

Energy Tidbits

ICYMI, CNQ's Multilateral Success is "Applicable Across our Large Heavy Oil Land Base" ie. Should Work Broadly for Industry

Produced by: Dan Tsubouchi

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Dan Tsubouchi
Chief Market Strategist
dsubouchi@safgroup.ca

Ryan Dunfield
CEO
rdunfield@safgroup.ca

Aaron Bunting
COO, CFO
abunting@safgroup.ca

Ryan Haughn
Managing Director
rhaughn@safgroup.ca

Overview

U.S. energy market indicators	2021	2022	2023
Brent crude oil spot price (dollars per barrel)	\$70.89	\$101.48	\$92.36
Retail gasoline price (dollars per gallon)	\$3.02	\$3.99	\$3.51
U.S. crude oil production (million barrels per day)	11.25	11.87	12.34
Natural gas price at Henry Hub (dollars per million British thermal units)	\$3.91	\$6.48	\$5.43
U.S. liquefied natural gas gross exports (billion cubic feet per day)	9.8	10.6	12.3
Shares of U.S. electricity generation			
Natural gas	37%	39%	37%
Coal	23%	20%	19%
Renewables	20%	22%	24%
Nuclear	20%	19%	20%
U.S. GDP (percentage change)	5.9%	1.8%	0.1%
U.S. CO₂ emissions (billion metric tons)	4.90	4.98	4.85

Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022

- Global oil inventories in our forecast fall by 0.2 million barrels per day (b/d) in the first half of 2023 (1H23) before rising by almost 0.7 million b/d in 2H23. This forecast leaves global oil inventories higher at the end of 2023 than we had forecast in the November STEO, which results in our Brent crude oil price forecast averaging \$92 per barrel (b) in 2023, \$3/b less than we had forecast last month.
- U.S. refinery utilization in our forecast remains near its five-year average through 2023. We expect the combination of a slight contraction in the U.S. economy and refinery maximization of distillate fuel production will reduce distillate prices in 1H23. We forecast U.S. diesel refining margins will fall by 19% in 2023 compared with 2022. However, the EU's ban on seaborne imports of petroleum products from Russia creates supply and price uncertainty for distillate markets in early 2023.
- We expect natural gas prices to increase from November levels as a result of both higher winter natural gas demand and rising LNG exports. Our forecast for the Henry Hub spot price averages more than \$6.00 per million British thermal units (MMBtu) in 1Q23, up from November's monthly average of about \$5.50/MMBtu. We expect natural gas prices will begin declining after January as U.S. storage levels move closer to the previous five-year average, largely as a result of rising U.S. natural gas production. However, the possibility of price volatility remains high.
- We raised our forecast for U.S. natural gas production by almost 1% in 2023 compared with last month's forecast. Although we continue to expect natural gas production in the Permian Basin

to be limited early in 2023 by the lack of pipeline capacity to bring associated natural gas production to market, we expect that these constraints will be resolved earlier than we had previously assumed. This change also contributes to slightly more crude oil production in 2023 than we had previously forecast.

- Freeport LNG [announced](#) its export terminal will resume partial operations exporting liquefied natural gas (LNG) in mid-December following an outage that began in June 2022. We expect Freeport LNG will ramp up utilization in the coming months and will reach full capacity by March 2023.
- The highest forecasted electricity prices for this winter are in ISO New England, where we expect on-peak wholesale power prices will average more than \$200 per megawatt-hour in January, up 35% from January 2022. Capacity constraints on pipelines delivering natural gas into New England make it likely that wholesale electricity prices will be set by relatively expensive imported LNG or fuel oil.
- The December STEO includes a contraction in U.S. economic activity in the fourth quarter of 2022 (4Q22) and 1Q23, which represents a slightly shorter and milder period of economic contraction than in last month's STEO. Uncertainty in macroeconomic conditions could significantly affect energy markets in the forecast period. Based on the S&P Global macroeconomic model, we assume U.S. GDP will remain flat in 2023.

Notable forecast changes

Current forecast: December 6, 2022; previous forecast: November 8, 2022	2022	2023
Natural gas production (current) (billion cubic feet per day)	98.1	100.4
Previous forecast	98.1	99.7
Percentage change	0.1%	0.7%
U.S. coal production (current) (million short tons)	592.7	539.2
Previous forecast	595.3	573.2
Percentage change	-0.4%	-5.9%
Brent spot average (current) (dollars per barrel)	\$101	\$92
Previous	\$102	\$95
Change	-0.6%	-3.1%
Global oil inventory change (current) (million barrels per day)	0.2	0.2
Previous	0.1	-0.3
Change	0.1	0.5
U.S. Distillate fuel inventories (current) (million barrels)	122.5	123.9
Previous forecast	116.8	115.6
Percentage change	4.9%	7.2%
Diesel fuel prices (current) (dollars per gallon)	\$5.05	\$4.48
Previous forecast	\$5.09	\$4.65
Percentage change	-0.8%	-3.8%

Data source: Energy Information Administration, *Short-Term Energy Outlook*, December 2022

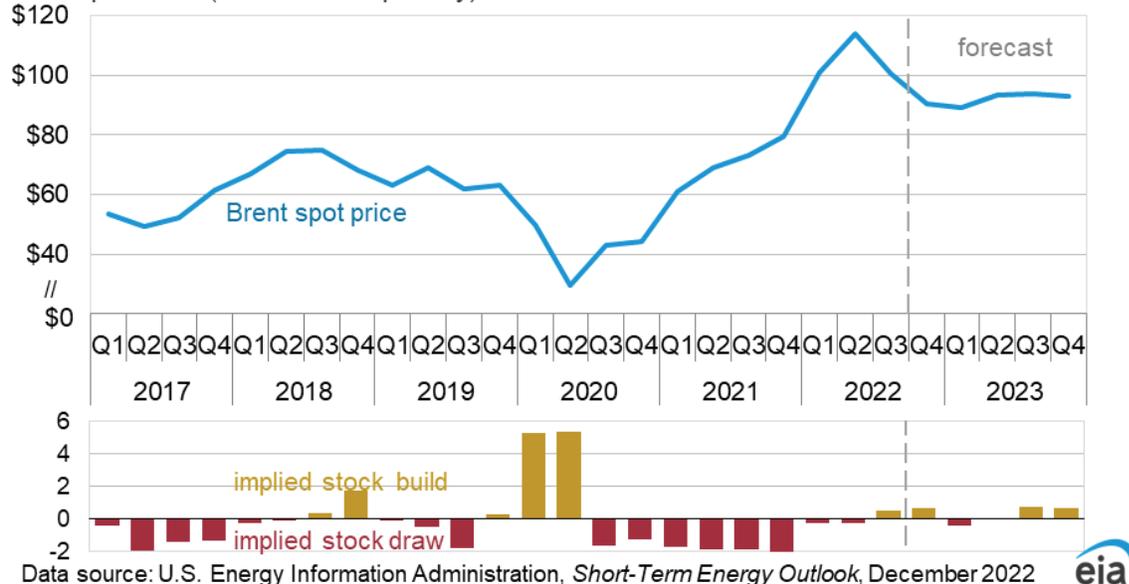
Global oil markets

Crude oil prices: The spot price of Brent crude oil averaged \$91 per barrel (b) in November. Although the average November Brent price was slightly lower than in October, daily spot prices reached almost \$100/b on November 7, before ending the month at \$86/b. The price declines were largely the result of market concerns about global economic growth, as well as COVID-related lockdowns in China that have reduced China’s oil demand. Brent crude oil spot prices are on pace to average \$101/b in 2022.

Despite the recent drop in crude oil prices, we still expect that falling global inventories of oil in early 2023 will push Brent prices back above \$90/b by the beginning of the second quarter of 2023 (2Q23). Although we expect some downward oil price pressure could emerge in the second half of 2023 (2H23) based on our forecast of rising oil inventories, that pressure will likely be balanced by the ongoing possibility of supply disruptions or production growth that is slower than our forecast. We forecast the Brent crude oil spot price will average \$92/b for all of 2023.

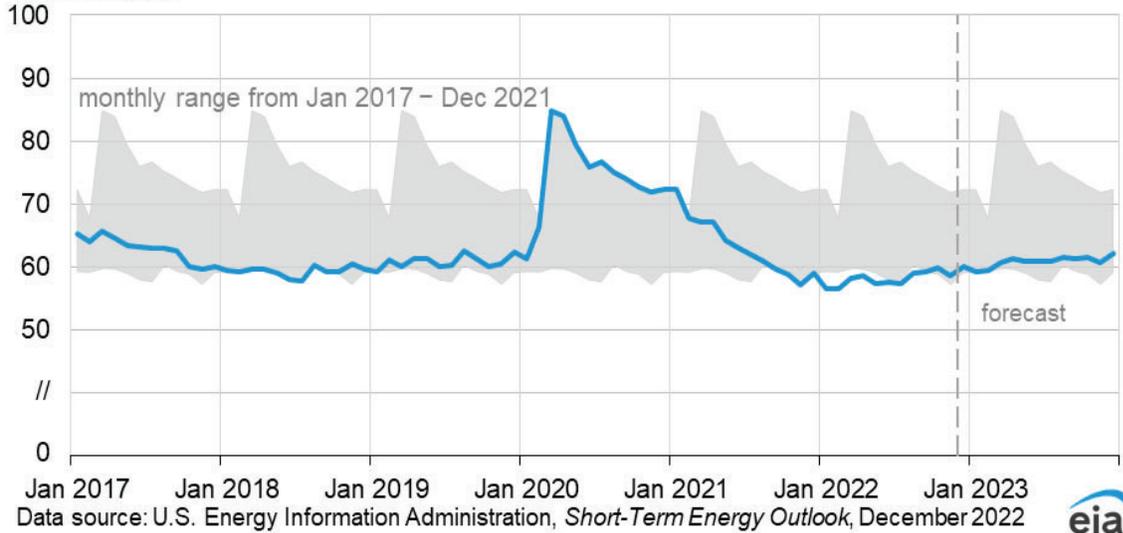
Brent crude oil spot price and global inventory changes

dollars per barrel (million barrels per day)



Total petroleum inventories: Although we estimate that petroleum inventories have increased thus far in 2H22, commercial petroleum inventories in OECD countries spent most of 2022 at their lowest levels in five years on a days-of-supply basis, and we expect that they will remain near the bottom of their recent five-year (2017–2021) range throughout 2023. Given relatively low global petroleum inventories and the necessary time and magnitude of inventory builds needed to replenish them, the market has limited slack during the forecast period, and any unplanned supply disruption has the potential to increase oil prices quickly and significantly.

Organization for Economic Cooperation and Development (OECD)
commercial inventories of crude oil and other liquids
 days of supply



Significant uncertainty remains around the impact that sanctions on Russia will have on global oil prices. The EU ban on seaborne imports of crude oil from Russia took effect on December 5, and the ban on petroleum product imports is set to begin on February 5. The EU and UK have indicated that they will continue to allow non-member countries that participate in the [G7's price cap](#) to access EU and UK based shipping insurance to import crude oil and petroleum products from Russia. We expect that most of Russia's crude oil exports that will no longer go to Europe will find a destination elsewhere. However, we expect Russia's oil production will continue to decline in 2023, largely because a number of countries will decrease their imports of crude oil and petroleum products from Russia.

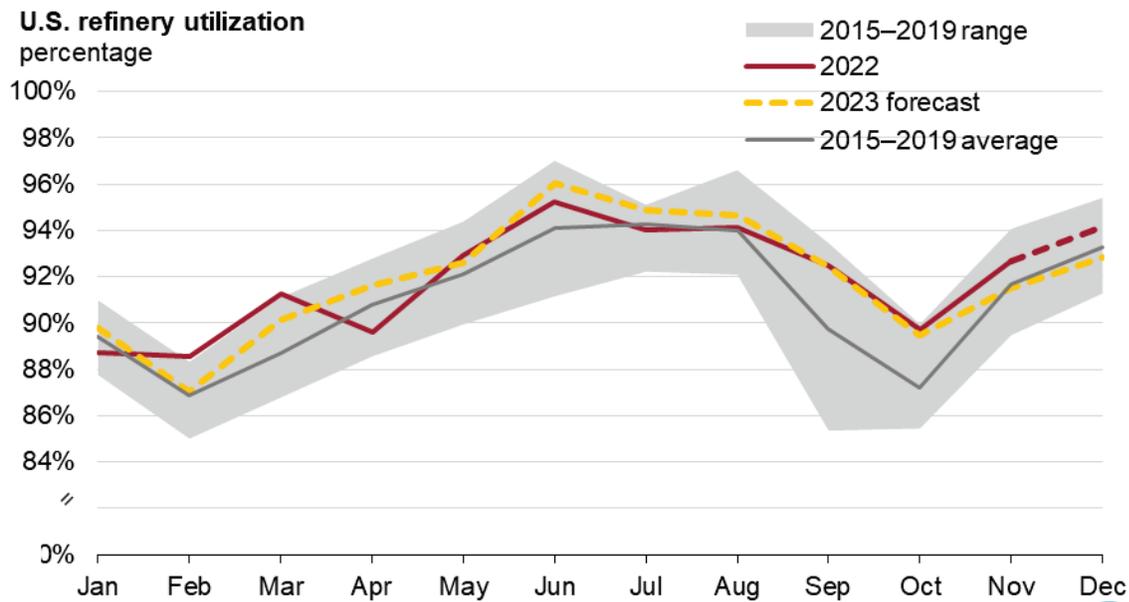
The U.S. Department of the Treasury [issued General License \(GL\) 41 at the end of November](#), allowing Chevron to resume oil production in Venezuela for export to the United States. This issuance introduces additional uncertainty related to our oil production forecast for Venezuela. Chevron's ability to increase production will depend on the state of production facilities, which have yet to be evaluated. We have raised our outlook for Venezuela's production starting in 1Q23.

Petroleum products

Refinery utilization: On average, U.S. refinery utilization has been higher in 2022 than its pre-pandemic five-year (2015–2019) average, and we estimate that this year's November utilization of 93% was slightly above the pre-pandemic five-year average for the month. According to our [Weekly Petroleum Status Report \(WPSR\)](#), refineries on the East Coast (PADD 1) operated at more than 100% of capacity during the last two weeks of October and all of November. The utilization of more than 100% is partially the result of an increase in capacity that was updated in our [September PSM](#) but not reflected in WPSR, leading to the reported operable capacity amount to be lower than actual in October and November. Also, our calculation of refinery utilization can briefly exceed 100% because we calculate it as gross inputs of crude oil divided by refinery capacity in [barrels per calendar day](#), which is designed to

account for realistic operating conditions such as allowing for down time. With refinery utilization back up to pre-pandemic levels and [relatively weak demand](#), product inventories increased in November, contributing to decreasing gasoline and distillate prices.

The United States has less refining capacity than during the pre-pandemic years, which means similar levels of utilization will result in less refinery output than in previous years. We forecast utilization will remain within the pre-pandemic five-year range in 2023, and average near the 2022 utilization of 92%. We also expect new refinery capacity to be added in the first half of 2023 (1H23) with the expansion of ExxonMobil’s Beaumont refinery.



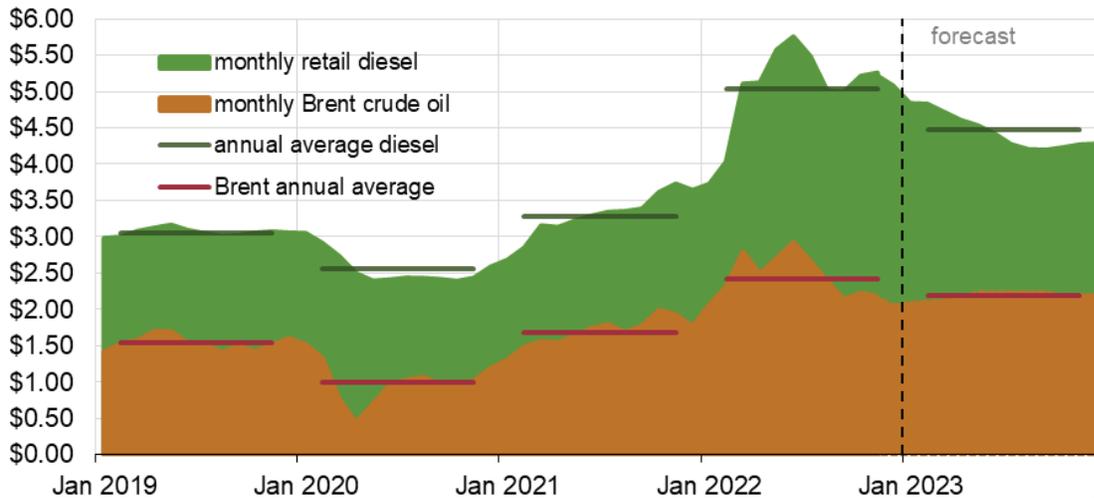
Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022

Distillate: The retail diesel price on December 5 was \$4.97 per gallon (gal), down 35 cents/gal from October 31. We expect that high refinery utilization will allow U.S. retail diesel prices to continue to decrease in December 2022 and to fall further in 1H23, averaging about \$4.50/gal next year.

Most of our forecast price decrease from 2022 to 2023 results from lower distillate refinery margins, which moderate beginning in early 2023 based on our expectation that distillate demand will decline in 2023 as production of distillate fuel increases. Although we expect the diesel refinery margin to decrease 19% in 2023 from 2022, we still expect it to be more than double 2021 levels.

U.S. diesel and crude oil prices

dollars per gallon



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022, and Refinitiv, an LSEG business



With higher-than-average refinery margins and high crude oil prices, we expect 2023 retail diesel prices to remain relatively high, albeit not as high as in 2022, as U.S. distillate inventories remain at or near multiyear lows through the end of our forecast. Ongoing constraints on global refining capacity will continue to limit distillate supplies and inventory builds during this time. Furthermore, [the EU's ban](#) on seaborne refined product imports from Russia beginning in February 2023 will keep supplies particularly tight in the Atlantic Basin.

Gasoline: We forecast U.S. retail gasoline prices will average about \$3.50/gal in 2023. U.S. retail gasoline prices finished November at their lowest price since February 2022, as high refinery utilization and falling demand contributed to rising gasoline inventories, which facilitated November's price decreases. As refiners maintain high utilization in response to high distillate margins, we expect this trend to continue and for gasoline inventories to reach five-year average levels in 2023, limiting upward pressure on gasoline prices. We expect high blend rates of fuel ethanol through 2023 as the petroleum component of gasoline remains relatively expensive compared with the price of ethanol, continuing the trend that started [this summer](#).

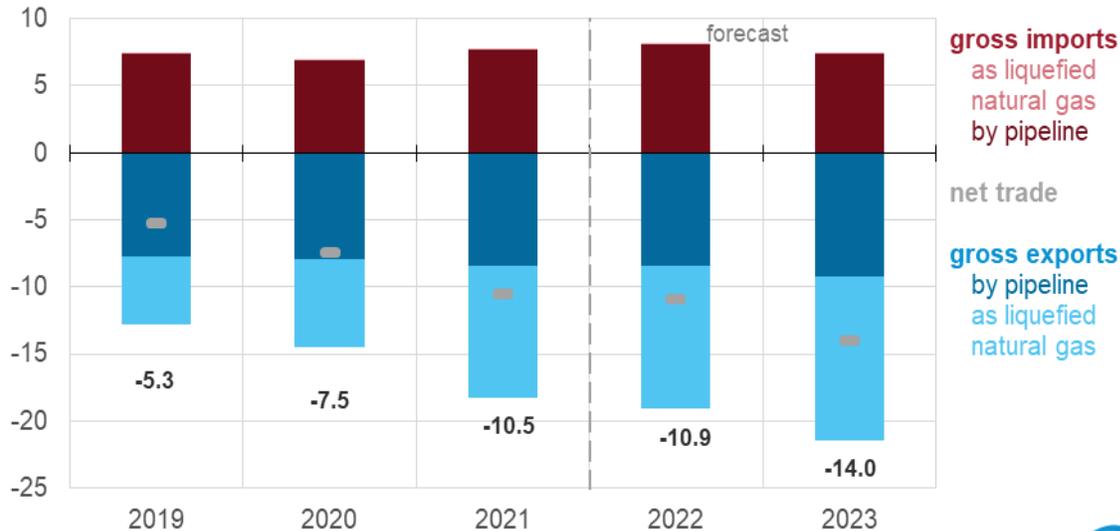
Natural gas

Natural gas trade: We forecast U.S. natural gas exports to increase in 2023, driven largely by growth in LNG exports. U.S. LNG exports peaked in the first half of 2022 (1H22) as facilities operated close to maximum capacity, and a new facility, Calcasieu Pass, [came online](#) and steadily increased output in 2022. However, [a fire at Freeport LNG in June](#) resulted in the shutdown of the facility, removing about 2.0 billion cubic feet per day (Bcf/d) of U.S. LNG export capacity in 2H22. The Freeport facility [recently announced](#) plans to come back online in December and to increase output to about 2.0 Bcf/d in January 2023. When Freeport LNG resumes, we forecast U.S. LNG exports will establish a new record close to 12.5 Bcf/d in March 2023. We expect LNG exports will then reach 12.7 Bcf/d by the end of 2023.

No new U.S. LNG export facilities are scheduled to come online in 2023. We forecast U.S. LNG exports will average 12.3 Bcf/d throughout 2023 as facilities continue to operate close to maximum capacity to meet high demand for natural gas in Europe and Asia.

U.S. annual natural gas trade

billion cubic feet per day



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022



Natural gas pipeline exports reached almost 9.0 Bcf/d in November, near its previous record. We forecast natural gas pipeline exports will reach record highs between 9.0 Bcf/d and 10.0 Bcf/d through the upcoming winter months. Natural gas pipeline exports from the United States flow to either Canada or Mexico.

Natural gas production: We forecast that U.S. production of dry natural gas will average about 100.0 Bcf/d from December through March, down about 0.5 Bcf/d from November due to weather-related declines, usually caused by freeze-offs and the possibility of extreme winter weather events. Mild weather in key producing regions could prevent those declines.

Dry natural gas production has increased during 2022 in the United States, averaging more than 100 Bcf/d in October and November and exceeding pre-pandemic monthly production records from 2019. Growth in natural gas production was driven by increased drilling activity in the [Haynesville region](#) in Louisiana and East Texas and in the [Permian region](#) in West Texas and Southeast New Mexico. Recent pipeline infrastructure expansions in both these regions facilitated the increases in production.

U.S. dry natural gas production billion cubic feet per day



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022



We forecast production to grow slightly in 2023, averaging between 100 Bcf/d and 101 Bcf/d for the year, about 2% more than in 2022. Production in our forecast for 1H23 is limited by pipeline constraints and declining [natural gas prices](#). In 2H23, [more pipeline infrastructure expansion projects](#) are set to come online and contribute to increases in dry natural gas production. The pace at which these projects are completed is a notable uncertainty in our forecast, and delays could result in lower production than we expect.

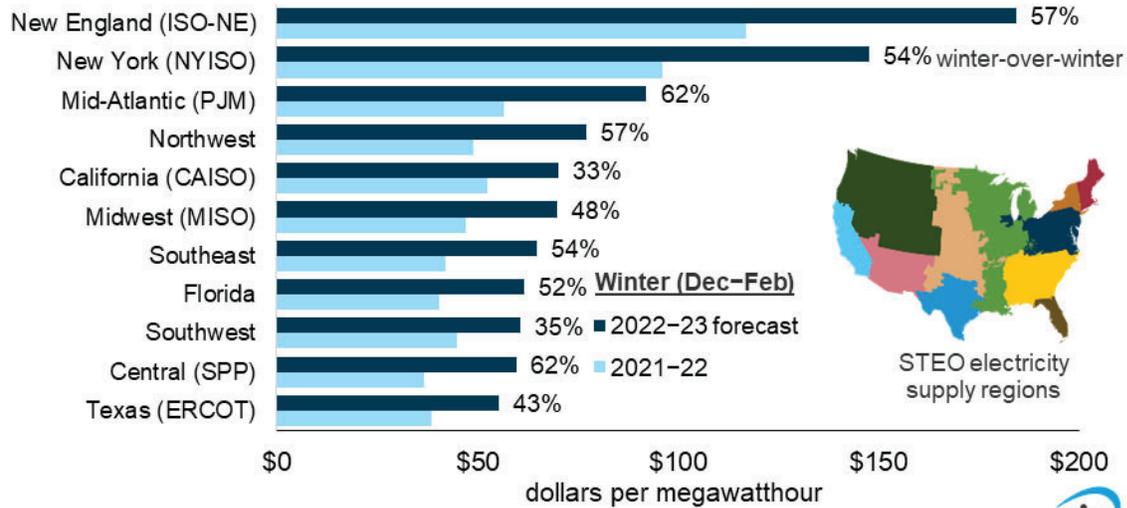
Electricity, coal, and renewables

Electricity prices: We forecast wholesale prices for on-peak power to rise in all areas of the country during the winter months as the weather becomes colder. Increases in wholesale electricity prices this winter (December–February) range from 33% higher than last winter in California (CAISO) to more than 60% higher in the mid-Atlantic (PJM) and central (SPP) regions.

Forecast on-peak wholesale prices for most regions generally average between \$60 and \$80 per megawatthour (MWh) between December and February. We expect the highest wholesale prices to occur in New England, where prices could average in excess of \$180/MWh, with winter peaks of more than \$200/MWh. We also expect high prices in New York (NYISO) and in mid-Atlantic (PJM) markets. However, if significant market stressors occur, such as periods of extreme cold weather or fuel supply problems, wholesale prices could be significantly higher than forecast.

We also forecast retail electricity prices to be higher this winter. However, retail prices grow less than wholesale prices because of regulatory and contractual factors that vary widely across the United States. The U.S. residential electricity price in the core winter months from December through February averages 14.5 cents per kilowatthour, which is 6% higher than last winter. Price increases range from almost no change in the West North Central region to 18% in New England.

Average on-peak wholesale electricity prices for STEO electricity supply regions, winter 2021–22 and winter 2022–23

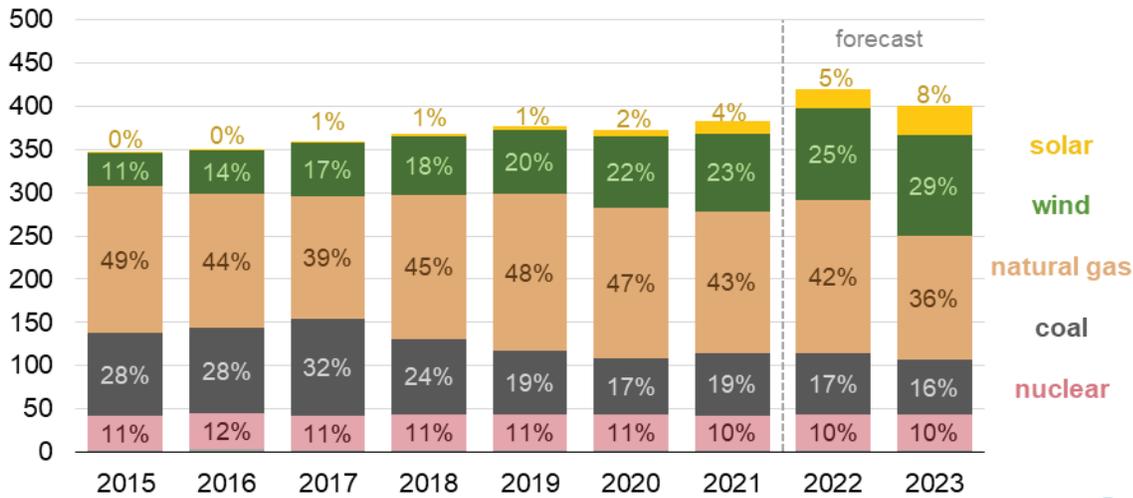


Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022

Electricity generation: Despite our forecast decline in natural gas prices in 2023, we expect the share of U.S. electric power generation supplied by natural gas will fall from 39% this year to 37% in 2023 as more renewable generating capacity comes online. We estimate that wind and solar combined account for 14% of U.S. generation in 2022, and we forecast that share will grow to 16% in 2023. Increasing generation from renewable energy, along with retirements reducing the available capacity of coal-fired power plants, contribute to our forecast that coal’s generation share will fall from 20% this year to 19% in 2023.

The Texas region (ERCOT) is likely to experience the largest shift in generation mix in 2023. We expect that the share of electric power generation from wind in ERCOT will grow from 25% in 2022 to 29% in 2023 and that the solar share will grow from 5% to 8%. ERCOT’s share of generation from coal in the forecast falls from 17% this year to 16% in 2023. But we expect growing generation from renewables, especially during peak hours, will cause the natural gas share to fall from 42% in 2022 to 36% in 2023.

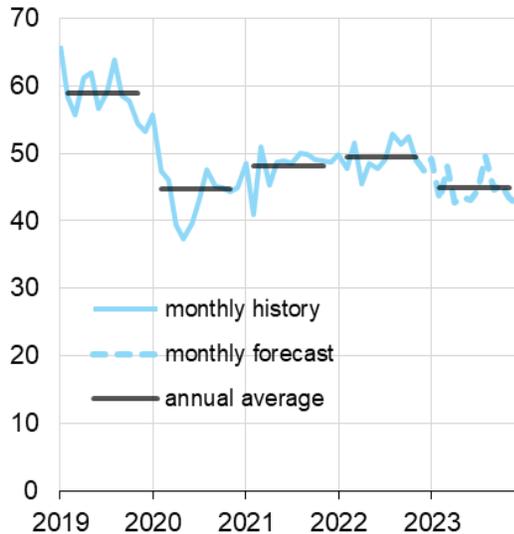
Electric Reliability Council of Texas (ERCOT) electricity generation by energy source, 2015–2023
billion kilowatthours



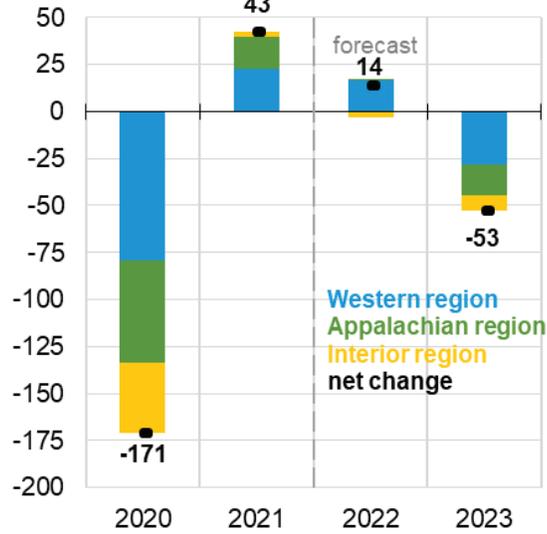
Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022

Coal markets: After increasing in both 2021 and 2022, we expect U.S. coal production to decline by 9% to less than 540 million short tons (MMst) in 2023. The primary reason for the decrease is our forecast of a 7% reduction in coal use by the electric power sector. That decline largely reflects almost 12 gigawatts (GW) of coal-fired capacity retirements in 2022 and another 9 GW in 2023. Those plant closures represent about 10% of the existing U.S. coal-fired generating fleet. Lower natural gas prices and growth in renewable resources also will reduce coal use by the electric power sector.

U.S. coal production
million short tons



Components of annual change
million short tons



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022

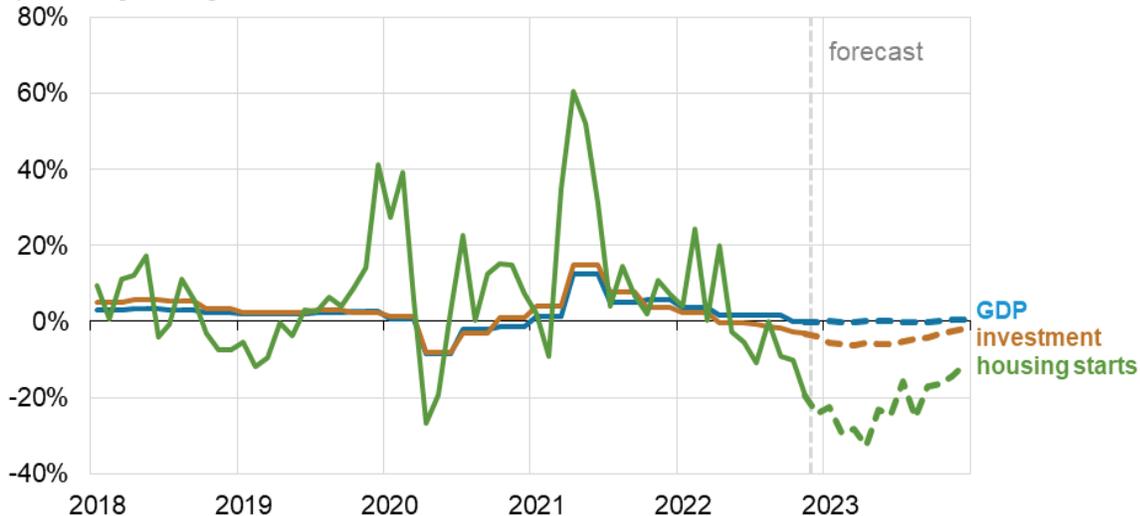
Economy, weather, and CO₂

U.S. macroeconomics: We base our U.S. macroeconomic forecasts on S&P Global’s macroeconomic model. We incorporate STEO energy price forecasts into the model to obtain the final macroeconomic assumptions.

S&P Global forecasts a milder and shorter contraction in U.S. economic activity compared with last month’s forecast. The upward revision in U.S. economic activity reflects the recent [GDP data release for 3Q22](#) and Consumer Price Index inflation in October. On an annual basis, we assume U.S. real GDP will remain relatively flat in 2023 after economic activity declines quarter over quarter between 4Q22 and 1Q23. The forecast is primarily driven by [real private fixed investment](#), which declines by 5% in 2023. A large component of this decline occurs in the residential sector, which has fallen due to slowing demand for housing. As a result, housing starts decline by more than 20% in 2023 in our assumptions, which will limit overall energy consumption growth in the United States in 2023.

Year-over-year change in GDP, private investment, and housing starts

percentage change



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, December 2022



Emissions: We forecast energy-related CO₂ emissions have increased slightly in the United States during 2022, driven by more consumption of natural gas and petroleum and partly offset by less coal consumption. Our forecast of natural gas emissions increase the most as a result of rising demand for that fuel in the electric power sector. Increases in CO₂ emissions from petroleum use reflect increased travel following the pandemic as well as increased industrial activity. We expect fossil fuel consumption (and related emissions) to decline in 2023 by almost 3%.

We expect U.S. energy consumption to grow faster than CO₂ emissions in 2022, and to fall more slowly than emissions in 2023. This reflects a decrease in our projected carbon intensity of energy—the emissions output per unit of energy consumed—of around 1% in 2022 and around 2% in 2023.

Weather: In October and November, U.S. population-weighted heating degree days (HDDs) were 13% more than last year and 4% more than the 10-year average. Based on forecasts from the National Oceanic and Atmospheric Administration, we expect the entire winter (October–March) to be colder than last winter, with 7% more HDDs in the United States compared with last winter and 2% more than the 10-year average.

The U.S. Energy Information Administration (EIA), the statistical and analytical agency within the U.S. Department of Energy (DOE), prepared this report. By law, our data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. Government. The views in this report do not represent those of DOE or any other federal agencies.

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

U.S. Energy Information Administration | Short-Term Energy Outlook - December 2022

	2021				2022				2023				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2021	2022	2023
Production (million barrels per day) (a)															
OECD	30.25	30.84	31.13	32.23	31.62	31.87	32.50	33.37	33.72	33.44	33.61	34.38	31.12	32.34	33.79
U.S. (50 States)	17.79	19.16	19.03	19.91	19.44	20.12	20.57	20.94	20.98	21.01	21.09	21.49	18.98	20.27	21.14
Canada	5.62	5.37	5.49	5.68	5.66	5.51	5.71	5.92	5.98	5.69	5.90	6.11	5.54	5.70	5.92
Mexico	1.93	1.95	1.90	1.92	1.91	1.89	1.89	1.86	1.90	1.87	1.83	1.79	1.92	1.89	1.85
Other OECD	4.91	4.37	4.72	4.71	4.61	4.35	4.33	4.65	4.86	4.88	4.80	4.99	4.68	4.48	4.88
Non-OECD	62.56	63.98	65.60	66.11	67.21	66.87	68.52	67.92	67.01	67.14	67.84	67.08	64.57	67.64	67.27
OPEC	30.34	30.88	32.28	33.10	33.75	33.76	34.71	34.21	34.26	34.59	34.78	34.42	31.66	34.11	34.52
Crude Oil Portion	25.07	25.49	26.84	27.67	28.19	28.33	29.24	28.69	28.67	29.13	29.28	28.89	26.28	28.61	29.00
Other Liquids (b)	5.26	5.39	5.44	5.44	5.56	5.43	5.48	5.52	5.59	5.46	5.50	5.54	5.38	5.50	5.52
Eurasia	13.42	13.65	13.63	14.27	14.39	13.39	13.58	13.87	13.09	12.14	12.40	12.48	13.74	13.81	12.52
China	4.99	5.03	5.01	4.93	5.18	5.18	5.11	5.15	5.21	5.24	5.23	5.27	4.99	5.15	5.24
Other Non-OECD	13.80	14.41	14.69	13.80	13.90	14.54	15.11	14.69	14.45	15.18	15.43	14.91	14.18	14.56	15.00
Total World Production	92.81	94.82	96.74	98.33	98.83	98.75	101.02	101.29	100.73	100.58	101.45	101.46	95.70	99.98	101.06
Non-OPEC Production	62.48	63.94	64.46	65.23	65.08	64.98	66.30	67.08	66.47	65.99	66.67	67.04	64.03	65.87	66.54
Consumption (million barrels per day) (c)															
OECD	42.58	44.13	45.87	46.89	45.84	45.45	46.46	46.54	46.24	45.21	45.72	46.14	44.88	46.08	45.83
U.S. (50 States)	18.58	20.13	20.30	20.54	20.22	20.27	20.47	20.48	20.30	20.53	20.49	20.71	19.89	20.36	20.51
U.S. Territories	0.21	0.19	0.19	0.20	0.22	0.20	0.20	0.21	0.21	0.19	0.20	0.21	0.20	0.21	0.20
Canada	2.19	2.16	2.43	2.33	2.25	2.21	2.41	2.33	2.27	2.22	2.32	2.30	2.28	2.30	2.28
Europe	11.95	12.66	13.88	13.94	13.15	13.43	13.92	13.83	13.56	13.18	13.58	13.34	13.12	13.58	13.42
Japan	3.77	3.07	3.17	3.66	3.70	3.03	3.19	3.51	3.69	3.05	3.07	3.37	3.41	3.36	3.29
Other OECD	5.89	5.93	5.90	6.23	6.30	6.33	6.28	6.18	6.20	6.04	6.07	6.21	5.99	6.27	6.13
Non-OECD	51.94	52.54	52.73	53.48	53.26	53.56	54.05	54.08	54.92	55.35	55.01	54.67	52.68	53.74	54.99
Eurasia	4.57	4.63	4.98	4.84	4.49	4.36	4.71	4.65	4.25	4.40	4.72	4.63	4.76	4.55	4.50
Europe	0.74	0.74	0.74	0.76	0.76	0.76	0.76	0.77	0.74	0.76	0.77	0.77	0.75	0.76	0.76
China	15.27	15.48	14.99	15.33	15.13	15.11	15.10	15.29	16.14	16.07	15.45	15.37	15.27	15.16	15.76
Other Asia	13.43	12.98	12.84	13.69	13.82	13.83	13.51	13.89	14.35	14.32	13.75	14.04	13.23	13.76	14.11
Other Non-OECD	17.93	18.71	19.18	18.86	19.06	19.50	19.96	19.48	19.43	19.79	20.33	19.85	18.68	19.50	19.86
Total World Consumption	94.52	96.67	98.59	100.37	99.10	99.02	100.51	100.62	101.16	100.57	100.73	100.81	97.56	99.82	100.82
Total Crude Oil and Other Liquids Inventory Net Withdrawals (million barrels per day)															
U.S. (50 States)	0.36	0.51	0.37	0.83	0.81	0.51	0.45	0.83	-0.03	-0.36	-0.10	0.45	0.52	0.65	-0.01
Other OECD	0.88	0.14	0.91	0.73	-0.09	-0.29	-0.52	-0.49	0.15	0.11	-0.20	-0.35	0.66	-0.35	-0.07
Other Stock Draws and Balance	0.46	1.20	0.58	0.48	-0.44	0.05	-0.44	-1.01	0.32	0.24	-0.43	-0.75	0.68	-0.46	-0.16
Total Stock Draw	1.71	1.85	1.85	2.04	0.27	0.27	-0.51	-0.67	0.43	-0.01	-0.72	-0.65	1.86	-0.16	-0.24
End-of-period Commercial Crude Oil and Other Liquids Inventories (million barrels)															
U.S. Commercial Inventory	1,311	1,281	1,251	1,199	1,154	1,180	1,215	1,184	1,188	1,236	1,251	1,219	1,199	1,184	1,219
OECD Commercial Inventory	2,916	2,873	2,759	2,640	2,604	2,656	2,739	2,753	2,744	2,782	2,814	2,816	2,640	2,753	2,816

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

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

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

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

- = no data available

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

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

Notes: EIA completed modeling and analysis for this report on December 1, 2022.

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

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

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

Forecasts: EIA Short-Term Integrated Forecasting System.

Table 4a. U.S. Petroleum and Other Liquids Supply, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - December 2022

	2021				2022				2023				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2021	2022	2023
Supply (million barrels per day)															
Crude Oil Supply															
Domestic Production (a)	10.82	11.34	11.18	11.66	11.47	11.70	12.03	12.29	<i>12.24</i>	<i>12.24</i>	<i>12.34</i>	<i>12.51</i>	11.25	11.87	12.34
Alaska	0.46	0.44	0.41	0.44	0.45	0.44	0.42	0.44	<i>0.43</i>	<i>0.37</i>	<i>0.39</i>	<i>0.41</i>	0.44	0.44	0.40
Federal Gulf of Mexico (b)	1.83	1.80	1.49	1.71	1.67	1.70	1.80	1.83	<i>1.84</i>	<i>1.81</i>	<i>1.73</i>	<i>1.72</i>	1.71	1.75	1.77
Lower 48 States (excl GOM)	8.54	9.10	9.29	9.50	9.35	9.56	9.80	10.02	<i>9.96</i>	<i>10.06</i>	<i>10.23</i>	<i>10.39</i>	9.11	9.69	10.16
Crude Oil Net Imports (c)	2.88	2.94	3.64	3.13	3.00	2.81	2.75	2.52	<i>3.24</i>	<i>3.65</i>	<i>3.88</i>	<i>3.41</i>	3.15	2.77	3.55
SPR Net Withdrawals	0.00	0.18	0.04	0.26	0.31	0.80	0.84	0.50	<i>0.01</i>	<i>0.17</i>	<i>0.06</i>	<i>0.11</i>	0.12	0.61	0.09
Commercial Inventory Net Withdrawals	-0.19	0.60	0.30	-0.01	0.08	-0.03	-0.12	0.22	<i>-0.31</i>	<i>0.14</i>	<i>0.15</i>	<i>-0.10</i>	0.18	0.03	-0.03
Crude Oil Adjustment (d)	0.30	0.59	0.44	0.44	0.71	0.81	0.77	0.69	<i>0.59</i>	<i>0.58</i>	<i>0.51</i>	<i>0.50</i>	0.44	0.74	0.54
Total Crude Oil Input to Refineries	13.81	15.65	15.61	15.49	15.56	16.09	16.26	16.22	<i>15.77</i>	<i>16.78</i>	<i>16.94</i>	<i>16.43</i>	15.15	16.03	16.48
Other Supply															
Refinery Processing Gain	0.85	0.98	0.96	1.04	0.95	1.07	1.05	0.99	<i>1.05</i>	<i>1.03</i>	<i>1.03</i>	<i>1.05</i>	0.96	1.02	1.04
Natural Gas Plant Liquids Production	4.89	5.50	5.56	5.74	5.61	5.92	6.09	6.20	<i>6.27</i>	<i>6.30</i>	<i>6.28</i>	<i>6.43</i>	5.42	5.96	6.32
Renewables and Oxygenate Production (e)	1.04	1.13	1.11	1.24	1.19	1.20	1.17	1.24	<i>1.20</i>	<i>1.22</i>	<i>1.21</i>	<i>1.27</i>	1.13	1.20	1.23
Fuel Ethanol Production	0.90	0.99	0.96	1.06	1.02	1.01	0.97	1.03	<i>0.99</i>	<i>0.99</i>	<i>0.98</i>	<i>1.01</i>	0.98	1.01	0.99
Petroleum Products Adjustment (f)	0.20	0.22	0.22	0.23	0.22	0.23	0.23	0.22	<i>0.21</i>	<i>0.22</i>	<i>0.22</i>	<i>0.22</i>	0.22	0.23	0.22
Product Net Imports (c)	-2.79	-3.07	-3.19	-3.79	-3.74	-3.99	-4.07	-4.51	<i>-4.48</i>	<i>-4.35</i>	<i>-4.89</i>	<i>-5.14</i>	-3.21	-4.08	-4.72
Hydrocarbon Gas Liquids	-1.95	-2.25	-2.15	-2.18	-2.14	-2.31	-2.16	-2.55	<i>-2.58</i>	<i>-2.54</i>	<i>-2.61</i>	<i>-2.61</i>	-2.14	-2.29	-2.59
Unfinished Oils	0.18	0.30	0.25	0.10	0.09	0.25	0.28	0.25	<i>0.23</i>	<i>0.27</i>	<i>0.38</i>	<i>0.19</i>	0.21	0.22	0.27
Other HC/Oxygenates	-0.08	-0.04	-0.03	-0.05	-0.09	-0.10	-0.07	-0.05	<i>-0.07</i>	<i>-0.05</i>	<i>-0.04</i>	<i>-0.04</i>	-0.05	-0.08	-0.05
Motor Gasoline Blend Comp.	0.55	0.79	0.67	0.43	0.40	0.60	0.48	0.36	<i>0.42</i>	<i>0.67</i>	<i>0.36</i>	<i>0.40</i>	0.61	0.46	0.46
Finished Motor Gasoline	-0.64	-0.64	-0.68	-0.88	-0.76	-0.73	-0.81	-0.87	<i>-0.83</i>	<i>-0.81</i>	<i>-0.97</i>	<i>-1.11</i>	-0.71	-0.79	-0.93
Jet Fuel	0.03	0.08	0.08	0.01	-0.04	-0.06	-0.11	-0.04	<i>0.00</i>	<i>0.08</i>	<i>0.04</i>	<i>0.06</i>	0.05	-0.06	0.04
Distillate Fuel Oil	-0.48	-0.87	-0.91	-0.86	-0.81	-1.15	-1.29	-1.06	<i>-1.01</i>	<i>-1.36</i>	<i>-1.42</i>	<i>-1.34</i>	-0.78	-1.08	-1.29
Residual Fuel Oil	0.07	0.05	0.08	0.15	0.14	0.10	0.10	0.10	<i>0.10</i>	<i>0.10</i>	<i>0.08</i>	<i>0.13</i>	0.09	0.11	0.10
Other Oils (g)	-0.48	-0.49	-0.50	-0.50	-0.54	-0.59	-0.49	-0.65	<i>-0.73</i>	<i>-0.72</i>	<i>-0.71</i>	<i>-0.82</i>	-0.49	-0.57	-0.74
Product Inventory Net Withdrawals	0.55	-0.27	0.03	0.58	0.42	-0.25	-0.26	0.12	<i>0.27</i>	<i>-0.67</i>	<i>-0.30</i>	<i>0.44</i>	0.22	0.01	-0.07
Total Supply	18.54	20.13	20.30	20.53	20.22	20.27	20.47	20.48	<i>20.30</i>	<i>20.53</i>	<i>20.49</i>	<i>20.71</i>	19.88	20.36	20.51
Consumption (million barrels per day)															
Hydrocarbon Gas Liquids	3.43	3.33	3.34	3.66	3.87	3.43	3.48	3.81	<i>4.08</i>	<i>3.53</i>	<i>3.47</i>	<i>3.94</i>	3.44	3.65	3.75
Other HC/Oxygenates	0.11	0.13	0.13	0.16	0.13	0.17	0.17	0.22	<i>0.20</i>	<i>0.21</i>	<i>0.20</i>	<i>0.26</i>	0.13	0.17	0.22
Unfinished Oils	0.08	0.07	-0.05	0.00	0.13	0.04	0.11	0.01	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	0.02	0.07	0.00
Motor Gasoline	8.04	9.09	9.14	8.98	8.47	9.00	8.88	8.75	<i>8.44</i>	<i>8.96</i>	<i>8.90</i>	<i>8.76</i>	8.82	8.78	8.77
Fuel Ethanol blended into Motor Gasoline	0.81	0.93	0.94	0.95	0.87	0.93	0.92	0.91	<i>0.87</i>	<i>0.93</i>	<i>0.92</i>	<i>0.93</i>	0.91	0.91	0.91
Jet Fuel	1.12	1.34	1.52	1.50	1.45	1.61	1.60	1.58	<i>1.53</i>	<i>1.67</i>	<i>1.68</i>	<i>1.66</i>	1.37	1.56	1.64
Distillate Fuel Oil	3.99	3.96	3.90	4.03	4.14	3.89	3.86	4.02	<i>4.03</i>	<i>3.91</i>	<i>3.85</i>	<i>3.96</i>	3.97	3.98	3.94
Residual Fuel Oil	0.26	0.25	0.35	0.40	0.38	0.31	0.39	0.32	<i>0.37</i>	<i>0.38</i>	<i>0.38</i>	<i>0.39</i>	0.31	0.35	0.38
Other Oils (g)	1.54	1.95	1.98	1.81	1.65	1.82	1.99	1.77	<i>1.65</i>	<i>1.88</i>	<i>2.01</i>	<i>1.75</i>	1.82	1.81	1.82
Total Consumption	18.58	20.13	20.30	20.54	20.22	20.27	20.47	20.48	<i>20.30</i>	<i>20.53</i>	<i>20.49</i>	<i>20.71</i>	19.89	20.36	20.51
Total Petroleum and Other Liquids Net Imports	0.09	-0.13	0.45	-0.65	-0.74	-1.18	-1.32	-1.98	<i>-1.23</i>	<i>-0.70</i>	<i>-1.01</i>	<i>-1.73</i>	-0.06	-1.31	-1.17
End-of-period Inventories (million barrels)															
Commercial Inventory															
Crude Oil (excluding SPR)	502.5	448.1	420.3	421.2	414.4	417.5	428.8	408.9	<i>436.9</i>	<i>424.4</i>	<i>410.6</i>	<i>420.1</i>	421.2	408.9	420.1
Hydrocarbon Gas Liquids	176.9	205.3	235.5	193.1	142.0	186.7	243.6	200.6	<i>154.3</i>	<i>205.9</i>	<i>247.3</i>	<i>204.4</i>	193.1	200.6	204.4
Unfinished Oils	92.5	92.3	89.5	79.7	87.9	88.8	82.3	77.0	<i>90.7</i>	<i>89.1</i>	<i>88.8</i>	<i>80.5</i>	79.7	77.0	80.5
Other HC/Oxygenates	29.3	27.7	25.7	28.7	34.1	29.4	27.3	29.0	<i>31.0</i>	<i>29.8</i>	<i>29.5</i>	<i>29.8</i>	28.7	29.0	29.8
Total Motor Gasoline	237.8	237.3	227.0	232.2	238.5	221.0	209.6	234.5	<i>237.6</i>	<i>243.9</i>	<i>234.2</i>	<i>245.7</i>	232.2	234.5	245.7
Finished Motor Gasoline	20.3	18.5	18.5	17.8	17.3	17.1	17.6	18.7	<i>16.6</i>	<i>18.0</i>	<i>19.7</i>	<i>22.3</i>	17.8	18.7	22.3
Motor Gasoline Blend Comp.	217.6	218.7	208.5	214.4	221.2	203.8	192.0	215.8	<i>221.0</i>	<i>225.8</i>	<i>214.5</i>	<i>223.3</i>	214.4	215.8	223.3
Jet Fuel	39.1	44.7	42.0	35.8	35.6	39.3	36.2	34.5	<i>36.2</i>	<i>40.2</i>	<i>42.5</i>	<i>39.3</i>	35.8	34.5	39.3
Distillate Fuel Oil	146.1	140.1	132.1	130.0	114.6	111.4	110.5	122.5	<i>113.4</i>	<i>117.8</i>	<i>123.0</i>	<i>123.9</i>	130.0	122.5	123.9
Residual Fuel Oil	30.9	31.5	27.8	25.8	27.9	29.2	27.3	27.7	<i>29.3</i>	<i>28.6</i>	<i>27.0</i>	<i>26.6</i>	25.8	27.7	26.6
Other Oils (g)	55.8	54.3	51.0	52.2	58.5	56.4	49.5	49.3	<i>58.6</i>	<i>56.7</i>	<i>47.5</i>	<i>49.0</i>	52.2	49.3	49.0
Total Commercial Inventory	1310.9	1281.4	1250.9	1198.6	1153.6	1179.7	1215.1	1184.0	<i>1188.0</i>	<i>1236.4</i>	<i>1250.5</i>	<i>1219.3</i>	1198.6	1184.0	1219.3
Crude Oil in SPR	637.8	621.3	617.8	593.7	566.1	493.3	416.4	370.7	<i>369.5</i>	<i>353.9</i>	<i>348.7</i>	<i>338.2</i>	593.7	370.7	338.2

(a) Includes lease condensate.

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

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

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

Table 5a. U.S. Natural Gas Supply, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - December 2022

	2021				2022				2023				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2021	2022	2023
Supply (billion cubic feet per day)															
Total Marketed Production	98.57	102.12	102.88	105.43	103.27	106.18	108.02	<i>109.44</i>	<i>108.60</i>	<i>108.26</i>	<i>109.32</i>	<i>110.53</i>	102.27	<i>106.75</i>	<i>109.18</i>
Alaska	1.02	0.95	0.90	1.02	1.06	1.00	0.96	<i>1.02</i>	<i>1.01</i>	<i>0.93</i>	<i>0.85</i>	<i>0.98</i>	0.97	<i>1.01</i>	<i>0.94</i>
Federal GOM (a)	2.33	2.30	1.82	2.10	2.05	2.11	2.19	<i>2.30</i>	<i>2.26</i>	<i>2.18</i>	<i>2.05</i>	<i>2.00</i>	2.14	<i>2.16</i>	<i>2.12</i>
Lower 48 States (excl GOM)	95.22	98.87	100.16	102.30	100.16	103.07	104.87	<i>106.13</i>	<i>105.33</i>	<i>105.15</i>	<i>106.43</i>	<i>107.56</i>	99.16	<i>103.58</i>	<i>106.13</i>
Total Dry Gas Production	91.14	94.43	95.14	97.49	95.10	97.59	99.21	<i>100.54</i>	<i>99.87</i>	<i>99.52</i>	<i>100.49</i>	<i>101.60</i>	94.57	<i>98.13</i>	<i>100.38</i>
LNG Gross Imports	0.15	0.02	0.03	0.04	0.15	0.01	0.06	<i>0.06</i>	<i>0.10</i>	<i>0.04</i>	<i>0.04</i>	<i>0.06</i>	0.06	<i>0.07</i>	<i>0.06</i>
LNG Gross Exports	9.27	9.81	9.60	10.32	11.50	10.80	9.74	<i>10.38</i>	<i>12.37</i>	<i>12.34</i>	<i>12.02</i>	<i>12.28</i>	9.76	<i>10.60</i>	<i>12.25</i>
Pipeline Gross Imports	8.68	6.81	7.24	7.82	8.89	7.73	7.84	<i>7.80</i>	<i>8.34</i>	<i>6.87</i>	<i>7.04</i>	<i>7.46</i>	7.63	<i>8.06</i>	<i>7.42</i>
Pipeline Gross Exports	8.31	8.66	8.50	8.40	8.43	8.45	8.06	<i>8.73</i>	<i>9.32</i>	<i>8.82</i>	<i>9.15</i>	<i>9.56</i>	8.47	<i>8.42</i>	<i>9.21</i>
Supplemental Gaseous Fuels	0.17	0.18	0.18	0.19	0.21	0.17	0.18	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	<i>0.19</i>	0.18	<i>0.19</i>	<i>0.19</i>
Net Inventory Withdrawals	17.18	-9.12	-7.87	1.03	20.14	-10.25	-8.95	<i>2.51</i>	<i>16.33</i>	<i>-13.11</i>	<i>-9.35</i>	<i>3.41</i>	0.24	<i>0.79</i>	<i>-0.74</i>
Total Supply	99.74	73.84	76.62	87.84	104.56	76.00	80.54	<i>92.00</i>	<i>103.15</i>	<i>72.34</i>	<i>77.24</i>	<i>90.89</i>	84.46	<i>88.22</i>	<i>85.85</i>
Balancing Item (b)	1.06	-1.02	-0.68	-1.54	0.33	0.27	0.59	<i>-0.38</i>	<i>-0.69</i>	<i>0.54</i>	<i>-0.09</i>	<i>-1.56</i>	-0.55	<i>0.20</i>	<i>-0.45</i>
Total Primary Supply	100.80	72.82	75.94	86.30	104.89	76.27	81.14	<i>91.63</i>	<i>102.46</i>	<i>72.88</i>	<i>77.14</i>	<i>89.33</i>	83.90	<i>88.42</i>	<i>85.40</i>
Consumption (billion cubic feet per day)															
Residential	26.05	7.58	3.67	14.61	26.09	7.85	3.56	<i>17.09</i>	<i>25.70</i>	<i>7.89</i>	<i>4.13</i>	<i>17.03</i>	12.92	<i>13.60</i>	<i>13.64</i>
Commercial	15.03	6.31	4.73	10.17	15.61	6.68	4.74	<i>11.73</i>	<i>15.12</i>	<i>6.65</i>	<i>5.27</i>	<i>11.62</i>	9.04	<i>9.67</i>	<i>9.64</i>
Industrial	24.21	21.67	21.45	23.59	25.50	22.38	21.83	<i>24.02</i>	<i>24.06</i>	<i>21.28</i>	<i>21.15</i>	<i>23.44</i>	22.73	<i>23.42</i>	<i>22.48</i>
Electric Power (c)	26.56	29.25	37.93	29.22	28.41	31.00	42.37	<i>29.67</i>	<i>28.06</i>	<i>28.71</i>	<i>38.02</i>	<i>28.14</i>	30.77	<i>32.89</i>	<i>30.75</i>
Lease and Plant Fuel	5.02	5.20	5.24	5.37	5.26	5.41	5.50	<i>5.57</i>	<i>5.53</i>	<i>5.51</i>	<i>5.57</i>	<i>5.63</i>	5.21	<i>5.44</i>	<i>5.56</i>
Pipeline and Distribution Use	3.77	2.65	2.78	3.19	3.86	2.81	2.99	<i>3.41</i>	<i>3.84</i>	<i>2.69</i>	<i>2.86</i>	<i>3.33</i>	3.09	<i>3.27</i>	<i>3.18</i>
Vehicle Use	0.15	<i>0.15</i>	<i>0.15</i>	<i>0.15</i>	<i>0.15</i>	<i>0.15</i>	0.15	<i>0.15</i>	<i>0.15</i>						
Total Consumption	100.80	72.82	75.94	86.30	104.89	76.27	81.14	<i>91.63</i>	<i>102.46</i>	<i>72.88</i>	<i>77.14</i>	<i>89.33</i>	83.90	<i>88.42</i>	<i>85.40</i>
End-of-period Inventories (billion cubic feet)															
Working Gas Inventory	1,801	2,585	3,306	3,210	1,401	2,325	3,146	<i>2,915</i>	<i>1,445</i>	<i>2,638</i>	<i>3,498</i>	<i>3,185</i>	3,210	<i>2,915</i>	<i>3,185</i>
East Region (d)	313	515	804	766	242	482	759	<i>671</i>	<i>211</i>	<i>560</i>	<i>871</i>	<i>757</i>	766	<i>671</i>	<i>757</i>
Midwest Region (d)	395	630	966	887	296	557	917	<i>827</i>	<i>313</i>	<i>639</i>	<i>993</i>	<i>873</i>	887	<i>827</i>	<i>873</i>
South Central Region (d)	760	993	1,053	1,143	587	885	1,007	<i>1,051</i>	<i>710</i>	<i>1,054</i>	<i>1,131</i>	<i>1,094</i>	1,143	<i>1,051</i>	<i>1,094</i>
Mountain Region (d)	113	175	205	171	90	137	184	<i>166</i>	<i>84</i>	<i>132</i>	<i>200</i>	<i>182</i>	171	<i>166</i>	<i>182</i>
Pacific Region (d)	197	246	248	218	165	240	247	<i>170</i>	<i>97</i>	<i>223</i>	<i>274</i>	<i>248</i>	218	<i>170</i>	<i>248</i>
Alaska	23	27	30	25	21	25	32	<i>30</i>	<i>30</i>	<i>30</i>	<i>30</i>	<i>30</i>	25	<i>30</i>	<i>30</i>

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

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

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

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

- = no data available

LNG: liquefied natural gas.

Notes: EIA completed modeling and analysis for this report on December 1, 2022.

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

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

Forecasts: EIA Short-Term Integrated Forecasting System.

