OPEC.

https://www.iea.org/reports/oil-market-report-december-2023

Oil Market Report - December 2023

Highlights

- World oil demand is on track to rise 2.3 mb/d to 101.7 mb/d in 2023, but this masks the impact of a further weakening of the macroeconomic climate. Global 4Q23 demand growth has been revised down by almost 400 kb/d, with Europe making up more than half the decline. The slowdown is set to continue in 2024, with global gains halving to 1.1 mb/d, as GDP growth stays below trend in major economies. Efficiency improvements and a booming electric vehicle fleet also drag on demand.

- US oil supply growth continues to defy expectations, with output shattering the 20 mb/d mark. This, combined with record Brazilian and Guyanese production along with surging Iranian flows will lift world output by 1.8 mb/d to 101.9 mb/d in 2023. Non-OPEC+ will again drive global gains in 2024, projected at 1.2 mb/d after OPEC+ deepens its voluntary oil cuts.

- Russian crude export prices declined sharply in November, with Urals falling below the $60/bbl price cap on 6 December. The lower prices and a 200 kb/d drop in oil shipments pushed November export revenues for crude and products down 17% m-o-m to $15.2 billion, a level not seen since July 2023. Revenues fell more for crude (-$2.4 billion m-o-m) than products (-$800 million).

- Refinery margins in Europe and Singapore rebounded marginally in November, but the US Gulf Coast underperformed again, slipping for the third month running. Weaker diesel and gasoline cracks drove much of the US hub's decline. Global crude runs in 4Q23 are expected to be materially weaker than previously estimated on deeper and longer refinery turnarounds, falling 3.6 mb/d m-o-m in October and only slowly recovering to a seasonal peak of 84.2 mb/d by December 2023.

- Global observed oil inventories declined by 19.6 mb in October. While crude oil inventories were largely unchanged, oil product stocks fell for the first time in four months, reversing the trend in 3Q23 when oil product stocks rose 1.3 mb/d, while crude drew 1.6 mb/d on average. OECD and non-OECD on-land stocks fell by 18.9 mb and 24.2 mb, respectively, while oil on water built by 23.5 mb.

- ICE Brent futures continued to fall in November, declining by $5/bbl to $83/bbl. Surging US crude exports and weaker global demand growth pressured the prompt crude price structure. The WTI contango deepened. Oil's bearish drift continued in early December after the 30 November OPEC+ meeting failed to halt the price rout, with Brent prices about $25/bbl below September's annual high.

Over a barrel

Oil market sentiment turned decidedly bearish in November and early December as non-OPEC+ supply strength coincided with slowing global oil demand growth. The extension of OPEC+ output cuts through 1Q24 did little to prop up oil prices. By early December, they had tumbled by about $25/bbl from September's highs, to their lowest levels in six months. At the time of writing, Brent futures were trading around $74/bbl and WTI close to $69/bbl.

Record-breaking supply from the United States, Brazil and Guyana, and sharply higher Iranian oil production, along with easing demand, prompted some OPEC+ members to announce more extensive 100 2 1Q24 cuts to fend off a potential inventory build. Improved drilling efficiencies and 95 0 well productivity in the shale patch saw US oil supply exceed 20 mb/d in September, defying industry warnings of an imminent slowdown in growth due to cost inflation and oil field service capacity constraints. As a result, upward revisions to US 2H23 supply are set to total close to 600 kb/d since our June Report. The United States is now on track to deliver a supply increase of 1.4 mb/d in 2023, accounting for two-thirds of the 2.2 mb/d non-OPEC+ expansion. At the same time, OPEC+ will post a 400 kb/d decline, cutting its market share to 51% in 2023 – the lowest since the bloc's creation in 2016. Hefty supply cuts, largely shouldered by Saudi Arabia, have been tempered by Iranian production at five-year highs. While non-OPEC+ supply growth is set to lose momentum in 2024, forecast gains of 1.2 mb/d may yet exceed the increase in global oil demand.

Evidence of a slowdown in oil demand is mounting, with the pace of expansion set to ease from 2.8 mb/d y-o-y in 3Q23 to 1.9 mb/d in 4Q23. A deterioration in the macroeconomic outlook led to a downward revision in our global oil consumption growth forecast of nearly 400 kb/d in the final three months of the year. Europe, Russia and the Middle East account for most of the adjustment. The impact of higher interest rates is feeding through to the real economy while petrochemical activity shifts increasingly to China, undermining growth elsewhere. Europe is particularly soft amid the continent's broad manufacturing and industrial slump. In addition, tighter efficiency standards and an expanding electric vehicle fleet continue to curb oil use. As a result, world oil demand growth in 2023 has been adjusted lower by 90 kb/d from last month's Report to 2.3 mb/d. China accounts for 78% of this year's increase. Oil consumption growth is expected to ease significantly in 2024, to 1.1 mb/d, with demand baselines normalising as Covid-related distortions fade.

The shift in global oil supply from key producers in the Middle East to the United States and other Atlantic Basin countries, and the dominant impact of China and its booming petrochemical sector on oil demand, are profoundly impacting global oil trade. East of Suez markets have already absorbed the majority of Russian flows following the invasion of Ukraine as well as rising Iranian exports, but now must adjust to increasing volumes of Atlantic Basin crude and NGLs. The continued rise in output and slowing demand growth will complicate efforts by key producers to defend their market share and maintain elevated oil prices.

OPEC+ crude oil production[1]
million barrels per day

	Oct 2023 Supply	Nov 2023 Supply	Nov Prod vs Target	Nov-2023 Target	Sustainable Capacity[2]	Eff Spare Cap vs Nov[3]
Algeria	0.96	0.96	0.0	0.96	1.0	0.04
Angola	1.15	1.08	-0.38	1.46	1.11	0.03
Congo	0.27	0.26	-0.05	0.31	0.27	0.01
Equatorial Guinea	0.05	0.05	-0.07	0.12	0.06	0.01
Gabon	0.23	0.23	0.06	0.17	0.21	-0.02
Iraq	4.36	4.29	0.07	4.22	4.75	0.46
Kuwait	2.57	2.6	0.05	2.55	2.83	0.23
Nigeria	1.35	1.26	-0.48	1.74	1.34	0.08
Saudi Arabia	8.99	9	0.02	8.98	12.16	3.16
UAE	3.25	3.24	0.37	2.88	4.2	0.96
Total OPEC-10	**23.18**	**22.97**	**-0.41**	**23.38**	**27.94**	**4.99**
Iran[4]	3.1	3.19			3.8	
Libya[4]	1.14	1.14			1.22	0.08
Venezuela[4]	0.78	0.8			0.8	-0.0
Total OPEC	**28.2**	**28.1**			**33.76**	**5.07**
Azerbaijan	0.49	0.49	-0.19	0.68	0.54	0.05
Kazakhstan	1.62	1.6	0.05	1.55	1.67	0.07
Mexico[5]	1.63	1.66			1.68	0.02
Oman	0.8	0.8	0	0.8	0.85	0.05
Russia	9.53	9.5	0.05	9.45	9.98	
Others [6]	0.87	0.86	-0.2	1.06	0.87	0.01
Total Non-OPEC	**14.94**	**14.91**	**-0.29**	**13.54**	**15.58**	**0.2**
OPEC+ 19 in cut deal[4]	**36.49**	**36.22**	**-0.69**	**36.92**	**41.84**	**5.16**
Total OPEC+	**43.14**	**43.01**			**49.35**	**5.27**

1. Excludes condensates. 2. Capacity levels can be reached within 90 days and sustained for an extended period. 3. Excludes shut in Iranian, Russian crude. 4. Iran, Libya, Venezuela exempt from cuts. 5. Mexico excluded from OPEC+ compliance. Only cut in May, June 2020. 6. Bahrain, Brunei, Malaysia, Sudan and South Sudan.

IEA World Oil Supply and Demand Forecasts: Summary (Table)

2023-12-14 09:00:00.0 GMT

By Kristian Siedenburg

(Bloomberg) -- Following is a summary of world oil supply and demand forecasts from the International Energy Agency in Paris:

	4Q 2024	3Q 2024	2Q 2024	1Q 2024	4Q 2023	3Q 2023	2Q 2023	1Q 2023	2024	2023
	Demand									
Total Demand	103.9	103.4	102.4	101.4	102.2	102.8	101.7	100.2	102.8	101.7
Total OECD	45.9	45.5	45.3	45.3	45.9	46.0	45.7	45.4	45.5	45.8
Americas	24.9	25.1	24.9	24.5	25.1	25.4	25.2	24.5	24.9	25.0
Europe	13.3	13.3	13.4	13.1	13.2	13.6	13.5	13.1	13.3	13.4
Asia Oceania	7.7	7.1	7.0	7.7	7.7	7.1	7.0	7.8	7.4	7.4
Non-OECD countries	58.0	57.9	57.0	56.1	56.2	56.8	56.0	54.8	57.3	56.0
FSU	5.0	5.0	4.8	4.8	4.9	5.0	4.9	4.9	4.9	4.9
Europe	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
China	17.5	17.5	17.0	16.7	16.7	16.9	16.6	15.6	17.2	16.4
Other Asia	15.0	14.4	14.8	14.7	14.6	14.1	14.5	14.4	14.7	14.4
Americas	6.5	6.5	6.4	6.2	6.3	6.5	6.3	6.2	6.4	6.3
Middle East	8.8	9.4	9.0	8.6	8.6	9.3	8.8	8.7	9.0	8.9
Africa	4.5	4.3	4.3	4.3	4.2	4.2	4.2	4.3	4.3	4.2
	Supply									
Total Supply	n/a	n/a	n/a	n/a	n/a	102.0	101.9	101.9	n/a	n/a
Non-OPEC	69.2	69.4	69.1	68.1	68.3	68.4	67.5	67.0	69.0	67.8
Total OECD	31.7	31.6	31.4	31.2	31.3	31.2	30.5	30.4	31.5	30.9
Americas	28.0	28.1	27.9	27.6	27.7	27.7	26.9	26.7	27.9	27.2
Europe	3.1	3.0	3.1	3.2	3.1	3.0	3.2	3.3	3.1	3.2
Asia Oceania	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Non-OECD	31.9	31.8	31.8	31.7	31.4	31.2	31.3	31.6	31.8	31.4
FSU	13.8	13.7	13.7	13.7	13.7	13.6	13.8	14.2	13.7	13.8
Europe	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
China	4.3	4.3	4.4	4.3	4.2	4.2	4.3	4.3	4.3	4.3
Other Asia	2.5	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.7
Americas	6.7	6.7	6.6	6.6	6.4	6.3	6.0	6.0	6.7	6.2
Middle East	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Africa	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3
Processing Gains	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4
Total OPEC	n/a	n/a	n/a	n/a	n/a	33.6	34.4	34.8	n/a	n/a
Crude	n/a	n/a	n/a	n/a	n/a	28.0	28.9	29.3	n/a	n/a
Natural gas										
liquids NGLs	5.7	5.7	5.6	5.6	5.6	5.6	5.5	5.5	5.6	5.5
Call on OPEC crude										
and stock change *	29.0	28.3	27.7	27.7	28.3	28.9	28.7	27.7	28.2	28.4

NOTE: Figures are in million of barrels per day. (*) equals total demand minus non-OPEC supply and OPEC natural gas liquids.

IEA changed the way it measures OPEC supply, adopting the industry-standard approach of counting most of Venezuela's Orinoco heavy oil as "crude oil."

SOURCE: International Energy Agency

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IEA: November Crude Oil Production in OPEC Countries (Table)
2023-12-14 09:00:00.2 GMT
By Kristian Siedenburg
(Bloomberg) -- Following is a summary of oil production in OPEC countries from the International Energy Agency in Paris:

	Nov. 2023	Oct. 2023	Nov. MoM
Total OPEC	28.10	28.20	-0.10
Total OPEC10	22.97	23.18	-0.21
Algeria	0.96	0.96	0.00
Angola	1.08	1.15	-0.07
Congo	0.26	0.27	-0.01
Equatorial Guinea	0.05	0.05	0.00
Gabon	0.23	0.23	0.00
Iraq	4.29	4.36	-0.07
Kuwait	2.60	2.57	0.03
Nigeria	1.26	1.35	-0.09
Saudi Arabia	9.00	8.99	0.01
UAE	3.24	3.25	-0.01
Iran	3.19	3.10	0.09
Libya	1.14	1.14	0.00
Venezuela	0.80	0.78	0.02

NOTE: Figures are in million of barrels per day. Monthly level change calculated by Bloomberg. Production data excludes condensates.
OPEC10 excludes Iran, Libya and Venezuela.
SOURCE: International Energy Agency

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IEA REPORT WRAP: Global Oil Demand Growth Is Slowing Sharply
2023-12-14 11:22:46.585 GMT
By Rachel Graham
(Bloomberg) -- The following stories were published Thursday from the IEA's monthly Oil Market Report:
* Oil Demand Growth Shows Signs of Sharper Slowdown
** Global oil demand growth is slowing down sharply as economic activity weakens in key countries

** IEA cuts 4Q demand growth forecast by 400k b/d
** Oil demand growth to halve to 1.1m b/d in 2024
** Global oil demand forecast at 102.8m b/d in 2024
** Record US supply wave is squeezing Saudi Arabia out of prime markets
** Click here for revisions to supply and demand forecasts
** Click here for table showing quarterly supply and demand forecasts by region
* Oil output is forecast to rise to record 101.9m b/d in 2023
* Non-OPEC+ is set to to drive oil output gain of 1.2m b/d in 2024
* 2024 global oil demand growth estimate raised by 130k b/d

OTHER:
* Russia November Oil Revenues Plunge to Five-Month Low
* OPEC Crude Output Falls 100k B/D on Nigeria, Angola Losses
* NGL Growth in China and US Shakes Up Oil Market Analysis
* WTI Midland Dominates Dated Brent Assessment on Export Boom
* Oil Refinery Run Rates Materially Undershoot Expectations
* European Diesel More Expensive Than Other Benchmarks

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IEA World Oil Supply/Demand Key Forecasts
2023-12-14 09:00:00.3 GMT
By Kristian Siedenburg
(Bloomberg) -- World oil demand 2024 forecast was revised to 102.8m b/d from 102.9m b/d in Paris-based Intl Energy Agency's latest monthly report.
* 2023 world demand was revised to 101.7 from 102.0m b/d
* Demand change in 2024 est. 1% y/y or 1.06m b/d
* Non-OPEC supply 2024 was revised to 69.0m b/d from 68.9m b/d is
* Call on OPEC crude 2023 was revised to 28.4 m b/d from 28.7m b/d
** OPEC crude production in Nov. fell by 100k b/d on the month to 28.1m b/d
* Detailed table: FIFW NSN S5NB6TGF4NPC <GO>
* NOTE: Fcasts based off IEA's table providing one decimal point

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Oil Demand Growth Shows Signs of Sharper Slowdown, IEA Says
2023-12-14 09:00:00.8 GMT
By Grant Smith
(Bloomberg) -- Global oil demand growth is slowing down sharply as economic activity weakens in key countries, the International Energy Agency said as it slashed estimates for this quarter.
The IEA sliced nearly 400,000 barrels a day from assessments of consumption growth for the final three months of 2023, and continues to expect that growth rates will decelerate dramatically next year. Meanwhile, soaring production from the US, Brazil and Guyana is offsetting production cuts by Saudi Arabia and its OPEC+ allies, it said.
“Evidence of a slowdown in oil demand is mounting,” the Paris-based adviser said in its monthly report on Thursday. “The increasingly apparent loss of oil demand growth momentum reflects the deterioration in the macroeconomic climate.”
Crude prices slumped to a five-month low below $73 a barrel in London earlier this week on signs of growing oversupply. Futures have tumbled around 23% since late September as China’s economic outlook darkens while output swells from a number of exporters.
Fresh production cutbacks announced by OPEC+ on Nov. 30 look set to eliminate a glut previously anticipated in the first quarter, but they come at a cost for the cartel: the 23-nation coalition will see its share of the global market whittled to the lowest level since its formation seven years ago, the IEA said.
They’re also helping to finance a “record-smashing” supply wave from the US, which is “squeezing Saudi Arabia and other core Middle Eastern producers out of prime export markets,” the report said. American oil production exceeded 20 million barrels a day in September, defying predictions that cost inflation would check its growth.
“The continued rise in output and slowing demand growth will complicate efforts by key producers to defend their market share and maintain elevated oil prices,” the IEA said. A significant supply rebound from OPEC nation Iran is also tempering curbs by other members.

Europe, Russia and the Middle East drove the agency's downgrade of fourth-quarter demand estimates. Europe was "particularly soft amid the continent's broad manufacturing and industrial slump," the IEA said. Higher interest rates are also a headwind, the agency noted.

Global oil demand growth remains on track to increase by a substantial 2.3 million barrels a day this year to average a record 101.7 million a day, bolstered by the remnants of the post-pandemic rebound in consumption.

Yet growth will slow by roughly 50% next year to 1.1 million barrels a day as that rebound peters out, and consumers turn to more efficient or electric vehicles. The rise in consumption can probably be satisfied by a similar increase in non-OPEC+ supplies, the agency said.

Such a demand slowdown would help put countries on the path agreed at COP28 climate talks in the United Arab Emirates this week, which culminated in a pledge to transition away from fossil fuels.

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OPEC Crude Output Falls 100k B/D on Nigeria, Angola Losses: IEA

2023-12-14 09:00:00.5 GMT

By Amanda Jordan

(Bloomberg) -- OPEC's November crude output dropped 100k b/d from a month earlier to 28.1m b/d, led by declines in Nigeria, Angola and Iraq, the IEA said in its monthly market report.

* Nigerian production slid 90k b/d to 1.26m b/d
* Operational issues cut Angolan supply by 70k b/d to 1.08m b/d
* Output in Algeria and Libya held steady
* Iraqi supply retreated 70k b/d to 4.29m b/d as storms disrupted loadings from southern terminals
* In Saudi Arabia, volumes edged up to 9m b/d
* Kuwaiti output crept up to 2.6m b/d; UAE slipped to 3.24m b/d
* In Iran, production climbed 90k b/d to 3.19m b/d, the highest since October 2018
* Supply in Venezuela inched up to 800k b/d
* NOTE: OPEC released its own figures for November on Wednesday, estimating its 13 members pumped 27.8m b/d

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NGL Growth in China and US Shakes Up Oil Market Analysis: IEA
2023-12-14 09:00:00.35 GMT
By Jack Wittels
(Bloomberg) -- The enormous growth in the supply and demand of ethane and propane in the world's two largest economies highlights the mounting importance of natural gas liquids in oil markets, the IEA said in its monthly Oil Market Report.
* "This can distort outdated analyses of the industry, which focus more narrowly on crude supply and refinery operations"
** "US NGLs, the preeminent source of supply growth since 2019, are ideally positioned to facilitate Chinese petrochemical expansion"
* China has built substantial LPG and ethane-cracking capacity, and enough propane dehydrogenation units to double the entire 2019 global capacity
** Refinery-integrated naphtha crackers are also part of China's chemicals expansion
* Meanwhile, since 2019, US exports of ethane and LPG have risen by 920k b/d, the IEA said, citing Kpler data
** 72% of this increase has been directed to China
* READ (Nov. 4): Two Fuels That Power the Global Economy Flash Red in Europe

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Russia November Oil Revenues Plunge to Five-Month Low, IEA Says
2023-12-14 09:00:00.6 GMT
By Bloomberg News
(Bloomberg) -- Russia's oil-export revenues in November

fell to lowest in five months amid a decline in global crude prices and tougher western sanctions against the Kremlin, according to the International Energy Agency.

The top-three global oil producer earned $15.2 billion from foreign sales of its crude and oil products in November, down more than 17% from the month before, the Paris-based agency said in its monthly oil report on Thursday. The nation's revenue was almost 11% lower than a year earlier, the IEA data show.

Russia earned substantially less than in October even though its daily oil exports were down by just 200,000 barrels to 7.2 million barrels, the agency said. The plunge in the flow of petrodollars to Moscow came as the value of Russian barrels declined amid a slide in global oil prices, plus recent US actions against several vessels accused of violating the western price cap, it said.

Revenue from oil production and exports are a key source of funds for the Russian government's budget, which is burdened by massive spending on the war in Ukraine and the need to maintain social expenditures ahead of presidential elections in March.

Western nations and their allies have imposed several rounds of energy sanctions against Russia in a move to reduce the Kremlin's revenue without disrupting supplies to the global market. In particular, the Group of Seven industrialized countries imposed a $60-a-barrel cap on Russian crude. While non-western buyers are free to buy the barrels at a higher price, they cannot access such western services as shipping and insurance.

READ: Russia Punches an $11 Billion Hole in Oil Sanctions Regime

For months, Russia has demonstrated it can work around the cap by amassing a large shadow fleet of tankers to carry its oil. Yet in recent weeks there have been a steady stream of US sanctions targeting Russia-controlled vessels, in a sign the West started a new stage in the enforcement of the rules.

"The added risk, and the consequent reduction in the number of ships available, bolstered shipping costs by around 65%

between the US Treasury's initial announcement and the last week of November," the IEA report said. This was aggravated by the overall decline in global oil prices amid concerns of a supply glut.
As a result, the average-weighed price of a Russian barrel in November dropped to $71.36 compared to $80.66 a month before.

The Russian government's fiscal oil revenue in November was up 20% from a year earlier and 12% from the prior month, totaling $12.2 billion, the IEA estimated, based on data from the nation's Finance Ministry.
The apparent disconnect with the overall flows of petrodollars into Russia "reflects price and volume trends for Russian crude and products with a one- to two-month lag," the IEA said. "The lower prices in November 2023 will appear in the revenues for December," it said.

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WTI Midland Dominates Dated Brent Assessment on Export Boom: IEA
2023-12-14 09:00:00.4 GMT
By Sherry Su
(Bloomberg) -- WTI Midland has been setting the Dated Brent benchmark for more than half the time since May as exports of the US grade flood the Atlantic basin, the IEA said in a monthly market report.
* "The integration of WTI deliveries into the Brent complex epitomizes the global ascendancy of US oil, with the price difference between the two benchmarks essentially derived from transatlantic freight costs"
* In June, WTI set Dated about 80% of the time, but ceded first place to Forties and Brent from July to September, when it set the price only 30% of the time
** This period saw greater interest in WTI from Asian refiners as they temporarily rebalanced their crude supply amid Saudi output cuts and higher Urals prices
** As bidding lured the grade away from Europe, WTI lost its North Sea competitiveness, moving above Brent and Forties
* WTI regained dominance in October and November as exports to Europe recovered, setting Dated about 80% of the time
* WTI Midland shipments to Europe have averaged around 1.2m b/d

year-to-date, making up about two-thirds of total transatlantic crude exports

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Oil Refinery Run Rates Materially Undershoot Expectations: IEA
2023-12-14 09:00:23.790 GMT
By Alaric Nightingale
(Bloomberg) -- Fourth-quarter refinery run rates have proved “materially weaker” than previously expected, the International Energy Agency says in its monthly oil-market report.
* Extended US maintenance, and refouts in Europe and the Middle East have depressed activity levels
* Likely that a collapse in margins in late September/early October contributed to refineries running less hard
* 4Q throughput rates now estimated at 81.9m b/d, about 725k b/d below last month’s report
* Estimates 2023 runs increase by 1.6m b/d y/y to reach 82.4m b/d, and 880k b/d in 2024
** IEA sees a sharp slowdown in demand for light and middle distillate fuels, from 2.2m b/d in 2023 to 780k b/d in 2024
* Anticipates more refineries may close next year when new plants come on stream in Nigeria and Oman, and others expand in China and India

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European Diesel More Expensive Than Other Benchmarks: IEA
2023-12-14 09:00:00.36 GMT
By Jack Wittels
(Bloomberg) -- European diesel prices have “moved

substantially higher" relative to other regional benchmarks, the IEA said in its monthly Oil Market Report.
* "Europe pays a premium for diesel compared with the lowest cost source of supply globally"
* Since the start of 2021, Middle East Gulf and US Gulf Coast have alternated in setting the cheapest global price for diesel
** Before G-7 Russian sanctions, the most competitive price globally was more often than not set by the USGC
** But post March 2022, the Middle East has been the cheapest two-thirds of the time
* "Europe's increasing reliance on supplies from East of Suez exporters partially explains the region's increased premium"
** At times, heavy futures market backwardation and extended journey times boost arbitrage costs to move product to Europe
** The cost of producing diesel locally via hydrocracking units also spiked in 2022, as gas prices breached $80/mmBtu, contributing to a higher European premium vs global markets

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https://twitter.com/CENTCOM/status/1735782605864194316

U.S. Central Command
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At approximately 0700, Dec. 15 (Sanaa time), Houthi forces contacted the Motor Vessel MSC ALANYA, a Liberian flagged vessel that was traveling north in the southern part of the Red Sea and threatened to attack it. The Houthis directed the vessel to turn around and proceed south. Although there were no U.S. ships in the area, U.S. forces maintained direct communications with the vessel, and the ALANYA continued north. It is believed to be traveling safely at this time.

At approximately 0900, Dec. 15 (Sanaa time), a UAV launched from Houthi held territory struck the Liberian flagged Motor Vessel AL JASRAH as it was travelling south in the Red Sea. The AL JASRAH immediately broadcast a mayday signal that said the crew was fighting a fire caused by the attack.

The fire has since been extinguished and the crew has since determined that no further assistance is needed.

Then, at approximately 1300, Dec. 15 (Sanaa time), Houthi forces launched two ballistic missiles towards the international shipping lanes in the Bab el-Mandeb strait. One of these missiles struck the Liberian flagged MV PALATIUM 3, which broadcast a mayday call and reported that the vessel was on fire. The USS MASON has responded to that request. The other missile likely missed any ships.

No injuries have been reported by any of the three ships attacked, but this latest round of attacks is yet another demonstration of the great risk to international shipping caused by these Houthi actions.

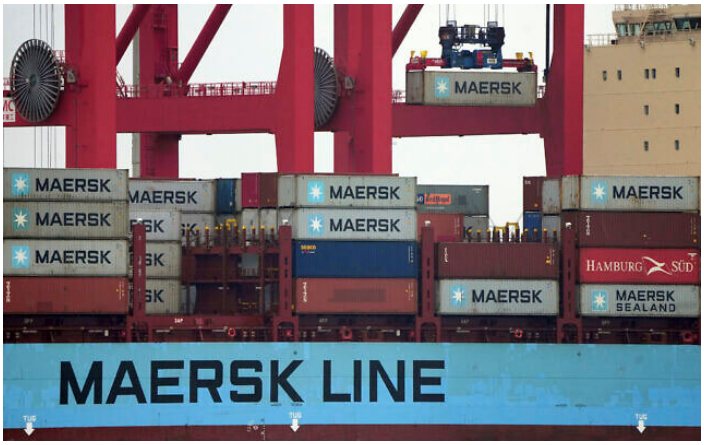
3:03 PM · Dec 15, 2023 · **1.1M** Views

https://www.timesofisrael.com/top-shipping-company-maersk-suspends-red-sea-route-after-two-more-houthi-strikes/?utm_source=dlvr.it&utm_medium=twitter

Top shipping company Maersk suspends Red Sea route after two more Houthi strikes

German company Hapag-Lloyd also suspends shipping through Bab al-Mandab Strait after one of its vessels was targeted by Yemeni rebels; ballistic missile slams into container ship

By **AGENCIES**15 December 2023, 9:17 pmUpdated: Today, 3:31 am 6



Illustrative -- The 'Vilnia Maersk' container vessel is unloaded at the 'Jade Weserport' conatiner terminal in Wilhelmshaven, Germany, November 15, 2022. (AP Photo/Michael Sohn)

One of the world's largest shipping companies, Maersk, said Friday it was suspending its vessels' passage through a key Red Sea strait following attacks by Yemeni Houthi rebels on merchant ships.

"Following the near-miss incident involving Maersk Gibraltar yesterday and yet another attack on a container vessel today, we have instructed all Maersk vessels in the area bound to pass through the Bab al-Mandab Strait to pause their journey until further notice," the Danish company said a statement to AFP.

German shipping company Hapag-Lloyd announced it too was suspending Red Sea container ship traffic until December 18, after one of its vessels was attacked by the Houthis.

"Hapag-Lloyd is interrupting all container ship traffic across the Red Sea until Monday," the company said in a statement sent to AFP.

At that point, they would make a decision on the subsequent period, it added.

The statements came after a ballistic missile fired by Yemen's Houthi rebels slammed into a cargo ship Friday in the Red Sea near the strategic Bab el-Mandeb Strait, following another attack only hours earlier that struck a separate vessel, authorities said.

The missile attack on the MSC Palatium III and the earlier assault on the Al Jasrah escalated a maritime campaign by the Iranian-backed Houthis.
The attacks also endanger ships traveling through a vital corridor for cargo and energy shipments for both Europe and Asia from the Suez Canal out to the Indian Ocean.

The Houthis say their attacks aim to end Israel's war with the Hamas terror group. However, the links to the ships targeted in the rebel assaults have grown more tenuous as the attacks continue.

"The Yemeni armed forces confirm they will continue to prevent all ships heading to Israeli ports from navigating in the (Red Sea) until they bring in the food and medicine that our steadfast brothers in the Gaza Strip need," the Houthi military spokesman, Brig. Gen. Yahya Saree, said in a statement claiming responsibility for Friday's attacks.

War erupted in Gaza after Hamas's October 7 massacre, which saw some 3,000 terrorists burst across the border into Israel by land, air and sea, killing some 1,200 people and seizing over 240 hostages of all ages — mostly civilians — under the cover of a deluge of thousands of rockets fired at Israeli towns and cities.

In response, Israel vowed to eliminate Hamas and launched a wide-scale offensive aimed at rooting out the terror organization's military and governance capabilities. The offensive has drawn international reproach for its mounting death toll, with the Hamas-run health ministry in Gaza reporting over 18,000 Palestinians dead. However, the number cannot be independently verified and is believed to include some 7,000 Hamas and Hamas-affiliated terror operatives as well as civilians killed by misfired Palestinian rockets.

Meanwhile, hijackers, likely from Somalia, separately seized a Bulgarian ship in the Arabian Sea.

A US defense official and the private intelligence firm Ambrey said the MSC Palatium III, a Liberian-flagged container ship, caught fire after the strike. It was not immediately clear if anyone on board the vessel had been hurt.

Two missiles were fired in the attack, likely trying to hit the Al Jasrah, the US official said. One went wide and splashed down in the water, the other slammed into the Palatium, the official said.

The Palatium turned around after the attack and was now trying to head south, tracking data analyzed by The Associated Press showed.

The Switzerland-based MSC, or Mediterranean Shipping Co., earlier had another vessel, the MSC Alanya, warned by the Houthis around the Bab el-Mandeb, Ambrey said. “The parent company had cooperated with Israel, and this was likely the reason why she was threatened.”

The official spoke on condition of anonymity to discuss intelligence matters. MSC did not immediately respond to a request for comment.

In the earlier Al Jasrah attack, it remained unclear if it was a missile or drone that hit the vessel, the official said. Ambrey and the British military’s United Kingdom Maritime Trade Operations, which monitors Mideast shipping lanes, also confirmed that attack.

“The projectile reportedly hit the port side of the vessel and one container fell overboard due to the impact,” Ambrey said. “The projectile caused a ‘fire on deck’ which was broadcast via” radio.

Shipper Hapag-Lloyd said no crew member had been hurt in the attack. It later announced that it was also pausing its ships through the Red Sea until Monday and “will decide for the period thereafter.”

Ambrey noted that Hapag-Lloyd “is known to have offices in the Israeli ports of Ashdod, Haifa and Tel Aviv.”

In his statement, military spokesman Saree claimed the Houthis targeted the Palatium III and the Alanya — not the Al Jasrah. It was not immediately clear why he erroneously identified the second ship.

The attacks Friday further escalate a campaign by the Houthi rebels, who have claimed responsibility for a series of missile assaults in recent days that just missed shipping in the Red Sea and its strategic Bab el-Mandeb Strait.

On Thursday, the Houthis fired a ballistic missile that missed a container ship traveling through the strait.

The day before that, two missiles fired from Houthi-held territory missed a commercial tanker loaded with Indian-manufactured jet fuel near the Bab el-Mandeb Strait. Also near the strait, a missile fired by Houthis on Monday night slammed into a Norwegian-flagged tanker in the Red Sea.

Global shipping has increasingly been targeted as the Israel-Hamas war threatens to become a wider regional conflict — even during a brief pause in fighting at the end of November during which Hamas exchanged 105 hostages for 240 Palestinian prisoners held by Israel. The collapse of the truce at the beginning of December has raised the risk of more sea attacks.

The Bab el-Mandeb Strait is only 29 kilometers (18 miles) wide at its narrowest point, limiting traffic to two channels for inbound and outbound shipments, according to the US Energy Information Administration. Nearly 10% of all oil traded at sea passes through it. An estimated $1 trillion in goods pass through the strait annually.

In November, Houthis seized a vehicle transport ship linked to Israel in the Red Sea off Yemen. The rebels still hold the vessel near the port city of Hodeida. Separately, a container ship owned by an Israeli billionaire came under attack by a suspected Iranian drone in the Indian Ocean.

