Energy Tidbits

Vitol's Muller on Russia's 7+ mmbd Oil/Products Exports "It is Impossible, Let Me Repeat, It is Impossible for the World to Get Bv Without All of That"

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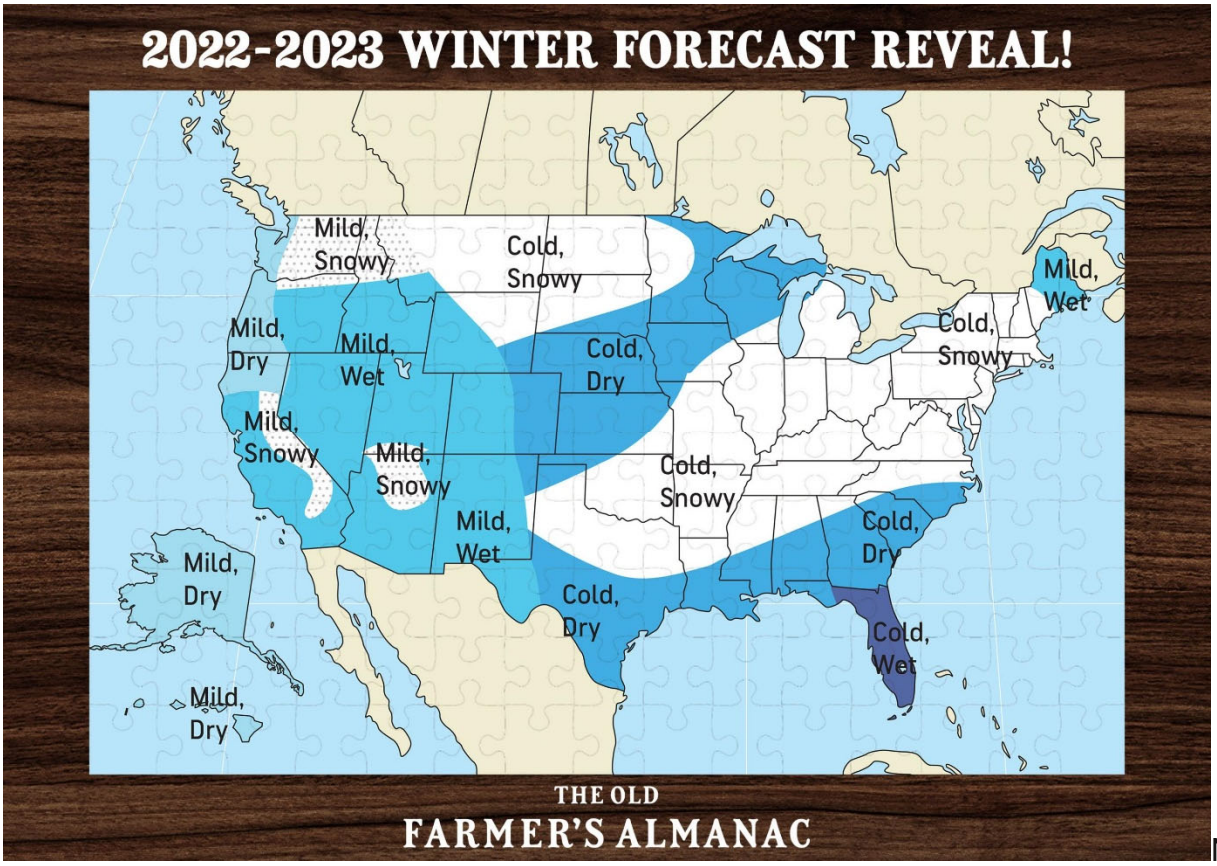
https://www.almanac.com/winter-extended-forecast-farmers-almanac

Wednesday, August 31, 2022

ALMANAC

2022–2023 Winter Weather Forecast Reveal

A Tale of Two Winters!



North America's favorite Almanac is back! *The 2023 Old Farmer's Almanac* has hit the shelves and is now available at retail stores everywhere, from sea to shining sea. With our official release, we also unveil our complete 2022–2023 winter weather map, revealing the final two regions: Hawaii and Alaska! Plus, we share our General Winter Forecast Report for the United States of America. (See our Canadian winter forecast here.)

A Tale of Two Winters!

Will the 2022-2023 winter forecast divide the country? (We're talking about weather, of course!)

The 2023 Old Farmer's Almanac is telling "A Tale of Two Winters" because—as the large U.S. map above shows—the weather this winter will split the country in two. Your region will be very cold or mild. Which will it be?

Will it be the best of winters or the absolute worst?

“Depending on where you live, this will be the best of winters or memorable for all the wrong reasons,” reports Janice Stillman, editor of *The Old Farmer’s Almanac*. “One half of the country will deal with bone-chilling cold and loads of snow, while the other half may feel like winter never really arrives.”