<https://semprainfrastructure.com/news-and-events/news-releases/sempra-infrastructure-announces-agreement-with-engie-for-supply-of-u-s-lng-from-port-arthur-lng-phase-1>

Sempra Infrastructure Announces Agreement with ENGIE for Supply of U.S. LNG from Port Arthur LNG Phase 1

DECEMBER 6, 2022

HOUSTON, Dec. 6, 2022 – [Sempra Infrastructure](#), a subsidiary of [Sempra](#) (NYSE: SRE) (BMV: SRE), today announced it has entered into a long-term sale and purchase agreement (SPA) with ENGIE S.A. for the supply of liquefied natural gas (LNG) from Phase 1 of its proposed Port Arthur LNG project under development in Jefferson County, Texas.

Under the SPA, ENGIE has agreed to purchase approximately 0.875 million tonnes per annum (Mtpa) of LNG for 15 years, delivered on a free-on-board basis, and sourced from natural gas producers whose gas has been certified by an independent third party in accordance with environmental, social and governance (ESG) performance criteria. The agreement also provides a framework to explore ways to lower the carbon intensity of LNG produced from the Port Arthur Phase 1 LNG project through GHG emission reduction, mitigation strategies and a continuous improvement approach.

“ENGIE is a leader in Europe’s energy transition and a great addition to our Port Arthur LNG customer portfolio,” said Justin Bird, CEO of Sempra Infrastructure. “We are excited to work with ENGIE to deliver reliable energy resources like LNG and contribute to the security of natural gas supply to their clients while supporting both companies’ ESG commitments.”

Sempra Infrastructure recently announced it had finalized an engineering, procurement and construction contract with Bechtel Energy for the proposed Port Arthur LNG Phase 1 and that it has entered into long-term agreements with ConocoPhillips and INEOS for the sale and purchase of approximately 5.0 Mtpa and 1.4 Mtpa of LNG respectively. The company is focused on completing the remaining steps necessary to achieve its goal of making a final investment decision for Phase 1 of the liquefaction project in the first quarter of 2023.

The Port Arthur LNG Phase 1 project is permitted and expected to include two natural gas liquefaction trains and LNG storage tanks and associated facilities capable of producing, under optimal conditions, up to approximately 13.5 Mtpa of LNG. A similarly sized Port Arthur LNG Phase 2 project is also competitively positioned and under active marketing and development.

Development of the Port Arthur LNG project is contingent upon completing the required commercial agreements, securing all necessary permits, obtaining financing, and reaching a final investment decision, among other factors.

About Sempra Infrastructure

Sempra Infrastructure delivers energy for a better world. Through the combined strength of its assets in North America, the company is dedicated to enabling the delivery of cleaner energy for its customers. With a continued focus on sustainability, innovation, world-class safety, championing people, resilient operations and social responsibility, its more than 2,000 employees develop, build and operate clean power, energy networks and LNG and net-zero solutions, that are expected to play a crucial role in the energy systems of the future. For more information about Sempra Infrastructure, please visit www.SempraInfrastructure.com and [Twitter](#).

Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

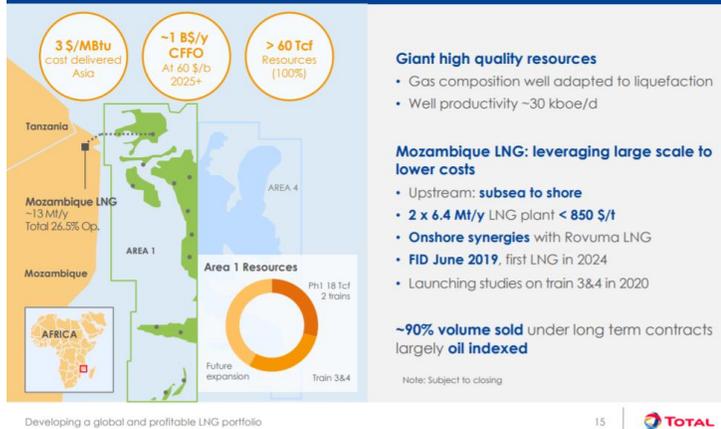
Posted Wednesday April 28, 2021. 9:00 MT

The next six months will determine the size and length of the new LNG supply gap that is hitting harder and faster than anyone expected six months ago. Optimists will say the Mozambique government will bring sustainable security and safety to the northern Cabo Delgado province and provide the confidence to Total to quickly get back to LNG development such that its LNG in-service delay is a matter of months and not years. We hope so for Mozambique's domestic situation, but will it be that easy for Total's board to quickly look thru what just happened? Total suspended LNG development for 3 months, restarted development on March 25, but then 3 days of violence led it to suspend development again on March 28, and announce force majeure on Monday April 26. Even if the optimists are right, Mozambique LNG is counted on for LNG supply and the major LNG supply project that are in LNG supply forecasts are now all delayed – Total Phase 1 of 1.7 bcf/d and its follow on Phase 2 of 1.3 bcf/d, and Exxon's Rozuma Phase 1 of 2.0 bcf/d. It is important to remember this 5.0 bcf/d of major LNG supply is being counted in LNG supply forecasts and starting in 2024. At a minimum, we think the more likely scenario is a delay of at least 2 years in this 5.0 bcf/d from the pre-Covid timelines. And this creates a much bigger and sooner LNG supply gap starting ~2025 and stronger outlook for LNG prices. Thermal coal in Asia will play a role in keeping a lid on LNG prices. But there will be the opportunity for LNG suppliers to at least review the potential for brownfield LNG projects to fill the growing supply gap. The thought of increasing capex was a non-starter six months ago, but there is a much stronger outlook for global oil and gas prices. Oil and gas companies are pivoting from cutting capex to small increases in 2021 capex and expecting for higher capex in 2022. We believe this sets the stage for looking at potential FID of brownfield LNG projects before the end of 2021 to be included in 2022 capex budgets. Mozambique is causing an LNG supply gap that someone will try to fill. And if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? Cdn natural gas producers hope so as this would mean more Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub.

Total declares force majeure on Mozambique LNG, Yesterday, Total announced [\[LINK\]](#) "Considering the evolution of the security situation in the north of the Cabo Delgado province in Mozambique, Total confirms the withdrawal of all Mozambique LNG project personnel from the Afungi site. This situation leads Total, as operator of Mozambique LNG project, to declare force majeure. Total expresses its solidarity with the government and people of Mozambique and wishes that the actions carried out by the government of Mozambique and its regional and international partners will enable the restoration of security and stability in Cabo Delgado province in a sustained manner". Total is working Phase 1 is ~1.7 bcf/d (Train 1 + 2, 6.45 mtpa/train) and was originally expected to being LNG deliveries in 2024. There was no specific timeline for Phase 2 of 1.3 bcf/d (Train 3 + 4, 5.0 mtpa/train), but was expected to follow Phase 1 in short order to keep capital costs under control with a continuous construction process with a potential onstream shortly after 2026.

Total Mozambique Phase 1 and 2

Mozambique LNG: unlocking world-class gas resources



Source: Total Investor Day September 24, 2019

Total's Mozambique force majeure is no surprise, especially the need to the restoration of security and stability "in a sustained manner". Yesterday, Total announced [\[LINK\]](#) "*Considering the evolution of the security*". No one should be surprised by the force majeure or the sustained manner caveat. SAF Group posts a weekly Energy Tidbits research memo [\[LINK\]](#), wherein we have, in multiple weekly memos, that Total had shut down development in December for 3 months due to the violent and security risks. It restarted development on Wed March 24, violence/attacks immediately resumed for 3 consecutive days, and then Total suspended development on Sat March 27. Local violence/attacks shut development down in Dec, the situation gets settled enough for Total to restart in March, only to be shut down 3 days thereafter. No one should be surprised especially with Total's need to see security and stability "in a sustained manner".

Does anyone really think Total will risk another quick 2-3 month restart or even in 2021? The Mozambique government will be working hard to convince Total to restart soon. We just find it hard to believe Total board will risk a replay of March 24-27 in 2021. Unfortunately, Mozambique has had internal conflict for years. It reached a milestone to the positive in August 2019. Our SAF Group August 11, 2019 Energy Tidbits memo [\[LINK\]](#) highlighted the signing of a peace pact between Mozambique President Nyusi and leader of the Renamo opposition Momade. This was the official end to a 2013 thru 2016 conflict following a failure to hold up the prior peace pact. At that time, FT reported [\[LINK\]](#) "Mr Nyusi has said that *"the government and Renamo will come together and hunt" rebels who fail to disarm. The government has struggled to stem the separate insurgency in the north, which has killed or displaced hundreds near the gas-rich areas during the past two years. While the roots of the conflict remain murky, it is linked to a local Islamist group and appears to be drawing on disaffection over sharing gas investment benefits, say analysts.*" This is just a reminder this is not a new issue. LNG is a game changer to Mozambique's economic future. It is, but also has been, a government priority to have the security and safety for Total and Exxon to move on their LNG developments. Its hard to believe the Mozambique government will be able to quickly convince Total and Exxon boards that they can be comfortable there is a sustained security/safety situation and they can send their people back in to develop the LNG. Total's board would allow any resumption of development before year end 2021. The last thing Total wants is a replay of March 24-27. The first question is how long will it take before the Total board is convinced its safe to restart. Could you imagine them doing a replay of what just happened? Wait three months, restart development and have to stop again right away? We have to believe that could lead the Total board to believe it is unfixable for years. We just don't think they are to prepared to risk that decision in 3 months. Its why we have to think there isn't a restart approval until at least in 2022 at the earliest ie. why we think the likely scenario is a delay of 2-3 years, and not a matter of months.

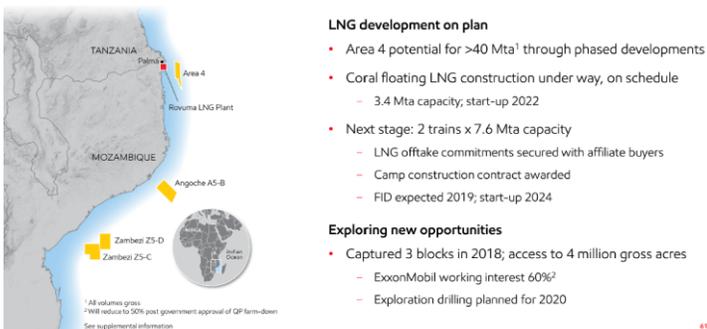
Mozambique's security issues pushes back 5.0 bcf/d of new LNG supply at least a couple years. The global LNG issue is that 5 bcf/d of new Mozambique LNG supply (apart from the Eni Coral FLNG of 0.45 bcf/d) won't start up in 2024 and

continuing thru the 2020s. And we believe all LNG forecasts included this 5.0 bcf/d to be in service in the 2020s as Mozambique had been considered the best positioned LNG supply to access Asia after Australia and Papua New Guinea. (i) Eni Coral Sul (Rovuma Basin) FLNG of 0.45 bcf/d planned in service in 2022. [\[LINK\]](#) This is an offshore floating LNG vessel that is still expected to be in service in 2022. (ii) Total Phase 1 to add 1.7 bcf/d with an in service originally planned for 2024. We expect the in service data to be pushed back to at least 2026 assuming Total gives a development restart approval in Dec 2021. In theory, this would only be a 1 year loss of time. However, Total has let services go, the project will be idle for 9 months, it isn't clear if the need to get people out quickly let them do a complete put the project on hold, and how many people will be on site maintaining the status of the development during the force majeure. Also what new procedures and safety will be put in place for a restart. These all mean there will be added time needed to get the project back to where it was when force majeure was declared ie. why we think a 12 month time delay will be more like an 18 month project delay. (iii) Exxon's Rozuma Phase 1 LNG will add 2.0 bcf/d and, pre-Covid, was expected to be in service in 2025. We believe the delays related to security and safety at Total are also going to impact Exxon. We find it highly unlikely the Exxon board would take a different security and safety decision than Total. Pre-pandemic, Exxon's March 6, 2019 Investor Day noted their operated Mozambique Rovuma LNG Phase 1 was to be 2 trains each with 1.0 bcf/d capacity for total initial capacity of 2.0 bcf/d with FID expected in 2019 and first LNG deliveries in 2024. The 2019 FID expectation was later pushed to be expected just before the March 2020 investor day. But the pandemic hit, and on March 21, 2020, we tweeted [\[LINK\]](#) on the Reuters story "*Exclusive: Coronavirus, gas slump put brakes on Exxon's giant Mozambique LNG plan*" [\[LINK\]](#) that noted Exxon was expected to delay the Rovuma FID. There was no timeline, but the expectation was that FID would now be in 2022 (3 years later than original timeline) and that would push first LNG likely to 2027. (iv) Total Phase 2 was to add 1.3 bcf/d. There was no firm in service date but it was expected to follow closely behind Phase 1 to maintain services. That would have put it originally in the 2026/2027 period. But if Phase 1 is pushed back 2 years, so will Phase 2 so more likely 2028/2029.. (v) Total Phase 1 + 2 and Exxon Rozuma Phase 1 total 5.0 bcf/d and would have been (and still are) in all LNG supply forecasts for the 2020s. (vi) We aren't certain if the LNG supply forecasts include Exxon Rozuma Phase 2, which would be an additional 2.0 bcf/d on top of the 5.0 bcf/d noted above. Exxon Rozuma has always been expected to be at least 2 Phases. This has been the plan since the Anadarko days given the 85 tcf size of the resource on Exxon's Area 4. There was no firm in service data for Phase 2, but it was expected they would also closely follow Phase 1 to maintain services. We expect that original timeline would have been 2026/2027 and that would not be pushed back to 2029/2030. (vii) It doesn't matter if its only 5 bcf/ of Mozambique that is delayed 2 to 3 years, it will cause a bigger LNG supply gap and sooner. The issue for LNG markets is this is taking projects that are in development effectively out of the queue for some period.

Exxon Mozambique LNG

UPSTREAM MOZAMBIQUE

Five outstanding developments



Source: Exxon Investor Day March 6, 2019

Won't LNG and natural gas get hit by Biden's push for carbon free electricity? Yes, in the US. For the last 9 months, we have warned on Biden's climate change plan that were his election platform and now form his administration's energy transition map. We posted our July 28, 2020 blog "*Biden To Put US On 'Irreversible Path to Achieve Net-Zero Emissions, Economy-Wide'*" Is a Major Negative To US Natural Gas in 2020s "[\[LINK\]](#) on Biden's platform "*The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future*" [\[LINK\]](#). Biden's new American Jobs Plan

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[\[LINK\]](#) lines up with his campaign platform including to put the US “on the path to achieving 100 percent carbon-free electricity by 2035.” Our July 28, 2020 blog noted that it would require replacing ~60% of US electricity generation with more renewable and it could eliminate ~40% (33.5 bcf/d) of 2019 US natural gas consumption. If Biden is 25% successful by 2030, it would replace ~6.3 bcf/d of natural gas demand. It would be a negative to US natural gas and force more US natural gas to export markets. The wildcard when does US natural gas start to decline if producers are faced with the reality of natural gas being phased out for electricity. The other hope is that when Biden says “carbon-free”, its not what ends up in the details of any formal policy statement ie. carbon electricity will be allowed with Biden’s push for CCS.

Will Cdn natural gas be similarly hit by if Trudeau move to “emissions free” and not “net zero emissions” electricity? Yes and No. Our SAF Group April 25, 2021 Energy Tidbits memo [\[LINK\]](#) was titled ““Bad News For Natural Gas, Trudeau’s Electricity Goal is Now 100% “Emissions Free” And Not “Net Zero Emissions””. On Thursday, PM Trudeau spoke at Biden’s global climate summit [\[LINK\]](#) and looks like he slipped in a new view on electricity than was in last Monday’s budget and his Dec climate plan. Trudeau said “In Canada, we’ve worked hard to get to over 80% emissions-free electricity, and we’re not going to stop until we get to 100%.” Speeches, especially ones made on a global stage are checked carefully so this had to be deliberate. Trudeau said “emissions free” and not net zero emissions electricity. It seems like this language is carefully written to exclude any fossil fuels as they are not emissions free even if they are linked to CCS. Recall in Liberals big Dec 2020 climate announcement [\[LINK\]](#), Liberals said ““Work with provinces, utilities and other partners to ensure that Canada’s electricity generation achieves net-zero emissions before 2050.” There is no way Trudeau changed the language unless he meant to do so. And this is a major change as it would seem to indicate his plan to eliminate all fossil fuels used for electricity. If so this would be a negative to Cdn natural gas that would be stuck within Western Canada and/or continuing to push into the US when Biden is trying to switch to carbon free electricity. We recognize that there is still some ambiguity in what will be the details of policy and the Liberals aren’t changing to no carbon sourced electricity at all. Let’s hope so. But let’s also be careful that politicians don’t change language without a reason or at least with a view to setting up for some future hit. Plus Trudeau had a big warning in that same speech saying “we will make it law to respect our new 2030 target and achieve net-zero emissions by 2050”. They plan to make it the law that Canada has to be on track for the Liberals 2030 emissions targets. This means that the future messaging will be that the Liberals have no choice but to take harder future emissions actions as it is the law. They will be just obeying the law as they will be obligated to obey the law. Everyone knows the messaging will be we have to do more get to Net Zero, that in itself will inevitably mean it will be the law if he actually does move to eliminate any carbon based electricity. So yes it’s a negative, that is unless more Cdn natural gas can be exported via LNG to Asia. We believe this would be a plus to be priced against global LNG instead of Henry Hub.

Biden’s global climate summit reminded there is too much risk to skip over natural gas as the transition fuel. Apart from the US and Canada, we haven’t seen a sea shift to eliminating natural gas for power generation, especially from energy import dependent countries. There is a strong belief that hydrogen and battery storage will one day be able to scale up at a competitive cost to lead to the acceleration away from fossil fuels. But that time isn’t yet here, at least not for energy import dependent countries. One of the key themes from last week’s leader’s speeches at the Biden global climate summit – to get to Net Zero, the world is assuming there will be technological advances/discoveries that aren’t here today and that have the potential to immediately ramp up in scale. IEA Executive Director Faith Birol was blunt in his message [\[LINK\]](#) saying “Right now, the data does not match the rhetoric – and the gap is getting wider.” And “IEA analysis shows that about half the reductions to get to net zero emissions in 2050 will need to come from technologies that are not yet ready for market. This calls for massive leaps in innovation. Innovation across batteries, hydrogen, synthetic fuels, carbon capture and many other technologies. US Special Envoy for Climate John Kerry said a similar point that half of the emissions reductions will have to come from technologies that we don’t yet have at scale. UK PM Johnson [\[LINK\]](#) didn’t say it specifically, but points to this same issue saying “To do these things we’ve got to be constantly original and optimistic about new technology and new solutions whether that’s crops that are super-resistant to drought or more accurate weather forecasts like those we hope to see from the UK’s new Met Office 1.2bn supercomputer that we’re investing in.” It may well be that the US and other self sufficient energy countries are comfortable going on the basis of assuming technology developments will occur on a timely basis. But, its clear that countries like China, India, South Korea and others are not prepared to do so. And not prepared to have the confidence to rid themselves of coal power generation. This is why there hasn’t been any material change in the LNG demand outlook

We expect the IEA's blunt message that the gap is getting wider will be reinforced on May 18. We have had a consistent view on the energy transition for the past few years. We believe it is going to happen, but it will take longer, be a bumpy road and cost more than expected. This is why we believe the demise of oil and natural gas won't be as easy and fast as hoped for by the climate change side. The IEA's blunt warning on the gap widening should not be a surprise as they warned on this in June 2020. Birol's climate speech also highlighted that the IEA will release on May 18 its roadmap for how the global energy sector can reach net zero by 2050. Our SAF Group June 11, 2020 blog "[Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition](#)" [\[LINK\]](#) feature the IEA's June 2020 warning that the critical energy technologies needed to reduce emissions are nowhere near where they need to be. In that blog, we said "there was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the "critical energy technologies" and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these "critical energy technologies" into major groupings and then ranked the progress of each of these pieces in its report "[Tracking Clean Energy Progress](#)" [\[LINK\]](#) by on track, more efforts needed, or not on track". Our blog included the below IEA June 2020 chart.

IEA's Progress Ranking For "Critical Energy Technologies" For Clean Energy Transition



Source: IEA

● On Track
 ● More Efforts Needed
 ● Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

We are referencing [Shell's long term outlook for LNG](#). We recognize there are many different forecasts for LNG, but are referencing Shell' LNG Outlook 2021 from Feb 25, 2021 for a few reasons. (i) Shell's view on LNG is the key view for when and what decision will be made for LNG Canada Phase 2. (ii) Shell is one of the global leaders in LNG supply and trading. (iii) Shell provides on the record LNG outlooks every year so there is the ability to compare and make sure the outlook fits the story. It does. (iv) Shell, like other supermajors, has had to make big capex cuts post pandemic and that certainly wouldn't put any bias to the need for more capex.

[Shell's March 2021 long term outlook for LNG demand was basically unchanged vs 2020 and leads to a LNG supply gap in mid 2020s](#). Shell does not provide the detailed numbers in their Feb 25, 2021 LNG forecast. We would assume they

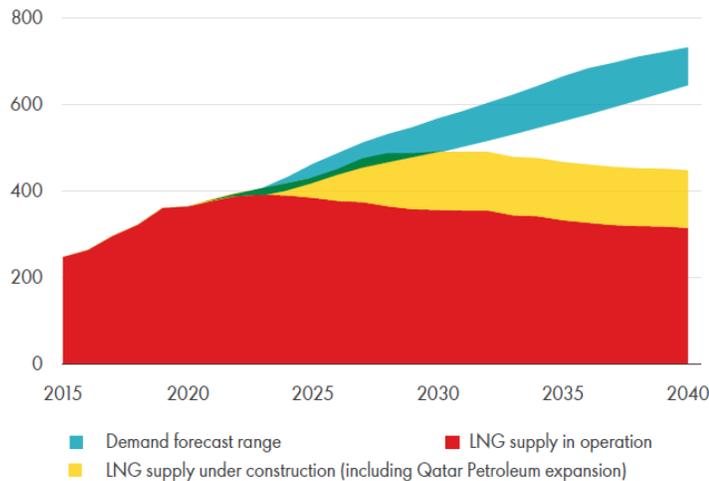
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would have reflected some delay, perhaps 1 year, at Mozambique but would be surprised if they put a 2-3 year delay in for the 5 bcf/d from Total Phase 1 +2 and Exxon Rozuma Phase 1. Compared to their LNG Outlook 2020, it looks like there was no change for their estimate of global natural gas demand growth to 2040, which looked relatively unchanged at approx. 5,000 bcm/yr or 484 bcf/d. Similarly, long term LNG demand looked unchanged to 2040 of ~700 mm tonnes (92 bcf/d) vs 360 mm tonnes (47 bcf/d) in 2020. In the 2021 outlook, Shell highlighted that the pandemic delayed project construction timelines and that the “*lasting impact expected on LNG supply not demand*”. And that Shell sees a LNG “*supply-demand gap estimated to emerge in the middle of the current decade as demand rebounds*”. Comparing to 2020, it looks like the supply-demand gap is sooner.

Supply-demand gap estimated to emerge in the middle of the current decade

Emerging LNG supply-demand gap

MTPA



Source: Shell LNG Outlook 2021, Feb 25, 2021

Mozambique delays are redefining the LNG markets for the 2020s: Delaying 5 bcf/d of Mozambique new LNG supply 2-3 years means a much bigger supply gap starting in 2025.. Even if the optimists are right, there are now delays to all major Mozambique LNG supply from LNG supply forecasts. We don't have the detail, but we believe all LNG forecasts, including Shell's LNG Outlook 2021, would have included Total's Phase 1 and Phase 2 and Exxon Rozuma Phase 1. As noted earlier, we believe that the likely impact of the Mozambique security concerns is that these forecasts would likely have to push back 1.7 bcf/d from Total Phase 1 to at least 2026, 2.0 bcf/d Exxon Rozuma Phase 1 to at least 2027, and 1.3 bcf/d Total Phase 2 to at least 2028/2029 with the real risk these get pushed back even further. 5.0 bcf/d is equal to 38 mtpa. These delays would mean there is an increasing LNG supply gap in 2025 and increasingly significantly thereafter. And even if a new greenfield LNG project is FID's right away, it wouldn't be able to step in to replace Total Phase 1 prior startup timing for 2024 or likely the market at all until at least 2027. Its why the decision on filling the gap will fall on brownfield LNG projects.

And does this bigger, nearer supply gap force LNG players to look at what brownfield LNG projects they could advance?

A greenfield LNG project would likely take at least until 2027 to be in operations. Its why we believe the Mozambique delays will effectively force major LNG players to look to see if there are brownfield LNG projects they should look to advance. Prior to the just passed winter, no one would think Shell or other major LNG players would be considering any new LNG FIDs in 2021. All the big companies are in capital reduction mode and debt reduction mode. But Brent oil is now solidly over \$60 and LNG prices hit record levels in Jan and the world's economic and oil and gas demand outlook are increasing with vaccinations. And we are starting to see companies move to increasing capex with the higher cash flows. We would not expect any major LNG players to move to FID right away. But we see them watching to see if 2021 plays out to still support this increasing LNG supply gap. And unless new mutations prevent vaccinations from returning the world to normal, we suspect that major LNG players, like other oil and gas companies, will be looking to increase

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capex as they approve 2022 budgets. The outlook for the future has changed dramatically in the last 5 months. The question facing Shell and others, should they look to FID new LNG brownfield projects in the face of an increasing LNG supply gap that is going to hit faster and harder than expected a few months ago. We expect these decisions to be looked at before the end of 2021. LNG prices will be stronger, but we expect the limiting cap in Asia will be that thermal coal will be used to mitigate some LNG price pressure.

Back to Shell, does increasing LNG supply gap provide the opportunity to at least consider a LNG Canada Phase 2 FID over the next 9 months? Shell is no different than any other major LNG supplier in always knowing the market and that the oil and gas outlook is much stronger than 6 months ago. No one has been or is talking about this Mozambique impact and how it will at least force major LNG players to look at if they should FID new brownfield LNG projects to take advantage of this increasing supply gap. We don't have any inside contacts at Shell or LNG Canada, but that is no different than when we looked at the LNG markets in September 2017 and saw the potential for Shell to FID LNG Canada in 2018. We posted a September 20, 2017 blog "*China's Plan To Increase Natural Gas To 10% Of Its Energy Mix Is A Global Game Changer Including For BC LNG*" [\[LINK\]](#). Last time, it was a demand driven supply gap, this time, it's a supply driven supply gap. We have to believe any major LNG player, including Shell, will be at least looking at their brownfield LNG project list and seeing if they should look to advance FID later in 2021. Shell has LNG Canada Phase 2, which would add 2 additional trains or approx. 1.8 bcf/d. And an advantage to an FID would be that Shell would be able to commit to its existing contractors and fabricators for a continuous construction cycle following on LNG Canada Phase 1 ie. to help keep a lid on capital costs. No one is talking about the need for these new brownfield LNG projects, but, unless Total gets back developing Mozambique and keeps the delay to a matter of months, its inevitable that these brownfield LNG FID internal discussions will be happening in H2/21. Especially since the oil and gas price outlook is much stronger than it was in the fall and companies will be looking to increase capex in 2022 budgets

A LNG Canada Phase 2 would be a big plus to Cdn natural gas. A LNG Canada Phase 2 FID would be a big plus for Cdn natural gas. It would allow another ~1.8 bcf/d of Cdn natural gas to be priced against Asian LNG prices and not against Henry Hub. And it would provide demand offset versus Trudeau if he moves to make electricity "emissions free" and not his prior "net zero emissions". Mozambique may be in Africa, but, unless sustained peace and security is attained, it is a game changer to LNG outlook creating a bigger and sooner LNG supply gap. And with a stronger tone to oil and natural gas prices in 2021, the LNG supply gap will at least provide the opportunity for Shell to consider FID for its brownfield LNG Canada Phase 2 and provide big support to Cdn natural gas for back half of the 2020s. And perhaps if LNG Canada is exporting 3.6 bcf/d from two phases, it could help flip Cdn natural gas to a premium to US natural gas especially if Biden is successful in reducing US domestic natural gas consumption for electricity. The next six months will be very interesting to watch for LNG markets.

Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs

Posted 11am on July 14, 2021

The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog “*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*” and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum’s massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas.

Sea change in Asian LNG buyers is also the best validation of the LNG supply gap and big to LNG supply FIDs. Has the data changed or have the market participants changed in how they react to the data? We can’t recall exactly who said that on CNBC on July 12, it’s a question we always ask ourselves. In the LNG case, the data has changed with Mozambique LNG delays and that has directly resulted in market participants changing and entering into long term contracts. We can’t stress enough how important it is to see Asian LNG buyers move to long term LNG deals. (i) Validates the sooner and bigger LNG supply gap. We believe LNG markets should look at the last two weeks of new long term deals for Asian LNG buyers as being the validation of the LNG supply gap that clearly emerged post Total declaring force majeure on its 1.7 bcf/d Mozambique LNG Phase 1 that was under construction and on track for first LNG delivery in 2024. Since then, markets have started to realize the Mozambique delays are much more than 1.7 bcf/d. They have seen major LNG suppliers change their outlook to a more bullish LNG outlook and, most importantly, are now seeing Asian LNG buyers changing from trying to renegotiate long term LNG deals lower to entering into long term LNG deals to have security of supply. Asian LNG buyers are cozying up to Qatar in a prelude to the next wave of Asian buyer long term deals. What better validation is there than companies/countries putting their money where their mouth is. (ii) Provides financial commitment to help push LNG suppliers to FID. We believe these Asian LNG buyers are doing much more than validating a LNG supply gap to markets. The big LNG suppliers can move to FID based on adding more LNG supply to their portfolio, but having more long term deals provides the financial anchor/visibility to long term capital commitment from the buyers. Long term contracts will only help LNG suppliers get to FID.

It was always clear that the Mozambique LNG supply delay was 5.0 bcf/d, not just 1.7 bcf/d from Total Phase 1. LNG markets didn’t really react to Total’s April 26 declaration of force majeure on its 1.7 bcf/d Mozambique LNG Phase 1. This was an under construction project that was on time to deliver first LNG in 2024. It was in all LNG supply forecasts. There was no timeline given but, on the Apr 29 Q1 call, Total said that it expected any restart decision would be least a year away. If so, we believe that puts any actual construction at least 18 months away. There will be work to do just to get back to where they were when they were forced to stop development work on Phase 1. Surprisingly, markets didn’t look the broader implications, which is why we posted our 7-pg Apr 28 blog “*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*” [\[LINK\]](#) We highlighted that Mozambique LNG delays were actually 5 bcf/d, not 1.7 bcf/d. And this 5 bcf/d of Mozambique LNG supply was built into most, if not all, LNG supply forecasts. The delay in Total Phase 1 would lead to a commensurate delay in its Mozambique LNG Phase 2 of 1.3 bcf/d. Total Phase 2 was to add 1.3 bcf/d. There was no firm in service date, but it was expected to

follow closely behind Phase 1 to maintain services. That would have put it originally in the 2026/2027 period. But if Phase 1 is pushed back at least 2 years, so will the follow on Phase 2, so more likely, it will be at least 2028/2029. The assumption for most, if not all, LNG forecasts was that Phase 2 would follow Phase 1. Exxon Rozuma Phase 1 of 2.0 bcf/d continues to be pushed back in timeline especially following Total Phase 1. Exxon's Mozambique Rozuma Phase 1 LNG will add 2.0 bcf/d and, pre-Covid, was originally expected to be in service in 2025. The project was being delayed and Total's force majeure has added to the delays. Rozuma onshore LNG facilities are right by Total. On June 20, we tweeted [\[LINK\]](#) on the Reuters report "*Exclusive: Galp says it won't invest in Rovuma until Mozambique ensures security*" [\[LINK\]](#). Galp is one of Exxon's partners in Rozuma. Reuters reported that Galp said they won't invest in Exxon's Rozuma LNG project until the government ensures security, that this may take a while, they won't be considering the project until after Total has reliably resumed work on its Phase 1, which likely puts any Rozuma decision until at least end of 2022 at the earliest. Galp has taken any Rozuma Phase 1 capex out of their new capex plans thru 2025 and will have to take out projects in their capex plan if Rozuma does come back to work. This puts Rozuma more likely 2028 at the earliest as opposed to before the original expectations of before 2025. Pre-pandemic, Exxon's March 6, 2019 Investor Day noted their operated Mozambique Rovuma LNG Phase 1 was to be 2 trains each with 1.0 bcf/d capacity for total initial capacity of 2.0 bcf/d with FID expected in 2019 and first LNG deliveries sometime before 2025. LNG forecasts had been assuming Exxon Rozuma would be onstream around 2025. The 2019 FID expectation was later pushed to be expected just before the March 2020 investor day. But the pandemic hit, and on March 21, 2020, we tweeted [\[LINK\]](#) on the Reuters story "*Exclusive: Coronavirus, gas slump put brakes on Exxon's giant Mozambique LNG plan*" [\[LINK\]](#) that noted Exxon was expected to delay the Rovuma FID. There was no timeline, but now, any FID is not expected until late 2022 at the earliest, that would push first LNG likely to at least 2028. What this means is that the Mozambique LNG delays are not 1.7 bcf/d but 5.0 bcf/d of projects that were in all, if not most, LNG supply forecasts. There is much more in our 7-pg blog. But Mozambique is what is driving a much bigger and sooner LNG supply gap starting ~2025 and stronger outlook for LNG prices

One of the reasons why it went under the radar is that major LNG suppliers played stupid on the Mozambique impact. It makes it harder for markets to see a big deal when the major LNG suppliers weren't making a big deal of Mozambique or playing stupid in the case of Cheniere in their May 4 Q1 call. In our May 9, 2021 Energy Tidbits memo, we said we had to chuckle when we saw Cheniere's response in the Q&A to its Q1 call on May 4 that they only know what we know from reading the Total releases on Mozambique and its impact on LNG markets. It's why we tweeted [\[LINK\]](#) "*Hmm! \$LNG says only know what we read on #LNG market impact from \$TOT \$XOM MZ LNG delays. Surely #TohokuElectric & other offtake buyers are reaching out to #Cheniere. MZ LNG delays is a game changer to LNG in 2020s, see SAF Group blog. Thx @olymppe_mattei @TheTerminal #NatGas*". How could they not be talking to LNG buyers for Total and/or Exxon Mozambique LNG projects. In the Q1 Q&A, mgmt was asked about Mozambique and didn't know any more than what you or I have read. Surely, they were speaking to Asian LNG buyers who had planned to get LNG supply from Total Mozambique or Exxon Rozuma Mozambique or both. Mgmt is asked "*wanted to just kind of touch on the color use talking about for these supply curve. And are you able to kind of provide any thoughts on the Mozambique and a deferral with the project of that size on 13 and TPA being deferred by we see you have you noticed any impact to the market has is there any impact for stage 3 with that capacity? Thanks.*" Mgmt replies "*No. Look, I only know about the Mozambique delay with what I read as well as what you read that from total and an Exxon. And it's a sad situation and I hope everybody is safe and healthy that were there to experience that unrest but no I don't think it's, again it's a different business paradigm than what we offer. So, we offer a full value product, the customer doesn't have to invest in equity, customer doesn't have to worry about the E&P side of the business because, we've been able to both the by at our peak almost 7 Dee's a day of US NAT gas from almost a 100 different producers on 26 different pipelines and deliver it to our to facilities. So we take care of a lot of what the customer needs*".

There are other LNG supply delays/interruptions beyond Mozambique. There have been a number of other smaller LNG delay or existing supply interruptions that add to Asian LNG buyers feeling less secure about the reliability of mid to long term LNG supply. Here are just a few examples. (i) Total Papua LNG 0.74 bcf/d. On June 8, we tweeted [\[LINK\]](#) "*Timing update Papua #LNG project. \$OSH June 8 update "2022 FEED, 2023 FID targeting 2027 first gas". \$TOT May 5 update didn't forecast 1st gas date. Papua is 2 trains w/ total capacity 0.74 bcf/d.*" We followed the tweet saying [\[LINK\]](#) "*Bigger #LNG supply gap being created >2025. Papua #LNG originally expected FID in 2020 so 1st LNG is 2 years delayed.*"

Common theme - new LNG supply is being delayed ie. [Total] Mozambique. Don't forget need capacity > demand due to normal maintenance, etc. Positive for LNG." (ii) Chevron's Gorgon. A big LNG story in H2/20 was the emergence of weld quality issues in the propane heat exchangers at Train 2, which required additional downtime for repair. Train 2 was shut on May 23 with an original restart of July 11, but the repairs to the weld quality issues meant it didn't restart until late Nov. The same issue was found in Train 1 but repairs were completed. However extended downtime for the trains led to lower LNG volumes. Gorgon produced ~2.3 bcf/d in 2019 but was down to 2.0 bcf/d in 2020. (iii) Equinor's Melkøya 0.63 bcf/d shut down for 18 months due to a fire. A massive fire led to the Sept 28, 2020 shutdown of the 0.63 bcf/d Melkøya LNG facility in Norway. On April 26, Equinor released "Revised start-up date for Hammerfest LNG" [\[LINK\]](#) with regard to the 0.63 bcf/d Melkøya LNG facility. The original restart date was Oct 1, 2021 (ie. a 12 month shut down), but Equinor said "Due to the comprehensive scope of work and Covid-19 restrictions, the revised estimated start-up date is set to 31 March 2022". When we read the release, it seemed like Equinor was almost setting the stage for another potential delay in the restart date. Equinor had two qualifiers to this March 31, 2022 restart date. Equinor said "there is still some uncertainty related to the scope of the work" and "Operational measures to handle the Covid-19 situation have affected the follow-up progress after the fire. The project for planning and carrying out repairs of the Hammerfest LNG plant must always comply with applicable guidelines for handling the infection situation in society. The project has already introduced several measures that allow us to have fewer workers on site at the same time than previously expected. There is still uncertainty related to how the Covid-19 development will impact the project progress."

Cheniere stopped the game playing the game on June 30. Our July 4, 2021 Energy Tidbits memo noted that it looks like Cheniere has stopped playing stupid with respect to the strengthening LNG market in 2021. We can't believe they thought they were fooling anyone, especially their competitors. Bu that week, they came out talking about how commercial discussions have picked up in 2021 and it's boosted their hope for a Texas (Corpus Christi) LNG expansion. On Wednesday, Platts reported "[Pickup in commercial talks boosts Cheniere's hopes on mid-scale LNG project](#)" [\[LINK\]](#) Platts wrote "*Cheniere Energy expects to make a "substantial dent" by the end of 2022 in building sufficient buyer support for a proposed mid-scale expansion at the site of its Texas liquefaction facility, Chief Commercial Officer Anatol Feygin said June 30 in an interview.*" "*As a result, he said, " The commercial engagement, I think it is very fair to say, has really picked up steam, and we are quite optimistic over the coming 12-18 months to make a substantial dent in that Stage 3 commercialization."* Platts also reported that Cheniere noted this has been a tightening market all year (ie would have been known by the May 4 Q1 call). Platts wrote "*We obviously find ourselves at the beginning of this year and throughout in a very tight market where prices today into Asia and into Europe are at levels that we frankly haven't seen in a decade-plus," Feygin said. "We've surpassed the economics that the industry saw post the Fukushima tragedy in March 2011, and that's happened in the shoulder period."* It's a public stance as to a more bullish LNG outlook

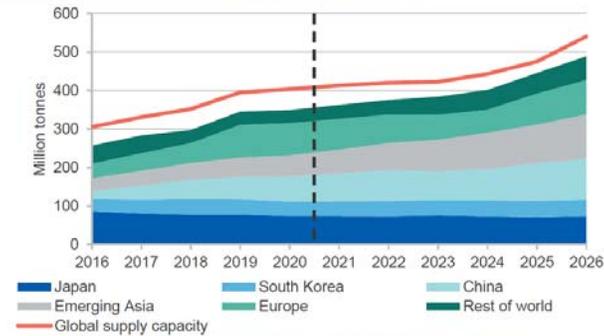
But we still see major LNG suppliers like Australia hinting but not outright saying that LNG supply gap is coming sooner. We have to believe Australia will be unveiling a sooner LNG supply gap in their September forecast. On June 28, we tweeted [\[LINK\]](#) on Australia's Resources and Energy Quarterly released on Monday [\[LINK\]](#) because there was a major change to their LNG outlook versus their March forecast. We tweeted "[#LNGSupplyGap. AU June fcast now sees #LNG mkt tighten post 2023 vs Mar fcast excess supply thru 2026. Why? \\$TOT Mozambique delays. See below SAF Apr 28 blog. Means brownfield LNG FID needed ie. like #LNGCanada Phase 2. #OOTT #NatGas](#)". Australia no longer sees supply exceeding demand thru 2026. In their March forecast, Australia said "*Nonetheless, given the large scale expansion of global LNG capacity in recent years, demand is expected to remain short of total supply throughout the projection period.*" Note this is thru 2026 ie. a LNG supply surplus thru 2026. But on June 28, Australia changed that LNG outlook and now says the LNG market may tighten beyond 2023. Interestingly, the June forecast only goes to 2023 and not to 2026 as in March. Hmmm! On Monday, they said "*Given the large scale expansion of global LNG capacity in recent years, import demand is expected to remain short of export capacity throughout the outlook period. Beyond 2023, the global LNG market may tighten, due to the April 2021 decision to indefinitely suspend the Mozambique LNG project, in response to rising security issues. This project has an annual nameplate capacity of 13 million tonnes, and was previously expected to start exporting LNG in 2024.*" 13 million tonnes is 1.7 bcf/d so they are only referring to Total Mozambique LNG Phase 1. So no surprise the change is Mozambique LNG driven but we have to believe the reason why they cut their forecast off this time at 2023 is that they are looking at trying to figure out what to forecast beyond 2023 in addition to Total Phase 1. And, importantly, we believe they will be changing their LNG forecast for more than Mozambique ie. India

demand that we highlight later in the blog. They didn't say anything else specific on Mozambique but, surely they have to also be delaying the follow on Total Phase 2 of 1.3 bcf/d and Exxon Rozuma Phase 1 of 2.0 bcf/d.

Australia's LNG Outlook: March 2021 vs June 2021 Forecasts

March 2021 LNG Outlook

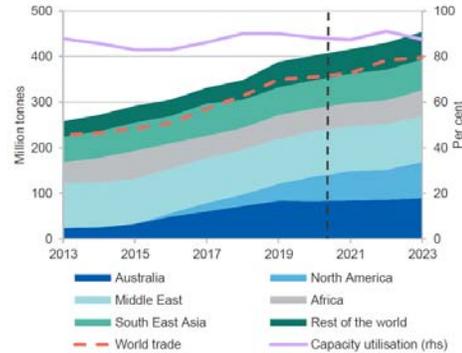
Figure 7.1: LNG demand and world supply capacity



Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

June 2021 LNG Outlook

Figure 7.1: LNG demand and world supply capacity



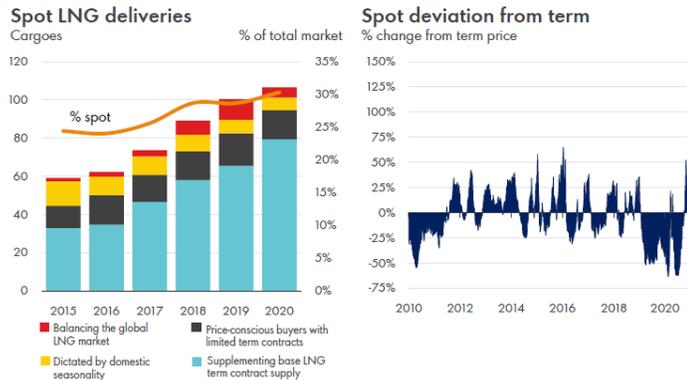
Source: Nexant (2021) World Gas Model; Department of Industry, Science, Energy and Resources (2021)

Source: Australia Resources and Energy Quarterly

Clearly Asian LNG buyers did the math, saw the new LNG supply gap and were working the phones in March/April/May trying to lock up long term supply. We wrote extensively on the Total Mozambique LNG situation before the April 26 force majeure as it was obvious that delays were coming to a project counted on for first LNG in 2024. Total had shut down Phase 1 development in December for 3 months due to the violence and security risks. It restarted development on Wed March 24, violence/attacks immediately resumed for 3 consecutive days, and then Total suspended development on Sat March 27. That's why no one should have been surprised by the April 26 force majeure. Asian LNG buyers were also seeing this and could easily do the same math we were doing and saw a bigger and sooner LNG supply gap. They were clearly working the phones with a new priority to lock up long term LNG supply. Major long term deals don't happen overnight, so it makes sense that we started to see these new Asian long term LNG deals start at the end of June.

A big pivot from trying to renegotiate down long term LNG deals or being happy to let long term contracts expire and replace with spot/short term LNG deals. This is a major pivot or abrupt turn on the Asian LNG buyers contracting strategy for the 2020s. There is the natural reduction of long term contracts as contracts reach their term. But with the weakness in LNG prices in 2019 and 2020, Asian LNG buyers weren't trying to extend long term contracts, rather, the push was to try to renegotiate down its long term LNG deals. The reason was clear, as spot prices for LNG were way less than long term contract prices. And this led to their LNG contracting strategy – move to increase the proportion of spot LNG deliveries out of total LNG deliveries. Shell's LNG Outlook 2021 was on Feb 25, 2021 and included the below graphs. The spot LNG price derivation from long term prices in 2019 and 2020 made sense for Asian LNG buyers to try to change their contract mix. Yesterday, Maeil Business News Korea reported on the new Qatar/Kogas long term LNG deal with its report "*Korea may face LNG supply cliff or pay hefty price after long-term supplies run out*" [\[LINK\]](#), which highlighted this very concept – Korea wasn't worried about trying to extend expiring long term LNG contracts. Maeil wrote "*Seoul in 2019 secured a long-term LNG supply contract with the U.S. for annual 15.8 million tons over a 15-year period. But even with the latest two LNG supply contracts, the Korean government needs extra 6 million tons or more of LNG supplies to keep up the current power pipeline. By 2024, Korea's long-term supply contracts for 9 million tons of LNG will expire - 4.92 million tons on contract with Qatar and 4.06 million tons from Oman, according to a government official who asked to be unnamed.*"

Spot LNG deliveries and Spot deviation from term price



Source: Shell LNG Outlook 2021 on Feb 25, 2021

Asian LNG buyers moving to long term LNG deals provide financing capacity for brownfield LNG FIDs. We believe this abrupt change and return to long term LNG deals is even more important to LNG suppliers who want to FID new projects. The big LNG players like Shell can FID new LNG supply without new long term contracts as they can build into their supply options to fill their portfolio of LNG contracts. But that doesn't mean the big players don't want long term LNG supply deals, as having long term LNG contracts provide better financing capacity for any LNG supplier. It takes big capex for LNG supply and long term deals make the financing easier.

Four Asian buyer long term LNG deals in the last week. It was pretty hard to miss a busy week for reports of new Asian LNG buyer long term LNG deals. There were two deals from Qatar Petroleum, one from Petronas and one from BP. The timing fits, it's about 3 months after Total Mozambique LNG problems became crystal clear. And as noted later, there are indicators that more Asian buyer LNG deals are coming.

Petronas/CNOOC is 10 yr supply deal for 0.3 bcf/d. On July 7, we tweeted [\[LINK\]](#) on the confirmation of a big positive to Cdn natural gas with the Petronas announcement [\[LINK\]](#) of a new 10 year LNG supply deal for 0.3 bcf/d with China's CNOOC. The deal also has special significance to Canada. (i) Petronas said "This long-term supply agreement also includes supply from LNG Canada when the facility commences its operations by middle of the decade". This is a reminder of the big positive to Cdn natural gas in the next 3 to 4 years – the start up of LNG Canada Phase 1 is ~1.8 bcf/d capacity. This is natural gas that will no longer be moving south to the US or east to eastern Canada, instead it will be going to Asia. This will provide a benefit for all Western Canada natural gas. (ii) First ever AECO linked LNG deal. It's a pretty significant event for a long term Asia LNG deal to now have an AECO link. Petronas wrote "The deal is for 2.2 million tonnes per annum (MTPA) for a 10-year period, indexed to a combination of the Brent and Alberta Energy Company (AECO) indices. The term deal between PETRONAS and CNOOC is valued at approximately USD 7 billion over ten years." 2.2 MTPA is 0.3 bcf/d. (iii) Reminds of LNG Canada's competitive advantage for low greenhouse gas emissions. Petronas said "Once ready for operations, the LNG Canada project paves the way for PETRONAS to supply low greenhouse gas (GHG) emission LNG to the key demand markets in Asia."

Qatar Petroleum/CPC (Taiwan) is 15 yr supply deal for 0.16 bcf/d. Pre Covid, Qatar was getting pressured to renegotiate lower its long term LNG contract prices. Now, it's signing a 15 year deal. On July 9, they entered in a new small long term LNG sales deal [\[LINK\]](#), a 15-yr LNG Sale and Purchase Agreement with CPC Corporation in Taiwan to supply it ~0.60 bcf/d of LNG. LNG deliveries are set to begin in January 2022. H.E. Minister for Energy Affairs & CEO of Qatar Petroleum Al-Kaabi said "We are pleased to enter into this long term LNG SPA, which is another milestone in our relationship with CPC, which dates back to almost three decades. We look forward to commencing deliveries under this SPA and to continuing our supplies as a trusted and reliable global LNG provider." The pricing was reported to be vs a basket of crudes.

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BP/Guangzhou Gas, a 12-yr supply deal for 0.13 bcf/d. On July 9, there was a small long term LNG supply deal with BP and Guangzhou Gas (China). Argus reported [\[LINK\]](#) BP had signed a 12 year LNG supply deal with Guangzhou Gas (GG), a Chinese city's gas distributor, which starts in 2022. The contract prices are to be linked to an index of international crude prices. Although GG typically gets its LNG from the spot market, it used a tender in late April for ~0.13 bcf/d starting in 2022. BP's announcement looks to be for most of the tender, so it's a small deal. But it fit into the trend this week of seeing long term LNG supply deals to Asia. This was intended to secure deliveries to the firm's Xiaohudao import terminal which will become operational in August 2022.

Qatar/Korea Gas is a 20-yr deal to supply 0.25 bcf/d. On Monday, Reuters reported [\[LINK\]](#) "South Korea's energy ministry said on Monday it had signed a 20-year liquefied natural gas (LNG) supply agreement with Qatar for the next 20 years starting in 2025. South Korea's state-run Korea Gas Corp (036460.KS) will buy 2 million tonnes of LNG annually from Qatar Petroleum". There was no disclosure of pricing.

More Asian buyer long term LNG deals (ie. India) will be coming. There are going to be more Asian buyer long term LNG deals coming soon. Our July 11, 2021 Energy Tidbits highlighted how India's new petroleum minister Hardeep Singh Puri (appointed July 8) hit the ground running with what looks to be a priority to set the stage for more India long term LNG deals with Qatar. On July 10, we retweeted [\[LINK\]](#) "New India Petroleum Minister hits ground running. What else w/ Qatar but #LNG. Must be #Puri setting stage for long term LNG supply deal(s). Fits sea change of buyers seeing #LNGSupplyGap (see SAF Apr 28 blog <http://safgroup.ca>) & wanting to tie up LNG supply. #OOTT". It's hard to see any other conclusion after seeing what we call a sea change in LNG buyer mentality with a number of long term LNG deals this week. Puri tweeted [\[LINK\]](#) "Discussed ways of further strengthening mutual cooperation between our two countries in the hydrocarbon sector during a warm courtesy call with Qatar's Minister of State for Energy Affairs who is also the President & CEO of @qatarpetroleum HE Saad Sherida Al-Kaabi". As noted above, we believe there is a sea change in LNG markets that was driven by the delay in 5 bcf/d of LNG supply from Mozambique (Total Phase 1 & Phase 2, and Exxon Rozuma Phase 1) that was counted on all LNG supply projections for the 2020s. Puri's tweet seems to be him setting the stage for India long term LNG supply deals with Qatar.

Supermajors are aggressively competing to commit 30+ year capital to Qatar's LNG expansion despite stated goal to reduce fossil fuels production. It's not just Asian LNG buyers who are now once again committing long term capital to securing LNG supply, it's also supermajors all bidding to be able to commit big capex to part of Qatar Petroleum's 4.3 bcf/d LNG expansion. Qatar Petroleum received a lot of headlines following their June 23 announcement on its LNG expansion [\[LINK\]](#) on how they received bids for double the equity being offered. And there were multiple reports that these are on much tougher terms for Qatar's partners. Qatar Petroleum CEO Saad Sherida Al-Kaabi specifically noted that, among the bidders, were Shell, Total and Exxon. Shell and Total have two of the most ambitious plans to reduce fossil fuels production in the 2020's, yet are competing to allocate long term capital to increase fossil fuels production. And Shell and Total are also two of the global LNG supply leaders. It has to be because they are seeing a bigger and sooner LNG supply gap.

Remember Qatar's has a massive expansion but India alone needs 3x the Qatar expansion LNG capacity. In addition to the competition to be Qatar Petroleum's partners, we remind that, while this is a massive 4.3 bcf/d LNG expansion, India alone sees its LNG import growing by ~13 bcf/d to 2030. The Qatar announcement reminded they see a LNG supply gap and continued high LNG prices. We had a 3 part tweet. (i) First, we highlighted [\[LINK\]](#) "1/3. #LNGSupplyGap coming. big support for @qatarpetroleum expansion to add 4.3 bcf/d LNG. but also say "there is a lack of investments that could cause a significant shortage in gas between 2025-2030" #NatGas #LNG". This is after QPC accounts for their big LNG expansion. The QPC release said "However, His Excellency Al-Kaabi voiced concern that during the global discussion on energy transition, there is a lack of investment in oil and gas projects, which could drive energy prices higher by stating that "while gas and LNG are important for the energy transition, there is a lack of investments that could cause a significant shortage in gas between 2025-2030, which in turn could cause a spike in the gas market." (ii) Second, this is a big 4.3 bcf/d expansion, but India alone has 3x the increase in LNG import demand. We tweeted [\[LINK\]](#) "2/3. Adding 4.3 bcf/d is big, but dwarfed by items like India. #Petronet gave 1st specific forecast for what it means if #NatGas is to be 15%

of energy mix by 2030 - India will need to increase #LNG imports by ~13 bcf/d. See SAF Group June 20 Energy Tidbits memo.” (iii) Third, Qatar’s supply gap warning is driven by the lack of investments in LNG supply. We agree, but note that the lack of investment is in great part due to the delays in both projects under construction and in FIDs that were supposed to be done in 2019. We tweeted [\[LINK\]](#) “3/3. #LNGSupplyGap is delay driven. \$TOT Mozambique Phase 1 delay has chain effect, backs up 5 bcf/d. See SAF Group Apr 28 blog Multiple Brownfield LNG FIDs Now Needed To Fill New #LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2? #NatGas.”

Seems like many missed India’s first specific LNG forecast to 2030. Our June 20, 2021 Energy Tidbits memo highlighted the first India forecast that we have seen to estimate the required growth in natural gas consumption and LNG imports if India is to meet its target for natural gas to be 15% of its energy mix by 2030. India will need to increase LNG imports by ~13 bcf/d or 3 times the size of the Qatar LNG expansion. Our June 6, 2021 Energy Tidbits noted the June 4 tweet from India’s Energy Minister Dharmendra Pradhan [\[LINK\]](#) reinforcing the 15% goal “We are rapidly deploying natural gas in our energy mix with the aim to increase the share of natural gas from the current 6% to 15% by 2030.” But last week, Petronet CEO AK Singh gave a specific forecast. Reuters report “LNG’s share of Indian gas demand to rise to 70% by 2030: Petronet CEO” [\[LINK\]](#) included Petronet’s forecast if India is to hit its target for natural gas to be 15% of energy mix by 2030. Singh forecasts India’s natural gas consumption would increase from current 5.5 bcf/d to 22.6 bcf/d in 2030. And LNG shares would increase from 50% to 70% of natural gas consumption ie. an increase in LNG imports of ~13 bcf/d from just under 3 bcf/d to 15.8 bcf/d in 2030. Singh did not specifically note his assumption for India’s natural gas production, but we can back into the assumption that India natural gas production grows from just under 3 bcf/d to 6.8 bcf/d. It was good to finally see India come out with a specific forecast for 2030 natural gas consumption and LNG imports if India is to get natural gas to 15% of its energy mix in 2030. Petronet’s Singh forecasts India natural gas consumption to increase from 5.5 bcf/d to 22.6 bcf/d in 2030. This forecast is pretty close to our forecast in our Oct 23, 2019 blog “Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030”. Here part of what we wrote in Oct 2019. “It’s taken a year longer than we expected, but we are finally getting visibility that India is taking significant steps towards India’s goal to have natural gas be 15% of its energy mix by 2030. On Wednesday, we posted a SAF blog [\[LINK\]](#) “Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030”. Our 2019 blog estimate was for India natural gas demand to be 24.0 bcf/d in 2030 (vs Singh’s 22.6 bcf/d) and for LNG import growth of +18.4 bcf/d to 2030 (vs Singh’s +13 bcf/d). The difference in LNG would be due to our Oct 2019 forecast higher natural gas consumption by 1.4 bcf/d plus Singh forecasting India natural gas production +4 bcf/d to 2030. Note India production peaked at 4.6 bcf/d in 2010.

Bigger, nearer LNG supply gap + Asian buyers moving to long term LNG deals = LNG players forced to at least look at what brownfield LNG projects they could advance and move to FID. All we have seen since our April 28 blog is more validation of the bigger, nearer LNG supply gap. And now market participants (Asian LNG buyers) are reacting to the new data by locking up long term supply. Cheniere noted how the pickup in commercial engagement means they “are quite optimistic over the coming 12-18 months to make a substantial dent in that Stage 3 commercialization.” Cheniere can’t be the only LNG supplier having new commercial discussions. It’s why we believe the Mozambique delays + Asian LNG buyers moving to long term deals will effectively force major LNG players to look to see if there are brownfield LNG projects they should look to advance. Prior to March/April, no one would think Shell or other major LNG players would be considering any new LNG FIDs in 2021. Covid forced all the big companies into capital reduction mode and debt reduction mode. But Brent oil is now solidly over \$70, and LNG prices are over \$13 this summer and the world’s economic and oil and gas demand outlook are increasing with vaccinations. And we are starting to see companies move to increasing capex with the higher cash flows. The theme in Q3 reporting is going to be record or near record oil and gas cash flows, reduced debt levels and increasing returns to shareholders. And unless new mutations prevent vaccinations from returning the world to normal, we suspect that major LNG players, like other oil and gas companies, will be looking to increase capex as they approve 2022 budgets. The outlook for the future has changed dramatically in the last 8 months. The question facing major LNG players like Shell is should they look to FID new LNG brownfield projects in the face of an increasing LNG supply gap that is going to hit faster and harder and Asian LNG buyers prepared to do long term deals. We expect these decisions to be looked at before the end of 2021 for 2022 capex budget/releases. One wildcard that could force these decisions sooner is the already stressed out global supply chain. We have to believe that discussion there will be pressure for more Asian LNG buyer long term deals sooner than later.

For Canada, does the increasing LNG supply gap provide the opportunity to at least consider a LNG Canada Phase 2 FID over the next 6 months? Our view on Shell and other LNG players is unchanged since our April 28 blog. Shell is no different than any other major LNG supplier in always knowing the market and that the oil and gas outlook is much stronger than 9 months ago. Even 3 months post our April 28 blog, we haven't heard any significant talks on how major LNG players will be looking at FID for new brownfield LNG projects. We don't have any inside contacts at Shell or LNG Canada, but that is no different than when we looked at the LNG markets in September 2017 and saw the potential for Shell to FID LNG Canada in 2018. We posted a September 20, 2017 blog "*China's Plan To Increase Natural Gas To 10% Of Its Energy Mix Is A Global Game Changer Including For BC LNG*" [\[LINK\]](#). Last time, it was a demand driven supply gap, this time, it's a supply driven supply gap. We have to believe any major LNG player, including Shell, will be at least looking at their brownfield LNG project list and seeing if they should look to advance FID later in 2021. Shell has LNG Canada Phase 2, which would add 2 additional trains or approx. 1.8 bcf/d. And an advantage to an FID would be that Shell would be able to commit to its existing contractors and fabricators for a continuous construction cycle following on LNG Canada Phase 1 ie. to help keep a lid on capital costs. We believe maintaining a continuous construction cycle is even more important given the stressed global supply chain. No one is talking about the need for these new brownfield LNG projects, but, unless some major change in views happen, we believe its inevitable that these brownfield LNG FID internal discussions will be happening in H2/21. Especially since the oil and gas price outlook is much stronger than it was in the fall and companies will be looking to increase capex in 2022 budgets.