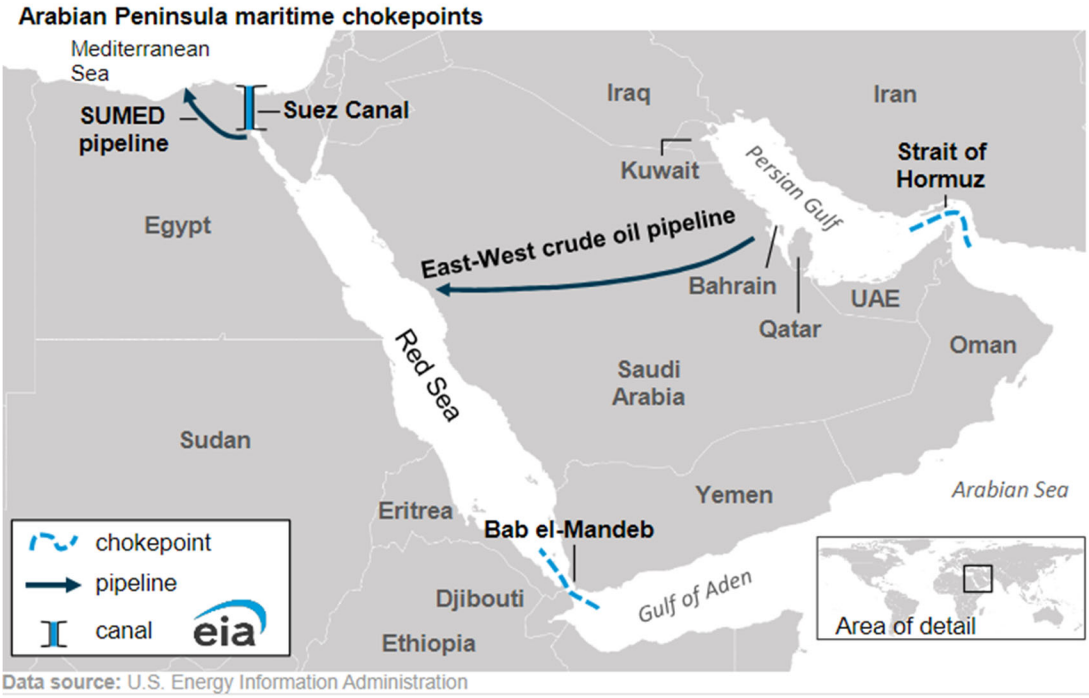
A separate, tentative cease-fire between the Houthis and a Saudi-led coalition fighting on behalf of Yemen’s exiled government has held for months despite that country’s long war. That’s raised concerns that any wider conflict in the sea — or a potential reprisal strike from Western forces — could reignite those tensions in the Arab world’s poorest nation.

The Times of Israel staff and Jacob Magid contributed to this report.

https://www.eia.gov/todayinenergy/detail.php?id=61025

DECEMBER 4, 2023

Red Sea chokepoints are critical for international oil and natural gas flows



Data source: U.S. Energy Information Administration

The Suez Canal, the SUMED pipeline, and the Bab el-Mandeb Strait are strategic routes for Persian Gulf oil and natural gas shipments to Europe and North America. Total oil shipments via these routes accounted for about 12% of total seaborne-traded oil in the first half of 2023, and liquefied natural gas (LNG) shipments accounted for about 8% of worldwide LNG trade.

The Suez Canal and SUMED pipeline are located in Egypt and connect the Red Sea with the Mediterranean Sea. The SUMED pipeline transports crude oil north through Egypt and has a capacity of 2.5 million barrels per day. The Bab el-Mandeb Strait is between the Horn of Africa and the Middle East, connecting the Red Sea to the Gulf of Aden and Arabian Sea. Most exports of petroleum and natural gas from the Persian Gulf to Europe and North America pass through multiple chokepoints, including the Suez Canal or the SUMED pipeline and both the Bab el-Mandeb and the Strait of Hormuz.

Volume of crude oil, condensate, and petroleum products transported through the Suez Canal, SUMED pipeline, and Bab el-Mandeb Strait (2018–1H23)
million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Suez Canal and SUMED pipeline	**6.4**	**6.2**	**5.3**	**5.1**	**7.2**	**9.2**
crude oil and condensate	3.4	3.1	2.6	2.2	3.6	4.9
petroleum products	3.0	3.1	2.6	2.9	3.6	4.3
LNG flows through Suez Canal (billion cubic feet per day)	**3.3**	**4.1**	**3.7**	**4.5**	**4.5**	**4.1**
Total oil flows through Bab el-Mandeb Strait	**6.1**	**5.9**	**5.0**	**4.9**	**7.1**	**8.8**
crude oil and condensate	**3.0**	**2.7**	**2.2**	**1.9**	**3.3**	**4.5**
petroleum products	**3.1**	**3.2**	**2.8**	**3.1**	**3.8**	**4.4**
LNG flows through Bab el-Mandeb Strait (billion cubic feet per day)	**3.1**	**3.9**	**3.7**	**4.5**	**4.5**	**4.1**

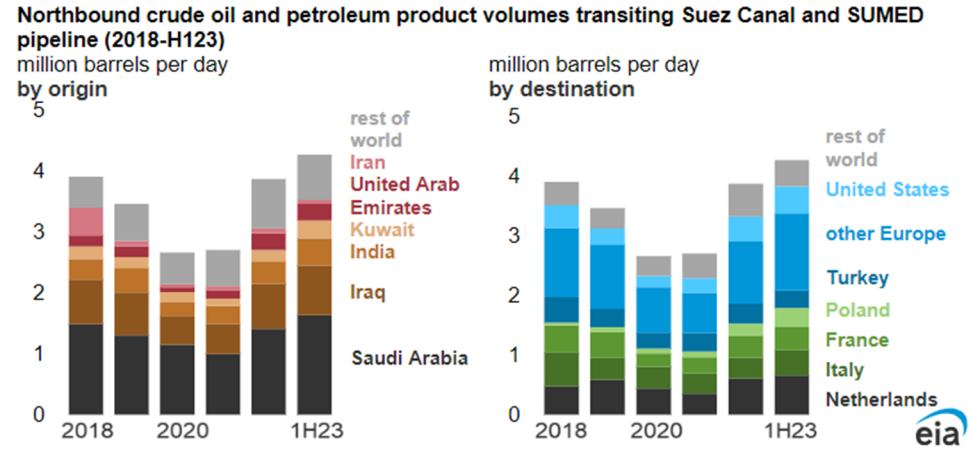
Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking
Note: LNG=liquefied natural gas, 1H23=first half of 2023

Oil shipments

Northbound oil flows toward Europe via the Suez Canal and SUMED pipeline fell between 2018 and 2020. Renewed U.S. sanctions on

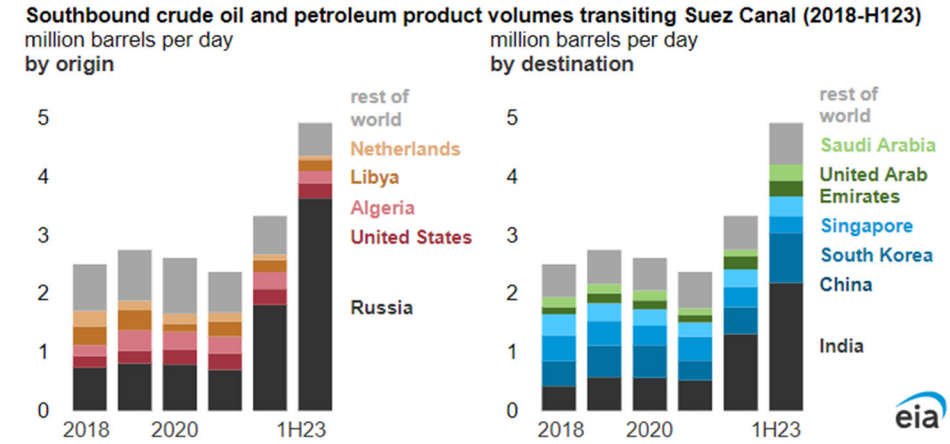
Iran reduced all exports from Iran, including those through the Suez Canal. In addition, less crude oil and oil products from Middle East producers moved through the Suez Canal because Europe imported less oil from the Middle East and more from the United States. The COVID-19 pandemic further reduced flows through the Suez Canal because of slowing global oil demand.

In the first half of 2023, northbound crude oil flowing through the Suez Canal and SUMED pipeline had increased by more than 60% from 2020, as demand in Europe and the United States rose from pandemic-induced lows. Also, Western sanctions on Russia's oil beginning in early 2022 shifted global trade patterns, leading Europe to import more oil from the Middle East via the Suez Canal and SUMED pipeline and less from Russia.



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking
Note: 1H23=first half of 2023.

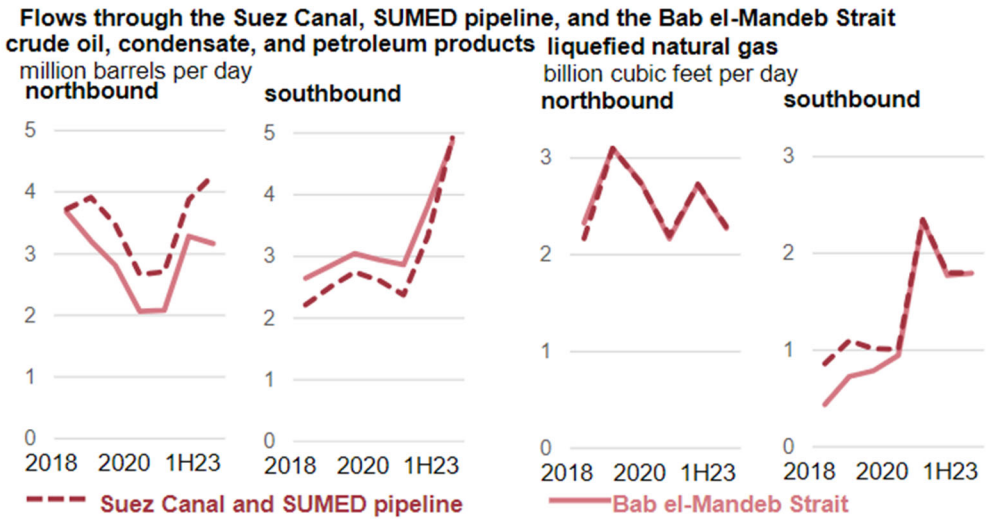
Southbound shipments through the Suez Canal rose significantly between 2021 and 2023, largely because of Western sanctions on Russia's oil exports. Oil exports from Russia accounted for 74% of Suez southbound oil traffic in the first half of 2023, up from 30% in 2021. Most of those export volumes were destined for India and China, which imported mostly crude oil from Russia. The Middle East, primarily Saudi Arabia and the United Arab Emirates, increased imports of refined oil products from Russia in 2022 and the first half of 2023 in order to generate electric power or to store or re-export.



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking

LNG shipments

LNG flows through the Suez Canal in both directions rose to a combined peak in 2021 and 2022 of 4.5 billion cubic feet per day (Bcf/d) before total flows declined in the first half of 2023 to 4.1 Bcf/d. Southbound LNG flows more than doubled from 2020 to 2021, mainly driven by growing exports from the United States and Egypt heading to Asia. In 2022 and the first half of 2023, southbound LNG volumes via the Suez Canal declined as U.S. and Egyptian LNG exports both favored European destinations over Asian markets, supplanting some of the natural gas exports that Russia historically sent to Europe. Most of the variation in northbound volumes reflects changes in Qatar's exports to Europe (via the Suez Canal) compared with Asia. Qatar also sent more LNG to Europe in 2022 to replace some volumes from Russia, increasing northbound flows.



Data source: U.S. Energy Information

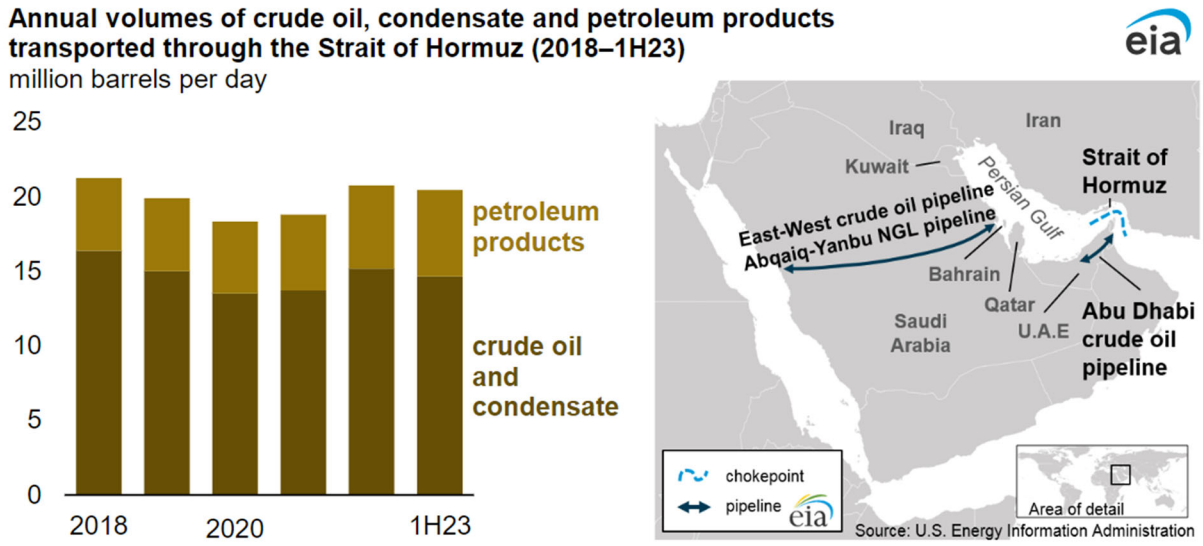
Although oil flow trends through the Bab al-Mandeb Strait are similar to those of the Suez Canal, more oil exits the Red Sea (northbound via the Suez Canal and southbound via the Bab el-Mandeb Strait) than enters the Red Sea through these chokepoints. Saudi Arabia transports some crude oil from the Persian Gulf via pipeline to the Red Sea for export mostly to Europe. LNG flows through the Bab el-Mandeb Strait have matched those in the Suez Canal over the last few years because the few LNG import terminals in the Red Sea have been used less.

Principal contributors: Candace Dunn, Justine Barden

https://www.eia.gov/todayinenergy/detail.php?id=61002

NOVEMBER 21, 2023

The Strait of Hormuz is the world's most important oil transit chokepoint



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking and FACTS Global Energy
Note: 1H23=first half of 2023

The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because large volumes of oil flow through the strait. In 2022, its oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. In the first half of 2023, total oil flows through the Strait of Hormuz remained relatively flat compared with 2022 because increased flows of oil products partially offset declines in crude oil and condensate.

Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security. The inability of oil to transit a major chokepoint, even temporarily, can create substantial supply delays and raise shipping costs, increasing world energy prices. Although most chokepoints can be circumvented by using other routes, which often add significantly to transit time, some chokepoints have no practical alternatives.

Between 2020 and 2022, volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz rose by 2.4 million b/d as oil demand recovered after the economic downturn from the COVID-19 pandemic. In the first half of 2023, shipments of crude oil and condensates dropped because OPEC+ members implemented crude oil production cuts starting in November 2022. Flows through the Strait of Hormuz in 2022 and the first half of 2023 made up more than one-quarter of total global seaborne traded oil. In addition, around one-fifth of global liquefied natural gas trade also transited the Strait of Hormuz in 2022.

Volume of crude oil, condensate, and petroleum products transported through the Strait of Hormuz (2018–1H23)
million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Strait of Hormuz	**21.3**	**19.9**	**18.3**	**18.8**	**20.8**	**20.5**
Crude oil and condensate	16.4	15.0	13.5	13.7	15.2	14.7
Petroleum products	4.9	4.9	4.8	5.1	5.6	5.8
World maritime oil trade	**77.4**	**77.1**	**71.9**	**73.2**	**75.2**	**76.3**
World total petroleum and other liquids consumption	**100.1**	**100.9**	**91.6**	**97.1**	**99.6**	**100.3**
LNG flows through Strait of Hormuz (billion cubic feet per day)	**10.3**	**10.6**	**10.4**	**10.6**	**10.9**	**10.8**

Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, and U.S. Energy Information Administration analysis based on Vortexa tanker tracking and FACTS Global Energy
Note: World maritime oil trade excludes intra-country volumes except those volumes that transit the Strait of Hormuz. LNG=liquefied natural gas. 1H23=first half of 2023.

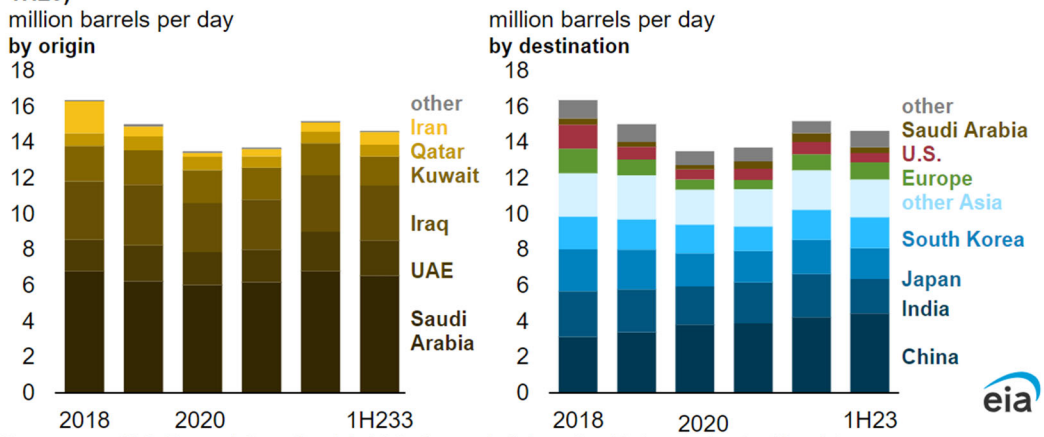
Only Saudi Arabia and the United Arab Emirates (UAE) have operating pipelines that can circumvent the Strait of Hormuz. Saudi Aramco operates the 5-million-b/d East-West crude oil pipeline and temporarily expanded the pipeline's capacity to 7 million b/d in 2019 when it converted some natural gas liquids pipelines to accept crude oil. The UAE links its onshore oil fields to the Fujairah export terminal on the Gulf of Oman with a 1.5 million b/d pipeline.

Iran inaugurated the Goreh-Jask pipeline and the Jask export terminal on the Gulf of Oman with a single export cargo in July 2021. The pipeline's capacity was 0.3 million b/d at that time, although Iran has not used the pipeline since then. We estimate that around 3.5 million b/d of effective unused capacity from these pipelines could be available to bypass the strait in the event of a supply disruption.

Based on tanker tracking data published by Vortexa, Saudi Arabia moves more crude oil and condensate through the Strait of Hormuz than any other country, most of which is exported to other countries. Around 0.5 million b/d transited the strait in 2022 from Saudi ports in the Persian Gulf to Saudi ports in the Red Sea.

We estimate that 82% of the crude oil and condensate that moved through the Strait of Hormuz went to Asian markets in 2022. China, India, Japan, and South Korea were the top destinations for crude oil moving through the Strait of Hormuz to Asia, accounting for 67% of all Hormuz crude oil and condensate flows in 2022 and the first half of 2023.

Annual volumes (crude oil and condensate) transported through the Strait of Hormuz (2018–1H23)



Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking data
Note: 1H23=first half of 2023.

In 2022, the United States imported about 0.7 million b/d of crude oil and condensate from Persian Gulf countries through the Strait of Hormuz, accounting for about 11% of U.S. crude oil and condensate imports and 3% of U.S. petroleum liquids consumption. U.S. crude oil imports from countries in the Persian Gulf have fallen by half since 2018 as domestic production has increased.

Principal contributors: Candace Dunn, Justine Barden

https://www.globaltimes.cn/page/202312/1303533.shtml

JN.1 will bring more COVID-19 infections, but won't seriously worsen current situation: experts

By Leng Shumei Published: Dec 13, 2023 01:08 AM

File Photo: VCG

The latest COVID-19 variant JN.1 is spreading around the world, leading to growing concerns in Chinese society, following a recent severe wave of respiratory infections. Chinese experts estimate that the variant will cause more infections in the near future, but it is not likely to seriously worsen the current situation.

Named JN.1, this variant was first identified in Luxembourg, before spreading to the UK, Iceland, France, and the US.

By the end of October, JN.1 made up less than 0.1 percent of SARS-CoV-2 viruses circulating in the US. But as of December 8, 2023, the ratio climbed to 15-29 percent, according to the US Centers for Disease Control and Prevention (CDC).

The US estimated that COVID-19 infections are likely to increase in the next month.

Data in the UK also suggested that the variant is spreading more than every other known strain, making up one in 13 cases in England last month.

The JN.1 variant is part of the BA.2.86 variant of the SARS-CoV-2 virus, with an additional L455S mutation in the RBD region. Early studies have shown that BA.2.86 has similar immune escape capabilities as the XBB variants. However, recent research has found that the L455S mutation in the JN.1 variant further enhances its immune evasion ability, allowing it to partially escape the humoral immune response induced by XBB.1.5 breakthrough infections, Lu Hongzhou, head of the Third People's Hospital of Shenzhen, told the Global Times on Tuesday.

According to current research, BA.2.86, first identified in August 2023, carries more than 30 mutations in the spike (S) protein compared to the XBB and BA.2 variants, indicating high potential for immune evasion.

Another name of JN.1 is BA.2.86.1.1 and there is only a single change between JN.1 and BA.2.86 in the spike protein, according to current research.

A recent study by Japanese scientists published on bioRxiv on December 8 evaluated the virological characteristics of the omicron subvariant JN.1, which shows robust immune evasion ability compared to other variants. This could be due to the acquisition of the L455S mutation in the spike protein. The study noted that JN.1 has the ability to become a dominant variant worldwide in the future.

But so far, there is no evidence that JN.1 presents an increased risk to public health compared to other variants, according to the US CDC.

Currently, the XBB variant of COVID-19 is still the main strain of the local infections in China. Many clinical

doctors told the media that they had witnessed an increase in COVID-19 infections recently and they predicted this wave of infections will last till late January 2024 with mortality and severe illness rates likely to increase.

"Since December last year, SARS-CoV-2 has been co-circulating with other respiratory pathogens in China, leading to many domestic residents in the country having experienced two or even three infections. Existing research data indicates that such infection experiences can generate strong and broad-spectrum neutralizing antibodies against different subvariants of Omicron. Furthermore, although JN.1 has increased immune escape ability, there is currently no evidence to suggest an increase in the pathogenicity of the JN.1 variant," Lu explained.

"Therefore, we speculate that the future prevalence of JN.1 in our country may temporarily increase the number of COVID-19 patients and burden hospitals, but it will not significantly worsen the ongoing respiratory disease outbreaks," he said.

Lu reiterated the necessity of vaccination as it is an effective method to improve the speed and intensity of antibody production, providing better protection for the body.

Authorities in multiple cities across China such as Shanghai and Tianjin have sent notices to advise local residents to take COVID-19 vaccines targeting the XBB variant, urging eligible individuals to get the vaccine in a timely manner to enhance their protection against the virus.

https://www.globaltimes.cn/page/202311/1302731.shtml

Hospitals across China grapple with respiratory illnesses surge

By GT staff reporters Published: Nov 29, 2023 10:37 PM Updated: Nov 29, 2023 10:47 PM

Sick children receive a drip at a children's hospital in Beijing on November 23, 2023. Photo: VCG

From providing more beds for pneumonia treatment and allocating more manpower to extending working hours, hospitals across China are grappling with a surge in cases of respiratory illnesses in children, especially a spike in mycoplasma pneumonia.

But the Global Times learned from several hospitals and clinics in Beijing, Shanghi and Central China's Henan Province that though facing an obvious increase in outpatient and inpatient visits for respiratory illnesses this winter, the health system has not been overwhelmed as it did during the early stage of the fight against COVID-19.

The Capital Institute of Pediatrics, a Beijing-headquartered renowned hospital for children, which has been one of the top choices for Beijing parents when their children get sick, has made several improvements to enhance its medical treatment capability - raising the number of infusion seats by 48.7 percent on the daily basis compared to their usual capacity, and also expanding the number of beds available for patients with pneumonia by 40.58 percent, according to Beijing Youth Daily.

In order to manage the high demand at the hospital, there has been an 86.36 percent increase in the number of doctors available for visits. Moreover, a dedicated fast-track system has been implemented for critically ill children, allowing them to receive diagnostic reports promptly, the Beijing Youth Daily report said.

The Global Times spoke with the pediatrics department at the First Affiliated Hospital of Henan University of Chinese Medicine on Wednesday. Zhou Rongyi, deputy director of the hospital's pediatrics department, stated that his department receives more than 2,000 visits a day, about 70 percent of whom are patients of respiratory tract infections. It has been hard to find a ward since October. Many children are infected with mycoplasma this time. One of the main reasons for this is the combination infections of influenza and mycoplasma."

As one of the coping measures, Zhou's hospital has opened pediatric wards previously used for treating COVID-19 patients to accommodate the surge in cases. Like many other pediatric hospitals, they have extended their working hours from 5:30 pm until 8 pm to provide convenience for working parents.

Zhou emphasized that "while some pediatric hospitals may have long queues and limited ward availability, overall, medical resources have not reached an overwhelmed state. Hospitals have learned from their experiences with COVID-19 and have developed strategies to prioritize severe cases and classify treatment based on symptoms."

Major hospitals and local health authorities have also disseminated information on influenza and pneumonia prevention measures to communities and grass-roots hospitals in a bid to alleviate pressure, Zhou said.

The overall medical situation in our hospital is currently stable, with a decrease in the number of children seeking treatment for mycoplasma pneumonia infection and an increase in cases of influenza, an expert from Shanghai Children's Medical Center, who asked for anonymity, told the Global Times on Wednesday.

The Global Times learned in Shanghai that major hospitals in this metropolis have been adding pre-examination tests, medical scheduling, and enhancing internet-based outpatient services as parts of their efforts to alleviate their pressure of receiving patients. The move has also reduced waiting time of patients.

Though facing overcrowding in hospitals, most people still tend to seek doctors in major hospitals. However, experts said, community hospitals can play a crucial role in managing this wave of respiratory disease.

A Beijing mother, preferred to be referred to as Song, who recently brought her child to the Liulitun Community Health Service Center in Beijing, shared her experience with the Global Times. Due to difficulties in registering at pediatric hospitals and long waiting times, she opted to visit the community hospital near her home. The doctor conducted various tests and prescribed medication for routine treatment. Song emphasized that parents do not need to overcrowd large hospitals when community hospitals are fully capable of providing effective treatment at an early stage.

Lu Hongzhou, head of the Third People's Hospital of Shenzhen, echoed this sentiment. He told the Global Times on Wednesday that most community hospitals can prescribe effective medications and treat respiratory diseases at an early stage.

This year's respiratory diseases are caused by commonly known pathogens, but there has been a noticeable increase in cases of mycoplasma pneumonia, which is more resistant to antibiotics due to long-term overuse. Zhou stated that in his clinical practice, about 80-90 percent of children infected with mycoplasma pneumonia are resistant to commonly used drugs. Early oral treatment in outpatient clinics is no longer effective, leading to more hospitalized cases.

Lu believes the recent outbreak of mycoplasma pneumonia is an "immunization gap," which resulted in children not having the opportunity to develop resistance to common viruses like influenza. As a result, when the COVID-19 restrictions were lifted, they became vulnerable to these pathogens, Lu told the Global Times on Wednesday.

Lu advised parents to consider the prevalence of the disease in their child's environment and seek timely diagnosis and medication. Lu reassured parents that there is no need to worry, as timely treatment can effectively manage infections like mycoplasma pneumonia.

Hypes are biased

Amid a surge in respiratory illnesses in China, which the country's health authorities have already attributed to known pathogens, certain overseas media reports have been sensationalizing the severity of the diseases and even raising doubts about China's transparency in dealing with respiratory illnesses. These reports have hyped concerns about whether travel restrictions should be imposed on China.

Respiratory and pediatric experts have rebuffed these claims, stating that such hype is not based on facts and reminding individual countries and media to avoid their biased perspectives when reporting on China-related affairs.

However, health experts reached by the Global Times have criticized these reports for sensationalizing an inhumane image of the country. The truth is that this practice is not common in hospitals across the country.

The Global Times found out that very few hospitals had set up study areas for children, including Jiangsu Nantong First People's Hospital. Later on, the hospital in Jiangsu clarified that the study zone was set up two months ago as a makeshift measure for students who haven't finished their homework, not as an encouragement for children to study while receiving medical treatment.

Both educational and health authorities in provinces including East China's Shandong Province as well as Beijing have also advised students not to take classes or do their homework when they are sick. Personal health always comes first.

When the World Health Organization made a standard request to China last week for information regarding the reported cases of "undiagnosed pneumonia," some Western media outlets publicized this request as unusual. Experts have noted that this was an attempt to sensationalize China's transparency over increase in respiratory diseases.

On Tuesday, when a reporter from Antara asked the spokesperson of China's Foreign Ministry about rising concerns among the international public about the safety of traveling to China as well as people who travel from China, Wang Wenbin, the spokesperson, said, "Let me assure you that it is safe to travel and do business here in China and there's no need to worry."

On Wednesday, answering a reporter from NHK about international attention over increasing outpatient and emergency visits, Wang said China's National Health Commission (NHC) held a press conference on November 26 to share information on the prevention and treatment of respiratory infectious diseases in winter. The NHC has had communication in a timely manner with the WHO, Wang emphasized.

Commenting on media's exaggerated worries and concerns about China's respiratory disease, Zhou, from the First Affiliated Hospital of Henan University of Chinese Medicine,told the Global Times that it is not surprising to see some Western media outlets spreading false information about China. "But facts speak for themselves."

More from AAA

115 Million Americans Expected to Travel over Christmas, New Year's

Second highest year-end holiday travel forecast since AAA began tracking in 2000

Aixa Diaz
Media Relations Manager
ADiaz@national.aaa.com

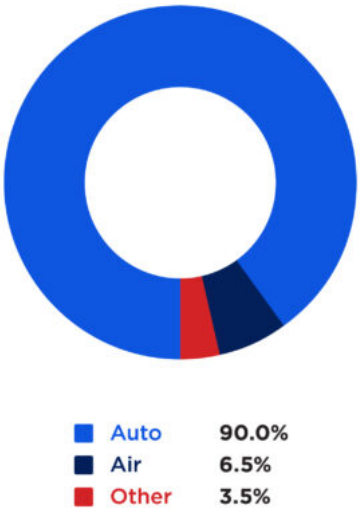
12/11/2023

WASHINGTON, DC (December 11, 2023) – AAA projects 115.2 million travelers will head 50 miles or more from home over the 10-day year-end holiday travel period*. This year's total number of domestic travelers is a 2.2% increase over last year and the second highest year-end travel forecast since 2000, when AAA began tracking holiday travel. 2019 remains the busiest Christmas and New Year's travel period on record with 119 million travelers.

Paula Twidale, Senior Vice President of AAA Travel. “More Americans are investing in travel, despite the cost, to make memories with loved ones and experience new places.”

AAA 2023 Year-End Holiday Travel Forecast

Share of Travelers by Mode



Number of Travelers by Mode

	Auto	Air	Other	Total
2023 (forecast)	103.6M	7.51M	4.05M	115.2M
2022	101.8M	7.17M	3.66M	112.7M
2019	108.0M	7.33M	3.89M	119.3M
Growth* (2022 to 2023)	1.8%	4.7%	10.7%	2.2%
Growth* (2019 to 2023)	-4.1%	2.4%	4.1%	-3.4%

*Percentages may differ due to rounding. | *Source:* S&P Global Market Intelligence

AAA expects nearly 104 million people will drive to their holiday destinations, an increase of 1.8% compared to 2022. This year’s projected number of drivers is the second highest on record after 2019 when 108 million drivers hit the road for the holidays. As 2023 comes to a close, drivers can expect to pay about the same or less for a gallon of gas than they did last holiday season, when the national average on Christmas Day and New Year’s Day was $3.10 and $3.20 respectively.

Airports are expected to be the busiest they’ve ever been over the Christmas and New Year’s travel period. AAA projects 7.5 million air travelers this holiday season,

for a roundtrip ticket to Orlando this holiday season is $613, down from $735 last year. A roundtrip ticket to Las Vegas is $508 now compared to $705 in 2022. “It depends on your desired route and destination. There are last-minute deals to be found, but if your preference is a nonstop flight with seat selection, AAA recommends booking well in advance and protecting your investment with travel insurance,” Twidale added.

The number of people traveling by other modes, like bus, train, and cruise, is projected to surpass 2019. AAA expects more than 4 million Americans will take alternative transportation over Christmas and New Year’s compared to 3.66 million in 2022 and 3.89 million in 2019. Demand for cruises has skyrocketed post-pandemic, and the industry is now preparing for the wave of bookings that traditionally happens at the start of the new year. “Savvy travelers know that right after the holidays is the best time to book a cruise,” Twidale said. “That’s when cruise lines offer some of the best deals, and AAA members get exclusive benefits in addition to those discounts.”

Best/Worst Times to Drive and Peak Congestion by Metro

INRIX, a provider of transportation data and insights, says there will be several days of potentially bad traffic during the 10-day holiday period. Saturday, December 23, and Thursday, December 28, will be the most congested days on the road. INRIX also says Saturday, December 30, when many people will be heading back home from their holiday destinations or traveling for New Year’s Eve, will see an increase in traffic compared to a normal Saturday. The best times to hit the road are before lunchtime or after 7pm.

could experience nearly double the typical delays," said Bob Pishue, transportation analyst at INRIX. "Avoid peak commuting hours and use traffic apps, local DOT notifications, and 511 services to minimize holiday travel traffic frustrations."

Please note that the times listed below are for the time zone in which the metro is located.