For 231 years, *The 2023 Old Farmer’s Almanac* has been helping readers to prepare for the season ahead with its 80 percent–accurate weather forecasts. For farmers, truckers, vacationers, wedding planners, skiers and snow bunnies, economists, and snow shovelers, here’s the general weather summary …

The 2022-2023 General Winter Forecast

What’s shaping the weather? Recent Solar Cycle 24 had the lowest level of solar activity in more than 100 years. We are now early in Cycle 25, which is expected to peak around July 2025 and also bring diminished activity, which historically has meant cooler temperatures, on average, across Earth.

We believe that most of the U.S. will be colder than normal this winter, although summer will be mostly warmer than usual. In addition to a neutral to perhaps weak El Niño, important weather influences will include a continued warm phase of the Atlantic Multidecadal Oscillation (AMO), a neutral to positive North Atlantic Oscillation (NAO), and a negative Pacific Decadal Oscillation (PDO). Oscillations are linked ocean–atmosphere patterns that can have long-term effects on the weather.

Below is the general forecast for the U.S. regions. For the Canadian winter map, go here.

A Tale of Wet & Mild?

For most of the western half of the United States, *The 2023 Old Farmer’s Almanac* is predicting a coming winter that’s “Wet & Mild”—one with lots of (mostly) rain and temperatures that trend upward by as much as several degrees above normal. Specifically:

- Winter temperatures will be milder than normal across eastern Maine, from the Rockies to the West Coast, and across Alaska and Hawaii.
- Precipitation will be above normal from Maine to southeastern Virginia, in Florida, and from the lower Great Lakes into Missouri.

This is in stark contrast to what’s coming for the rest of the country.

Or, A Tale of Shivery & Snowy?

Winter for much of the Midwest and along the East Coast is best described as “Shivery & Snowy.” The eastern half of the U.S. should brace for potentially record-breaking cold to define the season. This frigid forecast extends to the Deep South and Texas, which could see the mercury diving as much as 8°F below normal! Specifically:

- Winter temperatures will be colder than normal across much of the country between the East Coast and Rockies.
- Snowfall will be greater than normal from central New England through northern North Carolina, from the Lower Great Lakes and the Ohio and Tennessee Valleys into the southern Plains, from the northern Plains into eastern Washington, and across the higher terrain of the southern Rockies and California.
- Freezing temperatures will also bring above-average snow totals to most areas in the eastern U.S. that typically experience snowfall.

See regional forecast highlights below. And to get the complete weather predictions covering every week for 12 months of the year, order your copy of *The 2023 Old Farmer's Almanac*.

DAY 8

Today, as we complete our winter puzzle, we've added Regions 17 and 18: Alaska and Hawaii!

Yes, we've saved the best for last—two U.S. states known for incredible natural wonders and scenic beauty. Though they are far away from each other in distance (despite our map depiction!), both of these weather regions have something in common. They'll have milder-than-normal temperatures.

Alaska's winter temperatures will be much milder than normal, especially in December and January (10 degrees above average!). Hawaii's temperatures, while warmer than normal, are only slightly (about 1 degree) warmer than normal which is not surprising for the tropical state, where the length of day and temperature are relatively uniform throughout the year. For both regions, precipitation will be average to below average. In Alaska, snowfall will also be below normal, on average.

Regional Winter Predictions

See all 18 U.S. weather maps and regional highlights below.

Region 1: Northeast

Winter temperatures will be above normal in the north and below normal in the south. The coldest periods will be in early and late January and late February. Precipitation will be above normal. Snowfall will be below normal in the north and above normal in the south, with the snowiest periods in early to mid-December and the first half of January.

Region 2: Atlantic Corridor

Winter temperatures will be below normal, while precipitation and snowfall will be above normal. The coldest periods will be in early December, early and late January, and most of February. The snowiest periods will be in early to mid-January, late January, and late February.

Region 3: Appalachians

Winter will be colder than normal, with near-normal precipitation and above-normal snowfall. The coldest periods will be early December, late January, and mid- to late February. The snowiest periods will be in early and late January and in February in the south.

Region 4: Southeast

Winter temperatures will be below normal, with the coldest periods in early December, early and late January, and mid-February. Precipitation will be below normal. Snowfall will be above normal in the east and below normal in the west, with the best chances for snow in early and late January and mid-February.

Region 5: Florida

Winter will be colder and rainier than normal (1° below avg. in December, 3° below avg. in January, 4° below avg. in February, 1° below avg. in March) with the coldest temperatures in early and late January and mid-February.

Region 6: Lower Lakes

Winter will be colder than normal, with the coldest temperatures in early December and late January to mid-February. Both precipitation and snowfall will be above normal. The snowiest periods will be in late November to early December and early to mid-January.