A LNG Canada Phase 2 would be a big plus to Cdn natural gas. LNG Canada Phase 1 is a material natural gas development as its 1.8 bcf/d capacity represents approx. 20 to 25% of Cdn gas export volumes to the US. The EIA data shows US pipeline imports of Cdn natural gas as 6.83 bcf/d in 2020, 7.36 bcf/d in 2019, 7.70 bcf/d in 2018, 8.89 bcf/d in 2017, 7.97 bcf/d in 2016, 7.19 bcf/d in 2015 and 7.22 bcf/d in 2014. A LNG Canada Phase 2 FID would be a huge plus for Cdn natural gas. It would allow another ~1.8 bcf/d of Cdn natural gas to be priced against pricing points other than Henry Hub. And it would provide demand offset versus Trudeau if he moves to make electricity "emissions free" and not his prior "net zero emissions". Mozambique has been a game changer to LNG outlook creating a bigger and sooner LNG supply gap. And with a stronger tone to oil and natural gas prices in 2021, the LNG supply gap will at least provide the opportunity for Shell to consider FID for its brownfield LNG Canada Phase 2 and provide big support to Cdn natural gas for the back half of the 2020s. And perhaps if LNG Canada is exporting 3.6 bcf/d from two phases, it could help flip Cdn natural gas to a premium vs US natural gas especially if Biden is successful in reducing US domestic natural gas consumption for electricity. The next six months will be very interesting to watch for LNG markets and Cdn natural gas valuations. Imagine the future value of Cdn natural gas is there was visibility for 3.6 bcf/d of Western Canada natural gas to be exported to Asia.

<https://www.trafigura.com/press-releases/trafigura-signs-usd3-billion-loan-agreement-guaranteed-by-the-federal-republic-of-germany-to-secure-gas-supply/>

05 December 2022

Trafigura signs USD3 billion loan agreement guaranteed by the Federal Republic of Germany to secure gas supply

Geneva, December 5, 2022 - Trafigura, a market leader in the global commodities industry, has entered into a USD3 billion four-year loan jointly arranged and underwritten by Deutsche Bank and another international bank and syndicated to a number of participating banks. Over 25 banks participated in the successful syndication which was 1.6 times oversubscribed.

The loan is secured, in part, by a guarantee under the Untied Financial Loan program (UFK) of the government of the Federal Republic of Germany acting through the German Export Credit Agency (ECA) Euler Hermes Aktiengesellschaft. The program is a tool to secure the long-term delivery of strategic commodities to Germany.

The loan will support a new commitment by Trafigura to deliver substantial volumes of gas into the European gas grid, and ultimately into Germany, over the next four years. Trafigura will supply the gas to Securing Energy for Europe (SEFE), which was recently recapitalised by the German government. The first gas delivery took place on 1 November 2022 and Trafigura will primarily use existing quantities from its global gas and LNG portfolio to help secure gas supplies to SEFE. The agreement included a review of Trafigura's environmental, social and governance (ESG) policies and performance.

"We are proud to be contributing to Europe's energy security by supplying this significant volume of gas to Germany backed by our extensive portfolio and long term US LNG contracts," said Richard Holtum, Head of Gas and Power Trading for Trafigura.

<https://www.qatarenergy.qa/en/MediaCenter/Pages/newsdetails.aspx?ItemId=3738>

QATARENERGY, CONOCOPHILLIPS SIGN LONG-TERM SUPPLY AGREEMENT OF QATARI LNG TO GERMANY FOR AT LEAST 15 YEARS -

DOHA, Qatar • 29 November 2022 – QatarEnergy announced the signing of two long-term LNG sale and purchase agreements (SPAs) between QatarEnergy and ConocoPhillips affiliates for the delivery of up to two (2) million tons per annum (MTPA) of LNG from Qatar to Germany.

Pursuant to the two SPAs, a ConocoPhillips wholly owned subsidiary will purchase the agreed quantities to be delivered ex-ship to the “German LNG” receiving terminal, which is currently under development in Brunsbüttel in northern Germany, with deliveries expected to start in 2026.

The LNG volumes will be sourced from the two joint ventures between QatarEnergy and ConocoPhillips that hold interests in Qatar’s North Field East (NFE) and North Field South (NFS) projects.

The SPAs were signed today by His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, and Mr. Ryan Lance, the Chairman and CEO of ConocoPhillips, at a special event held at QatarEnergy’s headquarters in Doha in the presence of senior executives from both companies.

Speaking at the signing ceremony, His Excellency Mr. Saad Sherida Al-Kaabi said: “We are pleased to sign these agreements with our partner ConocoPhillips to supply up to 2 million tons per annum of LNG to Germany from the two QatarEnergy-ConocoPhillips joint ventures in the NFE and NFS LNG expansion projects respectively, starting in 2026. These agreements are momentous for several reasons. They mark the first ever long-term LNG supply to Germany with a supply period that extends for at least 15 years, thus contributing to Germany’s long-term energy security. They also represent the culmination of efforts between two trusted partners, QatarEnergy and ConocoPhillips, over many years, to provide reliable and credible LNG supply solutions to customers across the globe, and today, to German end-consumers. This is a concrete demonstration of QatarEnergy’s resolve to provide reliable energy supplies to all major markets around the world, and of our commitment to the German people.”

His Excellency Minister Al-Kaabi added: “Germany is the largest gas market in Europe, with significant demand in the industrial, power, and household sectors, and we are committed to contribute to the energy security of Germany and Europe at large. The agreements we are about to sign today are a further manifestation of this commitment, which is reinforced through the sizeable investments we have made and continue to make along the entire gas value chain encompassing production capacity increases in Qatar and the Golden Pass LNG export project in the United States. Such investments also include the execution of the largest LNG ship building program in the history of the energy sector, as well as securing long-term commitments in LNG receiving infrastructure in several European countries. Our dialogue with our European partners continues with the aim of achieving greater energy security, long-term market stability, and a smoother energy transition for the benefit of all.”

Minister Al-Kaabi expressed his thanks and appreciation to the teams from both sides whose hard work and dedication made these agreements possible and concluded his remarks by paying tribute to the leadership of His Highness the Amir Sheikh Tamim bin Hamad Al Thani, and His wise leadership and unwavering support to Qatar’s energy sector.

On his part, Mr. Ryan Lance, the Chairman and CEO of ConocoPhillips said: “QatarEnergy and ConocoPhillips are excited for the opportunity to responsibly and securely supply world markets with LNG from the Qatari expansion projects.”

“These agreements will provide an attractive LNG offtake solution for our new joint ventures with QatarEnergy and position the joint ventures as reliable sources of LNG supply into Europe,” Mr. Lance added.

ConocoPhillips’ partnership in the North Field LNG Expansion Projects is made up of a 3.125% share in the NFE project and a 6.25% share in the NFS project, which are planned to commence production in 2026 and 2027, respectively.

Heavy Crude Oil

Accessing more reservoir with multilateral technology



~1,570 defined multilateral locations⁽¹⁾

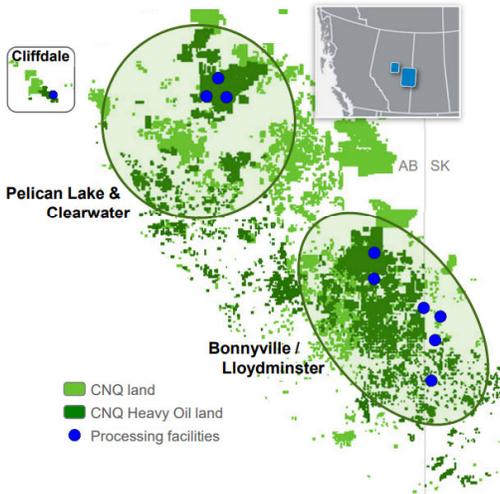
- Technology and innovation drive the evolution of horizontal well design
 - Multilateral configuration tailored to reservoir and fluid
 - Increases reservoir contact, resulting in higher production rates and higher EUR
 - Reduced surface disturbance
- Applicable across our large heavy oil land base

(1) Assumes US\$70/bbl WTI, 22% WCS differential, C\$3.25/GJ AECO and US\$1.00 to C\$1.30 foreign exchange.
Note: See Advisory for cautionary statements.



Heavy Crude Oil

Overview



Large land base
~3.2 million net acres
 ~1,570 defined multilateral locations⁽¹⁾
 ~1,600 defined slant locations⁽¹⁾
 High value **drill to fill** opportunities
 ~67,000 BOE/d available facility capacity

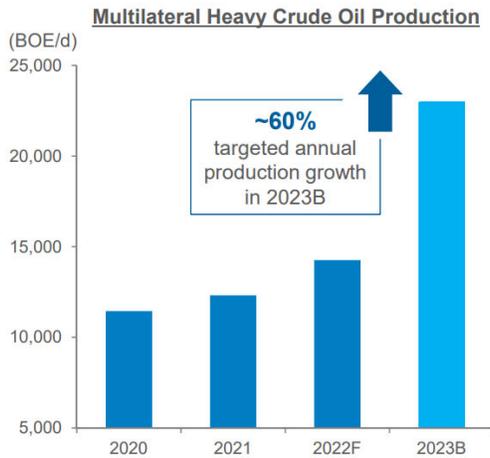
- Largest primary and polymer flood heavy crude oil producer in Canada
 - Production of ~120,000 bbl/d in 2022F
- Economies of scale with extensive infrastructure advantage
 - Large, concentrated land base
 - Repeatable, scalable programs
- Leveraging technology to reduce costs, increase productivity and reduce environmental footprint

(1) Assumes US\$70/bbl WTI, 22% WCS differential, C\$3.25/GJ AECO and US\$1.00 to C\$1.30 foreign exchange.
Note: See Advisory for cautionary statements.



Heavy Crude Oil: Bonnyville & Lloydminster

Multilateral technology & development over time



50% improvement in well productivity

42% improvement in capital efficiencies

~2.5x reduction in surface footprint compared to slant wells

~1,260 defined multilateral locations⁽¹⁾

- Multilateral well development drives higher productivity, stronger capital efficiencies and reduced surface disturbance
 - Increased reservoir contact and repeatability
 - Longer lateral lengths (~8,000 m)
 - Low risk, repeatable and scalable programs
- 2023B development plan
 - Targeting 133 multilateral wells
 - Strong capital efficiency of ~\$10,800/BOE/d

(1) Assumes US\$70/bbl WTI, 22% WCS differential, C\$3.25/GJ AECCO and US\$1.00 to C\$1.30 foreign exchange.
Note: See Advisory for cautionary statements.



TECHNOLOGY ADVANCEMENTS IN MULTILATERAL WELLS DRIVE STRONGER RESULTS

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Heavy Crude Oil: Bonnyville & Lloydminster

Leveraging improved multilateral technology

	Multilateral Wells		
	Pre 2018 wells	2022 wells	Improvement
Horizontal length per well (m)	5,200	8,500	~63% longer
EUR/Well (Mbbbl)	130	180	~38% increase
Production/Well (bbl/d) ⁽¹⁾	150	230	~50% higher
Capital Efficiency (\$/bbl/d) ⁽²⁾	\$16,200	\$9,450	~42% stronger



~2.5x reduction in surface footprint compared to slant wells

(1) Based on average initial production rate of 90 days.

(2) Costs include drill, complete, equip and tie-in well site. Production based on average initial production rate of 365 days.



TECHNOLOGY & CONTINUOUS IMPROVEMENT DRIVE HIGHER RETURNS

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<https://www.tcenergy.com/incident/milepost-14-incident/>



TC Energy actively responding to oil incident

Updated: 14:18pm CT - December 9, 2022

We are continuing to advance our response efforts at Milepost 14, including:

- An increased workforce on site including remediation crews.
- Product remains contained and multiple vacuum trucks and booms are onsite and we have begun the recovery process.
- Repair planning is also underway, as are shoreline assessments.
- Continuous air quality monitoring has been deployed.

The affected segment of the Keystone Pipeline System remains isolated and downstream migration of the release is contained. **Plans for return-to-service continue to be evaluated.**

At the time of the incident, the pipeline was operating within its design and regulatory approval requirements. Over the last several years, we have taken decisive action to implement measures to strengthen our approach to safety and the integrity of our system and will conduct a full investigation into the root cause of this incident, in cooperation with regulators.

We have been working closely with regulators, local elected officials, landowners, the community and tribal nations to keep them informed.

The health and safety of onsite staff and personnel, the surrounding community, and mitigating risk to the environment is our primary focus right now. Our response efforts will continue until we have fully remediated the site.

We will continue to provide updates as information becomes available.

Further inquiries can be sent to TC Energy media relations at media@tcenergy.com.

Updated: 16:40pm CT - December 8, 2022

TC Energy continues to respond to a release of oil from our Keystone Pipeline System into a creek in Washington County, Kansas.

The affected segment has been isolated and we have contained downstream migration of the release.

The system remains shutdown as our crews actively respond and work to contain and recover the oil. Our estimated release volume is 14,000 barrels.

Our primary focus right now is the health and safety of onsite staff and personnel, the surrounding community, and mitigating risk to the environment. We immediately activated our emergency response procedures and we have established environmental monitoring, including around-the-clock air monitoring. Our response efforts will continue until we have fully remediated the site.

We will continue to provide timely updates as information becomes available.

Further inquiries can be sent to TC Energy media relations at media@tcenergy.com.



TC Energy crews responding to incident on Dec. 8, 2022 in Washington County, Kansas

[DOWNLOAD IMAGE](#)

5:35am CT - December 8, 2022

We have shut down the Keystone Pipeline System and mobilized people and equipment in response to a confirmed release of oil into a creek in Washington County, Kan., approximately 20 miles (32 kilometres) south of Steele City, Neb.

Pursuant to our incident protocols, an emergency shutdown and response was initiated at approximately 8 p.m. CT, on Dec. 7, 2022, after alarms and a detected pressure drop in the system. The affected segment has been isolated, and booms deployed to control downstream migration of the release. The system remains shutdown as our crews actively respond and work to contain and recover the oil.

We are proceeding to make appropriate notifications, including to our customers and regulators and will work cooperatively with third parties to effectively respond to this incident.

Our primary focus right now is the health and safety of onsite staff and personnel, the surrounding community, and mitigating risk to the environment through the deployment of booms downstream as we work to contain and prevent further migration of the release.

We will provide more information as soon as it becomes available.

Further inquiries can be sent to TC Energy media relations at media@tcenergy.com.



U.S. Department
of Transportation
**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

December 8, 2022

VIA ELECTRONIC MAIL TO: richard_prior@tcenergy.com

Richard Prior
TC Oil Pipeline Operations, Inc.
700 Louisiana Suite 700
Houston, TX 77002

Re: CPF No. 3-2022-074-CAO

Dear Mr. Prior,

Enclosed please find a Corrective Action Order (CAO or Order) issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), in the above-referenced case. It requires TC Oil Pipeline Operations, Inc., to take certain corrective actions with respect to a pipeline failure that occurred on December 7, 2022, on the 36-inch Keystone pipeline three miles east of Washington, Kansas.

Service of the CAO by electronic mail is effective upon the date of transmission and acknowledgment of receipt as provided under 49 C.F.R. § 190.5. The terms and conditions of this Order are effective upon completion of service.

Sincerely,

Alan K. Mayberry
Associate Administrator
for Pipeline Safety

Enclosure: CAO

cc: Mr. Gregory Ochs, Director, Central Region, Office of Pipeline Safety, PHMSA

CONFIRMATION OF RECEIPT REQUESTED

**U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
OFFICE OF PIPELINE SAFETY
WASHINGTON, D.C. 20590**

In the Matter of)	
)	
TC Oil Pipeline Operations, Inc.,)	CPF No. 3-2022-074-CAO
)	
Respondent.)	
)	
)	

CORRECTIVE ACTION ORDER

Purpose and Background

This Corrective Action Order (CAO or Order) is being issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), under the authority of 49 U.S.C. § 60112, to require TC Oil Pipeline Operations, Inc. (TC Oil or Respondent), to take necessary corrective actions to protect the public, property, and the environment from potential hazards associated with the December 7, 2022, crude oil pipeline failure that occurred on the 36-inch Keystone pipeline, approximately three miles east of Washington, Kansas (Failure).

The Keystone Pipeline is a 2,687-mile hazardous liquid pipeline system between Hardisty, Alberta, Canada, and Patoka, Illinois, and Port Arthur, Texas.¹ The 36-inch diameter Cushing Extension was Phase 2 of the Keystone pipeline. Construction was completed in 2011 for the Cushing Extension. The Cushing Extension begins in Steele City, Nebraska and goes to Cushing, Oklahoma, and is approximately 288 miles long. The MOP of the pipeline is 1,440 psig, and it operates under Special Permit PHMSA-2006-26617.

At approximately 09:01 PM CST a leak detection alarm (volume imbalance) was received. An Emergency-Line Trip alarm was received 6-minutes later. The pipeline was subsequently shut down and isolation valves were commanded closed at 09:08 PM CST. The location of the Failure is Cushing Extension, MP 14. The affected segment of the pipeline spans from Steele City pump station (MP 0.0) to Hope pump station (MP 95.7, approximately). Upon receiving the leak alarms, TC Oil personnel were dispatched and identified a crude oil odor north of U.S. Highway 36. The failure location was subsequently confirmed to be approximately two miles north of the highway crossing. Crude Oil from the pipeline has impacted Mill Creek, at approximate coordinates of 39-degrees, 50-minutes, 33-seconds, and -96-degrees, 59-minutes, 44-seconds.

¹ See Overview, TC ENERGY, <https://www.tcenergy.com/operations/oil-and-liquids/keystone-pipeline-system/> (last accessed Dec. 8, 2022)

TC Oil was in the process of running an in-line inspection (ILI) tool. The ILI tool is currently downstream of the failure location. Respondent had bypassed the Hope, Kansas, pump station, the next station downstream, in preparation for the tool to pass when the failure occurred.

Pursuant to 49 U.S.C. § 60117, PHMSA has initiated an investigation of the Failure. The preliminary findings of the Agency's ongoing investigation are as follows:

Preliminary Findings

- On December 7, 2022, at approximately 09:01 PM CST a leak detection alarm (volume imbalance) was received. An Emergency-Line Trip alarm was received 6-minutes later.
- The pipeline was shut down and isolation valves were commanded closed at 09:08 PM CST.
- Upon receiving notification of the Failure, TC Oil personnel were dispatched and identified a crude oil odor north of U.S. Highway 36. The Failure location was subsequently confirmed approximately two miles north of the highway crossing.
- The location of the Failure is Cushing Extension, MP 14. The affected segment of the pipeline spans from Steele City pump station (MP 0.0) to Hope pump station (MP 95.7, approximately).
- The pipeline is a 36-inch diameter, 0.465-inch wall thickness, Grade X-70, and manufactured by Evraz. The MOP is 1,440 psig.
- The 36-inch diameter Cushing Extension was Phase 2 of the Keystone pipeline. Construction was completed in 2011 for the Cushing Extension. The Cushing Extension begins in Steele City, Nebraska and goes to Cushing, Oklahoma, and is approximately 288 miles long.
- Crude Oil from the pipeline has impacted Mill Creek crossing, at approximate coordinates of 39-degrees, 50-minutes, 33-seconds, and -96-degrees, 59-minutes, 44-seconds.
- Keystone pipeline traverses several High Consequence Areas and navigable rivers. The Keystone pipeline Cushing Extension traverses could affect HCA areas
- TC Oil was in the process of running an ILI tool. The ILI tool is currently downstream of the failure location. TC Oil had bypassed the Hope, Kansas, pump station, the next station downstream, in preparation for the tool to pass when the failure occurred.
- The initial estimated spill volume is approximately 14,000 barrels of crude oil.\
- On May 7, 2011, a reportable accident occurred on pump station piping on the Keystone crude oil pipeline at the Ludden Pump Station. On May 29, 2011, a second reportable

failure incident occurred on piping at the Severance Pump Station. On June 3, 2011, PHMSA issued a Corrective Action Order requiring Respondent to take corrective actions (CPF No. 3-2011-5006H). On June 13, 2011, Respondent submitted a response to this CAO requesting a hearing. Following informal discussions between Respondent and PHMSA, based on the most up-to-date information, PHMSA agreed to make minor changes and clarifications to the original CAO in an Amended CAO issued June 28, 2011. The Order was closed on January 13, 2015, after TC Oil had completed all the required corrective actions.

- On April 2, 2016, a reportable accident due to a leak in a cracked tie-in weld occurred on the Keystone pipeline on the 48.1-mile segment between Freeman (Pump Station 23) and Hartington (Pump Station 24). On April 9, 2016, PHMSA issued a Corrective Action Order requiring Respondent to take corrective actions (CPF No. 3-2016-5002H). The Order was closed on March 30, 2017, after TC Oil had completed all the required corrective actions.
- PHMSA issued a Corrective Action Order (CPF No. 3-2017-5008H) to TC Oil on November 28, 2017, due to a fracture that initiated at an area of previous mechanical damage. This Order was closed on January 29, 2019, after Respondent completed all the required corrective actions.
- On October 30, 2019, a reportable accident occurred on the 41.9-mile Keystone pipeline segment that runs between the Edinburg Pump Station and the Niagara Pump Station, near Niagara, North Dakota. On November 5, 2019, PHMSA issued a Corrective Action Order requiring Respondent to take corrective action (CPF No. 3-2019-5023H). The Order was closed on February 3, 2022, after TC Oil had completed all the required corrective actions.
- On October 14, 2022, PHMSA issued a Notice of Probable Violation, Proposed Civil Penalty, and Proposed Compliance Order (CPF No. 3-2022-025-NOPV) following a special inspection of TC Oil's Lucas delivery facility in Beaumont, Texas, following a crude oil spill that occurred there on May 7, 2020. The proceeding remains open at this time.
- The investigation is on-going, and information could change. This order may be amended based on further findings during the investigation.

Determination of Necessity for Corrective Action Order and Right to Hearing

Section 60112 of title 49, United States Code, authorizes PHMSA to determine that a pipeline facility is or would be hazardous to life, property, or the environment and if there is a likelihood of serious harm, to expeditiously order the operator of the facility to take necessary corrective action, including suspended or restricted use of the facility, physical inspection, testing, repair, replacement, or other appropriate action. An order issued expeditiously must provide an opportunity for a hearing as soon as practicable after the order is issued.

In deciding whether to issue an order, PHMSA must consider the following, if relevant: (1) the characteristics of the pipe and other equipment used in the pipeline facility, including the age, manufacture, physical properties, and method of manufacturing, constructing, or assembling the equipment; (2) the nature of the material the pipeline facility transports, the corrosive and deteriorative qualities of the material, the sequence in which the material is transported, and the pressure required for transporting the material; (3) the aspects of the area in which the pipeline facility is located, including climatic and geologic conditions and soil characteristics; (4) the proximity of the area in which the hazardous liquid pipeline facility is located to environmentally sensitive areas; (5) the population density and population and growth patterns of the area in which the pipeline facility is located; (6) any recommendation of the National Transportation Safety Board made under another law; and (7) any other factors PHMSA may consider as appropriate.

After evaluating the foregoing preliminary findings of fact, and having considered the characteristics of the pipeline, including the prior failures of the pipeline; the hazardous nature of the material (crude oil) transported; the uncertainty as to the root cause(s) of the Failure; the existing and potential additional impacts to property, the environment, and wildlife; and the possibility that the same condition(s) that may have caused the failure remain present in the pipeline and could lead to additional failures; I find that continued operation of the *Affected Segment*, as defined below, without corrective measures is or would be hazardous to life, property, or the environment, and that failure to issue this Order expeditiously would result in the likelihood of serious harm.

Accordingly, this Order mandating immediate corrective action is issued expeditiously without prior notice and opportunity for a hearing. The terms and conditions of this Order are effective upon receipt.

Within 10 days of receipt of this Order, Respondent may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, with a copy to the Director, PHMSA, OPS Central Region. If a hearing is requested, it will be held in accordance with 49 C.F.R. § 190.211.

After receiving and analyzing additional data in the course of this investigation, PHMSA may identify other corrective measures that need to be taken. Respondent will be notified of any additional measures required and, if appropriate, PHMSA will consider amending this Order. To the extent consistent with safety, Respondent will be afforded notice and an opportunity for a hearing prior to the imposition of any additional corrective measures.

Required Corrective Actions

Definitions:

Affected Segment – The “*Affected Segment*” means approximately 96 miles of TC Oil’s Keystone pipeline that contains the 36-inch diameter pipe from Steele City pump station (MP 0.0) to Hope pump station (MP 95.7, approximately). The *Affected Segment* traverses the following counties: Jefferson County NE, Washington County KS, Clay County KS, and Dickinson County KS.

Director – The "Director" means the Director, PHMSA, OPS Central Region.

Pursuant to 49 U.S.C. 60112, I hereby order TC Oil to take the following corrective actions:

1. **Shutdown of the Affected Segment.** The *Affected Segment* must remain shut-in and may not be operated until authorized to be restarted by the Director in accordance with the terms of this Order.
2. **Operating Pressure Restriction.** TC Oil must reduce and maintain a twenty percent (20%) pressure reduction in the actual operating pressure along the entire length of the *Affected Segment* such that upon restart the operating pressure along the *Affected Pipeline* will not exceed eighty percent (80%) of the actual operating pressure in effect at the failure location, immediately prior to the failure on December 7, 2022.
 - a. This pressure restriction is to remain in effect until written approval to increase the pressure or return the pipeline to its pre-failure operating pressure is obtained from the Director.
 - b. Within 15 days of receipt of the CAO, TC Oil must provide the Director the actual operating pressures of each pump station on the *Affected Segment* at the time of failure and the reduced pressure restriction set-points at these same locations.
 - c. This pressure restriction requires any relevant remote or local alarm limits, software programming set-points or control points, and mechanical over-pressure devices to be adjusted accordingly.
 - d. When determining the pressure restriction set-points, TC Oil must take into account any in-line inspection (ILI) features or anomalies present in the *Affected Segment* to provide for continued safe operation while further corrective actions are completed.
 - e. TC Oil must review the pressure restriction monthly by analyzing the operating pressure data, taking into account any ILI features or anomalies present in the *Affected Segment*. TC Oil must immediately reduce the operating pressure further to maintain the safe operations of the *Affected Segment*, if warranted by the monthly review. Further, TC Oil must submit the results of the monthly review to the Director including, at a minimum, the current discharge set-points (including any additional pressure reductions), and any pressure exceedance at discharge set-points. Submittals may be made quarterly, in accordance with Item 15 below.
3. **Review of Prior In-line Inspection (ILI) Results.**
 - a. Within 30 days of receipt of the CAO, TC Oil must conduct a review of any previous ILI results of the *Affected Segment*. In its review, TC Oil must re-evaluate all ILI results from the past 10 calendar years, including a review of the ILI vendors' raw data and analysis. TC Oil must determine whether any features were present in the failed pipe joints from the December 7, 2022, failure. Also, TC Oil must determine if any features with similar characteristics are present elsewhere on the *Affected Segment*. TC Oil must submit documentation of this ILI review to the Director within 45 days of receipt of the CAO, as follows:
 - i. List all ILI tool runs, tool types, and the calendar years of the tool runs.

- ii. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features present in the failed joint and other pipe removed.
 - iii. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features with similar characteristics present elsewhere on the *Affected Segment*.
 - iv. Explain the process used to review the ILI results and the results of the reevaluation.
4. ***Mechanical and Metallurgical Testing***. Within 45 days of receipt of the CAO, TC Oil must complete mechanical and metallurgical testing and failure analysis of the failed pipe, including an analysis of soil samples and any foreign materials. Mechanical and metallurgical testing must be conducted by an independent third-party acceptable to the Director, and must document the decision-making process and all factors contributing to the failure. TC Oil must complete the testing and analysis as follows:
- a. Document the chain-of-custody when handling and transporting the failed pipe section and other evidence from the failure site.
 - b. Within 10 days of receipt of the CAO, develop and submit the testing protocol and the proposed testing laboratory to the Director for prior approval.
 - c. Prior to beginning the mechanical and metallurgical testing, provide the Director with the scheduled date, time, and location of the testing to allow for an OPS representative to witness the testing.
 - d. Ensure the testing laboratory distributes all reports whether draft or final in their entirety to the Director at the same time they are made available to TC Oil.
5. ***Root Cause Failure Analysis***. Within 90 days following receipt of the CAO, complete a root cause failure analysis (RCFA) and submit a final report of this RCFA to the Director. The RCFA must be supplemented or facilitated by an independent third-party acceptable to the Director and must document the decision-making process and all factors contributing to the failure. The final report must include findings and any lessons learned and whether the findings and lessons learned are applicable to other locations within TC Oil's pipeline system.
6. ***Remedial Work Plan (RWP)***.
- a. Within 90 days following receipt of the CAO, TC Oil must submit a remedial work plan (RWP) to the Director for approval.
 - b. The Director may approve the RWP incrementally without approving the entire RWP.
 - c. Once approved by the Director, the RWP will be incorporated by reference into this Order.
 - d. The RWP must specify the tests, inspections, assessments, evaluations, and remedial measures TC Oil will use to verify the integrity of the *Affected Segment*. It must address all known or suspected factors and causes of the December 7, 2022, failure. TC Oil must consider the risks and consequences of another failure to develop a prioritized schedule for RWP-related work along the *Affected*

Segment.

- e. The RWP must include a procedure or process to:
- i. Identify pipe in the *Affected Segment* with characteristics similar to the contributing factors identified for the December 7, 2022, failure, including the age and manufacture of the entire length of the *Affected Segment*.
 - ii. Gather all data necessary to review the failure history (in service and pressure test failures) of the *Affected Segment* and to prepare a written report containing all the available information such as the locations, dates, and causes of leaks and failures.
 - iii. Integrate the results of the metallurgical testing, root cause failure analysis, and other corrective actions required by this Order with all relevant pre-existing operational and assessment data for the *Affected Segment*. Pre-existing operational data includes, but is not limited to, design, construction, operations, maintenance, testing, repairs, prior metallurgical analyses, and any third-party consultation information. Pre-existing assessment data includes, but is not limited to, ILI tool runs, hydrostatic pressure testing, direct assessments, close interval surveys, and DCVG/ACVG surveys.
 - iv. Determine if conditions similar to those contributing to the failure on December 7, 2022, are likely to exist elsewhere on the *Affected Segment*.
 - v. Conduct additional field tests, inspections, assessments, and evaluations to determine whether, and to what extent, the conditions associated with the failure on December 7, 2022, and other failures from the failure history (see (e)(ii) above) or any other integrity threats are present elsewhere on the *Affected Segment*. At a minimum, this process must consider all failure causes and specify the use of one or more of the following:
 - 1) ILI tools that are technically appropriate for assessing the pipeline system based on the cause of failure on December 7, 2022, and that can reliably detect and identify anomalies,
 - 2) Hydrostatic pressure testing,
 - 3) Close-interval surveys,
 - 4) Cathodic protection surveys, to include interference surveys in coordination with other utilities (e.g., underground utilities, overhead power lines, etc.) in the area,
 - 5) Coating surveys,
 - 6) Stress corrosion cracking surveys,
 - 7) Selective seam corrosion surveys; and
 - 8) Other tests, inspections, assessments, and evaluations appropriate for the failure causes.

Note: TC Oil may use the results of previous tests, inspections, assessments, and evaluations if approved by the Director, provided the results of the tests, inspections, assessments, and evaluations are analyzed with regard to the factors known or suspected to have caused the December 7, 2022, failure.

- vi. Describe the inspection and repair criteria TC Oil will use to prioritize, excavate, evaluate, and repair anomalies, imperfections, and other identified integrity threats. Include a description of how any defects will be graded and a schedule for repairs or replacement.
 - vii. Based on the known history and condition of the *Affected Segment*, describe the methods TC Oil will use to repair, replace, or take other corrective measures to remediate the conditions associated with the pipeline failure on December 7, 2022, and to address other known integrity threats along the *Affected Segment*. The repair, replacement, or other corrective measures must meet the criteria specified in (e)(vi) above.
 - viii. Implement continuing long-term periodic testing and integrity verification measures to ensure the ongoing safe operation of the *Affected Segment* considering the results of the analyses, inspections, evaluations, and corrective measures undertaken pursuant to the Order.
- f. Include a proposed schedule for completion of the RWP.
 - g. TC Oil must revise the RWP as necessary to incorporate new information obtained during the failure investigation and remedial activities, to incorporate the results of actions undertaken pursuant to this Order, and to incorporate modifications required by the Director.
 - i. Submit any plan revisions to the Director for prior approval.
 - ii. The Director may approve plan revisions incrementally.
 - iii. All revisions to the RWP after it has been approved and incorporated by reference into this Order will be fully described and documented in the *CAO Documentation Report*.
 - h. Implement the RWP as it is approved by the Director, including any revisions to the plan.
7. **CAO Documentation Report (CDR)**. TC Oil must create and revise, as necessary, a CAO Documentation Report (CDR). When TC Oil has concluded all the items in this Order it will submit the final CDR in its entirety to the Director. This will allow the Director to complete a thorough review of all actions taken by SNG with regards to this Order prior to approving the closure of this Order. The intent is for the CDR to summarize all activities and documentation associated with this Order in one document.
- a. **The Director may approve the CDR incrementally without approving the entire CDR.**
 - b. Once approved by the Director, the CDR will be incorporated by reference into this Order.
 - c. The CDR must include, but is not necessarily limited to, the following:
 - i. Table of Contents;
 - ii. Summary of the pipeline failure of December 7, 2022, and the response activities;
 - iii. Summary of pipe data, material properties, and all prior assessments of the *Affected Pipeline*;

- iv. Summary of all tests, inspections, assessments, evaluations, and analysis required by the Order;
 - v. Summary of the mechanical and metallurgical testing as required by the Order;
 - vi. Summary of the RCFA with all root causes as required by the Order;
 - vii. Documentation of all actions taken by TC Oil to implement the RWP, the results of those actions, and the inspection and repair criteria used;
 - viii. Documentation of any revisions to the RWP including those necessary to incorporate the results of actions undertaken pursuant to this Order and whenever necessary to incorporate new information obtained during the failure investigation and remedial activities;
 - ix. Lessons learned while completing this Order;
 - x. A path forward describing specific actions TC Oil will take on its entire pipeline system as a result of the lessons learned from work on this Order; and
 - xi. Appendices (if required).
8. **Restart Plan.** Prior to resuming operation of the *Affected Segment*, develop and submit a written *Restart Plan* to the Director for prior approval.
- a. The Director may approve the *Restart Plan* incrementally without approving the entire plan, but the *Affected Segment* cannot resume operation until the *Restart Plan* is approved in its entirety.
 - b. Once approved by the Director, the *Restart Plan* will be incorporated by reference into this Order.
 - c. The *Restart Plan* must provide for adequate patrolling of the *Affected Segment* during the restart process and must include incremental pressure increases during start up, with each increment to be held for at least 2 hours.
 - d. The *Restart Plan* must include sufficient surveillance of the pipeline during each pressure increment to ensure that no leaks are present when operation of the line resumes.
 - e. The *Restart Plan* must specify a daylight restart and include advance communications with local emergency response officials and adjacent landowners.
 - f. The *Restart Plan* must provide for a review of the *Affected Segment* for conditions similar to those of the failure including a review of construction, operating and maintenance (O&M) and integrity management records such as ILI results, hydrostatic tests, root cause failure analysis of prior failures, aerial and ground patrols, corrosion, cathodic protection, excavations and pipe replacements. TC Oil must address any findings that require remedial measures to be implemented prior to restart.
 - g. The *Restart Plan* must also include documentation of the completion of all mandated actions, and a management of change plan to ensure that all procedural modifications are incorporated into TC Oil's O&M procedures manual.

9. **Return to Service.** After the Director approves the *Restart Plan*, TC Oil may resume operation of the *Affected Segment* according to the terms of the *Restart Plan*, but the operating pressure must not exceed the limit in accordance with Item 2 above.

Other Requirements:

10. **Approvals.** With respect to each submission under this Order that requires the approval of the Director, the Director may: (a) approve, in whole or part, the submission; (b) approve the submission on specified conditions; (c) modify the submission to cure any deficiencies; (d) disapprove in whole or in part, the submission, directing that Respondent modify the submission, or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Director, Respondent shall proceed to take all action required by the submission as approved or modified by the Director. If the Director disapproves all or any portion of the submission, Respondent must correct all deficiencies within the time specified by the Director and resubmit it for approval.
11. **Extensions of Time.** The Director may grant an extension of time for compliance with any of the terms of this Order upon a written request timely submitted demonstrating good cause for an extension.
12. **Reporting.** Submit quarterly reports to the Director that: (1) include all available data and results of the testing and evaluations required by this Order; and (2) describe the progress of the repairs or other remedial actions being undertaken. The first quarterly report is due on March 8, 2023. The Director may change the interval for the submission of these reports.
13. **Documentation of the Costs.** It is requested that Respondent maintain documentation of the costs associated with implementation of this CAO. Include in each monthly report submitted, the to-date total costs associated with: (1) preparation and revision of procedures, studies and analyses; (2) physical changes to pipeline infrastructure, including repairs, replacements and other modifications; and (3) environmental remediation, if applicable.

Be advised that all material you submit in response to this enforcement action is subject to being made publicly available. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. § 552(b), along with the complete original document you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. § 552(b).

In your correspondence on this matter, please refer to “CPF No. 3-2022-074-CAO” and for each document you submit, please provide a copy in electronic format whenever possible. The actions required by this Order are in addition to and do not waive any requirements that apply to Respondent’s pipeline system under 49 C.F.R. Parts 190 through 199, under any other order

issued to Respondent under authority of 49 U.S.C. Chapter 601, or under any other provision of federal or state law.

Respondent may appeal any decision of the Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

Failure to comply with this Order may result in the assessment of civil penalties and in referral to the Attorney General for appropriate relief in United States District Court pursuant to 49 U.S.C. § 60120.

The terms and conditions of this Order are effective upon service in accordance with 49 C.F.R. § 190.5.

December 8, 2022

Alan K. Mayberry
Associate Administrator
for Pipeline Safety

Date Issued

Governor Newsom Unveils Price Gouging Penalty on Big Oil's Excessive Profits to Protect Californians from Being Ripped Off

Published: Dec 05, 2022

After big oil hiked gas prices and made record profits, Governor Newsom convened a special session of the Legislature and called for a price gouging penalty on oil companies

SACRAMENTO – Following unexplained gas price hikes that led to record profits for Big Oil, Governor Gavin Newsom and Senator Nancy Skinner (D-Berkeley) today unveiled a proposed price gouging penalty on oil companies' excess profits to deter excessive price increases and keep money in Californians' pockets.

The language of the [proposed price gouging penalty can be found here.](#)

"California's price gouging penalty is simple – either Big Oil reins in the profits and prices, or they'll pay a penalty," said Governor Newsom. "Big Oil has been lying and gouging Californians to line their own pockets long enough. I look forward to the work ahead with our partners in the Legislature to get this done."

[Taking on Big Oil's Excessive Profits](#)

"Putting the Governor's proposal in print allows the Legislature and the public to begin discussions on this important issue. No one can deny that California's gas prices were outrageously high compared to other states. And those high prices hurt California consumers and businesses," said Senator Skinner (D-Berkeley).

The proposal introduced today by Senator Skinner comes as the California Legislature is assembling in a special session called by the Governor to pass a price gouging penalty. The Legislature will also consider efforts to empower state agencies to more closely review gas costs, profits and pricing as well provide the state with greater regulatory oversight of the refining, distribution and retailing segments of the gasoline market in California.

The proposal would discourage oil refiners from fleecing Californians by making it unlawful to charge excessive profits – excessive refiner margins would be punishable by a civil penalty from the California Energy Commission (CEC). The amount of the maximum margin and the amount of the penalty will be determined through the legislative process. Any penalties collected by the penalty will go to a Price Gouging Penalty Fund and then given back to Californians.

The proposal also improves transparency and oversight of the oil industry by the state, expanding the CEC and the California Department of Tax and Fee Administration's ability to investigate and obtain information on costs, profits and pricing so that the state can better

address the causes of pricing irregularities and minimize the likelihood of future supply or price shocks.

According to a recent poll from Consumer Watchdog, [60% of California voters support a price-gouging penalty](#).

In the third quarter of 2022, from July to September, oil companies reported record high profits:

- [Phillips 66 profits jumped to \\$5.4 billion](#), a 1243% increase over last year's \$402 million;
- BP posted \$8.2 billion in profits, its second-highest on record, with [\\$2.5 billion going toward share buybacks](#) that benefit Wall Street investors;
- [Marathon Petroleum profits rose to \\$4.48 billion](#), a 545% increase over last year's \$694 million;
- [Valero's \\$2.82 billion in profits](#) that were 500% higher than the year before;
- PBF Energy's \$1.06 billion that was [1700% higher than the year before](#);
- Shell reported a \$9.45 billion haul that sent [\\$4 billion to shareholders for stock buybacks](#);
- [Exxon](#) reported their highest-ever \$19.7 billion in profits;
- [Chevron](#) reported \$11.2 billion in profits, their second-highest quarterly profit ever.

Taking action to lower prices at the pump, Governor Newsom in [September](#) ordered the switch to winter blend gasoline and [demanded accountability from oil companies and refiners](#) that do business in California. Since California's record-high gas prices of \$6.42, the Governor's actions have reduced those prices to \$4.77 most recently – a decrease of \$1.65 since the peak.

Oil production increased by 0.57% in Colombia during September; Gas recorded an increase of 0.93%

December 2, 2022. Minenergia Bogota.

Sector: Hydrocarbons

The restoration of production and the entry of new wells in the departments of Meta, Putumayo, Casanare and Arauca, drove the increase in oil production that reached 753,719 barrels average per day during September 2022.

- Meanwhile, the average production of traded gas was 1,097.54 million cubic feet per day (mpcd), 10.25 mpcd more than the production registered in August.

Minenergy. Bogotá, December 2, 2022.

The National Hydrocarbons Agency (ANH) reported that the controlled oil production during September of this year was 753,584 average barrels per day (bopd), 0.57% higher than that registered in August 2022 when it reached 749,299 average barrels per day.

This behavior is mainly due to the increase in production in the fields: Caño Sur Este of Ecopetrol S.A. (Meta), Cohembi of Gran Tierra Energy Colombia, LLC (Putumayo), Azogue of Parex Resources Colombia LTD; Branch (Casanare), Chichimene of Ecopetrol S.A. (Meta), Kitaro of Parex Resources Colombia LTD; Jacana of Geopark Colombia S.A.S (Casanare) and Andina of Parex Resources Colombia LTD, Branch (Arauca). With respect to the same month of 2021, there was an increase in daily oil production that corresponds to 1.26% (753,584 vs 744,173 bopd)

At the end of the third quarter of the year, oil production reached 750,343 barrels per day (bopd), higher than the production registered in the first and second quarters of 2022, when in March it was 751,407 (bopd) and in June it reached 752,294 (bopd), respectively.

Meanwhile, the ANH reported that the average production of gas marketed during September was 1,097.54 million cubic feet per day (mpcd), which represented an increase of 0.93% compared to August, when it reached 1,087.29 (mpcd).

This increase was mainly due to the increase in production in the fields: Clarinete of CNE OIL & GAS SAS (Córdoba/Sucre), Cupiagua of Ecopetrol S.A. (Casanare), Pauto Sur of Ecopetrol S.A. (Casanare), Cupiagua Liria of Ecopetrol S.A (Casanare), Cornamusa of Canacol Energy Colombia SAS (Sucre) and Aguas Vivas of Canacol Energy Colombia SAS (Córdoba).

Compared to September 2021, marketed gas production increased by 1.35% from 1,082.87 (mpcd) to 1,097.54 (mpcd).

Excerpts from ANI reporting on Hardeep Singh Puri comments post Jennifer Granholm meeting in Washington



<https://aninews.in/news/world/us/india-is-clear-about-its-policy-regarding-oil-purchases-will-buy-oil-from-wherever-it-has-to-hardeep-singh-puri20221008143703/>

India is clear about its policy regarding oil purchases, will buy oil from wherever it has to: Hardeep Singh Puri

ANI | Updated: Oct 08, 2022 14:37 IST

Washington [US], October 8 (ANI): India has reiterated its choice of importing oil from countries like Russia after OPEC Plus, a consortium of oil-producing nations led by Russia and Saudi Arabia announced a slash in oil production by two million barrels per day.

While taking to reporters in Washington DC during his ongoing US visit, Union Minister of Petroleum and Natural Gas Hardeep Singh Puri on Saturday touched on several topics including how India will balance OPEC Plus oil production cut, diversification of energy - equity infusion, bio-fuel blending and green hydrogen.

With rising global energy requirements, the OPEC production cut is likely to impact countries like India, the third largest oil importer. Speaking on the topic of balancing the imports from OPEC Plus countries as well as from the US, which is also a oil exporting country, Puri said "If you are clear about your policy, which means you believe in energy security, energy affordability you will buy from wherever you have to. Our energy purchases from sources hitherto unheard of, we are in discussion with them."

Answering how India will negotiate the tightrope of expectations, he told ANI, "It's not a tight rope, I don't look at - We will also acquire assets outside wherever - I mean in recent months- we did USD 1.6 billion equity infusion which BPCL has done in Brazil. We are looking at assets in Africa."

Puri explained that oil exporting countries need buyers as they have to sell their products in the market.

"Sometimes when you are looking at it in a journalistic manner, you would say that producers are holding all the cards. I disagree with that; I think the person or country with a large market also has a huge role to play. I am giving you a hypothetical example - If we decide to limit consumption, no matter what you produce, you will have to find a place to sell it too and I can tell you that in the last year or so, I have had my oil companies tell me that we can raise it from here, but there are traditional suppliers, this is a discussion which will go on," Puri said in response to a question by ANI.

"Much of the trade incidentally takes place in a manner which is not properly understood outside. It's not that - you have some fuels which have high density, some are lighter fuels - I don't want to get into that discussion - it may originate somewhere - we own assets outside, the product of those assets does not come to India, it goes in, it's sold in the swap market etc," he added.

This week's OPEC Plus announcement on oil production cut will likely have a cascading impact on geopolitical shifts amid the Russia-Ukraine crisis.

"Oil and energy have been traded for years. Governments in particular situations will react to geopolitical events. At the end of the day all governments are committed to issues of energy provisions; that is security and affordability," said Puri.

Meanwhile, an intense pressure campaign by the US to dissuade its Arab allies seemingly fell on deaf ears. Russia is already pumping below its OPEC+ ceiling, and the bulk of the cuts will be made by Gulf producers.

Speaking about the conflict and Indian diversification, Union minister Puri said, "I don't see any conflict. There are countries in OPEC that sell to us. They've never turned around and told us that they don't want to sell to us. If you don't sell to India and China, there are not many big markets left, even Europe collectively. Many of these are matured markets in energy. They don't utilize crude oil - some of them have gone into nuclear energy, and others are going into biofuels. I also want to share with you some of the advances which India has made - biofuel blending, when I was Ambassador to Brazil, we tried very hard, the central government tried to introduce 5 per cent ethanol blending in 15 of our States and Union Territories, we couldn't get it done."

Puri further stated that the India had taken a giant leap in bio-fuel blending after Prime Minister Narendra Modi assumed power in 2014.

"In 2014, when Prime Minister Narendra Modi assumed office, our bio-fuel blending was 1.4 per cent, today we have already reached 10.5 per cent of blending. We have a target of 20 per cent blending by 2030. We have just brought it forward to 2024-2025," said Puri.

He also gave examples of green Hydrogen and how India is providing opportunities for oil exploring companies.

"Green Hydrogen - We have Indian companies selling green ammonia to Germany - the world is moving at different fronts - exploration and production in India will shoot up. I have always said that we have neglected to the point, I even use words like 'criminal neglect.' We have 3.5 million square kilometres of sedimentary basin, and one million square kilometres of that sedimentary basin was called a 'no go area', just now a few months ago, 99.5 per cent of that 'no go area' has been cleaned up which means for an investor are happy to come and explore. There are not hundreds of players in the energy sector, five to six big companies, they are all interested, they are either forming joint ventures, just to come (to India)," said Puri. (ANI)

<https://aninews.in/news/world/us/india-under-no-global-pressure-to-shun-russian-oil-hardeep-singh-puri20221008093740/>

Union Minister of Petroleum and Natural Gas, Hardeep Singh Puri.

India under no global pressure to shun Russian oil: Hardeep Singh Puri

ANI | Updated: Oct 08, 2022 09:37 IST

Washington [US], October 8 (ANI): Union Minister of Petroleum and Natural Gas, Hardeep Singh Puri on Saturday said that India is under no pressure to shun Russian oil.

In a bilateral meeting with US energy secretary Jennifer Granholm, Puri said that the Indian government has a moral duty to provide energy to its citizens and it will continue to buy oil from wherever it has to.

Have I been told by anyone to stop buying Russian oil? The answer is a categorical No," Puri told reporters in Washington.

"India will buy oil from wherever it has to for the simple reason that this kind of a discussion cannot be taken to the consuming population of India," he added.

Since the start of the Ukraine conflict. India has sought to carve a middle path between Moscow and its Western critics and so far largely resisted Western pressure to cut its economic ties with the Kremlin.

The US is holding "deep talks" with India over the latter's reliance on Russian arms and oil, according to media reports citing a state department official. The official claimed that Indian representatives are starting to look at other markets to meet their demands as they try to become less dependent on Moscow for oil purchases.

Notably, the European Union (EU) on Thursday (local time) adopted its latest package of sanctions against Russia over the illegal annexation of Ukraine's Donetsk, Luhansk, Zaporizhzhia and Kherson regions.

The EU adopted restrictive measures against an additional 30 individuals and seven entities, read the EU's statement.

EU sanctions (8th package since the Ukraine war began) aim to force Russia to reduce prices & lose oil revenue. But as imports to the tune of 1.7 million barrels per day, the EU is still the biggest market for Russian crude.

Moreover, the EU is trying to determine the pricing of Russian oil through its insurance firms as Russia is the world's largest oil exporter. The European insurers rule commercial oil tankers by providing them with massive insurance.

The EU sanctions II forbid these insurers from providing services to Russian companies selling oil above the price cap.

Moreover, EU's sanctions package on Russia will impact countries like India. EU is capping what other countries can pay for Russian oil. It bans the sale of oil above that price. This applies only to oil transported by sea. While, the EU members importing Russian oil by pipeline won't be hurt by these sanctions.

Puri highlighted India is one of the largest oil importer and the demand is expected to rise driven by an increase in India's per capita consumption of energy which currently stands at one-third of the global average. Puri further stressed that the fuel demand is expected to keep rising as the country's economy grows.

It is pertinent to note that External Affairs Minister S Jaishankar also on several platforms had explained India's decision to continue buying Russian oil. Recently, Jaishankar said PM Modi's advice on the issue was to do what is best for the nation. "Due to the Russia-Ukraine conflict, petrol prices doubled. We had pressure from where to buy the oil but Prime Minister Narendra Modi and the government were of the view that we have to do what is the best for our nation," Jaishankar said. (ANI)

<https://aninews.in/news/world/us/oil-price-rise-in-india-is-way-below-global-price-hikes-hardeep-singh-puri20221008091154/>

Oil price rise in India is way below global price hikes: Hardeep Singh Puri

ANI | Updated: Oct 08, 2022 09:11 IST

Washington [US], October 8 (ANI): Union Petroleum and Natural Gas minister Hardeep Singh Puri said that compared to fuel price hikes globally, India only raised prices by 2 per cent, which is way below that of other countries.

"In terms of petrol and diesel, if the increases in North America are 43-46 per cent, in India we allow prices to go up by only 2 per cent or so. In terms of gas, global benchmarks went up by 260-280 per cent and our own ability to contain gas price increases was something around 70 per cent," Puri told reporters in Washington DC.

Puri on Thursday held bilateral meeting with US energy secretary Jennifer Granholm and other top officials of the Biden Administration.

The minister also highlighted India's commitment to accelerating a just and sustainable energy transition at the ministerial dialogue on India-US strategic clean energy.

During his visit, the union minister also held meetings with senior officials of the World Bank, the Presidential envoy for energy and infrastructure Amos Hochstein and senior representatives of the White House. Puri is scheduled to meet energy business leaders in Houston on Saturday.

The Union Minister said that India was "very confident" of navigating the Organisation of Petroleum Exporting Countries Plus (OPEC+) decision to cut oil production from November by a steeper-than-expected two million barrels per day (bpd). "

How will this impact India? We are very confident of being able to navigate through the situation," Puri told reporters in Washington.

"How will this navigate India? We're very confident of being able to navigate through the situation," said Puri.

Puri highlighted India is one of the largest oil importers and the demand is expected to rise driven by an increase in the country's per capita consumption of energy which currently stands at one-third of the global average. Puri further stressed that the fuel demand is expected to keep rising as the country's economy grows.

"In India, 5mn (oil) bpd is being consumed daily; it's set to rise. Our per capita consumption compared to global averages is 1/3rd. But I see in the coming years, 25 per cent of the global increase in demand will come from India. Energy is a critical driver of economic growth," the union minister said.

The Union Minister also said that India will buy crude oil from whichever country it wanted and that New Delhi faces no pressure from Washington to cut its energy buys from Russia.

"India will buy oil from wherever it has to for the simple reason that this kind of a discussion cannot be taken to the consuming population of India," Puri told reporters in Washington. (ANI)

Full text of Xi Jinping's keynote speech at China-GCC Summit

(Xinhua) 09:25, December 10, 2022

RIYADH, Dec. 9 (Xinhua) -- Chinese President Xi Jinping delivered a keynote speech here Friday at the China-Gulf Cooperation Council (GCC) Summit.

The following is the full text of the speech:

Building on Past Achievements and Jointly Creating a Brighter Future of China-GCC Relations

Riyadh, Dec. 9, 2022

Distinguished Colleagues,

Secretary General Dr. Nayef Falah Al-Hajraf,

Good afternoon!

At the outset, I wish to express heartfelt appreciation to the Kingdom of Saudi Arabia for hosting the China-Gulf Cooperation Council (GCC) Summit. It gives me great pleasure to join you in planning for the future of China-GCC relations.

The friendly exchange between China and GCC countries goes back nearly two millennia in history. Throughout those years, the two peoples interacted with each other continuously along the ancient Silk Road inspired by the "Eastern wisdom" of peace, harmony and truth. In 1981, China established contact with the GCC upon its inception. Forty plus years on, the two sides have written together a splendid chapter of solidarity, mutual assistance and win-win cooperation.

The leapfrog growth of China-GCC relations is attributed to the profound mutual trust. China and GCC countries have all along supported each other's sovereignty and independence, respected each other's development paths, upheld equality between countries regardless of their size, and stood firm in defending multilateralism.

The leapfrog growth is attributed to the high degree of complementarity. China has a vast consumer market and a complete industrial system, while the GCC, with rich energy and resources, is embracing diversified economic development. This makes the two sides natural partners of cooperation.

The leapfrog growth is attributed to the empathy of the two peoples. Both belonging to the family of Eastern civilizations, China and GCC countries have similar culture and values. And the peoples enjoy close bonds of friendship.

The leapfrog growth is also attributed to the solidarity between the two sides in times of adversity. Against regional and international uncertainties as well as challenges such as the financial crisis, the COVID-19 pandemic and major natural disasters, the two sides have come to each other's aid and navigated through the difficulties together.

Colleagues,

In response to the profound changes unseen in a century, GCC countries have strengthened themselves through unity, achieved economic growth despite COVID-19, and worked vigorously for political settlement of regional hotspots and thorny issues. They have made the GCC the most dynamic regional organization in the Middle East and the Gulf. China highly commends you for all this. Standing at a historical crossroads, we should carry forward the tradition of China-GCC friendship, and take the establishment of the China-GCC strategic partnership as an opportunity to enrich the strategic substance of this relationship.

- We should be partners for greater solidarity. We need to further consolidate political mutual trust and firmly support each other's core interests. We need to jointly uphold the principle of non-interference in internal affairs, practice true multilateralism, and defend the common interests of all developing countries.

- We should be partners for common development. We need to better synergize development strategies and leverage our respective strengths to cultivate driving forces for development. China looks forward to working with all parties to advance and implement the Global Development Initiative (GDI) and follow through on the 2030 Agenda for Sustainable Development, with a view to promoting regional development and prosperity.

- We should be partners for common security. China will continue to firmly support GCC countries in safeguarding their security, and support the efforts by regional countries to resolve differences through dialogue and consultation and to build a Gulf collective security architecture. China welcomes the participation of GCC countries in the Global Security Initiative (GSI) in a joint effort to uphold regional peace and stability.

- We should be partners for cultural prosperity. We need to enhance interactions between our peoples, increase cultural exchanges, draw on each other's fine cultural achievements, and promote the rich values of Eastern civilizations, so as to contribute our share to the development and progress of human civilizations.

Colleagues,

In the next three to five years, China is ready to work with GCC countries in the following priority areas:

First, setting up a new paradigm of all-dimensional energy cooperation. China will continue to import large quantities of crude oil on a long-term basis from GCC countries, and purchase more LNG. We will strengthen our cooperation in the upstream sector, engineering services, as well as storage, transportation and refinery of oil and gas. The Shanghai Petroleum and Natural Gas Exchange platform will be fully utilized for RMB settlement in oil and gas trade. The two sides will work more closely on clean and low-carbon technologies involving hydrogen, energy storage, wind and photovoltaic power and smart power grids, as well as localized production of new energy equipment. We will jointly establish a China-GCC forum on peaceful use of nuclear technology and a China-GCC nuclear security demonstration center. China will provide 300 training opportunities to GCC countries on peaceful use of nuclear energy and technology.

Second, making new progress in finance and investment cooperation. China and GCC countries could collaborate on financial regulation and facilitate the entry into China's capital market for GCC companies. China will work with the GCC to set up a joint investment commission and support cooperation between sovereign wealth funds from both sides in various forms. The two sides could explore setting up a China-GCC forum on industrial and investment cooperation, strengthen investment cooperation on digital economy and green development, and build a working mechanism on investment and economic cooperation. The two sides could start currency swap cooperation, deepen digital currency cooperation and advance the m-CBDC Bridge project.

Third, expanding new areas of cooperation on innovation, science and technology. China is ready to build big data and cloud computing centers with GCC countries, strengthen 5G and 6G technology cooperation, build together innovation and entrepreneurship incubators, and implement ten digital economy projects in such areas as cross-border e-commerce and communications network. A China-GCC cooperation mechanism in meteorological science and technology will be set up, and the two sides could convene a seminar on climate response.

Fourth, seeking new breakthroughs in aerospace cooperation. China will carry out a string of cooperation projects with GCC countries in remote sensing and communications satellite, space utilization, and aerospace infrastructure. The two sides could select and train astronauts together, and China welcomes GCC astronauts to its space station for joint missions and space science experiments with their Chinese colleagues. China welcomes GCC countries' participation in payloads cooperation in its aerospace missions including Chang'e and Tianwen, and will consider establishing a China-GCC joint center for lunar and deep space exploration.

Fifth, nurturing new highlights in language and cultural cooperation. China will cooperate with 300 universities, middle and primary schools in GCC countries on Chinese language education, work with GCC countries to set up 300 Chinese language smart classrooms, provide 3,000 "Chinese Bridge" summer/winter camp opportunities, and set up Chinese language learning and testing centers and online Chinese classes. The two sides could hold a China-GCC language and culture forum, and compile a bilingual library for people-to-people and cultural exchanges and mutual learning.

Colleagues,

China and GCC countries share the glorious mission of developing and revitalizing our nations. Our relations are both time-honored and young. Let us build on our achievements and work together to deliver an even brighter future of China-GCC relations. Thank you.

The Joint Prevention and Control Mechanism Comprehensive Group issued a notice

Further optimize the implementation of new crown pneumonia epidemic prevention and control measures

2022-12-08 06:59 Source: People's Daily - People's Daily

Beijing, December 7 (Reporter Bai Jianfeng) The comprehensive group of the joint prevention and control mechanism of the State Council recently issued the "Notice on Further Optimizing the Implementation of the Prevention and Control Measures for the New Crown Pneumonia Epidemic."

Recently, all localities and departments have thoroughly implemented the decision-making and deployment of the Party Central Committee and the State Council, adhered to the ninth version of the prevention and control plan, implemented 20 optimization measures, and continued to rectify the problem of increasing the code at every level, and achieved positive results. According to the current epidemic situation and virus mutation, in order to be more scientific and accurate in prevention and control, and effectively solve the outstanding problems in the prevention and control work, the comprehensive group of the joint prevention and control mechanism of the State Council issued the Notice on Further Optimizing the Implementation of the Prevention and Control Measures of the New Coronary Pneumonia Epidemic.

First, scientifically and accurately divide risk areas. High-risk areas are designated according to buildings, units, floors, and households, and must not be arbitrarily expanded to areas such as communities, communities, and streets (townships). No temporary lockdowns of all forms shall be used.

The second is to further optimize nucleic acid detection. Do not carry out nucleic acid testing for all employees according to administrative regions, further reduce the scope and frequency of nucleic acid testing. According to the needs of epidemic prevention work, antigen testing can be carried out. Nucleic acid testing shall be carried out for employees in high-risk positions and personnel in high-risk areas in accordance with relevant regulations, and other personnel are willing to conduct due diligence. Except for special places such as nursing homes, welfare homes, medical institutions, childcare institutions, primary and secondary schools, a negative nucleic acid test certificate is not required, and the health code is not checked. Important institutions, large enterprises and some specific places can determine prevention and control measures by the territory on their own. Cross-regional mobile personnel will no longer be checked for negative nucleic acid test certificates and health codes, and landing inspections will no longer be carried out.

The third is to optimize and adjust the isolation method. Infected people should be scientifically classified and treated, and asymptomatic infections and mild cases with home isolation conditions are generally isolated at home, or they can voluntarily choose centralized isolation for treatment. During the home isolation period, health monitoring was strengthened, and the Ct value of nucleic acid test was ≥ 35 for two consecutive times on the sixth and seventh days of isolation, and the condition was promptly transferred to the designated hospital for treatment. Close contacts who have the conditions for home isolation are subject to 5-day home isolation, or they can voluntarily choose centralized isolation, and will be released after a negative nucleic acid test on the fifth day.