For example, Atlanta routes = ET and Los Angeles routes = PT

Best and Worst Times to Travel by Car

Date	Worst Travel Time	Best Travel Time
Saturday, Dec 23	11:00 AM – 7:00 PM	Before 10:00 AM
Sunday, Dec 24	*Minimal Traffic Impact Expected*	
Monday, Dec 25	*Minimal Traffic Impact Expected*	
Tuesday, Dec 26	1:00 – 5:00 PM	Before 12:00 PM
Wednesday, Dec 27	1:00 – 7:00 PM	Before 12:00 PM
Thursday, Dec 28	2:00 – 8:00 PM	Before 12:00 PM
Friday, Dec 29	2:00 – 8:00 PM	Before 12:00 PM
Saturday, Dec 30	5:00 – 7:00 PM	Before 12:00 PM
Sunday, Dec 31	*Minimal Traffic Impact Expected*	
Monday, Jan 01	*Minimal Traffic Impact Expected*	

Peak Congestion by Metro

Metro	Route	Peak Congestion Period	Est. Travel Time	Compared to Typical

	I-20 W	PM	minutes	
Boston	Boston to Portsmouth via I-95 N	Saturday 12/23, 4:15 PM	1 hour 41 minutes	55%
Chicago	Milwaukee to Chicago via I-94 E	Thursday 12/28, 5:30 PM	1 hour 47 minutes	29%
Denver	Fort Collins to Denver via I-25 S	Friday 12/29, 2:00 PM	1 hour 40 minutes	67%
Detroit	Detroit to Cleveland via I-75 S	Saturday 12/23, 6:45 PM	3 hours 18 minutes	27%
Houston	Houston to Galveston via I-45 S	Saturday 12/23, 5:15 PM	1 hours 6 minutes	38%
Los Angeles	Bakersfield to Los Angeles via I-5 S	Wednesday 12/27, 6:15 PM	2 hours 41 minutes	50%
Minneapolis	Eau Claire to Minneapolis via I-94 W	Thursday 12/28, 10:15 AM	2 hours 7 minutes	62%
New York	New York to Hamptons	Saturday 12/23, 2:30	2 hours 8 minutes	50%

Portland	Portland to Hood River via I-84 E	Saturday 12/23, 5:45 PM	1 hour 39 minutes	40%
San Diego	San Diego to Palm Springs via I-15 N	Saturday 12/23, 5:00 PM	2 hours 50 minutes	22%
San Francisco	San Francisco to Sacramento via I-80 E	Saturday 12/23, 5:15 PM	1 hour 49 minutes	73%
Seattle	Seattle to Bellingham via I-5 N	Wednesday 12/27, 6:45 PM	2 hours 33 minutes	47%
Tampa	Tampa to Orlando via I-4 E	Tuesday 12/26, 4:15 PM	2 hours 59 minutes	58%
Washington, DC	Baltimore to Washington DC via Balt/Wash Pkwy S	Friday 12/29, 3:45 PM	1 hour 1 minute	67%

SOURCE: INRIX

This holiday season, many travelers are heading to warm weather destinations like Florida and the Caribbean, tourist hotspots like New York and Las Vegas, and European cities like London and Rome. Here are top domestic and international destinations, based on AAA flight booking data.

DOMESTIC	INTERNATIONAL/U.S. TERRITORIES
Orlando, FL	London, England
Anaheim, CA	St. Thomas, U.S. Virgin Islands
Chicago, IL	Aruba
Charlotte, NC	Dublin, Ireland
Miami, FL	Toronto, Ontario, Canada
Atlanta, GA	Rome, Italy
Las Vegas, NV	Reykjavík, Iceland
New York, NY	San Juan, Puerto Rico
Phoenix, AZ	Montego Bay, Jamaica
Houston, TX	Costa Rica

Airport Parking Tips

With a record number of air travelers expected this holiday season, AAA recommends travelers plan ahead and take precautions when driving to the airport and parking their vehicles.

Reserve a parking spot ahead of time to save time and money.

Choose a well-lit, secure garage.

and peace of mind given their proximity to the terminals.

If choosing off-site parking, look for reputable businesses like The Parking Spot which is securely fenced and offers a shuttle to the airport (AAA members get a discount).

Opt for covered parking, if you live in an area expecting inclement weather.

Remove valuables from your vehicle.

Lock doors and roll up windows.

Take a photo of your spot to remember where you parked.

Keep your ticket – and receipt, if you prepaid – handy to show when exiting.

Holiday Forecast Methodology

Travel Forecast

In cooperation with AAA, S&P Global Market Intelligence developed a unique methodology to forecast actual domestic travel volumes. The economic variables used to forecast travel for the current holiday are leveraged from S&P Global Market Intelligence's proprietary databases. These data include macroeconomic drivers such as employment, output, household net worth, asset prices including stock indices, interest rates, housing market indicators, and variables related to travel and tourism including gasoline prices, airline travel, and hotel stays. AAA

Historical travel volume estimates come from DK SHIFFLET's TRAVEL PERFORMANCE/MonitorSM. The PERFORMANCE/MonitorSM is a comprehensive study measuring the travel behavior of U.S. residents. DK SHIFFLET contacts over 50,000 U.S. households each month to obtain detailed travel data, resulting in the unique ability to estimate visitor volume and spending, identify trends, and forecast U.S. travel behavior, all after the trips have been taken.

The travel forecast is reported in person-trips. In particular, AAA and SPGMI forecast the total U.S. holiday travel volume and expected mode of transportation. The travel forecast presented in this report was prepared the week of October 9, 2023.

***Year-End Holiday Travel Period**

For the purposes of this forecast, the year-end holiday travel period is defined as the 10-day period from Saturday, December 23, 2023 to Monday, January 1, 2024.

About AAA

Started in 1902 by automotive enthusiasts who wanted to chart a path for better roads in America and advocate for safe mobility, AAA has transformed into one of North America's largest membership organizations. Today, AAA provides roadside assistance, travel, discounts, financial and insurance services to enhance the life journey of 64 million members across North America, including 57 million in the United States. To learn more about all AAA has to offer or to become a member, visit AAA.com.

businesses and individuals with the right data, expertise and connected technology so that they can make decisions with conviction. From helping our customers assess new investments to guiding them through ESG and energy transition across supply chains, we unlock new opportunities, solve challenges and accelerate progress for the world. We are widely sought after by many of the world's leading organizations to provide credit ratings, benchmarks, analytics and workflow solutions in the global capital, commodity, automotive markets. With every one of our offerings, we help the world's leading organizations plan for tomorrow, today. For more information, visit www.spglobal.com.

About DKSA

DK SHIFFLET boasts the industry's most complete database on U.S. resident travel both in the U.S. and worldwide. Data is collected monthly from a U.S. representative sample, adding over 60,000 traveling households annually and is used daily by leading travel organizations and their strategic planning groups. DK SHIFFLET is an MMGY Global company.

About INRIX

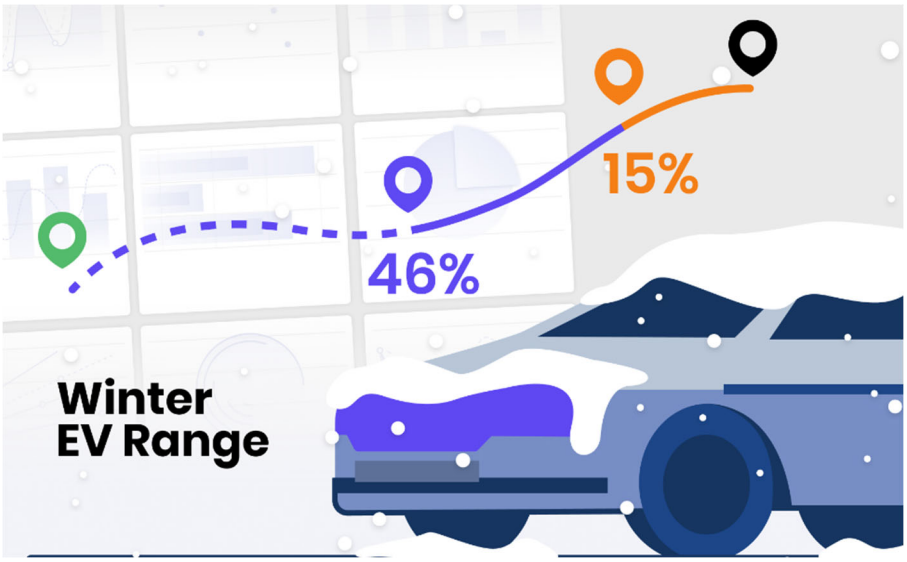
Founded in 2004, INRIX pioneered intelligent mobility solutions by transforming big data from connected devices and vehicles into mobility insights. This revolutionary approach enabled INRIX to become one of the leading providers of data and analytics into how people move. By empowering cities, businesses, and people with valuable insights, INRIX is helping to make the world smarter, safer, and greener. With partners and solutions spanning across the entire mobility ecosystem, INRIX is uniquely positioned at the intersection of technology and transportation – whether it's keeping road users safe, improving traffic signal

https://www.recurrentauto.com/research/winter-ev-range-loss

RESEARCH

Winter & Cold Weather EV Range 10,000+ Cars

Blake Hough **Andrew Garberson** **Marketing** **November 15, 2023**



Do electric cars have less range cold temperatures? Yes, the 18 popular EV models that we analyzed had an average of 70.3% of their range in freezing conditions, but each model performs differently as our chart illustrates.

Other key findings:

- Heat pump technology is extending EV range above 14F, if not colder, making it a key consideration for people who live in cold climates.
- Hyundai Kona continues to exceed EPA estimates in many driving conditions.
- Audi e-tron distinguishes itself as a winter leader by dropping the least range in cold conditions.
- Vehicles with LFP batteries should not experience noticeably more range loss than their NCA counterparts in normal cold conditions, although winter charging times may be a bit slower.

All cars lose efficiency in the cold weather. However, drivers only really worry about it when it comes to electric cars, since the lower efficiency translates directly to lower range. For EV owners in colder climates, like northern portions of the United States and Canada, daily driving and charging behaviors must be adjusted in winter months.

That's the bad news. The good news is that this range loss is temporary and there is no long term damage to your battery. As the ice melts and the temperatures rise, your vehicle's range should return to normal. We're here to help you understand what to expect in the winter and how some minor adjustments can give you all the range and comfort you need.

Why Does Cold Weather Affect Electric Vehicle Range?

Winter range loss occurs for a few reasons. We cover them in detail in our hot and cold temperature article but the two main contributing factors are chemical and mechanical.

- Chemical and physical reactions in the battery occur more slowly in cold temperatures. Cold temperatures inhibit chemical reactions and act as resistance that slows down the physical processes. This reduces the EVs available power.
- The major reason that EVs lose range in the winter is due to cabin heating to keep the driver and passengers warm. Unlike in a conventional car, electric cars have to use energy to produce cabin heat. In the internal combustion engine (ICE) that powers traditional cars, the "waste heat" generated by the engine can be pumped directly into the car to warm people up. On the other hand, an EV has a much more efficient motor which does not generate nearly as much heat. The heaters that keep the car warm generally draw energy from the high voltage battery, reducing how much capacity is left for driving.

Although other organizations have studied the effect of cold weather on range, including AAA, these tests are sometimes run in laboratory settings or with a small vehicle sample. This ongoing research project includes a much larger data set under real world driving conditions.

2023 Update: Recurrent collected observed, ground-truthed data over winter 2022-23 in order to update and improve the accuracy of our winter range data for several models, including the Ford F-150 Lightning, Hyundai Kona EV, and the Chevrolet Bolt. These verified winter range values reflect average observed data for a variety of drivers under a wide range of use cases.

We also include temperature specific dashboard data for several newer models, including the Hyundai Ioniq 5 and Kia EV6.

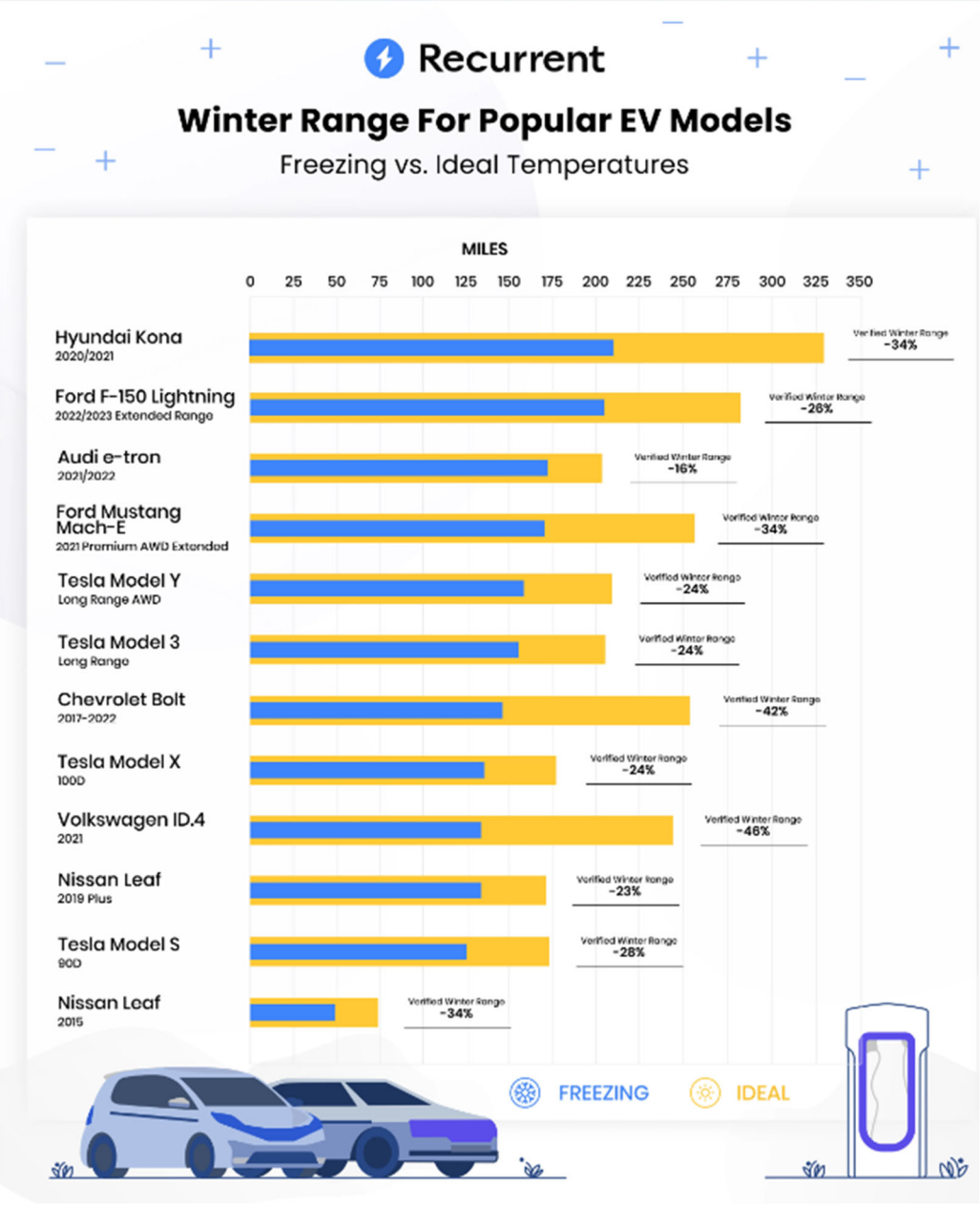
Electric Cars React to Winter in *Very* Different Ways

This chart compares 12 popular EV models to show range loss in freezing temperatures, as compared to the ideal driving temperature. Note that the ideal driving temperature is defined as the temperature at which a specific model sees its highest average range. This exact temperature varies from car to car.

This analysis includes aggregated and anonymized data from over 10,000 vehicles in the Recurrent community from across the United States as well as tens of thousands of data points from on-board devices that provide data on energy usage.

All winter range data in this chart is verified with on-the-ground, real-world data collected from on-board devices or using energy in/energy out data. We will continue to update this chart as we verify new models.

Verified winter range figures include all real-world variables, such as uneven terrain, variable driving speeds and uses, and calendar aging in vehicle batteries. They show the average expectation for winter driving conditions in a range of real use cases.



Verified winter ranges are based on original Recurrent research using a combination of on-board devices and real-time usage data providing more than 3,500,000 datapoints.

Tips for Avoiding Winter Range Loss

- It takes more energy to warm up a cold car than to keep a warm car warm. So, as much as possible, you want to warm up your car while it's still charging. This is called preconditioning.
- Preconditioning is available in most EVs using your phone's app or by setting up a departure time. Some vehicles also offer a "winter weather" package that is specially designed to keep battery temperatures in an ideal zone so they are always ready when you start to drive.
- Once your car is warm and you're on the road, plan to use seat warmers, a heated steering wheel, and turn down the cabin heater. These features use less energy and provide targeted heat, giving you more battery to travel.

- Expect for longer charge times. To protect the high voltage battery, many cars limit the charging voltage when the battery is cold. Regular charge speed will return when the battery has warmed up.
- In many newer EVs, if you use the in-car navigation system to head to a charger, the car will condition the battery for optimal charging temperature, meaning your charge time may be reduced.
- Turn down regenerative braking on icy roads. You will want to be able to engage your brakes more than in temperate conditions.
- Regenerative braking may also be limited by your battery management system if the battery is cold, since a cold battery cannot charge as fast as a warm one.
- When possible, store your EV plugged in with a maximum charge setting of 70 or 80%. That way, the car can pull energy from the wall to keep warm, rather than using the battery. Otherwise, you may return to a lower battery capacity than expected.
- Consider a heat pump if winter range is a major concern. This newer technology can help you preserve range when it's cold. Jump to the bottom of this article to learn more.

Individual Model Data

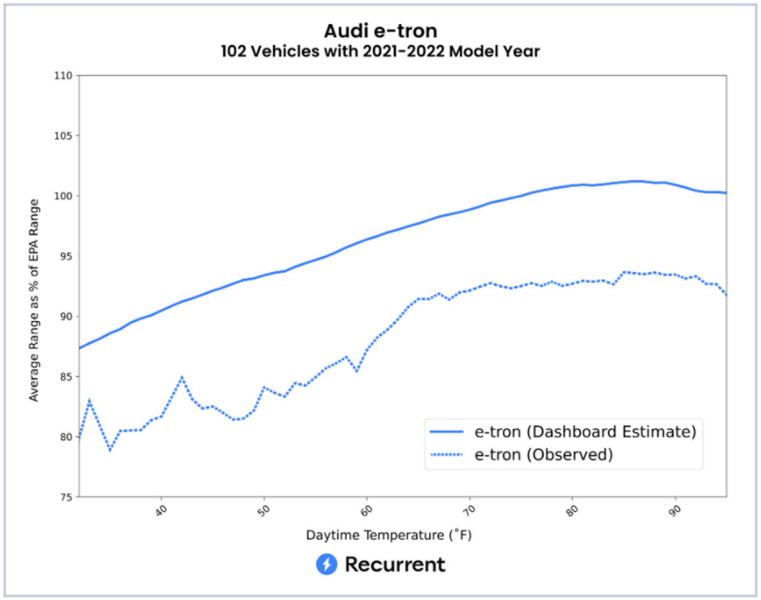
The data in the charts below comes from our full community of over 18,000 vehicles. We display the dashboard-reported range as it changes with temperature, and, where available, the observed range that has been ground-truthed and verified by secondary data.

2021-2022 Audi e-tron Winter Range

Model or Trim: Premium Plus
Observed Range at 32F: 80% of Original EPA Range
Observed Maximum Range: 94% of Original EPA Range
Heat Pump: Yes

The e-tron was Audi's first all-electric vehicle and even though it never had the sales volume of a Tesla or Chevy, it was built with intent and tons of comfort features. Since the e-tron was first released in 2019, Audi has been able to fine-tune its specs to preserve range in wintry conditions.

The e-tron is one of the few earlier EVs that was planned and released with a heat pump, allowing for recapture up to 3 kW of waste heat from the motor. Heated seats also come standard and, in extreme temperatures, telematics will inform the driver of limited performance. Notably, the 2023 Q4 e-tron was not outfitted with the heat pump, due to semiconductor shortages. Helpful internet friends suggest that you can check the equipment of 2023 Audis by opening the hood and looking for a sticker that says 'R744,' which indicates that there is a heat pump.

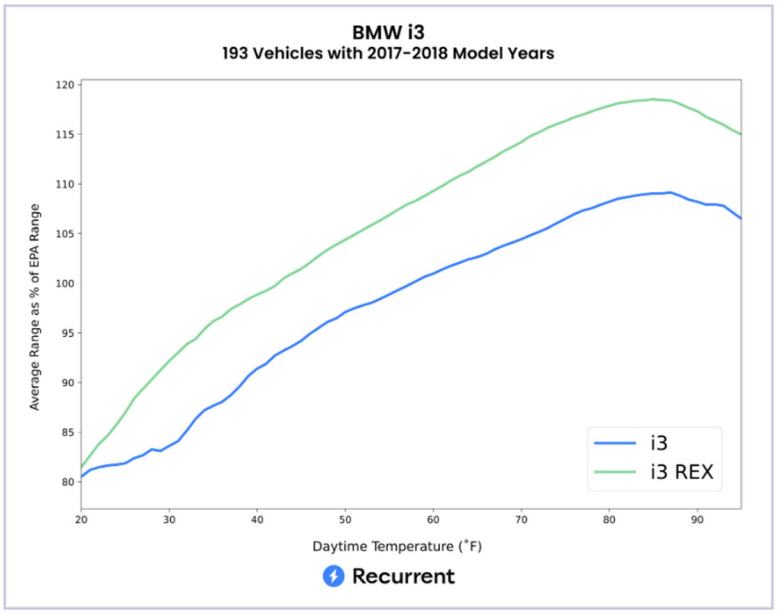


This chart includes all model years, although there are some differences. Prior to 2021, the e-tron came with an optional cold weather package with adaptive windshield wipers, heated washer jets, rear heated seats, and a preconditioning heater for the high-voltage battery. Starting in 2021, the winter package was discontinued, but heated seats, four-zone climate control, and heated steering wheels are now all standard. The preconditioning feature is also standard, but owners warn that to heat the battery using wall power, rather than battery power, it must be set up using the MyAudi app rather than in the car directly.

2017-2018 BMW i3 Winter Range

Model or Trim: 42 kWh Battery, (Range Extender; REx)
Dashboard Range at 32F: 85% (94% REx) of Original EPA Range
Dashboard Maximum Range: 109% (119% REx) of Original EPA Range
Heat Pump: Possibly

Off the bat, the BMW i3 does not sound like the ideal winter weather car since it is a small, rear-wheel drive hatchback with narrow tires. On top of that, it does not have range parity with other EV leaders, like the 250-mile Chevy Bolt, so each mile of range loss would be noticed. But, most early model year i3s in the US do come standard with a heat pump, at least until 2019 when it became an add-on. Many used models also have a gasoline range extender (called REx). Both of those help to preserve range in cold temperatures.



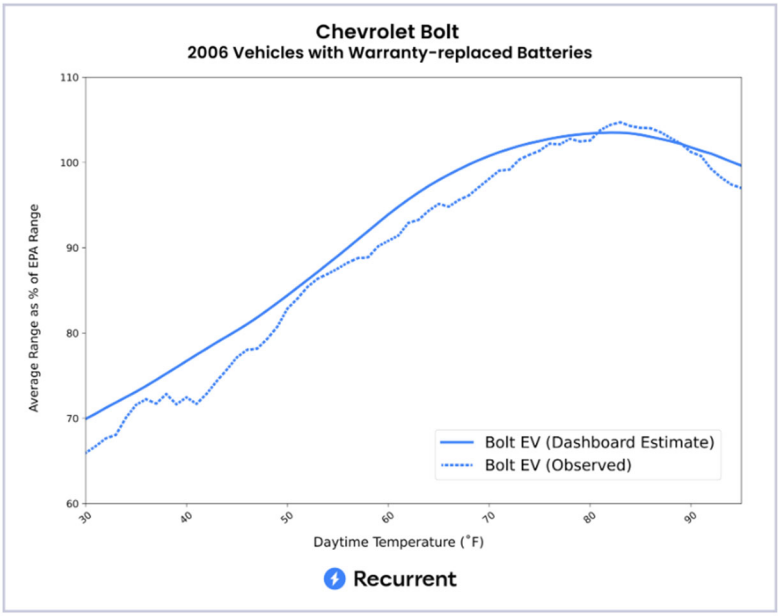
This little BMW clearly experiences some winter range loss in cold temperatures, although the larger battery packs do seem to hold up better than the earlier models.

2017-2022 Chevy Bolt Winter Range

Model or Trim: 66 kWh Battery
Observed Range at 32F: 68% of Original EPA Range
Observed Maximum Range: 105% of Original EPA Range
Heat Pump: No

The Chevy Bolt was the original long-range EV for drives who could not get a Tesla. Although it does not come with many bells or whistles, its efficiency and range make it wildly popular in the EV community. Recurrent closely followed the Bolt recall the past few years and now, generally reports data for models with the updated, 66 kWh battery.

The Bolt battery management system, which is responsible for showing the driver range and energy use data, is particularly sensitive to external temperature changes. Conveniently, the driver gets three range numbers: the best case, the worst case, and the average. Luckily, the 259-mile rated range means that even winter range should be okay for most daily driving. Drivers in inhospitable climates such as Alaska reports that at -40 F, the Bolt can lose half its range, but thankfully most drivers won't see those temperatures. And, if you do, you still have more than 100 miles to see you home.

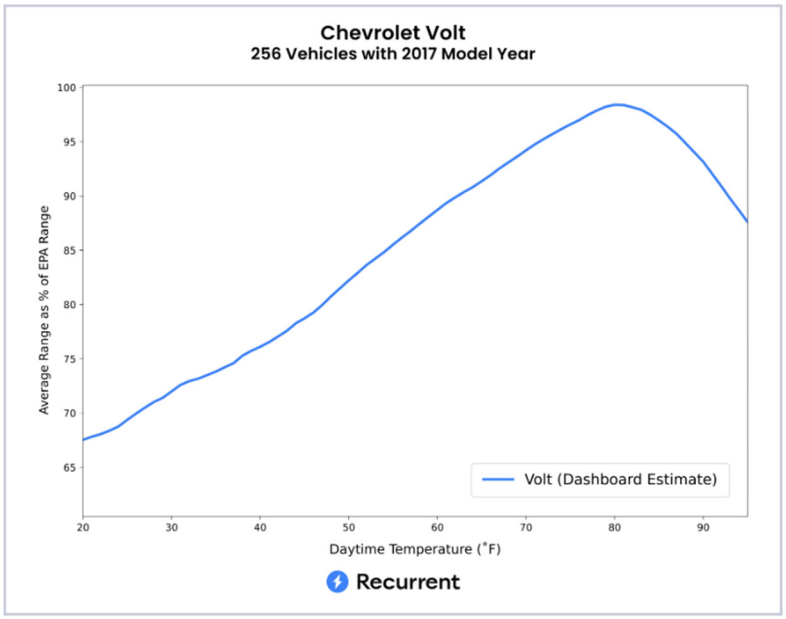


The Bolt manual suggests leaving the car plugged in (with max charge set to 80%) when it is very cold or very hot, so that the thermal management system does not deplete the battery. When the car is off, the Bolt thermal management system will not kick in if the battery is above the mid-30's, and will only start to warm it when the car is turned on.

2017 Chevy Volt Winter Range

Model or Trim: 18.4 kWh Battery
Dashboard Range at 32F: 73% of Original EPA Range
Dashboard Maximum Range: 98% of Original EPA Range
Heat Pump: No

The Chevy Volt has been on the road since 2011 and although production ended with the 2019 model year, it is still one of the top five most popular used EVs. As far back as its release, GM mentions winter weather and outlines the systems they have in place to combat cold weather range loss. The benefit to driving a plug-in hybrid in the cold is that the engine can cycle between electric and combustion, since the combustion engine will produce "waste heat" that can be used to warm the battery and cabin. As GM explains, "Using engine heat this way enables faster window defrosting and rear seat heating than taking energy from the battery."



Note: The chart does not include the 16.0 kWh battery, which is similar to the 16.5 and 17.1 kWh lines.

Since the Volt was an early model EV, it pioneered vehicle preconditioning, allowing drivers to remotely heat their car with an app. Preconditioning allows the cabin to warm up while the car is still plugged in, drawing power from the grid, not the vehicle's battery. Since it takes more energy to heat the cabin than to maintain a constant temperature, this definitely helps the Volt maintain its range in cold weather. Volts also come with heated seats, which are a great, low energy way to keep the driver and front seat passenger warm.

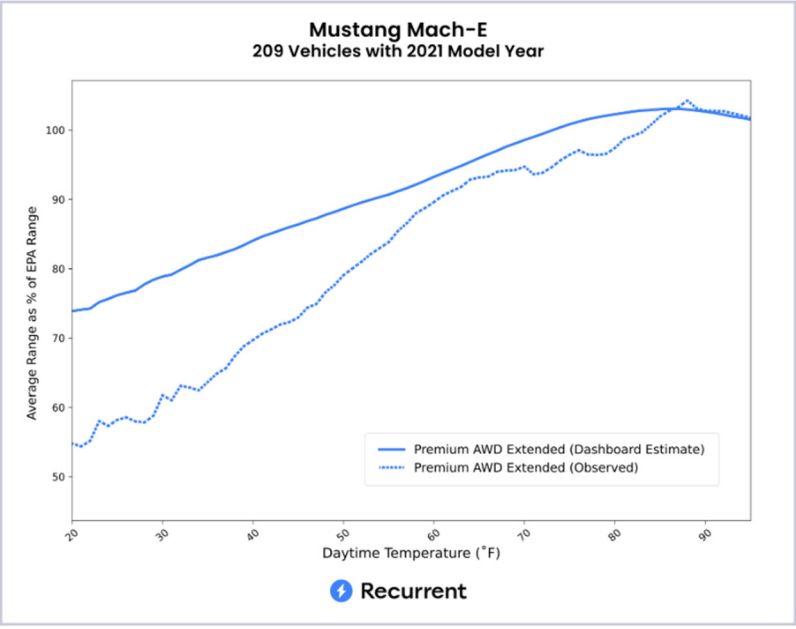
2021 Ford Mustang Mach-E

Model or Trim: Premium AWD
Observed Range at 32F: 63% of EPA Range
Observed Maximum Range: 104% of Original EPA Range
Heat Pump: No

The Mustang Mach-E was Ford's first big EV release, and the auto world welcomed it with both fanfare and controversy. It hasn't been on the road for many winters, but it comes with the standard app-based departure settings such as preconditioning and warming the cabin.

However, Ford did not install a heat pump, relying instead on resistance heating, which is known to have a big effect on winter range, since energy must be drawn from the high voltage battery to generate the heat.

In the chart below, the dotted line represents real-world range, while the solid lines represent the on-board range as seen on the dashboard and by telematics. Ford's on-board diagnostics are very close to real range at many temperatures.



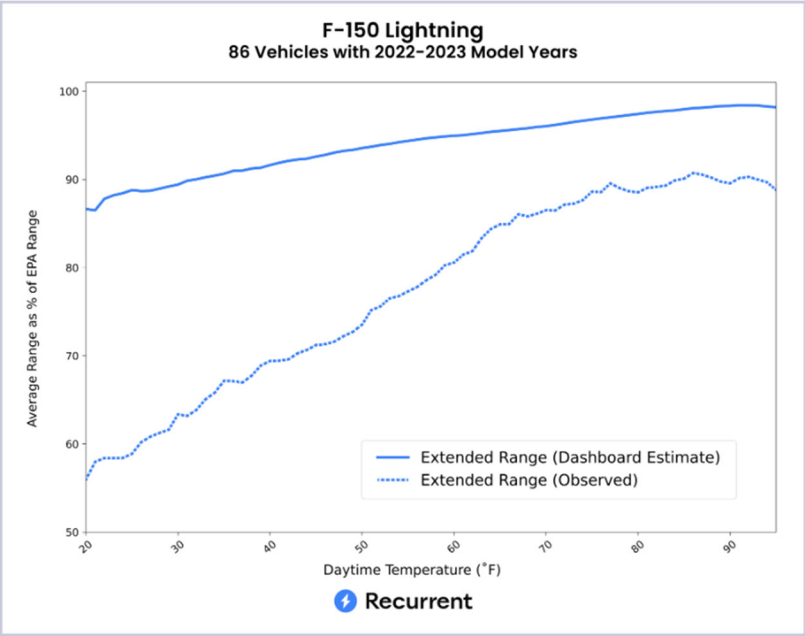
In terms of handling, many drivers report great handling in snow and ice, but urge interested shoppers to get all wheel drive if they live anywhere that might see winter precipitation.

2022-2023 Ford F-150 Lightning Winter Range

Model or Trim: Extended Range
Observed Range at 32F: 64% of EPA Range
Observed Maximum Range: 91% of Original EPA Range
Heat Pump: No

The Ford F-150 has been the best selling truck in the US for decades and is currently in its fourteenth generation. Part of the new lineup is the F-150 Lightning, the first electric truck brought to market by a traditional car manufacturer. If you're using the truck for towing, then winter weather is the least of your range worries. Also worth noting is that power, which is necessary for towing, is reduced in cold weather, due to the slower chemical reactions in the battery.

If you're not towing and just need your F-150 Lightning to take you across town - or across the country - expect range reductions on par with its cousin, the Mustang Mach-E.