Region 7: Ohio Valley

Winter will be colder than normal, with below-normal precipitation but above-normal snowfall. The coldest periods will occur in early and mid-December, early and late January, and much of February, with the snowiest periods throughout January and in late February and early March.

Region 8: Deep South

Winter will be colder than normal, with the coldest periods in early December and early and late

January. Precipitation will be below normal, with abovenormal snowfall in the north. The best chances for snow in the north will be in early to mid-January and mid-February.

Region 9: Upper Midwest

Winter temperatures will be below normal, with the coldest periods in late November, early December, early and late January, and mid-February. Precipitation and snowfall will be below normal in the east and above normal in the west. The snowiest periods will be in late November, early and late December, and early and late March.

Region 10: Heartland

Winter will be colder than normal, on average, with the coldest periods in late November, early December, early to mid-January, and mid- to late February. Precipitation and snowfall will be above average in the east and below average in the west. The snowiest periods will be in late November, early to mid-January, and February.

Region 11: Texas-Oklahoma

Winter will be colder than normal, with the coldest periods in early to mid-January and early to mid-February. Precipitation will be below average, but snowfall will be above average in the north, with the best chances for snow in mid- to late January and early February.

Region 12: High Plains

Winter will be colder than normal, with the coldest periods in late November, early December, early and late January, and early and late February. Precipitation and snowfall will be above normal in the north and below normal in the south. The snowiest periods will be in mid- to late November, mid- to late January, and early February.

Region 13: Intermountain

Winter will be warmer than normal, with the coldest periods in mid-November and early February. Precipitation will be above normal, with above-average snowfall in the far north and far south. The snowiest periods will be in mid- November, late December, early to mid-January, and early February.

Region 14: Desert Southwest

Winter will be warmer than normal, with above-normal precipitation. The coldest periods will be in late November, normal precipitation. The coldest periods will be in late November, mid- and late December, and mid- January. Snowfall will be below normal in most areas that normally receive snow, with the snowiest periods in early to mid-January and early February.

Region 15: Pacific Northwest

Winter temperatures will be milder than normal, with slightly below-normal precipitation and snowfall. The coldest periods will be in mid-November and early and late December. The snowiest period will be in mid-November.

Region 16: Pacific Southwest

Winter will be warmer and wetter than normal, with above-normal mountain snows. The coldest temperatures will occur in mid-November, mid-January, and early February. The stormiest periods will be in mid- to late December, early and late January, early and late February, and late March.

Region 17: Alaska
Winter temperatures will be much milder than normal, with the coldest periods in mid- to late November, early December, and late January. Precipitation and snowfall will be below normal, on average, with the snowiest periods in early November, mid-December, late January, and early February.

Region 18: Hawaii
Winter temperatures will be warmer than normal, with the coolest periods in mid-November and mid- to late February. Rainfall will be below normal, with the stormiest periods in early and late November and early March.

Table 1. Summary of natural gas supply and disposition in the United States, 2017-2022