The fourth is to implement "quick sealing and quick solution" in high-risk areas. High-risk areas where there are no new infected persons for 5 consecutive days should be unblocked in time.

Fifth, ensure the basic drug purchase needs of the masses. Pharmacies in various places should operate normally and must not be closed at will. The masses must not be restricted from purchasing over-the-counter drugs such as antipyretic, cough, antiviral, and cold treatment online and offline.

Sixth, accelerate the promotion of new crown virus vaccination for the elderly. All localities should adhere to the principle of due diligence, focus on increasing the vaccination rate of people aged 60-79, accelerate the vaccination rate of people aged 80 and above, and make special arrangements. Optimize vaccination services through measures such as setting up green channels for the elderly, temporary vaccination sites, and mobile vaccination vans. It is necessary to carry out training on the determination of contraindications to vaccination step by step, and guide medical staff to scientifically determine contraindications to vaccination. Refine science popularization publicity, mobilize the whole society to participate in mobilizing the elderly for vaccination, and all localities can adopt incentive measures to mobilize the enthusiasm of the elderly for vaccination.

Seventh, strengthen the health situation of key groups and categorical management. Give play to the role of grassroots medical and health institutions as "gatekeepers" of family doctors' health, find out the elderly with cardiovascular and cerebrovascular diseases, COPD, diabetes, chronic kidney disease, tumors, immune deficiencies and other diseases and their new coronavirus vaccination status in their jurisdiction, and promote the implementation of hierarchical and categorical management.

Eighth, ensure the normal operation of society and basic medical services. Non-high-risk areas shall not restrict the movement of personnel, and shall not suspend work, production or business. Medical personnel, public security, transportation and logistics, supermarkets, supply assurance, water, electricity and heating and other personnel who ensure basic medical services and the normal operation of society are included in the "white list" management, relevant personnel do a good job in personal protection, vaccination and health monitoring, ensure normal medical services and basic living materials, water, electricity and heating and other supplies, do their best to maintain normal production and work order, promptly solve the urgent and difficult problems raised by the masses, and effectively meet the basic living needs of the masses during the epidemic handling period.

The ninth is to strengthen the security of epidemic-related security. It is strictly forbidden to block fire escapes, unit doors, and community doors in various ways to ensure that the public can go out for medical treatment and emergency avoidance. Promote the establishment of a docking mechanism between communities and specialized medical institutions, and provide medical facilities for the elderly, minors, pregnant women, persons with disabilities, and persons with chronic diseases living alone. Strengthen care and psychological counseling for lockdown personnel, patients, and front-line staff.

Ten is to further optimize the epidemic prevention and control work in schools. All schools in all regions should resolutely implement the requirements of scientific and precise prevention and control, schools without epidemics should carry out normal offline teaching activities, and supermarkets, canteens, sports venues, libraries, etc. on campus should be opened normally. Schools with epidemics should accurately delineate risk areas, and normal teaching and living order should still be ensured outside the risk areas.

People's Daily (Version 08, 08 December 2022)

(Responsible editors: Yue Hongbin, Bai Yu)

<https://www.globaltimes.cn/page/202212/1281579.shtml>

S China's Guangzhou is expected to return to pre-epidemic conditions by first half 2023: Zhong Nanshan

By Global Times Published: Dec 11, 2022 12:23 PM Updated: Dec 11, 2022 12:18 PM



China's top respiratory disease expert Zhong Nanshan Photo: VCG

The first wave of COVID-19 infections in Guangzhou, South China's Guangdong Province, is likely to peak between mid-early January and mid-February in 2023, and the local society will return to pre-epidemic conditions in the first half of 2023, China's top respiratory disease expert Zhong Nanshan said on Friday.

The senior health official and his team made the judgment during an interview on Friday, during which he also mentioned that the focus moving forward should be put on preventing severe illness caused by the virus, and strengthening the COVID-19 vaccination.

Zhong stressed that although domestic vaccines are slightly less effective in preventing infection, they have fewer side effects and are safer than overseas equivalents, while both are equally effective in preventing severe illness.

It usually takes two weeks for booster shots to work, which will be of great benefit in preventing large-scale transmission during the Spring Festival travel rush when large numbers of people travel between parts of the country. There is an urgent need to scale up vaccination across the country, Zhong added.

Omicron is not scary, as about 99 percent of those infected with the virus can fully recover within seven to 10 days, Zhong noted. He added that an analysis of data from major cities in China has found that the severity rate of the Omicron variant was less than 1 percent and the fatality rate less than 0.1 percent indicating that Omicron's pathogenicity has been significantly reduced.

Renowned Chinese epidemiologist Li Lanjuan echoed the Zhong's opinion, saying there is no need to panic over Omicron. Both Li and Zhong believed that asymptomatic infection is not a disease, and silent carriers are not patients.

Zhong said that the COVID-19 epidemic is not over yet, but he stressed that the pathogenicity of the Omicron variant has been greatly reduced. "This is the trend of the future evolution of the coronavirus," he said.

According to data released by Singapore, the case fatality rate of the Omicron variant in the epidemic period from January to November this year was 0.45‰, much lower than the 3.6‰ case fatality rate of the Delta variant in the period from June 2021 to January 2022.

Li Yimin, a member of Zhong Nanshan's team and chief physician for the Department of Intensive Care Medicine at the First Affiliated Hospital of Guangzhou Medical University, said that in the current wave of cases in Guangzhou, the proportion of severe cases caused by the coronavirus is not large and pneumonia caused by Omicron infection is also very rare, mainly manifested by the aggravation of the underlying disease.

Zhong said it is not appropriate to use fatality rates from other regions to estimate that hundreds of thousands of people will die in the Chinese mainland. "I do not believe this will happen. The vaccination rate in the Chinese mainland has reached 68.86 percent, which is not enough but can largely prevent large-scale deaths," he said.

Zhong also called on respiratory physicians and researchers to take responsibility for helping optimize national policies so that the country can "prevent the epidemic, stabilize the economy and secure development."

China has adjusted and optimized its COVID-19 measures over recent days, including allowing asymptomatic carriers and patients with mild symptoms and those who meet certain requirements to quarantine at home. The adjustments have led to a degree of concern among the public about whether the risk of infection might be higher than before.

According to media reports, average daily sales of COVID-19 antigen self-testing kits have increased more than 400 folds compared with November.

A total of 2,338 confirmed cases and 8,477 asymptomatic infections were reported on the Chinese mainland on Saturday, with 39,391 confirmed cases still under medical observation and treatment nationwide as of the same day, according to the National Health Commission. Global Times

China's Greater Bay Area Becomes Key Mega Region in Global Economy

08 July 2022 [Rajiv Biswas](#)

The Greater Bay Area comprises 11 major cities of the Pearl River Delta in southeastern China, including Hong Kong Special Administrative Region (SAR), Macao SAR, as well as nine key cities in Guangdong Province of mainland China, including Guangzhou and Shenzhen.

The Greater Bay Area has become one of the three key mega-regions of China, with a total GDP that reached USD 2 trillion in 2021, equivalent to the GDP of Canada. Large-scale investment in key transport infrastructure such as bridges, ports, railways and highways has helped to drive the region's economic integration and economic development.

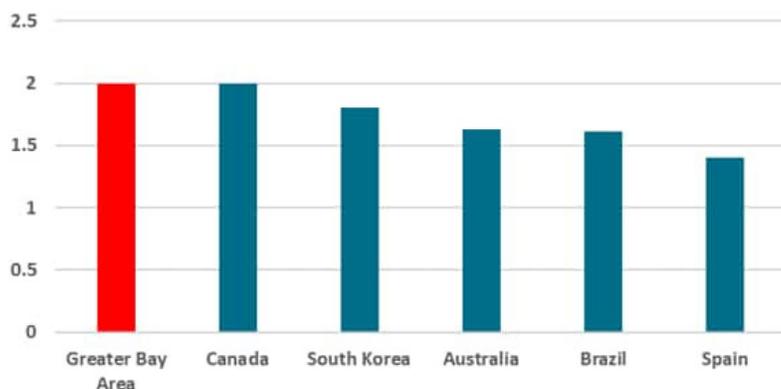
Mainland China's Economic Ascendance

The rapid growth of mainland China's economy over the past two decades has been a major driving factor for the increasing economic weight of APAC in the world economy. Mainland China's weight in world GDP has risen from 3.6% in 2000 to 18.6% by 2021, measured in nominal USD terms. The development of the Greater Bay Area as a key mega-region of the Chinese economy has been an important driver contributing to China's rapid economic growth since 2000. The Pearl River Delta has been an important industrial powerhouse for China's manufacturing exports over the past three decades. The other leading mega-regions of China are the Yangtze River Delta region centered on Shanghai and the Capital Economic Zone centered on the Beijing-Tianjin economic corridor.

By 2021, the Greater Bay Area's GDP was estimated at USD 2 trillion, which was equivalent to 11% of the combined GDP of mainland China, Hong Kong SAR and Macao SAR. When the Greater Bay Area GDP is benchmarked globally, its GDP was equivalent to Canada's GDP in 2021. When compared with large APAC industrial nations, the GDP of the Greater Bay Area exceeded the GDP of South Korea in 2021.

Greater Bay Area GDP, 2021

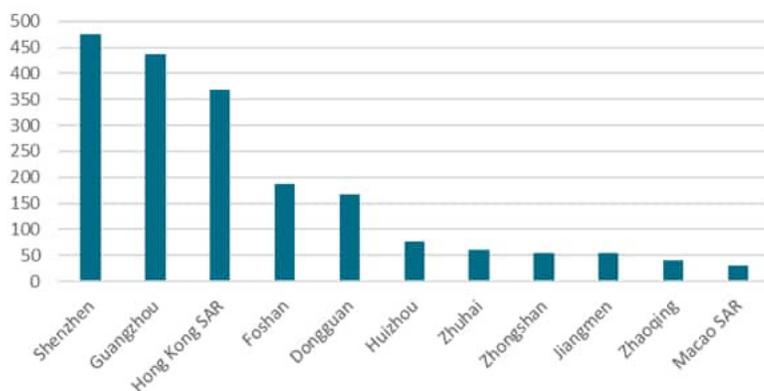
USD trillion, nominal terms Source: S&P Global



Hong Kong SAR and Macao SAR have also become important markets for Guangdong Province. Trade between Guangdong Province with Hong Kong SAR and Macao SAR accounted for 14.2% of Guangdong's total trade outside of mainland China in 2021.

GDP of Key Cities in Greater Bay Area

USD billion Source: HKTDC



However, the COVID-19 pandemic has also created tremendous disruptions to the pattern of mainland China's economic growth during 2020-22. In the first half of 2021, a number of cities in the Greater Bay Area have been hit by recent outbreaks of COVID-19 clusters. Shenzhen and Dongguan were among the cities that faced strict COVID-19 containment measures during March 2022, impacting on economic activity.

However, the latest Caixin PMI surveys of manufacturing and services in mainland China showed a strong rebound in economic activity for the month of June. Business confidence regarding the 12-month outlook for manufacturing output improved to a four-month high in June. Companies were generally upbeat in their forecasts as they anticipated more increases in production and further improvements in client demand as the recent pandemic outbreaks recede.

Mainland China General Manufacturing PMI

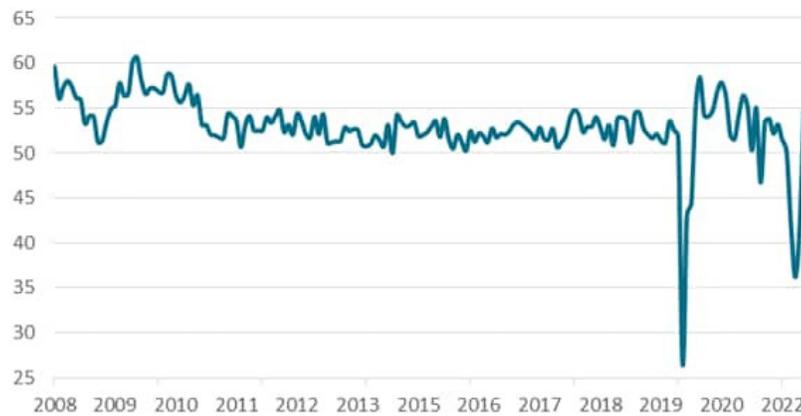
sa, >50 = improvement since previous month



Sources: Caixin, S&P Global.

Mainland China Services Business Activity Index

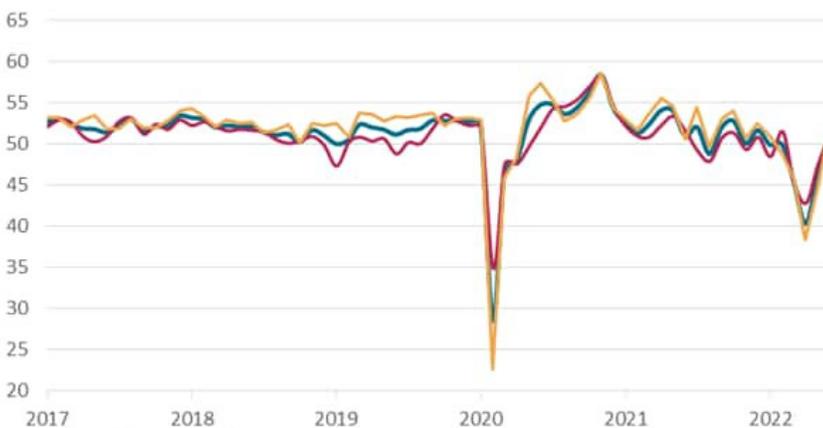
sa, >50 = growth since previous month



Sources: Caixin, S&P Global

Mainland China Manufacturing and Services New Orders

sa, >50 = improvement since previous month



Sources: Caixin, S&P Global.

The Role of Hong Kong SAR

Hong Kong SAR has the third largest economy amongst the major cities of the Greater Bay Area, after Shenzhen and Guangzhou. Hong Kong's international financial centre plays an important role in the economic development of the Greater Bay Area, as an international banking and insurance hub,

as well as an important international capital markets centre. This has helped to facilitate international financing flows for the Greater Bay Area, complementing the role of Shenzhen and Guangzhou as important domestic financial centres in mainland China.

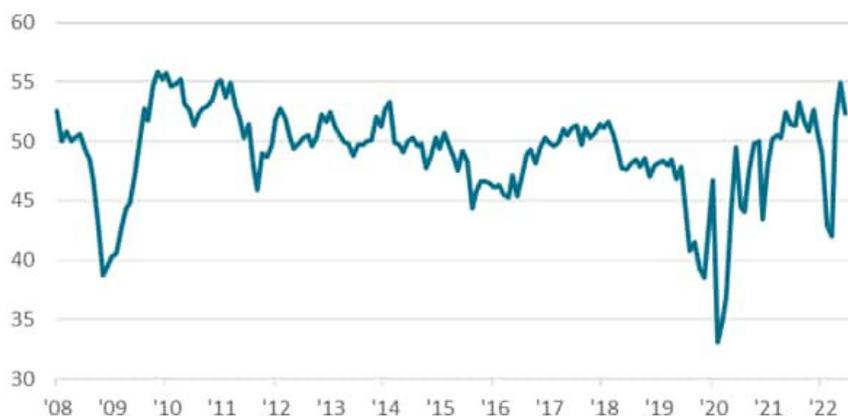
Hong Kong SAR continues to play a key role in capital markets financing for mainland Chinese companies, through bank lending, debt issuance and equity capital raising.

Hong Kong SAR also continues to be an important logistics hub for the Greater Bay Area for shipping and commercial aviation.

Despite severe disruptions to economic activity in 2020-22 during the COVID-19 pandemic, the headline seasonally adjusted S&P Global Hong Kong SAR Purchasing Manager's Index™ (PMI™) posted 52.4 in June, down from 54.9 in May. June data indicated a third consecutive month of expansion in output amid looser pandemic restrictions. New order volumes increased for a third successive month, but at a slower rate than in May. The recent COVID-19 outbreaks weighed negatively on new business, as firms recorded a thirteenth successive month of contraction in new orders from mainland China. The effects of COVID-19 also continued to impact vendor performance, according to surveyed firms. June data signaled a fourteenth consecutive month in which delivery times lengthened.

S&P Global Hong Kong PMI

sa, >50 = improvement since previous month



Sources: Caixin, S&P Global.

Economic Outlook for the Greater Bay Area

The COVID-19 pandemic has created tremendous disruptions to the pattern of economic growth worldwide during 2020-22, including for China. In the near-term, a key downside risk for China's economic outlook is from new COVID-19 outbreaks, which could continue to act as a significant drag on economic growth momentum, including for the Greater Bay Area. Even though economic activity has rebounded in June after pandemic restrictions in Shanghai and Beijing were eased, new COVID-19 cases have been reported in early July in some cities.

The city of Xi'an, capital of Shaanxi Province in Northwestern China, with a population of 13 million, has escalated pandemic restrictions for the week starting 6 July, after detecting domestic cases of Omicron BA.5.2 variant. Shanghai has announced plans to complete two rounds of mass testing for

most residents in 12 out of 16 districts over 5-7 July, aiming to stamp out further transmission after a number of new infections were detected.

However, despite the uncertainties caused by near-term disruptions due to the pandemic, over the medium to long-term, the Greater Bay Area will continue to be a key driver of China's economic growth. The Greater Bay Area will continue to be a leading APAC mega-region for manufacturing production, financial services as well as for shipping and logistics.

Nevertheless, the Greater Bay Area will also face structural economic challenges. The pace of mainland China's economic growth has slowed significantly since 2010, as ageing demographics and the declining marginal productivity of capital have contributed to a gradual moderation in the pace of growth.

As mainland China's ageing demographics increasingly impact on the nation's long-term potential growth rate, the outperformance of mainland China's economic growth relative to world growth is expected to gradually narrow over the next decade and beyond. Whereas mainland China's GDP growth rate significantly exceeded world GDP growth over the period from 2000-21, this gap is forecast to narrow significantly over the next two decades.

This will also impact upon the future development path of the Greater Bay Area, increasing the competitive challenges to transition its manufacturing sector from being a low-cost "factory of the world" to a higher value-added manufacturing hub. Consequently, large-scale investment in physical infrastructure such as bridges, railways, ports and airports have been an important priority for government spending, in order to build competitive advantage. Investment in technology and innovation has also been an important driver for improving competitive advantage, through development of universities and research institutes.

Despite these competitive challenges, the GDP of the Greater Bay Area is projected to reach USD 5.8 trillion by 2040. This would be equivalent to around 2.3% of world GDP in 2040 and would slightly exceed the GDP of France. Within the APAC region, the Greater Bay Area will have an even larger economic footprint, with its GDP projected to be 5.5% of total APAC GDP by 2040.

Rajiv Biswas, Asia Pacific Chief Economist, S&P Global Market Intelligence
Rajiv.biswas@spglobal.com

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Purchasing Managers' Index™ (PMI™) data are compiled by IHS Markit for more than 40 economies worldwide. The monthly data are derived from surveys of senior executives at private sector companies, and are available only via subscription. The PMI dataset features a headline number, which indicates the overall health of an economy, and sub-indices, which provide insights into other key economic drivers such as GDP, inflation, exports, capacity utilization, employment and inventories. The PMI data are used by financial and corporate professionals to better understand where economies and markets are headed, and to uncover opportunities.

Marketplace review

A year of disruption and dislocation in commodity markets



Saad Rahim
Chief Economist

Overview

As the global economy emerged from COVID-19 and picked up speed, initial expectations were for 2022 to be a less volatile year. By any measure, this turned out not to be the case.

Indeed, at the start of our financial year in October 2021, it seemed the lack of investment in new supply, combined with post-pandemic demand recovery, would result in significant tightness in numerous commodity markets.

The fact that markets were in a fragile state to begin with magnified the shock from Russia's invasion of Ukraine in February 2022 and led to unprecedented price volatility.

The war has upended historic commodity trade flows, led to record low inventories in many commodities and created uncertainty about supply. Sanctions added multiple layers of complexity and disruption.

Throughout the tumult, commodity prices have consistently struggled to reflect underlying supply and demand.

This is due primarily to three major macroeconomic headwinds that overwhelmed the fundamentals: Central Banks, led by the US Federal Reserve, raising interest rates rapidly to combat the highest inflation in decades; Europe's energy crisis; and China's zero-COVID-19 policies and property sector weakness.

Taking the first point, supply chain disruptions, a surge in demand as lockdown restrictions eased, record low inventories of housing and vehicles, and a lack of workers all contributed to inflationary pressures.

This was especially true in the US, as the population shifted from consuming goods to services, which in turn drove wages higher, resulting in yet more inflationary pressures. Europe, meanwhile, had to contend not just with these factors, but also with soaring energy costs resulting from Russian curtailment of gas supplies.

Central banks responded by sharply lifting benchmark policy rates in a very short period of time. Rising US yields and concerns about the impact of tighter financial conditions on the global economy saw the US dollar strengthen substantially, to the highest level in over 20 years against major currencies, and the highest ever in the case of many others. This was another challenge for commodity prices, which are denominated in US dollars.

While rising energy costs have contributed to inflation across the world, they have been particularly pronounced in Europe, due to the curtailment of Russian exports of gas. This was the second headwind.

Although Russian flows to Europe had already started to decline in 2021, it is only in the months following the invasion of Ukraine that the full weight of Moscow's cuts came to bear.

Over the course of the second and third quarters of 2022, flows dropped by 80 percent versus pre-invasion levels and sent power and gas prices in Europe soaring to record levels. Europe's benchmark gas price (TTF) rose from a long-term average of close to €20 per megawatt hour to well over €300/MWh, while power prices spiked to a record of over €700/MWh in some of the major, western European countries.

As a result, many big industrial consumers in Europe were forced to curtail output. The prospect of further cuts raised the spectre of a major industrial recession, dampening sentiment and the outlook for demand.

The third major macro-economic headwind was China's growth, which was weaker than expected for two main reasons.

The first of these was the impacts of China's zero-COVID-19 policies, which led to restrictions being imposed on large parts of the country in the second quarter of 2022.

Shanghai in particular saw an extended period of lockdown, and given its status as a main financial and manufacturing hub, the impacts on activity and sentiment were widespread. More broadly, the unpredictable nature of outbreaks and the stringency of lockdown restrictions meant consumer and investor confidence remained subdued for most of the year. The impact was magnified by the second factor: ongoing weakness in the property sector, brought about in part by the government's attempts to manage the indebtedness of key players in that sector.

Although growth outside the property sector rebounded materially in the third quarter of 2022, as shown by dwindling stockpiles of base metals and other production and investment indicators, the weakness in property has soured investor sentiment.

In this "macro versus micro" environment, commodity prices struggled to perform, and in many cases seemed to have completely disconnected from physical market realities.

Oil markets

Oil markets were buffeted on one side by constrained supply, due to under-investment and sanctions, and on the other side by potential demand weakness, caused by China's zero-COVID-19 lockdowns and higher prices.

By the middle of the year, prices seemed set to move higher thanks to stresses on the supply side, which looked difficult if not impossible to solve in the near term.

However, the underlying tightness in markets was masked as Organisation for Economic Cooperation and Development (OECD) governments chose to try and cushion the impact of higher prices on consumers by authorising unprecedented releases from their respective strategic reserves.

The impact was most acutely felt in the US, due to the release of 180 million barrels of crude into the market.

This oil flowed into commercial inventories, allowing them to hold at levels that by end of the year were well within historical ranges, giving the appearance of a well-supplied market.

As a result, however, the US Strategic Petroleum Reserve (SPR) fell to under 400 million barrels for the first time since 1984, as demand remained relatively robust despite high prices, leading to inventory draws.

A major reason why SPR releases were needed is because supply has continued to be constrained. Consensus projections coming into this year were for US oil production to grow by close to one million barrels per day (December-to-December), but instead, production has grown only approximately 0.3 million barrels per day.

The lack of growth reflects lower investment rates in the sector, as companies have prioritised shareholder returns and capital discipline over increasing capital expenditures and production.

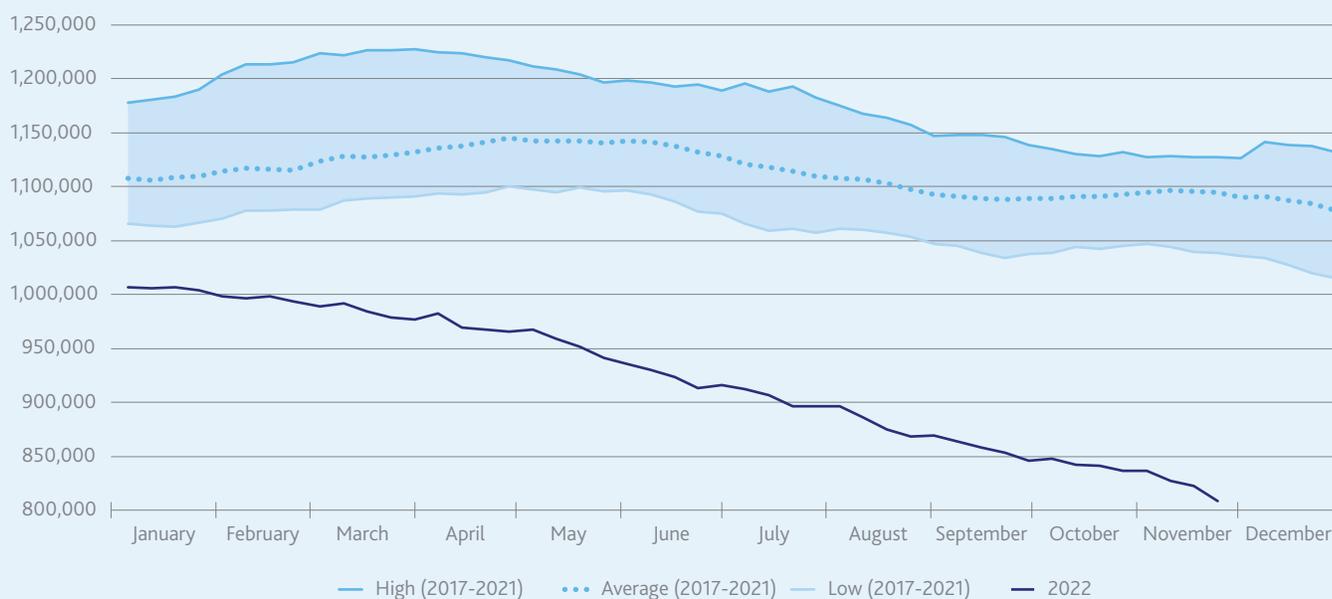
As such, while the rig count (as a proxy for overall investment) continued its post-pandemic rebound in the earlier part of the year, it has effectively flat-lined since June 2022, limiting the scope for further production gains.

The other notional source of additional supply has traditionally been OPEC and its allies. Not only did they recently agree to a two million barrel per day output cut, but their production capacity is falling short of expectations due to years of under-investment.

Even prior to the Russian invasion of Ukraine, OPEC+ producers were collectively under-performing their production quotas by over 1.5 million barrels per day, as the output of members outside the "core OPEC" countries of Saudi Arabia, Iraq, UAE and Kuwait hit multi-decade lows. New capacity is being brought on in the core group, but outside of the UAE it will take some years yet to reach the market.

US crude inventories including Strategic Petroleum Reserve

Stated in thousand barrels



Source: Energy Intelligence Agency (EIA)

And this is all before the extent of the impact of sanctions and the G7 price cap on Russian oil flows is known. While the overall intent of the EU and US is to redirect flows, not reduce them, the uncertainty involved in dealing with such an extensive and inter-connected market means that in reality there is likely to be at least some impact.

If nothing else, the redirection of Russian barrels from Europe to other markets such as India and China – and from Arabian Gulf and US barrels to Europe to compensate – has turned the shipping market on its head.

Increased transit times have effectively taken vessels out of the supply pool, pushing daily freight rates significantly higher than they were previously, with rates for some classes of clean product tankers reaching new records.

Oil demand overall has struggled to regain its pre-pandemic highs, but this is in large part due to the impact of China's zero-COVID-19 policies, which have restricted travel both domestically and internationally. Even when these policies were relaxed, the risk of further lockdowns impacted domestic travel plans and dampened demand.

But while growth might have been softer than anticipated, it was certainly not contractionary. Indeed, the International Energy Agency's latest report estimated 2022 oil demand growth at 2.1 million barrels per day – a strong increase relative to history.

Metals markets

The dominant theme in metals this year has been Chinese demand, overwhelming all other factors, including record low inventories for key metals such as copper.

The dual headwinds of China's zero-COVID-19 policy and weak property sector drove investor sentiment to the degree that even though demand was robust in the second half of the year and stocks dwindled, prices declined.

How metal prices perform from here will depend on China's exit from COVID-19 lockdowns, in terms of timing and sustainability, and also on the property sector not getting worse.

Perhaps no other metal has shown the 'macro versus micro' conflict better than copper. By the end of our fiscal year in September, copper stocks had fallen to the lowest level in modern history in terms of days of use, and the lowest absolute levels since 2007. And yet the price was USD3,000 per tonne below the record levels reached in March.

Still, the price has started to pick up since the start of October, helped by a strong rebound in Chinese copper demand. Contrary to what media reporting and sentiment might indicate, China's copper demand in the second half of 2022 should grow by close to seven percent year-on-year.

The pick-up has been led by many of the same sectors that drove ex-China growth in the first half of the year, but with particular emphasis on the expansion of the grid and electric vehicle production. Overall, global demand for refined copper is set to grow by a healthy 2.8 percent over 2022.

Global refined copper stocks in days of use

Stated in days of use



US dollar strength headwind for commodities

Stated in USD/metric tonne

Stated in Euro:USD



Source: Bloomberg Finance L.P., Trafigura Research

The year ahead

Looking forward, the world appears poised for more volatility and uncertainty. The war in Ukraine continues and could cause further disruption to global trade if the conflict escalates. Inflation may be coming off its peak, thanks in no small part to declining energy prices, but it remains too high for comfort.

As such, central banks are still in the mode of tightening financial conditions, and the full impacts have yet to be felt, especially as we are still not at the end of the rate-hiking cycle.

China may be looking towards a gradual re-opening, but a massive resurgence in COVID-19 cases could see Beijing revert to previous lockdown measures. A colder-than-normal winter plus any further disruptions to gas supplies could trigger a fresh spike in European energy prices.

And yet, as of now, global economic growth may be slower, but is far from contracting. Labour markets remain very healthy, consumer spending remains robust, and credit markets show no signs of stress. A continuing reversal in the US dollar, rates and inflation will all be tailwinds for global growth. Governments have embarked on major renewable and infrastructure investment programmes that should provide a source of sustained future demand, in particular for key metals.

However, renewed demand growth will run up against the realities of structural under-investment across commodities. Given how low inventories are for key raw materials already, together with a lack of readily available spare capacity, any sustained rebound in consumption could lead to significant tightness and a supply crunch.

Indeed, we appear to be running the risk of moving away from a world of commodity cycles to one of commodity spikes, where a lack of production capacity results in prices rising to levels that cause demand destruction, before falling. But even then, prices will remain elevated, given how long it takes to bring online new projects and the unyielding focus on capital discipline and shareholder returns of the major mining houses and big oil companies.

Performance review

Oil and Petroleum Products

A record performance for Trafigura's Oil and Petroleum Products Trading division for a third consecutive year.

Jose Maria Larocca
Ben Luckock
Hadi Hallouche
Co-Heads of Oil Trading

312.5_{mmt}

Total volume traded
(2021: 330.3mmt)

6.6_m

Average barrels traded
per day
(2021: 7.0m)

Oil and Petroleum Products volumes traded (mmt)

	2022	2021
Biofuel	0.7	0.6
Bitumen	0.2	0.3
Condensates	2.0	1.7
Crude oil	149.0	156.0
Fuel oil	36.7	38.4
Gasoline	24.3	24.8
Liquefied petroleum gas (LPG)	7.8	8.3
Liquefied natural gas (LNG) ¹	13.0	14.0
Middle distillates	41.4	46.7
Naphtha	13.6	16.2
Natural gas ¹	23.7	23.2
Total	312.5	330.3

¹ Million metric tonnes of oil equivalent.

Performance overview

The impact of the COVID-19 pandemic and the subsequent rebound in demand in most key economies placed further pressure on previously efficient global supply chains in the first half of our financial year. But these disruptions were eclipsed by the impact of Russia's invasion of Ukraine in February, which required a fundamental reworking of energy supply routes – in addition to the significant humanitarian impact of the war in Ukraine.

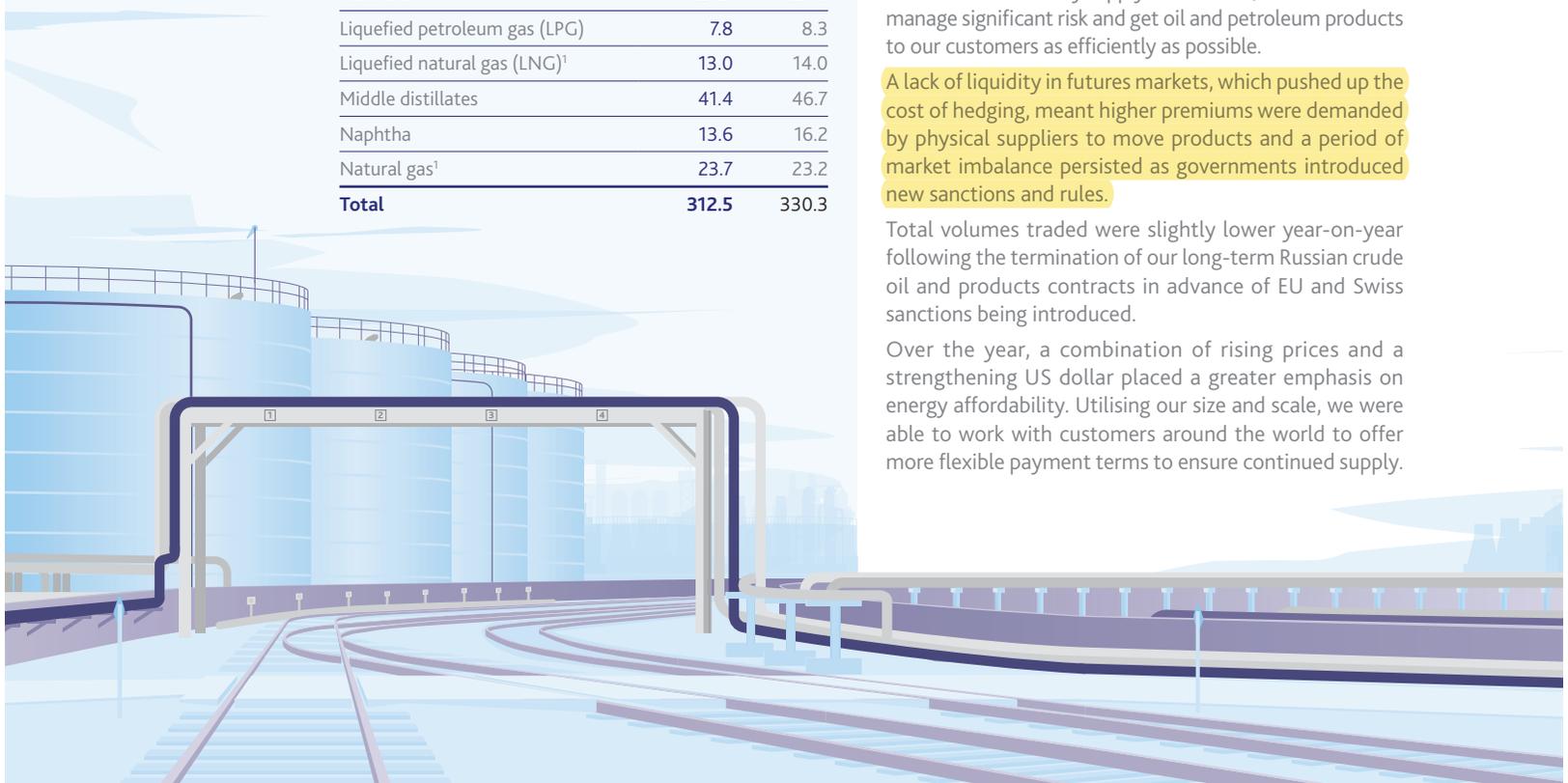
With an increased focus on security of supply, against a backdrop of heightened market volatility, our Oil and Petroleum Products division delivered a record result in 2022.

Key to this performance was a determination to help our customers adjust to changing trade flows, as well as close coordination between each of our trading teams. This allowed the division to identify supply bottlenecks, ensure we could manage significant risk and get oil and petroleum products to our customers as efficiently as possible.

A lack of liquidity in futures markets, which pushed up the cost of hedging, meant higher premiums were demanded by physical suppliers to move products and a period of market imbalance persisted as governments introduced new sanctions and rules.

Total volumes traded were slightly lower year-on-year following the termination of our long-term Russian crude oil and products contracts in advance of EU and Swiss sanctions being introduced.

Over the year, a combination of rising prices and a strengthening US dollar placed a greater emphasis on energy affordability. Utilising our size and scale, we were able to work with customers around the world to offer more flexible payment terms to ensure continued supply.



At the same time, we added a number of new commodities to our product offering including aviation gas, biofuels, base oil, petrochemicals and ammonia, a precursor to low carbon ammonia becoming a globally traded fuel source, in particular for the shipping industry and to transport hydrogen. These more specialised commodities are high value products that allow us to offer a wider service to customers and exploit synergies with other trading activities across the business.

Looking ahead, we expect the crude oil market to remain unsettled in 2023, as low global inventories and geopolitical instability run up against concerns of slowing global growth as central banks raise interest rates to fight inflationary pressures. Managing the repercussions from these changes will be the main priority for the division in 2023.

Crude oil

The global crude oil market was volatile in 2022, as demand remained strong but supply was pressured by the war in Ukraine and active market management by OPEC and its allies. This included a period of near record prices and backwardation¹.

The sanctions levied on Russia following the full invasion of Ukraine changed long-established trade flows and forced consumers in Europe and a number of other countries to look further afield for supplies.

Our global footprint and experienced teams enabled us to adapt to these fast-changing market dynamics. Clear communication and decisive action were key in understanding disrupted markets and providing security of supply for our customers.

Volumes were slightly lower, in part due to the decision to terminate long-term contracts to offtake Russian origin crude oil.

During the year, we struck supply deals with a number of refiners and secured new offtake arrangements with producers in Canada and West Africa. The Crude oil team also continued to build on Trafigura's long-established position in US shale oil, expanding its customer base and introducing Midland West Texas Intermediate to several end users that have not used the grade before. The decision to add US Midland West Texas Intermediate to the benchmark assessment for Brent should boost demand and customer acceptance.

Gasoline

Demand for gasoline remained below its pre-COVID-19 levels in 2022, with the shift to homeworking, particularly in the US, continuing to affect commuter traffic levels.

Following the invasion of Ukraine, there were concerns that sanctions placed on Russian exports of vacuum gas oil would affect US refinery runs and a reduction in Russian naphtha supply would shrink global gasoline supply. Consequently, we witnessed a large increase in refinery margins.

Against this backdrop, our Gasoline team performed strongly and volumes remained consistent with the same period in 2021. The highlight of the year was the expansion of our European business, which will continue to be an important driver for the Gasoline team over the next 12 months.

In the year ahead, several themes will shape the gasoline market, including the trend towards working from home and a policy change in China to increase refinery runs. At the same time, supply chain disruptions caused by the Russia-Ukraine conflict will continue to create regional imbalances and periodic distortions.

Naphtha and condensates

Faltering demand and ample supply were the main drivers of the naphtha market in 2022, as the conditions that prevailed in the previous financial year were almost reversed.

In Asia, the petrochemicals industry struggled as strict COVID-19 policies took their toll on economic activity in China, while European producers were hit with rising costs and slowing growth, impacting their margins. On the supply side, refinery runs picked up. The result was an oversupplied market and naphtha was forced to reprice at a level where a lot more of it could be used in gasoline blending. In condensates, it was a year where heavier grades did significantly better as a result of their higher middle distillates yield.

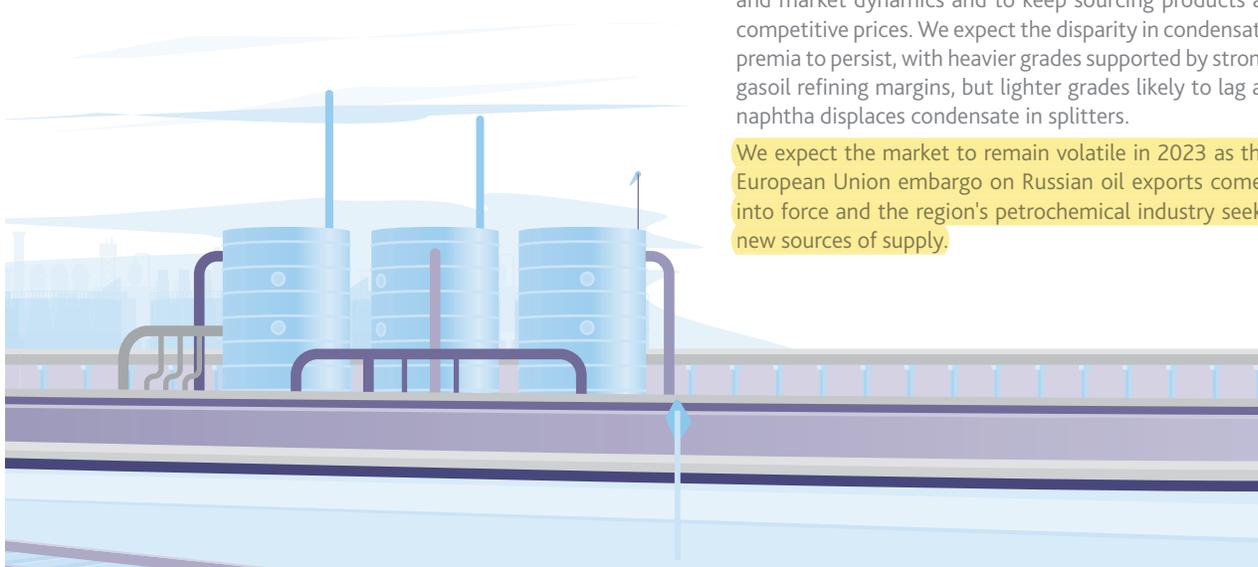
Our Naphtha and Condensates team seized on these changing market dynamics to deliver a strong performance over the year, using its global reach and diversified portfolio to help balance supply and demand. However, volumes were down on 2021 as a result of reduced activity in Russia following the invasion of Ukraine.

Given our global footprint and access to storage and shipping, the Naphtha and Condensates team is in a strong position to help its customers adapt to changing trade flows and market dynamics and to keep sourcing products at competitive prices. We expect the disparity in condensate premia to persist, with heavier grades supported by strong gasoil refining margins, but lighter grades likely to lag as naphtha displaces condensate in splitters.

We expect the market to remain volatile in 2023 as the European Union embargo on Russian oil exports comes into force and the region's petrochemical industry seeks new sources of supply.



www.trafigura.com/oil



¹ A market structure where prompt contracts trade above later-dated ones in a sign of tightening supplies.



▲ Marine fuel bunkering, Algoa Bay, South Africa.

Fuel oil

High prices, low stocks and volatility were the key features of bunker and fuel oil markets in 2022. On the supply side, traditional trade flows were disrupted by the war in Ukraine and the subsequent sanctioning of Russian oil. At the same time, fuel consumption continued its post-pandemic recovery as reflected by increased bunker demand. There was also greater use of fuel oil in power plants as a result of soaring gas prices. Together, this led to heavily backwarddated markets and record-high premia.

Our Fuel oil trading team performed exceptionally well in this challenging environment, stepping up as a stable and reliable supplier as many rivals struggled to access the finance or hedging tools needed to handle unprecedented market volatility. Although our traded volumes fell in Europe, we increased our presence in Asia and expanded our footprint in the Americas.

In addition to our strong performance in physical trading, we continued to expand our operations with TFG Marine, the bunkering joint venture between Trafigura Marine Logistics, Frontline and Golden Ocean, building our volumes and customer base year on year. We also established a new base oil trading book, a product used by refineries to make lubricating oil and greases, quickly finding synergies with our current customer base.

Looking forward, the key challenge for the Fuel oil team will be understanding and handling the impact on supply and demand of heightened geopolitical tensions, tighter monetary policy and a changing competitive landscape.

Distillates

The distillates market in 2022, was a story of strongly rising demand as the post-pandemic economic recovery continued. Gas-to-oil switching provided a further demand kicker. The global refining system struggled to increase production fast enough, while supply chains had to be consistently rearranged amid complex web of sanctions on Russian oil and diesel flows. In addition to those factors, extreme weather events and significantly higher gas prices in Europe resulted in a large volume of diesel being used.

Against this backdrop, it was a highly successful year for the Distillates team. Lower volumes meant we were able to focus on core markets and help key clients make sense of an increasing complex supply picture.

The team was able to extend its reach into industries that had previously relied on gas but were looking for cheaper options to power their operations. This highlighted the ability of Trafigura to draw on a deep pool of expertise to help create new supply chains.

We made sure storage positions did not become over troublesome in a heavily backwarddated market and we were alert to inflationary pressures in shipping and liquidity requirements to enable us to hedge price exposure.

The outlook for 2023 will depend on the balance between slowing global growth and the extent of gas-to-oil switching. The availability of cargoes as Europe's embargo on Russian diesel comes into force will be another factor in determining the direction of the distillates market.

Bitumen

Commodity prices and high energy costs were the main influences on the bitumen market in 2022. The year started slowly, in terms of paving activity, especially in developing countries, which struggled with the rising cost of bitumen. COVID-19 lockdowns in China weighed on demand in the Far East for the third year in a row. As we progressed through the year and the roadwork season started in the US and northwestern Europe, consumption started to pick up, creating business opportunities mainly in the Atlantic basin.

On the supply side, production was ample because of a strong pickup in transport fuel demand, which triggered higher refinery runs globally.

Our Bitumen team was able to react quickly to these regional trends and deliver a stronger performance on a year-on-year basis, using storage capacity and our large fleet of bitumen carriers to win tenders and supply customers. Volumes were broadly stable across the financial year.

The outlook for the year ahead is highly uncertain and dependent on the impact of tighter financial conditions as central banks raise interest rates and uncertainty over the rate of crude and fuel oil production next year.

Biofuels

Biofuel markets were rocked by extreme turbulence in 2022, with prices swinging from levels high enough to spark demand destruction to lows that made it a cheaper blending component than fossil fuels in some regions of the world.

Adding to the volatility, some countries in Europe also slashed their blending mandates to reduce prices at the pump for consumers and because of concerns about supplies of grain, vegetable oils and gas following events in Ukraine. As the war continues, other countries could do the same, placing a question mark over biofuel demand in the year ahead.

Notwithstanding these developments, we remain committed to continuing to find ways to grow and expand our customer base. The Biofuels team performed exceptionally well during the year, weathering a multitude of storms, while at the same time expanding our business in Europe, Latin America and Asia.

As we head into 2023, a strong focus will remain on any further changes to government policies and blending mandates. We will continue to look for synergies between our biofuels and the rest of our refined products business.

Liquefied petroleum gas

Unlike other parts of the oil industry, liquefied petroleum gas (LPG) experienced little impact from the war in Ukraine. The main driver of the market in 2022 was sluggish economic growth in Asia, and China in particular, as a result of strict COVID-19 policies and weakness in the property and petrochemicals sectors. This dented demand for LPG from the Chinese petrochemicals industry, which also had to contend with weak export markets in Europe.

On the supply side, we continued to see an increase in LPG exports, with strong flows out of the US and the Arabian Gulf. We expect production growth to continue in 2023, although infrastructure bottlenecks could crimp supplies from the US.

Over the financial year, our LPG business continued to expand its geographical reach and the scope of its operations. Our portfolio now includes ammonia, a fuel we expect to play a meaningful role in the energy transition.

While we expect more challenging conditions in 2023, large flows of LPG will still need to be moved between regions to balance the market. We expect to play a meaningful role in this process and also in helping Europe seek alternative sources of supply as trading flows of other products are further affected as a consequence of the war in Ukraine.

Liquefied natural gas and natural gas

In 2022, natural gas made headline news as prices rocketed to unprecedented levels deepening the energy crisis in Europe.

Over the past two years, Russia has been steadily reducing its sales to the bloc so that today they are now at a fraction of pre-pandemic levels.

To compensate, Europe has been forced to restart its fleet of coal-fired power stations, extend the life of ageing nuclear power plants and bid aggressively for every available cargo of liquified natural gas (LNG) on the market.

In this environment, our Integrated Gas and LNG team performed well. However, our immediate priority following Russia's invasion of Ukraine in February 2022 was ensuring the safety of colleagues in Kyiv, who had built a successful domestic trading business.

Our LNG and Natural gas team also got to work helping customers adapt to the new market realities caused by the war and the reordering of global energy flows.

Using our network of leased pipelines, we were able to carry gas from the Permian Basin, which straddles West Texas and southeastern New Mexico, to liquefaction plants on the coast, then across the Atlantic to deliver it to our regasification slots in Europe.

From here, our LNG and Natural gas team was able to trade and deliver the molecules to where they were needed. In many instances, the gas went into leased storage ahead of the winter.

This cohesive approach allows us to increase efficiencies, reduce costs and meet demand wherever it appears in the supply chain.

Of course, the year was not without its challenges. The sharp increase in margining requirements by futures exchanges and clearing brokers substantially increased the cost of moving physical cargoes, which reduced liquidity in both physical and financial markets and exacerbated volatility. The explosion at the Freeport LNG terminal, where we have an offtake agreement, removed LNG and significant flexibility from our portfolio at a time when the market needed them most.

However the size and scale of our operations meant that we were able to substantially mitigate any issues for our end buyers relating to the lost Freeport volumes and we continued to ensure safe and reliable LNG supply.

Looking forward, we expect gas and LNG markets to remain volatile. While Europe should avoid a blackout this winter by drawing on inventories and cutting demand, it will need to import huge volumes of LNG in 2023 given the massive reduction in flows from Russia. For LNG to continue to flow to Europe as opposed to other demand centres, the price will need to remain elevated and we expect security of supply to remain paramount for customers in Europe through next winter and beyond.

Performance review

Metals and Minerals

Despite market volatility due to numerous geopolitical events, the Metals and Minerals division recorded a robust performance in 2022.

23.3_{mmt}

Total volume non-ferrous concentrates and refined metals traded
(2021: 22.8mmt)

91.3_{mmt}

Total volume bulk minerals traded
(2021: 82.7mmt)

Performance overview

Demand from China was subdued for a number of metals compared to prior years due to successive and prolonged shutdowns as the government sought to contain rising cases of COVID-19. This was, however, partially offset by strong demand from western economies driven by the acceleration of the energy transition, namely investment in renewable energy and electric vehicles.

Despite the broadly positive fundamentals of underlying supply and demand for metals and minerals, London Metal Exchange (LME) prices were weighed down, in particular in the second half of our financial year. The key drivers for weaker prices include a strong US dollar and macroeconomic concerns as central banks increased interest rates to combat inflation and fears grew of recession in major economies.

Volumes remained broadly consistent with the prior year, with concentrates up eight percent and refined metals down by six percent. During the year we were alert for opportunities to expand our business and started to explore investment in lithium, a key battery metal.

**Gonzalo de Olazaval,
Kostas Bintas**
Co-Heads of Metals

Non-ferrous concentrates and refined metals traded (mmt)	2022	2021
Concentrates total	14.4	13.3
Refined metals total	8.9	9.5
Total	23.3	22.8

Ken Loughnan
Head of Bulk Minerals

Bulk minerals volumes traded (mmt)	2022	2021
Iron ore	31.0	23.1
Coal	60.3	59.6
Total	91.3	82.7





For some of our metals, inventories were and remain at record lows, while the power crisis in Europe has forced many smelters to curtail production, further tightening markets. Amid rising geopolitical tensions, there is also a sharper focus on security of supply, particularly around key energy transition metals such as copper, nickel and cobalt.

This was highlighted by the US Inflation Reduction Act, a USD369 billion flagship package to spur investment in green technologies. It was also evident in the EU's decision to increase its renewable energy production target to 45 percent by 2030 as the region seeks to wean itself off Russian fossil fuels. Ultimately, these policies and others are highly metals intensive. However, a lack of investment in new supply means large deficits could emerge in a number of the products we trade between now and the end of the decade.

Looking forward, we expect macro economic factors to continue to influence metals prices into 2023, albeit with the potential for greater supply disruptions as consumers become more selective about the origin and carbon footprint of the metal they consume.



[www.trafigura.com/
metals](http://www.trafigura.com/metals)

Non-ferrous concentrates and refined metals

Copper

For the copper market, 2022 started brightly with prices pushing steadily higher in a tight stock environment. Copper went on to hit a record high, at above USD10,600 per metric tonne, amid fears that Russia's invasion of Ukraine could curtail supplies.

The concerns proved to be misplaced but sentiment remained positive, with copper viewed by many investors as a beneficiary of the accelerating decarbonisation agenda in the US and Europe.

However, as attention shifted to aggressive monetary tightening, China's property market and increasing COVID-19 cases in the country's major cities, prices plunged, falling briefly below USD7,000. A strong US dollar also weighed on copper, which continued to trade at a narrow range to the year-end although it has since rallied to around USD8,500 per metric tonne at financial year end.

For most of the year, copper demand remained robust. Investment in energy infrastructure in Europe continued.

The same was true in China after a third year of summer power shortages. Combined with another year of spectacular growth in electric vehicle output, that provided enough demand to more than offset the loss of activity in the property sector.

On the supply side, we have seen a year of heightened disruptions, with many mines forced to lower production forecasts as a result of operational problems related to COVID-19 and local community issues.

These factors, combined with a drought in Chile, the world's largest copper producer, left the copper market running close to the disruption levels seen during the height of the pandemic in 2020. As we head into 2023, we expect to see a change in the traditional physical flows on the back of further self-sanctioning of Russian metal.

Despite this turbulence, the Copper team delivered a solid performance as we continued to reap the benefits of an integrated approach across refined copper and concentrates. Volumes were broadly stable and we continued to actively engage with our customers, helping them to determine the carbon footprint of the cargoes they are buying through cutting edge digital technology.

As financial conditions continue to tighten, we expect the market to further consolidate as clients recognise the value in dealing with counterparties that have the scale and financial strength to cope with increasingly volatile markets while delivering first-class customer service.

Even after several new projects come online in 2023, we expect to see increasingly large supply deficits and for a tight market to become the new normal for copper.



Alumina and aluminium

The aluminium market experienced unprecedented volatility in 2022, reflected by extreme price movements on the London Metal Exchange. In the space of three months between December 2021 and the start of March 2022 – the benchmark aluminium price rose 60 percent to a record high above USD4,000 per tonne as a result of strong demand and concerns over disruptions to Russian supply.

However, prices quickly reversed course as a deteriorating macroeconomic outlook and rising inflationary pressures weighed on the market. While demand fears persist, Europe's energy crisis and the war in Ukraine have exposed serious fault lines in the supply chain both for aluminium and its key ingredient alumina.

These risks were particularly noticeable in Europe in 2022, with soaring gas prices increasing aluminium production costs to more than USD15,000 a tonne at certain points of the year. This is because of the large amounts of electricity needed to transform alumina into refined metal. We estimate that a third of European aluminium production is now curtailed, and that further closure risks remain.

In China, which is the world's biggest producer of aluminium, lower-than-expected rainfall in the south-west forced further capacity cuts. The war in Ukraine also caused production disruptions, with one of the largest alumina refineries in the world curtailed because of its proximity to the conflict.

Our Alumina and Aluminium team was able to successfully meet these challenges in 2022, drawing on our long-established position in the physical market to serve our customers and expand our trading book. As the largest independent global alumina and aluminium trader by volume, our focus going forward will be on helping our customers manage these volatile and unpredictable market conditions. For 2023, the outlook hinges how producers and consumers adapt to less stability and more complicated logistics.

▼ Trafigura Group's equity investment: Prony Resources cobalt-nickel mine in new Caledonia.



Nickel and cobalt

The nickel market was challenging in 2022, caused by the technical squeeze on the London Metal Exchange in March, which saw prices hit USD100,000 per metric tonne. This further exaggerated the disconnect between prices in the physical and futures markets.

Fundamentally, the market remained well supplied during the year thanks in large part to increased production capacity in Indonesia and new facilities capable of converting nickel pig iron into battery grade metal. If plans for further expansions are realised, it could see Indonesia's share of global nickel supply rise to more than 50 percent next year.

On the demand side, there was healthy demand for battery grade nickel as global electric vehicle sales continued to grow rapidly, led by China but weaker for lower purity metal used by the stainless steel industry.

The outlook for the nickel market in 2023 is one of oversupply, driven by production growth in Indonesia and the ongoing weakness of the Chinese property sector, which is affecting stainless steel demand. Set against this, demand for battery-grade nickel is likely to remain robust although consumers are becoming more selective about the volumes they are prepared to buy, seeking assurance on sustainability, origin and carbon intensity.

Despite these volatile market conditions, the nickel team supplied record volumes to our customers, boosted by increased supply from Terrafame and Prony Resources. As a result, we are able to meet the needs of our growing customer base in both stainless steel and battery metals while also developing new products, such as lithium and other key battery metals, to meet the future needs of the market.

For cobalt, COVID-19 outbreaks and flooding in Durban, South Africa, created huge logistical challenges exporting material from the Democratic Republic of the Congo (DRC), in the first half of the financial year. This boosted prices that in turn incentivised higher output from small scale or individual mines, also in the DRC. This artisanal production doubled year-on-year to account for 20 percent of primary supply.

Despite a mild recovery in demand from the aerospace industry, sales of portable electronics dropped, while car manufacturers continued efforts to reduce cobalt in the batteries that power electric vehicles. Together, these factors lead to a significant market surplus that started to materialise by the end of our financial year in September and weighed on prices.

The highlight of the year was completing the largest pre-financing on record for a mine in the DRC. The USD600 million facility will allow our long-standing partner Shalina Resources to complete the Mutoshi mine in Kolwezi. This is expected to come online in 2023 and has the potential to provide a new source of supply of cobalt hydroxide for refiners around the world.

Overall, the demand profile for cobalt remains attractive due to the rising popularity of electric vehicles. However, as with nickel, the provenance of material is becoming increasingly important. While supply is sufficient to meet demand over the coming years, certain volumes may not be accepted by consumers. As a result, prices could diverge between responsibly sourced metal and metal that fails to meet industry standards.

Zinc and lead

Throughout the 2022 financial year, the zinc market experienced periods of extreme tightness in the physical market and declines in London Metal Exchange stocks to historically low levels.

A key driver of these trends was surging gas and power prices. A number of zinc smelters in Western Europe were placed on care and maintenance, including Nyrstar's Budel plant in the Netherlands. These closures and rising freight costs drove up premiums outside China for refined zinc.

In China, rolling lockdowns hit demand and the market was weaker. In zinc concentrates, mine supply was stable year on year and treatment charges trended higher.

The lead market was more subdued in 2022. There was continued strong demand for the metal outside China but inside the country demand and production dynamics were greatly affected by reduced mobility from the COVID-19 lockdowns. The concentrates market has seen strong continued demand from Chinese smelters and mine supply remained stable. The refined and concentrates markets are both expected to be balanced this year with low stocks of both globally.

The Zinc and Lead team responded well to these market conditions, drawing on its global reach to meet the evolving needs of its client base. In terms of volumes, we maintained our market position over the year.

We expect similar conditions in 2023 financial year with European power prices, demand growth in China and recession fears the key factors that will influence zinc and lead markets. Against that backdrop, our strategy will be to remain agile and respond to the changing needs of our customers.

▼ Finished zinc blocks at Nyrstar's smelting facility Budel, the Netherlands.



Bulk minerals

Coal

Coal prices scaled new heights during the 2022 financial year as record gas prices and sanctions against Russia boosted demand. Thermal coal, which is burned in power stations to generate electricity, rose as high as over USD400 per metric tonne for some brands as buyers in Asia and Europe scrambled for material in a market where there has been an almost total absence of investment in new mines outside of China.

Metallurgical coal, used to produce steel, had a more turbulent year, with prices pulling back from record levels of USD660 per metric tonne in early 2022 as mills in Europe cut production in response to slowing demand.

Against this backdrop, our global Coal Trading team performed strongly with volumes steady year on year and robust financial results.

There was strong demand for the team's services throughout the year, both from customers looking to replace expensive gas with cheaper coal and from those seeking an alternative to sanctioned Russian output.

The Coal team was able to respond rapidly to these changing requirements drawing on its strong relationships with producers around the world. On the demand side, we saw increased volumes being delivered to Europe as utility companies restarted mothballed power stations in response to an unprecedented energy crisis in the region.

Over the next 12 months, we expect thermal coal prices to remain at elevated levels because of the lack of new supply and the ongoing energy gas crisis in Europe, while metallurgical coal will be more subdued as recession fears mount. We will continue to meet the fuel requirements of our customers globally, whilst providing support for their energy transition goals.

Iron ore

The iron ore market traded in a wide range in the 2022 financial year, between USD87 and USD163 per tonne as optimism about the outlook for the global economy and Chinese policy stimulus gave way to pessimism as central banks rapidly raised interest rates and China persisted with its zero-COVID-19 policy.