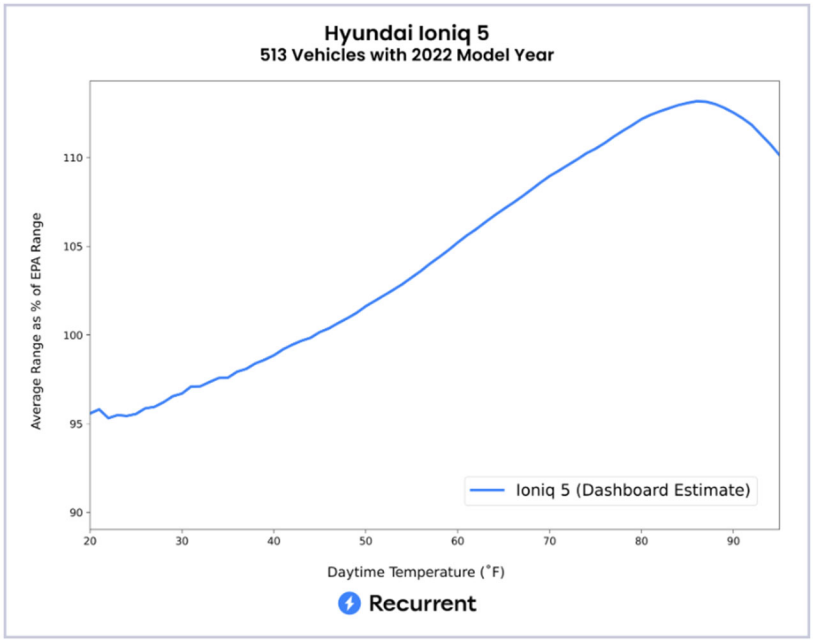
Like the Mustang Mach-E, the F-150 Lightning does not have a heat pump and relies on electricity from the battery to keep the cabin temperate. Of course, preconditioning via app helps save you a lot of range, as does relying on heated seats or a heated steering wheel once you're on the road. And, since the F-150 Lightning is so heavy, make sure your tires are properly inflated and that a recent cold snap has not dropped your pressure.

2022 Hyundai Ioniq 5 Winter Range

Dashboard Range at 32F: 97% of EPA Range
Dashboard Maximum Range: 113% of Original EPA Range
Heat Pump: on AWD models

Our results for the Hyundai Ioniq 5 are based on dashboard, rather than observed range data.

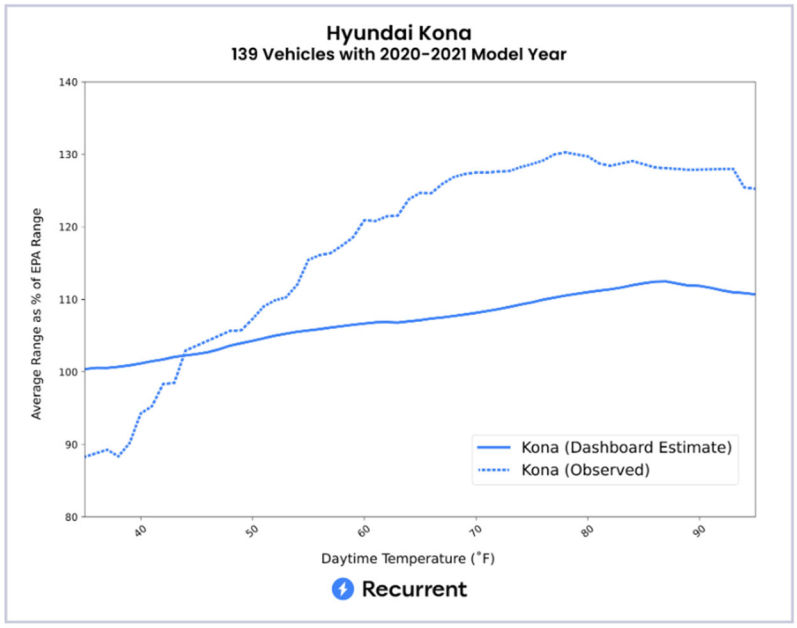
Like its predecessor, the Kona EV, the Ioniq 5 was released standard with a heat pump on the international market. In the US, it debuted with heat pump technology only in AWD configurations. It is also equipped with a winter setting, which keeps the battery warm when parked, and a "Snow mode" which increases tire traction and adjusts braking and handling in bad weather. Like most competitors, certain trims can be equipped with heated seats and steering wheel, and all trims now come standard with battery warmer and preconditioning. It will also preheat the battery for level 3 charging if you use the on-board navigation system to head towards a charger.



2020-2021 Hyundai Kona Electric Winter Range

Observed Range at 32F: 84% of Original EPA Range
Observed Maximum Range: 130% of Original EPA Range
Heat Pump: No

The Hyundai Kona is the brand's well-known small SUV that comes in both electric and ICE versions. Overall, the Kona EV may have be the one vehicle that most consistently outperforms its EPA-rated range. And drivers report that it's great in the winter - it has enough range that it can lose a bit when cold, and the FWD motor handily navigates the snow and ice. An industry-leading heat pump is available in the Canadian and European Kona EVs, but it was not available across model years in the US prior to 2023. Startingin 2023, a heat pump is standard on international models, and included on the US Limited and SEL trims. As we get data on the new configurations, we're excited to see the impact on winter range.

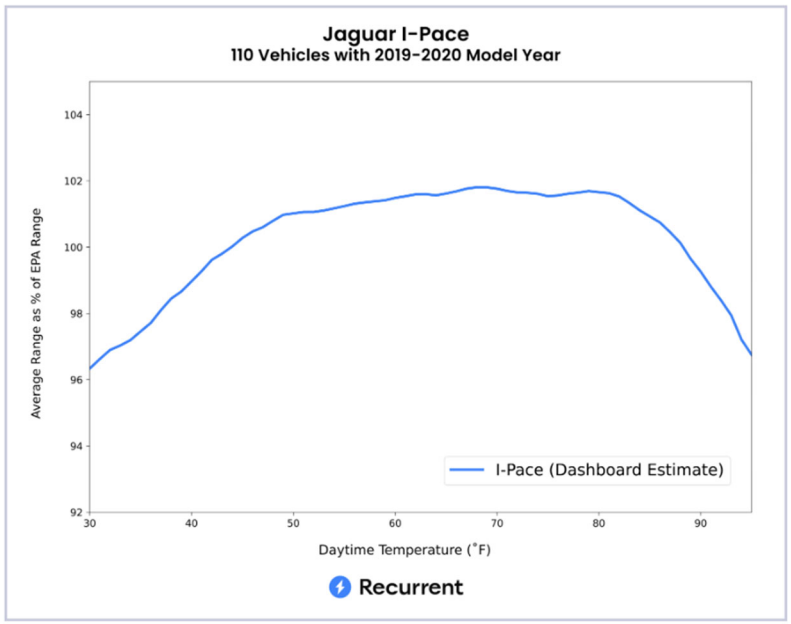


In 2020, select US markets had an optional battery warmer to help charge time in the cold, as well as a “comfort and convenience” package that helps mitigate winter range loss. This package seems to be included in the 2023 model year for SEL and Limited trims, as well. From what we know so far, though, the battery warmer only works when the car is on, so merely leaving it plugged in is not enough to precondition your battery.

2019-2020 Jaguar I-PACE Winter Range

Dashboard Range at 32F: 97% of Original EPA Range
Dashboard Maximum Range: 102% of Original EPA Range
Heat Pump: Yes

The Jaguar I-PACE is an EV that has been on the road for quite a few years, but remains elusive in the Recurrent data set. Therefore, we can only report on the dashboard range for its winter performance. The I-PACE is known for having a large but very inefficient battery, and there are rumors that a lot of the battery is held in reserve for cold weather range loss. That being said, drivers reliably get 200+ miles in our community, even with the oldest models.



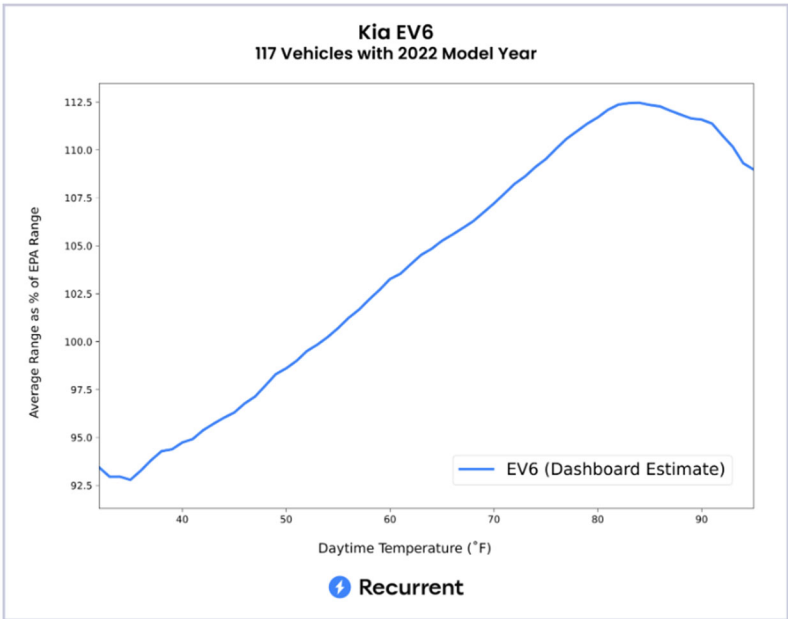
Despite the visible curvature in the chart, the I-PACE only reports about 10 miles of range loss in the cold weather - amounting to less than 5% of total range lost when temperatures are around freezing. This is due to the I-PACE’s early adoption of heat pump technology to control cabin temperature, instead of relying on the high voltage battery.

The I-PACE also boasts a sophisticated thermal management system that pulls waste heat from the motor to warm the battery or cabin when needed, helping to preserve the range.

2022 Kia EV6 Winter Range

Model or Trim: Extended Range
Dashboard Range at 32F: 93% of EPA Range
Dashboard Maximum Range: 113% of Original EPA Range
Heat Pump: AWD models

The Kia EV6 debuted with most of the same specifications as its cousin, the Ioniq 5. Both are built on Hyundai's E-GMP (Electric-Global Modular Platform) architecture and use the same batteries and motors. The big differences are in style and performance - a category in which the Kia outperforms with more torque and more horsepower. However, many drivers note that for everyday utility and comfort, the Ioniq 5's practicality comes out on top. Overall, it's unsurprising to see similar dashboard results in cold weather range testing between the two.



Like the Ioniq 5, the US EV6 RWD was originally released without a heat pump, while the AWD versions come with one. According to Kia, the "next-generation heat-pump-based thermal management system allows the EV6 to retain 80% of its optimal range, even down to -7 degrees celsius" (or 19.4 F). "The same thermal management technology works with the fast-charging system to reduce the harmful impact of that on the battery's lifespan."

2015 Nissan LEAF Winter Range

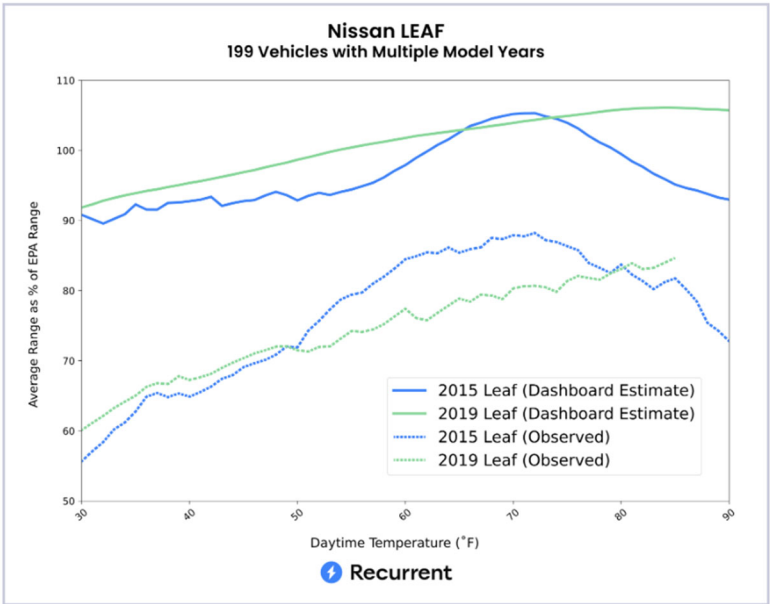
Model or Trim: S 40 kWh Battery
Observed Range at 32F: 58% of Original EPA Range
Observed Maximum Range: 88% of Original EPA Range
Heat Pump: No

2019 Nissan LEAF Winter Range

Model or Trim: SL/SV Plus 62 kWh Battery
Observed Range at 32F: 62% of Original EPA Range
Observed Maximum Range: 85% of Original EPA Range
Heat Pump: No

Nissan's LEAF was the earliest mass market EV, offering early electric drivers a modest range at a very affordable price. Unfortunately, being so early to the market, the first few model years were known to perform poorly in the extreme heat and cold. This is likely due to the fact that Nissan chose a passive battery thermal management system, rather than actively controlling battery temperature.

It is interesting to compare the temperature dependence in the 2015 and the 2019 model years. The earlier LEAFs exhibit a lot more temperature sensitivity in both the dashboard and real range than the later models.



Nissan tells drivers what to expect in cold weather driving:

- Regenerative braking is restricted since the battery cannot charge as quickly.
- The colder it is, the less charge the battery can hold.
- Nissan doesn't recommend storing the LEAF below -13F for over seven days because the battery risks freezing. In 2018, this guidance was updated to -1F. But again, our Alaska drivers report high satisfaction with their LEAFs.
- Some LEAFs come with battery warmers, which will turn on when the battery hits -1F and will turn off after reaching 14F.
- The battery warmer will not operate if the battery is below 15% state of charge and is not charging.

Tesla Model 3 Winter Range

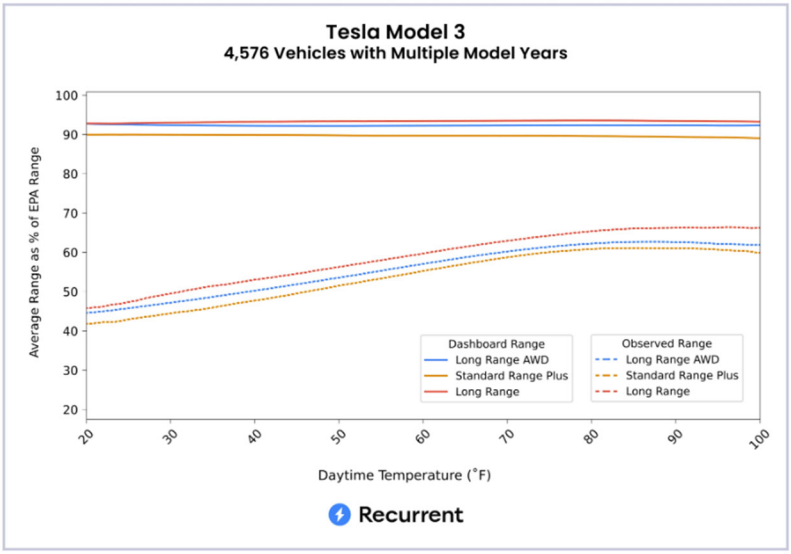
Model or Trim: Long Range
Observed Range at 32F: 50% of Original EPA Range
Observed Maximum Range: 66% of Original EPA Range
Heat Pump: 2021 models onwards

For years, Tesla drivers in the Recurrent fleet complained that our reports failed to accurately represent the range variations they saw in their cars. And that comes down to two things:

1. Tesla does have a very robust and aggressive thermal management system that kicks in at both high and low temperatures
2. But, they also "game" the on-board range estimates that drivers see and that we long relied on for our reports.

In the real world, drivers do experience lower range in the winter and summer as efficiency changes, as all EV drivers do.

In 2022, we added Tesla Real Range data to our reports for Tesla drivers. This data reflected the average fluctuations that a Tesla driver in a similar make, model, and year would see in the heat and the cold, using observed, real-world data. The dotted line below shows the Tesla Real Range as observed from on-board devices and energy usage. This shows a more reasonable winter range than the dashboard range prediction, in the solid line. It's worth noting that across the board, Tesla's thermal management is still great at controlling cold weather range loss, thanks to a patented heat pump system that was rolled out in 2021.

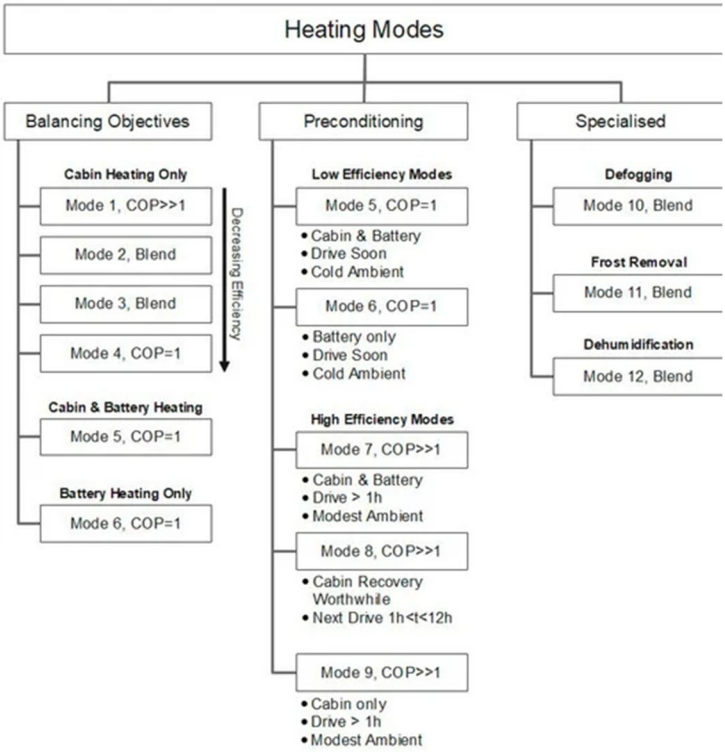


Teslas will also limit regenerative braking in the winter to protect the battery from damaging charges when cold. Once the car warms up, regenerative braking will come back. Similarly, charging your Tesla at a Supercharger will be slow going until the battery warms up so Tesla recommends waiting until you've driven a bit to use a charging station, or using the built-in navigation to head to a Supercharger. If Tesla registers that you are headed to fast charge, it will precondition your battery for optimal speeds.

Tesla Model Y Winter Range

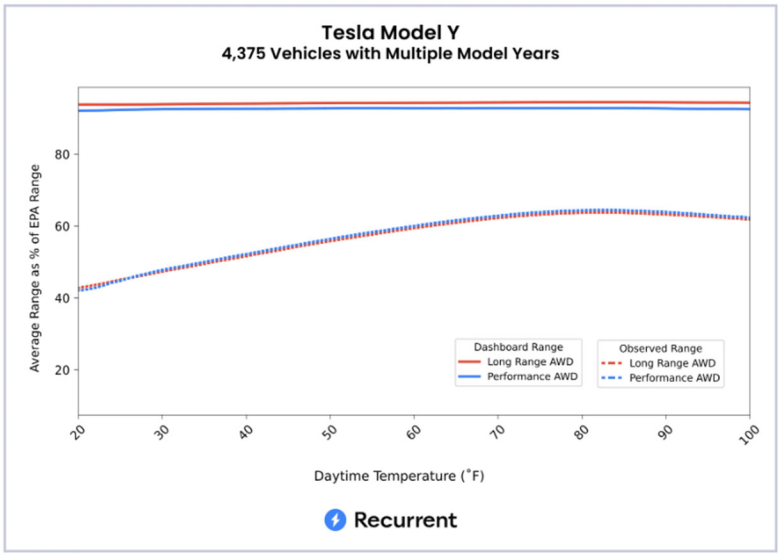
Model or Trim: Long Range AWD
Observed Range at 32F: 48% of Original EPA Range
Observed Maximum Range: 64% of Original EPA Range
Heat Pump: Yes

The Model Y was Tesla's first car to use their patented heat pump system to help regulate temperatures without drawing on the high voltage battery. This system, known as the "octovalve," claims to have 12 heating modes and 3 cooling modes.



From Wray A, Ebrahimi K. Octovalve Thermal Management Control for Electric Vehicle. *Energies*. 2022; 15(17):6118. https://doi.org/10.3390/en15176118

The system goes so far as to use the thermal mass of the battery to store heat, which can be moved around the rest of the car.



If the thermodynamic details of this sound interesting, we recommend reading more about how the Model Y is changing the game on EV heating. Remember that you can truly leverage the efficiency of the Model Y's heating by preconditioning the car and using cabin heaters conservatively.

Tesla Model S Winter Range

Model or Trim: 75D
Observed Range at 32F: 45% of Original EPA Range
Observed Maximum Range: 63% of Original EPA Range
Heat Pump: 2021 models onwards

The Tesla Model S was the original mass market Tesla, released in 2012 after the Roadster's popularity made Tesla a household name. While they are generally considered the higher end models, as opposed to the more moderately priced Model 3 and Y, the S did not originally come with the sophisticated winter weather engineering discussed above. However, as of last winter, all new models now come with heat pump technology.

Note that in our Verified Winter Range data, we include older models that are not equipped with a heat pump, which may decrease the overall winter range.

Tesla Model X Winter Range

Model or Trim: 75D
Observed Range at 32F: 48% of Original EPA Range
Observed Maximum Range: 61% of Original EPA Range
Heat Pump: 2021 models onwards

The Model X is an SUV built onto the Model S platform and has been on the market since 2016. Both the X and S come with an optional Subzero Weather Package, which includes any or all of the following, depending on the exact year and software package:

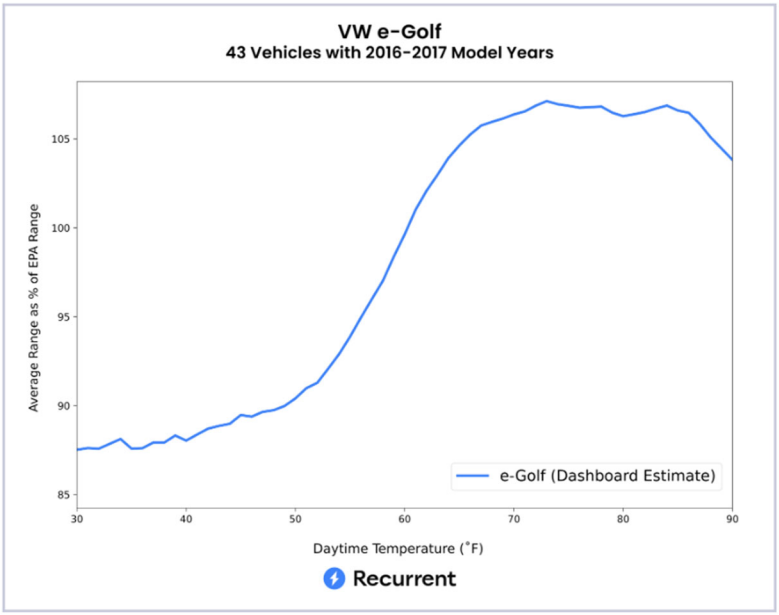
- Heated rear seats
- Heated steering wheel
- Heated washer nozzles
- Heater windshield wipers
- Heated side mirrors
- Camera heaters

All of these features help to reduce reliance on energy intensive cabin heating and defrost necessary car components. Of course, it's easy to set a departure time and precondition the car and battery, too. And, as of 2021, Model X is now equipped with a heat pump.

2016-2017 VW e-Golf in the Winter

Model or Trim: 36 kWh Battery
Observed Range at 32F: 88% of Original EPA Range
Observed Maximum Range: 111% of Original EPA Range
Heat Pump: Some premium trims

The VW e-Golf is an electrified version of the beloved VW Golf and predecessor to the more recent ID.4. Long-time VW drivers will tell you that driving the e-Golf in winter offers good traction and handling, but those with resistance heaters note substantial range drops in the winter - probably because the baseline range is not very high. Like most other manufacturers who don't offer heat pumps as standard, VW recommends using optional heated seats and remotely preconditioning the cabin by setting a departure time. International models of the e-golf have options for a cold weather package, including heated mirrors and windshield, but these were hard to find in the US.

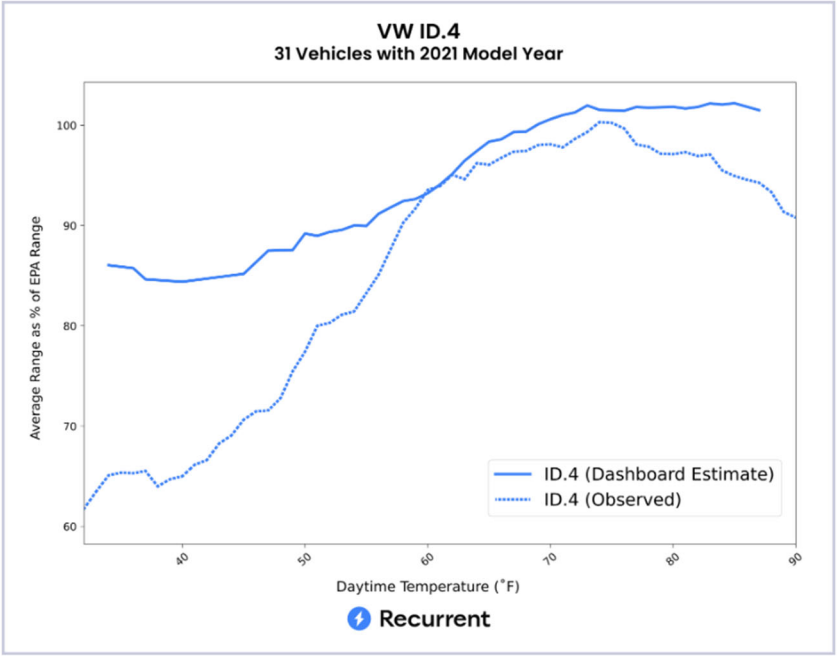


However, in the US, a heat pump was included for some premium trim options, although in our data, it was impossible to tell which cars were equipped with them. Overall, since the e-golf is a local commuter with limited battery size, we recommend preconditioning before venturing into the cold -- see below for more on that!

2021 VW ID.4 in the Winter

Model or Trim: 82 kWh Battery
Observed Range at 32F: 65% of Original EPA Range
Observed Maximum Range: 95% of Original EPA Range
Heat Pump: No

The Volkswagen ID.4 built on the success of the e-golf and includes several thoughtful designs to help tackle the cold: an all-wheel drive option, heated steering wheel and front seats, and remote preconditioning. In the AWD configuration, the car also comes with a heated windshield. However, both configurations include a resistive cabin heater, so there is noticeable range loss when the temperatures are low. Like many other models in this list, the Canadian versions do come with a heat pump, and is optional on the European ID.4s. When US customers balked, Volkswagen doubled down on preconditioning and the use of heated interior elements.



How Important are Heat Pumps?

If you're shopping for a new EV, or spend any time on EV forums, you will see mention of heat pump technology. Heat pumps are a more energy efficient option for cabin heating and cooling. This technology is being explored because unlike a gas car, EVs have to generate their own heat, which draws on the battery and can reduce range.

Currently, there are two main heating systems that are used in EVs:

1. Resistive heater - this is like your traditional radiator or space heater. You simply pass an electric current through a conductor, creating heat via electric resistance. Although super simple and 100% efficient, a resistive heater can draw 4-8kW from the battery, meaning a major loss of efficiency and range.
2. Heat Pump - this is the new(er) kid on the block, even though the technology is not that new or groundbreaking. Heat pumps use electricity to *move* heat from one place to another. They use a reverse refrigeration cycle to bring in heat from the outside air that has been boosted in temperature by a reverse refrigeration cycle. Read our deep dive on heat pumps.

There is a lot of debate about how much heat pumps matter and what temperature is cold enough that resistive heaters and heat pumps become equally efficient. One recent study of heat pumps in buildings found that well below 32°F, heat pump efficiency is still significantly higher than resistive heating systems, especially when temperature doesn't usually drop below 14°F.

When it comes to EVs, in early 2022, a UK-based company performed real-world winter range testing to show that "models equipped with a heat pump fell short by an average of 25.4% from their official figures, compared with the 33.6% deficit suffered by those that relied on a regular interior heater." Vehicles with heat pumps equipped averaged 3.2 miles/kWh, while those with resistive or PCT-based heaters averaged 2.9 miles/kWh. Those efficiency numbers can translate into big differences in winter range.

From multiple studies on heat pumps, it seems like as temperatures approach 0F, the lead that heat pumps have on resistive heaters narrows. For instance, at 32F, the range loss with a resistive heater may be 25%, or 50 miles, while range loss with a heat pump is as low as 5.9%, or 11 miles. That is a fivefold difference in range loss. But, when you get down to 20°F, heat pumps may only get you an extra 3-15% range.

Still, if you live in a climate that is cold for a lot of the year, or if you need your car to get as much range as possible in the winter, finding an EV with a heat pump can make a big difference.

https://www.spiegel.de/wirtschaft/e-auto-foerderung-laeuft-bereits-am-sonntag-aus-von-4500-euro-auf-null-a-9f19e332-131e-4c28-8b83-5a0683848e2b

From 4500 euros to zeroE-car subsidy expires on Sunday

At the beginning of 2024, the much-used environmental bonus for the purchase of electric cars should expire. Now the Ministry of Economic Affairs has had to bring the end forward by two weeks – for reasons of savings.

16.12.2023, 11.49 a.m.

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Federal Minister for Economic Affairs Robert Habeck (Greens) at the IAA motor show in Munich

Photo: Sven Hoppe / dpa

The traffic light pulls the plug: As a consequence of the Karlsruhe budget ruling, the federal government is letting the state subsidy for e-car purchases expire earlier than planned. As early as 17 December, no new applications for the so-called environmental bonus could be submitted, the Federal Ministry of Economics under Robert Habeck (Greens) announced.

Applications received up to and including this Sunday would be processed in the order in which they were received and, if the eligibility requirements are met, would be approved. However, the ministry confirmed to SPIEGEL that car buyers can only apply if they already have the registration of the car.

60 billion less

According to the current guidelines, the environmental bonus should have expired next year. However, due to austerity measures, the German government brought forward the end.

The reason: The government subsidies for the purchase of climate-friendly electric cars have so far been financed from the Climate and Transformation Fund (KTF). However, the ruling of the Federal Constitutional Court had deprived the KTF of 60 billion euros, which is now no longer available to it.

With the funding, the German government wanted to achieve the goal of putting a total of 2030 million fully electric cars on the roads by 15. For this reason, buyers with a net list price of 40,000 euros received an environmental bonus of 4500 euros. For more expensive cars, the bonus was smaller. According to the Federal Ministry for Economic Affairs, a total of ten billion euros have been paid out since 2016 – for around 2.1 million vehicles.

According to experts, the impact of the production freeze could be significant. Specifically, sales of purely battery-powered cars are likely to shrink in Germany for the first time in 2024 after almost a decade of steady growth: "We are calculating with 90,000 to 200,000 fewer vehicles," said car expert Ferdinand Dudenhöffer, the »Handelsblatt«.

Ford Will Cut Planned Electric F-150 Production as Demand Slows
2023-12-12 19:50:32.11 GMT

By Neal E. Boudette Neal E. Boudette is based in Michigan and has been covering the auto industry for two decades. He joined The New York Times in 2016 after more than 15 years at The Wall Street Journal.

(New York Times) -- Ford and other automakers have had to readjust their electric vehicle production plans because sales have been weaker than they had expected.

Slower-than-expected growth in sales of electric vehicles has forced several automakers to scale back once-ambitious production plans. Ford Motor has become the latest company to join that pullback.

In a memo sent to suppliers, the company said that it now expected to produce an average of 1,600 electric F-150 Lightning pickup trucks per week in 2024, about half of the level it had previously hoped to achieve.

The reduced target reflects the substantial dimming of expectations for sales of battery-powered cars and trucks that automakers are now coming to grips with. Ford and its main rival, General Motors, had been racing to increase production of a variety of electric vehicles, but consumer enthusiasm has not kept pace with those plans over the last six months. Some would-be buyers have been put off by the high prices of many electric vehicles, including the F-150 Lightning, as well as the availability and reliability of charging stations.

G.M. once expected to produce 400,000 electric vehicles by the middle of 2024, but withdrew that goal in November, and is delaying some new electric models. Rivian, a younger automaker, has said it aims to make 52,000 electric vehicles by the end of this year, a third of the 150,000 a year it is hoping its Illinois factory will eventually produce.

Similarly, Ford had hoped to have the capacity to make 600,000 battery-powered vehicles a year by the end of next year. As recently as September, Ford said it aimed to be able to make 150,000 electric F-150s a year — a rate of about 3,000 vehicles a week. It has also lowered production plans for its electric sport utility vehicle, the Mustang Mach-E.

“Given the dynamic E.V. environment, we are being judicious about our production and adjusting future capacity to better match market demand,” Ford’s chief financial officer, John Lawler, said last month in a conference call with financial analysts.

News of Ford’s memo to suppliers was earlier reported by Automotive News.

Even with the reduced target, Ford still expects 2024 production and sales of the Lightning to easily surpass 2023 levels, a spokeswoman said. In the first 11 months of this year, Ford sold more than 20,000 of the trucks, a rise of more than 50 percent from the same period in 2022. The company’s sales of all electric models grew 16 percent, to more than 62,000 vehicles.

Spurred by Tesla and its rapid growth in sales and profits, traditional

automakers have been spending tens of billions of dollars to develop an array of electric models and to tool up factories to produce them and their batteries.

But even Tesla has struggled with slower sales growth this year. That has forced the company to cut prices of its two most popular models several times, pushing down its profit margin significantly.

Other companies are pushing back plans for new models. Last month, G.M. said it would delay electric versions of its Chevrolet Silverado and GMC Sierra pickups, and the Chevrolet Equinox sport-utility vehicle. Honda once planned to develop a small electric car with G.M. but nixed that effort this year.

Ford has four battery plants under construction in the United States, but recently said it would scale back the size of one of those, in Michigan.

Early on, automakers expected customers to flock to electric cars and trucks. At the end of 2021, Ford had accepted reservations for more than 200,000 F-150 Lightnings.

But strong early interest has not always resulted in booming sales. Cost is a big culprit. The price of batteries remains high, which has made some electric vehicles much more expensive than comparable gasoline-powered models at a time when consumers have been struggling with inflation.