billion cubic feet

Year and month	Gross withdrawals	Marketed production	NGPL production[a]	Dry gas production[b]	Supplemental gaseous fuels[c]	Net imports	Net storage withdrawals[d]	Balancing item[e]	Consumption[f]
2017 total	**33,292**	**29,238**	**1,897**	**27,341**	**66**	**-121**	**254**	**-400**	**27,140**
2018 total	**37,326**	**33,009**	**2,235**	**30,774**	**69**	**-719**	**314**	**-300**	**30,139**
2019 total	**40,780**	**36,447**	**2,548**	**33,899**	**61**	**-1,916**	**-503**	**-408**	**31,132**
2020									
January	3,597	3,194	240	2,954	6	-248	581	8	3,300
February	3,363	2,985	224	2,761	5	-216	545	-53	3,041
March	3,582	3,196	240	2,956	6	-284	53	-24	2,707
April	3,374	3,012	226	2,786	5	-231	-311	-8	2,241
May	3,285	2,927	220	2,707	5	-209	-454	18	2,067
June	3,217	2,873	216	2,657	5	-151	-363	-18	2,131
July	3,374	3,021	227	2,795	5	-139	-165	-7	2,489
August	3,350	3,012	226	2,786	5	-148	-232	-9	2,401
September	3,265	2,918	219	2,699	5	-221	-329	18	2,172
October	3,364	2,992	225	2,767	5	-282	-96	-74	2,320
November	3,352	2,985	224	2,761	5	-316	-6	-8	2,435
December	3,490	3,089	232	2,857	5	-287	597	-5	3,168
Total	**40,614**	**36,202**	**2,717**	**33,485**	**63**	**-2,732**	**-180**	**-164**	**30,472**
2021									
January	E3,506	E3,110	233	E2,877	5	-279	707	-17	3,292
February	E2,924	E2,586	172	E2,415	5	-152	781	-7	3,042
March	E3,482	E3,092	231	E2,861	5	-357	59	47	2,616
April	E3,409	E3,036	239	E2,797	5	-356	-174	-33	2,238
May	E3,510	E3,130	247	E2,883	5	-373	-416	-6	2,094
June	E3,391	E3,036	239	E2,797	4	-331	-248	-6	2,215
July	E3,491	E3,151	247	E2,904	5	-338	-170	-13	2,388
August	E3,531	E3,173	251	E2,922	5	-343	-159	-14	2,411
September	E3,413	E3,050	241	E2,808	4	-315	-391	3	2,110
October	E3,595	E3,220	257	E2,963	5	-317	-361	-52	2,238
November	E3,552	E3,161	252	E2,910	6	-315	132	-73	2,660
December	E3,679	E3,266	259	E3,008	5	-368	323	12	2,980
Total	**E41,483**	**E37,011**	**2,867**	**E34,144**	**59**	**-3,845**	**83**	**-159**	**30,283**
2022									
January	E3,591	E3,184	246	E2,938	6	-314	994	-40	3,583
February	E3,227	E2,856	223	E2,634	5	-286	658	29	3,040
March	E3,614	E3,209	267	E2,942	6	-377	163	30	2,764
April	RE3,520	RE3,136	257	RE2,879	5	-340	-214	R27	2,358
May	RE3,660	E3,271	266	RE3,006	5	-382	R-403	R3	R2,229
June	E3,548	E3,190	259	E2,930	2	-319	-323	18	2,308
2022 6-month YTD	**E21,160**	**E18,847**	**1,518**	**E17,329**	**29**	**-2,018**	**876**	**66**	**16,282**
2021 6-month YTD	**E20,223**	**E17,991**	**1,361**	**E16,630**	**30**	**-1,849**	**709**	**-23**	**15,497**
2020 6-month YTD	**20,419**	**18,187**	**1,365**	**16,822**	**32**	**-1,339**	**51**	**-78**	**15,487**

[a] We derive monthly natural gas plant liquid (NGPL) production, gaseous equivalent, from sample data reported by gas processing plants on Form EIA-816, *Monthly Natural Gas Liquids Report*, and Form EIA-64A, *Annual Report of the Origin of Natural Gas Liquids Production*.

[b] Equal to marketed production minus NGPL production.

[c] We only collect supplemental gaseous fuels data on an annual basis except for the Dakota Gasification Co. coal gasification facility, which provides data each month. We calculate the ratio of annual supplemental fuels (excluding Dakota Gasification Co.) to the sum of dry gas production, net imports, and net withdrawals from storage. We apply this ratio to the monthly sum of these three elements. We add the Dakota Gasification Co. monthly value to the result to produce the monthly supplemental fuels estimate.

[d] Monthly and annual data for 2017 through 2020 include underground storage and liquefied natural gas storage. Data for January 2021 forward include underground storage only. Appendix A, Explanatory Note 5, contains a discussion of computation procedures.

[e] Represents quantities lost and imbalances in data due to differences among data sources. Net imports and balancing item excludes net intransit deliveries. These net intransit deliveries were (in billion cubic feet): -24 for 2020; -8 for 2019; -12 for 2018; and 14 for 2017. Appendix A, Explanatory Note 7, contains a full discussion of balancing item calculations.

[f] Consists of pipeline fuel use, lease and plant fuel use, vehicle fuel, and deliveries to consuming sectors as shown in Table 2.

R Revised data.

E Estimated data.

RE Revised estimated data.

Source: 2017-2020: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2020*. January 2021 through current month: Form EIA-914, *Monthly Crude Oil and Lease Condensate, and Natural Gas Production Report*; Form EIA-857, *Monthly Report of Natural Gas Purchases and Deliveries to Consumers*; Form EIA-191, *Monthly Underground Gas Storage Report*; EIA computations and estimates; and Office of Fossil Energy and Carbon Management, *Natural Gas Imports and Exports*. See Table 7 for detailed source notes for Marketed Production. See Appendix A, Notes 3 and 4, for discussion of computation and estimation procedures and revision policies.