Prices briefly rose above USD160 per metric tonne in March based on anticipation of easing lock-down restrictions in China and the likelihood of even more stimulus to fight the slump of the property market. As these expectations fell short in July, the steel making commodity moved steadily lower and ended September at below USD100 per metric tonne – roughly where it had been a year earlier.

The 2022 financial year saw bleaker demand in Europe, where soaring energy prices have forced steel mills to curtail production, weighed on the market in the latter months of the financial year although it displayed less volatility than other commodities.

On the supply side, output from Australia and Brazil was weaker than expected amid logistics-related challenges, but not enough to impact prices, while China continued to buy iron ore at roughly the rate predicted by forecasters despite weakness in the property market, as infrastructure and manufacturing activities expanded.

For our Iron ore team, it was another year of expanding trading volumes. We saw increased shipments from Porto Sudeste, our Brazilian iron ore terminal, a trend that will continue next year with the commissioning of the Tico-Tico mine in the south-eastern state of Minas Gerais. We also increased other export volumes through deals with the industry's major producers.

Looking forward, we expect iron ore to remain in a tight range until there is more certainty around the outlook for the global economy.

Oil price outlook – Snapshot: December 6, 2022

Disclaimer: Please note that BNEF does not offer investment advice. Clients must decide for themselves whether current market prices fully reflect the issues discussed in this note.

Category	Indicator	Signal	Comment
Fundamentals	Refinery margins		<ul style="list-style-type: none"> Global refinery margins were lower over the past week, as oil product cracks across the barrel weakened.
	Crude stocks		<ul style="list-style-type: none"> In the week ending November 25, land crude-oil storage levels in BloombergNEF's tracked regions (the US, ARA and Japan) fell 3.1% to 543.0 million barrels (m bbl). The stockpile deficit against the five-year average (2015-19) widened from 42.7m bbl to 55.5m bbl. Including global floating crude stockpiles from the same week, total crude oil inventories decreased 2.0% to 646.3m bbl, while the stockpile surplus widened from 13.5m bbl to 16.6m bbl.
	Product stocks		<ul style="list-style-type: none"> In the week ending November 25, gasoline and light distillate stockpiles in BNEF's tracked regions (the US, ARA, Singapore, Japan and Fujairah) rose by 1.9% week-on-week to 258.1m bbl, with the stockpile deficit against the three-year average (2017-19) narrowing from 4.9m bbl to 3.4m bbl. Gasoil and middle distillate stockpiles in BNEF's tracked regions were up 2.8% to 145.5m bbl, with the stockpile deficit against the three-year average narrowing from 20.6m bbl to 18.5m bbl. Oil product stockpiles in tracked regions grew by 0.4% to 968.0m bbl, with the stockpile deficit against the three-year seasonal average narrowing from 11.1m bbl to 5.2m bbl. Altogether, crude and product stockpiles decreased by 0.6% to 1,614.3m bbl, with the stockpile surplus widening from 2.4m bbl to 11.4m bbl.
	Demand indicators		<ul style="list-style-type: none"> In the week to December 6, global jet fuel demand from commercial passenger flights is set to rise by 0.5% to 5.05 million barrels per day. Jet fuel consumption by international passenger flight departures is up 67,900 barrels per day (or +2.3%) week-on-week, while consumption by domestic passenger flight departures falls by 43,200 barrels per day (or -2.1%). In the week to December 4, flight departures in the Eurocontrol area rose to 86.0% of the equivalent week in 2019, up from 85.9% last week. The four-week moving average however slipped to 86.5%, from 87.2%. Meanwhile, in the same week, US passenger throughput grew to 93.4% of the average week in 2019, up from 93.1% last week. The four-week moving average increased to 94.7%, from 94.4%. In the week to November 30, TomTom's peak congestion data showed growth in Europe (+1.4%) and Asia Pacific ex-China (+6.1%), while North America showed a decline (-19.6%). Versus the same week in 2021, North America is down 7.2 points week-on-week to 99.3%, while Europe is down 2.6 points to 96.9%, while Asia Pacific ex-China is up 1.1 percentage points to 106.5%. Road congestion in China's 15 key cities fell by 23.4 percentage points to 71.4% of January 2021 levels in the week to November 30, according to BNEF's calculation based on Baidu data. Note that BNEF has revised the methodology used to calculate the changes in China's city congestion levels, refer to slide 14 for more information. In the week to November 29, global daily average new Covid-19 cases grew 11% to 472,000. Europe saw a 19% increase to 140,000 daily cases, while the Asia Pacific jumped 10% to 240,000 daily cases (with the number in China more recently surged 28% to 35,433 cases in the week to December 4). However, the Americas also saw cases fall 1% to 78,000 daily cases. Several cities in Western Europe and East Asia turned cooler over the past week, although temperatures by-and-large remained mild.
Financial	Macro indicators		<ul style="list-style-type: none"> The dollar index averaged 105.7 over the past week and was 0.8% lower from the week before. The Global Manufacturing PMI fell for the sixth consecutive month to 48.8 in November, from 49.4 in October. The China Manufacturing PMI rose to 49.4 from 49.2 in the same time period.
	Hedge fund positioning		<ul style="list-style-type: none"> In the week to November 29, Managed Money net positioning in the oil complex was down by 42.0m bbl (or -9.8%) week-on-week to 388.2m bbl, and stood at the sixth percentile of the past five years.
	Options chains and volatility		<ul style="list-style-type: none"> Brent and WTI 1M volatility skews rose over the past week after several weeks of decline.
Outlook	Weekly call		<ul style="list-style-type: none"> BNEF is bearish on oil prices for the week ahead, with Brent Feb-23 trading at \$81.80/bbl and WTI Jan-23 trading at \$76.04/bbl at the time of writing. The EU agreement to set a price cap of \$60/bbl for Russian oil could have a pronounced short-term impact on oil flows from the country due to operational risks – particularly the way Russian crude prices are fixed as a differential to benchmark crude prices, rather than as a standalone flat price. While a sizeable portion of Russian supplies are likely to be cut off from the market, the key impact of the price cap will be to reinforce the rewiring of global oil flows that's taken shape since the Ukraine invasion. EU can source more crude oil, albeit at a higher freight cost, from other regions such as the US, North Sea, Middle East, West Africa and Guyana. Meanwhile, a significant portion of excess Russian oil cargoes will continue to be redirected to alternative buyers such as China, India and Turkey. The option to revise the price cap every two months from mid-January will also ensure the EU can still gain access to Russian oil supplies should the situation require. As of December 4, the seven-day moving average of new daily Covid-19 cases in China has fallen to 35,433 cases, down 13.1% from the highs reached on December 2. China's reported easing of Covid-19 measures could mean that the oil demand forecasts for the first quarter of 2023 remain largely unaffected. High frequency mobility indicators showed a decreasing trend for global road traffic activity, as congestion levels in North America and China plunged. Road congestion levels are likely to see a seasonal lull period due to the winter season. Weekly oil inventories saw a bearish move over the past week as the stockpile surplus against its seasonal average (2017-19) widened. The oil product stockpile deficit has continued to shrink at a fast pace and is likely to flip into a surplus in the coming weeks, and if so will be its first surplus in at least since November 2021.

Past outlooks

Disclaimer: Please note that BNEF does not offer investment advice. Clients must decide for themselves whether current market prices fully reflect the issues discussed in this note

Date of report	Refinery margins	Crude stocks	Product stocks	Demand indicators	Commitment of traders	Options chain and volatility	BNEF week ahead call	Brent/WTI price at time of writing (\$/bbl)	Web Link
December 6	↓	↔	↓	↓	↓	↔	↓	Brent-Feb: 81.80 WTI-Jan: 76.04	
November 28	↔	↓	↓	↓	↓	↔	↔	Brent-Feb: 81.42 WTI-Jan: 74.17	
November 21	↑	↔	↓	↓	↓	↔	↓	Brent-Jan: 83.07 WTI-Jan: 76.03	
November 16	↔	↑	↔	↔	↑	↑	↔	Brent-Jan: 93.91 WTI-Dec: 86.81	
November 2	↔	↔	↓	↔	↑	↑	↔	Brent-Jan: 94.43 WTI-Dec: 88.22	
October 26	↔	↓	↔	↓	↓	↔	↔	Brent-Jan: 91.89 WTI-Dec: 85.77	
October 19	↔	↓	↔	↓	↑	↔	↓	Brent-Dec: 90.28 WTI-Dec: 82.78	
October 4	↔	↔	↑	↔	↓	↓	↔	Brent-Dec: 90.71 WTI-Nov: 85.26	
September 27	↔	↓	↓	↓	↓	↓	↔	Brent-Dec: 94.06 WTI-Nov: 87.83	
September 6	↓	↑	↔	↓	↔	↑	↓	Brent-Nov: 101.00 WTI-Oct: 95.40	
August 30	↔	↔	↓	↑	↑	↑	↑	Brent-Oct: 93.65 WTI-Sep: 87.83	
August 16	↔	↓	↔	↓	↓	↔	↓	Brent-Oct: 97.60 WTI-Sep: 91.50	
August 9	↔	↓	↔	↔	↓	↓	↔	Brent-Oct: 99.38 WTI-Sep: 93.42	
August 2	↔	↑	↔	↔	↔	↔	↓	Brent-Oct: 101.94 WTI-Sep: 98.46	

To view past reports on terminal, go to [NI BNEFOIL](#), search for the report and click on the icon to the far right:

24 ✓ Oil Price Indicators Weekly

BNE

11/30

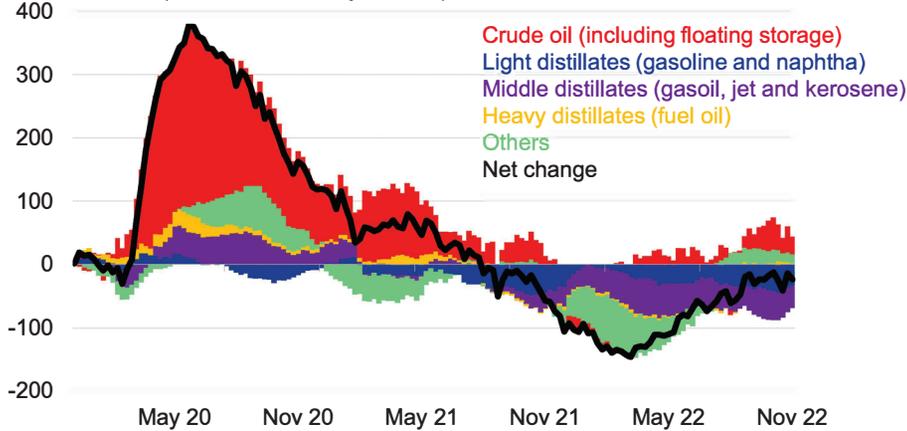


Weekly oil inventories

Oil inventories fell slightly over the past week

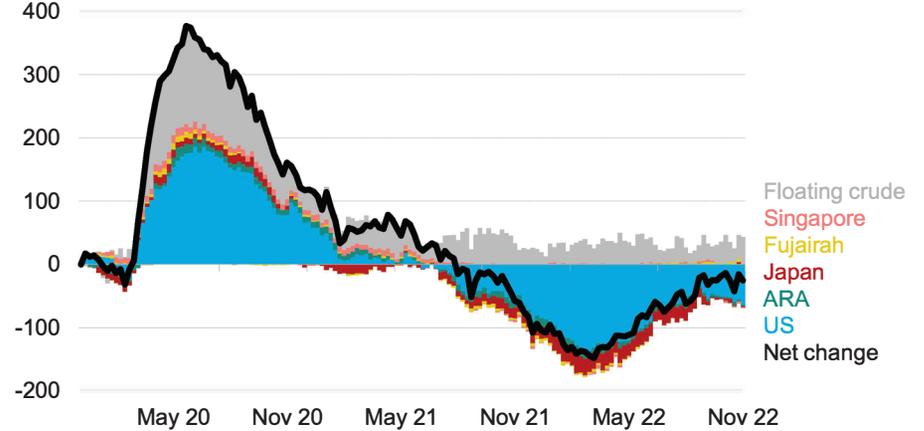
Weekly oil inventories by type

Million barrels (indexed to January 1, 2020)



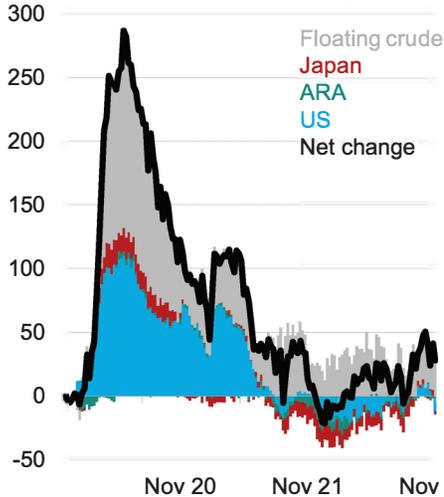
Weekly oil inventories by region

Million barrels (indexed to January 1, 2020)



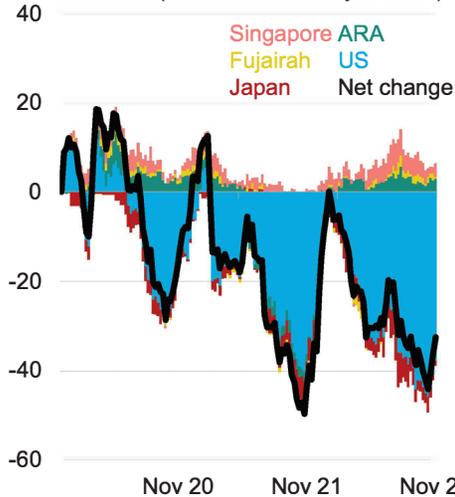
Crude inventories

Million barrels (indexed to January 1, 2020)



Light distillate inventories

Million barrels (indexed to January 1, 2020)



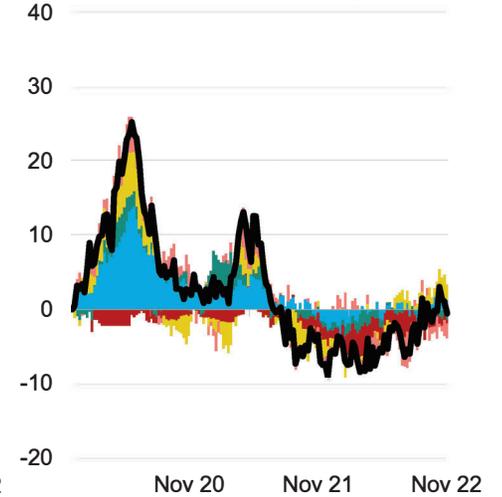
Middle distillate inventories

Million barrels (indexed to January 1, 2020)



Heavy distillate inventories

Million barrels (indexed to January 1, 2020)



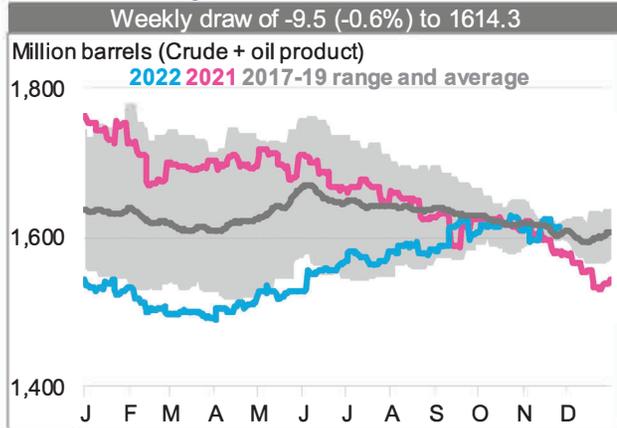
Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ, Vortexa, Genscape. Note: As of the week ending **November 25, 2022**.

Aggregated oil stockpiles

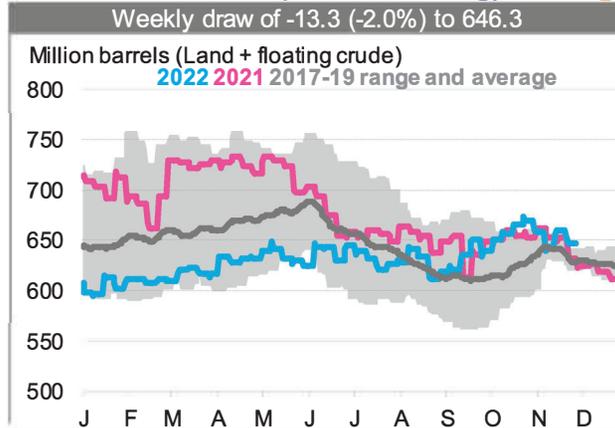
Bearish: Stockpile surplus widened from 2.4m bbl to 11.4m bbl

- Charts below use the **2017-19** (three-year) seasonal stockpiles. All calculations are recalibrated to measure against their respective three-year seasonal averages, so the values below may differ from the previous slides.
- Land crude inventories include the US, ARA, Japan and Shandong Teapots. Floating storage data are global. Oil product storage includes the US, ARA, Japan, Singapore, Shandong Teapots and Fujairah. Floating crude inventories may have been adjusted since the previous report – see slide 8 for further info.

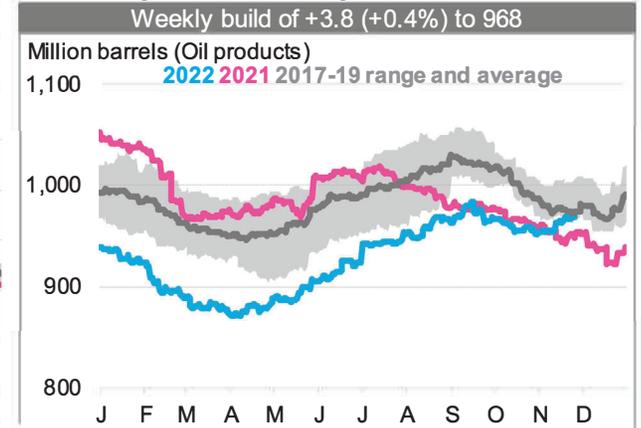
Total oil and product stocks



Total crude stocks (land + floating)

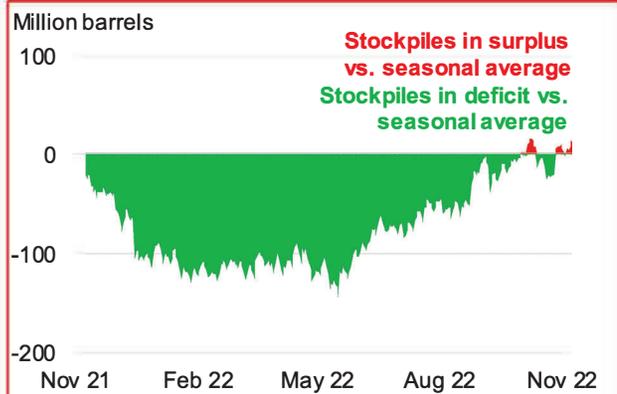


Total oil product stockpiles

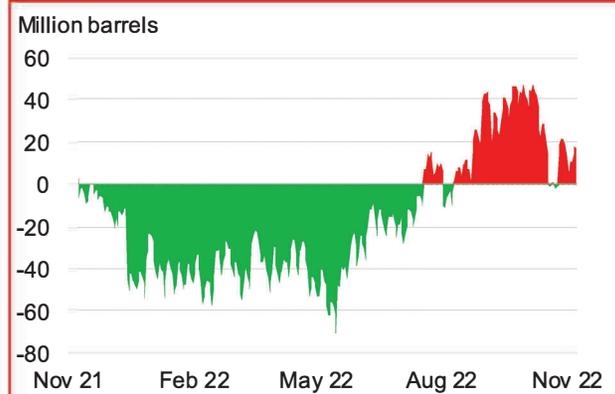


----- Charts below subtract current stockpiles by the 2017-19 (three-year) seasonal average -----

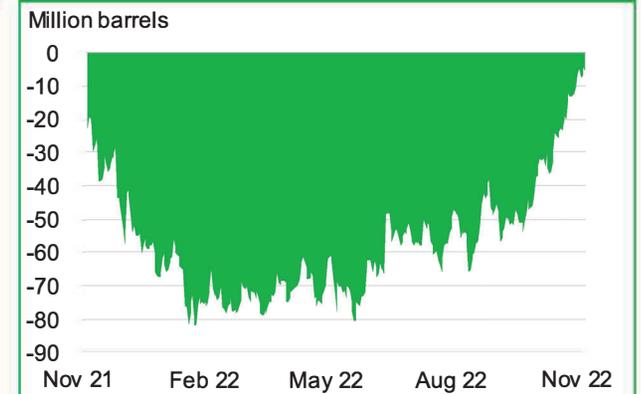
Surplus widened from +2.4 to +11.4



Surplus widened from +13.5 to +16.6



Deficit narrowed from -11.1 to -5.2



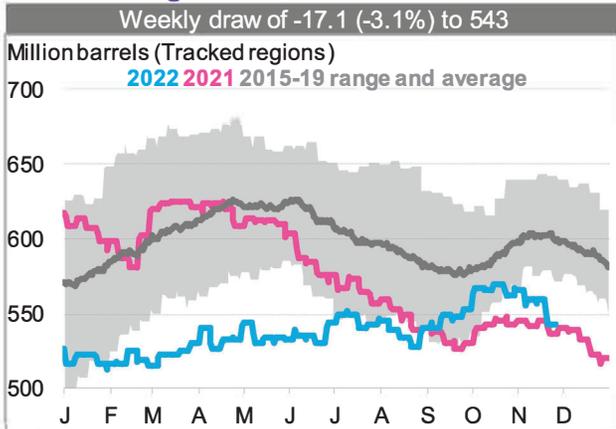
Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ, Vortexa, Genscape. Note: As of the week ending November 25, 2022.

Crude stocks: Land

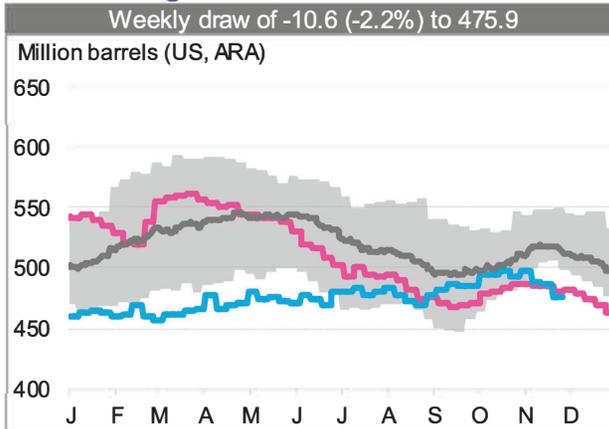
Bullish: Stockpile deficit widened from 42.7m bbl to 55.5m bbl

- Crude inventory rises when supply outstrips demand (meaning more physical oil is available than is needed). High or rising inventories are therefore a bearish factor for oil prices. Every year, storage levels fluctuate due to seasonal demand trends. The intra-year directional movement of stockpile levels is somewhat predictable, yet the magnitude of movement can differ significantly from expectations.
- A useful way to gauge if the intra-year storage levels differ from the norm is to measure the difference between the current and seasonal average inventory levels.

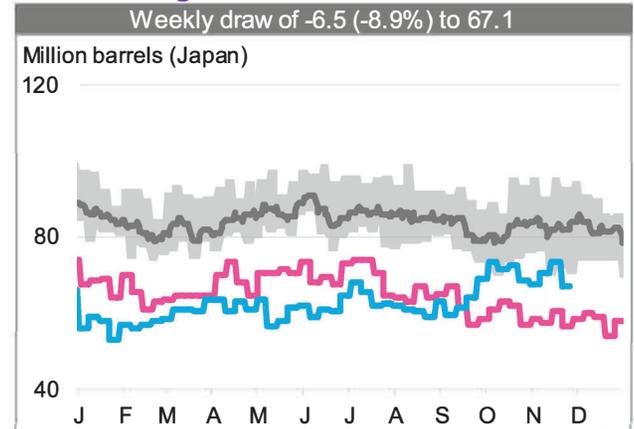
Land storage: Total



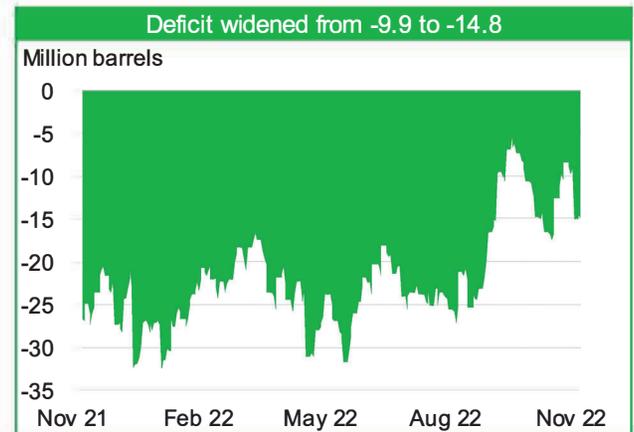
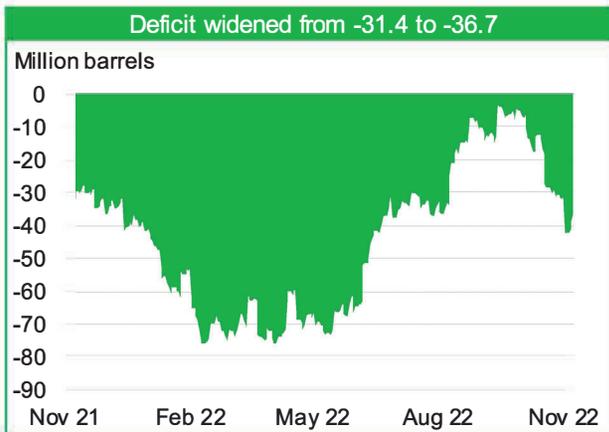
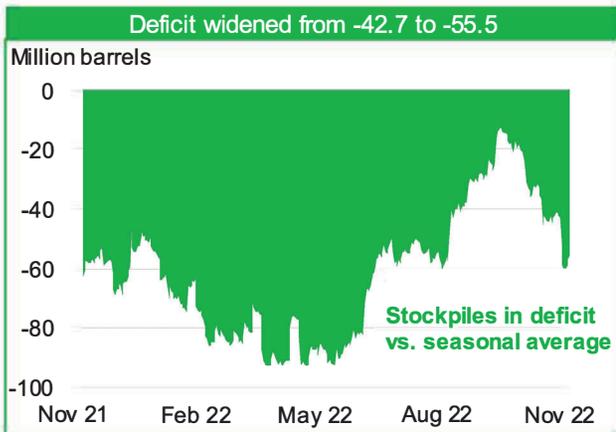
Land storage: West of Suez



Land storage: East of Suez



Charts below subtract current stockpiles by the 2015-19 (five-year) seasonal average



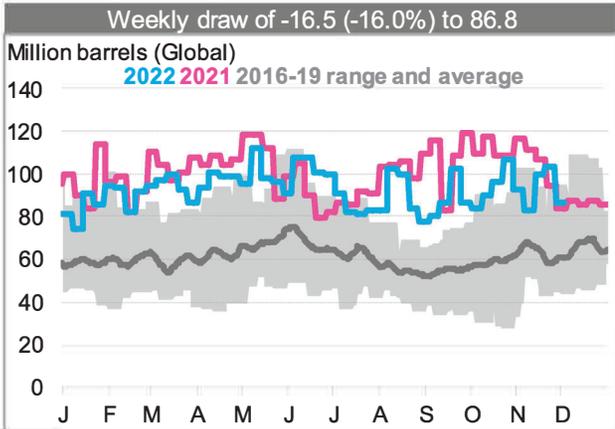
Source: BloombergNEF, US EIA, Genscape, PAJ. Note: As of the week ending November 25, 2022.

Crude stocks: Floating

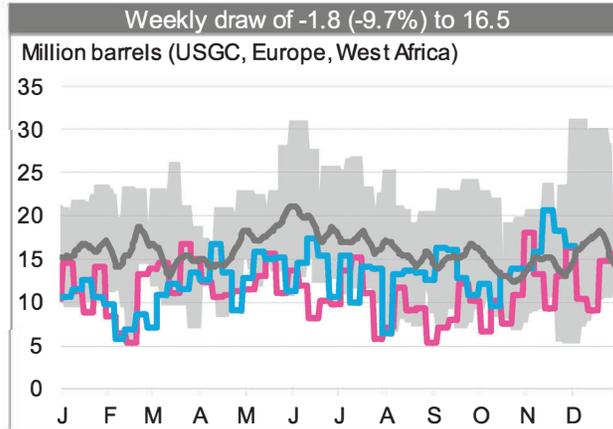
Neutral: Stockpile surplus remained rangebound

- Floating storage is only profitable if the strength of contango (future versus prompt price) is greater than the tanker costs. Therefore, tankers become floating storage when the profit from a storage play exceeds the cost of the forward freight agreement (FFA).
- The floating storage data used in the “Oil Price Outlook” slide is for the previous week (ie, the week before the latest data shown below).

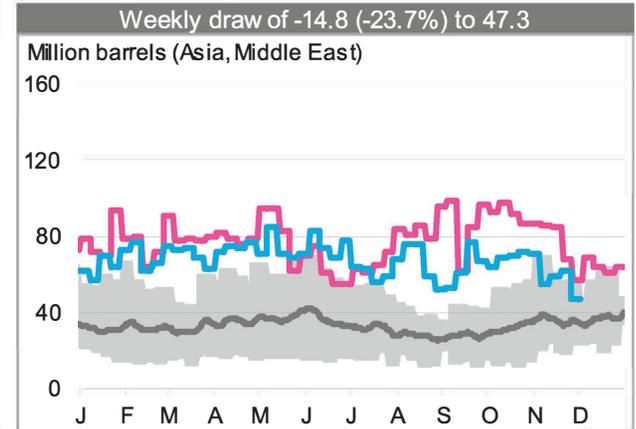
Floating storage: Total



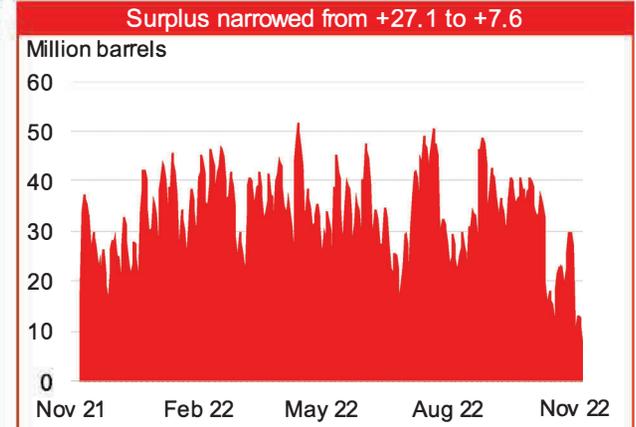
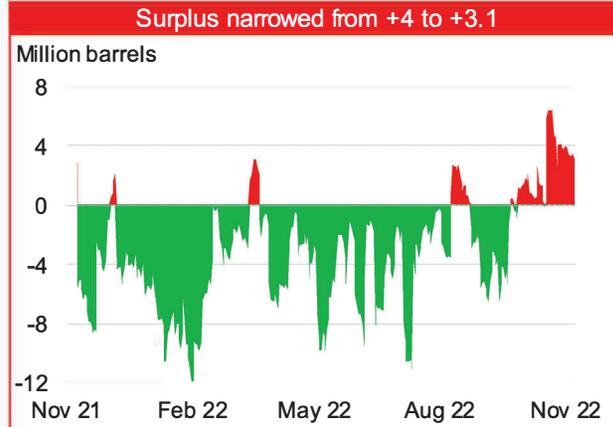
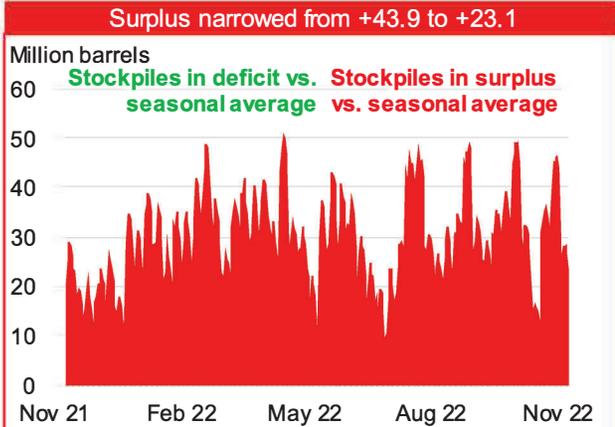
Floating storage: West of Suez



Floating storage: East of Suez



----- Charts below subtract current stockpiles by the 2016-19 (four-year) seasonal average -----



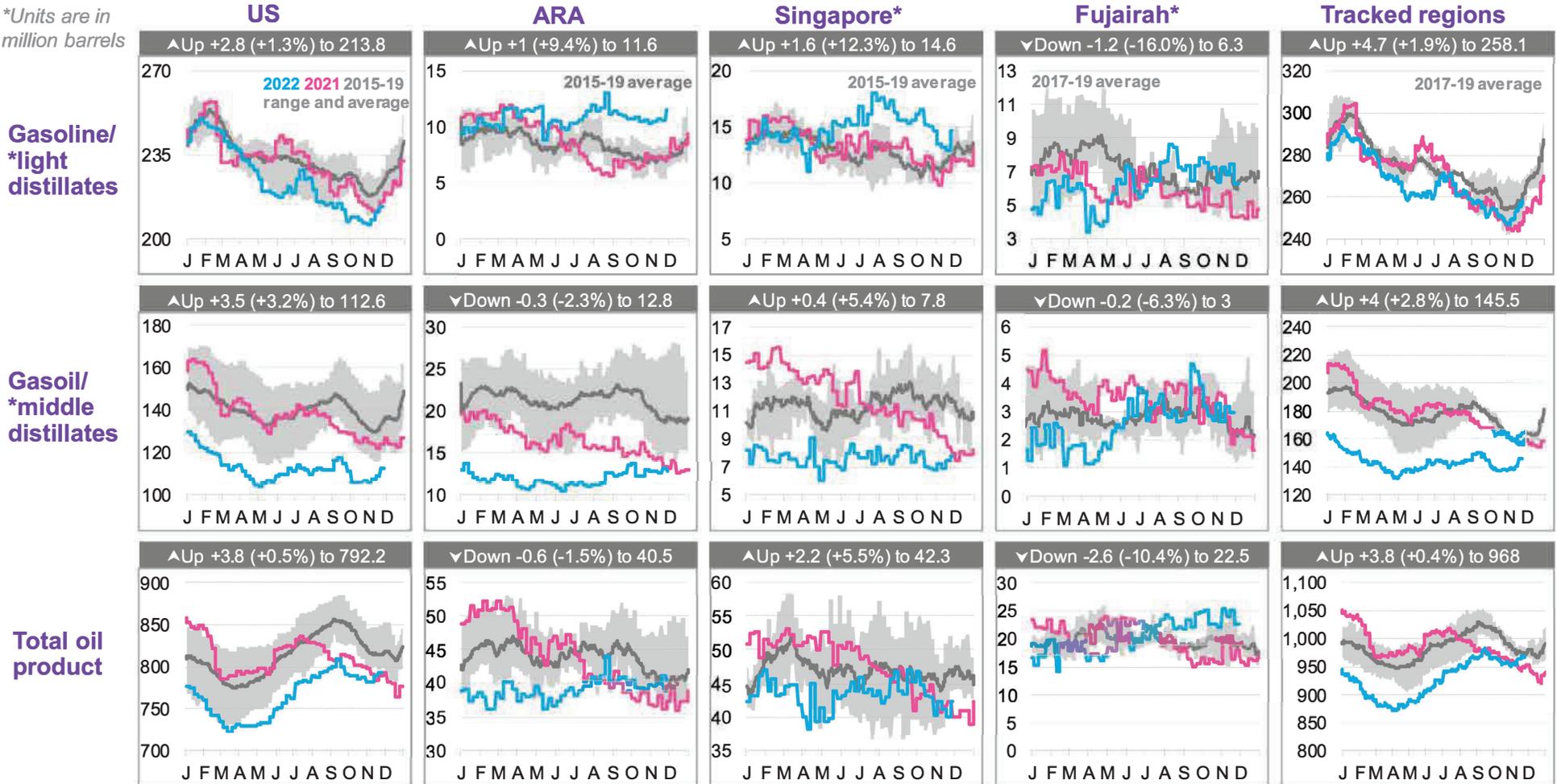
Source: BloombergNEF, Vortexa. Note: As of the week ending December 2, 2022. *Raw data from Vortexa are revised frequently, so the data in this report might change week-to-week.

Product stocks: Current versus seasonal average

Neutral: Oil product stockpiles in tracked regions grew by 0.4% over the past week

- Chart legend are as follows: **2022**, **2021** and the **2015-19** range and average. For Fujairah and tracked regions, the **2017-19 (three-year)** seasonal range is shown. Tracked regions include US, ARA, Singapore, Japan and Fujairah

*Units are in million barrels



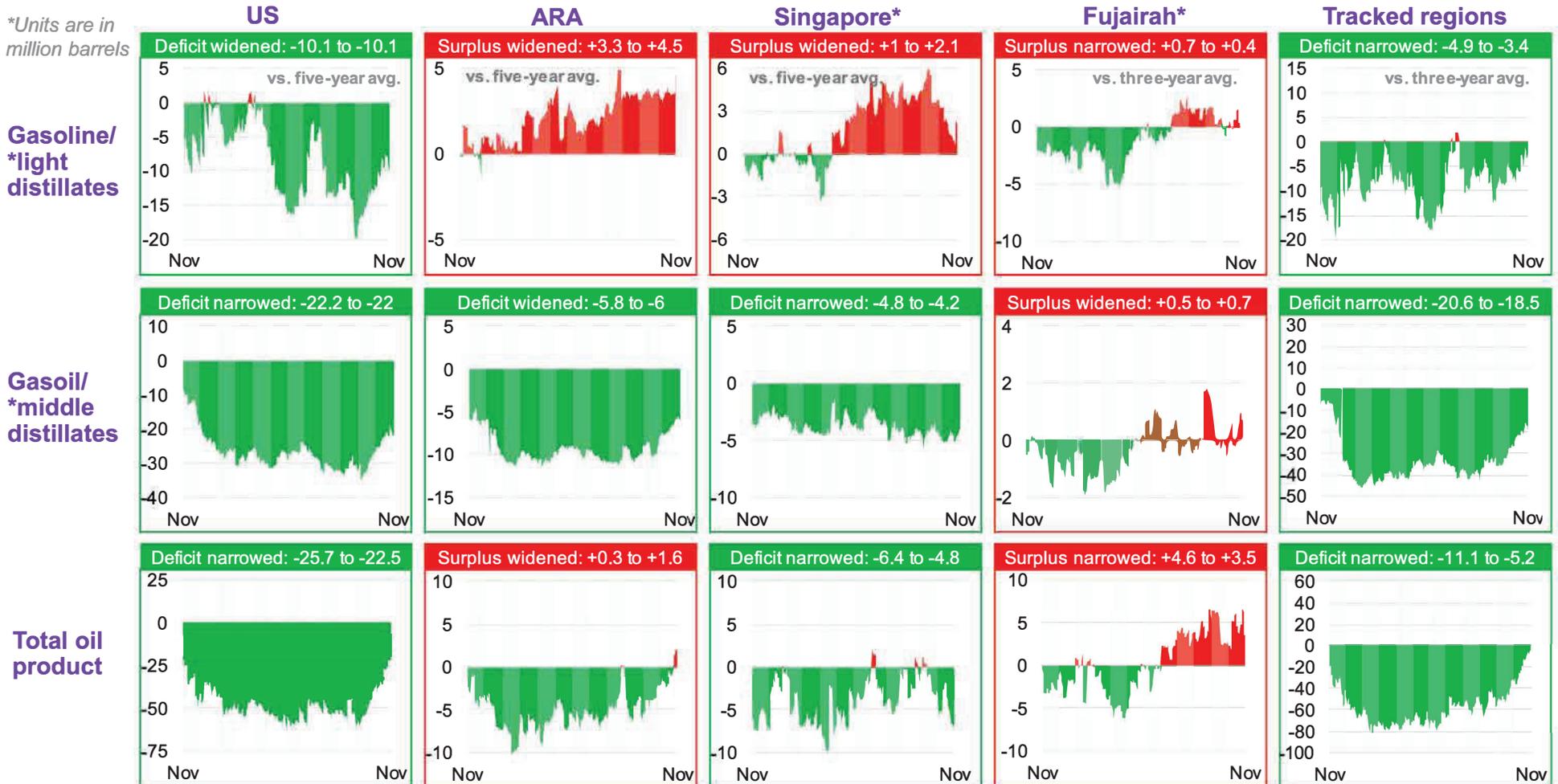
Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ. Note: As of the week ending November 25, 2022.

Product stocks: Current versus seasonal average

Bearish: Oil product stockpile deficit against the seasonal average narrowed from 11.1m bbl to 5.2m bbl

- The charts below compare each respective regional product stockpile level against the seasonal average defined in the previous slide.
- Red** signifies that the current stockpile levels are higher (in surplus) than the seasonal average, while **green** signals that the current stockpiles are lower (in deficit).

*Units are in million barrels



Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ. Note: As of the week ending November 18, 2022.

Dec 09, 2022 10:41:01

OIL DEMAND MONITOR: Economic Woes Take Toll Though China

Pivots

Signs abound that appetite for fuels to stay subdued for now

India's consumption, better outlook for aviation are positives

By John Deane

(Bloomberg) -- Global economic headwinds continue to depress oil consumption, though India's thirst for fuels, a bumpy recovery in air travel and China's steps toward easing Covid-19 curbs are plus-points in the outlook for demand.

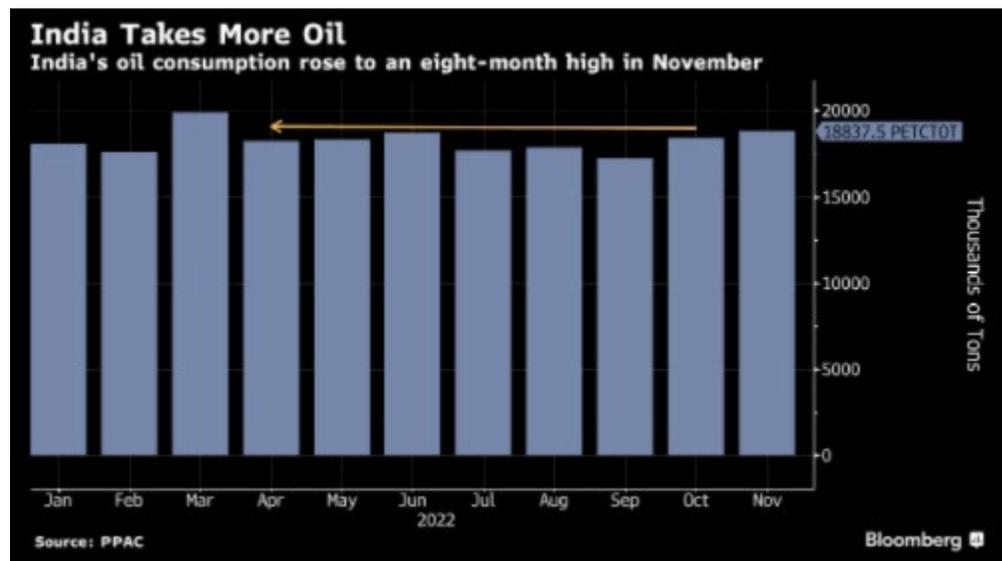
Concerns about the global malaise stoked by high interest rates have helped drive Brent crude prices toward a hefty weekly decline, with plenty of pointers suggesting that the coming months will see subdued demand for fuels.

Saudi Arabia lowered most prices for Asia, its main market, in a sign that the need for oil remains fragile, while neighboring Kuwait's state energy company said customers are reluctant to increase imports next year. China's actual crude demand is likely to fall 2% this year, according to an official at China National Petroleum Corp.'s research unit.

In the US, the latest data from the Energy Information Administration showed gasoline demand down month-on-month and year-on-year, as well as trailing the five-year average.

Still in India, consumption of diesel - the country's most-used petroleum fuel - jumped 19% year-on-year in November, with demand for gasoline and LPG also rising, according to provisional data from the oil ministry's Petroleum Planning & Analysis Cell. Overall oil-product usage added 10%, to the highest since March.

Read More, Nov. 14: India Is Bright Spot for Oil Demand: Elements by Javier Blas



In the skies, while OAG Aviation continues to show global seat capacity trailing pre-pandemic levels by about 16%, it also saw airlines providing about 31% more capacity this year than in 2021. The flight-data provider estimates a 22% year-on-year increase in the first quarter of 2023, for "another optimistic sign of the recovery."

Elsewhere, China moved definitively away from its long-held Covid-Zero approach, easing a range of restrictions with which it has persisted after the rest of the world moved on to living with the virus, and prompting outgoing Premier Li Keqiang to say that the country's economy will "keep picking up."

The Bloomberg oil-demand monitor uses a range of high-frequency data to help identify emerging trends. Following are the latest indicators. The first two tables shows fuel demand and road congestion, the next shows air travel globally and the last is refinery activity:

Demand Measure	Location	% y/y	% vs 2020	% vs 2019	% m/m	Freq	Latest Date	Latest Value	Source
Gasoline product supplied	US	-6.7	+10	-7.5	-7.2	w	Dec. 2	8.36m b/d	EIA
Distillates product supplied	US	-0.8	+4.8	-0.2	-15	w	Dec. 2	3.55m b/d	EIA
Jet fuel product supplied	US	+14	+5.9	-29	-10	w	Dec. 2	1.39m b/d	EIA
Total oil products supplied	US	-1.1	+5.9	-7	-7.7	w	Dec. 2	19.63m b/d	EIA
All motor vehicle use index	UK	+1	+11	-3	-1	w	Dec. 5	97	DfT
Car use	UK	+2.2	+13	-7	unch	w	Dec. 5	93	DfT
Heavy goods vehicle use	UK	-4.5	-2.7	+7	+0.9	w	Dec. 5	107	DfT
Gasoline (petrol) avg sales per filling station	UK	-1.1	+30	-6.5	+2.1	m	Week to Nov. 27	6,721 liters/d	BEIS
Diesel avg sales per station	UK	-5.9	+6.4	-12	+3.4	m	Week to Nov. 27	9,166 liters/d	BEIS

Total road fuels sales per station	UK	-4	+15	-9.8	+2.9	m	Week to Nov. 27	15,887 liters/d	BEIS
Total Products	India	+10	-2.6	+1.8	2.4	m	November	18.8m tons	PPAC
Gasoline	India	+8.1				m	November	2.86m tons	PPAC
Diesel	India	+19				m	November	7.76m tons	PPAC
LPG	India	+5.1				m	November	2.47m tons	PPAC
Jet fuel	India	+22		-13	+4.1	m	November	572k tons	Bberg
Toll roads volume	France	-6.2		-4.2		m	October	n/a	Atlantia
Toll roads volume	Italy	-1.4		-0.7		m	October	n/a	Atlantia
Toll roads volume	Spain	-8.9		-8		m	October	n/a	Atlantia
Toll roads volume	Brazil	+0.3		+1.4		m	October	n/a	Atlantia
Toll roads volume	Chile	-5.7		+20.1		m	October	n/a	Atlantia
Toll roads volume	Mexico	+3.6		+12.4		m	October	n/a	Atlantia
Gasoline	Spain	+4.4			-4.5	m	October	509k m3	Exolum

Diesel (and heating oil)	Spain	-2.5			-2.4	m		October	2230k m3	Exolum
Jet fuel	Spain	+29.6			-4	m		October	570 m3	Exolum
Total oil products	Spain	+2.6			-3	m		October	3309 m3	Exolum
Road fuel sales	France	-3			+8	m		October	4.173m m3	UFIP
Gasoline	France	-1.1				m		October	n/a	UFIP
Road diesel	France	-3.7				m		October	n/a	UFIP
Jet fuel	France	+39		-16.8	+1.45	m		October	631k m3	UFIP
All petroleum products	France	-4.3			-9.1	m		October	4.744m tons	UFIP
All vehicles traffic	Italy	unch			-5	m		November	n/a	Anas
Heavy vehicle traffic	Italy	-2			+0.2	m		November	n/a	Anas
Gasoline	Portugal	-0.8	+13.5	+6	-4.2	m		October	92k tons	ENSE
Diesel	Portugal	-2.7	+1.1	-6.3	+4.5	m		October	409.5k tons	ENSE
Jet fuel	Portugal	+39	+163	-0.4	-6.5	m		October	143.7k tons	ENSE

Notes: Click here for a PDF with more information on sources, methods. The frequency column shows w for data updated weekly, 2/m for twice a month and m for monthly. The column showing "vs 2020" is used for some data, such as comparing Portuguese jet fuel sales for October 2022 vs October 2020.

In DfT UK daily data, which is updated once a week, the column showing versus 2019 is actually showing the change versus the first week of February 2020, to represent the pre-Covid era.

In BEIS UK daily data, the column showing versus 2019 is actually showing the change versus the average of Jan. 27-March 22, 2020, to represent the pre-Covid era. The publication frequency switched from weekly to monthly, after July 28.

Atlantia is publishing toll road data on a monthly basis, rather than the weekly format seen in 2021

City congestion:

Measure	Location	% chg vs avg 2019	% chg m/m	Dec 5	Nov 28	Nov 21	Nov 14	Nov 7	Oct 31	Oct 24	Oct 17	Oct 10	Oct 3	Sept 26
		(for Dec. 5)		Congestion mins added to 1 hr trip at 8am* local time										
Congestion	Tokyo	+10	+10	41	37	47	37	37	34	39	37	8	34	38
Congestion	Taipei	+3	+5	37	37	34	34	35	45	35	52	4	34	37
Congestion	Jakarta	-12	-15	34	34	31	33	40	35	36	37	37	36	34
Congestion	Mumbai	-54	+19	22	20	23	23	19	21	2	31	25	21	28
Congestion	New York	-4	-14	30	30	32	33	35	26	37	29	5	31	16
Congestion	Los Angeles	-7	-5	33	28	21	36	35	29	35	35	26	37	27
Congestion	London	+5	-31	40	47	40	45	57	38	22	47	53	41	49
Congestion	Rome	-1	-17	48	47	49	50	58	8	51	49	53	56	40
Congestion	Madrid	-78	-70	8	28	26	29	26	2	35	32	31	31	29
Congestion	Paris	+31	+18	58	49	51	49	49	8	33	43	39	49	44
Congestion	Berlin	-5	+4	32	27	35	30	31	19	26	28	29	1	26
Congestion	Mexico City	-24	-17	37	35	0	29	45	34	40	39	38	39	40
Congestion	Sao Paulo	-31	-12	30	22	35	10	34	40	33	34	31	29	38

Source: TomTom. Click here for a PDF with more information on sources, methods.

* 9am statistics are used for Mumbai. All other cities use 8am.

NOTE: TomTom has been unable to provide data on most Chinese cities since April 2021. Taipei and Jakarta were added to the table in December 2021.

Air Travel:

Measure	Location	y/y	vs 2 yrs ago	vs 2019	m/m	w/w	Freq.	Latest Date	Latest Value	Source
changes shown as %										
All flights	Worldwide	-3.8	+19	-2.5	-6.4	-2.9	d	Dec. 5	176,246	Flightradar24
Commercial flights	Worldwide	+5.6	+41	-12	-2.3	-1.5	d	Dec. 5	98,984	Flightradar24
Seat capacity per week	Worldwide	+9.6	+63	-16		-0.3	w	Dec. 5 week	89.89m seats	OAG
Air traffic (flights)	Europe			-14	-6.1	-1	d	Dec. 5	23,539	Eurocontrol
Air passenger traffic per month	China	-59	-68	-72	-21		m	October 2022	15.9m	CAAC
Heathrow airport passengers	UK	+94	+373	-16	+1.95		m	October 2022	5.89m	Heathrow

NOTE: Comparisons versus 2019 are a better measure of a return to normal for most nations, rather than y/y comparisons.

FlightRadar24 data shown above, and comparisons thereof, all use 7-day moving averages, except for w/w which uses single day data.

Refineries:

Measure	Location	y/y	chg vs 2019	m/m chg	Latest as of Date	Latest Value	Source
Changes are in ppt unless noted							
Crude intake	US	+5.1%	-1.3%	+3.1%	Dec. 2	16.6m b/d	EIA
Utilization	US	+5.7	+3.6	+3.4	Dec. 2	95.5 %	EIA
Utilization	US Gulf	+8.4	+3	+4.7	Dec. 2	97.3 %	EIA
Utilization	US East	+2.7	+26	-5.8	Dec. 2	95.1 %	EIA
Utilization	US Midwest	+0.4	+0.6	+3.7	Dec. 2	95 %	EIA
Utilization (indep. refs)	Shandong, China	-2.9	-2.3	-0.9	Dec. 2	67.1 %	Oilchem

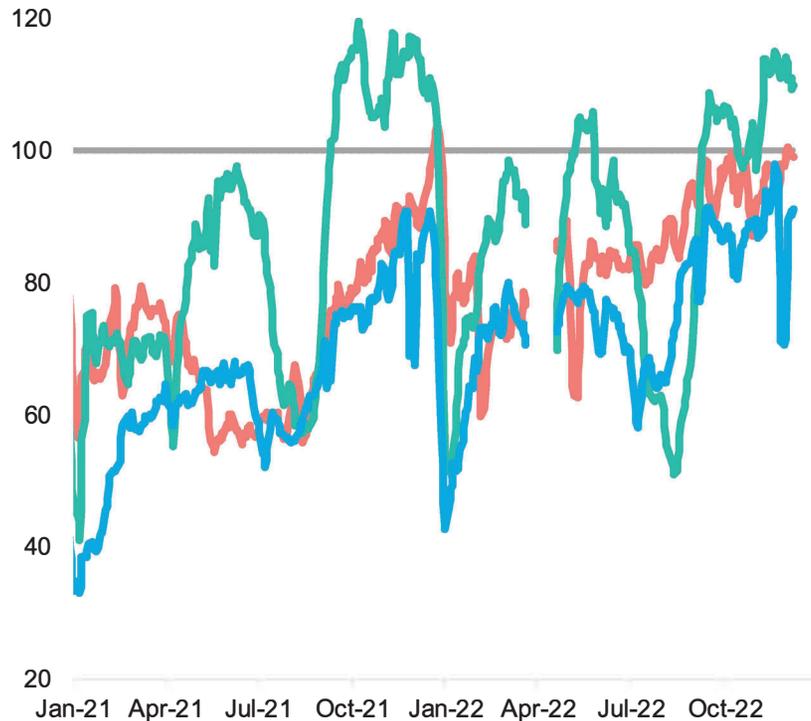
NOTE: US refinery data is weekly. China Shandong utilization is updated twice a month. Changes are shown in percentages for the row on crude intake, while refinery utilization changes are shown in percentage points. SCI99 data on Chinese refinery run rates was discontinued in late 2021.

Comparing the two mobility indicators

China and US traffic levels normalize as rest of the world remains stable

TomTom congestion index

Indexed to the peak congestion of the average week in 2019 (five-day weekday moving average)

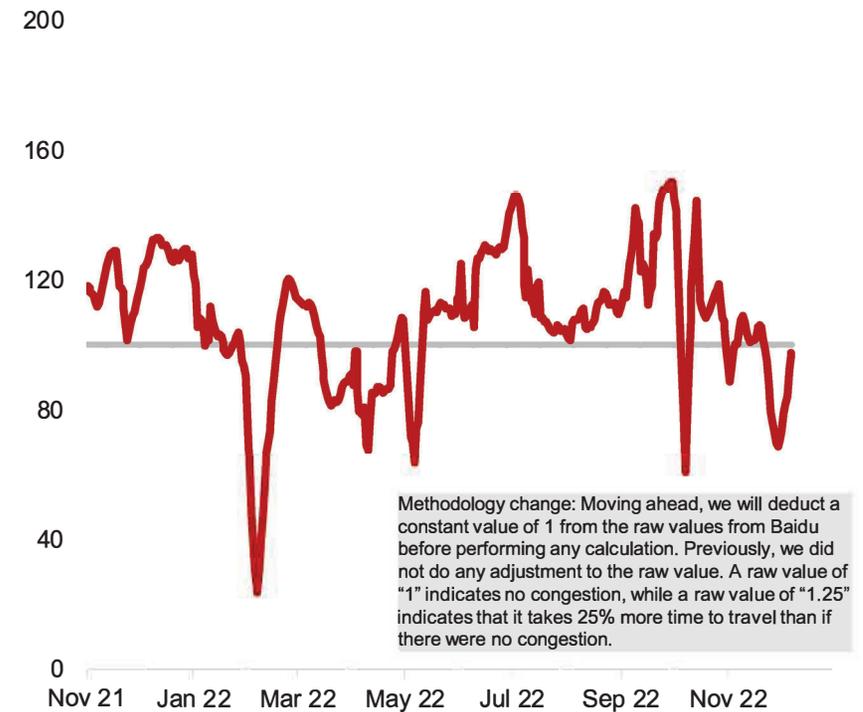


	Latest	Week Δ	Four-week Δ
Europe	110.1	-3.8 (-3.3%)	-2.7 (-2.4%)
Asia Pacific	99.2	-0.8 (-0.8%)	3.2 (+3.4%)
North America	91.3	17.7 (+24.1%)	-1.1 (-1.1%)

Source: TomTom road congestion data, BloombergNEF. Note: **Asia Pacific excludes China**. Data updated to **December 7, 2022**. Δ = change.

China-15 (Baidu) congestion index

Daily peak congestion levels, indexed to January 2021 (seven-day moving average)



	Latest	Week Δ	Four-week Δ
China-15	97.60	26.23 (+36.76%)	-11.67 (-10.68%)

Source: BloombergNEF, calculated from Baidu data. Note: Data updated to **December 7, 2022**. Δ = change.

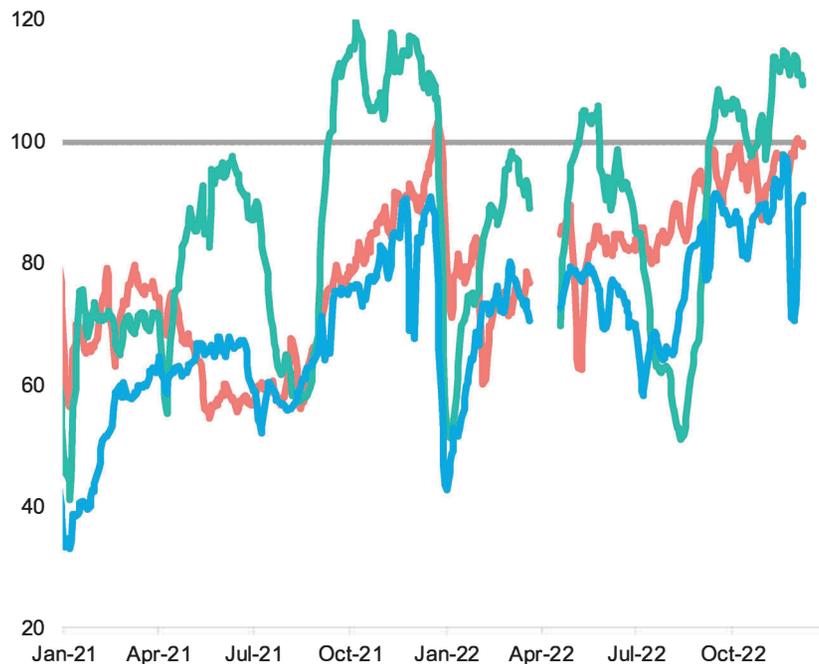
Apple Mobility reports were discontinued on April 14, 2022. We have resumed updating TomTom congestion data, which was previously updated to March 16.