When it introduced the Lightning, Ford said the truck would start at $40,000 but the company raised prices soon after, disappointing many people who reserved the truck. The pickup now starts at $50,000 and the top-of-the-line version starts at $92,000.

In addition it can also be hard to find enough places to charge electric cars and trucks in many parts of the country, unnerving some car buyers, especially people who do not have a garage or driveway where they can install a personal charger. Some drivers have also complained about long lines at public chargers or that some machines are broken or take too long to charge vehicles.

“We are going to respond to demand,” Mary T. Barra, G.M.’s chief executive, said in a November conference call. “We are going to make sure we have the right products at the right time, but we’re not overbuilding.”

Click Here to see the story as it appeared on the New York Times website.

-0- Dec/12/2023 19:50 GMT

To view this story in Bloomberg click here:
https://blinks.bloomberg.com/news/stories/S5KKG7TVI5MO

https://www.motortrend.com/reviews/ford-f150-lightning-electric-truck-towing-test/amp/

Tow No! The Ford F-150 Lightning Struggled in Our Towing Test

We towed 3100-, 5300-, and 7200-pound travel trailers with Ford's electric truck and didn't get very far from home.

Related Video

Eric TingwallWriterJim FetsPhotographer
Jul 31, 2022

Before you hitch an Airstream to your electric truck and set out to circumnavigate the country, you need to understand this: With the largest available battery pack, a fully charged 2022 Ford F-150 Lightning electric truck has less energy onboard than a regular F-150 with four gallons of gas in its tank.

Consider how far a combustion-powered F-150 would tow at max capacity on four gallons of regular unleaded. Thirty five miles? Maybe 40 if you drive slowly?

Now that you understand where we're starting from, you won't be as surprised to learn that the towing range of the electric F-150 is dismal. In MotorTrend testing, an F-150 Lightning Platinum saddled with a camper that nearly maxed out its 8,500-pound towing capacity couldn't even cover 100 miles. Range improved when we hooked up a significantly lighter trailer, but not by as much as you might expect.

How Much Can The Ford F-150 Lightning Tow?

The Lightning's towing capacity ranges from 5,000 pounds up to 10,000 pounds. To hit the big number, you'll need an XLT or Lariat trim with the optional extended-range battery, and the Max Trailer Tow package that adds more battery- and motor-cooling capacity. To get there, you'll spend at least $75,094.

2022 Ford F-150 Lightning Towing Capacity

	Standard-Range Battery	Extended-Rang
Pro	5,000 lb Max Tow Pkg: 7,700 lb	N/A
XLT	5,000 lb Max Tow Pkg: 7,700 lb	7,700 lb Max Tow Pkg: 1
Lariat	5,000 lb Max Tow Pkg: 7,700 lb	7,700 lb Max Tow Pkg: 1
Platinum	N/A	7,700 lb Max Tow Pkg: 8

We performed our testing with the top-shelf $92,669 Platinum trim (full test at this link), which includes the larger battery and has a standard towing capacity of 7,700 pounds. The Max Trailer Tow upgrade, which wasn't equipped on our test truck, raises that to 8,500 pounds.

The Test: Towing The Line

With more than 500 pop-ups, teardrops, travel trailers, fifth-wheels, camper vans, and RVs on the lot, the General RV dealership in Wixom, Michigan, inspires grand dreams about wandering America on wheels. We set our sights significantly shorter, though, as we embarked on an out-and-back loop as far as we dared travel with the heaviest trailer we plucked out of General RV's toy box. That camper, a 2022 Grand Design Imagine 2910BH, sleeps eight, measures nearly 34 feet long, and weighs 7,218 pounds.

We followed the same methodology used to determine an EV's MotorTrend Road-Trip Range. With the automatic climate control set to 72 degrees, headlights on, and the audio system playing, our testing imitates how most owners will use their vehicles, rather than reaching for the maximum possible range. We targeted an average speed of 70 mph, but construction at the beginning and end of our route meant our speed was slightly lower than we were aiming for. All three tests were at least consistent, with average highway speeds between 64 and 67 mph.

After establishing an 80-mile route, we repeated the test with a 17-foot, 3,140-pound Forest River R Pod RP-153, and a 28-foot, 5,260-pound Coachmen Freedom Express 246RKS. We used the energy consumption from these real-world tests to extrapolate how far someone could drive on a full charge.

The Results: How Far Can A Ford F-150 Lightning Tow?

Before we answer the big question, let's set the baseline. While the EPA says the F-150 Lightning Platinum is good for 300 miles, that number is based on a mix of city and highway driving. With only a driver aboard and no trailer in tow, the Platinum achieved a MotorTrend Road-Trip Range of 255 miles.

We had been warned to expect the range to be cut in half when towing, but the effect of towing these travel trailers proved even more significant. With the smallest and lightest trailer, we measured a range of just 115 miles. That figure fell to 100 miles with the middleweight camper and sank to a mere 90 miles with the 7,218-pound Grand Design trailer.

2022 Ford F-150 Lightning Platinum Towing Test

	Forest River R Pod RP-153	Coachmen Freedom Express 246RKS	G
TRAILER WEIGHT	3,140 lb	5,260 lb	7,
LENGTH	17 ft	28 ft 2 in	33

APPROXIMATE FRONTAL AREA	77 sq ft	88 sq ft	89
MT ROAD-TRIP RANGE	115 mi	100 mi	90

The tightly clustered results reveal that aerodynamics have a bigger impact on towing range than weight. Using the width and height of the trailers to calculate a crude approximation of frontal area, the larger two trailers more than double the area plowing through the air compared to an unladen F-150. If you're towing something smaller and sleeker, such as a boat, an open car hauler, or a utility trailer, you'll likely be able to push farther than we did on a single charge.
We should also note that the XLT and Lariat models are more efficient than the Platinum, stretching the same battery pack to an EPA-rated range of 320 miles. Cherry-picking the right trim and options could buy you a few more towing miles.

What's It Like To Tow With The Ford F-150 Lightning?

With 775 lb-ft of torque on tap, the electric Ford F-150 shoves off from a stop smoothly and confidently, but that authority wanes as speeds climb. Equipped with single-speed transmissions at the front and rear motors, the Lightning can't just downshift into the meat of the torque curve like a gas truck does, so passing maneuvers at highway speeds require patience and planning with a heavy trailer.

The Lightning takes some of the stress out of towing, however, with clever and easy-to-use tech. The blind-spot monitor can extend to cover trailers up to 33 feet long, and a Tow Technology package that's standard on the Platinum and available on all other trims adds a trailer brake controller, a 360-degree camera system, and Pro Trailer Backup Assist, which takes the guesswork out of steering a trailer in reverse. It also includes Ford's brilliant Smart Hitch feature that puts the dark art of dialing in the tongue weight within reach of average Joes and Janes. Carrying between 10 and 15 percent of a trailer's weight on the hitch makes for more stable towing, and Smart Hitch makes figuring out if you are within that window a simple extension of hooking up the trailer—if the Lightning indicates the hitch is carrying more or less than that, you either repack the trailer or use a weight-distribution hitch to shift the balance of the load.

Perhaps most important, the Lightning doesn't try to hide its limited towing range. The truck cut its estimated range in half every time we connected a trailer and punched the load's weight and dimensions into the 15.5-inch touchscreen. That number then fell rapidly during the first few miles of highway driving until it accurately reflected what was possible. Until someone figures out how to double or triple the energy density of lithium-ion batteries, that seems like the most we can ask of electric vehicles that are pressed into towing duty.

World Climate Guide, Average Temps in Dec/Jan/Feb in Canada https://www.climatestotravel.com/temperatures/canada#december

Canada - Average temperatures in December

City (from north to south)	Min (°C)	Max (°C)	Mean (°C)	Min (°F)	Max (°F)	Mean (°F)
Alert	-33	-26	-29.4	-28	-14	-20.8
Eureka	-36	-29	-32.8	-33	-21	-27.0
Resolute	-31	-23	-27.0	-24	-10	-16.6
Sachs Harbour	-27	-22	-24.5	-16	-8	-12.2
Inuvik	-28	-20	-24.1	-19	-4	-11.4
Dawson (370 m.)	-27	-18	-22.6	-17	0	-8.8
Iqaluit	-23	-15	-18.8	-9	6	-1.9
Rankin	-28	-20	-24.2	-19	-4	-11.5
Yellowknife	-25	-17	-21.2	-14	1	-6.1
Whitehorse (705 m.)	-17	-8	-12.7	2	17	9.1
Fort Nelson (380 m.)	-23	-14	-18.1	-9	7	-0.6
Churchill	-26	-18	-21.8	-15	0	-7.3
Nain	-15	-8	-11.2	6	18	11.9
Prince Rupert	0	6	3.2	33	43	37.7
Edmonton (700 m.)	-15	-4	-9.5	5	24	14.9
Labrador City (550 m.)	-21	-10	-15.5	-5	13	4.1
Saskatoon (500 m.)	-17	-7	-12.2	1	19	10.0
Moosonee	-17	-8	-12.6	1	18	9.3
Calgary (1,050 m.)	-12	1	-5.6	11	33	21.9
Regina (600 m.)	-17	-6	-11.2	2	22	11.8
Winnipeg (240 m.)	-17	-7	-11.8	2	20	10.8
Vancouver	1	7	4.1	34	45	39.4
St Johns	-4	2	-1.2	24	36	29.8
Quebec City	-11	-2	-6.6	12	28	20.1
Greater Sudbury (350 m.)	-12	-3	-7.2	11	27	19.0
Montreal	-8	0	-4.4	17	31	24.1
Ottawa	-9	-1	-5.2	16	29	22.6
Saint John	-8	2	-2.8	18	36	27.0
Halifax	-4	3	-0.8	24	37	30.6
Toronto	-5	2	-1.8	23	35	28.8
Average Canada	-17.2	-8.8	-12.9	1.1	16.1	8.8

Canada - Average temperatures in January

City (from north to south)	Min (°C)	Max (°C)	Mean (°C)	Min (°F)	Max (°F)	Mean (°F)
Alert	-36	-29	-32.2	-32	-19	-26.0
Eureka	-40	-32	-35.9	-39	-26	-32.6
Resolute	-35	-27	-31.1	-31	-17	-23.9
Sachs Harbour	-29	-24	-26.7	-20	-12	-16.1
Inuvik	-31	-23	-26.9	-24	-9	-16.4
Dawson (370 m.)	-30	-21	-25.5	-22	-6	-13.8
Iqaluit	-30	-22	-26.0	-22	-8	-14.7
Rankin	-34	-26	-29.6	-29	-14	-21.3
Yellowknife	-29	-20	-24.6	-20	-4	-12.3
Whitehorse (705 m.)	-20	-11	-15.3	-4	12	4.4
Fort Nelson (380 m.)	-24	-14	-19.2	-11	6	-2.6
Churchill	-30	-22	-26.0	-22	-7	-14.8
Nain	-21	-13	-17.1	-6	8	1.2
Prince Rupert	0	6	2.7	31	42	36.8
Edmonton (700 m.)	-15	-5	-10.0	4	24	13.9
Labrador City (550 m.)	-27	-15	-20.9	-16	5	-5.6
Saskatoon (500 m.)	-20	-9	-14.7	-4	16	5.6
Moosonee	-23	-12	-17.8	-10	10	0.0
Calgary (1,050 m.)	-13	0	-6.3	9	32	20.6
Regina (600 m.)	-20	-9	-14.2	-4	17	6.5
Winnipeg (240 m.)	-21	-10	-15.4	-5	14	4.3
Vancouver	1	7	4.3	34	45	39.7
St Johns	-8	0	-4.2	18	31	24.5
Quebec City	-16	-6	-11.1	3	21	12.0
Greater Sudbury (350 m.)	-17	-7	-11.8	1	20	10.7
Montreal	-14	-4	-8.9	8	24	16.0
Ottawa	-14	-5	-9.8	6	23	14.4
Saint John	-13	-1	-7.1	9	30	19.2
Halifax	-8	0	-4.2	17	32	24.5
Toronto	-9	-2	-5.4	15	29	22.2
Average Canada	-20.8	-11.9	-16.2	-5.5	10.6	2.8

Canada - Average temperatures in February

City (from north to south)	Min (°C)	Max (°C)	Mean (°C)	Min (°F)	Max (°F)	Mean (°F)
Alert	-37	-29	-33.2	-35	-21	-27.8
Eureka	-40	-33	-36.8	-41	-27	-34.2
Resolute	-36	-28	-31.9	-32	-19	-25.4
Sachs Harbour	-30	-25	-27.7	-22	-13	-17.9
Inuvik	-30	-21	-25.5	-22	-6	-13.9
Dawson (370 m.)	-27	-14	-20.4	-16	6	-4.7
Iqaluit	-31	-23	-27.0	-24	-9	-16.5
Rankin	-34	-26	-29.6	-28	-14	-21.2
Yellowknife	-27	-17	-21.8	-16	2	-7.3
Whitehorse (705 m.)	-17	-6	-11.4	2	21	11.5
Fort Nelson (380 m.)	-20	-8	-13.9	-4	18	6.9
Churchill	-29	-20	-24.5	-20	-4	-12.1
Nain	-22	-13	-17.6	-8	8	0.3
Prince Rupert	0	7	3.2	32	44	37.8
Edmonton (700 m.)	-15	-3	-9.0	5	26	15.9
Labrador City (550 m.)	-26	-13	-19.7	-15	8	-3.4
Saskatoon (500 m.)	-18	-7	-12.6	-1	20	9.4
Moosonee	-23	-10	-16.7	-10	14	2.0
Calgary (1,050 m.)	-12	2	-5.0	11	35	23.0
Regina (600 m.)	-18	-6	-12.1	0	21	10.3
Winnipeg (240 m.)	-19	-7	-13.0	-1	19	8.6
Vancouver	1	9	4.9	34	47	40.9
St Johns	-8	-1	-4.6	17	31	23.7
Quebec City	-15	-4	-9.8	4	24	14.4
Greater Sudbury (350 m.)	-16	-5	-10.2	4	24	13.6
Montreal	-12	-2	-7.4	10	28	18.7
Ottawa	-13	-3	-8.3	8	26	17.1
Saint John	-12	0	-6.2	10	31	20.8
Halifax	-8	0	-3.6	18	33	25.6
Toronto	-9	-1	-4.9	16	31	23.1
Average Canada	-20.1	-10.3	-15.0	-4.1	13.4	5.0

https://taxfoundation.org/data/all/global/corporate-tax-rates-by-country-2023/

Corporate Tax Rates around the World, 2023

December 12, 202316 min readBy: **Cristina Enache**

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Key Findings

- In 2023, 13 countries made changes to their statutory corporate income tax rates. Six countries—Belarus, Morocco, Sri Lanka, Turkey, the United Arab Emirates, and the United Kingdom—increased their top corporate tax rates, while 7 countries—including Austria and Guinea—reduced their corporate tax rates.
- The countries with the highest corporate tax rates in the world are Comoros (50 percent), Puerto Rico (37.5 percent), and Suriname (36 percent), while the countries with the lowest corporate rates are Barbados (5.5 percent), Turkmenistan (8 percent), and Hungary (9 percent). Fifteen jurisdictions do not impose a corporate tax.
- Some low-tax jurisdictions that previously did not have a corporate income tax have implemented or are exploring implementation options due to the Organisation for Co-operation and Development (OECD) Pillar Two agreement. These include the United Arab Emirates, Bermuda, Guernsey, Jersey, and the Isle of Man.
- The worldwide average statutory corporate income tax rate, measured across 181 jurisdictions, is 23.45 percent. When weighted by GDP, the average statutory rate is 25.67 percent.
- Asia has the lowest regional average rate at 19.80 percent, while South America has the highest regional average statutory rate at 28.38 percent. However, when weighted by GDP, Europe has the lowest regional average rate at 24.49 percent and South America has the highest at 32.65 percent.
- The average top corporate rate among EU Member States is 21.13 percent, 23.73 percent in OECD countries, and 27.18 percent in the
- The worldwide average statutory corporate tax rate has consistently decreased since 1980 but has leveled off in recent years.
- The average statutory corporate tax rate has declined in every region since 1980.

Introduction

In 1980, corporate tax rates around the world averaged 40.18 percent, and 46.83 percent when weighted by GDP.[1] Since then, countries have recognized the impact that high corporate tax rates have on business investment decisions; in 2023, the average is now 23.45 percent, and 25.67 when weighted by GDP, for 181 separate tax jurisdictions.[2]

Declines have been seen in every major region of the world, including in the largest economies. In the United States, the 2017 Tax Cuts and Jobs Act brought the country's statutory corporate income tax rate from the fourth highest in the world closer to the middle of the distribution.[3]

Asian and European countries tend to have lower corporate income tax rates than countries in other regions, and many developing countries have corporate income tax rates that are above the worldwide average.

Today, most countries have corporate tax rates below 30 percent.

Notable Corporate Tax Rate Changes in 2023

Thirteen countries changed their statutory corporate income tax rates in 2023. Six countries increased their top corporate rates: Morocco (31 percent to 32 percent), United Arab Emirates (0 percent to 9 percent), Sri Lanka (24 percent to 30 percent), Turkey (23 percent to 25 percent), Belarus (18 percent to 20 percent) and the United Kingdom (19 percent to 25 percent). In 2023, the United Arab Emirates introduced a federal corporate tax of 9 percent on taxable income above AED 375,000 (USD 102,000). However, the new corporate income tax will not apply to the extraction of natural resources as these activities are already subject to taxation in the Emirates.[4]

Seven countries across four continents—Guinea, South Africa, Bangladesh, the Republic of Korea, Austria, Aruba, and Saint Vincent and the Grenadines—reduced their corporate tax rates in 2023. The tax rate reductions ranged from just 1 percentage point in Austria, the Republic of Korea, and South Africa, to 10 percentage points in Guinea.

Table 1: Notable Corporate Income Tax Rate Changes in 2023

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Country	2022 Tax Rate	2023 Tax Rate	Change from 2022 to 2023
Africa			
Guinea	35%	25%	-10 ppt
Morocco	31%	32%	+1 ppt
South Africa	28%	27%	-1 ppt
Asia			
United Arab Emirates	0%	9%	+9 ppt
Bangladesh	30%	27.5%	-2.5 ppt
Republic of Korea	27.5%	26.5%	-1 ppt
Sri Lanka	24%	30%	+6 ppt
Turkey	23%	25%	+2 ppt
Europe			
Austria	25%	24%	-1 ppt
Belarus	18%	20%	+2 ppt
United Kingdom	19%	25%	+6 ppt
North America			
Aruba	25%	22%	-3 ppt
Saint Vincent and the Grenadines	30%	28%	-2 ppt

Source: Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate," updated April 2023, https://stats.oecd.org/index.aspx?DataSetCode=Table_II1 and "Statutory Corporate Income Tax Rates," updated November 2023, https://stats.oecd.org/index.aspx?DataSetCode=CTS_CIT; PwC, "Worldwide Tax Summaries – Corporate Taxes," 2023, https://taxsummaries.pwc.com/; Bloomberg Tax, "Country Guides – Corporate Tax Rates," accessed November 2023, https://www.bloomberglaw.com/product/tax/toc_view_menu/3380; and researched individually, see Tax Foundation, "worldwide-corporate-tax-rates," GitHub, https://github.com/TaxFoundation/worldwide-corporate-tax-rates.

Scheduled Corporate Tax Rate Changes in the OECD and Selected Jurisdictions

Among OECD countries, Austria and Morocco have announced they will implement changes to their statutory corporate income tax rate over the coming years.

- In **Austria**, the corporate income tax will be cut from 24 percent in 2023 to 23 percent in 2024.[5]
- In **Morocco**, the top corporate income tax was increased from 31 percent to 35 percent for companies with a taxable income higher than MAD 100 million (USD 9.9 million). However, this increase will be introduced over three years, with a one percentage point increase each For the fiscal year of 2023, the corporate income tax rate applicable is 32 percent. [6]

The Impact of Global Minimum Tax

More than 140 countries have already agreed to a 15 percent global minimum tax, as part of the 2021 global tax agreement coordinated by the OECD. The model rules defined by the OECD under the global minimum tax, also known as Pillar Two, are incentivizing countries around the world to implement a corporate income tax for the first time.

Apart from the United Arab Emirates, which has recently introduced a 9 percent federal corporate income tax, Bermuda is also considering introducing a corporate income tax for the first time.

In recent years, the Bermuda government extended the tax exemption granted to Bermuda companies until March 2035. This exemption is supposed to protect companies from any newly enacted taxes on income or capital gains until March 2035.[7] However, in October 2023, to "minimize top-up taxes" levied on Bermuda multinational companies, draft legislation was presented to adopt a 15 percent statutory corporate income tax.[8]

Additionally, in May 2023, the governments of Guernsey, Jersey, and the Isle of Man agreed on a joint internal approach to Pillar Two starting in 2025.[9]

At the end of 2022, the EU also adopted its own Pillar Two directive and all Member States have committed to implement the EU rules. The Member States are obliged to implement the rules by 31 December 2023.[10] While some Member States required to implement the directive are not expected to meet the end of 2023 deadline, Estonia, Latvia, Lithuania, Malta, and the Slovak Republic already announced that they intend to defer the application to a later date as this is allowed by the directive under certain conditions.

However, while countries are looking for ways to implement the global minimum tax rate, they are also considering new qualified refundable tax credit incentives for multinational companies allowed under the framework to continue competing for investment.[11]

The Highest and Lowest Corporate Tax Rates in the World

One hundred and forty-one of the 225 separate jurisdictions surveyed in 2023 have corporate tax rates at or below 25 percent.[12] One hundred and twenty have rates above 20 percent but below or at 30 percent. The

average rate among the 225 jurisdictions is 22.27 percent.[13] The United States has the 84th-highest corporate tax rate with a combined federal and state statutory rate of 25.77 percent.[14]

The 20 countries with the highest statutory corporate income tax rates span almost every region, albeit unequally. While eight of the top 20 countries are in Africa, Oceania appears only once and Europe twice. Of the remaining jurisdictions, four are in North America, and five are in South America.

Table 2: 20 Highest Statutory Corporate Income Tax Rates in the World, 2023

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Country	Continent	Tax Rate
Comoros*	Africa	50%
Puerto Rico	North America	37.5%
Suriname	South America	36%
Argentina	South America	35%
Chad	Africa	35%
Colombia	South America	35%
Cuba	North America	35%
Equatorial Guinea	Africa	35%
Malta	Europe	35%
Sudan	Africa	35%
Sint Maarten (Dutch part)	North America	34.5%
American Samoa	Oceania	34%
Brazil	South America	34%
Venezuela (Bolivarian Republic of)	South America	34%
Cameroon	Africa	33%
Saint Kitts and Nevis	North America	33%
Morocco	Africa	32%
Mozambique	Africa	32%
Namibia	Africa	32%
Portugal	Europe	31.5%

Note: The normal corporate tax rate is 35 percent, which applies to both Comorian companies and foreign companies deriving Comorian-source income. However, public industrial and commercial enterprises or those where the state or certain public institutions are participants are subject to a corporate tax rate of 50 percent if their turnover exceeds 500 million Comorian francs; see Bloomberg Tax, "Country Guides: Comoros," https://www.bloomberglaw.com/product/tax/document/25590833704.

Sources: Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate," updated April 2023, https://stats.oecd.org/index.aspx?DataSetCode=Table_II1 and "Statutory Corporate Income Tax Rates," updated November 2023, https://stats.oecd.org/index.aspx?DataSetCode=CTS_CIT; PwC, "Worldwide Tax Summaries – Corporate Taxes," 2023, https://taxsummaries.pwc.com/; Bloomberg Tax, "Country Guides – Corporate Tax Rates," accessed November 2023,

On the other end of the spectrum, the 20 countries with the lowest non-zero statutory corporate tax rates all charge rates at or below 15 percent. Nine countries have statutory rates of 10 percent, five being small European nations (Andorra, Bosnia and Herzegovina, Bulgaria, Kosovo, and Macedonia). The only two OECD members

represented among the bottom 20 countries are Hungary and Ireland. Hungary reduced its corporate income tax rate from 19 to 9 percent in 2017. Ireland has had its 12.5 percent rate in place since 2003.

Table 3: 20 Lowest Statutory Corporate Income Tax Rates in the World, 2023 (Excluding Jurisdictions with a Corporate Income Tax Rate of Zero Percent)

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Country	Continent	Tax Rate
Barbados	North America	5.5%
Turkmenistan	Asia	8%
Hungary	Europe	9%
United Arab Emirates	Asia	9%
Andorra	Europe	10%
Bosnia and Herzegovina	Europe	10%
Bulgaria	Europe	10%
Republic of Kosovo	Europe	10%
Kyrgyzstan	Asia	10%
Paraguay	South America	10%
Qatar	Asia	10%
The Former Yugoslav Republic of Macedonia	Europe	10%
Timor-Leste	Oceania	10%
China, Macao Special Administrative Region	Asia	12%
Republic of Moldova	Europe	12%
Cyprus	Europe	12.5%
Gibraltar	Europe	12.5%
Ireland	Europe	12.5%
Liechtenstein	Europe	12.5%
Albania	Europe	15%

Sources: OECD, "Table II.1. Statutory corporate income tax rate" and "Statutory Corporate Income Tax Rates"; PwC, "Worldwide Tax Summaries – Corporate Taxes"; Bloomberg Tax, "Country Guides – Corporate Tax Rates"; and researched individually, see Tax Foundation, "worldwide-corporate-tax-rates."

Of the 225 jurisdictions surveyed, 15 currently do not impose a general corporate income tax. All these jurisdictions are small, island nations. A handful, such as the Cayman Islands and Bermuda, are well known for their lack of corporate taxes.

Table 4: Countries without General Corporate Income Tax, 2023

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Country	Continent
Anguilla	North America
Bahamas	North America
Bahrain*	Asia
Belize*	North America
Bermuda	North America
British Virgin Islands	North America
Cayman Islands	North America
Guernsey	Europe

Country	Continent
Isle of Man	Europe
Jersey	Europe
Saint Barthelemy	North America
Tokelau	Oceania
Turks and Caicos Islands	North America
Vanuatu	Oceania
Wallis and Futuna Islands	Oceania

Notes: *Bahrain has no general corporate income tax but has a targeted corporate income tax on oil companies, which can be as high as 46 percent. See Deloitte, "International Tax - Bahrain Highlights 2023," last updated February 2023, https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-bahrainhighlights-2023.pdf. In Belize the corporate tax rate is 40 percent but as this rate applies only to the petroleum industry, the corporate tax rate in Belize has been included in this database as 0 percent to ensure consistency of treatment across all jurisdictions. See OECD, "Corporate Tax Statistics 2023," November 2023, https://doi.org/10.1787/f1f07219-en.

Sources: OECD, "Table II.1. Statutory corporate income tax rate" and "Statutory Corporate Income Tax Rates"; PwC, "Worldwide Tax Summaries – Corporate Taxes"; Bloomberg Tax, "Country Guides – Corporate Tax Rates."

Regional Variation in Corporate Tax Rates

Corporate tax rates can vary significantly by region. South America has the highest average statutory corporate tax rate among all regions at 28.38 percent. Asia has the lowest average statutory corporate tax rate among all regions at 19.80 percent.

When weighted by GDP, South America has the highest average statutory corporate tax rate at 32.65 percent, while Europe has the lowest at 24.49 percent.

In general, larger and more industrialized nations tend to have higher corporate income tax rates than smaller nations. The G7, which is comprised of the seven wealthiest nations in the world, has an average statutory corporate income tax rate of 27.18 percent and a weighted average rate of 26.68 percent. OECD member states have an average statutory corporate tax rate of 23.73 percent and a rate of 26.16 percent when weighted by GDP. The BRICS[15] have an average statutory rate of 27.20 percent and a weighted average statutory corporate income tax rate of 26.11 percent.

Table 5: Average Corporate Tax Rate by Region or Group, 2023

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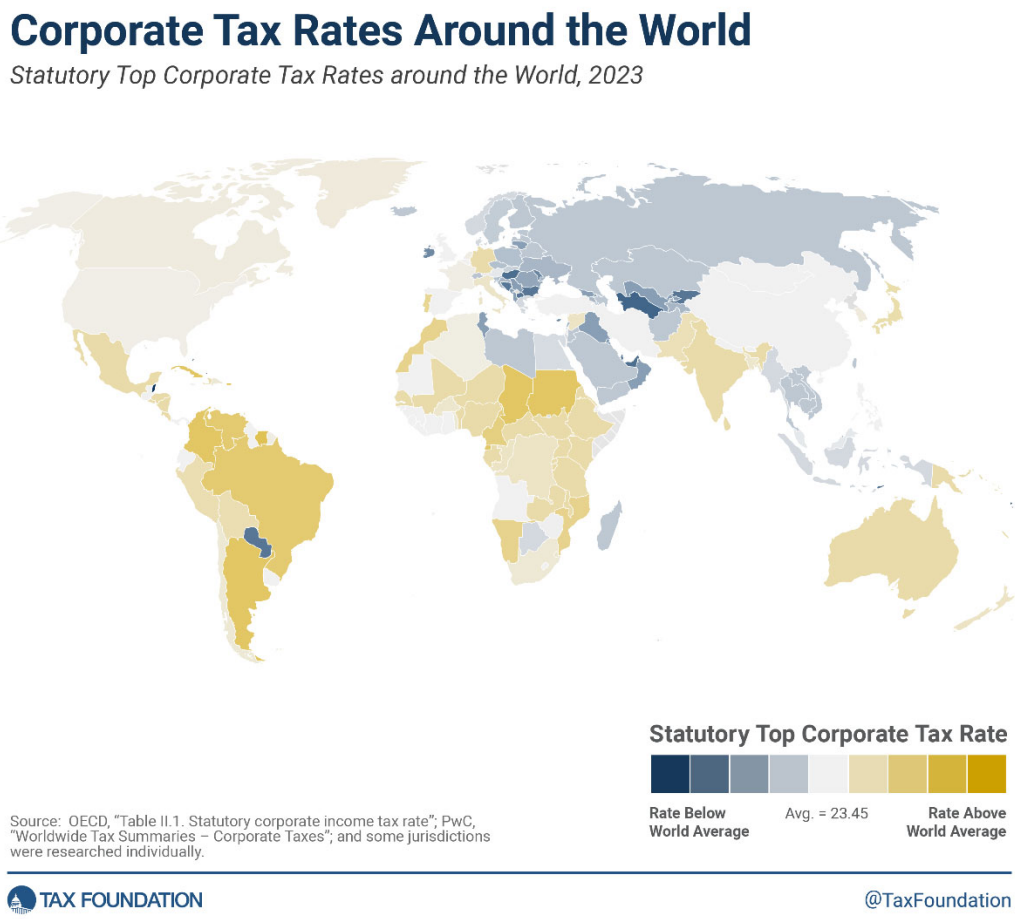
Region	Average Rate	Average Rate Weighted by GDP	Number of Countries Covered
Africa	27.37%	27.28%	51
Asia	19.80%	25.02%	47
Europe	19.92%	24.49%	39
North America	25.46%	26.10%	24
Oceania	23.75%	29.72%	8
South America	28.38%	32.65%	12
G7	27.18%	26.68%	7
OECD	23.73%	26.16%	38

Region	Average Rate	Average Rate Weighted by GDP	Number of Countries Covered
BRICS	27.20%	26.11%	5
European Union	21.13%	25.21%	27
G20	27.09%	26.51%	19
World	23.45%	25.67%	181

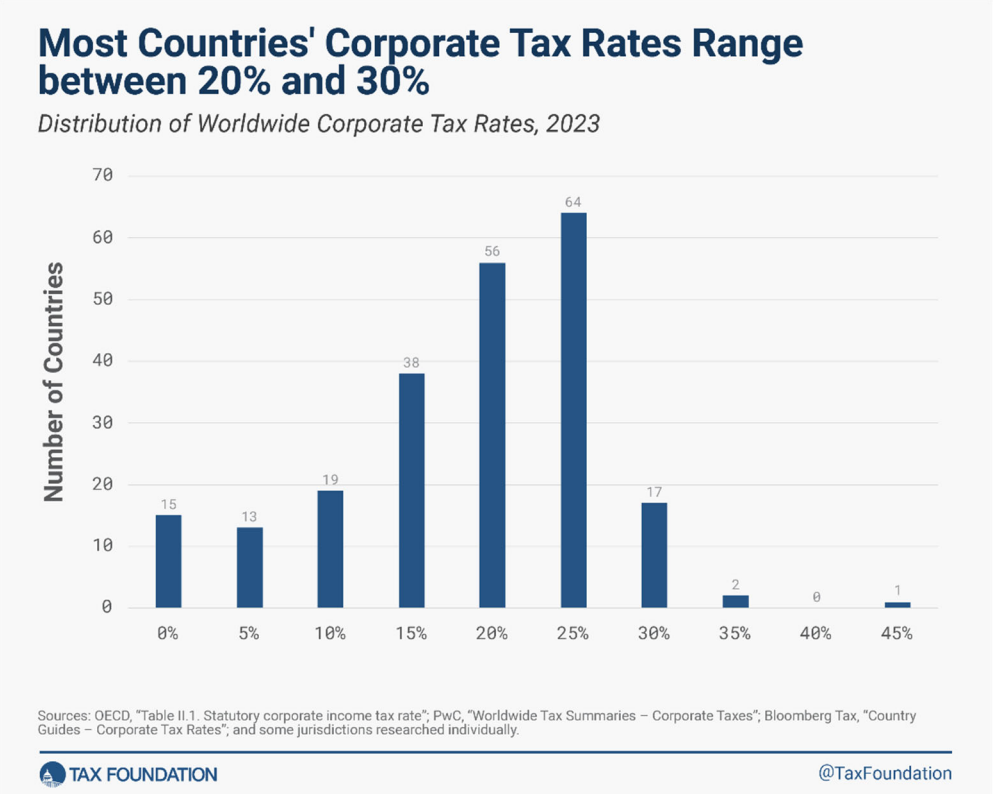
Sources: Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate" and "Statutory Corporate Income Tax Rates"; PwC, "Worldwide Tax Summaries – Corporate Taxes"; Bloomberg Tax, "Country Guides – Corporate Tax Rates"; and some jurisdictions researched individually, see Tax Foundation, "worldwide-corporate-tax-rates." GDP calculations are from the U.S. Department of Agriculture, "International Macroeconomics Data Set."