Note: Data for 2017 through 2019 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 states and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Table 5. U.S. natural gas exports, 2020-2022

volumes in million cubic feet; prices in dollars per thousand cubic feet

	2022 6-month YTD	2021 6-month YTD	2020 6-month YTD	2022 June	2022 May	2022 April	2022 March
Exports							
Volume (million cubic feet)							
Pipeline							
Canada	485,516	469,082	469,153	68,164	77,512	79,930	104,177
Mexico	1,040,993	1,067,501	925,210	181,120	185,349	175,878	169,271
Total pipeline exports	**1,526,510**	**1,536,583**	**1,394,363**	**249,284**	**262,861**	**255,808**	**273,448**
LNG							
Exports							
By vessel							
Antigua and Barbuda	11	0	0	3	2	3	2
Argentina	55,290	42,261	10,601	25,246	20,111	9,933	0
Bahamas	232	235	108	47	42	34	43
Bangladesh	12,663	27,374	7,046	0	3,346	0	3,421
Barbados	92	120	142	0	0	0	34
Belgium	57,027	5,584	25,028	7,023	3,441	7,341	17,743
Brazil	52,825	119,861	25,762	3,857	15,303	3,448	2,236
Chile	19,849	65,519	48,513	0	9,943	3,530	3,214
China	28,430	201,356	53,374	7,329	0	10,217	7,527
Colombia	1,398	892	1,528	912	0	0	0
Croatia	41,542	17,320	0	7,925	8,543	6,763	3,358
Dominican Republic	27,624	31,019	7,264	5,838	4,964	3,645	6,530
Egypt	0	0	0	0	0	0	0
France	295,860	103,845	76,456	37,564	47,807	56,343	64,415
Greece	36,975	14,201	27,908	9,633	11,994	1,336	4,116
Haiti	79	65	53	13	9	11	10
India	56,542	110,037	57,863	10,653	7,152	14,223	10,438
Indonesia	717	0	0	0	0	0	0
Israel	0	6,051	6,474	0	0	0	0
Italy	72,105	23,983	55,404	7,137	21,696	15,519	7,088
Jamaica	616	16,752	9,554	48	144	135	92
Japan	108,255	203,873	129,133	21,561	24,024	13,231	17,697
Jordan	0	0	3,294	0	0	0	0
Kuwait	34,884	14,653	3,297	8,105	14,204	7,298	0
Lithuania	44,084	19,492	9,467	6,729	11,237	13,770	5,700
Malaysia	0	0	0	0	0	0	0
Malta	2,345	2,928	2,648	0	0	0	0
Mexico	3,292	13,354	16,968	3,292	0	0	0
Netherlands	164,508	96,630	58,553	34,420	28,902	28,395	24,922
Nicaragua	0	0	0	0	0	0	0
Pakistan	3,074	13,801	10,224	0	0	3,074	0
Panama	9,676	6,136	7,384	623	1,192	1,536	0
Poland	61,390	32,204	26,709	14,282	18,224	13,882	3,831
Portugal	33,400	27,021	16,964	5,582	3,888	6,632	10,728
Singapore	10,077	13,740	10,610	3,352	0	0	6,725
South Korea	125,007	229,868	156,835	25,054	17,538	13,813	19,289
Spain	258,196	61,051	130,251	29,639	40,337	40,259	59,224
Taiwan	56,895	43,618	33,035	6,892	15,975	9,541	12,161
Thailand	18,708	10,841	25,664	6,920	3,419	0	0
Turkey	126,866	53,947	84,120	7,542	7,281	6,637	16,629
United Arab Emirates	0	0	3,474	0	0	0	0
United Kingdom	195,870	97,682	79,514	3,326	10,608	39,775	56,799
By truck							
Canada	48	40	2	8	8	15	0
Mexico	790	366	434	105	115	122	144
Re-exports							
By vessel							
Argentina	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0
Japan	0	0	305	0	0	0	0
South Korea	0	0	305	0	0	0	0
United Kingdom	0	0	0	0	0	0	0
Total LNG exports	**2,017,243**	**1,727,720**	**1,222,265**	**300,659**	**351,448**	**330,463**	**364,116**
CNG							
Canada	*	181	222	0	0	0	*
Total CNG exports	*****	**181**	**222**	**0**	**0**	**0**	*****
Total exports	**3,543,752**	**3,264,484**	**2,616,850**	**549,944**	**614,309**	**586,271**	**637,564**

See footnotes at end of table.

Table 5. U.S. natural gas exports, 2020-2022

volumes in million cubic feet; prices in dollars per thousand cubic feet – continued