TomTom congestion index

North American levels jump from Thanksgiving dip

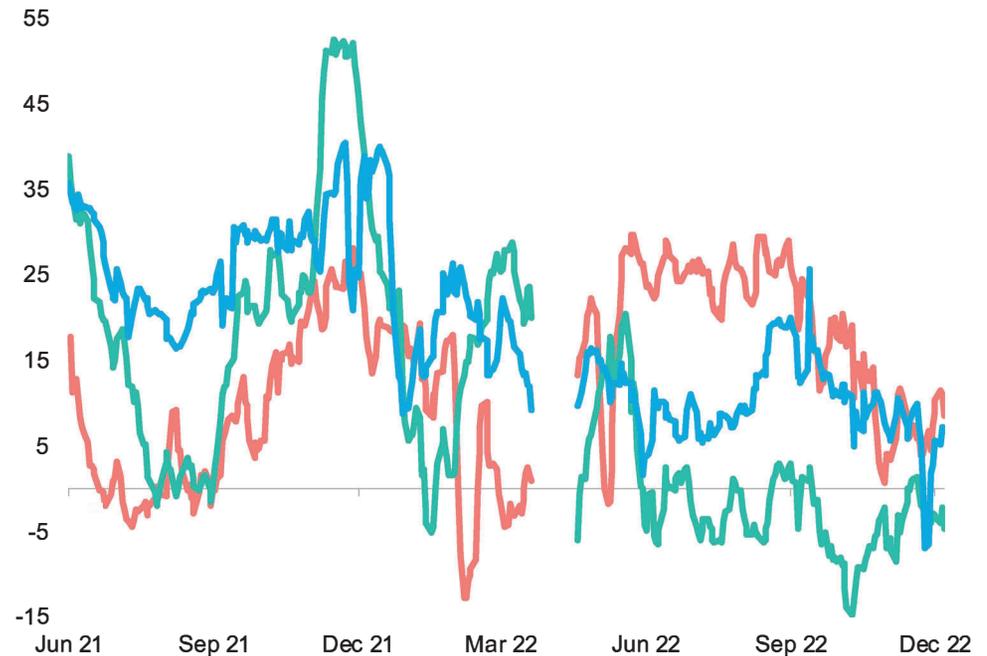
Regional road-congestion index

Indexed to the peak congestion of the average week in 2019 (five-day weekday moving average)



Index point change versus the previous year

Percentage point change vs the year before (seven-day moving average)



	Latest	Week Δ	Four-week Δ
Europe	110.1	-3.8 (-3.3%)	-2.7 (-2.4%)
Asia Pacific	99.2	-0.8 (-0.8%)	3.2 (+3.4%)
North America	91.3	17.7 (+24.1%)	-1.1 (-1.1%)

	Index point Δ vs year before	Index point Δ vs year before (last week)
Europe	-2.66	-3.08
Asia Pacific	9.94	6.53
North America	5.86	-0.74

Source: TomTom Traffic Index, BloombergNEF. Note: **Asia Pacific excludes China. Data updated to December 7, 2022, with weekly addition from November 23, 2022. Index point change versus the previous year is obtained by averaging the latest weekly values. Δ = change.**

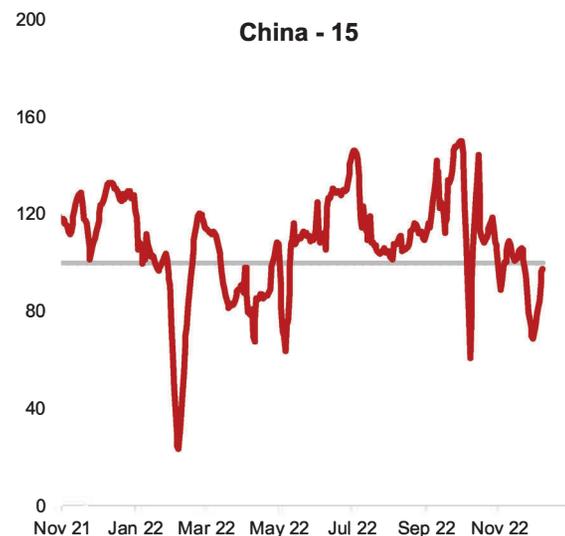
China (Baidu) congestion index

China rebounds after freefall amid Covid policies U-turn

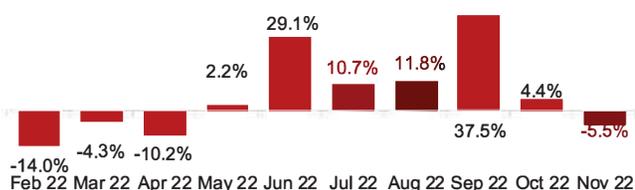
China congestion index (calculated from Baidu data)

Daily peak congestion levels, indexed to January 2021 (seven-day moving average)

Daily peak congestion levels, indexed to January 2021 (seven-day moving average)

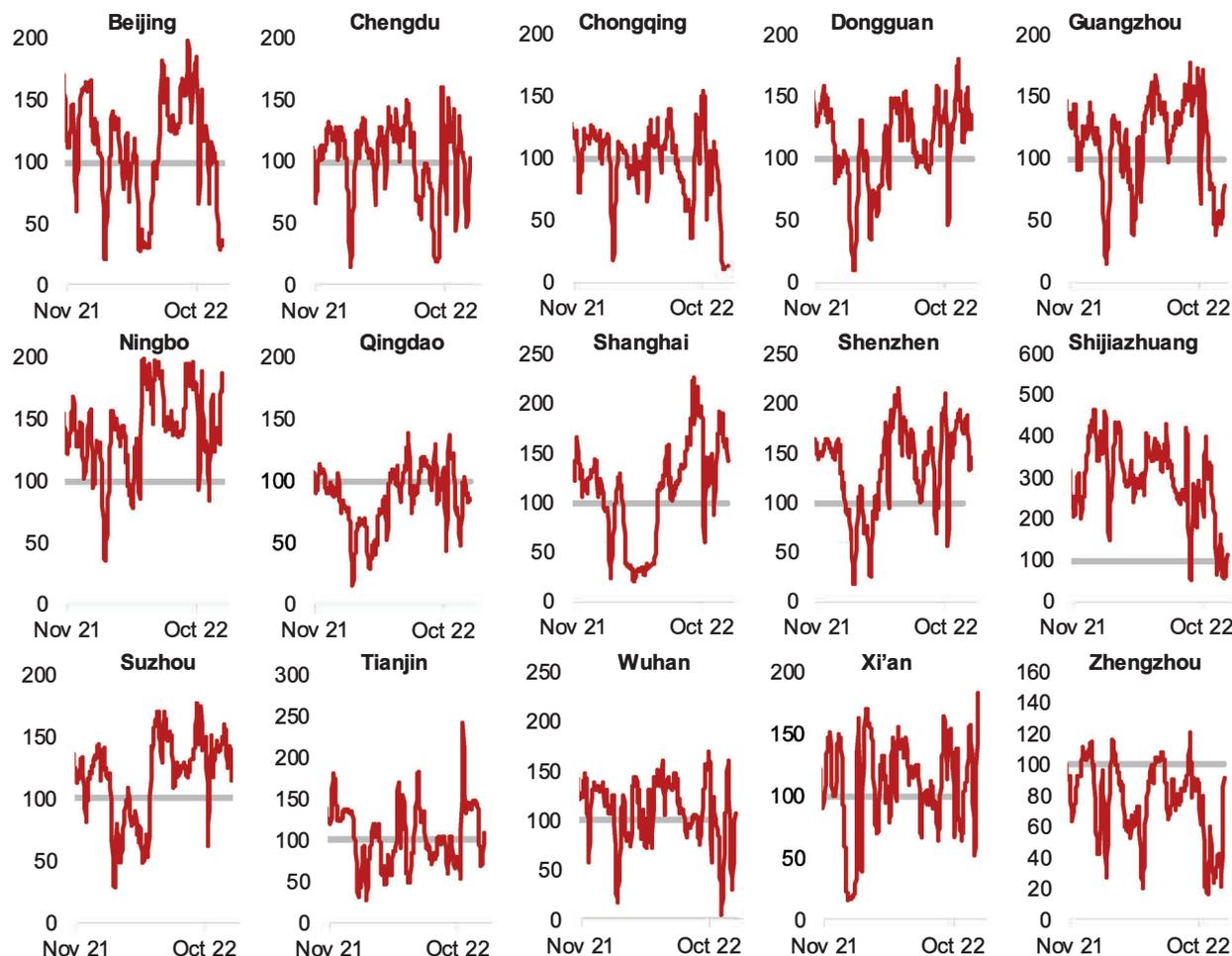


Monthly % change from January 2021 level



	Latest	Week Δ	Four-week Δ
China - 15	97.60	26.23 (+36.76%)	-11.67 (-10.68%)

Road traffic in China in the week ending December 7 was up 26.23 percentage points to 97.60 of January 2021 levels.



Source: BloombergNEF, calculated from Baidu's data. Note: **Data updated to December 7, 2022.** City-level charts display the 15 cities with the highest number of vehicle registrations (excluding two- and three-wheelers). The China-15 congestion level is calculated by taking the weighted average of the congestion levels in the 15 cities and their vehicle registration numbers. Δ = change.

ExxonMobil Outlook for Energy												
Energy demand (quadrillion BTUs, unless otherwise noted)									annual change	% change	Share of total	
Energy by Regions	2000	2010	2020	2021	2025	2030	2040	2050	2021 2050	2021 2050	2021	2050
World	404	511	548	572	592	616	639	658	0.5%	15%	100%	100%
OECD	220	224	205	213	212	210	201	193	-0.3%	-9%	37%	29%
Non OECD	184	286	344	360	380	406	439	465	0.9%	29%	63%	71%
Africa	22	29	34	35	38	43	51	58	1.8%	67%	6%	9%
Asia Pacific	121	198	243	253	268	285	302	315	0.8%	25%	44%	48%
China	45	100	132	138	146	153	152	154	0.4%	12%	24%	23%
India	17	26	36	38	41	48	58	66	1.9%	73%	7%	10%
Europe	77	80	70	72	72	70	65	64	-0.4%	-12%	13%	10%
European Union	61	64	54	56	55	52	48	47	-0.6%	-17%	10%	7%
Latin America	19	25	25	26	27	29	33	35	1.0%	33%	5%	5%
Middle East	17	28	33	35	38	41	45	48	1.1%	39%	6%	7%
North America	111	109	103	109	109	110	106	101	-0.2%	-7%	19%	15%
United States	94	91	85	89	90	90	85	80	-0.4%	-11%	16%	12%
Russia/Caspian	37	42	41	43	40	39	38	36	-0.6%	-15%	7%	6%
Energy by type - World												
Primary	404	511	548	572	592	616	639	658	0.5%	15%	100%	100%
Liquids	147	166	165	175	185	191	199	200	0.5%	15%	31%	30%
Oil	147	164	161	171	180	185	187	183	0.2%	7%	30%	28%
Gas	89	116	137	143	149	158	169	178	0.8%	25%	25%	27%
Coal	91	140	141	144	139	134	110	88	-1.7%	-39%	25%	13%
Nuclear	27	29	27	29	31	35	40	44	1.4%	49%	5%	7%
Biomass/Waste	39	44	50	51	51	53	54	54	0.2%	5%	9%	8%
Hydro	9	12	14	14	15	16	18	19	1.0%	35%	3%	3%
Geothermal	2	2	4	4	5	5	6	7	1.9%	71%	1%	1%
Biofuels	0	2	4	4	5	6	12	17	5.1%	320%	1%	3%
Wind	0	1	6	7	9	14	24	36	6.0%	446%	1%	6%
Solar	0	1	4	5	7	11	20	32	6.6%	538%	1%	5%
End-use sectors - World												
Residential and commercial												
Total	94	107	116	119	123	128	134	138	0.5%	16%	100%	100%
Oil	13	11	11	11	11	10	9	9	-0.8%	-20%	9%	6%
Gas	21	24	27	28	29	29	28	26	-0.3%	-8%	24%	19%
Biomass/Waste	28	28	28	28	27	27	26	24	-0.5%	-12%	23%	18%
Electricity	23	32	39	41	45	50	60	68	1.8%	67%	34%	49%
Other	10	11	11	12	12	11	11	11	-0.3%	-9%	10%	8%
Transportation												
Total	77	95	99	108	119	128	136	144	1.0%	33%	100%	100%
Oil	76	91	91	100	110	114	110	102	0.1%	2%	92%	71%
Biofuels	0	2	4	4	5	6	12	17	5.1%	320%	4%	12%
Gas	0	1	2	2	3	3	5	7	3.6%	182%	2%	5%
Other	1	1	2	2	2	4	10	18	8.5%	959%	2%	12%
Industrial												
Total	144	195	215	221	225	234	249	259	0.5%	17%	100%	100%
Oil	45	51	52	53	54	57	65	70	1.0%	33%	24%	27%
Gas	37	44	54	56	59	62	67	70	0.8%	25%	25%	27%
Coal	26	51	48	47	44	42	38	32	-1.4%	-33%	21%	12%
Electricity	22	31	40	43	46	51	58	67	1.6%	58%	19%	26%
Other	14	18	21	22	22	22	21	19	-0.5%	-13%	10%	7%
Power generation - World												
Primary	145	189	212	223	232	246	259	280	0.8%	26%	100%	100%
Oil	14	10	7	7	5	4	3	2	-3.7%	-66%	3%	1%
Gas	31	46	53	56	59	63	69	75	1.0%	34%	25%	27%
Coal	61	84	89	94	93	90	70	55	-1.8%	-41%	42%	20%
Nuclear	27	29	27	29	31	35	40	44	1.4%	49%	13%	16%
Hydro	9	12	14	14	15	16	18	19	1.0%	35%	7%	7%
Wind	0	1	6	7	9	14	24	36	6.0%	446%	3%	13%
Solar	0	0	3	3	5	9	17	28	7.6%	735%	2%	10%
Other Renewables	4	7	12	12	13	15	17	20	1.6%	59%	6%	7%
Electricity demand (terawatt hours)												
World	13223	18594	23551	24856	27324	30859	36836	43900	2.0%	77%	100%	100%

Tactical views

A new playbook

Our 2023 playbook is ready to quickly adjust depending on how markets price economic damage and our risk stance evolves.

We prefer short-term government bonds for income: The jump in yields reduces the need to take risk by seeking yield further out the curve. U.S. two-year Treasury yields have soared above 10-year yields. See the chart. We break out short-term Treasuries as a neutral.

We add to our overweight to investment grade credit. Higher yields and strong balance sheets suggest to us investment grade credit may be better placed than equities to weather recessions.

We like U.S. agency mortgage-backed securities (MBS) for their higher income and because they offer some credit protection via the government ownership of their issuers. And our expectation for persistent inflation relative to market pricing keeps us overweight inflation-linked bonds.

Long-term government bonds remain challenged as we have described, so we stay underweight.

In equities, we believe recession isn't fully reflected in corporate earnings expectations or valuations – and we disagree with market assumptions that central banks will eventually turn supportive with rate cuts. We look to lean into sectoral opportunities from structural transitions – such as healthcare amid aging populations – as a way to add granularity even as we stay overall underweight. Among cyclicals, we prefer energy and financials. We see energy sector earnings easing from historically elevated levels yet holding up amid tight energy supply. Higher interest rates bode well for bank profitability. We like healthcare given appealing valuations and likely cashflow resilience during downturns.

“

A bottom-up look at what our companies are telling us is probably the best lens we have into the future.”



Carrie King
Global Deputy Chief
Investment Officer,
Blackrock Fundamental
Equities

Short over long

U.S. Treasury yields, 2000-2022



Chart takeaway: We see long-term yields rising further as term premium returns. Yet we expect less room for short-term yields to climb given the limited scope we see for a further jump in expected policy rates.

Past performance is not a reliable indicator of current or future results. Source: BlackRock Investment Institute, with data from Refinitiv Datastream, November 2022. Notes: The chart shows U.S. 10-year and two-year Treasury yields.

We expect views to change more frequently than in the past. Our stance heading into 2023 is broadly risk-off, with a preference for income over equities and long-term bonds.

Regime drivers

Faster transition

We track the transition to net-zero carbon emissions like we track any other driver of investment risks and opportunities, such as monetary policy. We take a view on how it is likely to play out, not how it *should* play out. We assess its implications for financial risks and returns.

Our research suggests the global transition could accelerate, boosted by significant climate policy action, by technological progress reducing the cost of renewable energy and by shifting societal preferences as physical damage from climate change – and its costs – become more evident.

Europe has intensified its efforts to build clean energy infrastructure as it seeks to wean itself off Russian energy. The clearest example of that is the European Commission's RePowerEU Plan. Further impetus is likely to come from higher traditional energy prices, which are exacerbating the cost-of-living crisis and have shifted the economics decisively in favor of cleaner energy sources. In the U.S., the Inflation Reduction Act is poised to unleash enormous investment.

We see it cutting clean technology costs and spurring domestic manufacturing.

We see opportunities in transition-ready investments. Infrastructure is one way to play into that. See page 13. Yet the transition is set to add to production constraints, in our view. It involves a huge reallocation of resources. Oil and gas will still be needed to meet future energy demand under any plausible transition. If high-carbon production falls faster than low-carbon alternatives are phased in, shortages could result, driving up prices and disrupting economic activity. The faster the transition, the more out of sync the handoff could be – meaning more volatile inflation and economic activity.

“

We find good opportunities by getting ahead of where the green investments are going.”



Hannah Johnson
Portfolio Manager, Natural Resources, BlackRock Fundamental Equity

Policy helping accelerate the transition

Total annual green investment, past and planned, 2015–2030

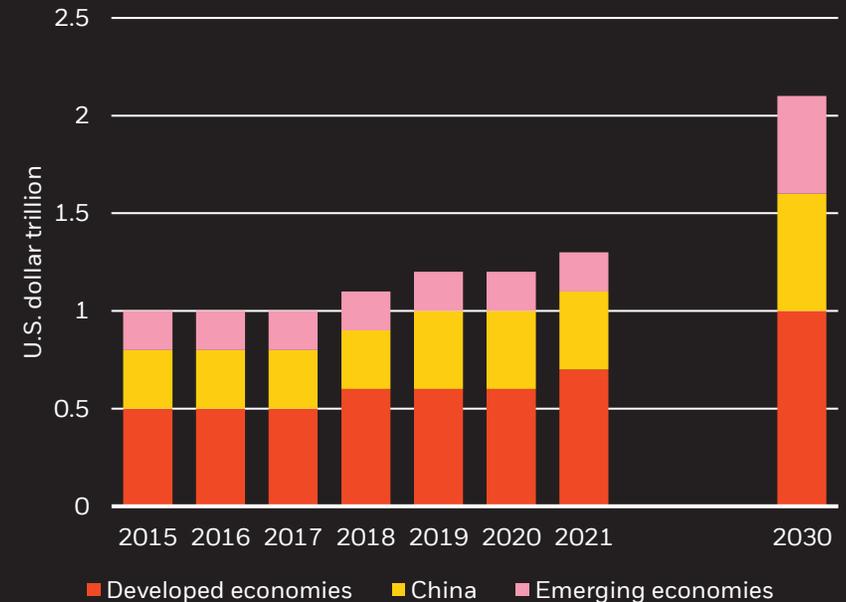


Chart takeaway: Global investment in the net-zero transition is set to step up notably in coming years – largely thanks to key policy action.

Source: BlackRock Investment Institute and International Energy Agency (IEA), November 2022. Notes: The chart shows IEA estimates of past and planned annual green investment, in trillions of U.S. dollars. Forward-looking estimates may not come to pass.

We track the transition to net-zero carbon emissions as we track any other driver of investment risks and opportunities.

let's use this competitive advantage. What is your view? Is Europe still upfront in the ESG field, or is there a shift and balance here?

Laurence Fink

First, I would answer, Jörg, to say it's not a race. It's certainly not a competitive race. No question, society in Europe stated that sustainability is a societal risk. In the United States, it took a number of years for society and government to start talking that way. It was harder in the United States to move forward when government was saying climate risk was not a societal risk. I think, globally now, including Asia and China, our conversations, and this began about two years ago, are saying -- more and more societies are saying climate risk is a societal risk.

And once you go over that hurdle, then you have more cooperation. And that's what we're seeing now. And to me, I see a huge movement, very accelerated movement by the Biden administration. I see huge movement by investors now in the United States. I don't think it matters who's first or second on this, because this is not a race. We're all trying to improve society and improve the earth's health. And so I would start there. But I would say -- saying it's a societal risk and actually moving to a true net zero, that's the difficulty. Okay. We can all believe in it, but now getting there we're not seeing what I would say an aggressive stance by many governments yet.

They're talking the talk. Many societies, including Europe, are talking the talk but not walking the talk. Because to really get to a net zero, we don't have the science yet. A great article today about as much as airlines want to move forward on more sustainable, they can't do it yet. Biofuels right now are 50% to 60% more expensive than hydrocarbons. The margins on airlines is so severe. Now, basically, if we want to get every airline to use biofuels, I think within a number of years, we could do it. But are we then really getting back to your inflation story in question? Maybe that it will reduce the cost differential of the green premium. But to do that, are we willing to say to everybody in the world that you're going to be -- your cost of flying is up 30% to offset the cost or whatever the differential is?

Jörg Eigendorf

Should it be up 30%, because it's external costs of environmental damage? Should it be up 30%?

Laurence Fink

With the cost of flying or the biofuel costs?

Jörg Eigendorf

No, the cost for carbon -- for cost for flying in general?

Laurence Fink

Yes, did we create a giant carbon tax is that what you're referring to that offsets it? The problem is it displaces so many jobs. It displaces -- I don't think politically you can do that day one, it displaces jobs. When I write in my CEO letters, a transition has to be fair and just. And so if you can tell me we can increase a carbon tax to X, Y without displacing jobs, without having regional inequalities, without

having all these other issues, let's do it. It's just not feasible now. Now, what is feasible that I don't see movement in Europe. If Europe really is about this, and if the U.S. is really going to be about this, to name two parts of the world, we need to develop a continental power grid.

Okay. We all know we're going to move to electric cars. We now have solar and wind having no green premium versus any other source of energy today. Now it's intermittent. We have to have storage and all that. But that's a great example of these issues. It took 30 years to bring the cost of solar and wind back down to the same level of other hydrocarbon costs. We need to do that for every industry. So what I'm trying to suggest is, and this is why I say transition is an opportunity, but it's an opportunity because we have to be investing more and more.

We need to do the R&D. Governments are going to need to do much more R&D in credits on developing new science and technologies. It's not just about the carbon tax. Here's my issue in many of the countries of Europe. If they really want to have a true carbon tax, shouldn't 100% of the revenue from carbon tax go into green? In many countries in Europe, the carbon tax goes to balance a budget. Okay. That's not a good solution. And so what I'm trying to say is, it's not so simple here. And my last thing I would like to say, and I'm saying it loudly to every person who will listen to me, if society believes that all public companies need to now report under TCFD, the IFR standards, whatever standard one wants to use, it can't just ask public companies of doing it and not ask for a society.

Right now, what we are seeing worldwide is a movement by regulators and policymakers moving very rapidly for disclosure of public companies. You see that in Europe right now, some countries have mandated it. But there's no conversation about the rest of society. So the burden is, if Deutsche Bank and BlackRock tomorrow needed to report under TCFD Scope 3, which is all our supply chains, we are then the policeman. We are the organization that is policing the down streaming. I don't think politically that's going to work. They're going to hate us more than ever; big companies, banks, because isn't it the responsibility of government setting policy that policy is good for all of society.

But right now, all I'm seeing is mostly governments and regulators are asking public companies to move forward. BlackRock is too, by the way. We don't manage a lot of private money. But the key of getting this done to really get into net zero, and to doing it effectively, is that asking all the society moving together. And the last thing, if we only ask public companies to disclose and to report, if they don't ask the rest of society, we're going to have some very important companies that are in hydrocarbons or chemicals to go private. And that's not a solution. That doesn't change the net zero of the world.

Two, what we have witnessed in Europe are some of the hydrocarbon companies what they do, they sell some of the worst and dirtiest of their assets. And that's considered good. We as a shareholder like how those companies look now because they have less of a carbon footprint. But the world doesn't change. It just goes from a transparent organization to an opaque organization. That is not going to get us to where we want to go as a society. And so these are issues we need to ask. And so I'm urging everybody to focus on this in a societal way, not just with public companies. And we need regulators.

When you ask Christian about coming together, if we could get one thing done in the G20s, the COP26 is have a one taxonomy, which we don't have at the moment, so we can judge companies worldwide in the same way. But two, we come to terms with the idea that we're trying to get all parts of society moving together, not just public companies, or we're going to have this incredible arbitrage of companies leaving the private -- leaving public domain into the private domain. We're going to see a lot of the worst assets just going into the private domain, then we don't change the world.

Jörg Eigendorf

Thank you, Larry. You touched very important topics here. Effectively, [indiscernible] short is how do we manage this transition? It's not black and white. It's not green or brown. It's how do we get from A to B as quickly as possible? What role for governments to play, what role for banks to play and what role for society?

Christian Sewing

Well, first of all, it's important that we are really not talking about a race, but that we are talking from ambition to impact. We need an impact now and not only the talk, but really impact. By the way, that was the reason why we declared last week or two weeks ago in our sustainability deep dive, that we don't want to even raise our absolute numbers for the time being, but we move it forward by two years in order to have an impact. Number two, the most important, because when we talk about ESG, of course, climate change is super important and it's a societal task. But we have to do it in a way that the S part is not lost on people's mindset. And that's what I'm always saying.

When we talk about the climate change and the transformation, for instance, German corporates have to do, it's our task as the bank to support the transformation integrate, but not to stop in an abrupt way the relationship with corporate. I think that would be the worst thing to do, because you leave something on the table, which is twofold. A, a societal problem in countries like, for instance, Germany or in others and the real issue exactly what Larry is saying is only moved from one country into another because the production will take place but at another part of the world, and it's not addressed.

And in this regard, I really do think that when we talk about the role of banks, the role of regulators; a, we need to take this jointly together with the governments. Secondly, there must be a clear understanding that with a certain ratio to be achieved or implemented by the end of next year, nothing is actually one. We need the understanding that this is a transformation over the next four, five, six years in order to come into the direction of net zero. But if we stop from one day to the other, also what we as public companies are sometimes by some of our shareholders, we do actually nothing good for the long term to the society, to the environment, and it will net zero not help the climate. And therefore, we need the joint understanding that this is a long way of transformation.

In this regard, I think the banks are very much there to support that. This is something where we want to be part of, but we need the understanding that this is a long-term race, that this needs joint understanding of regulators, governments and the private economy. And what Larry is saying is more than true. I can tell you in our M&A activities, in the mandates we are getting, we get so many mandates that we should advise public companies in order to get rid of the so-called bad part of their

production facilities. That goes privately. That goes somewhere else where it's not reported. That doesn't help the next generation. That is not the right thing to do. But therefore, we need to change the direction of speech, the direction how people and public companies are measured and we need a different understanding what is really needed.

And getting it right, ESG, getting it right is a 10-year task starting now and it must be a fundamental transformation. For that, the banks are there. And for that, to be honest, we need two other things. You need balance sheet in order to finance it, happy to do this. And in Europe, other than in the U.S., more than ever, we need the Capital Markets Union, because the financing needs in order to transform the economy in Europe cannot only be done by banks. We need a deeper capital market. And therefore, I kept saying and I keep saying the Green Deal in Europe will only come if the Capital Markets will also come -- the Capital Markets Union will come to Europe. The one thing is the necessity for the other and we should jointly work on both.

Jörg Eigendorf

Larry, we see the huge volume targets out and [indiscernible] very clear coming to an end and the final 1.5 minute, we see the huge volume targets out there. What will be the future metrics banks have to follow, companies have to follow? Is it carbon footprint? Is it green asset ratio? What will be the future of what everybody will scrutinize?

Laurence Fink

It has to be more than that. Just to further the conversation that Christian and I just had, Jörg, I don't believe in divestiture of public companies. And so their carbon footprint is going to be larger for a while. But I want to understand how are they evolving into a more green foundational company? How are they moving? How are they creating green hydrogen from regular hydrogen? How are they doing this? Some of the top energy companies are going to be the leaders in the decarbonization component of sequestering carbon.

And so it can't just be done through a metric as saying, and this is some of the risks we have, and we just use carbon footprint, then you have massive divestiture and the world doesn't get anywhere. These are very complex solutions that have to be done. And so to me, it's not about okay, what's your carbon footprint? If they could do it for BlackRock and we could do that, we can measure there. But the companies that are essential in the carbon world, and I'm talking about agricultural companies, because agriculture represents 18% of the footprint of carbon. I'm talking about steel and cement, they represent 10%.

We focus on a lot of other things, but there are many components that create this carbon footprint. It is not about just okay, a numeric number of where's your carbon footprint but I want to understand over this journey, how are you migrating and changing it? How are you creating -- I look at this using a financial term. I use the carbon or let's say energy and oil, that's an iostream. Okay. How are you going to navigate your iostream and create a new stream of revenues? Those are the things that we're going to do this fairly and justly is going to be how we're going to have to do it.

The last thing I just want to say and to link in ESG&E with the question on inflation, let's be clear. If we rush this and if our solution is entirely just to get a green world, we're going to have much higher inflation, because we do not have the technology to do all this yet to have it equivalent to the cheapness of hydrocarbons. And so that's going to be a big policy issue going forward too. Are we going to be willing to accept more inflation if the inflation is to accelerate our green footprint? And that's going to be a big policy question.

Jörg Eigendorf

A final question to both of you and just one word answer before I hand over then to Christian also for the one word answer and his final remarks. But, Larry, with that complex issue, are you an optimist or a pessimist that we get that done fast enough?

Laurence Fink

I've lived my life as being an optimist. Because when we talk about the problems and when we see the problems and the severity of the problems, we solve solutions. That is the beauty of human beings. We proved it with COVID, having a vaccination within 10 months. So if we focus on it, we talk about it, we talk about how severe it is, we'll fix it.

Jörg Eigendorf

Christian, you're an optimist.

Christian Sewing

I couldn't agree more. I think I said in my first answer to one of the question and now it depends on leadership. And if you have the right people around with the right mindset and with the long-term horizon and with the right spirit, to be honest, we will get the stuff. You need now to really get the right people in the world together in order to address it. And we have proven so many things over the last years and decades that I don't think this will stop us.

Question-and-Answer Session

Jörg Eigendorf

Thank you so much for this seventh conversation with Larry Fink on our Global Financial Services and FinTech Conference. I think for everybody who has followed us in the last 40 minutes, Larry, we would like to see an eighth conversation with Larry Fink and Christian next year again. Thank you so much. And thanks to everybody who followed us in the last 40 minutes. Thank you and goodbye.

Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition

Posted Thursday June 11, 2020. 1:45 MT

We expect one of the major global energy themes in 2021 will be that the world is not on track for a smooth energy transition to a world of clean energy. And this will be elevated to the #1 global energy theme if Joe Biden becomes President and moves to *“rally the rest of the world to meet the threat of climate change.”* There has been no pull back from the aspirational goal of almost every country for a clean energy transition, even in the face of a global economic crash. It is going to happen. The world is on a path for clean energy at the cost of fossil fuels. But this transition is not just adding more wind and solar. Rather it is complex, requires advancing a wide range of *“critical energy technologies”* and, most of all, a major jump up in investment capital. The IEA has just provided data to show the world is far behind in *“critical energy technologies”* and in invested capital for the energy transition. And this week, Shell’s CEO noted his concerns (similar to the IEA) that also point to a disorderly energy transition. If the world isn’t ready for this energy transition, it should point to a need for more oil and gas to fill the delay gap, and this should lead to delays in oil demand declines on the path to peak oil demand. We don’t think the energy transition will impact oil demand by millions b/d. However, even if the energy transition delay only reduces oil demand declines by 0.5 mmb/d or more, it should help push back peak oil demand a few years. And this should be happening as non-OPEC oil supply sees an impact from the lower upstream capex over the past couple years and the massive capex cuts in 2020. And we think this helps support a higher WTI oil price by \$5 for the 2022 to 2027 period whether you believe in the current forward strip for WTI averages ~\$44 for 2022 thru 2027, or, if you are like us, believe in oil above the strip. Its support for a view that oil in the 2022 to 2027 period will stronger than expected. And maybe the demise of oil will be like the expected demise of coal – it will take longer than expected.

Shell warned the world is not ready for a smooth energy transition. Shell CEO’s message was very clear and was captured clearly in the title of the Bloomberg Green Tuesday story *“Shell’s CEO Worries About a Disorderly Energy Transition: Q&A”*. The Shell CEO said *“The energy transition is massively complex. It will require orchestration on a scale that the world has never seen. If you don’t start with it soon, it’s going to be highly disruptive at the end or it’s not going to happen. And both are unpalatable conclusions”*.

“The energy transition is massively complex”, its not just adding more wind/solar. The Shell CEO reminded of something that is overlooked by almost everyone, he said *“the energy transition is massively complex. It will require orchestration on a scale that the world has never seen.”* We think the most overlooked aspect of the energy transition is that it is much more than just adding more solar and wind to replace some portion of the fuel supply. One of the major challenges is replacing an electricity grid that has been built on fossil fuels, nuclear and hydro delivering high intensity energy on a continuous as needed for whatever is needed basis. Again, its not just adding solar and wind, its having the proper electricity storage, generation and delivery system to support this fossil fuels out/renewables in switch.

The IEA reminds the energy transition has many “critical energy technologies”, the vast majority of which are not on track. There was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the *“critical energy technologies”* and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these “critical energy technologies” into major groupings and then ranked the progress of each of these pieces in its report *“Tracking Clean Energy Progress”* [\[LINK\]](#) by on track, more efforts needed, or not on track

IEA's Progress Ranking For "Critical Energy Technologies" For Clean Energy Transition

● Power	● Renewable Power	● Geothermal
	● Solar PV	● Ocean Power
	● Onshore Wind	● Nuclear Power
	● Offshore Wind	● Natural Gas-Fired Power
	● Hydropower	● Coal-Fired Power
	● Bioenergy Power Generation	● CCUS in Power
	● Concentrating Solar Power	
● Fuel Supply	● Methane Emissions from O&G	● Flaring Emissions
	● Chemicals	● Pulp and Paper
● Industry	● Iron and Steel	● Aluminum
	● Cement	● CCUS in Industry and Transformation
	● Electric Vehicles	● Transport Biofuels
● Transport	● Rail	● Aviation
	● Fuel Consumption of Cars and Vans	● International Shipping
	● Trucks and Busses	
	● Building Envelopes	● Lighting
● Buildings	● Heating	● Appliances and Equipment
	● Heat Pumps	● Data Centres and Data Transmission Networks
	● Cooling	
	● Energy Storage	● Demand Response
● Energy Integration	● Hydrogen	● Direct Air Capture
	● Smart Grids	

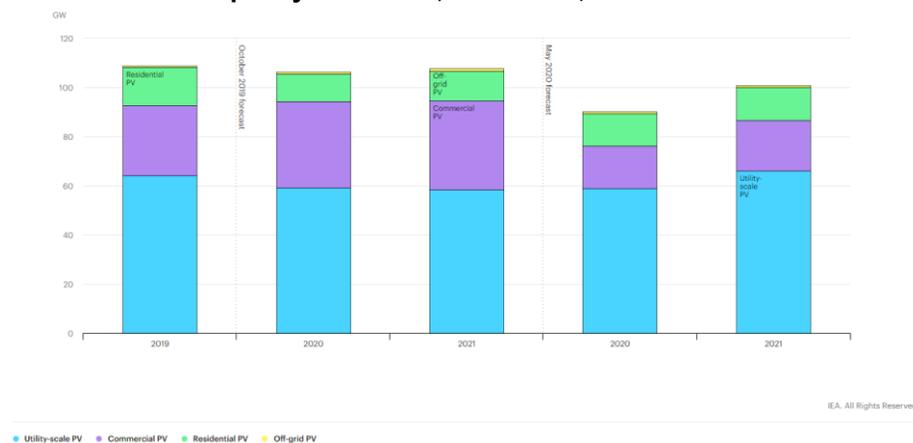
Source: IEA

● On Track ● More Efforts Needed ● Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

Even the "on track" items like solar PV are seeing a pause in growth especially with lower 2019 and 2020 investment capital. As noted in the above chart, the IEA ranks Solar PV as one of its few green dots "on track" critical energy technologies. However, the IEA's tracking update also shows how COVID-19 has led to the IEA revising down its solar PV capacity additions forecast down by ~15% for 2020 and by ~5% for 2021 ie. solar PV additions won't get back to 2019 levels at least until 2022 or possibly 2023. The IEA explains "Covid-19 has led to construction delays and weaker than anticipated investment, requiring us to revise capacity addition projections down by over 15% for 2020".

IEA's Solar PV Capacity Additions, 2019-2021, October 2019 Forecast vs May 2020 Forecast



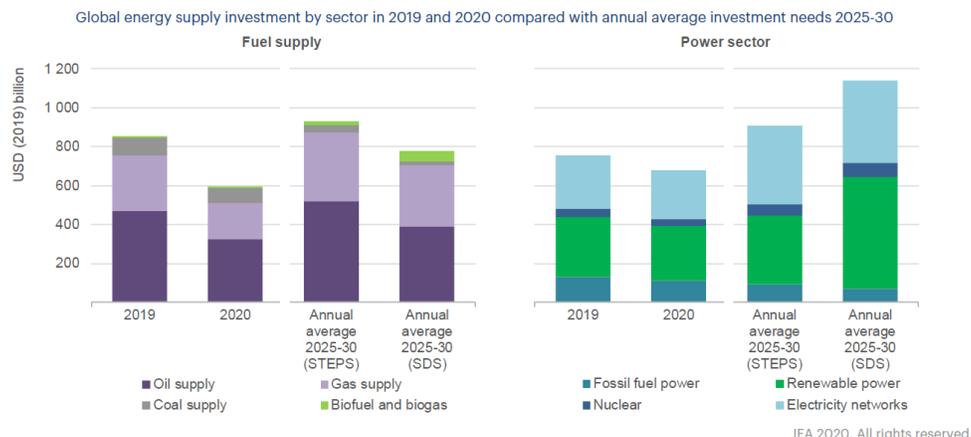
Source: IEA Tracking Clean Energy Progress, June 2020

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No surprise the energy transition is not on track, there hasn't been enough capital invested in the transition even before COVID-19. On May 27, we tweeted [\[LINK\]](#) "Seems clean energy supply + related grid/infra won't be anywhere close to meet aspirational goals of many countries" based on the IEA's just released that morning major report "World Energy Investment 2020" [\[LINK\]](#). The IEA reviews investment in the full spectrum of energy including in 2020 and provided some excellent insight into the implications of the capital, or lack thereof, for the future. The IEA notes the required investment capital for clean energy wasn't being spent in 2019 and COVID-19 made the investment gap larger in 2020. Prior to 2020, the IEA estimated clean energy spending was relatively flat for 2015-2019, before declining in 2020. As is happening in almost every sector, the world economy crash in 2020 has led to declines in invested capital in all energy sectors, including power and clean energy. In discussing renewables, one of the many shortfall IEA comments was on slide 90 "Current investment levels are not aligned with a sustainable pathway. Compared with the average annual investments projected in the IEA SDS, power sector spending in 2019 was about 35% short of the level required a decade from now. There is a continued need for capital reallocation to meet energy security and sustainability goals, to bring in more low-carbon power and to ensure that renewable-rich systems can operate with sufficient system flexibility. The largest projected growth in investment to align with such a pathway would be required in solar PV and wind, on average an extra USD 160 billion of spending each year. Electricity networks would require an extra USD 150 billion from today's levels, in addition to a higher level of capital for other renewables and nuclear."

IEA's Estimated 2019 and 2020 Invested Vs Future Required Investment

Even before 2020, investment trends were poorly aligned with the world's projected needs



Notes: STEPS = Stated Policies Scenario; SDS = Sustainable Development Scenario. Electricity networks include also battery storage investment. Projected investment levels are from the World Energy Outlook 2019; the point of comparison is the period from 2025-30 in order to provide an indicative post-recovery benchmark for spending levels.

Source: IEA Tracking Clean Energy Progress, June 2020

Massive government intervention will be needed to get the energy transition closer to its energy transition miss. It doesn't make a difference what side of the clean energy fence someone is on, everyone knows that the energy transition has been, and must continue to be, driven by governments if there is to be any shot of trying to get closer to the energy transition target. The Shell CEO said something everyone knows – leaving it to the private sector to somehow fit all the pieces together on a timely basis won't work. It will require increasing government intervention. Bloomberg asked the Shell CEO "All that will need a very heavy-handed government. Do you support that?" And he replied "If we believe that somehow the market is going to take care of this, that you put a price on carbon and everything will sort itself out, or that we can shame companies into doing it by having ESG frameworks that will tell them what is right and what is wrong, then I think we're kidding ourselves. This needs a very significant interventionist approach, and all industries have to be part of the intervention."

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2021 could see a major global (and Canada) renewal push and commitment to the energy transition aspirational goal. The Nov 3 US presidential elections will determine if there is a renewed and urgent global push on climate change. The united global push for climate change was given a major kick in the pants when, on Nov 4, 2019, the Trump administration announced it was starting the formal process to withdraw from the Paris Accord. The official withdraw date would be Nov 4, 2020, one day after the upcoming US presidential election. And the reality is that the US had effectively ceased to have any interest in working on climate change since President Trump was elected in Nov 2016. It still ~5 months to the election, but Joe Biden is currently running well ahead. One of his climate change priorities [\[LINK\]](#) is to “*Rally the rest of the world to meet the threat of climate change*” and he also tries to deal with the need to catch up investment saying “*the United States urgently needs to embrace greater ambition on an epic scale to meet the scope of this challenge*”. But, at least in the US, we see Biden’s initial 2021 push for climate change initiatives to be more aspirational than specific programs as he will be restrained to some degree by the increasing US debt and the expected slower recovery of the US economy as noted by Fed Chair Powell yesterday. In Canada, we believe we could see a similar new urgency to climate change in 2021. We recognize it isn’t a major topical item today, but we believe there is a good chance for an early fall federal election and, if the polls hold, the Liberals would likely have a majority government. We believe that, even with the massive debt increases, this would lead to increasing federal government support for clean energy initiatives in Canada and possibly (likely?) to support clean energy initiatives in developing countries.

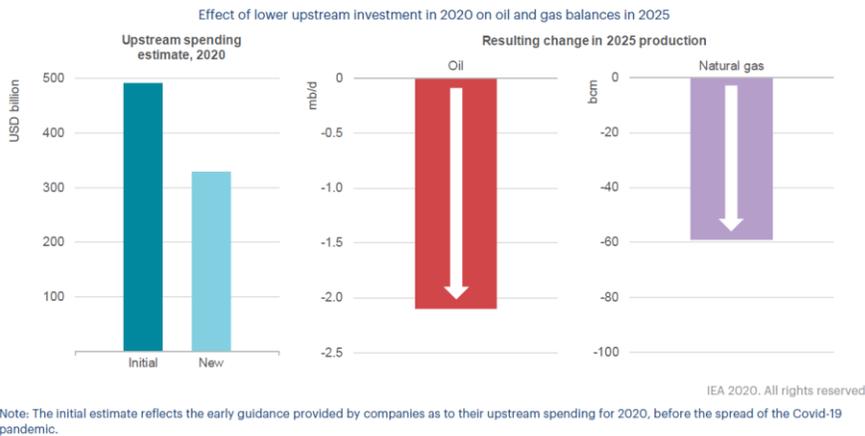
The aspiration to spend more will be there, but increasing government debt levels will have to limit government incentives that require government capital or hurt government revenues. The reason why the IEA report caught our attention is that the investing gap was worse in 2020 when 2019 was already lagging. It’s hard to see the scenario where 2021 investing jumps up significantly above 2019 to start to close the gap. Rather, we have to believe the gap will, at best, be maintained in 2021. No one has to be an economist to know that every country in the world is taking on massive debt in its fight against the economic shut down from COVID-19. Our concern is that the increased debt has to force all governments to go slower than they would want on the clean energy transition. This will just widen the gap. The countries that have a reasonable financial position will continue to support clean energy advancement, but their pace will inevitably be slowed down due to balance sheets. It’s why we think a Biden presidency will be more aspirational in 2021. Yesterday, the US Treasury Dept [\[LINK\]](#) reported there continues to be an accelerating in US federal government debt. It reached \$26 trillion, after hitting \$25 trillion on May 5, and \$24 trillion on April 7. US debt is up over \$6 trillion since the Nov 2016 elections. Our SAF June 7, 2020 Energy Tidbits [\[LINK\]](#) highlighted the Thurs June 4 German government \$145b stimulus package and that it included a doubling of EV purchase incentives, but did not include any incentives for ICE vehicles. It was also interesting to see how the German government targeted cheaper EVs as the priority to get a broader EV penetration. But then there are most countries, such as Mexico, that are having a much tougher time with the economic hit from COVID-19. On May 16, we tweeted [\[LINK\]](#) “*Not yet law, but seems Mexico will move to "temporarily" limit renewables. COVID-19 has been impacting near term power/#NatGas demand, but any limit on renewables should restore Mexico's steady increase in #NatGas consumption as economy restarts and need for US #NatGas supply*”. Mexico’s concern was that it needed to maintain the reliability of the electricity grid in the face of the COVID-19 health crisis, but the reality is that it doesn’t have any financial flexibility to support any new renewable initiatives for the time being. If governments are going to provide some form of incentive, they need to have the financial capacity to do so and many governments do not have that luxury. COVID-19 is only going to increase the gap and put the energy transition further behind. This is a key point from the IEA’s reports.

We think the decline rate in oil demand on the path to peak oil demand will be like coal’s demise – slower than expected, especially with the delays and gaps in the clean energy transition. We believe the world is on the path to a clean energy transition and there will be peak oil demand. But we always think about coal when we think about the energy transition that will lead to peak oil demand. No one ever disagreed that governments will go to intervene to move to eliminate coal power generation. But it hasn’t happened anywhere near as quickly as expected. When we see the Shell CEO comments and IEA reports, it’s clear that the energy transition isn’t going as smoothly and quickly as expected. Most importantly, the IEA highlighted that investment in clean energy is too low and there are too many “*critical energy technologies*” that are not on track. And to use the demise of coal analogy, this should point to better demand for oil for a good portion of the 2020s. Our May 27 tweet on the IEA investment report also said “*Seems clean energy supply + related grid/infra won’t be anywhere close to meet aspirational goals of many countries. Good for oil/gas prices in mid 20’s, will need more oil/gas just as impact of big capex cuts kick in.*” It doesn’t have to be a huge change in demand, even

if demand is only 0.5 mmb/d or a little better than the expected decline in oil demand growth rates in the 2020s on the path to peak oil demand. It will be a positive to oil price expectations as it will happen during the period that will see the impact of underinvestment in oil today from the past couple years, and more so from the massive upstream underinvestment in 2020. Below is the IEA's May 27 below graph showing how the underinvestment in oil in 2020 will hurt 2025 production by ~2 mmb/d. Plus the global oil industry has moved away from long cycle projects like major 100,000 b/d oil sands projects so there aren't an inventory of large long cycle projects in inventory. And even if oil prices are much stronger than expected, oil companies won't re-add long cycle oil projects given that that the energy transition (while delayed) is solidly the goal.

IEA Impact of Lower Upstream Spending In 2020

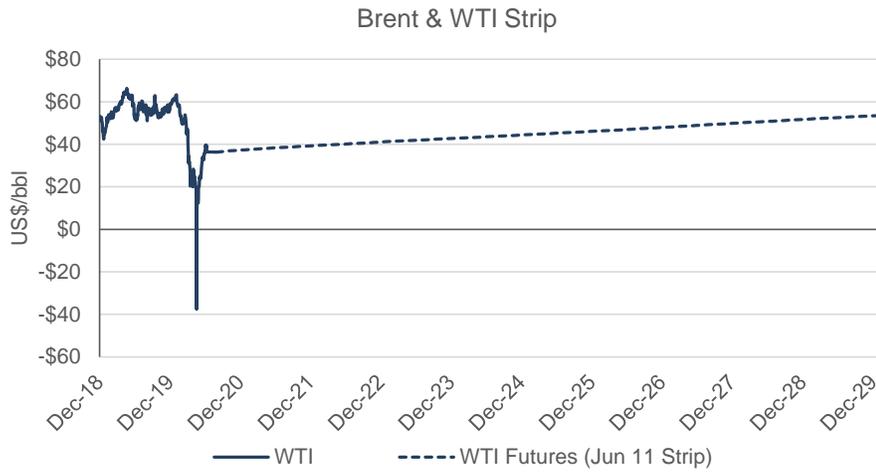
What do the investment cutbacks mean for energy security and emissions?



Source: IEA World Energy Investment 2020

There is a big difference for oil if WTI is >\$50 versus >\$40. There is a big difference to the US/Canada oil sector if WTI is >\$50 or >\$40. We don't think we need to see hugely better oil prices, just better visibility looking to oil for 2022 thru 2027. We think the IEA and Shell views will become more broadly accepted once there is a focus on a post COVID-19 world. We don't see a huge impact, but rather believe its reasonable to see this clean energy transition delay will lead to a lesser decline in oil demand growth rates on the way to peak oil demand. It doesn't have to be a huge impact, but even if its only delaying oil demand decline by 0.5 mmb/d thru 2027, we could see the potential to impact oil by \$5 whether you believe in the WTI forward strips (currently average ~\$44 for the 6 years 2022 thru 2027, before WTI reaches \$50 in 2028), or if you are already more bullish (as we are) expecting oil above these forward strips. As noted above, these delays should happen when the impact of upstream underinvestment kicks in. In addition, we don't expect to see any major oil company approve a large long cycle oil project like the former +100,000 b/d oil sands projects, especially as these major oil companies are all committing to reduce emissions and be leaders in the clean energy transition. If there is stronger oil demand in the 2022 to 2027 period and WTI >\$50, it means that the likely winners will be those with spare capacity (ie. OPEC+), or effective spare capacity from short cycle quality shale/tight oil in US and Canada, and also oil projects that have multi phase quick cycle development like Exxon in offshore Guyana, or even small scale SAGD.

WTI Oil Price Futures



Source: Bloomberg

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Performance – opening statement on mandate.

Dec 2022. *“The Ministry of Finance decides the overall investment framework through our management mandate. **The mandate specifies which asset classes we can invest in**, defines the benchmark index, and lays down certain constraints and requirements. We manage the fund with the objective of achieving the highest possible return after costs with acceptable risk. We place great emphasis on being a responsible investor.”*

Apr 2021. *“The Ministry of Finance decides the overall investment strategy of the fund, expressed through our mandate. The mandate is a public document, which makes the risk assumed in the management of the fund transparent to all stakeholders. We contribute to the public discussion and the development of the fund strategy by publishing relevant research and through our role as an advisor to the Ministry of Finance. Material changes to the strategy are anchored by the Ministry of Finance in the Norwegian parliament. This supports the fund’s long-term investment horizon, which is important during periods of substantial turbulence in financial markets.”* Later in the Investment Strategies *“The mandate puts certain constraints and requirements on our operational management against this benchmark.”*

Investment Strategies

Dec 2022. *“In this strategy period **we will strengthen our long-term mindset, be patient, and vary active risk as market conditions change**. This allows us to take advantage of the best opportunities when they arise. Variations in asset prices can be related to behavioural factors or leverage causing pro-cyclicality. Long-term investors are well-positioned to take advantage of such variations. We will seek to buy when others want to sell and sell when others want to buy.”*

Apr 2021. Did not include a statement like the above.

Equities – Securities selection

Dec 2022. *“**We will take sector risk when risk-reward is particularly attractive** and use our specialist knowledge to identify trends that make us expect higher long-term returns in some sectors than others.”*

Apr 2021. Did not include a statement like the above.

Real Assets – Renewable energy infrastructure

Dec 2022. *“Renewable energy infrastructure. • We will continue to build a portfolio of **high-quality** renewable energy infrastructure assets – mainly in wind and solar power. We will build a portfolio with stable cash flows and limited risk to the principal investment. • We will investigate new opportunities related to the energy transition and consider investments in the storage and transmission of renewable energy. • **We will consider investing in funds** for renewable energy infrastructure to explore new markets and technologies.”*

Apr 2021. Less commentary on renewable energy infrastructure and included under the general discussion. *“We will gradually build up the renewable energy portfolio. We will primarily aim to invest in wind and solar power. We will focus on projects with reduced power price risk, stable cash flow and limited risk to the principal investment.”*

We will be a global leader in responsible investment

Dec 2022. *“The management mandate requires responsible investment to be an integral part of the management of the fund. Responsible investment and active ownership support long-term value creation and our goal of highest possible return. **Managing climate-related risks and opportunities is a key priority. We have a financial interest in an orderly energy transition in line with the Paris Agreement. We will drive the companies we invest in towards net zero emissions by 2050.”***

Apr 2021. *“We are the largest single shareholder in the world. Responsible investing and ownership activities form an integral part of our management of the fund. These activities support the return objective of the fund by improving the relationship between long-term return and risk. We have built up expertise in our organisation and a robust platform for*

responsible investment. We will be a global leader in responsible investment. We will increase external collaboration, use new technologies and provide new solutions to emerging issues.”

Dec 2022. *“We will push for mandatory corporate sustainability reporting and environmental and social due diligence to improve company performance and the quality and availability of ESG data. • We will sharpen our expectations on climate change and human rights and communicate our views on audit practices and consumer interests.”*

Apr 2021. Did not include a statement like the above.

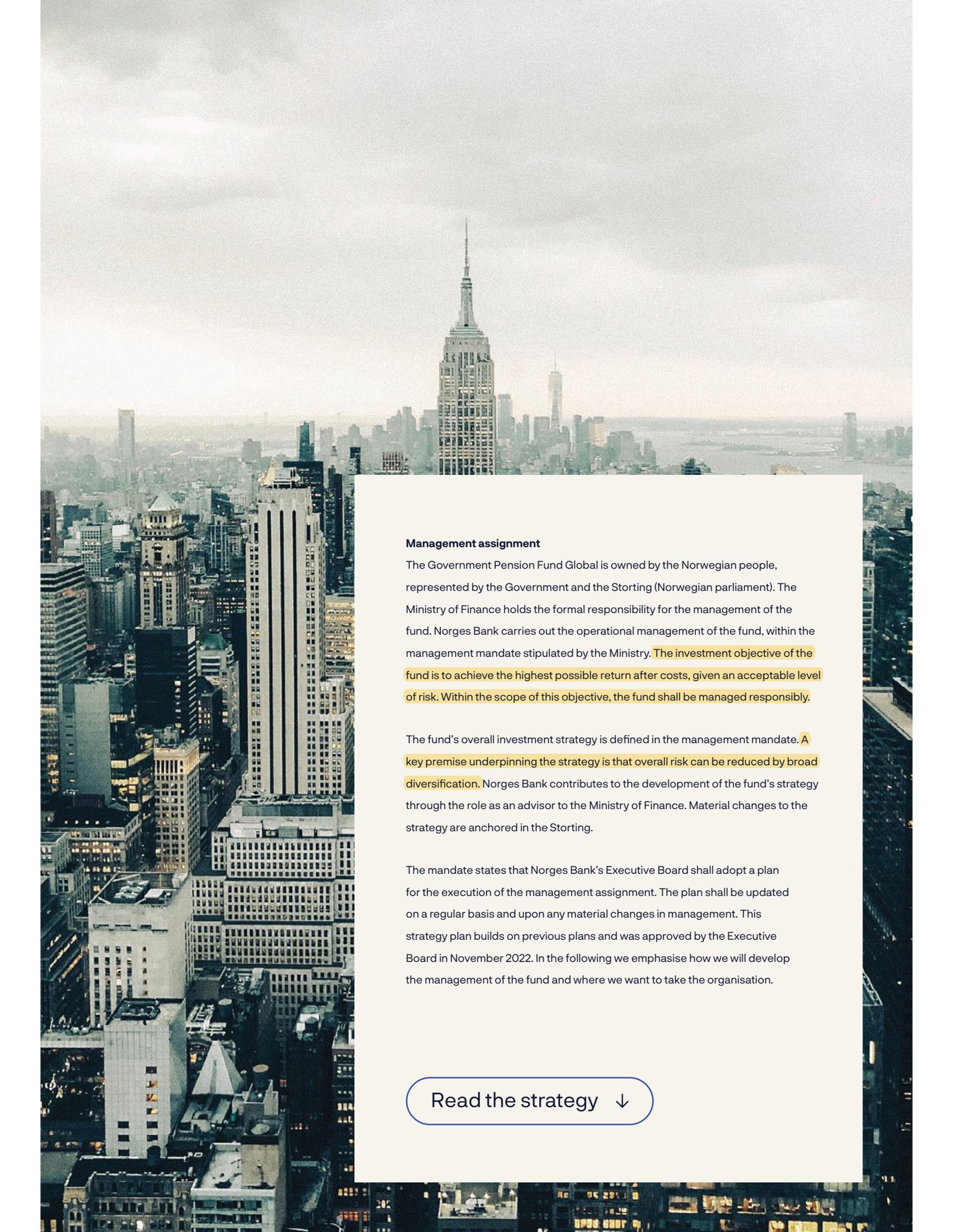
Dec 2022. *“We will further develop our principles for climate risk management and integrate climate risk measurement in our portfolio analysis to identify risks and opportunities.”*

Apr 2021. *“We will further develop the strategy to analyse and address climate change risks and identify investment and ownership opportunities.”*

Portfolio

Dec 2022. *“We will develop our ESG database and analytical tools to make ESG information more relevant, reliable, and available to the organisation. • We will further develop our principles for climate risk management and integrate climate risk measurement in our portfolio analysis to identify risks and opportunities.”*

Apr 2021. *“We will further integrate ESG data into our investment process. We will structure proprietary and external data and use new methods for analysing them, including artificial intelligence. • We will further develop the strategy to analyse and address climate change risks and identify investment and ownership opportunities.”*



Management assignment

The Government Pension Fund Global is owned by the Norwegian people, represented by the Government and the Storting (Norwegian parliament). The Ministry of Finance holds the formal responsibility for the management of the fund. Norges Bank carries out the operational management of the fund, within the management mandate stipulated by the Ministry. **The investment objective of the fund is to achieve the highest possible return after costs, given an acceptable level of risk. Within the scope of this objective, the fund shall be managed responsibly.**

The fund's overall investment strategy is defined in the management mandate. **A key premise underpinning the strategy is that overall risk can be reduced by broad diversification.** Norges Bank contributes to the development of the fund's strategy through the role as an advisor to the Ministry of Finance. Material changes to the strategy are anchored in the Storting.

The mandate states that Norges Bank's Executive Board shall adopt a plan for the execution of the management assignment. The plan shall be updated on a regular basis and upon any material changes in management. This strategy plan builds on previous plans and was approved by the Executive Board in November 2022. In the following we emphasise how we will develop the management of the fund and where we want to take the organisation.

[Read the strategy](#) ↓

Performance

Performance ●

Technology ●

Operational robustness ●

People ●

Communication ●



Our goal is to achieve the highest possible return



The Ministry of Finance decides the overall investment framework through our management mandate. The mandate specifies which asset classes we can invest in, defines the benchmark index, and lays down certain constraints and requirements. We manage the fund with the objective of achieving the highest possible return after costs with acceptable risk. We place great emphasis on being a responsible investor.

The fund strategy has been developed gradually over time. We contribute to the development of the fund's investment strategy through our role as an advisor to the Ministry of Finance. Proximity to the portfolio and our experience from the management of the fund provide good basis for strategic advice to the asset owner. We have a dedicated team responsible for preparing advice to the Ministry and doing supporting analysis relevant for the development of the fund's investment strategy. We develop customized analytical tools and make extensive use of internal and external data sources. To further support our advisory activities and assure the quality of our work, we collaborate with peers and academics.

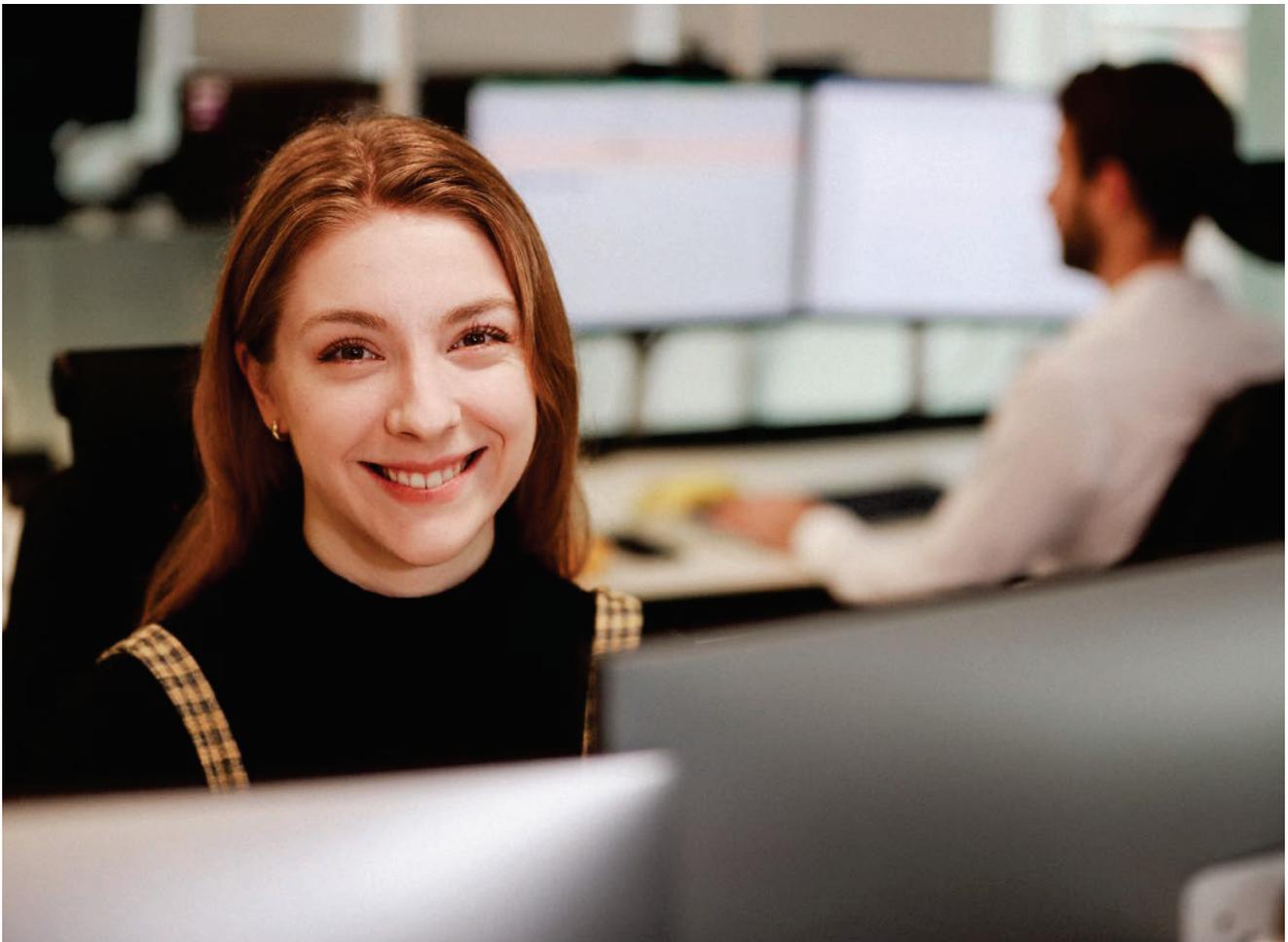
Central to the management mandate is the benchmark index consisting of 70 percent equities and 30 percent fixed income. We manage the fund close to this index. However, we believe some investment opportunities diversify the fund beyond the reference index, particularly unlisted assets. All our investment processes have active elements. This improves our ability to achieve the highest possible return and to be a responsible owner.