The following map illustrates the current state of corporate tax rates around the world. Countries in Africa and South America tend to have higher corporate tax rates than Asian and European jurisdictions. Oceania's and North America's corporate tax rates tend to be close to the world average.



Distribution of Corporate Tax Rates

Only three tax jurisdictions impose a corporate income tax at statutory rates greater than 35 percent. [16] The following chart shows a distribution of corporate income tax rates among 225 jurisdictions in 2023. A plurality of countries (120 total) impose a rate above 20 percent and below or at 30 percent. Seventeen jurisdictions have a statutory corporate tax rate above 30 percent and below or at 35 percent. Eighty-five jurisdictions have a statutory corporate tax rate below or at 20 percent, and 205 jurisdictions have a corporate tax rate below or at 30 percent.

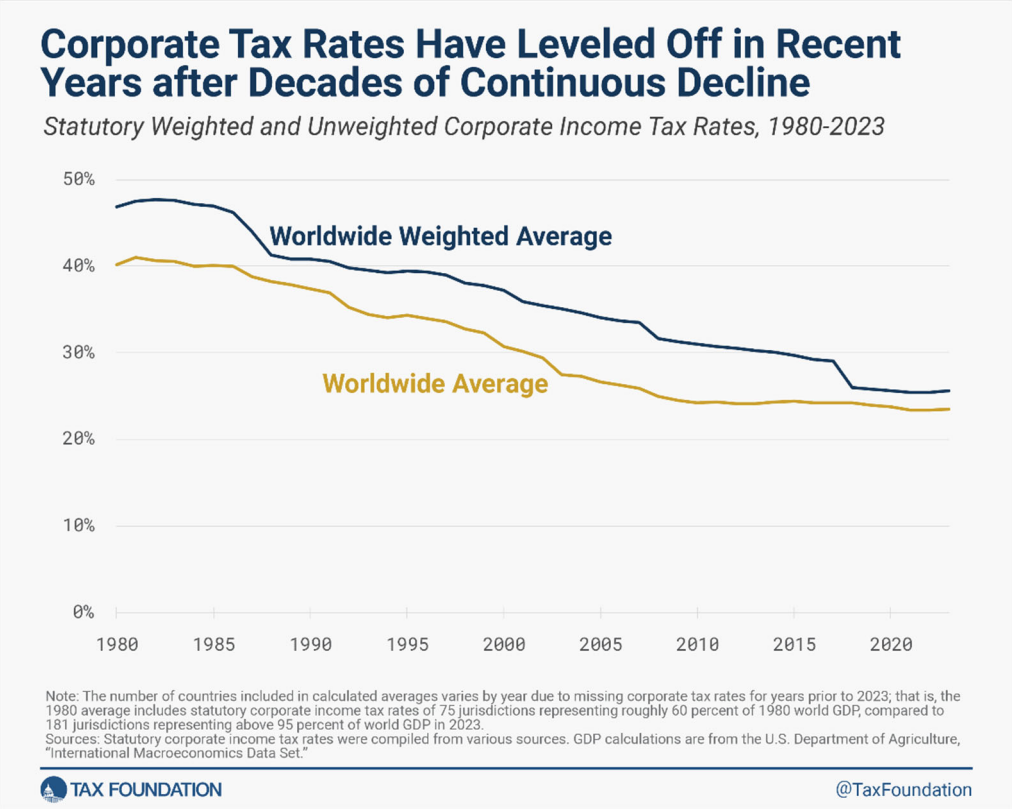


The Decline of Corporate Tax Rates since 1980 Leveled Off in Recent Years

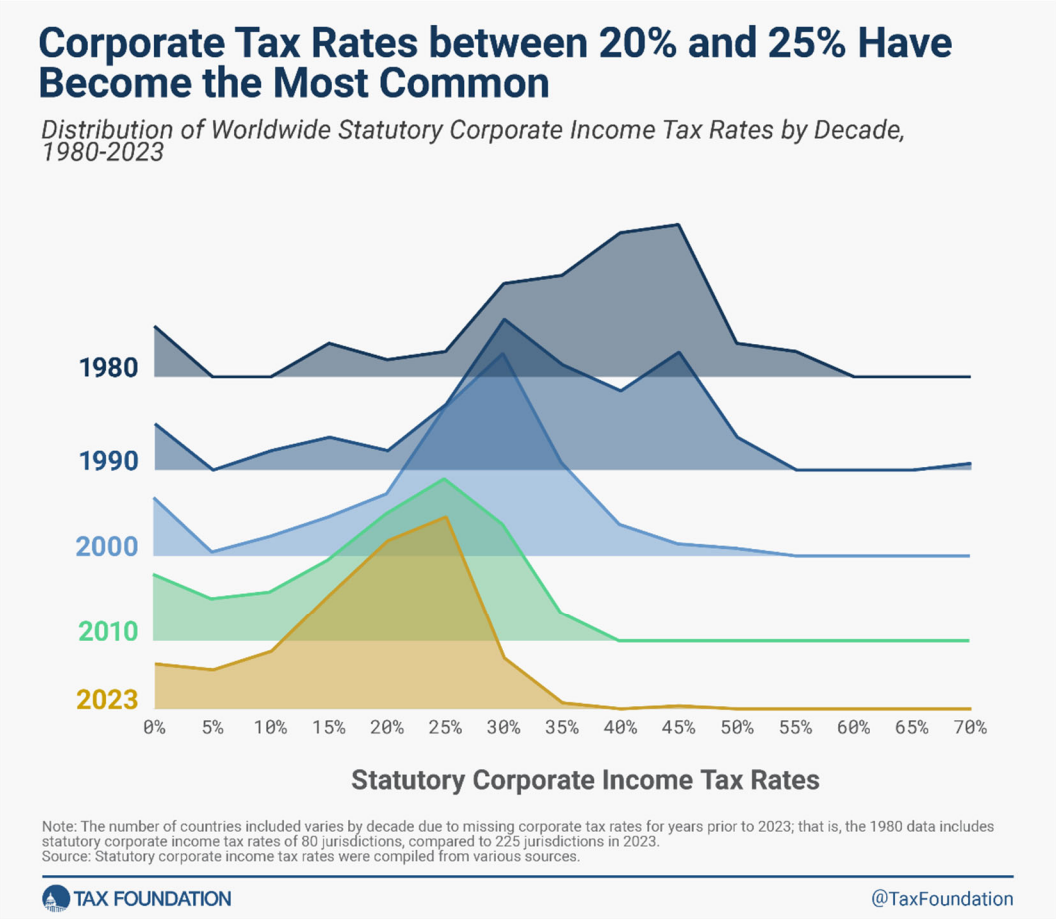
Over the past 43 years, corporate tax rates have consistently declined on a global basis. In 1980, the unweighted average worldwide statutory tax rate was 40.18 percent. Today, the average statutory rate stands at 23.45 percent—a 42 percent reduction.[17]

Despite a general decline in corporate tax rates around the world, OECD and non-OECD countries have also become more reliant on revenue from corporate income taxes. One cause for this change has been a shift in the jurisdictions included.[18] Secondly, the negative revenue impact of the decline in corporate tax rates was generally offset by reducing or abolishing tax relief policies. [19]

The weighted average statutory rate has remained higher than the simple average over this period. Prior to U.S. tax reform in 2017, the United States was largely responsible for keeping the weighted average higher, given its relatively high tax rate, as well as its significant contribution to global GDP. Figure 3 shows the significant impact the change in the U.S. corporate rate had on the worldwide weighted average. The weighted average statutory corporate income tax rate has declined from 46.83 percent in 1980 to 25.67 percent in 2023, representing a 45 percent reduction over the 43 years surveyed.

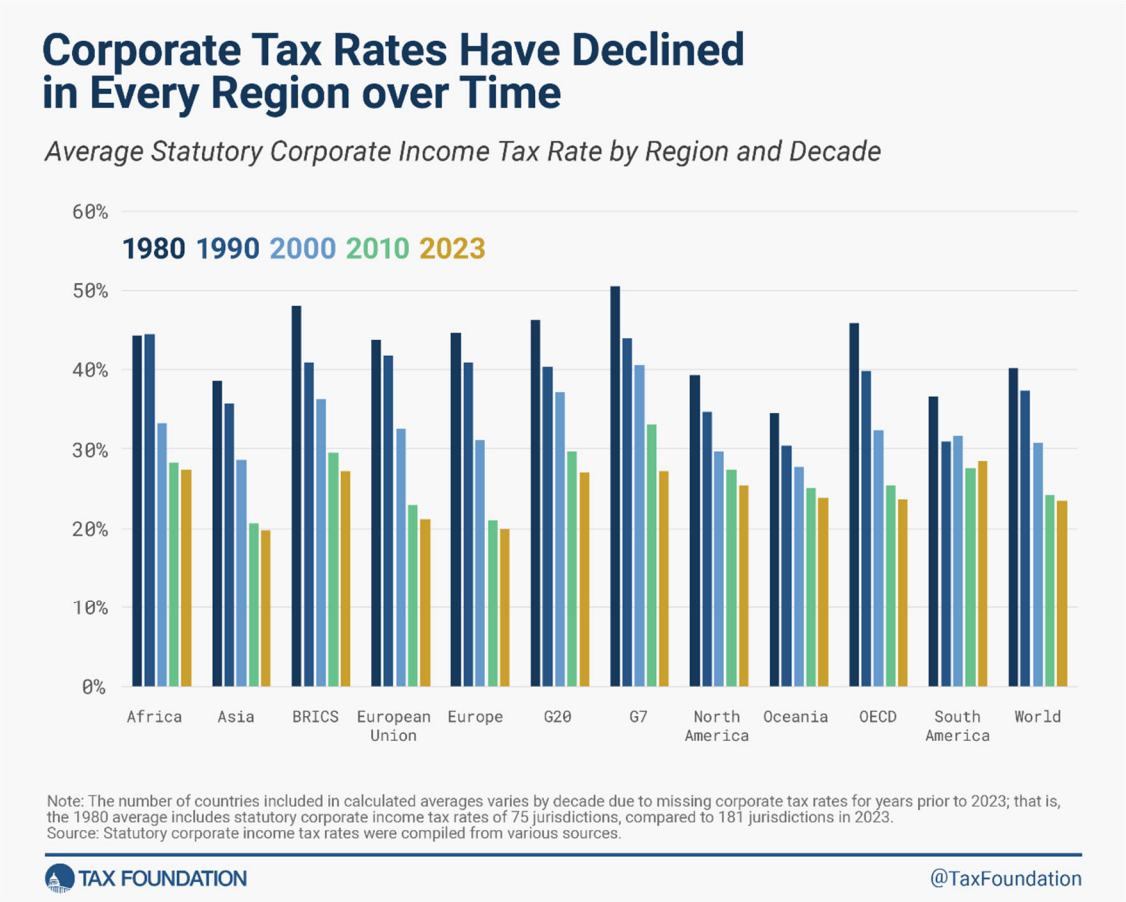


Over time, more countries have shifted to taxing corporations at rates of 30 percent or lower, with the United States following this trend with its tax changes at the end of 2017. The largest shift occurred between 1990 and 2000, with 49 percent of countries imposing a statutory rate below 30 percent in 2000 and only 27 percent of countries in the dataset imposing a statutory rate below 30 percent in 1990. This trend continued between 2000 and 2010, with 79 percent of countries imposing a statutory rate below 30 percent in 2010. Currently, 91 percent of countries impose a statutory rate below 30 percent.[20]



All regions saw a net decline in average statutory rates between 1980 and 2023. The average declined the most in Europe, with the 1980 average of 44.6 percent dropping to 19.92 percent—a 55 percent decline. South America has seen the smallest decline, with the average only decreasing by 23 percent, from 36.66 percent in 1980 to 28.38 percent in 2023.

South America saw two periods, 1990-2000 and 2010-2023, during which the average statutory rate increased slightly by less than one percentage point, although the average rate decreased over the full 43-year period.



Conclusion

Worldwide and regional average top statutory corporate tax rates have declined over the past four decades due to countries turning to more efficient tax types.[21] However, they have leveled off in recent years. Of the 225 jurisdictions around the world, only six have increased their top corporate income tax rate in 2023, a trend that might be reversed in the coming years as more countries agree to implement the global minimum tax.

Compare All 2023 Corporate Tax Rates

Table 6: Statutory Top Corporate Tax Rates around the World, 2023

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Search:

ISO3	Country	Continent	Corporate Tax Ra
AFG	Afghanistan	AS	20.00%
ALA	Aland Islands	EU	20.00%
ALB	Albania	EU	15.00%
DZA	Algeria	AF	26.00%
ASM	American Samoa	OC	34.00%
AND	Andorra	EU	10.00%
AGO	Angola	AF	25.00%
AIA	Anguilla	NO	0.00%

ISO3	Country	Continent	Corporate Tax Ra
ATG	Antigua and Barbuda	NO	25.00%
ARG	Argentina	SA	35.00%
ARM	Armenia	AS	18.00%
ABW	Aruba	NO	22.00%
AUS	Australia	OC	30.00%
AUT	Austria	EU	24.00%
AZE	Azerbaijan	AS	20.00%
BHS	Bahamas	NO	0.00%
BHR	Bahrain	AS	0.00%
BGD	Bangladesh	AS	27.50%
BRB	Barbados	NO	5.50%
BLR	Belarus	EU	20.00%
BEL	Belgium	EU	25.00%
BLZ	Belize	NO	0.00%
BEN	Benin	AF	30.00%
BMU	Bermuda	NO	0.00%
BTN	Bhutan	AS	25.00%
BOL	Bolivia (Plurinational State of)	SA	25.00%
BES	Bonaire, Sint Eustatius and Saba	NO	25.80%
BIH	Bosnia and Herzegovina	EU	10.00%
BWA	Botswana	AF	22.00%
BRA	Brazil	SA	34.00%

PREVIOUSNEXT

Notes: Continent abbreviations are as follows: “AF” is Africa, “AS” is Asia, “EU” is Europe, “OC” is Oceania, “NO” is North America, and “SA” is South America. Countries are assigned to continents based on ISO standards; see DataHub.io, "Comprehensive country codes: ISO 3166, ITU, ISO 4217 currency codes and many more," https://datahub.io/core/country-codes#resource-country-codes_zip.

Sources: Statutory corporate income tax rates are from OECD, “Table II.1. Statutory corporate income tax rate,” and “Statutory Corporate Income Tax Rates”; PwC, “Worldwide Tax Summaries – Corporate Taxes”; Bloomberg Tax, “Country Guides – Corporate Tax Rates”; and some jurisdictions researched individually, see Tax Foundation, “worldwide-corporate-tax-rates.”

Appendix

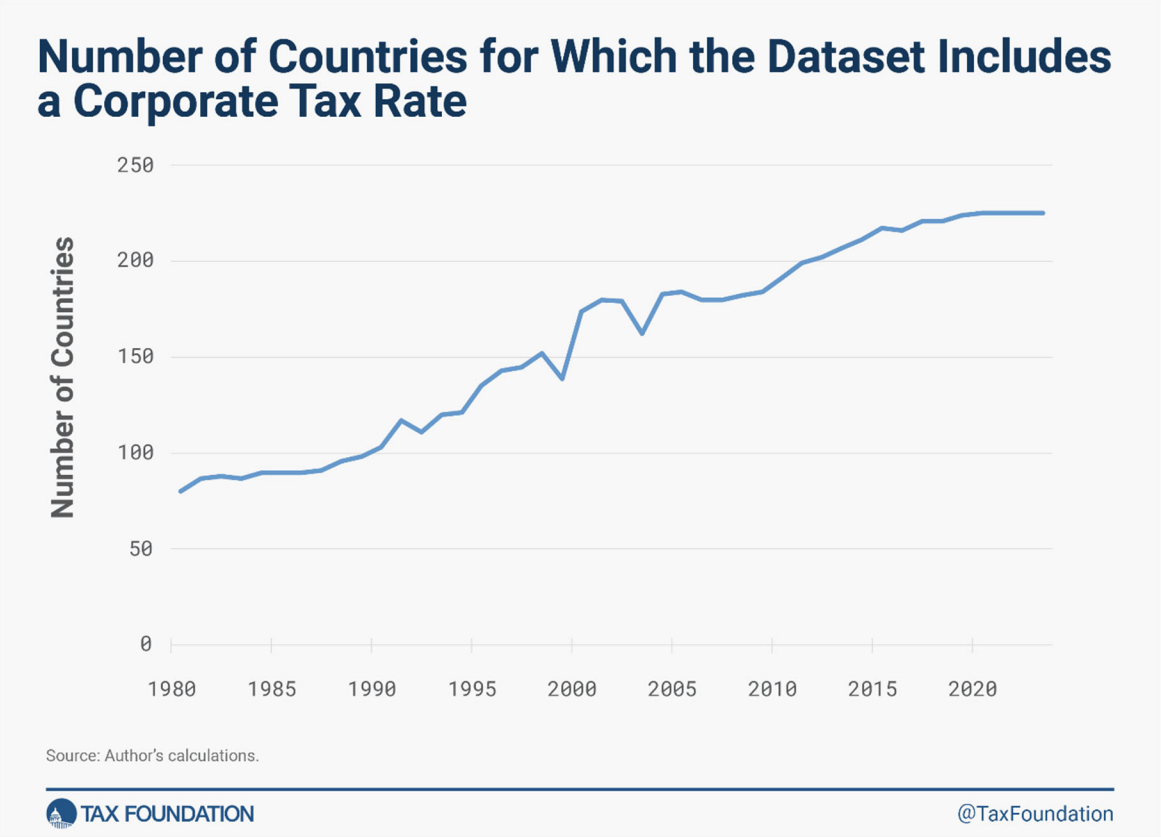
Note: *All data and methodological notes are accessible in our GitHub repository.*

The Dataset

Scope

The dataset compiled for this publication includes the 2023 statutory corporate income tax rates of 225 sovereign states and dependent territories around the world. Tax rates were researched only for jurisdictions that are among the around 250 sovereign states and dependent territories that have been assigned a country code by the International Organization for Standardization (ISO). As a result, zones or territories that are independent taxing jurisdictions but do not have their own country code are generally not included in the dataset.

In addition, the dataset includes historic statutory corporate income tax rates from 1980 to 2022. However, these years cover tax rates of fewer than 225 jurisdictions due to missing data points. Please let Tax Foundation know if you are aware of any sources for historic corporate tax rates that are not mentioned in this report, as we constantly strive to improve our datasets.



To be able to calculate average statutory corporate income tax rates weighted by GDP, the dataset includes GDP data for 181 jurisdictions. When used to calculate average statutory corporate income tax rates, either weighted by GDP or unweighted, only these 181 jurisdictions are included (to ensure the comparability of the unweighted and weighted averages).

Definition of Selected Corporate Income Tax Rate

The dataset captures standard top statutory corporate income tax rates levied on domestic businesses. This means:

- The dataset does not reflect special tax regimes, including but not limited to patent boxes, offshore regimes, or special rates for specific industries.
- A number of countries levy lower rates for businesses below a certain revenue threshold. The dataset does not capture these lower rates.

- A few countries levy gross revenue taxes on businesses instead of corporate income taxes. Since the tax rates of a corporate income tax and a gross revenue tax are not comparable, these countries are excluded from the dataset.
- Some countries have a separate tax rate for nonresident companies. This dataset does not consider nonresident tax rates that differ from the general corporate rate.

Sources

Tax Rates for the Year 2023

For OECD and non-OECD countries, the statutory corporate income tax rates used are the *combined* corporate income tax rates provided by the OECD; see OECD, "Table II.1. Statutory corporate income tax rate," updated April 2023, https://stats.oecd.org/index.aspx?DataSetCode=Table_II1 and "Statutory Corporate Income Tax Rates," updated November 2023, https://stats.oecd.org/index.aspx?DataSetCode=CTS_CIT. Another source used for non-OECD jurisdictions is the statutory rates provided by PwC, "Worldwide Tax Summaries – Corporate Taxes," 2023, https://taxsummaries.pwc.com/. The study also relies on Bloomberg Tax, "Country Guides – Corporate Tax Rates," accessed in November 2023, https://www.bloomberglaw.com/product/tax/toc_view_menu/3380. Jurisdictions that are not part of these sources were researched individually. The source for each of these jurisdictions is listed in a GitHub repository; see Tax Foundation, "worldwide-corporate-tax-rates," GitHub, https://github.com/TaxFoundation/worldwide-corporate-tax-rates.

Tax Rates for the Years 1980-2022

Tax rates for the time frame between 1980 and 2022 are taken from a dataset compiled by the Tax Foundation over the last few years. These historic rates come from multiple sources: PwC, "Worldwide Tax Summaries – Corporate Taxes," 2010-2022; KPMG, "Corporate Tax Rate Survey," 1998- 2003; KPMG, "Corporate tax rates table," 2003-2019; EY, "Worldwide Corporate Tax Guide," 2004-2019; OECD, "Historical Table II.1 – Statutory corporate income tax rate," 1999, http://www.oecd.org/tax/tax-policy/tax-database.htm#C_CorporateCaptial; the University of Michigan – Ross School of Business, "World Tax Database," https://www.bus.umich.edu/otpr/otpr/default.asp; and numerous government websites.

Gross Domestic Product (GDP) for the years 1980-2023

GDP calculations are from the U.S. Department of Agriculture, "International Macroeconomics Data Set-Historical and projected real gross domestic product (GDP) and growth rates of GDP for baseline countries/regions (in billions of 2015 dollars) 1970-2033," August 3, 2022, https://www.ers.usda.gov/data-products/international-macroeconomic-data-set/.

References

[1] Unless otherwise noted, calculated averages of statutory corporate income tax rates only include jurisdictions for which GDP data is available for all years between 1980 and 2023. For 2023, the dataset includes statutory corporate income tax rates of 225 jurisdictions, but GDP data is available for only 181 of these jurisdictions, reducing the number of jurisdictions included in calculated averages to 181. For years prior to 2023, the number of countries included in calculated averages varies by year due to missing corporate tax rates; that is, the 1980 average includes statutory corporate income tax rates of 75 jurisdictions, compared to 181 jurisdictions in 2023.

[2] Statutory corporate income tax rates are from OECD, "Table II.1. Statutory corporate income tax rate," updated April 2023, https://stats.oecd.org/index.aspx?DataSetCode=Table_II1 and "Statutory Corporate Income

Tax Rates," updated November 2023, https://stats.oecd.org/index.aspx?DataSetCode=CTS_CIT; PwC, "Worldwide Tax Summaries – Corporate Taxes," 2023, https://taxsummaries.pwc.com/. Bloomberg Tax, "Country Guides – Corporate Tax Rates," accessed November 2023, https://www.bloomberglaw.com/product/tax/toc_view_menu/3380; and researched individually, see Tax Foundation, "worldwide-corporate-tax-rates," GitHub, https://github.com/TaxFoundation/worldwide-corporate-tax-rates. GDP calculations are from the U.S. Department of Agriculture, "International Macroeconomics Data Set," Aug. 22, 2022, https://www.ers.usda.gov/data-products/international-macroeconomic-data-set/.

[3] Kari Jahnsen and Kyle Pomerleau, "Corporate Income Tax Rates around the World, 2017," Tax Foundation, Sep. 7, 2017, https://taxfoundation.org/corporate-income-tax-rates-around-the-world-2017/.

[4] PwC, "Worldwide Tax Summaries – United Arab Emirates," 2023, https://taxsummaries.pwc.com/united-arab-emirates/corporate/taxes-on-corporate-income.

[5] PwC, "Worldwide Tax Summaries – Austria," 2023, https://taxsummaries.pwc.com/austria/corporate/taxes-on-corporate-income.

[6] PwC, "Worldwide Tax Summaries – Morocco," 2023, https://taxsummaries.pwc.com/morocco/corporate/taxes-on-corporate-income.

[7] PwC, "Worldwide Tax Summaries – Bermuda," 2023, https://taxsummaries.pwc.com/bermuda/corporate/significant-developments.

[8] Bloomberg Tax, "Bermuda Proposes Bill on Corporate Tax in Line With OECD Rules," Nov. 16, 2023, https://news.bloombergtax.com/daily-tax-report-international/bermuda-proposes-bill-on-corporate-tax-in-line-with-oecd-rules.

[9] States of Guernsey, "Guernsey aligns with Jersey and Isle of Man on approach to OECD's Pillar Two Framework," https://gov.gg/Guernsey-Jersey-IoM-align-OECD-Pillar-Two.

[10] KPMG, "EU Member States reach agreement on Minimum Tax Directive (Pillar Two)," Dec. 13, 2022, https://kpmg.com/mt/en/home/insights/2022/12/eu-member-states-reach-agreement-on-minimum-tax-directive-pillar-two.html.

[11] Bloomberg Tax, "Tax Havens Race to Lure Companies as 15% Global Levy Looms," Dec. 6. 2023, https://news.bloombergtax.com/daily-tax-report-international/tax-havens-race-to-lure-companies-as-15-global-levy-looms.

[12] As no averages are presented in this section, it covers all 225 jurisdictions for which corporate income tax rates were found in 2023 (thus including jurisdictions for which GDP data was not available).

[13] This average is lower than the average of the 181 jurisdictions because many of the jurisdictions for which no GDP data is available are small economies with low corporate income tax rates.

[14] Where applicable, similar combinations of national and subnational rates are included in this dataset. For example, the combined German corporate tax rate is 29.94 percent, which includes both the federal rate of 15 percent and municipal trade taxes ranging from 14 to 17 percent.

[15] BRICS is a group of countries with major emerging economies. The members of this group are Brazil, Russia, India, China, and South Africa.

[16] As no averages are presented in this chapter, it covers all 225 jurisdictions for which 2023 corporate income tax rates were found (thus including jurisdictions for which GDP data was not available).

[17] Historical data comes from multiple sources: PwC, "Worldwide Tax Summaries – Corporate Taxes," 2010-2019; KPMG, "Corporate Tax Rate Survey," 1998- 2003; KPMG, "Corporate tax rates table," 2003-2019; EY, "Worldwide Corporate Tax Guide," 2004-2019; OECD, "Historical Table II.1 – Statutory corporate income tax rate," 1999, http://www.oecd.org/tax/tax-policy/tax-database.htm#C_CorporateCaptial; University of Michigan – Ross School of Business, "World Tax Database," https://www.bus.umich.edu/otpr/otpr/default.asp; and numerous government websites.

[18] Daniel Bunn, "Sources of Government Revenue in the OECD," Tax Foundation, 2023, https://taxfoundation.org/publications/sources-of-government-revenue-in-the-oecd/.

[19] OECD, "Revenue Statistics 2023: Tax Revenue Buoyancy in OECD Countries," OECD Publishing, 2023, https://read.oecd-ilibrary.org/taxation/revenue-statistics-2023_9d0453d5-en#page22.

[20] This section of the report covers all 225 jurisdictions for which 2022 corporate income tax rates were found (thus including jurisdictions for which GDP data was not available).

[21] Asa Johansson, Christopher Heady, Jens Arnold, Bert Brys, and Laura Vartia, "Tax and Economic Growth," OECD, Jul. 11, 2008, https://www.oecd.org/tax/tax-policy/41000592.pdf; see also, Alex Durante, "Reviewing Recent Evidence of the Effect of Taxes on Economic Growth," Tax Foundation, May 21, 2021, https://taxfoundation.org/reviewing-recent-evidence-effect-taxes-economic-growth/.

Share

Corporate Tax Rates around the World, 2023

ISO3	Country	Continent	Corporate Tax Rate
AFG	Afghanistan	AS	20.00%
ALA	Aland Islands	EU	20.00%
ALB	Albania	EU	15.00%
DZA	Algeria	AF	26.00%
ASM	American Samoa	OC	34.00%
AND	Andorra	EU	10.00%
AGO	Angola	AF	25.00%
AIA	Anguilla	NO	0.00%
ATG	Antigua and Barbuda	NO	25.00%
ARG	Argentina	SA	35.00%
ARM	Armenia	AS	18.00%
ABW	Aruba	NO	22.00%
AUS	Australia	OC	30.00%
AUT	Austria	EU	24.00%
AZE	Azerbaijan	AS	20.00%
BHS	Bahamas	NO	0.00%
BHR	Bahrain	AS	0.00%
BGD	Bangladesh	AS	27.50%
BRB	Barbados	NO	5.50%
BLR	Belarus	EU	20.00%
BEL	Belgium	EU	25.00%
BLZ	Belize	NO	0.00%
BEN	Benin	AF	30.00%
BMU	Bermuda	NO	0.00%
BTN	Bhutan	AS	25.00%
BOL	Bolivia (Plurinational State of)	SA	25.00%
BES	Bonaire, Sint Eustatius and Saba	NO	25.80%
BIH	Bosnia and Herzegovina	EU	10.00%
BWA	Botswana	AF	22.00%
BRA	Brazil	SA	34.00%
VGB	British Virgin Islands	NO	0.00%
BRN	Brunei Darussalam	AS	18.50%
BGR	Bulgaria	EU	10.00%
BFA	Burkina Faso	AF	27.50%
BDI	Burundi	AF	30.00%
CPV	Cabo Verde	AF	22.44%
KHM	Cambodia	AS	20.00%
CMR	Cameroon	AF	33.00%
CAN	Canada	NO	26.21%
CYM	Cayman Islands	NO	0.00%
CAF	Central African Republic	AF	30.00%
TCD	Chad	AF	35.00%
CHL	Chile	SA	27.00%
CHN	China	AS	25.00%
HKG	China, Hong Kong Special Administrative Region	AS	16.50%

ISO3	Country	Continent	Corporate Tax Rate
MAC	China, Macao Special Administrative Region	AS	12.00%
COL	Colombia	SA	35.00%
COM	Comoros	AF	50.00%
COG	Congo	AF	28.00%
COK	Cook Islands	OC	20.00%
CRI	Costa Rica	NO	30.00%
CIV	Cote d'Ivoire	AF	25.00%
HRV	Croatia	EU	18.00%
CUB	Cuba	NO	35.00%
CUW	Curacao	NO	22.00%
CYP	Cyprus	EU	12.50%
CZE	Czechia	EU	19.00%
COD	Democratic Republic of the Congo	AF	30.00%
DNK	Denmark	EU	22.00%
DJI	Djibouti	AF	25.00%
DMA	Dominica	NO	25.00%
DOM	Dominican Republic	NO	27.00%
ECU	Ecuador	SA	25.00%
EGY	Egypt	AF	22.50%
SLV	El Salvador	NO	30.00%
GNQ	Equatorial Guinea	AF	35.00%
ERI	Eritrea	AF	30.00%
EST	Estonia	EU	20.00%
ETH	Ethiopia	AF	30.00%
FLK	Falkland Islands (Malvinas)	SA	26.00%
FRO	Faroe Islands	EU	18.00%
FJI	Fiji	OC	20.00%
FIN	Finland	EU	20.00%
FRA	France	EU	25.83%
PYF	French Polynesia	OC	25.00%
GAB	Gabon	AF	30.00%
GMB	Gambia	AF	27.00%
GEO	Georgia	AS	15.00%
DEU	Germany	EU	29.94%
GHA	Ghana	AF	25.00%
GIB	Gibraltar	EU	12.50%
GRC	Greece	EU	22.00%
GRL	Greenland	NO	26.50%
GRD	Grenada	NO	28.00%
GUM	Guam	OC	21.00%
GTM	Guatemala	NO	25.00%
GGY	Guernsey	EU	0.00%
GIN	Guinea	AF	25.00%
GNB	Guinea-Bissau	AF	25.00%
GUY	Guyana	SA	25.00%
HTI	Haiti	NO	30.00%
HND	Honduras	NO	30.00%

ISO3	Country	Continent	Corporate Tax Rate
HUN	Hungary	EU	9.00%
ISL	Iceland	EU	20.00%
IND	India	AS	30.00%
IDN	Indonesia	AS	22.00%
IRN	Iran (Islamic Republic of)	AS	25.00%
IRQ	Iraq	AS	15.00%
IRL	Ireland	EU	12.50%
IMN	Isle of Man	EU	0.00%
ISR	Israel	AS	23.00%
ITA	Italy	EU	27.81%
JAM	Jamaica	NO	25.00%
JPN	Japan	AS	29.74%
JEY	Jersey	EU	0.00%
JOR	Jordan	AS	20.00%
KAZ	Kazakhstan	AS	20.00%
KEN	Kenya	AF	30.00%
KIR	Kiribati	OC	30.00%
XKX	Kosovo (Republic of)	EU	10.00%
KWT	Kuwait	AS	15.00%
KGZ	Kyrgyzstan	AS	10.00%
LAO	Lao People's Democratic Republic	AS	20.00%
LVA	Latvia	EU	20.00%
LBN	Lebanon	AS	17.00%
LSO	Lesotho	AF	25.00%
LBR	Liberia	AF	25.00%
LBY	Libya	AF	20.00%
LIE	Liechtenstein	EU	12.50%
LTU	Lithuania	EU	15.00%
LUX	Luxembourg	EU	24.94%
MDG	Madagascar	AF	20.00%
MWI	Malawi	AF	30.00%
MYS	Malaysia	AS	24.00%
MDV	Maldives	AS	15.00%
MLI	Mali	AF	30.00%
MLT	Malta	EU	35.00%
MRT	Mauritania	AF	25.00%
MUS	Mauritius	AF	15.00%
MEX	Mexico	NO	30.00%
FSM	Micronesia (Federated States of)	OC	30.00%
MCO	Monaco	EU	25.00%
MNG	Mongolia	AS	25.00%
MNE	Montenegro	EU	15.00%
MSR	Montserrat	NO	30.00%
MAR	Morocco	AF	32.00%
MOZ	Mozambique	AF	32.00%
MMR	Myanmar	AS	22.00%
NAM	Namibia	AF	32.00%