	2022			2021			
	February	January	Total	December	November	October	September
Exports							
Volume (million cubic feet)							
Pipeline							
Canada	74,313	81,420	937,124	108,568	85,136	62,464	72,023
Mexico	154,484	174,892	2,154,457	166,956	165,449	184,472	178,746
Total pipeline exports	**228,797**	**256,311**	**3,091,580**	**275,524**	**250,585**	**246,936**	**250,769**
LNG							
Exports							
By vessel							
Antigua and Barbuda	0	2	8	3	2	0	3
Argentina	0	0	83,449	2,077	0	0	1,950
Bahamas	31	34	486	36	34	36	43
Bangladesh	5,896	0	37,734	0	0	0	3,276
Barbados	31	28	297	34	27	25	33
Belgium	7,691	13,786	5,584	0	0	0	0
Brazil	10,660	17,322	307,714	24,246	10,715	40,769	38,282
Chile	0	3,162	121,881	2,938	2,956	6,364	7,929
China	3,357	0	453,304	17,050	50,228	42,202	48,584
Colombia	0	486	2,247	0	0	0	436
Croatia	5,870	9,084	36,133	3,117	9,416	0	0
Dominican Republic	0	6,647	53,095	5,969	2,780	5,619	0
Egypt	0	0	0	0	0	0	0
France	39,646	50,084	170,780	33,892	10,021	9,333	6,578
Greece	8,094	1,802	39,708	5,305	7,629	1,515	799
Haiti	16	20	137	4	8	17	10
India	7,210	6,866	196,218	3,203	14,807	10,548	23,941
Indonesia	717	0	3,269	1,218	456	477	1,118
Israel	0	0	8,906	0	0	0	2,855
Italy	13,629	7,037	34,210	0	0	0	0
Jamaica	111	86	25,276	113	715	1,858	2,931
Japan	10,214	21,527	354,948	24,297	33,947	37,666	10,290
Jordan	0	0	0	0	0	0	0
Kuwait	5,277	0	34,476	0	0	6,193	10,333
Lithuania	3,131	3,518	30,919	0	0	0	3,282
Malaysia	0	0	0	0	0	0	0
Malta	2,345	0	5,427	0	0	0	2,498
Mexico	0	0	15,200	0	0	1,088	0
Netherlands	31,591	16,279	174,339	23,354	8,829	17,157	10,424
Nicaragua	0	0	1	0	0	0	0
Pakistan	0	0	45,818	0	2,490	3,138	9,642
Panama	3,069	3,255	8,436	0	0	911	0
Poland	7,475	3,695	56,320	7,159	7,068	3,270	0
Portugal	3,703	2,868	65,865	9,630	5,380	10,459	3,696
Singapore	0	0	20,918	0	3,728	0	0
South Korea	27,489	21,824	453,483	38,201	30,787	33,836	31,375
Spain	39,359	49,379	215,062	32,579	22,821	35,638	31,274
Taiwan	6,115	6,211	99,350	12,034	3,404	7,123	5,789
Thailand	4,880	3,490	14,548	0	0	0	0
Turkey	43,697	45,081	188,849	38,420	47,330	19,385	24,176
United Arab Emirates	0	0	0	0	0	0	0
United Kingdom	25,301	60,060	195,046	60,315	30,648	3,302	3,099
By truck							
Canada	4	13	128	20	8	8	19
Mexico	157	148	1,250	148	160	182	150
Re-exports							
By vessel							
Argentina	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	0
South Korea	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0
Total LNG exports	**316,766**	**353,791**	**3,560,818**	**345,363**	**306,397**	**298,119**	**284,813**
CNG							
Canada	0	0	211	0	0	0	0
Total CNG exports	**0**	**0**	**211**	**0**	**0**	**0**	**0**
Total exports	**545,563**	**610,102**	**6,652,609**	**620,886**	**556,982**	**545,055**	**535,583**

See footnotes at end of table.

Table 5. U.S. natural gas exports, 2020-2022

volumes in million cubic feet; prices in dollars per thousand cubic feet – continued