We take advantage of the fund's long horizon and limited short-term liquidity needs when we invest. We can withstand large fluctuations in the fund's value and make investments whose underlying value may take a long time to realise. Our long horizon enables us to act differently from other investors in difficult and illiquid markets. We believe that the most profitable investment opportunities arise in volatile markets.

- Performance ●
- Technology ●
- Operational robustness ●
- People ●
- Communication ●

The fund's size offers economies of scale. We can be innovative and implement new ideas at little additional cost. Being a large active participant in capital markets makes us an attractive business and trading partner. The fund's size can also provide investment opportunities in unlisted markets, that might not be accessible to all investors.

Financial markets are constantly evolving. As an active and responsible investor, we must be willing and able to quickly adapt to new risks and opportunities. We believe speed is a mindset and that organisations that can make the right decisions quickly, generally outperform. To succeed, we will work hard to promote efficiency in all processes. We will avoid complacency and hubris





We will strengthen our long-term mindset, be patient, and vary active risk as market conditions change.

Investment strategies

We use a range of investment strategies in our management of the fund. They are grouped into three main categories: market exposure, securities selection, and fund allocation. Our investment strategies are complementary and tailored to our characteristics – a large fund with a long horizon. We report risk and performance according to these three main strategies. The three main strategies are pursued across equity, fixed income, and real asset management.

In this strategy period we will strengthen our long-term mindset, be patient, and vary active risk as market conditions change. This allows us to take advantage of the best opportunities when they arise. Variations in asset prices can be related to behavioural factors or leverage causing pro-cyclicality. Long-term investors are well-positioned to take advantage of such variations. We will seek to buy when others want to sell and sell when others want to buy.

- We will promote psychological safety so that our portfolio managers dare to be contrarian and avoid herd behaviour. We will further develop our investment simulator to analyse our investment decisions, systematically learn from our mistakes, and provide portfolio managers with feedback so that they can make better decisions in the future.
- We will take allocation positions both to manage the fund's total risk profile and exploit periods when we believe variations in asset prices are excessive. We will take such positions across equities, fixed income, and real assets as part of our fund allocation strategy. Our active risk-taking will vary as market conditions change.



70%

equities in the
benchmark index

Equities

The fund's benchmark index consists of 70 percent equities. Our equity management is based on two main strategies: market exposure and securities selection based on fundamental research. These strategies enable us to achieve exposure to the broad equity market as expressed in our equity benchmark, while at the same time enhancing returns based on company analysis.

Market exposure

We manage the largest part of our equity portfolio internally through our market exposure strategy. We invest broadly in the companies in the benchmark but seek to avoid mechanical benchmark replication with its high trading costs. We also enhance return by following a diversified set of index refinement strategies, such as corporate action and capital market strategies.

For a large fund, it is critical to manage and trade the portfolio efficiently. This is particularly important going forward, with potentially large capital flows in and out of the fund combined with large market fluctuations.

- We will improve our traders' ability to plan, source liquidity, and trade efficiently through closer collaboration between our traders and internal portfolio managers.
- We will take advantage of market developments and new technologies to further automate our trading process to cost-efficiently implement our investment decisions.

Our size makes us an attractive partner in capital market events. Investors who are passive in such events may risk less allocation than desired. To reduce the likelihood of this, we work actively with facilitators and companies considering such transactions. A large, stable capital base and the best credit standing also make us an attractive partner for securities lending. The fund's characteristics enable us to achieve higher earnings on securities lending than the average investor.



We will continue to access companies directly to deepen our understanding of industry and company dynamics.

- We will enhance portfolio returns by continuing to take active positions around corporate actions and capital market events.
- We will continue to lend our equities responsibly and seek to capture more of the income while maintaining acceptable counterparty risk. We will explore the opportunity to insource a larger part of our lending activities to increase net income.

Securities selection

Our securities selection strategy is based on fundamental research. In this strategy, we benefit from our unique access to companies as a large and long-term owner. We will continue to access companies directly to deepen our understanding of industry and company dynamics. Our internal and external managers are specialists who have built strong skills in collecting and analysing information. Specialised expertise and delegated authority enable investment decisions independent of consensus.

- We will take sector risk when risk-reward is particularly attractive and use our specialist knowledge to identify trends that make us expect higher long-term returns in some sectors than others.
- We will expand our forensic accounting and behavioural analysis to reduce exposure to companies we expect to underperform.
- We will identify quality companies and take slightly larger stakes when we have reason to believe they will outperform.
- We will use external managers in segments and markets where we believe they will enhance returns. In some markets, we also believe external managers will reduce the risk of our investments by avoiding certain companies with problematic business models and weak corporate governance.
- We will pursue the opportunity to invest in companies before they list (pre-IPO). This would give us access to companies earlier in the company life cycle and potentially enhance returns.

30%

fixed income in
the benchmark

Fixed income

The fund's benchmark consists of 30 percent fixed income. The fund is invested in a broad range of bonds issued by governments and related institutions, as well as companies. The main purpose of our fixed income portfolio is to dampen fund volatility, provide liquidity, and harvest risk premia in the bond market.

Fixed income management is based on two main strategies: market exposure and securities selection based on fundamental research. In the strategy for market exposure, we seek to achieve the desired benchmark exposure as cost-effectively as possible while ensuring that the fixed income portfolio fulfils its objective. We also enhance returns by being active in capital market events and taking more short- to medium-term positions based on fundamental research and temporary differences in prices of similar bonds. In our strategy for securities selection, we seek to improve returns through in-depth company analysis and by harvesting risk premia in the corporate bond market.

- We will leverage technology and integrate analytics in our trading process to allow for simplification and automation where beneficial, and to improve our decisions on where, when, and with whom we trade.
- We will invest in selected segments outside the benchmark to diversify the portfolio and harvest risk premia.
- We will invest our corporate bond portfolio based on company research and utilise our company knowledge across equities and fixed income.
- We will continue to develop our fixed-income lending and actively size our lending exposure depending on market conditions and acceptable counterparty risk.



Real assets

We invest in real assets to improve diversification as part of our fund allocation strategy. Our real asset investments include listed and unlisted real estate and unlisted infrastructure for renewable energy. The fund's characteristics make us an attractive partner for unlisted investments and provide investment opportunities that might not be accessible to all investors. We invest alongside high-quality partners with extensive sector experience both within real estate and renewable energy infrastructure. We want to build long-term relationships with our main partners.

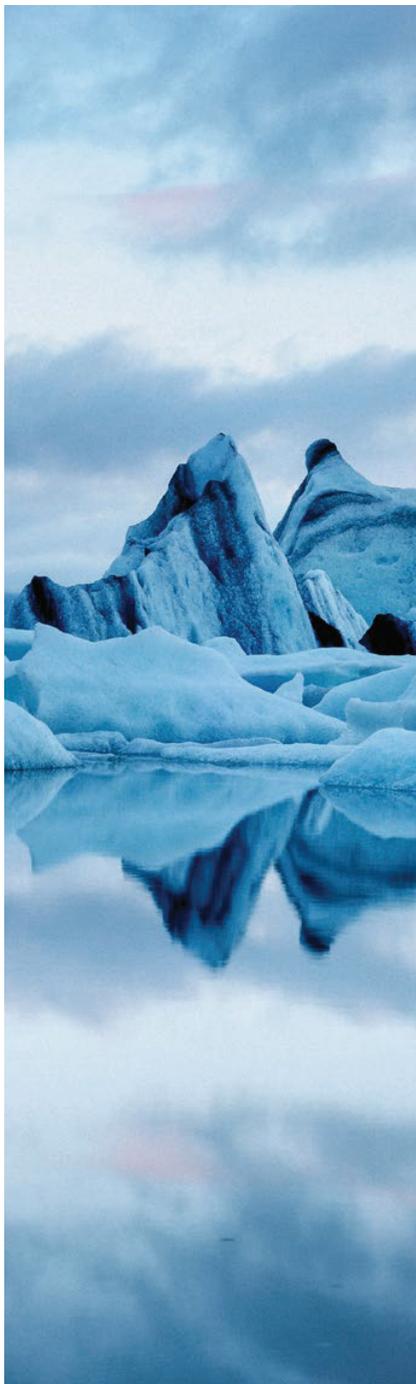
Real estate

- We will target a real estate portfolio of 3–7 percent of the fund. The portfolio consists of listed and unlisted real estate under a combined strategy.
- We will use the flexibility in the combined strategy to access growing sectors and segments in a cost-efficient way. We will enhance return by using the liquidity in the combined strategy to exploit periods of disruptions in real estate markets.
- We expect to pursue more development projects in the coming years to adapt our investments to increased demand for energy efficiency and flexibility in buildings. To access the most attractive assets at acceptable risk we will invest alongside best-in-class investment partners with a proven development track record.

Renewable energy infrastructure

- We will continue to build a portfolio of high-quality renewable energy infrastructure assets – mainly in wind and solar power. We will build a portfolio with stable cash flows and limited risk to the principal investment.
- We will investigate new opportunities related to the energy transition and consider investments in the storage and transmission of renewable energy.
- We will consider investing in funds for renewable energy infrastructure to explore new markets and technologies.





We will be a global leader in responsible investment

The management mandate requires responsible investment to be an integral part of the management of the fund. Responsible investment and active ownership support long-term value creation and our goal of highest possible return. **Managing climate-related risks and opportunities is a key priority. We have a financial interest in an orderly energy transition in line with the Paris Agreement. We will drive the companies we invest in towards net zero emissions by 2050.**

We work with responsible investment and ownership at three levels. We work at the market level to elevate global standards for all companies. We work at the portfolio level to monitor Environment, Social and Governance (ESG) information and integrate this into the management of the fund. We work at the company level to promote good governance and sustainable business practices. We will be a transparent and result-oriented owner. We will continue to develop our activities in collaboration with companies, peers, academia, and other stakeholders.

Market

We engage with standard setters, market participants, and exchanges to promote well-functioning and efficient markets. International principles contribute to improved standards in all markets.

- We will push for mandatory corporate sustainability reporting and environmental and social due diligence to improve company performance and the quality and availability of ESG data.
- **We will sharpen our expectations on climate change** and human rights and communicate our views on audit practices and consumer interests.
- We will engage and share expertise with other investors to promote best practices more effectively. We will increase our engagement in industry initiatives and with emerging market standard setters.



Portfolio

We invest globally and our investments are exposed to environmental and social developments that affect the global economy. We want our investments to be resilient to the effects of such developments.

- We will develop our ESG database and analytical tools to make ESG information more relevant, reliable, and available to the organisation.
- We will further develop our principles for climate risk management and integrate climate risk measurement in our portfolio analysis to identify risks and opportunities.
- We will make the buildings we own more energy efficient to improve return-risk characteristics and to reach our goal of net zero emissions by 2050 for our unlisted real estate portfolio.

Company

We promote long-term value creation in the companies we invest in and lend to. We set clear goals for all ownership activities. We prioritise stewardship engagements with our largest holdings and companies with material sector and company specific risks.

- We will contribute to long-term value creation by supporting and challenging companies on their governance and sustainability priorities and following up on the results.
- We will use voting more actively to promote our investor views and hold boards accountable. We will consider filing shareholder proposals if companies fail to meet our expectations.
- We will ask companies to commit to business activities aligned with net zero emissions by 2050 and to set short- and medium-term reduction goals for direct and material indirect emissions.



We will ask companies to commit to business activities aligned with net zero emissions by 2050.

Technology

Performance ●

Technology ●

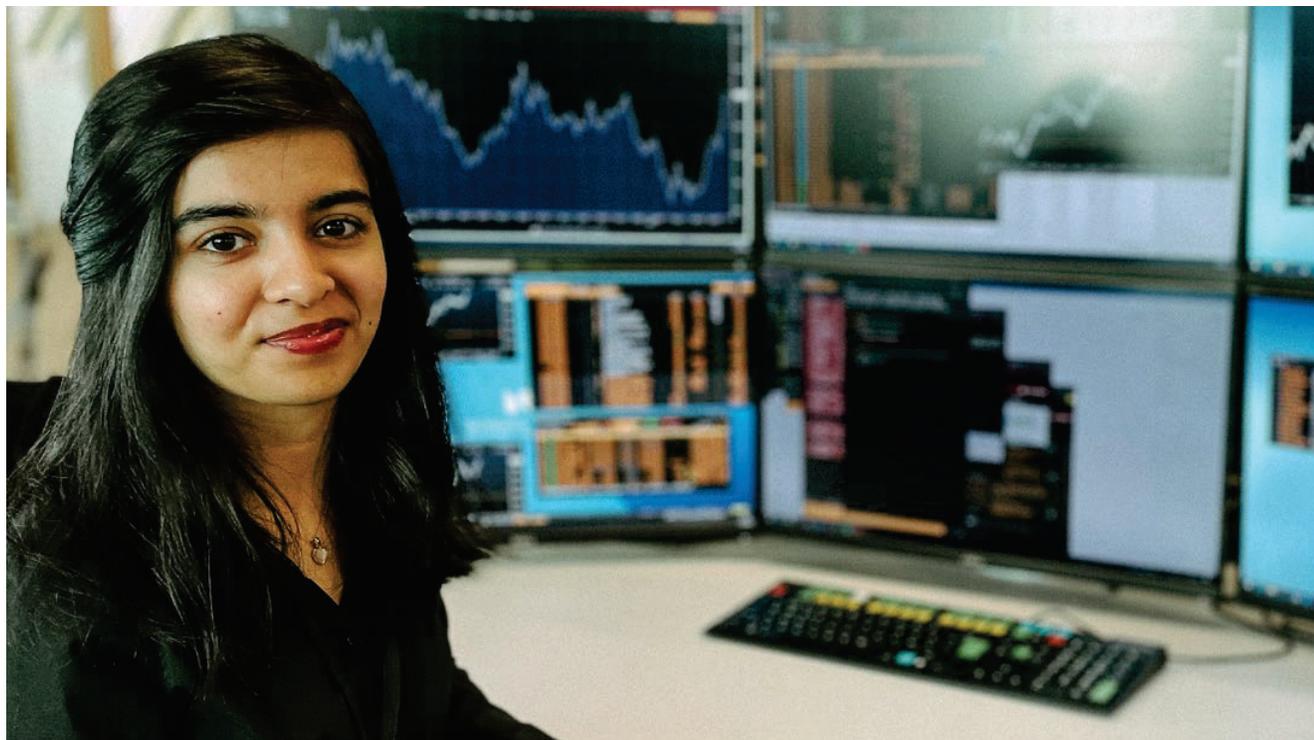
Operational robustness ●

People ●

Communication ●



We will become the leading technology organisation in investment management.



Technology is key to fulfilling our management assignment in a secure and robust way. Our IT infrastructure is based on a cloud platform, which ensures flexibility and scalability. We focus on innovation and building our own solutions with our own people. To succeed, we need to attract, develop, and retain the best people.

- We will improve our IT infrastructure and remove legacy solutions not suited for our cloud platform. Better adapting our IT infrastructure to the cloud enables us to standardise, automate, and reduce daily maintenance.
- We will simplify and reduce bureaucracy in our processes. This enables us to faster develop and launch new solutions based on new technology and our changing needs.
- We will improve data management, quality and accessibility through a new strategy for our data warehouse.



We will create a leading technology community within our organisation and be a magnet for technology talents within the financial sector.

Our investment processes are technology-driven and based on vast amounts of data and analytics. It is crucial that we strike the right balance between internally built solutions and external solutions for the efficiency and robustness of these processes.

- We will develop order management and trading solutions tailored to our needs. We will also buy adaptable and well-proven solutions externally when appropriate.
- We will use our immense set of market and non-market data to support machine learning with the aim of strengthening our investment processes.

We will create a leading technology community within our organisation and be a magnet for technology talents within the financial sector. We will continue to invest in our solutions and people, to ensure technology development is as efficient as possible.

- We will reduce reliance on consultants. We will hire and develop our own people to become more robust and build the proud technology culture we strive for.
- We will encourage closer collaboration with investment areas. A close relationship between technology and the rest of the organisation ensures that technology developments are tailored to our needs.



Operational Robustness

- Performance ●
- Technology ●
- Operational robustness ●
- People ●
- Communication ●



Our people, processes, and systems are key to safeguarding the fund's assets.



Operational robustness is essential to achieving our goal of highest possible return in a secure and cost-efficient way. We have comprehensive compliance and risk management frameworks where risks are identified, assessed, and integrated in our decision processes. A strong compliance and risk management culture is critical for an effective control environment. We will safeguard Norges Bank's legal, tax, commercial, and operational interests through use of appropriate legal means.

- We will maintain the highest standard of conduct and integrity. We will further develop our training and awareness program to ensure adherence to laws, regulations, and best practices.
- We will continue to promote a no-blame culture when incidents occur. This ensures that incidents are reported and assessed as quickly as possible. We must learn from our mistakes and continuously improve.



Geopolitical risk could become more important in the management of the fund in the coming years.

Our management assignment is complex and involves a high number of transactions and processes. We have chosen to have one global custodian to enable a robust and efficient model for instructing transactions and for safekeeping our assets. Despite a high degree of automation, the efficiency of our processes ultimately relies on our people.

- We will strengthen teams that are highly dependent upon specialist skills and key individuals to improve operational robustness. We will increase internal mobility to encourage innovation and knowledge sharing.
- We will ensure that our processes are supported by technology that increases the robustness and efficiency of the organisation.

Geopolitical risk could become more important in the management of the fund in the coming years. Also, organised cyber-criminals are becoming more specialised, sophisticated, and well-funded.

- We will monitor geopolitical risk and develop our scenario analysis and stress tests to strengthen our ability to assess these risks.
- We will strengthen security governance and embed appropriate security controls in our processes.
- We will strengthen business continuity and crisis management, including our IT disaster recovery capabilities. This enables us to better respond to cyber-attacks and recover more quickly from such attacks.

Ownership and climate risk in the GPFG - on the instruments for managing climate risk in the GPFG

Speech by Deputy Governor Øystein Børsum, 21 December 2021.

Actual performance may differ from published text

Introduction

Climate challenges are an engaging theme.

Figure: Emissions must be reduced

The world economy, as it operates today, is not sustainable. It must be, and then emissions must go down. It concerns us all - and not least our common fund. With a broadly diversified, global portfolio and a long horizon, we are in many ways burdened with the world economy.

Norges Bank is a financial investor. We will secure and create financial value for future generations. It is our task as manager of the fund. But how the assignment is carried out can also have an impact beyond the purely financial. Among other things, in the transition to a low-emission society. What our role should be - what our work should consist of - is what I want to talk about today.

This summer, an expert group submitted a report to the Ministry of Finance with recommendations on how climate risk should be managed in the fund. During the autumn, we at Norges Bank worked to assess the proposals and look at how they can be implemented.

A couple of days ago, the Executive Board sent its response to the Ministry of Finance. In the bank's management of climate risk, a lot is already being done, and we are outlining even more ambitious plans for the future. As a long-term and global investor with ownership interests in several thousand companies, we have a financial interest in the companies adapting to the risk and opportunities that climate change entails in a good way.

We propose that Norges Bank be a driving force for the companies we are invested in to adjust to net zero emissions over time - that the companies we invest in reflect the restructuring that the world has to go through.

The fund as an investor

Our characteristics as an investor

The climate risk in the fund is related to who we are as an investor and our overall investment strategy. In short: The fund is large, broadly diversified, long-term and close to the index.

Chart: Large, broadly diversified, long-term and index-linked

Of the fund's more than 12,000 billion, 70 per cent is invested in shares. With that, we are one of the world's largest shareholders. We are owners of 9000 companies in 70 countries.

And we are long-term. **By using only the real return, the fund can in principle be perpetual.**

The strategy is based somewhat simply on the following: **If we are to achieve the best balance between expected return and risk, we must spread the investments widely and own a little of everything in the market.** There is a solid professional basis for this approach.

How climate risk is relevant to the fund

What does this way of managing the fund have to say for the fund's climate risk? **By spreading the investments widely, we are protected against incidents that only affect individual companies or special sectors. But we can not protect ourselves from events or developments that affect everyone.**

The fund is exposed to two types of climate risk - physical risk and transition risk.

Transition risk is about whether the *companies* we own will manage the transition to a low-emission economy. Here the challenge is very different across sectors and companies.

Chart: Transition risk and the fund

The fund's equity investments can be categorized according to transition risk as assessed by the research company MSCI today. The blue bars in the figure show shares of the fund's portfolio. The white bars show the emissions in the companies. The companies that have ended up in the category «restructuring» have high emissions and must therefore restructure significantly. They make up 14 percent of the equity portfolio. The rest are companies that are either considered to be neutrally positioned or are considered to make a positive contribution to a green transition. The latter are thus part of the solution. [1]

Physical risk is more directly linked to climate change. The easiest to think about are acute events such as extreme weather, but also more gradual changes such as warmer climates, droughts and increased sea levels can affect individual investments in both negative and positive directions.

In a scenario where the world does not succeed in the transition to a low-emission economy, the risk increases, also for the fund, because the consequences of major climate change will be felt everywhere. As owners of shares, bonds and real assets, we are invested in everything from real estate and infrastructure, forestry and the food industry to all kinds of production capital. All of these are investments that can be affected by changes in the environment, including heat waves, floods and fires. We own a little of everything.

For a large, long-term, global fund, there will be nowhere to hide.

Climate risk is a long-term and important risk that the fund must deal with.

What does a long-term goal of net zero emissions mean for the fund?

A key recommendation from the expert group is that Norges Bank's responsible management be given a long-term goal of working towards net zero emissions from the companies in which the fund is invested. Norges Bank supports this recommendation.

Some may interpret this as a plan to sell shares in companies with large emissions.

But that is not our approach, nor is it the expert group's proposal. Instead of selling ourselves out, we will through active ownership be a *driving force* for the companies to adapt. In order to influence, we must actually be owners.

And we believe that ownership work works.

It works because we are big. Norges Bank is among the ten largest owners in about half of the companies we are invested in, and we have experienced that the companies listen when we talk.

Responsible management - a chain of instruments

Figure: Responsible management - a chain of instruments

Responsible management is our foremost tool in the work with climate risk and climate-related investment opportunities. I will now consider some important parts of this work. We are already doing a lot, and now we want to do even more.

The work can be grouped into three: The work we do towards the markets, towards the companies and with the portfolio. Together, this constitutes a coherent chain of instruments. I can not take a full review of the work here, but will highlight some points.

Default setting

The first point, standard setting, is about standards for reporting and measuring companies' climate risk.

Good common standards are important. This enables us as managers to assess the companies' prospects, prioritize ownership work and make good investment decisions.

But not just us. Better reporting will make the financial markets more well-functioning and better able to allocate capital. International standards provide equal conditions across markets and set the list for all companies. We, and other major investors, have an important role to play in contributing to the development of these standards.

Among the particularly important initiatives we have supported are climate reporting from the Task Force on Climate-Related Financial Disclosures (TCFD). Such reporting has been voluntary, but we believe that it must now become a requirement. Another issue we are working on is a comprehensive standard for sustainability reporting in line with the recently launched International Sustainability Standards Board (ISSB).

We will also work for good standards for reporting on companies' indirect emissions in the value chain, so-called "framework 3". In many sectors, this is crucial for understanding the companies' climate risk. We will also work with other climate-related issues where international standards may be appropriate. The use of various forms of climate quotas can be an example of this.

Our work with the companies starts with setting clear expectations.

We have formulated our expectations in our own expectations documents. In the climate area, we already expect companies to have a climate strategy, set emission targets, report on developments and stress test their business models against different climate scenarios. Going forward, it is natural for us to emphasize the horizon towards zero emissions. This will provide a clearer direction for the exercise of ownership.

Exercise of ownership

The exercise of ownership will be central to the work to manage the fund's climate risk. Not least, the dialogue with the companies is important.

Figure: Climate is more often a theme in the dialogue

The dialogue with the companies follows our expectations. Last year we had about 3,000 meetings with the companies, and as you can see from this figure, sustainability is increasingly on the agenda.

Going forward, we will increase ownership activity on climate, both in scope and depth.

We will give particular priority to ownership activity towards the companies that have the largest emissions, towards those that have not published their own climate plans or have inadequate climate reporting. We will also strengthen the ownership activity aimed at the financial sector, which is indirectly exposed to climate risk through lending and investments.

The dialogue is adapted to the sector and situation. Steel and cement are an example. These companies currently have large emissions, but are also manufacturers of products we also need in a low-emission society. Therefore, the dialogue is precisely about transition plans, much about the technological measures and investments needed for change. We also address the need for industry standards and lobbying, which is a significant challenge.

Figure: Companies report better on climate

We see signs that the work is working. For example, when we analyze the reporting from 1,500 companies, we see that the companies we have been actively involved in have made greater progress in reporting on climate strategy than the other companies. Of course, we should not take all the credit for these advances. But there is progress.

In the future, we will report more about the dialogue with the companies, what they are about and changes we see. That it is visible is a tool in itself.

Reporting and voting

The dialogue with the companies will not succeed in all cases. We can then hold the boards responsible for their decisions through our voting. This year, we have, among other things, in six cases voted against renewed confidence in board members due to inadequate management of climate risk. This sounds small, but in the future we will work to use this tool to a greater extent than today.

We have started by announcing our voting five days before the actual voting. What we do is noticed.

Another alternative is to promote shareholder proposals, alone or together with others. In the past year, we have supported 19 shareholder proposals on climate. One of those who gained a majority led to a large international company initiating work on reporting on emissions in the value chain ("Box 3"). Going forward, we will also consider promoting our own shareholder proposals.

Risk-based divestments

A last resort, when the exercise of ownership does not succeed, is the sale. It will not be the case that we automatically sell out if the ownership work does not succeed. But in some cases it can be the result.

Norges Bank can sell out of a company on a financial basis. This is what we call risk-based divestments. These are companies that we believe handle climate risk in a very deficient way - and thus provide an increased financial risk. This is about avoiding companies that we believe do not have sustainable business models.

Figure: More than half of the sales are related to climate

Risk-based divestments are active decisions made by Norges Bank, which draw on the fund's framework for deviations from the benchmark index. In the period 2012-2020, we have made more than 300 such sales, and more than half have been linked to climate change.

We are ready to do more of this in the future.

As a continuation of risk-based divestments, we have also begun to systematically assess companies' sustainability risk before entering the fund's benchmark index.

The fund is managed close to the index. Risk-based divestments will therefore mainly be relevant for smaller companies. For larger companies, we have more limited room for maneuver, as such sales will to a greater extent draw on the framework for deviations from the benchmark index.

The behavioral criterion

Figure - Responsible management - a chain of instruments

This takes me over to the second form of divestiture, namely exclusion on ethical grounds. The fund's ethical guidelines contain both a product-based coal criterion and a behavior-based climate criterion.

The latter includes companies that are linked to serious environmental damage or to an unacceptable degree lead to greenhouse gas emissions.

The Council on Ethics advises observing or excluding a company based on this criterion. Based on their recommendations, the Executive Board of Norges Bank makes the final decision based on these recommendations. A decision on exclusion means that the company is excluded from both the portfolio and the benchmark index. It therefore does not draw on our framework for deviations.

It is our experience that the practice of this criterion is complex and that it requires broad insight and detailed information about companies' activities and plans.

Norges Bank expects that we will - in light of the work I have talked about today - gather further detailed information about the companies' climate risk and climate plans. We will share this information with the Council on Ethics.

Downsizing or exclusion is the last link in the chain of instruments, but far from the most important. We plan for Norges Bank to be a driving force for the companies in the portfolio to adjust to net zero emissions over time. Active ownership is the key tool.

End

Before I conclude, I would like to mention that we invest in companies that can contribute to solutions to the climate challenges, both through the environmental mandates and in the rest of equity management. We are now also in the process of building up a portfolio of high-quality wind and solar power plants.

The first environmental mandates were established in December 2009, and have had positive learning effects for several parts of the organization. As we write in the letter to the ministry, we will in future draw more on the competence of the managers of the environmental mandates in other parts of the administration.

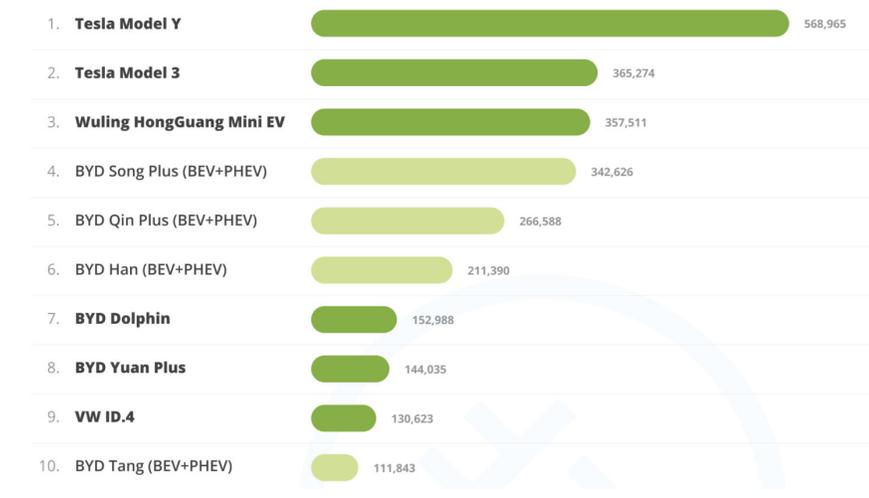
Overall: Our ambition is for us to be a leader in responsible management. In collaboration with other large investors, we will contribute to the development of standards and methods for reporting. We will strengthen our dialogue with companies about climate both in scope and depth, and utilize the entire toolbox we have as an investor. We will influence companies to take the restructuring seriously. We expect concrete plans, not empty words or greenwashing! And not least - we must have a clear voice in our ownership work.

Footnote

[\[1\]](#) The calculations are based on the analysis company MSCI's classification of companies' transition risk. 80 per cent of the market value of the fund's equity portfolio ends up in the group of companies that are neutrally exposed to transition risk.

PUBLISHED December 21, 2021 9:00 AM

Best Selling Plugin Vehicles in the World | January–October 2022



100% Electric Vehicles = 11% Of New Vehicle Sales Globally!

And 16% of new vehicles sold across the world have a plug.



By
[José Pontes](#)

Published
2 days ago

Global plugin vehicle registrations were up 55% in October 2022 compared to October 2021, reaching 932,000 units, the second best result ever. That was only behind the record 1,040,000 registrations of the previous month of September.

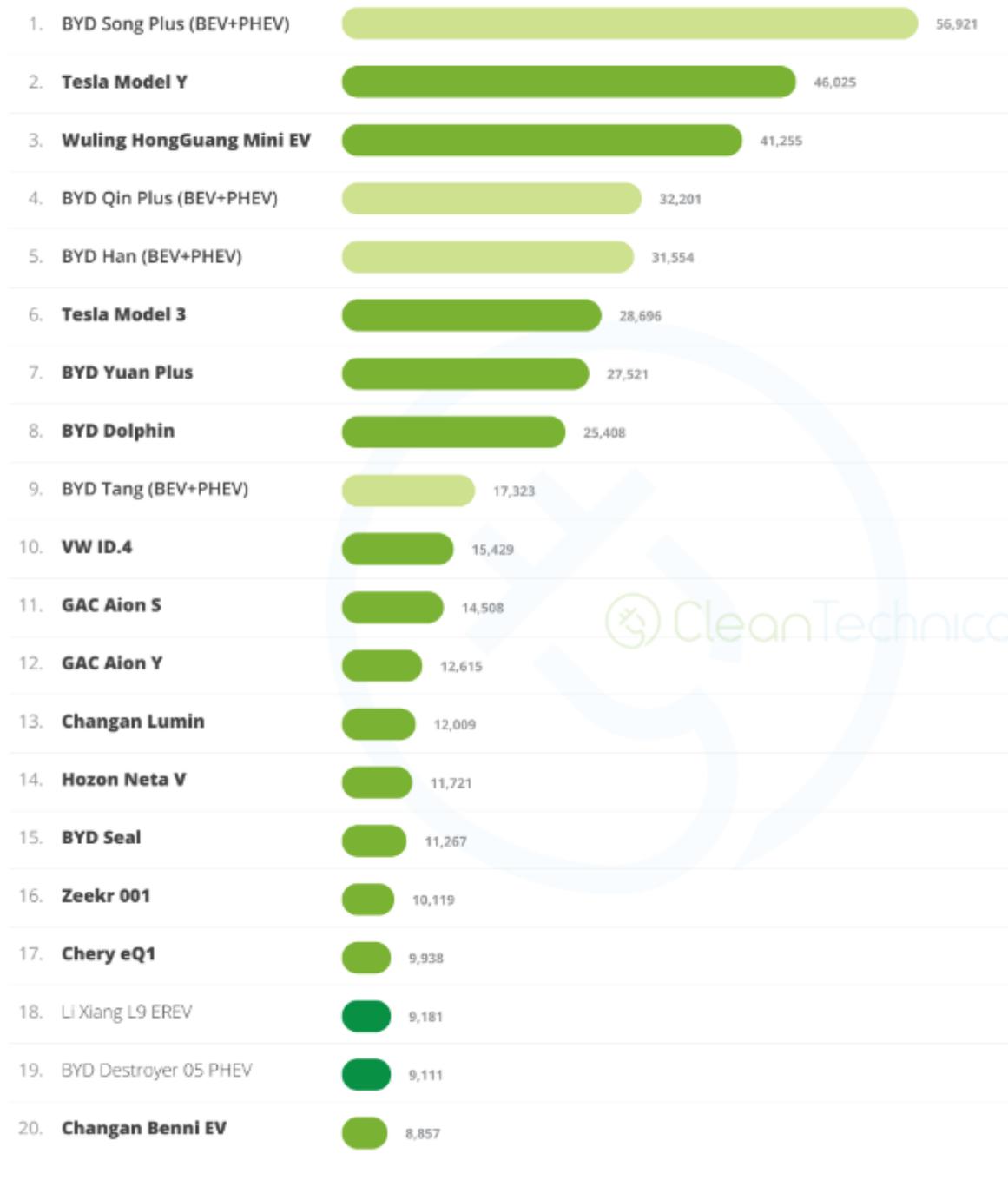
With such a strong month in October, plugins represented 16% share of the overall auto market. Full electrics (BEVs) reached 11% share of the market! And these numbers could have been even larger if the overall market had not been in “recovery mode.” That, added to the fact that plugless hybrids (HEVs) posted their highest growth rate since last January (+17% YoY), confirms once again the significant correlation between the HEV and pure ICE (internal combustion engine) markets.

In October, the BEV growth rate (+54% YoY) was slightly smaller than that of plugin hybrids (+60%), but if we exclude China from the plugin hybrid vehicle (PHEV) tally, we discover that PHEVs would be up by just 5%. Still, this is the first time since February that plugin hybrids are up without the help of the Chinese market. Much of it can be explained by the fact that a number of European markets, most notably Germany, are going to end incentives on PHEVs by the end of this year. We can expect a PHEV registration peak by year end in Europe, which will help the plugin hybrid numbers globally in the next couple of months.

Year to date, the plugin vehicle share was stable at 13% (9.4% BEV). With the plugin market now consistently reaching two-digit results in market share, one can say that *EV disruption* is knocking on the global automotive market's doors. Expect the floodgates to open next year!

That's all great, but the internet loves lists, so here you go: **The top 20 electric car sales leaders in the world!**

Best Selling Plugin Vehicles in the World | October 2022



BEV PHEV BEV+PHEV

After Tesla's *end-of-quarter delivery peak*, which (probably) made the Tesla Model Y the best selling model in the overall auto market in September, the US automaker's expected delivery slowdown in October allowed for another model to become the best seller in the plugin table. As such, the BYD Song (BEV+PHEV) became last month's best selling plugin model, with both versions of the model scoring record performances (50,797 units for the PHEV version, 6,124 units for the BEV version). This is a continuation of what seems to be a never-ending ramp-up of the midsize SUV.

Despite ending in the #2 spot, the Tesla Model Y actually had a good month, with the midsize crossover scoring its *best first-month-of-quarter ever*. So, there is a strong possibility the Model Y will score another record result in December, which could allow it to once again be the best selling model globally in the overall auto market in December!

The little Wuling Mini EV managed to stay ahead of most of BYD's Fab 5, ending the month in the last place on the podium.

Off the podium, despite losing the #3 spot to the Wuling Mini EV, the #4 BYD Qin Plus (32,201 registrations) ended ahead of some high-profile models, like the #5 BYD Han (31,554 registrations, a new record), the #7 BYD Yuan Plus (27,521 registrations, a second record in a row), the #8 BYD Dolphin (25,408 registrations, 4th consecutive monthly record), the #9 BYD Tang (17,323 registrations, a new monthly record), and ... the #5 Tesla Model 3 (28,696 registrations).

Demand for the Tesla midsize sedan is one of this quarter's question marks, and also an open question for 2023. While Tesla Model Y demand will continue to be strong in the next few quarters, one wonders how the Model 3 will behave in the same time period. We have seen its demand soften recently, due to external and internal competition (*ahem, standard range Model Y*).

Outside the BYD/Tesla *duopoly*, **the #10 Volkswagen ID.4 was the only legacy OEM model on this table**. The German crossover scored 15,429 sales (deliveries). It was not a record month because Volkswagen's Chinese operations are having a hard time moving units out of dealerships, unlike what is happening in both Europe and the USA, which could be attributed to the fact that China is by far the most competitive EV market in the world.

Below the VW model comes a long list of models in *record-breaking mode*. That includes GAC's Aion S (#11, with 14,508 registrations), Changan's ever expanding Lumin city EV in #13 (12,009 registrations), and the #16 Zeekr 001. With a record 10,119 registrations, the Zeekr model is becoming a force to be reckoned with in the full size category. Will we see the big fastback get close to BYD's category rulers, the Tang and Han, in 2023? With export plans already being set, one cannot rule out that possibility in the future.

And because BYD hasn't been mentioned for a while, we have two more BYD models on the rise. The Destroyer 05 is in #19, with a record 9,111 registrations, while its BEV sibling, the BYD Seal, did even better, by jumping into #15 with 11,267 registrations in only its third month on the market!

This makes 8 BYDs in the global top 20!

Rank	Model	October	%
1	BYD Song Plus (BEV+PHEV)	56,921	6.1%
2	Tesla Model Y	46,025	4.9%
3	Wuling HongGuang Mini EV	41,255	4.4%
4	BYD Qin Plus (BEV+PHEV)	32,201	3.5%
5	BYD Han (BEV+PHEV)	31,554	3.4%
6	Tesla Model 3	28,696	3.1%
7	BYD Yuan Plus	27,521	3.0%
8	BYD Dolphin	25,408	2.7%
9	BYD Tang (BEV+PHEV)	17,323	1.9%
10	VW ID.4	15,429	1.7%
11	GAC Aion S	14,508	1.6%
12	GAC Aion Y	12,615	1.4%
13	Changan Lumin	12,009	1.3%
14	Hozon Neta V	11,721	1.3%
15	BYD Seal	11,267	1.2%
16	Zeekr 001	10,119	1.1%
17	Chery eQ1	9,938	1.1%
18	Li Xiang L9 EREV	9,181	1.0%
19	BYD Destroyer 05 PHEV	9,111	1.0%
20	Changan Benni EV	8,857	1.0%
	Others	500,532	53.7%
	TOTAL	932,191	100%

Outside the top 20, as usual, there is a lot to talk about — coming from all over the place.

Looking at models coming from legacy OEMs, BMW saw two models shining. The iX3 reached a year best score of 5,315 sales (if we were to add the X3 PHEV units to the tally, it would reach 6,982 sales). Meanwhile, the fastback i4 scored a record 5,233 sales, its 3rd record month in a row. So, it seems the Bavarian automaker is finally getting serious in ramping up its midsize offering.

Speaking of *finally getting serious in ramping up production*, the *hatchback-that-thinks-it's-a-crossover* Chevrolet Bolt EUV (*hey, remember me?*) scored a record 5,016 sales, while its older sibling, the more simply titled “Bolt EV” also did quite well. The *mini MPV that thinks it's a hatchback* reached 2,161 sales, its best result since June 2021. It seems Chevrolet is *back in the game!*

Still on the topic of the USA, Jeep saw its *hardcore* Wrangler PHEV reach 5,775 registrations last month, the 4×4's best score in over a year. The Wrangler's success is creating an interesting issue at Jeep: because demand is far higher than the company expected, and battery supply is limited, they had to reduce the launch of the production Jeep Grand Cherokee PHEV to smaller volumes and the Grand Wagoneer PHEV launch was postponed to a later date as Jeep awaits a greater supply of batteries. Interestingly, the Wrangler PHEV was also Stellantis' best selling plugin last month, outselling the Peugeot e-208 EV (5,215 units) and Fiat 500e (5,225 units).

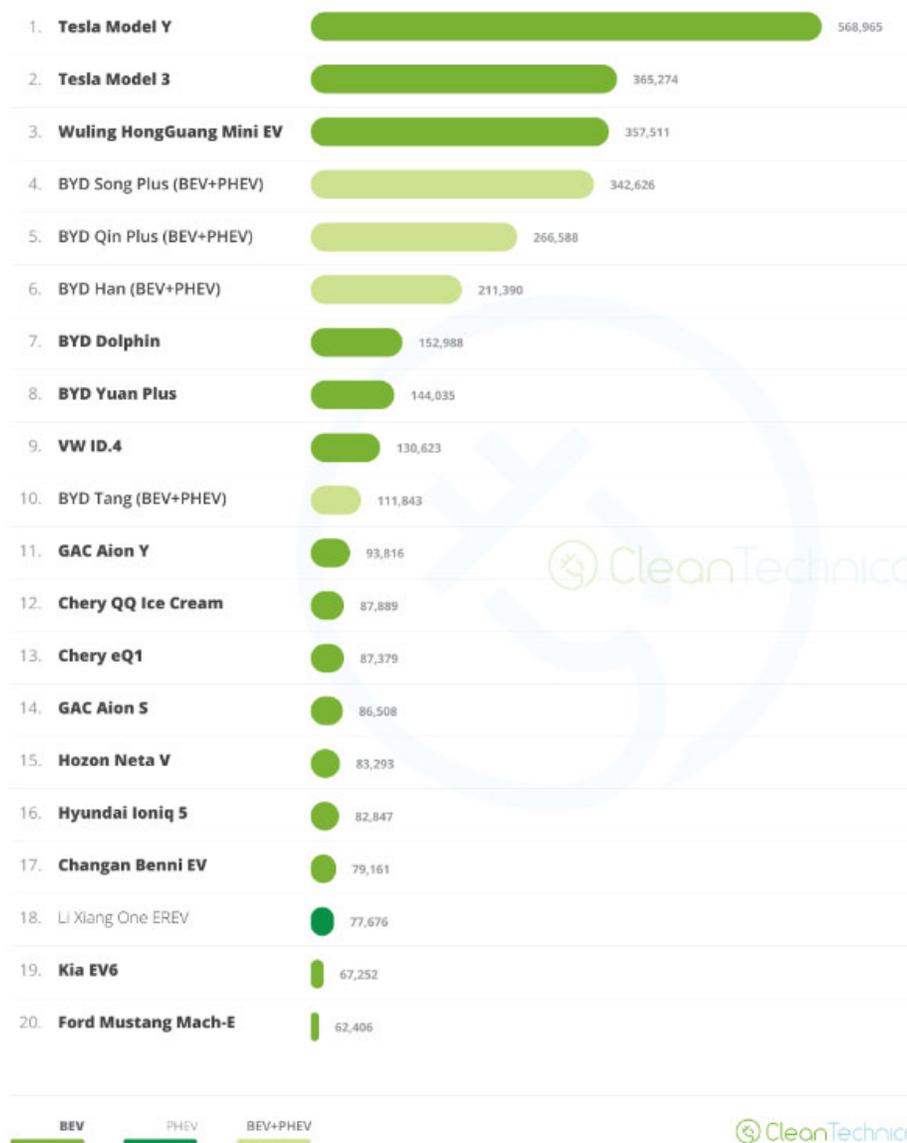
In the Volkswagen Group mothership, the Audi Q4 e-tron scored 6,828 registrations, its second record month in a row thanks to greater production output and its introduction in relevant markets, like South Korea. It's MEB-platform relative, the VW ID.3, is also profiting from the higher production output, scoring 7,174 registrations, which is already an *okay result* but is still far from the promises made at the time of the ID.3 launch (*the car that was going to retire the once all-mighty VW Golf*). Will we see it reach sustained five-digit performances anytime soon?

Still on the legacy OEM field, Volvo saw its compact SUV XC40 reach 7,582 units, a new year best, mostly thanks to a record 4,902 units from its BEV version while the PHEV version clocked 2,680 units. Highlighting Volvo's recent BEV ramp-up, *Volvo's cooler cousin* Polestar 2 had a record 5,503 registrations in October.

In the Chinese *new blood* group, the highlight belongs to AITO, with the full size M7 reaching a record 5,503 registrations while its smaller sibling, the midsize M5, got 6,812 registrations. It seems the Huawei-backed automaker has two winners in its hands. Are there more to come? They will need them if they want to fulfill their ambitions....

As for Chinese legacy OEMs, Dongfeng's Fengshen E-Series (8,315 registrations) continues to be popular among fleets, while the new rising star in this field is Changan's recent Shenlan SL03. The OEM's take on the *Tesla Model 3 formula* (or is it the *BYD Qin Plus formula*?) scored 8,176 registrations in October. Expect the midsize sedan to soon reach five-digit results, which would make it the 5th midsize car to reach those sales levels, after the Tesla Model 3, BYD Qin Plus, BYD Seal/Destroyer 05, and GAC Aion S. And what about legacy OEM models? (*cricket sounds*)

Best Selling Plugin Vehicles in the World | Jan–Oct 2022



In the year-to-date (YTD) table, the Tesla Model 3 lost ground to the #3 Wuling Mini EV and #4 BYD Song, but because both competitors are still far away (8,000 units for the Wuling and 23,000 units for the BYD) and Tesla's end-of-quarter push in December will prevent any surprise, Tesla's #1 plus #2 finish is guaranteed this year. Despite this, the sign has been given: the Model 3 is no longer untouchable and Tesla's #1 and #2 rankings will be in danger next year. More important for this year's ranking, the #4 BYD Song is 15,000 units behind the #3 Wuling Mini EV, and with the BYD model's *never-ending record streak* still happening, expect the midsize SUV to surpass the little Wuling EV by the end of the year. Judging by October's results, it might already happen in November....

Rank	Model	YTD	%
1	Tesla Model Y	568,965	7.3%
2	Tesla Model 3	365,274	4.7%
3	Wuling HongGuang Mini EV	357,511	4.6%
4	BYD Song Plus (BEV+PHEV)	342,626	4.4%
5	BYD Qin Plus (BEV+PHEV)	266,588	3.4%
6	BYD Han (BEV+PHEV)	211,390	2.7%
7	BYD Dolphin	152,988	2.0%
8	BYD Yuan Plus	144,035	1.9%
9	VW ID.4	130,623	1.7%
10	BYD Tang (BEV+PHEV)	111,843	1.4%
11	GAC Aion Y	93,816	1.2%
12	Chery QQ Ice Cream	87,889	1.1%
13	Chery eQ1	87,379	1.1%
14	GAC Aion S	86,508	1.1%
15	Hozon Neta V	83,293	1.1%
16	Hyundai Ioniq 5	82,847	1.1%
17	Changan Benni EV	79,161	1.0%
18	Li Xiang One EREV	77,676	1.0%
19	Kia EV6	67,252	0.9%
20	Ford Mustang Mach-E	62,406	0.8%
	Others	4,290,606	55.4%
	TOTAL	7,750,676	100%

The first change came all the way down at #14 — the GAC Aion S was up two spots, being followed by the #15 Hozon Neta V, which also jumped two spots. Both climbs were thanks to a bad month for the Hyundai Ioniq 5 and the *sales sunset* of the Li Xiang One.

Speaking of the Chinese startup's big SUV, another model to profit from the One's slowdown was the Changan Benni EV, allowing the small EV to climb a position into #17.

After a one month absence, the Ford Mustang Mach-E returned to the #20 position, kicking out the Great Wall Ora Good Cat.

But Ford's stylish crossover cannot rest too much, because just 91 units behind, the Kia Niro (BEV + PHEV) is profiting from the new generation to climb positions and target a top 20 position¹

Date: 7 December 2022

2022 SAF Production Increases 200% - More Incentives Needed to Reach Net Zero

Geneva – The International Air Transport Association (IATA) estimates that Sustainable Aviation Fuel (SAF) production will reach at least 300 million liters in 2022—a 200% increase on 2021 production of 100 million liters. More optimistic calculations estimate total production in 2022 could reach 450 million liters. Both scenarios position the SAF industry on the verge of an exponential capacity and production ramp-up toward an identified tipping point of 30 billion liters by 2030, with the right supporting policies.

Airlines are committed to achieve net zero CO2 emissions by 2050 and see SAF as a key contributor. Current estimates expect SAF to account for 65% of the mitigation needed for this, requiring a production capacity of 450 billion liters annually in 2050.

Having agreed to a Long Term Aspirational Goal (LTAG) on climate at the 41st Assembly of the International Civil Aviation Organization (ICAO) in October 2022, governments now share the same target for aviation’s decarbonization and interest in the success of SAF.

“There was at least triple the amount of SAF in the market in 2022 than in 2021. And airlines used every drop, even at very high prices! If more was available, it would have been purchased. That makes it clear that it is a supply issue and that market forces alone are insufficient to solve it. Governments, who now share the same 2050 net zero goal, need to put in place comprehensive production incentives for SAF. It is what they did to successfully transition economies to renewable sources of electricity. And it is what aviation needs to decarbonize,” said Willie Walsh, IATA’s Director General.

To date, over 450,000 commercial flights have been operated using SAF, and the growing number of airlines signing offtake agreements with producers sends a clear signal to the markets that SAF is needed in larger quantities, and so far in 2022, around 40 offtake agreements have been announced.

Incentive-based policies

Until we have commercialized options for alternative power sources such as hydrogen, all of aviation’s SAF supply will be derived from biofuel refineries. These refineries produce renewable biodiesel, biogas, as well as SAF and their refining capacity is set to grow by over 400% % by 2025 compared to 2022. The challenge for aviation is to secure its supply of SAF from this capacity. And to do that successfully governments need to put in place SAF production incentives similar to what is already in place for biogas and biodiesel.

SAF Production To-Date

YEAR	2019	2020	2021	2021E
Estimated SAF Output (Million Liters)	25	62.5	100	300-450

COVID-19

State of the aviation industry

IATA Economics

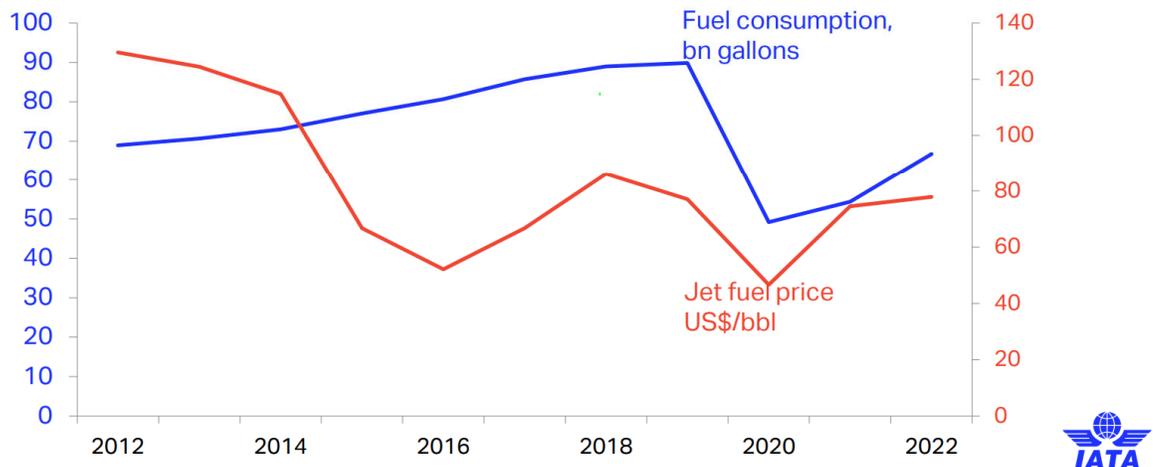
9th November 2021



Fuel cost rising with the higher traffic and fuel prices

Jet fuel price is expected to be \$77.8/brl in 2022 vs \$74.5/brl in 2021

Fuel Consumption and the price of jet fuel



Source: IATA Economics, Refinitiv Eikon data

MOSE

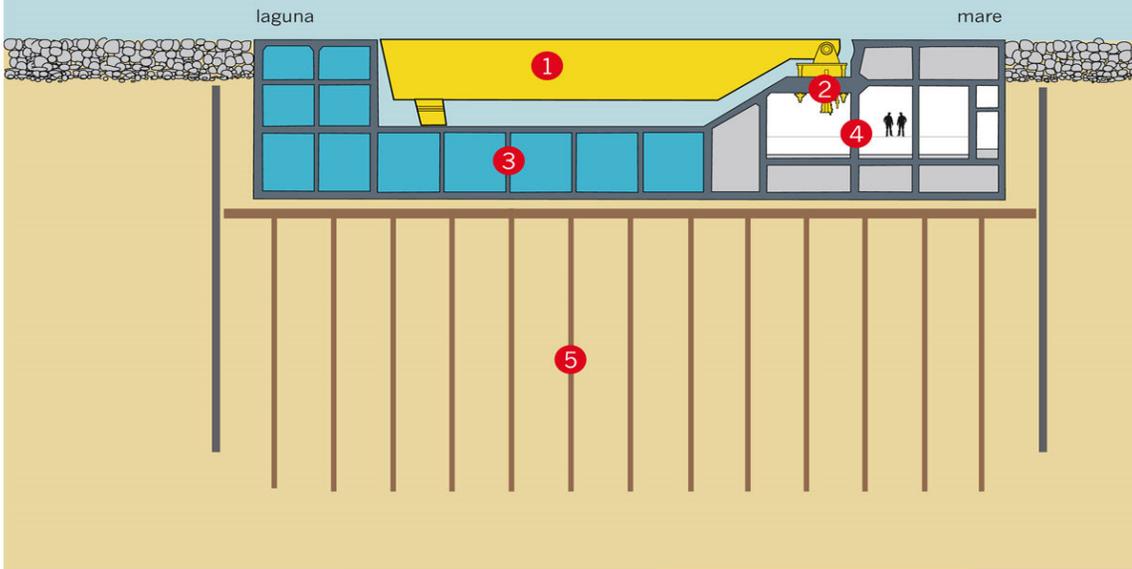


The Venice Lagoon and the three inlets

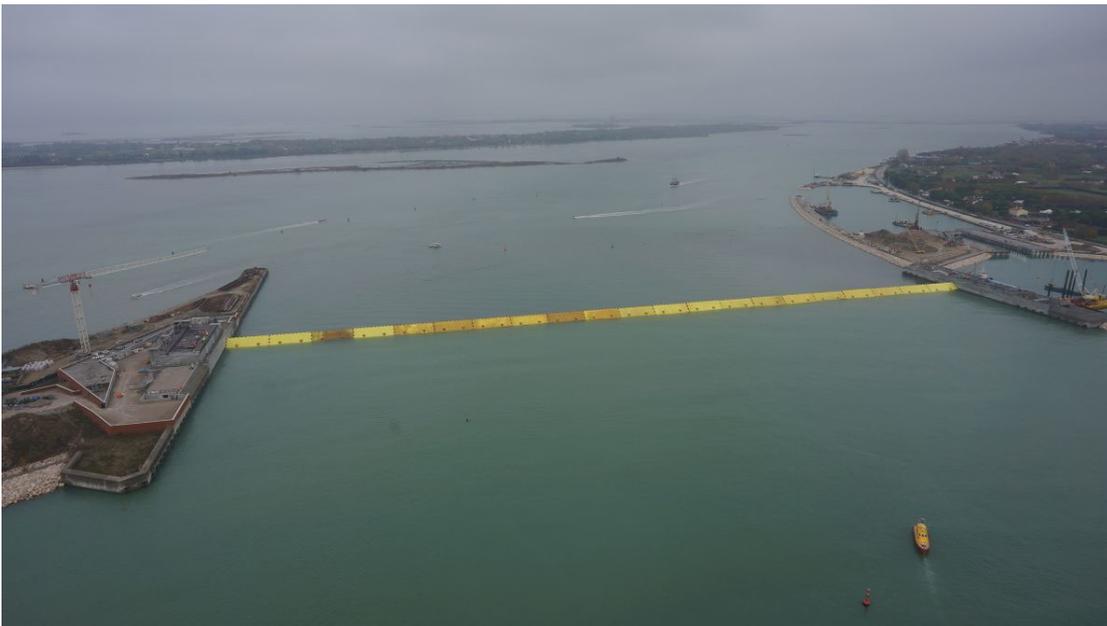
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How the Mose System works

1. Paratoia
2. Cerniera
3. Sede della paratoia
4. Gallerie impianti
5. Elementi per consolidamento fondale



Barrier: type section and construction elements



The gates emerged in the North Lido inlet

Location\$

The Mose system is located at the inlets of Lido, Malamocco and Chioggia, the three gates of the coastal cordon through which the tide spreads from the Adriatic sea into the Lagoon. To respond to the objective set by the Law for

Venice 798/84, the complete defense of the entire lagoon from the high tides of any level, an integrated system of works has been developed that foresees the barriers of mobile gates, able to isolate the lagoon from the sea during the events of high tide, complementary works such as the cliffs outside the port mouths, designed to attenuate the levels of the most frequent tides and the rise of the banks and pavements, at least up to +110 cm, in the most low in the lagoon dwellings. The integration of these interventions defines an extremely functional defense system that guarantees the quality of the water, the protection of the morphology and the landscape, the maintenance of the port activity.

Configuration§

The Mose is formed by a series of barriers consisting of mobile gates located at the inlets. There are 4 defense barriers: 2 at the inlet of Lido (the one closest to Venice which is twice the size of the other two and is made up of 2 channels with different depths) which are respectively composed of 21 gates and one in the north channel of 20 that in the south channel, the two barriers are connected to each other by an intermediate island; 1 barrier formed by 19 sluice gates at the port mouth of Malamocco and 1 barrier of 18 gates at the port mouth of Chioggia. The depths and pre-existing sections of the mouth canals are not altered by the work. At the port mouths of Lido and Chioggia, take shelter and small navigation basins allow the admission and transit of pleasure boats, rescue vehicles and fishing boats even with the sluice gates in operation. At the mouth of Malamocco a navigation basin was built for the transit of ships, so as to guarantee the operation of the port even with the sluice gates in operation. The basin, protected by the outer cliff that creates a calm water basin sheltered by the waves, is located on the south bank of the mouth and has a useful length of about 370 m and a width of 48 m. The cliffs to the south of the port mouths, requested by the Council of Ministers on 15 March 2001 and the Steering, Coordination and Control Committee of 6 December 2001, serve to dampen the liveliness of tidal currents at the mouths attenuating the most frequent tidal levels. The cliff outside the mouth of Malamocco also has the function of creating a basin of calm waters that facilitates the entry of ships into the navigation basin, to the sluice gates.

Operation and construction elements§

When they are inactive, the **floodgates** are full of water and lie completely invisible in housings placed in the backdrop. In the event of a particularly high tide hazard which could cause flooding of the territory, compressed air is introduced into the sluices which empties it from the water. As the water exits the sluice gates, rotating around the axis of the hinges, they rise up to emerge and block the flow of the incoming tide in the lagoon. The sluice gates remain in use only for the duration of the high water event: when the tide falls, and in the lagoon and the sea the same level is reached, the sluice gates are again filled with water and come back into their own premises. Each gate is made up of a metal box-like structure bound by two hinges to the housing box. Each gate is 20 m wide and has different lengths proportional to the depth of the mouth channel where it is installed (Lido-Treporti: 18.6 m and Malamocco: 29.6 m) and variable thickness (Lido-Treporti: 3.6 m and Chioggia: 5 m). The average closing time of the port inlets is about 4/5 hours (including the maneuver times for the opening and closing of the sluice gates).

The **housing caissons** are the elements that form the basis of defense barriers: they house mobile sluice gates and systems for their operation. They are connected by tunnels that also allow technical inspections. The connecting element between the barriers and the territory is represented by the shoulder boxes. They contain all the systems and buildings necessary for the operation of the sluice gates.