ISO3	Country	Continent	Corporate Tax Rate
NRU	Nauru	OC	25.00%
NPL	Nepal	AS	25.00%
NLD	Netherlands	EU	25.80%
NCL	New Caledonia	OC	30.00%
NZL	New Zealand	OC	28.00%
NIC	Nicaragua	NO	30.00%
NER	Niger	AF	30.00%
NGA	Nigeria	AF	30.00%
NIU	Niue	OC	30.00%
MNP	Northern Mariana Islands	OC	21.00%
NOR	Norway	EU	22.00%
OMN	Oman	AS	15.00%
PAK	Pakistan	AS	29.00%
PAN	Panama	NO	25.00%
PNG	Papua New Guinea	OC	30.00%
PRY	Paraguay	SA	10.00%
PER	Peru	SA	29.50%
PHL	Philippines	AS	25.00%
POL	Poland	EU	19.00%
PRT	Portugal	EU	31.50%
PRI	Puerto Rico	NO	37.50%
QAT	Qatar	AS	10.00%
KOR	Republic of Korea	AS	26.50%
MDA	Republic of Moldova	EU	12.00%
ROU	Romania	EU	16.00%
RUS	Russian Federation	EU	20.00%
RWA	Rwanda	AF	30.00%
BLM	Saint Barthelemy	NO	0.00%
SHN	Saint Helena	AF	25.00%
KNA	Saint Kitts and Nevis	NO	33.00%
LCA	Saint Lucia	NO	30.00%
MAF	Saint Martin (French Part)	NO	20.00%
VCT	Saint Vincent and the Grenadines	NO	28.00%
WSM	Samoa	OC	27.00%
SMR	San Marino	EU	17.00%
STP	Sao Tome and Principe	AF	25.00%
SAU	Saudi Arabia	AS	20.00%
SEN	Senegal	AF	30.00%
SRB	Serbia	EU	15.00%
SYC	Seychelles	AF	25.00%
SLE	Sierra Leone	AF	25.00%
SGP	Singapore	AS	17.00%
SXM	Sint Maarten (Dutch Part)	NO	34.50%
SVK	Slovakia	EU	21.00%
SVN	Slovenia	EU	19.00%
SLB	Solomon Islands	OC	30.00%
ZAF	South Africa	AF	27.00%

ISO3	Country	Continent	Corporate Tax Rate
SSD	South Sudan	AF	30.00%
ESP	Spain	EU	25.00%
LKA	Sri Lanka	AS	30.00%
PSE	State of Palestine	AS	15.00%
SDN	Sudan	AF	35.00%
SUR	Suriname	SA	36.00%
SWZ	Swaziland	AF	27.50%
SWE	Sweden	EU	20.60%
CHE	Switzerland	EU	19.65%
SYR	Syrian Arab Republic	AS	28.00%
TWN	Taiwan	AS	20.00%
TJK	Tajikistan	AS	18.00%
THA	Thailand	AS	20.00%
MKD	The Former Yugoslav Republic of Macedonia	EU	10.00%
TLS	Timor-Leste	OC	10.00%
TGO	Togo	AF	27.00%
TKL	Tokelau	OC	0.00%
TON	Tonga	OC	25.00%
TTO	Trinidad and Tobago	NO	30.00%
TUN	Tunisia	AF	15.00%
TUR	Turkey	AS	25.00%
TKM	Turkmenistan	AS	8.00%
TCA	Turks and Caicos Islands	NO	0.00%
UGA	Uganda	AF	30.00%
UKR	Ukraine	EU	18.00%
ARE	United Arab Emirates	AS	9.00%
GBR	United Kingdom of Great Britain and Northern Ireland	EU	25.00%
TZA	United Republic of Tanzania	AF	30.00%
USA	United States of America	NO	25.77%
VIR	United States Virgin Islands	NO	23.10%
URY	Uruguay	SA	25.00%
UZB	Uzbekistan	AS	15.00%
VUT	Vanuatu	OC	0.00%
VEN	Venezuela (Bolivarian Republic of)	SA	34.00%
VNM	Viet Nam	AS	20.00%
WLF	Wallis and Futuna Islands	OC	0.00%
YEM	Yemen	AS	20.00%
ZMB	Zambia	AF	30.00%
ZWE	Zimbabwe	AF	24.72%

http://www.kcna.kp/en/article/q/5ed71cc79da176fbaa80aff3630b495f.kcmsf

Respected Comrade Kim Jong Un Makes Important Speech at 5th National Conference of Mothers

Pyongyang, December 5 (KCNA) -- **Kim Jong Un**, general secretary of the Workers' Party of Korea (WPK) and president of the State Affairs of the Democratic People's Republic of Korea, on December 4 made an important speech at the 5th National Conference of Mothers "On Duty of Mothers for Their Families and Society":

Dear mothers,

On behalf of the Party Central Committee and the government of the Republic, I once again warmly congratulate the participants in the 5th National Conference of Mothers and the mothers who received the Communist Mother Honor Prize at the conference.

I am very pleased that the conference of mothers is held with splendor at a proud time when the year 2023 is to be concluded with precious victories and epoch-making successes and that the whole country could extend greetings of thanks in chorus to the mothers who have made numerous exertions for many years.

In the glorious history of our country which advances by winning victories through all sorts of hardships, there are soldiers with arms, scientists with clear heads, devoted workers and diligent farmers.

But, on the highest peak of all of those glories and honors, there are always Korean women who are the best in the world, all the mothers of this country.

The credit for the brilliant today of our country goes to our mothers who are ordinary and simple and the strongest before any difficulties and have become the genuine models of always devoting themselves unhesitatingly to the road of patriotism as well as the roots for bringing up a large number of heroes in all parts of the country.

The period between the 4th and 5th national conferences of mothers coincides with the 10-odd years, the most arduous and grimmest period in the history of our Party and country.

Clearly imprinted in those trying days and months is the group of righteous and strong mothers who have overcome hardships, regarding all pains for the country and their children as pleasure, in order to be always upright before them.

Thanks to the mothers who endure obediently all sorts of difficulties and affliction, believing that anything our Party is determined to do is all right, we could decide on and push ahead with such grand undertakings as another great cause of nation-building, and all those projects could be crowned with successes by the devoted efforts of the mothers who became admirable assistants and faithful servants to their husbands and children.

But for mothers who have backed up the Party policies without a change of mind, reliably supported the arms of faith held by their sons and daughters and kindled the raging flames of patriotic movement throughout the country while enduring for scores of years the harshest trials that women of other countries could hardly stand even for a few days, we could not have continued to advance steadily and vigorously along the road of strengthening the national power.

When I hear the news of good deeds done by many youths who volunteered to work at difficult and labor-consuming worksites and devote themselves, including those young builders performing new miracles at the construction site for a new street in the Sopho area which is showing its magnificent appearance from day to day, I am thrilled to heart at the thought of our mothers who supported the good choice of their children and encouraged them heartily.

In fact, the mothers should be praised by the times only for the painstaking efforts and merits they have made while giving birth to many children and bringing them up in the days of insufficiency and difficulties and doing all sorts of troublesome work to take care of their husbands and parents-in-law.

But, with such great worries and work, our mothers are taking full responsibility for a post of the revolution, a part of socialist construction like men, and cultivating the freshness and beauty of our society with their thoughtfulness and kindness.

Mothers have been standing not only on the agricultural and light industrial fronts to which our Party attaches importance, but also on the scientific research bases and spark-flying construction sites. And the names of mothers can be found in the front ranks of patriotic meritorious persons who have stirred up the times and their love and affection can be felt in the strong breathing of the country which is overcoming the cold wind of trials and opening up a future with virtues and beautiful traits.

Their jewel-like patriotic mind and precious sweat shine in the bright laughter and happy tears of the great socialist family sharing difficulties and hardships with each other, and they can be deeply felt in the absolute strength and proud edifices of the Republic.

All of what we have had and are proud of at present -- all of those symbolizing the high prestige and mightiness of the Republic will remain forever along with the history made by the mothers of Korea with noble mind and the feats they have performed with resourceful and diligent efforts.

I would like to extend once again my warm thanks to all the mothers of the country who have become great strength to our Party in the grim annals of the revolution, as they always did in the past, and devoted their pure and ardent patriotism and loyalty to the prosperity of the country.

Respected mothers,

The future of a country and a nation is reflected first in the ideological and spiritual qualities of mothers and is built from the minds and hands of mothers.

Nearly one century has passed since our revolution was pioneered.

We can no longer see those mothers of anti-Japanese guerrilla origin who turned out in the sacred war for national liberation, leaving their beloved children under the eaves of other's house, and those mothers who dedicated all their children and even daughter-in-law to the revolution and who wrote epics of the Chollima era, holding aloft the communist slogan "One for all and all for one!". The generations, who have known about them only through videos and books, have become mothers now.

However, the beautiful mental world peculiar to the Korean mothers is being invariably carried forward and the history of noble life dedicated to the future is going on.

This is precious for the future of our Party and state just like lifeline and blood vessel.

If the mothers have a firm mind, the cornerstone of the country is solid, and if the spiritual world of mothers is noble, the baton of the revolution will be steadily carried forward and the nature of Korean-style socialism will remain unchanged.

We hold the conference of mothers with splendor as now because the future of Korea is shining brightly amid the steady inheritance of the proud history and tradition of mothers which have been carried forward generation after generation.

In the minds and appearances of mothers, we read the noble view of life that one's life is for younger generation and one's devoted efforts will result in a prosperous country where posterity will lead a happy life, and we are looking back upon the traces of their beautiful lives again.

Everyone has a mother and memories of childhood spent under her warm and benevolent care as well as of unforgettable images.

Among them, what children do not forget forever are their mothers' whole life of devotion, in which mothers had been always busy doing everything for their children but nothing for themselves, and the tears shed by mothers who were very happy to see their children do a good thing for the country or gave a whipping to their children when they did a sinful act even a bit.

Through their examples, mothers taught their children that the political integrity given by the Party is more precious than the physical life they gave, and that the life they devote is more valuable than the life they enjoy. Our younger generation realized the real meaning of life and patriotism in the teachings and appearances of the mothers before the books.

It is certain that a good child is to be grown up under the care of a good mother.

The generation, who were born and grew up under the care of such mothers, witnessing the traces of their mothers from aside and learning the real worth of life, hands over the baton of patriotism and loyalty to the next generation and that baton is handed down generation to generation. This is a law-governed historical process in which the future of our country is built.

Our mothers are, indeed, truly precious persons who link the new generation with the same blood of patriotism and are the first builders of the beautiful future.

Dear participants,

It is the primary revolutionary task to prepare well the younger generation to be the main force of our society and to hold up our powerful state.

As the first step is important in human life, family education takes the first place among family education, school education and social education, and the influence of mother is particularly important in family education.

For that reason, the Party has attached greater importance to the congress of the children's union and the conference of mothers than other conferences, and the Party Central Committee directly organized this conference with deep care and much efforts.

Expecting that this conference will be a practical occasion for all mothers to be more deeply aware of their responsibility and duty before the family and society and successfully fulfill them, I would like to inform you of the important policies of the Party and government and to make some requests.

As you know, the economic situation of the country was difficult and the obstructive moves of the enemies were unprecedentedly vicious, but we have made countless changes incomparable with those we made ten-odd years ago and we are going to make a stubborn struggle with a higher ideal and goal in the future and thus make an unimaginable development after another ten years.

As all our people actually see, listen and feel, the major policies being pursued by our Party and government at present are the gigantic works to create better living conditions and more civilized living environments.

The most essential requirement of people's life is the problems of food, clothing and housing. The struggle to implement the Party's programme for the rural revolution in the new era is a historic cause of solving the food problem for the people in a perfect and sustained way in the near future and, at the same time, of modernizing the countryside, which had been a pronoun of centuries-old backwardness.

To accomplish this cause at an early date, the Party and the government offer the countryside lots of farm machines and farming supplies by mobilizing the important sector every year even in times of shortage and difficulties and, this year, launched large-scale projects to restore and perfect the irrigation facilities across the country, which had not been touched for decades, and thus made big stride in laying foundations for agricultural production.

At present, our agricultural sector is pushing ahead with the work to go over to the farming with focus on rice, wheat and barley, develop the animal husbandry and the fruit farming and build large-scale greenhouse farms. This work is for gratifying the desires of mothers who wish to provide their children and families with tasty and nutritious food all the time.

Saying that the reclamation of tidelands falls under the same category, he noted that President **Kim Il Sung** highlighted the need to reclaim the tideland on the west coast without fail in order to feed all the

people with rice and that our army addressed itself to the project for reclamation of tideland in a bid to complete it in seven to eight years.

Though it is a hard and grand nature-remaking project, we should complete in our generation it to be flawless for all ages. Then, the future generations will benefit from it forever, without knowing what the lack of farmland and the food problem are like.

For the issue of raising children - the foremost concern of mothers - we have done not a few jobs and have a promising prospect.

Now I feel very fulfilled that our Party and government, with much efforts, managed to feed all the children of the country with dairy products everyday, fully provide all the schoolchildren with "Sonamu"-trademarked school bags, uniforms and things and give a facelift to children's palaces, camps and halls.

However, not content with this, we put forward a policy of making a great revolution in education and are striving for its implementation to ensure that our rising generations receive the best education under the best and advanced educational conditions and circumstances in the world during all school from kindergarten to university.

While putting titanic state efforts into establishing a new chemical industry and creating the production capacity of chemical fibre in order to satisfactorily settle the clothing problem for people, we actively encourage such development levers as an exhibition of advanced garments to develop in a more civilized way the costumes of all the people including mothers.

Recent years saw more gigantic construction projects than ever on a nation-wide scale, and what is most important here is to solve the housing problem for people at a high level.

Under the resolution of the 8th WPK Congress, the project for building 50 000 flats in the capital city has been carried out for three years so that over 10 000 households of the capital moved into new houses every year. And modern rural houses fit for an ideal society have taken their shapes across the country from last year to be offered to agricultural workers one after another.

By carrying out a construction project to remodel the provincial, city and county seats to meet the requirements of modern civilization, we intend to bring about a new world where the whole country from the capital city to local areas and mountain villages has undergone radical changes.

And we plan to solve the problems of domestic water, cooking fuel, public transport, lift, heating for the citizens of the capital city first and, on this basis, satisfactorily tackle the necessary living problems including the problem of providing domestic water for local cities.

Noting that the important policies planned by the Party and the government at present include a project for building general hospitals equipped with modern, advanced medical service facilities in every provincial seat, he went on to say:

In addition, various important popular policies are on the table and I believe that if all these come to fruition, a truly fundamental change will be made in the life of our people.

All mothers should fulfill their responsibility and duty assumed before society and families with confidence in and optimism about the prospects of our socialist construction and a changed ideal society to come in the near future.

They have heavy mission to bring up their children to be pillars of socialist and communist construction and masters of future society.

The first step of a revolutionary is taken under the care of the mother and his true growth can be guaranteed by his mother's care.

No one can replace mothers for their position and duty.

If mothers fulfill their responsibility as educators, faster and more remarkable progress will be made in making the young people and all other members of the society communist persons.

First of all, mothers themselves should become communist mothers who have noble and beautiful moral qualities.

Unless a mother becomes a communist, it is impossible for her to bring up her sons and daughters as communists and transform the members of her family into revolutionaries.

There is a saying that if you want to judge a man, you should judge his mother, so there is a large difference between the outlooks on life and the world of the children who grow up under the care of mothers who devote themselves to the society and the collective and are willing to help those suffering pain, and of the children who grow up, seeing their mothers devote all energies to only their children and families.

So, the traits of all our mothers should be the virtues of helping others tide over their difficulties and sharing others' sorrow and the humanity of sharing their happiness with their neighbors and rejoicing at others' success as their own one.

The harmony of the families our mothers defend and tend also has a great effect on the growth of their children.

Mothers should always bear in mind that it is a great thing for the country to manage their household affairs carefully and promote the happiness and harmony of the families as housewives, and make an effort to become a meticulous mother, a grateful wife and a kind-hearted daughter-in-law.

If a mother truly wants her children to be fine persons, she should train her children consciously through the revolutionary struggle and the practice of socialist construction.

The posts for national defence and the sites of socialist construction are revolutionary universities which give the children valuable experiences of life that cannot be gained in the yard of their families and

cultivate the spirit of loving their comrades and the collective and the will and ability to surmount the difficulties.

It will be mothers' greatest pleasure to see their children growing up as pillars of the country while realizing in the struggle and life how precious our Party and social system are.

With their inborn true feelings of flogging their kids with tears in their eyes to bring them up as honest persons, mothers should have no hesitation in making their beloved children work in the difficult and labor-consuming posts and workplaces.

For mothers, another important thing is to always pay deep attention to their mental and moral lives.

The children, who were well-mannered and innocent when they were young, grow up to be unmannered and become tainted with a bad thing if their mothers pay less attention to them who are older.

Mothers should give regular education to their children so that they can study and lead an organizational life well and lead a sound moral life not only when they are young but also after they have entered university and society.

Some mothers pay attention to their children's studies while neglecting their education in courtesy and morality, including the polite way of speaking, and their use of words and deeds different from our own style. Some other mothers think that they perform their responsibility as mothers when they bring their children up in a special way, providing special clothing for them.

The struggle against alien practices now intensifies in society. Only when mothers actively join in the struggle, can all such practices be eliminated.

Mothers should take an active part in socialist construction and exert a revolutionary influence on their children by setting practical examples.

Though the word working woman is an everyday word, it means the brilliant honor and clear expression of a communist woman who devotes herself to our cause with a firm confidence in the truthfulness and victory of the cause.

Mothers should go beyond the bounds of their homes and take an active part in public life to devote their sincere patriotic sweat and make innovations at factories and workplaces. By doing so, they should be socialist working women of whom their children are proud and live a worthwhile life under the love and trust of the collective.

They should also fully discharge their duty as citizens by actively doing good deeds that will contribute to the prosperity of the country, including assistance to the army and the grand construction sites.

It is important for mothers to know well about the acuity and cause of the present grave situation and the key to the great change under such circumstances, he said, stressing the need for mothers to have pride and self-esteem in the victory we have achieved and fully understand the validity and truth of our

Party's policies which can never be denied with anything and thoroughly reject all the attempts and hypocrisy of the enemy.

He said that when all mothers clearly understand that it is patriotism to give birth to many children and do so positively, our cause of building a powerful socialist country can be hastened faster.

He called upon the Party organizations and working people's organizations including the women's union to positively lead and help mothers to fulfill their duties for families and society.

If children rely on their mother’s care, their mothers rely on the care of the organization.

The organization's constant warm care will be an encouragement to our mothers who have more troubles, worries and difficulties than others owing to incomplete living condition.

Our Party hopes that not a few special mothers but all mothers of the country would lead a worthwhile life in the same ranks towards communism.

Even though some mothers have led a humdrum or dishonorable life so far, they can emerge model mothers and innovators thanks to the sincere efforts of organizations in future and then it will be the great delight.

The Party organizations and women’s union organizations should organize and guide the work properly so that mass movements involving mothers become voluntary work based on patriotic enthusiasm and duty proper to a citizen.

Referring to the principled issues arising in expanding the ranks of communist mothers, he stressed that the Party organizations and women's union organizations should enlighten and sincerely help mothers to voluntarily get aware of their duties before families and society and give birth to many children and bring them up with devotion.

It is necessary for the Party Central Committee and provincial, city and county Party committees to always pay attention to the women’s union organizations so that they can perform their role properly, bearing in mind that the work of the women’s union is an important part of our Party work, and solve the problems arising in the women’s union on a priority basis and guard strictly against the overburdens imposed on it.

The Party and power organs and economic bodies should ensure that the benefits of the state such as giving priority to families with many children in allotment of dwelling houses, foods and commodity supply and medical service are correctly realized, and apply special subsidies in order to contribute to the life in actuality and take more preferential treatments in various aspects.

Dear mothers!

It is the long-cherished desire of our Party to provide our people, who are the best people in the world and have endured more sufferings and troubles than anyone else, with a happy and highly-civilized life as soon as possible. This reflects the dream our mothers have had generation after generation.

It is the most glorious and honorable task to bear in mind the mothers' dreams and wishes for bringing up their children well in the beautiful land of socialism and communism and realize them to the utmost.

Our Party will make more dynamic struggle to achieve everything desired by the toughest and most beautiful mothers in the world and their beloved sons and daughters as soon as possible.

Dear mothers!

I regard it as the greatest pride that our mothers are the most honest and greatest in the world.

It is a great blessing and fortune for the sons and daughters of this country to call such good mothers their mother.

Heartily wishing all the mothers of the country good health and happiness, in reflection of the minds of all the sons and daughters in this land, I declare the 5th National Conference of Mothers closed. -0-

https://www.globaltimes.cn/page/202312/1303684.shtml

China's elderly population aged 60 and over reaches 280m, 19.8% of total

Elderly care services continue advancing in quality, efficiency

By Liu Caiyu

Published: Dec 14, 2023 11:02 PM

Photo: Xinhua

China's elderly population aged 60 and above reached 280.04 million by the end of 2022, accounting for 19.8 percent of the total population, according to the latest report released by the Ministry of Civil Affairs. Demographers say China has paid great attention to addressing challenges brought by the aging population but more can be improved, such as further optimizing China's social security system.

The country's elderly population aged 65 and over reached 209.78 million in 2022, accounting for 14.9 percent of the total population, while the national dependency ratio of the elderly population aged 65 and above hit 21.8 percent, the report titled Communique on the Development of the National Cause for Aging said.

Since China became an aging society at the end of the 20th century, the number and

proportion of the elderly population have continued to grow. From 2000 to 2018, the elderly population aged 60 and above increased from 126 million to 249 million, and in 2022, the number reached 280 million. The proportion of elderly population also increased from 10.2 percent in 2000 to 17.9 percent in 2018, and further to 19.8 percent in 2022.

After the founding of the People's Republic of China, there have been three birth peaks. It is expected that the size of the elderly population will reach the peak of 520 million in 2054, Yuan Xin, a professor from the Institute of Population and Development at Nankai University's School of Economics, told the Global Times.

"China's aging rate is faster than that of 15 countries with more than 100 million people in the world. One of the reasons is the drop in the fertility rate," Yuan noted. China's fertility rate is estimated to have dropped to a record low of 1.09 in 2022, data from China Population and Development Research Center showed.

China's pressure in dealing with such a large elderly population is unprecedented, not only in terms of size but also in terms of the rapid increase in growth, Yuan noted.

Since the 18th National Congress of the Communist Party of China, more than 300 documents and plans for the elderly population have been issued at or above the provincial or ministerial level.

Wang Jianjun, former executive deputy director of the Office of the National Working Commission on Aging, has said that prioritizing the health of the elderly, China has seen improvements in providing basic insurance care and has built a complete welfare system to support the aging society.

When it comes to the supply of elderly care services, the report is optimistic, saying in this area it is being "continuously enhanced."

In 2022, the compliance rate of supporting elderly care service facilities in newly built residential areas in cities across the country reached 83.2 percent. Improvement of quality and efficiency among special care hospitals and hospitals for the family of martyrs has been seen after the central budget delineated support for them, the report said.

Data shows that by the end of 2022, there were 387,000 elderly care institutions and facilities of various types across the country, with a total of 8.294 million elderly care beds.

Among them, 41,000 were registered elderly care institutions, an increase of 1.6 percent over the previous year, with 5.183 million beds, an increase of 2.9 percent over the previous year. There are, by the end of 2022, 347,000 community elderly care service institutions and facilities with 3.111 million beds, according to the report.

Additionally, China continues to optimize the establishment of majors related to elderly care services at secondary vocational schools, higher vocational colleges, and higher vocational undergraduate schools.

Also, the National Development and Reform Commission and other departments have introduced several policies and measures to provide relief and support to the elderly care and childcare service industry.

The Ministry of Housing and Urban-Rural Development has guided qualified regions to explore providing vacant public rental housing free of charge to social institutions, so that they can provide meal assistance, day care, rehabilitation care, elderly education and other services for the elderly in the community, according to the report.

Yuan told the Global Times that if society offers more social participation opportunities for the elderly by raising the retirement age, the income status and consumption willingness of the elderly population would be a huge potential market and new economic growth point.

The demographer said supporting facilities and systems would have to be established to support the raising of the retirement age, for example, letting the elderly choose whether to extend their retirement flexibly and if they are okay to do part-time work.

https://www.yicaiglobal.com/news/chinas-labor-force-nears-average-age-of-40-report-says

China’s Labor Force Nears Average Age of 40 as Population Grows Old

GUO JINHUI
DATE: DEC 15 2023
/ SOURCE: YICAI

China’s Labor Force Nears Average Age of 40 as Population Grows Old

(Yicai) Dec. 15 -- As a result of China’s rapidly ageing population, the average age of someone working in the country is pushing 40, according to a new report.

The labor force’s average age was 39.4 in 2021, up from 32.3 in 1985, the report published recently by the Central University of Finance and Economics showed. Rural male workers are the oldest group, at 40.4.

By region, workers in northeastern provinces are the oldest, at 41.2 in Heilongjiang, 40.8 in Liaoning, and 40.6 in Jilin. The provincial-level areas with younger workers included Hainan, Xinjiang Uygur Autonomous Region, Guangdong, Guizhou, and Tibet Autonomous Region.

An aging labor force will crimp innovation and production efficiency, adversely affecting economic and social development, Li Haizheng, a professor at the university, told Yicai. To increase the amount of human capital, China should optimize its population structure, boost the fertility rate, and raise the level of people's education, he added.

China’s human capital growth, which reflects the value of workers' knowledge and skills and is mainly measured by personal incomes in the report, is slowing as the labor force ages. The mean annual growth rate in urban areas fell to 9.1 percent in 2021 from 15.3 percent in 2010, and that in rural areas fell to 4.3 percent from 8.4 percent.

Chinese workers received an average of 6.1 years to 10.8 years of schooling in the period between 1985 and 2021, climbing to 11.7 years from 8.2 in the cities and to 9.2 years from 5.5 in the countryside.

The education gap associated with gender is closing, according to the report. The average length of schooling for urban women surpassed that of men in 2020, but the gap between urban and rural areas has not yet improved significantly.

Editors: Dou Shicong, Martin Kadiev

Dan Tsubouchi @Energy_Tidbits · 59s

Increasing potential for US to retaliate? Certainly justified.

Can't help wonder if Sat Houthis 14 drones was another one directed at US Navy?

Normally, CENTCOM names specific nearby ships under attack when US steps in to defend and and not just "ships in the area"

#OOTT

> **U.S. Central Command** @CENTCOM
>
> In the early morning hours of December 16 (Sanna time) the US Arliegh Burke-class guided missile destroyer USS CARNEY (DDG 64), operating in the Red Sea, successfully engaged 14 unmanned aerial systems launched as a drone wave from Houthi-controlled areas of Yemen. The UAS were assessed to be one-way attack drones and were shot down with no damage to ships in the area or reported injuries. Regional Red Sea partners were alerted to the threat.
>
> 
>
> 7:49 AM · Dec 16, 2023 · **2.4M** Views

> **Dan Tsubouchi** @Energy_Tidbits · Dec 14
>
> 
>
> is this 1st time US admits Houthi drone was heading "***directly***" towards a US Navy ship?
>
> How much longer can US keep amazing restraint to NOT expand into regional conflict....
>
> Show more

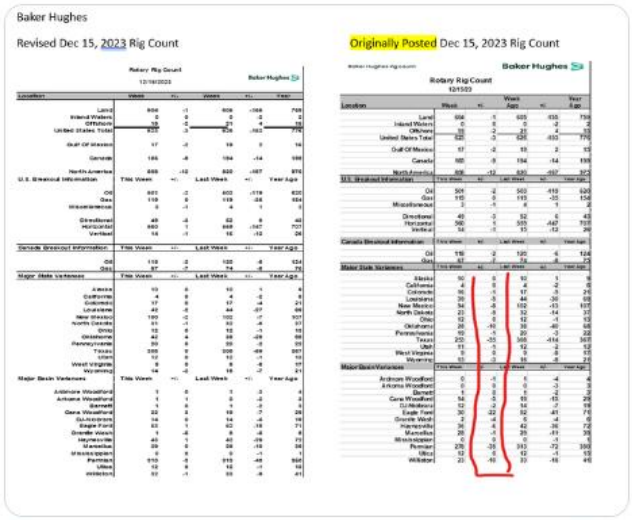
22

Dan Tsubouchi @Energy_Tidbits · 21h

See 👇

Baker Hughes posts revised North American rig count as of Dec 15 to correct for WoW changes in the big basins.

#OOTT



6 5 22 7.4K

Dan Tsubouchi @Energy_Tidbits · 23h

Floating #Oil storage 12/15 is 70.40 mmb, -13.81 WoW vs revised up 12/08 of 84.21 mmb.

If not revised, 12/15 of 70.40 would be 3rd lowest in last 12-mths following 10/20 of 63.49 and 12/16/22 of 69.89.

Thx @Vortexa @business
#OOTT

Posted Dec 16, 9am MT		Dec 9, 9am MT		Dec 2, 9am MT	
Date	Last Px	Date	Last Px	Date	Last Px
Fr 12/15/2023	70395	Fr 12/08/2023	81357	Fr 12/01/2023	64522
Fr 12/08/2023	84214	Fr 12/01/2023	70451	Fr 11/24/2023	89720
Fr 12/01/2023	71322	Fr 11/24/2023	89211	Fr 11/17/2023	94198
Fr 11/24/2023	87496	Fr 11/17/2023	89988	Fr 11/10/2023	72726
Fr 11/17/2023	88559	Fr 11/10/2023	74585	Fr 11/03/2023	79527
Fr 11/10/2023	71370	Fr 11/03/2023	80390	Fr 10/27/2023	78547
Fr 11/03/2023	78731	Fr 10/27/2023	78680	Fr 10/20/2023	64853
Fr 10/27/2023	77790	Fr 10/20/2023	63674	Fr 10/13/2023	75093
Fr 10/20/2023	63486	Fr 10/13/2023	74746	Fr 10/06/2023	74243
Fr 10/13/2023	73523	Fr 10/06/2023	75022	Fr 09/29/2023	83049
Fr 10/06/2023	73574	Fr 09/29/2023	85261	Fr 09/22/2023	89151

Source: Bloomberg, Vortexa

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Dec 15/23	Dec 8/23	WoW	Dec 8/23	Jun 23/23	Dec 15 vs Jun 23
Asia	36.20	42.66	-6.46	41.44	73.57	-37.37
Europe	5.54	9.62	-4.08	10.64	6.44	-0.90
Middle East	6.98	8.14	-1.16	9.04	7.17	-0.19
West Africa	4.68	6.28	-1.60	6.54	7.62	-2.94
US Gulf Coast	2.46	2.33	0.13	2.84	0.97	1.49
Other	14.54	15.18	-0.64	10.86	37.55	-23.01
Global Total	70.40	84.21	-13.81	81.30	133.32	-62.92

Vortexa crude oil floating storage posted on Bloomberg 9am MT on Dec 16
Source: Vortexa, Bloomberg

3 · 6 · 41 · 4.6K

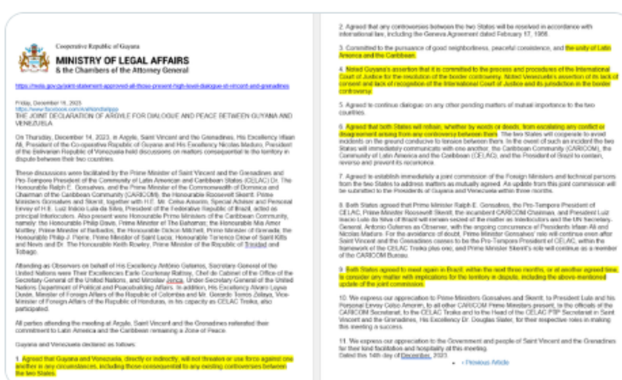
Dan Tsubouchi @Energy_Tidbits · Dec 16

VEN/GUY 11-pt statement.

Headline is VEN will not threaten or use force vs Guyana re the "border controversy"

But no resolve yet as VEN doesn't recognize International Court jurisdiction.

VEN/GUY to meet again within 3 mths on "territory in dispute".
...
Show more



2 · 5 · 2.4K

Dan Tsubouchi @Energy_Tidbits · Dec 16

#Houthis major disruption to global trade.

MSC, largest container shipper, is latest to says its ships will not transit thru Suez Canal, be rerouted via Cape of Good Hope. Follows Maersk 2nd largest.

Reminder 8.8 mmbd and 4.2 bcfd also goes thru Bab el Mandeb.

#OOTT

https://www.msc.com/en/newsroom/customer-advisories/2023/decemberhermsc-palatium-iii-incident-in-red-sea---rerouting-suez-traffic-to-cape

MSC PALATIUM III Incident in Red Sea - Rerouting Suez Traffic to Cape

12/16/2023

On 15 December 2023 the container ship MSC PALATIUM III was attacked at approximately 09.37 UTC while transiting the Red Sea under sub charter to Messina Line. All crew are safe with no reported injuries, meanwhile the vessel suffered limited fire damage and has been taken out of service.