	2021						
	August	July	June	May	April	March	February
Exports							
Volume (million cubic feet)							
Pipeline							
Canada	71,586	68,264	69,528	70,561	74,567	91,301	78,198
Mexico	193,710	197,623	198,242	192,549	182,918	183,051	137,381
Total pipeline exports	**265,296**	**265,887**	**267,770**	**263,110**	**257,485**	**274,352**	**215,579**
LNG							
Exports							
By vessel							
Antigua and Barbuda	0	0	0	0	0	0	0
Argentina	14,363	22,798	19,312	16,226	4,485	2,238	0
Bahamas	56	46	48	45	46	39	29
Bangladesh	7,085	0	3,493	6,948	10,219	3,566	0
Barbados	27	31	22	19	30	14	19
Belgium	0	0	0	2,100	0	3,484	0
Brazil	34,204	39,637	32,293	19,726	11,615	21,977	13,118
Chile	16,262	19,913	0	17,598	10,293	21,320	6,524
China	51,662	42,222	42,319	37,731	50,474	28,476	3,415
Colombia	919	0	0	0	892	0	0
Croatia	2,980	3,299	2,923	3,364	3,666	7,367	0
Dominican Republic	5,901	1,806	4,670	5,283	2,905	5,577	5,689
Egypt	0	0	0	0	0	0	0
France	7,111	0	3,683	11,926	36,120	33,678	14,851
Greece	3,607	6,651	0	6,796	0	6,805	0
Haiti	24	8	18	12	3	10	11
India	20,592	13,090	16,503	28,259	13,752	17,381	13,776
Indonesia	0	0	0	0	0	0	0
Israel	0	0	0	0	3,225	2,826	0
Italy	3,401	6,826	3,425	2,923	6,896	10,739	0
Jamaica	2,907	0	2,927	2,925	2,370	2,458	2,365
Japan	19,979	24,895	39,783	25,058	28,756	27,673	18,271
Jordan	0	0	0	0	0	0	0
Kuwait	3,298	0	7,126	0	3,705	3,821	0
Lithuania	1,677	6,469	3,285	3,049	3,078	3,228	6,851
Malaysia	0	0	0	0	0	0	0
Malta	0	0	0	0	2,928	0	0
Mexico	0	758	0	0	0	0	13,354
Netherlands	7,347	10,597	3,030	26,611	17,060	24,204	22,777
Nicaragua	0	1	0	0	0	0	0
Pakistan	3,319	13,428	3,376	0	3,323	3,421	0
Panama	1,390	0	0	2,341	0	3,279	0
Poland	0	6,619	10,635	3,581	7,382	3,507	7,099
Portugal	6,382	3,296	5,538	10,765	7,358	0	3,360
Singapore	0	3,449	0	3,089	3,660	3,303	0
South Korea	50,101	39,314	55,918	46,033	21,683	32,203	18,094
Spain	23,068	8,630	7,833	5,234	22,974	13,900	3,733
Taiwan	6,728	20,653	3,097	10,157	6,594	13,450	0
Thailand	3,707	0	0	3,453	7,388	0	0
Turkey	0	5,591	0	3,017	0	3,619	20,652
United Arab Emirates	0	0	0	0	0	0	0
United Kingdom	0	0	0	10,586	13,877	17,440	34,343
By truck							
Canada	18	16	7	18	15	0	0
Mexico	147	97	105	48	48	19	63
Re-exports							
By vessel							
Argentina	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	0
South Korea	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0
Total LNG exports	**298,262**	**300,143**	**271,368**	**314,922**	**306,818**	**321,023**	**208,394**
CNG							
Canada	14	16	27	25	29	36	32
Total CNG exports	**14**	**16**	**27**	**25**	**29**	**36**	**32**
Total exports	**563,572**	**566,046**	**539,165**	**578,056**	**564,333**	**595,411**	**424,004**

See footnotes at end of table.

Table 5. U.S. natural gas exports, 2020-2022

volumes in million cubic feet; prices in dollars per thousand cubic feet – continued

	2021						2020
	January	Total	December	November	October	September	August
Exports							
Volume (million cubic feet)							
Pipeline							
Canada	84,927	902,449	84,307	81,358	72,833	62,211	60,810
Mexico	173,360	1,990,809	164,577	166,135	185,799	182,068	185,867
Total pipeline exports	**258,287**	**2,893,258**	**248,884**	**247,493**	**258,632**	**244,279**	**246,677**
LNG							
Exports							
By vessel							
Antigua and Barbuda	0	0	0	0	0	0	0
Argentina	0	15,068	0	0	0	0	2,249
Bahamas	28	257	36	31	25	20	21
Bangladesh	3,148	10,660	0	0	0	0	0
Barbados	17	241	25	15	17	14	14
Belgium	0	31,946	0	3,633	3,285	0	0
Brazil	21,132	111,826	29,927	30,191	22,427	0	3,520
Chile	9,784	80,615	9,793	3,252	6,836	3,277	7,428
China	38,940	214,401	45,525	45,083	35,115	11,245	13,699
Colombia	0	4,626	0	0	0	2,548	550
Croatia	0	3,275	3,275	0	0	0	0
Dominican Republic	6,895	26,050	5,000	5,106	5,909	0	2,772
Egypt	0	0	0	0	0	0	0
France	3,587	90,237	3,752	3,390	6,639	0	0
Greece	600	48,403	3,382	3,543	0	7,027	0
Haiti	12	118	17	11	9	8	11
India	20,367	124,402	10,241	10,299	17,762	10,514	10,319
Indonesia	0	0	0	0	0	0	0
Israel	0	15,834	0	0	0	3,041	3,001
Italy	0	68,453	0	3,083	0	0	6,734
Jamaica	3,708	17,052	2,374	0	2,514	2,610	0
Japan	64,331	287,672	54,004	32,967	31,554	6,855	22,541
Jordan	0	6,872	0	0	0	3,578	0
Kuwait	0	17,293	0	0	3,603	3,508	6,886
Lithuania	0	28,879	6,291	3,621	6,191	3,308	0
Malaysia	0	0	0	0	0	0	0
Malta	0	2,648	0	0	0	0	0
Mexico	0	34,408	0	3,056	7,398	3,285	3,701
Netherlands	2,949	85,573	3,316	6,684	3,603	6,671	0
Nicaragua	0	0	0	0	0	0	0
Pakistan	3,682	36,934	0	3,436	10,009	9,853	3,412
Panama	516	12,764	271	1,448	433	3,228	0
Poland	0	36,900	7,033	0	3,157	0	0
Portugal	0	36,922	3,711	5,830	3,564	6,853	0
Singapore	3,688	28,341	0	7,658	3,416	0	2,967
South Korea	55,936	316,227	39,617	49,103	14,239	32,126	13,814
Spain	7,377	199,966	13,583	9,907	14,118	15,206	3,222
Taiwan	10,319	64,363	12,470	6,216	3,636	9,007	0
Thailand	0	32,622	0	3,705	0	0	0
Turkey	26,659	123,957	20,188	12,817	0	3,611	0
United Arab Emirates	0	10,110	0	0	0	0	3,359
United Kingdom	21,436	160,199	30,378	26,544	17,191	3,664	0
By truck							
Canada	0	10	8	0	0	0	0
Mexico	83	822	46	52	68	73	78
Re-exports							
By vessel							
Argentina	0	2,164	0	0	0	0	2,164
Brazil	0	82	0	0	82	0	0
Japan	0	387	0	0	82	0	0
South Korea	0	387	0	0	82	0	0
United Kingdom	0	0	0	0	0	0	0
Total LNG exports	**305,196**	**2,389,963**	**304,263**	**280,682**	**222,963**	**151,128**	**112,462**
CNG							
Canada	32	386	29	35	26	17	20
Total CNG exports	**32**	**386**	**29**	**35**	**26**	**17**	**20**
Total exports	**563,515**	**5,283,607**	**553,176**	**528,210**	**481,621**	**395,424**	**359,159**