The need to defend the lagoon territory from increasingly frequent and intense high water is the origin of the design of the Mose system, whose subsequent realization, currently underway, may also be an opportunity for a comprehensive exploitation of the territory. The Venice Water Authority, prescribed by the Ministry of Cultural and Environmental Heritage as expressed in the Safeguard Commission, instructed the University of Architecture in Venice to carry out the preliminary project for the insertion of the defense works from the high waters into the landscape of the Venetian coasts. For each inlet, a proposal of intervention has been elaborated whose guidelines

can be summarized in the necessity to maintain unchanged the character and the perception of the places; in the enhancement of the environmental, landscape and historical complexity of the coast; in the improvement of their practicability and functionality.

By Tim Quinson

(Bloomberg) -- Funds linked to environmental, social and governance principles are by definition supposed to minimize risks tied to those three factors. In 2022, the approach did little to help protect investors from the brutal slide in the financial markets.

The 10 largest ESG funds by assets have all posted double-digit losses, with eight of them falling even more than the S&P 500's 14.8% decline. The laggards include BlackRock Inc.'s \$20.7 billion iShares ESG Aware MSCI USA exchange-traded fund (ESGU) and Vanguard Group's \$5.9 billion ESG US Stock ETF (ESGV).



The \$6 billion Brown Advisory Sustainable Growth Fund (BAFWX) was the worst performer of the bunch, having slumped 28.1% this year as of the close of business on Dec. 5. The fund had more than two-fifths of its assets in software, semiconductor and internet stocks as recently as the end of October. The once high-flying technology sector has been particularly hard hit this year amid rising interest rates, inflationary concerns and the possibility of a US recession. It's been a "bad year for growth stocks" and the Brown Advisory fund is the most "growth-oriented" of the 10 funds on the list, said Jon Hale, director of sustainability research for the Americas at Morningstar Inc. The Parnassus Core Equity, Pioneer and TIAA Social Choice Equity are more "value" focused,

seeking shares that trade at low levels relative to earnings and other financial metrics. As a result, this group reported slightly smaller losses, he said.

The fund declines are occurring during the most turbulent period for the S&P 500 since the global financial crisis of 2008. The US index has posted a move of at least 1%—both up and down—on almost half of trading days since the start of the year.



While few of the biggest funds measure their performance against the S&P 500, the index is the most widely followed stock benchmark in the US. Of the 10 largest ESG funds by assets, just one is a fixed-income fund, according to data compiled by Morningstar Direct. The \$5.9 billion TIAA-CREF Core Impact Bond Fund (TSBIX) has dropped 13% this year, less than the equity funds.

The performance of the 10 largest funds compares with the average 12% decline of ESG-labeled stock funds with more than \$500 million of assets so far in 2022, according to data compiled by Bloomberg.

Despite the losses, a paper released this month by the National Bureau of Economic Research said that investors are willing to be charged “higher fees for ESG-oriented index funds in exchange for their financial and non-financial benefits.” The Harvard Business School professors who helped write the study entitled How Do Investors Value ESG found that investors will—on average—pay 20 basis points more a year for funds with an ESG mandate as opposed to funds without an ESG mandate. “When we incorporate the possibility that investors are willing to accept lower financial returns in exchange for the psychic and societal benefits of ESG, we find that the implicit value that investors place on ESG stocks is higher still,” the authors wrote.

For ESG optimists, the NBER report helps explain why money keeps rolling into ESG funds despite the bad performance. This year, a net \$44 billion has gone into ESG-labeled ETFs, Bloomberg data show.

Whether that trend continues almost definitely depends on how much patience investors have if losses keep mounting.

Bloomberg Green publishes Good Business every week, providing unique insights on ESG and climate-conscious investing.

To contact the author of this story:

Tim Quinson in New York at standards@bloomberg.net

To contact the editor responsible for this story:

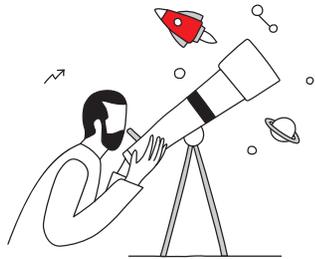
David Rovella at drovella@bloomberg.net

Lin Noueihed

To view this story in Bloomberg click here:

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Executive summary

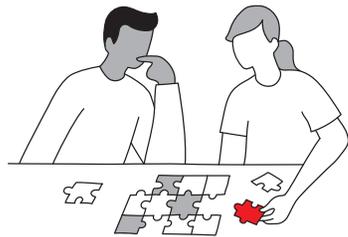


Ninety-five percent of surveyed billionaires believe that they should use their wealth or resources to help tackle global challenges.

In our survey of billionaire clients, just over two thirds state it's their responsibility to "lead the way," while almost a third believe they should use their wealth or resources to help tackle these challenges.

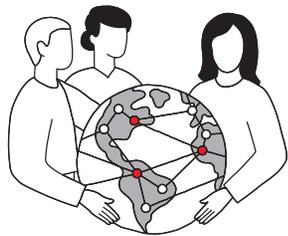
They are doing so across their activities, not just through philanthropy.

With many of today's billionaires being self-made entrepreneurs, they're most commonly driving environmental and social change through their businesses. However, they also do so through philanthropy and investing. Almost a fifth of those surveyed see their capital as a catalyst – helping to create solutions that others can adopt at scale.



Turning to legacy, making a positive impact on society is a priority.

Almost half of our clients surveyed say that they want to tackle global challenges for the sake of future generations, with a third stating that they want their resources to have a positive impact on the world.



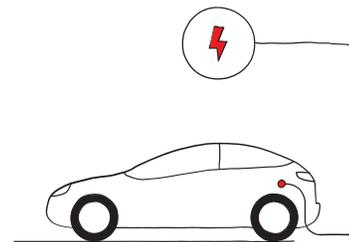
They see the greatest opportunities for impact in smart agriculture, clean water and poverty alleviation.

More than 40% of the billionaires surveyed see smart agriculture as one of the areas where they can make the greatest impact, alongside clean water and poverty alleviation. While they also see opportunities in green energy as well as waste management and recycling, they believe government has a greater potential role in these areas.



Energy and Asia judged best for financial opportunities.

When it comes to purely commercial business and investment opportunities, the billionaires surveyed view the energy sector and Asia-Pacific economies as having the best outlook over the next five years.



Global collaborations can lead to a new era in finding solutions to the world's problems.

At UBS, we believe that billionaires can make the greatest environmental and societal difference if they connect with others in global collaborations. By doing so, they can scale up capital and new ways of doing things to make a material difference.



Legacy: prioritizing impact and values

Just as billionaires are turning their attention to society's greatest challenges, so their attitude to legacy appears to be changing in similar ways. Many of today's billionaires appear most interested in leaving legacies based on positive values and making the world a better place.

When asked about what they would like their legacies to be, just over three quarters of respondents would like to pass down their values and principles to their family and the next generations. Giving an insight into what these values are, almost half (48%) say they get involved in addressing global challenges as it's important to help future generations, with a third stating that they want to use their resources to have a positive impact on the world. But as businesspeople and investors, over four in ten (43%) think that addressing global challenges will help them to combine their values with financial returns. Acknowledging that global challenges may now offer financial opportunities, almost a third (29%) think these areas will be the source of the best future investment returns.

Type of legacy to leave behind for future generations

Which, if any, of the following best describe the type of legacy you would like to leave behind for future generations?



Source: UBS Billionaire Survey 2022

CASE STUDY

Engineering the UK's small nuclear power plants

In order to meet its net zero commitments, the UK is developing a fleet of small modular reactors (SMRs), with funding from a consortium including the French Perrodo family.

The industry consortium led by Rolls-Royce, the UK aero-engine maker, is joining the British taxpayer to put GBP 405 mn into developing the SMRs. Rolls-Royce has funding from US energy company Exelon Generation and the Perrodos through their BNF Resources investment vehicle.

The small, modular design allows the power station parts to be built in factories ready for quick assembly at chosen locations, making them far cheaper than traditional nuclear power stations.

CASE STUDY

Slashing aviation emissions by 70%

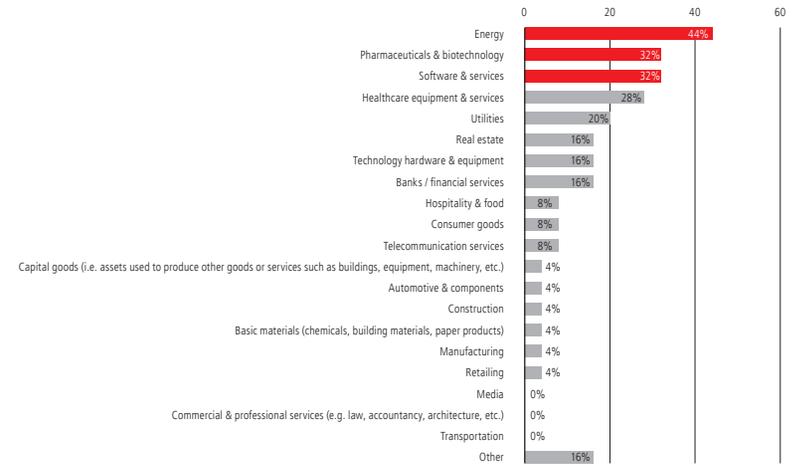
When Breakthrough Energy Ventures (BEV) announced a USD 50 million grant for LanzaJet Freedom Pines Fuels' sustainable aviation fuel (SAF) plant in October 2022, this was the latest of its initiatives in pursuit of the goal of net zero carbon emissions by 2050.

Backed by investments from more than 30 of the world's best-known billionaire entrepreneurs, BEV is accelerating technological transformation. It's supporting cutting-edge research and development, investing in companies that turn green ideas into clean products and advocating policies that speed innovation.

LanzaJet's plant in Georgia in the United States will be the first in the world to produce alcohol-to-jet SAF on a commercial scale. Projected to be operational in 2023, the plant's SAFs will lower carbon emissions by at least 70% compared with fossil fuels.

Energy viewed as top sector for business/investment returns

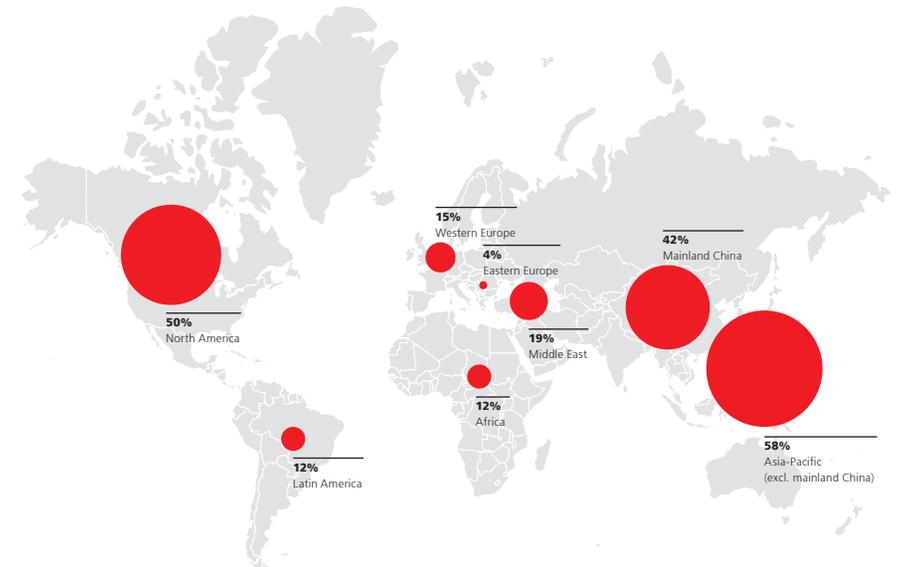
In which of the following sectors do you think there will be the greatest opportunity for business and/or investment returns over the next five years?



Source: UBS Billionaire Survey 2022

APAC and North America are best for business/investment returns

In which of the following regions do you think there will be the greatest opportunity for business and/or investment returns over the next five years?



Source: UBS Billionaire Survey 2022

Energy sector and Asia-Pacific judged best for medium-term opportunities

When it comes to purely commercial business and investment opportunities, the billionaires surveyed have clear ideas about where they see most potential in the next five years (irrespective of global challenges). From a sector perspective, they favor energy, possibly due to today's supply constraints and the accelerating secular transition to renewables. At the same time though, they continue to favor technology and health-care businesses – some of which have fallen from grace in terms of public equity market valuations in 2022.

Regionally, they are primarily looking to Asia-Pacific economies such as Southeast Asia and India, where economic growth remains robust. North America, with its huge domestic market and vibrant entrepreneurial culture, also remains a popular region. While still ahead of the rest of the world, mainland China lags these regions somewhat. Meanwhile, surprisingly few are drawn to Western Europe considering its position as one of the world's major economic blocs.

Yet billionaires aren't entirely optimistic. When asked what concerned them most at a UBS client event, the most common answer was geopolitics, closely followed by inflation.

Exceptional wealth volatility: yet rise of innovators continues

It's a time of shifting fortunes. Rapidly rising interest rates, stop-start pandemic re-openings and war in Europe are feeding market uncertainty and volatility, with wealth created and eroded in almost equal measure. Yet amidst the instability some themes persist – especially the broad concept of smart innovators rising to the top.

While the flux in billionaire wealth is exceptional, the total wealth and number of billionaires was only slightly lower at the March 2022 cut-off date for our data than 12 months earlier. There were 2,668 billionaires worth USD 12.7 trillion in March 2022, down somewhat on a year earlier when 2,755 individuals accounted for USD 13.1 trillion in 2021. (Notably, however, the total wealth and number of billionaires is likely to have fallen further since March 2022 due to declines in asset prices.)

There is a considerable underlying turnover in billionaires behind the data. A fifth (20.4%) of their population changed from 2021 to 2022, as 360 (11.6% of the cohort) saw their wealth dip below a billion dollars, while 273 (8.8%) reached that level.

For context, turnover was higher in 2021, but this was due to the number of new billionaires, as super-loose monetary policy intended to ease pandemic stresses lifted asset prices. In that year, 29.2% of the cohort changed. There were 744 new billionaires and only 84 dropouts.





Number of new and dropped-out billionaires by sector in 2022

Organization	Dropped-out		New		Billionaire population	
	No. of billionaires	% of Total	No. of billionaires	% of Total	Final worth USD bn	No. of billionaires
Automotive	8	10.3%	8	10.3%	518.5	68
Construction & engineering	3	5.9%	5	9.8%	123.9	46
Diversified	21	9.9%	14	6.6%	946.3	181
Energy	9	8.2%	6	5.5%	471.3	97
Fashion & retail	45	14.9%	21	6.9%	1'616	249
Finance & investments	30	7.0%	50	11.6%	1'741	392
Food & beverage	31	13.0%	15	6.3%	935.35	203
Gambling & casinos	4	14.3%	2	7.1%	107.6	23
Healthcare	29	11.7%	24	9.7%	709.1	216
Logistics	4	9.5%	4	9.5%	196.2	35
Manufacturing	37	9.7%	44	11.6%	1'096	338
Media & entertainment	10	9.2%	10	9.2%	443.1	95
Metals & mining	13	15.7%	6	7.2%	379.6	67
Real estate	35	14.7%	12	5.0%	686.7	192
Service	24	29.6%	3	3.7%	190.3	54
Sports	0	0%	3	11.1%	98.6	27
Technology	57	13.8%	41	9.9%	2'239	348
Telecom	0	0%	5	13.5%	207.1	37
Grand Total	360	11.6%	273	8.8%	12,706	2,668

From fintech to tech and electric vehicles

Analyzing the results by sector gives insights into new economic themes, as well as the rise of disruptors, some of them in “green” industries.

Notably, finance and investments had the highest number of billionaires (392 in aggregate) as well as one of the greatest turnovers. Taken together, their wealth totaled USD 1.7 trillion. Fifty new billionaires were created during the year, while 30 dropped from the list. Among the new billionaires were fintech disruptors, as well as private equity and hedge fund partners.

Technology, the second most populous sector, also experienced a considerable flux. There were 41 new tech billionaires while 57 disappeared, leaving a total of 348 worth USD 2.2 trillion. This instability reflects the dynamism of a sector where barriers to entry are low and innovation is perpetual.

Finally, manufacturers flourished amid extraordinary demand for durable goods, as well as the emergence of new electric vehicle and battery entrepreneurs. There were 338 manufacturing billionaires in 2022 worth a total USD 1.1 trillion, with 44 new joiners and 37 dropouts.

Shifting regional fortunes

Location influenced fortunes to an exceptional degree. India's billionaires prospered as the country overtook the UK to become the fifth largest economy in 2022. Powered by a youthful labor force, it is the fastest-growing of the world's major economies. One hundred and sixty-six billionaires, up from 140 the previous year, increased their total wealth by a quarter (25.7%) to USD 749.8 billion.

While wealth was flat across Western Europe at a total of USD 2.3 trillion, with the number of billionaires falling from 474 to 467 year on year, Swiss billionaires fared better. Although the total number of billionaires living there only increased by one to 41, their combined wealth rose by a quarter (25.0%) to USD 181.9 billion, reflecting the country's position as a hub for finance, as well as pharmaceuticals and commodities trading.

The United States, home to about a third of billionaires globally, was resilient with 735 up from 724 in 2021. Total wealth rose by 6.9% to USD 4.7 trillion.

In the Middle East and Africa, overall wealth rose by 7.5% to USD 279.4 billion, although the number of billionaires fell from 91 in 2021 to 89 in 2022.

By contrast, wealth dipped in countries slow to emerge from the pandemic. Japan suffered from the twin effects of late reopening and a currency that fell significantly during the period, eroding the value of wealth in US dollars. There were 40 Japanese billionaires, worth a total USD 154.5 billion – a fall of almost a third (31.5%) on the previous year.

Mainland China's zero-COVID policy slowed the growth after many years as the world's fastest-growing large economy. There were 540 billionaires, down from 626 a year before. After a decade of significantly increasing, total wealth fell by a fifth (19.9%) to USD 2.0 trillion.

Turning to Eastern Europe, the war in Ukraine severely affected billionaires' wealth. The number of billionaires in the region fell by 27 from 154 to 127, while their total wealth dropped by more than a third (34.7%) to USD 455 billion.

Number of billionaires and their wealth by selected markets

Market	2021				2022			
	Final worth USD bn	YoY % difference	No. of billionaires	YoY % difference	Final worth USD bn	YoY % difference	No. of billionaires	YoY % difference
Brazil	211.7	66.6%	65	44.4%	186.7	-11.8%	62	-4.6%
Canada	231.1	61.8%	64	45.5%	242.9	5.1%	63	-1.6%
France	512.3	68.4%	42	7.7%	550	7.4%	43	2.4%
Germany	625.5	40.3%	136	28.3%	608	-2.8%	134	-1.5%
Hong Kong	448.2	44.6%	71	7.6%	383.4	-14.5%	67	-5.6%
India	596.4	90.8%	140	37.3%	749.8	25.7%	166	18.6%
Japan	225.4	104.9%	49	88.5%	154.5	-31.5%	40	-18.4%
Mainland China	2'532	114.7%	626	61.3%	2'027	-19.9%	540	-13.7%
Russia	578.1	51.8%	117	20.6%	326.9	-43.5%	83	-29.1%
Singapore	156.9	73.0%	27	0.0%	106.7	-32.0%	26	-3.7%
Switzerland	145.5	50.9%	40	14.3%	181.9	25.0%	41	2.5%
United Kingdom	213.9	38.9%	56	21.7%	199.1	-6.9%	49	-12.5%
US	4'398	49.1%	724	17.5%	4'701	6.9%	735	1.5%
Grand Total	10'875	64.7%	2'157	31.8%	10'418	-4.2%	2'049	-5.0%

Number of billionaires and their wealth by region / subregion

Region	Subregion	2021				2022			
		Final worth USD bn	YoY % difference	No. of billionaires	YoY % difference	Final worth USD bn	YoY % difference	No. of billionaires	YoY % difference
Americas	Latin America	312.1	72.1%	92	43.8%	284.5	-8.8%	88	-4.4%
Americas	North America	4'766	49.1%	801	19.2%	5'105	7.1%	813	1.5%
Americas	Total	5'078	50.3%	893	21.3%	5'389	6.1%	901	0.9%
APAC	North Asia	2'994	108.9%	765	60.4%	2'442	-18.4%	672	-12.2%
APAC	South Asia	597.8	90.4%	141	36.9%	751.3	25.7%	167	18.4%
APAC	Southeast Asia & Oceania	1'122	56.4%	237	22.8%	1'053	-6.1%	245	3.4%
APAC	Total	4'714	91.3%	1'143	47.9%	4'247	-9.9%	1'084	-5.2%
EMEA	Eastern Europe	696.9	52.5%	154	21.3%	455	-34.7%	127	-17.5%
EMEA	Middle East & Africa	260	33.8%	91	19.7%	279.4	7.5%	89	-2.2%
EMEA	Western Europe	2'336	51.3%	474	23.8%	2'336	0.0%	467	-1.5%
EMEA	Total	3'293	50.0%	719	22.7%	3'070	-6.8%	683	-5.0%
Grand Total	Total	13'084	62.8%	2'755	31.5%	12'706	-2.9%	2'668	-3.2%

SAF

Dan Tsubouchi @Energy_Tidbits · 3h

Good reference report on why Greater Bay Area is a must watch area if Covid isn't peaking until mid-Jan to mid-Feb from @SPGlobal July 8 "China's Greater Bay Area Becomes Key Mega Region in Global Economy". #OOTT

spglobal.com/marketintellig...

📄 Dan Tsubouchi @Energy_Tidbits · 4h

Covid cases likely to peak mid-Jan to mid-Feb in Guangzhou, a major city in south China's Greater Bay Area that is >10% of China GDP

#Oil markets will keep waiting to see if China's economy can sustainably reopen after Covid relaxation this week.

#OOTT

The screenshot shows a report titled "The Cities" with a map of the Greater Bay Area. The map highlights several cities in different colors: Shenzhen (green), Hong Kong (orange), Macau (purple), and others. The report text is partially obscured by redaction bars. The report title is "The Cities" and it appears to be a market intelligence report from S&P Global.

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SAF

Dan Tsubouchi @Energy_Tidbits · 4h

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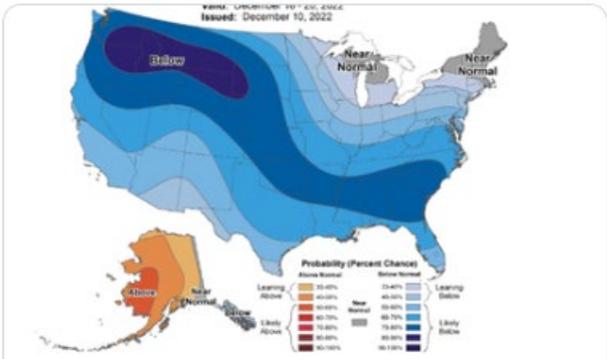
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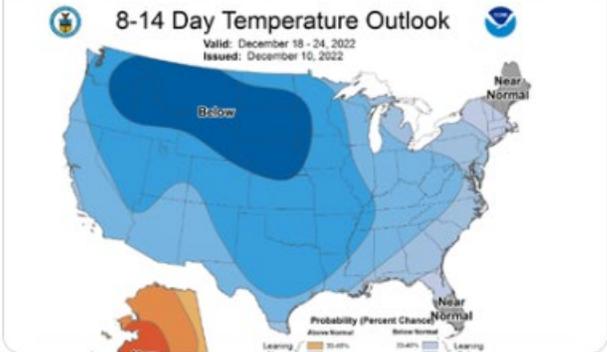
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SAF Dan Tsubouchi @Energy_Tidbits · 19h
Finally, some cold weather expected across all of the US in the lead up to Xmas. Below are today's @NOAA updated 6-10 and 8-14 day outlooks. #OOTT #NatGas

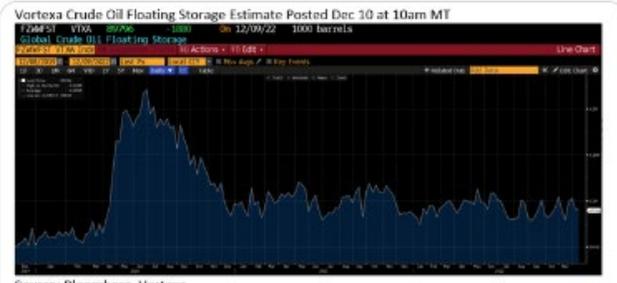


<https://www.cpc.ncep.noaa.gov/products/predictions/814day/index.ph>



3 9 24 ↑

SAF Dan Tsubouchi @Energy_Tidbits · 23h
 #Vortexa crude #Oil floating storage at 12/09 est 89.80 mmb, -1.88 mmb WoW vs upwardly revised by +7.12 mmb 12/02 of 91.68 mmb. The prior several weeks had smaller revisions. Wide range, but average is unchanged at ~95 mmb for past 7 wks. Thx @Vortexa @business. #OOTT



Source: Bloomberg, [Vortexa](#)

Posted Dec 10am MT					Dec 3, 10am MT					Nov 26, 10am MT							
F2WVFST	VTXA	Indx			F2WVFST	VTXA	Indx			F2WVFST	VTXA	Indx					
ID	3D	1M	6M	YTD	1Y	5Y	Date	Last Px		ID	3D	1M	6M	YTD	1Y	5Y	
Fr	12/09/2022						Fr	12/02/2022	84560	Fr	11/25/2022						
Fr	12/02/2022						Fr	11/25/2022	102.426k	Fr	11/18/2022						
Fr	11/25/2022						Fr	11/18/2022	99390	Fr	11/11/2022						
Fr	11/18/2022						Fr	11/11/2022	81568	Fr	11/04/2022						
Fr	11/11/2022						Fr	11/04/2022	90847	Fr	10/28/2022						
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Fr	10/28/2022						Fr	10/21/2022	92757	Fr	10/14/2022						
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Fr	09/16/2022																

Source: Bloomberg, [Vortexa](#)

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Dan Tsubouchi @Energy_Tidbits · Dec 10

Dan Tsubouchi @Energy_Tidbits - Dec 10

Big #BlackRock warning can't get rid of #Oil #NatGas without low-carbon truly able to fill the void. "the faster the #EnergyTransition, the more out of sync the handoff could be - meaning more volatile inflation & economic activity". Positive for #Oil #NatGas in 2020s. #OOTT

Regime drivers

Faster transition

We track the transition to net-zero emissions as we see how any other driver of investment risks and opportunities, such as monetary policy. We take a view on how it is likely to play out, not how it should play out. We assess its implications for financial risks and returns.

Our research to gauge the global transition to net-zero emissions, based on signals from climate policy action, by technology of progress reducing the cost of renewable energy and by shifting societal preferences as physical climate risks become more salient to investors.

Europe has already led to shift to clean energy infrastructure as it seeks to meet its 2030 climate goals. The clearest example of that is the European Commission's **Fit-for-55**. To hit its target is likely to come from higher traditional energy prices, which are necessitated by the need to invest in new energy and have shifted the economics decisively towards clean energy sources. In the US, the Inflation Reduction Act is passed to address energy investment.

We see a strong clean-technology (CT) and spurring domestic manufacturing.

We see opportunities in transition-ready investments, but transition is not easy to play out. The case is, yet the transition is set to add to production constraints in our view. It involves a large reallocation of resources. Oil and gas will still be needed to meet future energy demand under any plausible scenario.

Dark fuel: Low-carbon alternatives are plentiful, shortages could result, driving up prices and disrupting economic activity. The faster the transition, the more out of sync the handoff could be - meaning more volatile inflation and economic activity.

66 We find great opportunities by getting ahead of where the green investments are going.

Harshad Johane
Portfolio Manager, Natural Resources, BlackRock
Fundamental Analyst

12 2022 outlook

Policy helping accelerate the transition
Total annual green investment, past and planned, 2010-2020

USD billions

2010 2016 2017 2018 2019 2020 2020

Developed economies China Emerging economies

Chart takeaway: Global investment in the net-zero transition is set to step up markedly in coming years - largely thanks to key policy action.

Source: Greenium Research, with data from International Energy Agency (IEA), Bloomberg NEF, Reuters. Chart uses 12 months of period-annualized annual green investment, unless in US dollar, based on latest available figures.

We track the transition to net-zero carbon emissions as we track any other driver of investment risks and opportunities.

Dan Tsubouchi @Energy_Tidbits - Dec 7

2/2. Is #BlackRock warning #EnergyTransition path is for 2020s Energy Crisis?

#Oil #NatGas needed to meet future energy demand under any plausible transition...

Show this thread

Dan Tsubouchi @Energy_Tidbits - Dec 10

Over next 3-5 yrs, Xi wants "Shanghai Petroleum & Natural Gas Petroleum Exchange platform will be fully utilized for RMB settlement in #Oil #LNG trade". Saudi, UAE, Qatar, have to give their big customer something, but can they give China more than nominal volumes in RMB? #OOTT

Full text of Xi Jinping's keynote speech at China-CCO Summit

2020年12月10日，中国国家主席习近平在出席第二届“一带一路”国际合作高峰论坛开幕式并发表题为《携手构建命运与共的中东欧全面战略伙伴关系》的重要讲话。全文如下：

尊敬的各位来宾，各位朋友，女士们、先生们，大家好！很高兴与大家相聚北京，共同开启第二届“一带一路”国际合作高峰论坛。首先，我谨代表中国政府和人民，向各位来宾致以诚挚的问候和热烈的欢迎！

各位来宾，各位朋友，中东欧地区是“一带一路”倡议的重要交汇点。中国和中东欧国家有着悠久的历史渊源和深厚的传统友谊。随着全球化和经济全球化的深入发展，中国和中东欧国家在经贸、人文、科技、教育、环保等领域开展了广泛的合作，取得了丰硕的成果。特别是近年来，随着“一带一路”倡议的深入推进，中国和中东欧国家的合作日益紧密，互利共赢的局面不断巩固和扩大。

各位来宾，各位朋友，当前，世界百年未有之大变局加速演进，全球疫情大流行影响深远，世界经济复苏乏力，国际形势复杂多变。面对严峻挑战，中国和中东欧国家要坚定信心，同舟共济，共克时艰，共同推动世界经济复苏和全球发展。中国将坚定不移地扩大开放，为中东欧国家提供更多发展机遇。我们将继续深化与中东欧国家的务实合作，推动贸易和投资自由化便利化，促进产业链供应链深度融合，实现优势互补、共同发展。

各位来宾，各位朋友，中国和中东欧国家在能源、环保、数字经济等领域有着广阔的合作空间。我们将继续加强在能源领域的合作，推动能源生产和消费革命，共同构建清洁低碳、安全高效的能源体系。我们将继续深化在环保领域的合作，共同应对气候变化，推动绿色低碳发展。我们将继续加强在数字经济领域的合作，推动数字经济创新发展，共同构建数字丝绸之路。

各位来宾，各位朋友，中国和中东欧国家在人文交流、教育合作、科技创新等方面有着广泛的合作基础。我们将继续推动人文交流，增进相互了解和友谊。我们将继续深化教育合作，推动教育交流互鉴，培养更多高素质人才。我们将继续加强科技创新合作，推动科技交流互鉴，共同构建开放创新的国际科技合作网络。

各位来宾，各位朋友，中国和中东欧国家在“一带一路”倡议下有着广阔的合作前景。我们将继续秉持共商共建共享原则，推动“一带一路”倡议高质量发展，为构建人类命运共同体作出更大贡献。谢谢大家！

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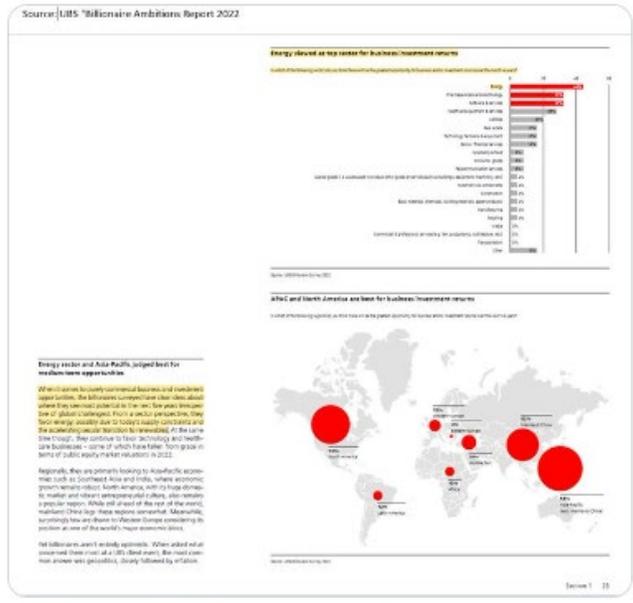
Dan Tsubouchi @Energy_Tidbits · Dec 9



#UBS survey of 50 billionaire clients says energy 44%, pharma/bio 37%, software 32% as to where they see the most potential in the next 5 yrs when it comes to purely commercial & investment opportunities.

unfortunately, didn't split out #NatGas #Oil etc vs renewable.

#OOT



2 5 15

SAF

Dan Tsubouchi @Energy_Tidbits · Dec 9

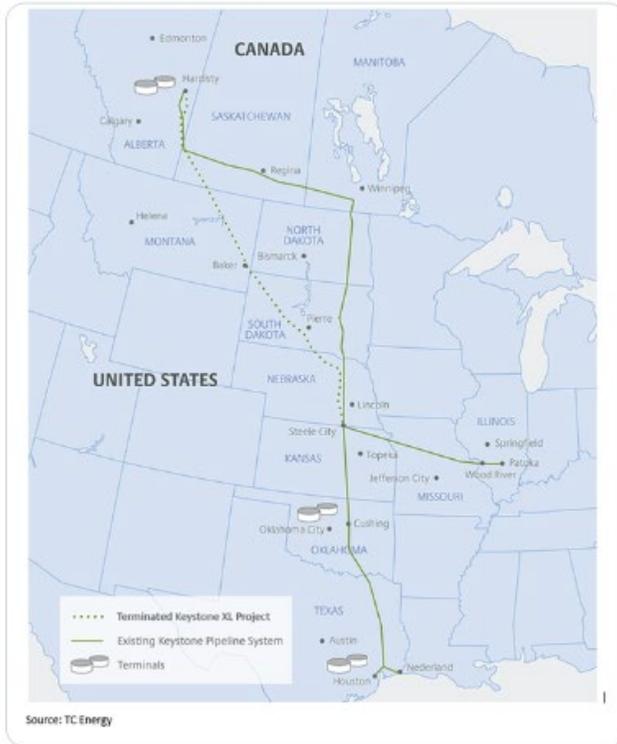
...

#Keystone Force Majeure

@PHMSA_DOT on "Affected Segment" (south leg to Cushing). No hint of when PHMSA will approve a "Restart", but limited to 80% of operating pressure upon restart

Partial relief to Cdn #Oil diffs, nothing on east leg to Patoka #OOTT

phmsa.dot.gov/sites/phmsa.do...



SAF

Dan Tsubouchi @Energy_Tidbits · Dec 9

...

#BigOil revaluation and/or belief #Oil prices higher in 2023?

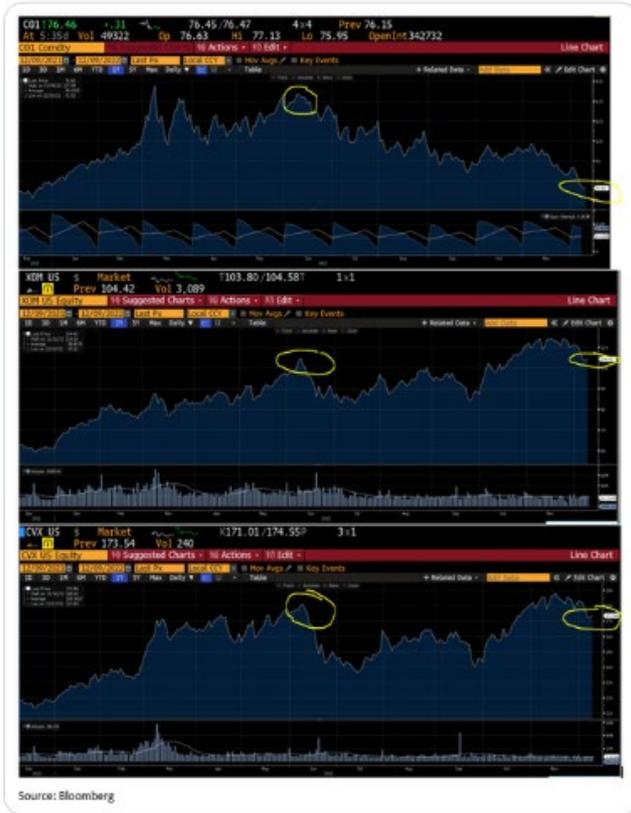
Brent -\$6 this wk, -\$48 vs 06/08 peak

06/08/22: Brent \$123.58. XOM \$104.59. CVX \$181.13.

12/08/22: Brent \$75.31. XOM \$104.42. CVX \$173.54.

Change: Brent -39.1%. XOM -0.2%. CVX -4.2%.

#OOTT



Source: Bloomberg



SAF

Dan Tsubouchi @Energy_Tidbits - Dec 8

...

#Trafigra The Year Ahead, @saadrahim reiterates 09/14 tweet theme - realities of structural under-investment, low inventories, lack of spare capacity set up risk moving away from world of commodity cycles to one of commodity spikes. ie. each subsequent low is higher. #OOTT



Dan Tsubouchi @Energy_Tidbits - Sep 14



#Trafigra case for a serious upcycle in #Oil. Prices spike to where causes demand destruction, but because haven't had enough time to catch up on investment, each subsequent low is actually higher. See SAF Group transcript. Thx @saadrahim ...

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18

Share icon

Buckle Up! Imagine long-term #Oil #NatGas prices if #Exxon is even within 5 years to being right on timing of peak demand?

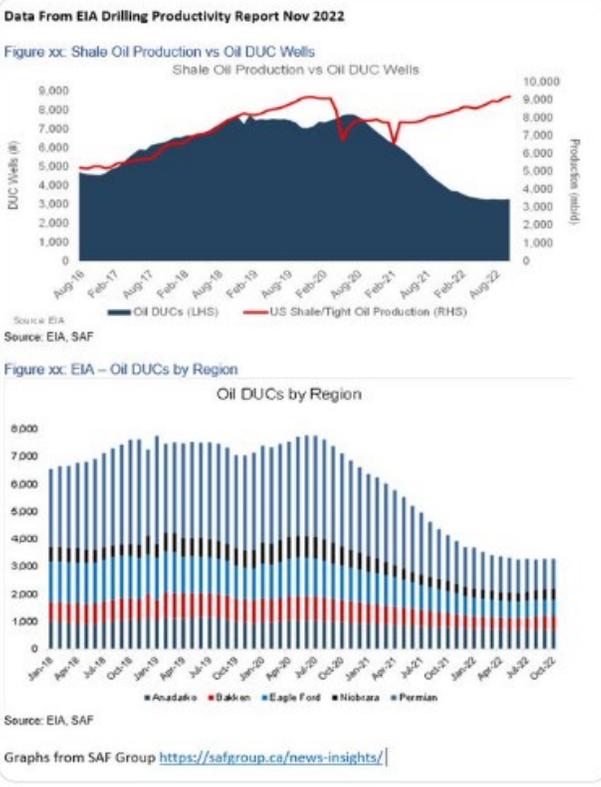
Exxon 2022 Outlook for Energy: Peak #Oil demand ~2040 even if transportation peaks ~2030. Peak #NatGas demand after 2050.

#OOTT

corporate.exxonmobil.com/energy-and-inn...

ExxonMobil Outlook for Energy									
Energy demand (quadrillion Btu), unless otherwise noted									
Energy by Region	2000	2010	2020	2030	2040	2050	2060	2070	2080
	2000	2010	2020	2030	2040	2050	2060	2070	2080
World	86	171	314	572	936	1368	1839	2352	2925
North America	25	50	90	150	230	320	410	500	590
Europe	14	28	48	78	108	138	168	198	228
Asia Pacific	11	22	42	82	142	242	342	442	542
China	2	4	8	16	32	64	128	256	512
India	1	2	4	8	16	32	64	128	256
Latin America	3	6	12	24	48	96	192	384	768
Middle East	1	2	4	8	16	32	64	128	256
Other	1	2	4	8	16	32	64	128	256
United States	18	36	64	112	160	208	256	304	352
Canada	7	14	28	56	112	224	448	896	1792
Other Americas	1	2	4	8	16	32	64	128	256
Europe	14	28	48	78	108	138	168	198	228
Asia Pacific	11	22	42	82	142	242	342	442	542
China	2	4	8	16	32	64	128	256	512
India	1	2	4	8	16	32	64	128	256
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World	86	171	314	572	936	1368	1839	2352	2925
Change									
2000-2010									
2010-2020									
2020-2030									
2030-2040									
2040-2050									
2050-2060									
2060-2070									
2070-2080									
2000-2080									
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2000-2010									
2010-2020									
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SAF Dan Tsubouchi @Energy_Tidbits - Dec 8
 Lower Permian #Oil growth rate as DUCs worked thru in 21/21. 7:40am MT, #Exxon Q&A. CEO Woods expect ~20% Permian growth this year, but "going forward, i would say a more ratable growth of 10% per year roughly". DUCs down = less US growth is for US in total, not just XOM. #OOTT



🗨️ 14 ❤️ 41 📌



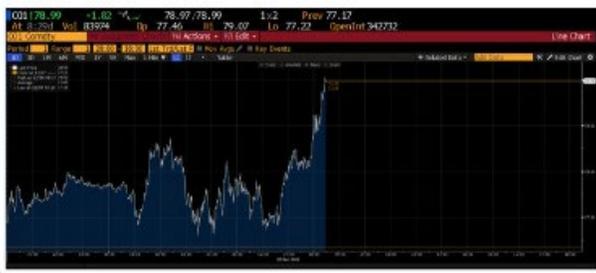
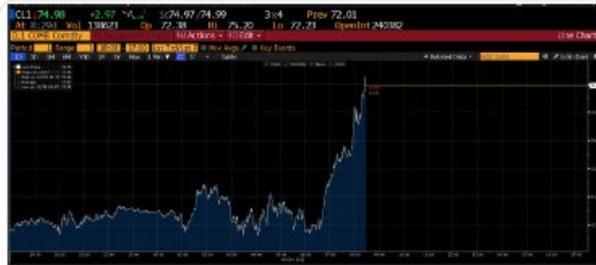
Dan Tsubouchi @Energy_Tidbits - Dec 8



Expect WCS/WTI Cdn #Oil diffs to be hit once WCS starts trading.

WTI and Brent are up strong based Keystone shut down (see 📍) and taking >600,000 b/d of Cdn oil that would find its way down to the Gulf Coast.

#OOTT



— Dan Tsubouchi @Energy_Tidbits - Dec 8



Negative to Cdn #Oil differentials as @TCEnergy says #Keystone pipeline shut due to leak in Nebraska. Will back up Cdn oil until it reopens. Keystone moved ~620,000 b/d in Q2. #OOTT
tcenergy.com/newsroom/state...



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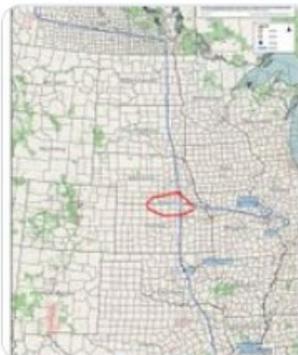
Dan Tsubouchi @Energy_Tidbits - Dec 8



Dan Tsubouchi @Energy_Tidbits - Dec 8



Negative to Cdn #Oil differentials as @TCEnergy says #Keystone pipeline shut due to leak in Nebraska. Will back up Cdn oil until it reopens. Keystone moved ~620,000 b/d in Q2. #OOTT
tcenergy.com/newsroom/state...



to oil incident

response to a confirmed release of oil into a creek, approximately 8 p.m. CT, on Dec. 7, 2022, after alarms at town as our crews actively respond and work to contain...
 ...ors and will work cooperatively with third parties to effect...
 ...nding community, and mitigating risk to the environmen...



8

4



SAF Dan Tsubouchi @Energy_Tidbits · Dec 7
More China gradual reopening.

Macao says will gradually relax epidemic prevention measures in line with the country's prevention and control policies.

Macao gaming stocks up tonight.

#OOTT



<https://www.asx.gov.au/stock/stock/32213888>

The HKSAR Government is preparing a plan for the relaxation of prevention and control measures, calling on residents to get vaccinated as soon as possible to check their health.

Subscribe to the Telegram government news channel: <https://t.me/macagoocs> to receive the latest news instantly.

Information Bureau
2022-12-06 22:44

Information Bureau: The HKSAR Government is preparing a plan for relaxing prevention and control measures, calling on residents to get vaccinated as soon as possible to check their health.

Secretary for Social Affairs and Culture Au Yeung Yu said on the 6th that with the weakening of the pathogenicity of the new crown virus, Macao will gradually take epidemic prevention measures in line with the country's prevention and control policies. It is expected that community cases will continue to appear in Macao, but the government will not allow large-scale infection and is currently preparing relevant plans to deal with it.

In an interview with the media after attending the plenary meeting of the Legislative Council in the afternoon, Au Yeung Yu said that with the weakening of the pathogenicity of the new coronavirus Omicron variant, more and more data show that if infected with Omicron virus, most of them are asymptomatic infections, and the SAR Government is constantly studying coping strategies. Macao adheres to the consistency with the country's prevention and control policies, and with the gradual relaxation of national prevention and control measures, Macao has also gradually relaxed its epidemic prevention measures of the control of non-rod areas and secondary close contacts. She said that the new coronavirus will gradually enter the local community, and it is expected that there will be community cases for a period of time, and the SAR Government will respond to the epidemic in a planned manner, and if there are many infected cases in the community, corresponding measures will be implemented, including arranging sufficient medical outpatient clinics, medical institutions to guide the use of medicine, online consultation services, etc.

She pointed out that the health department will introduce photo and text packs to explain the characteristics and infection symptoms of the Omicron virus to the general public, and strive to distribute anti-epidemic kits to residents of different ages in Macao in a short period of time to teach residents how to cope and administer medicine.

Au Yeung Yu stressed that although the pathogenicity of Omicron virus is weak, it will have a greater impact on the elderly and patients with chronic diseases. The vaccination rate of the elderly in Macao is low, and there are still more than 6,000 elderly people over 60 years old who have not been vaccinated, calling for vaccination as soon as possible. At present, the BioNTech bivalent mRNA vaccine has been available for residents to administer, and it is hoped that the public will actively cooperate. She said that in the past three years, the SAR government has tried its best to check the residents, and hopes that the residents will also check their own health, get vaccinated as soon as possible, and jointly cope with the epidemic.

1 3

SAF Dan Tsubouchi @Energy Tidbits · Dec 7
1/2. #BlackRock prefers #Energy stocks in its 2023 Global Outlook.

"Among cyclicals, we prefer energy and financials. We see energy sector earnings easing from historically elevated levels yet holding up amid tight energy supply."

#OOTT

Tactical views

A new playbook

The 2023 outlook is more likely to reflect improving market conditions for equities, though we remain cautious on bonds. We expect US and European equity markets to continue to lead the way in 2023, with US equity markets showing more volatility than the rest of the world. We expect US equity markets to continue to lead the way in 2023, with US equity markets showing more volatility than the rest of the world.

Chart overview
US: 2014-2022
20%
10%
0%
-10%
-20%
-30%
-40%
-50%
-60%
-70%
-80%
-90%
-100%
2014 2015 2016 2017 2018 2019 2020 2021 2022

Chart Message We continue to see global equity markets as being stronger than bonds, but we expect the market for short-term yields to show more volatility than the rest of the year in 2023.

Key Message We expect views to change more frequently than in the past. Our stance heading into 2023 is broadly risk-off, with a preference for income over equities and long-term bonds.

3 4 29

SAF Dan Tsubouchi @Energy Tidbits · Dec 7
2/2. Is #BlackRock warning #EnergyTransition path is for 2020s Energy Crisis?

#Oil #NatGas needed to meet future energy demand under any plausible transition

Economic activity at risk if high-carbon production falls > than low-carbon adds. Faster transition = more risk.

#OOTT

Engine drivers

Faster transition

We continue to see global equity markets as being stronger than bonds, but we expect the market for short-term yields to show more volatility than the rest of the year in 2023.

Chart overview
Policy helping accelerate the transition
US: 2014-2022
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
-1.0
2014 2015 2016 2017 2018 2019 2020 2021 2022

Chart Message Global investment in the net-zero transition is up from \$1.2 trillion in 2021 to \$1.8 trillion in 2022, with a focus on clean energy and infrastructure.

Key Message We track the transition to net-zero carbon emissions as we track any other driver of investment risks and opportunities.

1 11

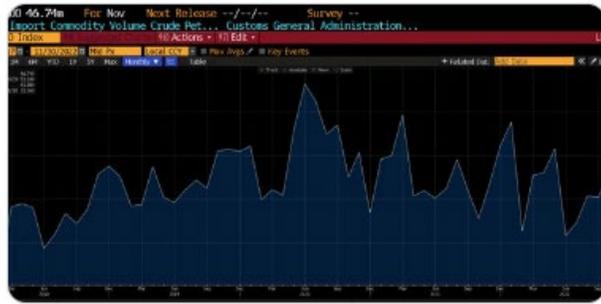
Dan Tsubouchi @Energy_Tidbits · Dec 7
China customs data for #Oil imports.

Higher fuel export quotas drove MoM jump, but good to see higher than pre-Covid.

Nov 2022: 11.42 mmb/d, +11.9% YoY, +12.0% MoM
Nov 2021: 10.21 mmb/d
Nov 2020: 11.08 mmb/d
Nov 2019: 11.18 mmb/d
Oct 2022: 10.20 mmb/d

Thx @business

#OOTT



2 2

Dan Tsubouchi @Energy_Tidbits · Dec 7
China State Council "New Ten Rules" to optimize Covid response. Not a complete "Let Go", but an active optimization rather than a passive one.

ie. test results & health codes will no longer be checked for domestic cross-regional travel or for travelers upon arrival.

#OOTT

The screenshot shows a news article with a green header: 'China releases new 10-point plan to optimize COVID response'. The text discusses the State Council's 'New Ten Rules' for COVID-19 response. Key points include: 1. Prioritize domestic supply and demand, and optimize the supply chain. 2. Optimize the supply chain, and ensure the stability of the supply chain. 3. Optimize the supply chain, and ensure the stability of the supply chain. 4. Optimize the supply chain, and ensure the stability of the supply chain. 5. Optimize the supply chain, and ensure the stability of the supply chain. 6. Optimize the supply chain, and ensure the stability of the supply chain. 7. Optimize the supply chain, and ensure the stability of the supply chain. 8. Optimize the supply chain, and ensure the stability of the supply chain. 9. Optimize the supply chain, and ensure the stability of the supply chain. 10. Optimize the supply chain, and ensure the stability of the supply chain.

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SAF

Dan Tsubouchi @Energy_Tidbits - Dec 6

China #JetFuel demand & scheduled domestic air flights finding a bottom for now until clear momentum for reopening. Like seen in Apr Covid peak. Flights Nov 29-Dec 5 +0.5% WoW, Nov 22-28 +3.5% WoW, Nov 15-21 -2.7% WoW, Nov 8-14 -5.3% WoW. Thx @BloombergNEF Claudio Lubis. #OOTT



1 5

SAF

Dan Tsubouchi @Energy_Tidbits - Dec 6

It's Working!

tightly spaced multi-leg horizontal wells without fracking in Cdn conventional #oil plays

11/30. \$CNQ "applicable across our large heavy oil land base"

See 10/26 tweet. \$CPG in light oil at Viewfield & seeing "if can apply it throughout our other assets"

#OOTT

Heavy Crude Oil: EnergyView
 Multilateral technology & benefits

It's Working! Upside is applicable to many Cdn #Oil plays by small/big producers. See \$CPG tightly spaced multi-leg horizontal wells without need for fracking cost/execution. Works in Viewfield, looking at Shaunavon & "see if" can apply it throughout our oth...

Dan Tsubouchi @Energy_Tidbits - Oct 26

It's Working! Upside is applicable to many Cdn #Oil plays by small/big producers. See \$CPG tightly spaced multi-leg horizontal wells without need for fracking cost/execution. Works in Viewfield, looking at Shaunavon & "see if" can apply it throughout our oth...

1 5 16

SAF **Dan Tsubouchi** @Energy_Tidbits · Dec 6
h/t to 🇺🇸 for 🇪🇺 key weapons defence support. "... we've gone thru in the 1st 10 mths of the war, 5 yrs work of Javelin anti-tank missiles and we've gone thru 13 yrs worth of Stinger [surface-to-air missiles] production"
[@RaytheonTech](#) CEO to [@andrewsorkin](#).



🗨️ 1 🔄 1 ❤️ 4 📤

43 Dan Tsubouchi Retweeted

SAF

Dan Tsubouchi @Energy_Tidbits · Dec 5

...

Hmm!

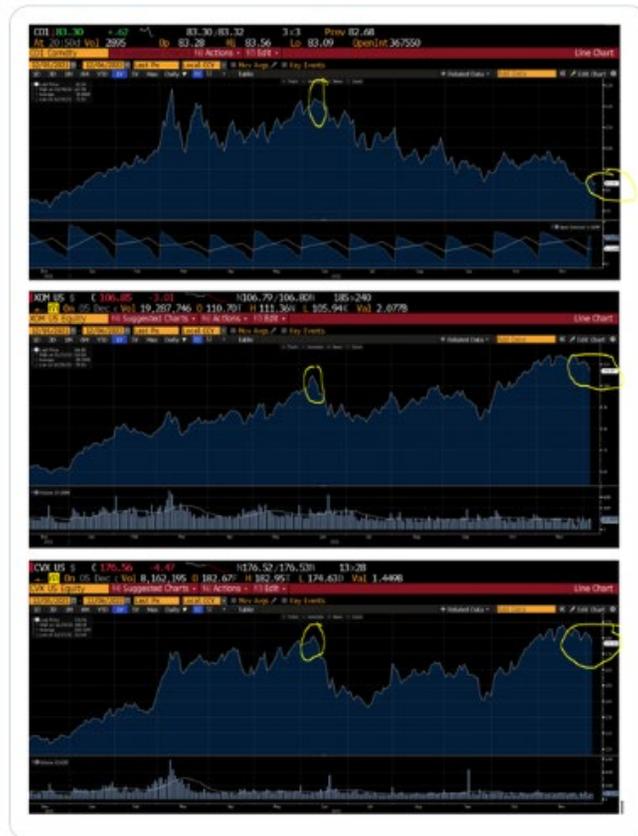
Looks like equity investors still see big returns from #BigOil shares even with Brent down \$40 in last 6 mths.

06/08/22: Brent \$123.58. XOM \$104.59. CVX \$181.13.

12/05/22: Brent \$82.42. XOM \$106.85. CVX \$176.56.

Change: Brent -33.3%. XOM +2.2%. CVX -2.5%.

#OOTT



4

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16

↑

SAF

Dan Tsubouchi @Energy_Tidbits · Dec 5

California follows RUS oil price cap approach to propose to cap refinery margins

Bill 2(c) would give "CA authority to order that refinery maintenance & turnarounds be rescheduled in specific circumstances.."

Will this just lead to higher for longer CA #Gasoline prices?

#OOT

Governor Newsom Unveils Price Gouging Penalty on Big Oil's Excessive Profits to Protect Californians from Being Ripped Off

Gov. Gavin Newsom today announced a new law that will cap the profits of the state's largest oil refiners. The law, Assembly Bill 2(c), will cap the annual percentage increase in the refiners' gross profit margin at 10 percent. The law also requires the refiners to provide the state with data on their gross profit margins and to allow the state to order that refinery maintenance and turnarounds be rescheduled in specific circumstances.

The law is part of a broader effort to address the state's energy needs and to protect consumers from price gouging. Newsom said that the law is necessary because the refiners' profits have increased significantly in recent years, while the price of gasoline has risen sharply.

The law will take effect on January 1, 2023. Newsom said that he expects the law to save consumers billions of dollars in the form of lower gasoline prices.

The law also includes provisions that will allow the state to order that refinery maintenance and turnarounds be rescheduled in specific circumstances. This is intended to ensure that the state's energy needs are met during periods of high demand.

Newsom said that he is proud of the law and that it represents a significant step in the state's effort to address its energy needs and to protect consumers from price gouging.

2 5 18

SAF

Dan Tsubouchi @Energy_Tidbits · Dec 5

China keeps highlighting Covid prevention & control is facing new situations & new tasks ie. moving into a new phase.

8th consecutive day of declining new cases. SB with less mass testing!

@business reopening basket keeps going higher. thx @DavidinglesTV @YvonneManTV.

#OOT

China's New Daily Local Covid Cases

Date	New Daily Local COVID Cases
Dec 1	1,200
Dec 2	1,150
Dec 3	1,100
Dec 4	1,100

China Reopening Basket

Date	China Reopening Basket
Dec 1	100
Dec 2	105
Dec 3	110
Dec 4	115

4 8

SAF

Dan Tsubouchi @Energy_Tidbits · Dec 5

...

Hmm!

12/05. Germany \$3b loan guarantee for #Trafigura to secure long-term #NatGas #LNG.

11/29 tweet 🗨️, wonder what the DE "give" was to get @qatarenergy @conocophillips 15-yr LNG supply deal to DE?

Seems Germany needs long-term #NatGas!. #OOTT

[releases/trafigura-signs-usd3-billion-loan-agreement-guaranteed-by-the-federal-republic-of-germany-to-secure-gas-supply/](#)

3 billion loan agreement guaranteed by the Federal Republic of Germany to secure gas

Trafigura, a market leader in the global commodities industry, has entered into a USD3 billion four-year loan jointly guaranteed by a consortium of international banks and syndicated to a number of participating banks. Over 25 banks participated in the successful syndication of the loan.

The loan is guaranteed under the United Financial Loan program (UFL) of the government of the Federal Republic of Germany. The program is a tool to secure the long-term delivery of strategic commodities to Germany. The loan is used to fund the commitment by Trafigura to deliver substantial volumes of gas into the European gas grid, and ultimately into Germany, through its commitment to the Securing Energy for Europe (SEFE), which was recently recapitalised by the German government. The first gas deliveries will be made in 2023, and will be used to supply existing quantities from its global gas and LNG portfolio to help secure gas supplies to SEFE. The agreement is in line with Germany's energy security and climate change (ESG) policies and performance.

The agreement is a significant step in supporting Europe's energy security by supplying this significant volume of gas to Germany backed by our extensive portfolio of gas assets. Dan Tsubouchi, Head of Gas and Power Trading for Trafigura.

SAF Dan Tsubouchi @Energy_Tidbits · Nov 29



. @qatarenergy/@conocophillips long-term 15-yr supply of "UP TO" 0.26 bcf/d Qatari #LNG to Germany.

No DE buyers announced, so feels more like COP/Qatar tying up DE regas capacity. ...





Dan Tsubouchi @Energy_Tidbits · Dec 5 ...
 A "Big NIL" impact of Russia oil price cap on India says @HardeepSPuri.

"i have been on record to say we will buy from whomever we have to"

"My moral duty is to my consumers"

See 🗨️ 10/08 thread, just like he told @SecGranholm in Washington in Oct.

#OOTT

SAF Group created transcript of comments by India energy minister, Hardeep Singh Puri with Senthil Cheralvarayan on BQ Prime on Dec 5, 2022. <https://twitter.com/bqprime/status/1599642566957679344>

Items in "italics" are SAF Group created transcript

On the new price cap on Russia oil, at 13:20 min mark, Cheralvarayan *what are the implications to India?" Puri: "We can't say we can't, because you know I don't want you to be reporting a statement by a minister who said NIL. Let me explain that. Let me explain that. I have said repeatedly on record. When saying are you under pressure. "A", I am under no pressure. "B", it is unlikely that I can be put under pressure. And "C", I have already diversified. I used to source my imports from 27 countries. We are already sourcing from 29 countries. Russia was a marginal supplier, up until 31st of March 2022 they accounted for 0.2% of our total imports. I, meaning India, india consumes 5 million barrels a day. 60 million people go to the petrol pump to fill up. Our month on month consumption is rising. Today, I have Iraq as the largest supplier. I have the Saudis, I have the Emirates, I have Kuwait, I have Russia. Each one of us, each one of them wanting to sell more to India. So you would be way much within your right to ask is India playing a market card even if you don't ask the question. I am saying, Yes, we are playing the market card. And I have been on record to say we will buy from whomever we have to. I was asked by a particular lady, not in the interview you are referring to, but another lady, don't you have any moral compunction. *My moral duty is to my consumers.**

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

🗨️ **Dan Tsubouchi** @Energy_Tidbits · Oct 8
 1/3. Great @ANI reporting on clear India energy position from @HardeepSPuri post @SecGranholm meeting. "Have I been told by anyone to stop buying Russian oil? The answer is a categorical No". #OOTT #NatGas #LNG
[Show this thread](#)

🗨️ 1 🔄 4 ❤️ 3 📤



Dan Tsubouchi @Energy_Tidbits · Dec 5 ...
 No surprise, "EU's Price Cap on Russian Oil Won't Impact India, says Hardeep Puri - BQ Exclusive".

See 🗨️ 10/08 thread, @HardeepSPuri has been clear India won't be playing by US/EU #Oil rules.

#OOTT

bqprime.com/business/eus-p...

🗨️ **Dan Tsubouchi** @Energy_Tidbits · Oct 8
 1/3. Great @ANI reporting on clear India energy position from @HardeepSPuri post @SecGranholm meeting. "Have I been told by anyone to stop buying Russian oil? The answer is a categorical No". #OOTT #NatGas #LNG
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