Due to this incident and to protect the lives and safety of our seafarers, until the Red Sea passage is safe, MSC ships will not transit the Suez Canal Eastbound and Westbound. Already now, some services will be rerouted to go via the Cape of Good Hope instead.

This disruption will impact the sailing schedules by several days of vessels booked for Suez transit. We ask for your understanding under these serious circumstances.

Should you have any questions, please contact your local MSC representatives.

https://www.marineinsight.com/know-more/10-largest-container-shipping-companies-in-the-world/

> **Dan Tsubouchi** @Energy_Tidbits · Dec 15
>
> 
>
> *"we have instructed all Maersk vessels in the area bound to pass through the Bab al-Mandab Strait to pause their journey until further notice," the Danish company said a statement to AFP"*
> timesofisrael.com/top-shipping-c.....
> *Show more*

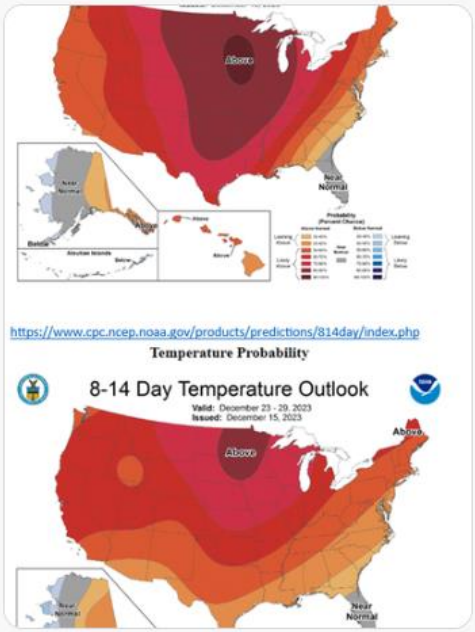
1 · 19 · 34 · 11K

Dan Tsubouchi @Energy_Tidbits · Dec 15

#Natgas investors to stay on sidelines until after Xmas to see if will turn cold.

Today's @NOAA temp outlook calls for much warmer than normal temps across US for Dec 21-29.

A warm Nov/Dec start is difficult, but not impossible to catch up, BUT needs a very cold Jan/Feb.
#OOTT



1 3 7 3K

Dan Tsubouchi @Energy_Tidbits · 4m

"*we have instructed all Maersk vessels in the area bound to pass through the Bab al-Mandab Strait to pause their journey until further notice," the Danish company said a statement to AFP*" timesofisrael.com/top-shipping-c...

See 👇 @eiagov 8.8 mmbd & 4.2 bcf LNG thru Bab el Mandeb.

#OOTT

3 3 218

Dan Tsubouchi @Energy_Tidbits · 6h

icymi. new york fed williams comments earlier that turned futures down a bit.
@SquawkCNBC @SquawkStreet #OOTT

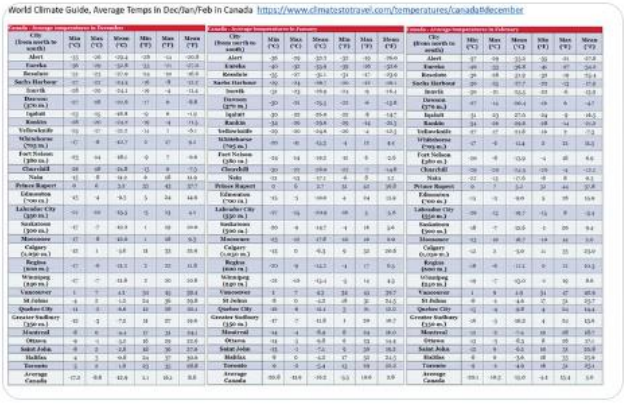
1 · 1 · 1.5K

Dan Tsubouchi @Energy_Tidbits · 6h

Note @RecurrentAuto #EVs range loss at freezing 32F or 0C.

SB no issue for 🇨🇦 within city drivers w/ home charging.

Challenge for EVs penetration for rural, working fleets, longer commute, Sat skiers, pickups for work, etc is 🇨🇦 Dec/Jan/Feb is a lot colder than freezing.
#OOTT


World Climate Guide, Average Temps in Dec/Jan/Feb in Canada https://www.climatestotravel.com/temperatures/canada#december

> **Recurrent** @RecurrentAuto · Nov 20
>
> 
>
> Do cold temperatures impact the expected range of your EV?
>
> Yes, the popular EV models that we analyzed had an average of 70.3% of their range in freezing conditions...
> Show more

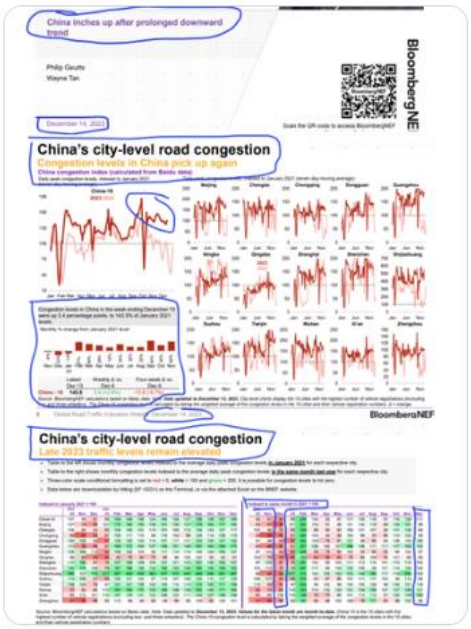
2 · 2 · 5 · 1.6K

Dan Tsubouchi @Energy_Tidbits · 19h

China stalled economy, increasing respiratory cases & snow in Beijing/northern China are all likely holding back any big recovery in Baidu road congestion levels.

Dec is big MoM decline in city-level road congestion with 12 of 15 top cities down MoM.

Thx @BloombergNEF. #OOTT



2 3 2.1K

Dan Tsubouchi @Energy_Tidbits · 21h ·

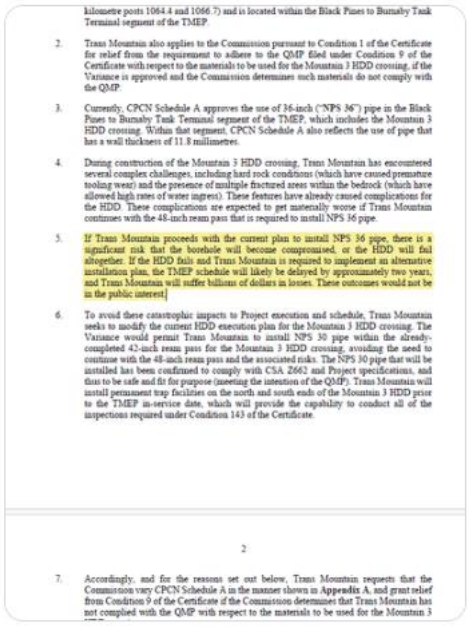
WOW!

#TransMountain warns #TMX could be delayed by ~2 yrs & suffer $billions in losses unless get relief.

See 👇 CER filing.

Thx @RodNickel_Rtrs for flagging. reuters.com/sustainability...

#OOTT



kilometre posts 1064.4 and 1066.7) and is located within the Black Pines to Burnaby Tank Terminal segment of the TMEP.

2. Trans Mountain also applies to the Commission pursuant to Condition 1 of the Certificate for relief from the requirement to adhere to the QMP filed under Condition 9 of the Certificate with respect to the materials to be used for the Mountain 3 HDD crossing, if the Variance is approved and the Commission determines such materials do not comply with the QMP.

3. Currently, CPCN Schedule A approves the use of 36-inch ("NPS 36") pipe in the Black Pines to Burnaby Tank Terminal segment of the TMEP, which includes the Mountain 3 HDD crossing. Within that segment, CPCN Schedule A also reflects the use of pipe that has a wall thickness of 11.8 millimetres.

4. During construction of the Mountain 3 HDD crossing, Trans Mountain has encountered several complex challenges, including hard rock conditions (which have caused premature tooling wear) and the presence of multiple fractured zones within the bedrock (which have allowed high rates of water ingress). These features have already caused complications for the HDD. These complications are expected to get materially worse if Trans Mountain continues with the 48-inch ream pass that is required to install NPS 36 pipe.

5. If Trans Mountain proceeds with the current plan to install NPS 36 pipe, there is a significant risk that the borehole will become compromised, or the HDD will fail altogether. If the HDD fails and Trans Mountain is required to implement an alternative installation plan, the TMEP schedule will likely be delayed by approximately two years, and Trans Mountain will suffer billions of dollars in losses. These outcomes would not be in the public interest.

6. To avoid these catastrophic impacts to Project execution and schedule, Trans Mountain seeks to modify the current HDD execution plan for the Mountain 3 HDD crossing. The Variance would permit Trans Mountain to install NPS 30 pipe within the already-completed 42-inch ream pass for the Mountain 3 HDD crossing, avoiding the need to continue with the 48-inch ream pass and the associated risks. The NPS 30 pipe that will be installed has been confirmed to comply with CSA Z662 and Project specifications, and thus to be safe and fit for purpose (meeting the intention of the QMP). Trans Mountain will install permanent trap facilities on the north and south ends of the Mountain 3 HDD prior to the TMEP in-service date, which will provide the capability to conduct all of the inspections required under Condition 143 of the Certificate.

7. Accordingly, and for the reasons set out below, Trans Mountain requests that the Commission vary CPCN Schedule A in the manner shown in **Appendix A**, and grant relief from Condition 9 of the Certificate if the Commission determines that Trans Mountain has not complied with the QMP with respect to the materials to be used for the Mountain 3

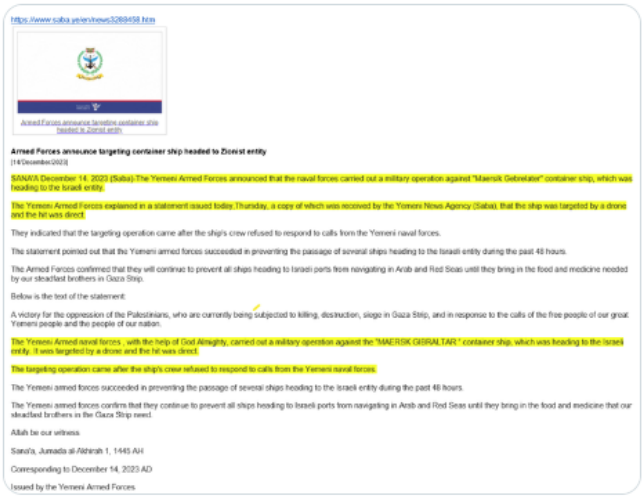
Dan Tsubouchi @Energy_Tidbits · 22h

#Houthis say direct hit on Maersk container ship.

" *"The vessel was not hit," a Maersk spokesperson told Reuters in an emailed statement"* reuters.com/world/maersk-s...

Either way, reminds of increasing Houthi drone/rocket attacks on ships/tankers/US navy/France navy.

#OOTT



https://www.saba.ye/en/news3289458.htm

Armed Forces announce targeting container ship headed to Zionist entity

Armed Forces announce targeting container ship headed to Zionist entity

[14/December/2023]

SANA'A December 14, 2023 (Saba):The Yemeni Armed Forces announced that the naval forces carried out a military operation against "Maersk Gebrelater" container ship, which was heading to the Israeli entity.

The Yemeni Armed Forces explained in a statement issued today,Thursday, a copy of which was received by the Yemeni News Agency (Saba), that the ship was targeted by a drone and the hit was direct.

They indicated that the targeting operation came after the ship's crew refused to respond to calls from the Yemeni naval forces.

The statement pointed out that the Yemeni armed forces succeeded in preventing the passage of several ships heading to the Israeli entity during the past 48 hours.

The Armed Forces confirmed that they will continue to prevent all ships heading to Israeli ports from navigating in Arab and Red Seas until they bring in the food and medicine needed by our steadfast brothers in Gaza Strip.

Below is the text of the statement:

A victory for the oppression of the Palestinians, who are currently being subjected to killing, destruction, siege in Gaza Strip, and in response to the calls of the free people of our great Yemeni people and the people of our nation.

The Yemeni Armed naval forces , with the help of God Almighty, carried out a military operation against the "MAERSK GIBRALTAR " container ship, which was heading to the Israeli entity. It was targeted by a drone and the hit was direct.

The targeting operation came after the ship's crew refused to respond to calls from the Yemeni naval forces.

The Yemeni armed forces succeeded in preventing the passage of several ships heading to the Israeli entity during the past 48 hours.

The Yemeni armed forces confirm that they continue to prevent all ships heading to Israeli ports from navigating in Arab and Red Seas until they bring in the food and medicine that our steadfast brothers in the Gaza Strip need.

Allah be our witness.

Sana'a, Jumada al-Akhirah 1, 1445 AH

Corresponding to December 14, 2023 AD

Issued by the Yemeni Armed Forces

> **Dan Tsubouchi** @Energy_Tidbits · Dec 9
>
> 
>
> #Houthis expand target list. warn it will target **any ship of any nationality** in Red Sea/Bab el Mandeb **IF it is heading to Israel.**
>
> Suez Canal 101: Every ship thru the Suez has to go thr...
> Show more

3 4 1.7K

Dan Tsubouchi @Energy_Tidbits · 5h

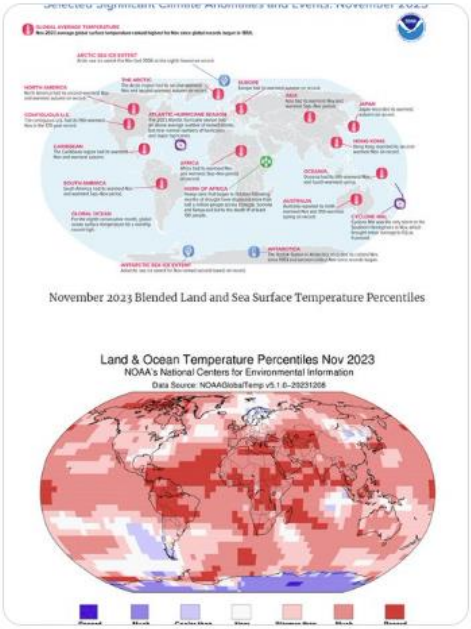
No wonder global #LNG #NatGas prices are weak.

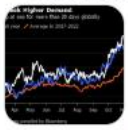
- Global warmest Nov on record.
- US 19th warmest on record
- EU 15th warmest on record
- Asia warmest on record.

Need sustained cold temps ASAP broadly in world or risk repeat of winter 22/23 hit on 2023 prices.

...

Show more



> **Dan Tsubouchi** @Energy_Tidbits · 9h
>
> 
>
> Need sustained cold weather ASAP broadly in EU & Asia or else risk repeat of winter 22/23 for #LNG & EU #NatGas prices.
>
> LNG on water >20 days worldwide jumped to highest...
> Show more

2 4 6 2.3K

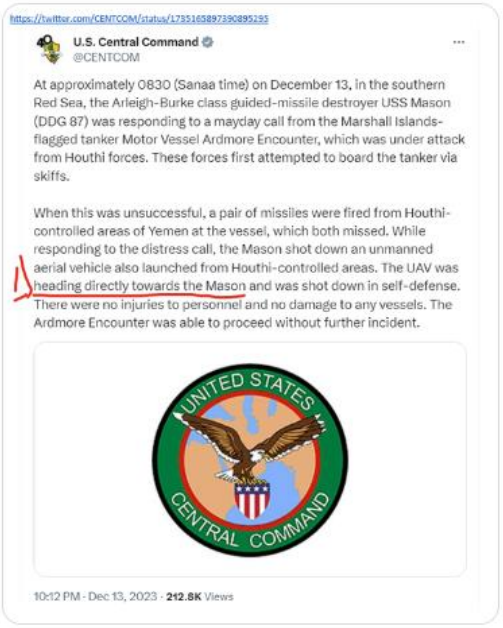
Dan Tsubouchi @Energy_Tidbits · 9h

is this 1st time US admits Houthi drone was heading "***directly***" towards a US Navy ship?

How much longer can US keep amazing restraint to NOT expand into regional conflict.

Kudos to US Navy in shooting down drones!

#OOTT



3 5 19 2.4K

Dan Tsubouchi @Energy_Tidbits · 9h

Need sustained cold weather ASAP broadly in EU & Asia or else risk repeat of winter 22/23 for #LNG & EU #NatGas prices.

LNG on water >20 days worldwide jumped to highest seasonal level since at least 2017, 70% higher than an average over the last six yrs. @MaznevaElena

#OOTT

3 2 3.5K

Dan Tsubouchi @Energy_Tidbits · 22h

What will Maduro's next move be on his claim for Guyana's oil riches after tomorrow's meeting that isn't expected to show any movement on Venezuela or Guyana side?

Thx @ArgusMedia Canute James

#OOTT

https://www.argusmedia.com/en//news/2518754-venezuela-guyana-disagree-on-meeting-goals?backToResults=true

Venezuela, Guyana disagree on meeting goals

Published date: 13 December 2023

The presidents of Guyana and Venezuela have expressed widely differing views about the purpose of their meeting in St Vincent and the Grenadines Thursday amid rising tension over Caracas's claim to Guyana's resource-rich Essequibo province.

In a letter to the meeting's host, St Vincent prime minister Ralph Gonsalves, Venezuela's Nicolas Maduro said he welcomed the opportunity to meet Guyana president Irfaan Ali "...with the hope that it becomes at a starting point towards the return of direct negotiations."

But Ali rejected direct negotiations with Maduro to resolve the dispute, telling Gonsalves the meeting is to "de-escalate the conflict," and that the UN's International Court of Justice (ICJ) is to rule over the disputed matters.

Essequibo — which Venezuela calls Guayana Esequiba — makes up the western two-thirds of Guyana. Long running tension between the countries has prevented them from agreeing to a maritime border.

The dispute flared anew in October after Guyana awarded offshore exploration permits to several prospectors in the Stabroek block offshore Essequibo that partially overlaps the disputed waters. Venezuela started to move more troops to the border region and held a nationwide vote earlier this month that Maduro claims affirms Venezuela's rights to the province.

The ICJ says it will determine the merits of the case, but Maduro has rejected that ruling, saying the ICJ role "is violative of the principle of mutual consent already agreed upon between the parties."

In a statement Gonsalves said the purpose of the meeting is for the two leaders to have "respectful" dialogue.

"Many things need to be addressed and the matter of the commitment to international law, the commitment to maintaining the region as a zone of peace and not to go to open conflict are all of great importance," Gonsalves said.

By Canute James

4 11 2K

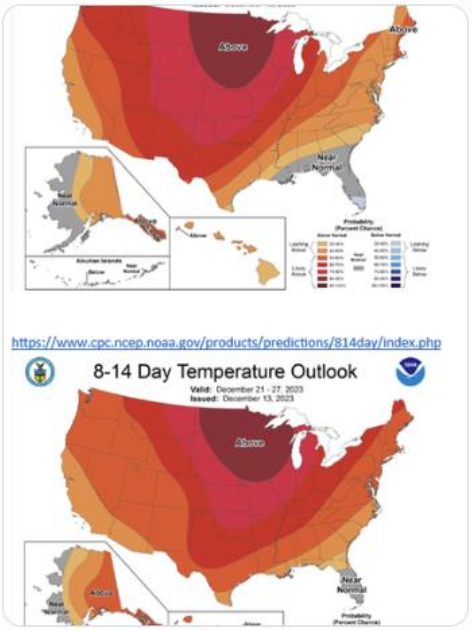
Dan Tsubouchi @Energy_Tidbits · 22h

#Natgas investors to stay on sidelines until after Xmas to see if will turn cold.

Today's @NOAA temp outlook calls for warmer than normal temps across US for Dec 19-27.

A warm Nov/Dec start is difficult, but not impossible to catch up, BUT will need a cold Jan & Feb.

#OOTT



2 7 1.6K

Dan Tsubouchi @Energy_Tidbits · 6h

For those not near their laptops. @EIAgov just released at 8:30am MT its #Oil #Gasoline #Distillates inventory as of Dec 8. Table below compares EIA data vs @business expectations and vs @APIenergy yesterday. Prior to release, WTI was $69.15. #OOTT

Oil/Products Inventory Dec 8: EIA, Bloomberg Survey Expectations, API

(million barrels)	EIA	Expectations	API
Oil	-4.26	-1.80	-2.30
Gasoline	0.41	1.90	5.80
Distillates	1.49	-0.19	0.28
	-2.36	-0.09	3.78

Note: Oil is commercial so builds in no change in SPR for the Dec 8 week
Note: Included in the oil data, Cushing had a 1.23 mmb build for Dec 8 week
Source EIA, Bloomberg
Prepared by SAF Group https://safgroup.ca/news-insights/

9 1.1K

Dan Tsubouchi @Energy_Tidbits · 7h

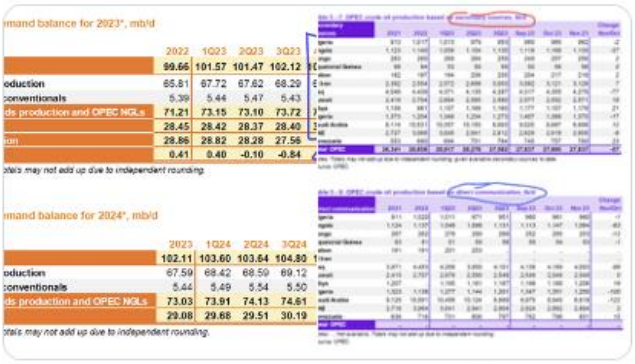
#OPEC's big #Oil call in its monthly Dec MOMR.

Call on OPEC est +2.73 mmb/d QoQ to 31.12 mmb/d in Q4/23.

Vs Secondary Sources OPEC Oct 27.895 mmb/d & Nov 27.837 mmb/d.

Could be almost 3 mmb/d deficit in Q4/23!

#OOTT



mand balance for 2023*, mb/d

	2Q22	1Q23	2Q23	3Q23
	99.66	101.57	101.47	102.12
oduction	65.81	67.72	67.62	68.29
conventionals	5.39	5.44	5.47	5.43
ds production and OPEC NGLs	71.21	73.15	73.10	73.72
	28.45	28.42	28.37	28.40
ion	28.86	28.82	28.28	27.56
	0.41	0.40	-0.10	-0.84

otals may not add up due to independent rounding.

mand balance for 2024*, mb/d

	2Q23	1Q24	2Q24	3Q24
	102.11	103.60	103.64	104.80
oduction	67.59	68.42	68.59	69.12
conventionals	5.44	5.49	5.54	5.50
ds production and OPEC NGLs	73.03	73.91	74.13	74.61
	29.08	29.68	29.51	30.19

otals may not add up due to independent rounding.

3 2 19 2.5K

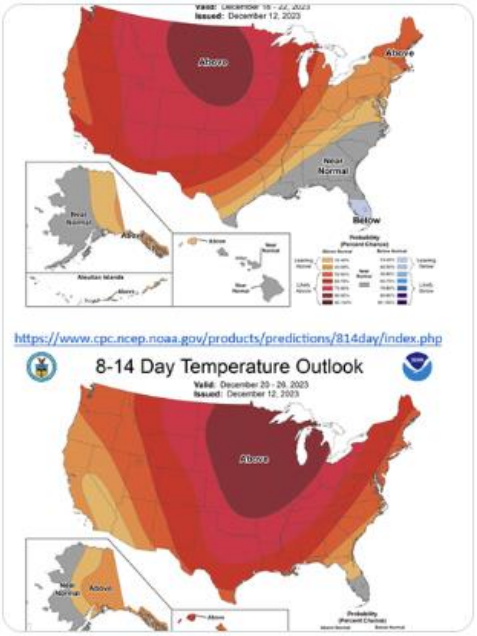
Dan Tsubouchi @Energy_Tidbits · Dec 12

#Natgas investors to stay on sidelines until post Xmas.

Same message, today's @NOAA temperature outlook calls for warmer than normal temps across US for Dec 18-26.

A warm Nov/Dec start is difficult, but not impossible to catch up, BUT will need a cold Jan & Feb.

#OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Dec 11
>
> 
>
> Capital to stay on sidelines for #NatGas until post Xmas?
>
> Today's @NOAA temperature outlook calls for warmer than normal temps across US for Dec 17-25....
> Show more

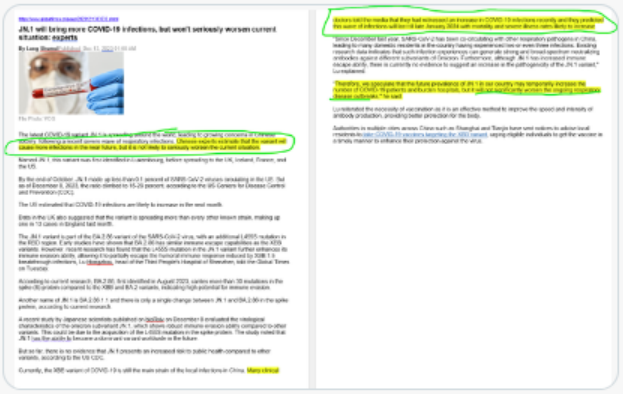
2 5 4.5K

Dan Tsubouchi @Energy_Tidbits · Dec 12

Holdback to China mobility?

"*doctors told the media that they had witnessed an increase in COVID-19 infections recently & they predicted this wave of infections will last till late January 2024 with mortality & severe illness rates likely to increase*" China state media.

#OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Dec 11
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>
> Weak Chinese consumer, increasing respiratory cases or most likely both.
>
> China scheduled domestic flights for 5h consecutive week are ~90,000 flights and stuck back at Mar 21-2...
> Show more

4 · 13 · 5.4K

Dan Tsubouchi @Energy_Tidbits · Dec 12

Is the fear that #Oil consumption to keep going up unless supply is squeezed off by tax/regulations?

Environment Min Guilbeault "*Phasing out inefficient fossil fuel subsidies around the world ensures that spending is aligned with climate ambition.*"
theguardian.com/environment/20...
#OOTT

1 · 1 · 1.1K

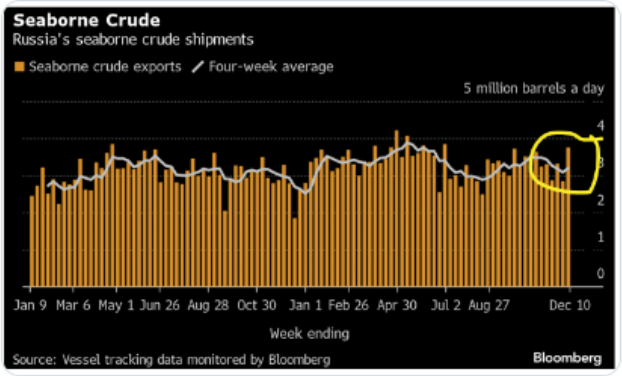
Dan Tsubouchi @Energy_Tidbits · Dec 12

Big +0.91 mmbd WoW increase in Russia #Oil shipments to 3.76 mmbd for Dec 10 wk.

Increase was expected as prior weeks were down due to Black Sea storms.

4-wk ave to Dec 10 now 3.2 mmbd, just below 3.28 mmbd commitment.

Thx @JLeeEnergy
#OOTT



3 8 3.4K

Dan Tsubouchi @Energy_Tidbits · Dec 12

"WOW" says @BeckyQuick @SquawkCNBC

US consumer deposit balances still 40% above pre-Covid. think the excess savings during Covid + wage growth savings boost doesn't run out until "well past 2024" says $BAC Liz Everett Krisberg .

#OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Dec 5
>
> 
>
>
> US consumer still spending!
>
> $BAC CEO "*what you're seeing in the tension between how I feel versus what I do. And how I feel is I feel inflation, I'm reading about everything is more ...*
> Show more

1 25 69 51K

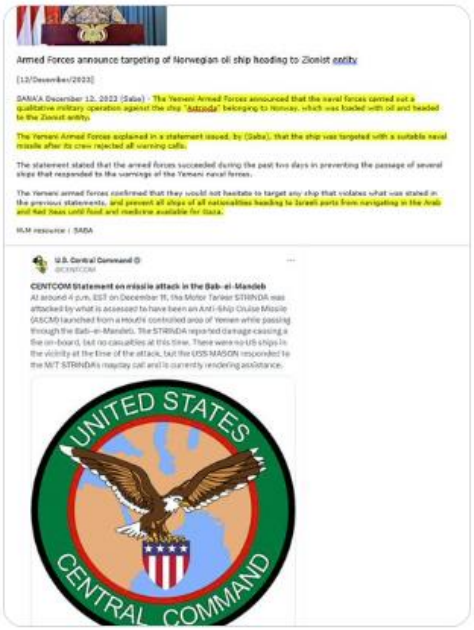
Dan Tsubouchi @Energy_Tidbits · Dec 12

#Houthis hits Norwegian fuel tanker with cruise missile and remind will "prevent all ships of all nationalities heading" to Israel

Brent -$0.20 to $75.73.

See 👇12/09 post, @EIAgov: 8.8 mmbd #Oil #Products & 4.1 bcfd #LNG thru Bab el Mandeb

#OOTT



Armed Forces announce targeting of Norwegian oil ship heading to Zionist entity

[12/December/2023]

SANA'A December 12, 2023 (Saba) - The Yemeni Armed Forces announced that the naval forces carried out a qualitative military operation against the ship "Astroula" belonging to Norway, which was loaded with oil and headed to the Zionist entity.

The Yemeni Armed Forces explained in a statement issued, by (Saba), that the ship was targeted with a suitable naval missile after its crew rejected all warning calls.

The statement stated that the armed forces succeeded during the past two days in preventing the passage of several ships that responded to the warnings of the Yemeni naval forces.

The Yemeni armed forces confirmed that they would not hesitate to target any ship that violates what was stated in the previous statements, and prevent all ships of all nationalities heading to Israeli ports from navigating in the Arab and Red Seas until food and medicine available for Gaza.

MLM resource / SABA

U.S. Central Command ⓥ
@CENTCOM

CENTCOM Statement on missile attack in the Bab-el-Mandeb

At around 4 p.m. EST on December 11, the Motor Tanker STRINDA was attacked by what is assessed to have been an Anti-Ship Cruise Missile (ASCM) launched from a Houthi controlled area of Yemen while passing through the Bab-el-Mandeb. The STRINDA reported damage causing a fire on-board, but no casualties at this time. There were no US ships in the vicinity at the time of the attack, but the USS MASON responded to the M/T STRINDA's mayday call and is currently rendering assistance.

UNITED STATES ARMY CENTRAL COMMAND

> **Dan Tsubouchi** @Energy_Tidbits · Dec 9
>
> 
>
> #Houthis expand target list. warn it will target **any ship of any nationality** in Red Sea/Bab el Mandeb **IF it is heading to Israel.**
>
> Suez Canal 101: Every ship thru the Suez has to go thr...
> Show more

1 3 8 3.9K

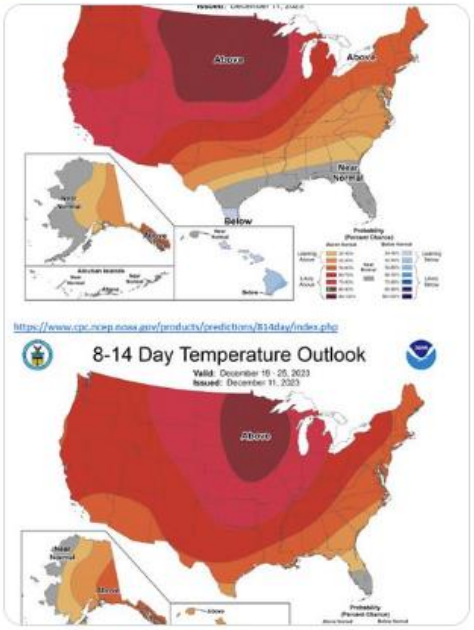
Dan Tsubouchi @Energy_Tidbits · Dec 11

Capital to stay on sidelines for #NatGas until post Xmas?

Today's @NOAA temperature outlook calls for warmer than normal temps across US for Dec 17-25.

A warm start to winter is difficult, but not impossible to catch up, BUT will need a cold Jan & Feb.

#OOTT



2 5 8 8K

Dan Tsubouchi @Energy_Tidbits · 2h

Weak Chinese consumer, increasing respiratory cases or most likely both.

China scheduled domestic flights for 5h consecutive week are ~90,000 flights and stuck back at Mar 21-27 levels.

Thx @BloombergNEF Claudio Lubis
#OOTT

1 5 1.2K

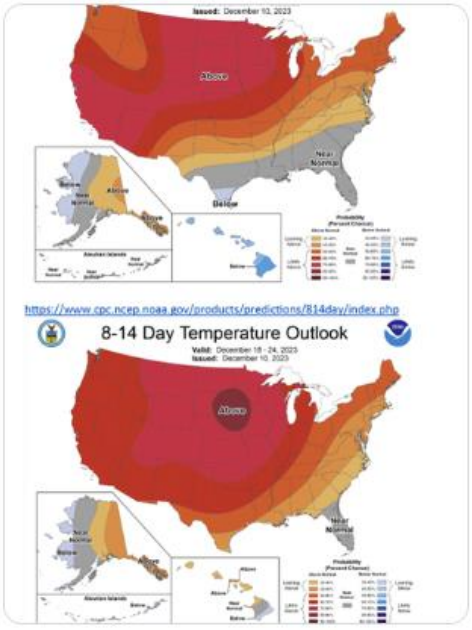
Dan Tsubouchi @Energy_Tidbits · Dec 10

Negative for HH #NatGas prices.

Today's Dec 10 updated @NOAA 6-10 & 8-14 day temp outlook still call for much warmer than normal temps for Dec 16-24.

A warm start to winter is difficult, but not impossible to catch up, BUT will need a cold Jan!

#OOTT



3 8 13 4.9K