See footnotes at end of table.

Table 5. U.S. natural gas exports, 2020-2022

volumes in million cubic feet; prices in dollars per thousand cubic feet – continued

	2020						
	July	June	May	April	March	February	January
Exports							
Volume (million cubic feet)							
Pipeline							
Canada	71,778	66,516	67,752	71,722	86,579	77,354	99,231
Mexico	181,152	162,927	145,242	138,544	166,550	151,071	160,875
Total pipeline exports	**252,930**	**229,442**	**212,994**	**210,266**	**253,130**	**228,425**	**260,106**
LNG							
Exports							
By vessel							
Antigua and Barbuda	0	0	0	0	0	0	0
Argentina	2,218	2,229	8,372	0	0	0	0
Bahamas	15	18	20	23	20	13	15
Bangladesh	3,614	0	3,406	0	0	0	3,640
Barbados	15	20	20	15	28	26	33
Belgium	0	0	1,348	3,324	3,724	9,872	6,761
Brazil	0	0	0	0	6,891	10,433	8,438
Chile	1,515	3,313	11,068	14,098	3,216	10,731	6,087
China	10,358	0	14,535	21,140	17,699	0	0
Colombia	0	0	0	0	0	1,003	525
Croatia	0	0	0	0	0	0	0
Dominican Republic	0	0	2,554	1,838	2,872	0	0
Egypt	0	0	0	0	0	0	0
France	0	0	9,546	16,336	23,491	20,520	6,563
Greece	6,544	1,076	3,430	3,233	8,892	0	11,276
Haiti	8	7	10	8	9	11	7
India	7,404	10,100	10,534	16,674	17,245	0	3,309
Indonesia	0	0	0	0	0	0	0
Israel	3,317	3,277	0	0	3,197	0	0
Italy	3,232	12,998	6,452	3,135	9,895	16,616	6,308
Jamaica	0	0	0	5,770	1	2,914	869
Japan	10,618	21,836	13,729	18,387	21,845	21,360	31,975
Jordan	0	0	3,294	0	0	0	0
Kuwait	0	0	0	3,297	0	0	0
Lithuania	0	3,049	3,473	2,945	0	0	0
Malaysia	0	0	0	0	0	0	0
Malta	0	0	0	0	0	48	2,600
Mexico	0	0	0	0	7,037	3,167	6,764
Netherlands	6,746	6,870	6,826	10,305	13,772	14,099	6,681
Nicaragua	0	0	0	0	0	0	0
Pakistan	0	0	0	3,334	0	3,567	3,323
Panama	0	0	3,070	0	906	3,408	0
Poland	0	3,385	6,258	3,523	3,583	6,677	3,282
Portugal	0	0	0	10,777	0	6,187	0
Singapore	3,690	0	0	0	10,610	0	0
South Korea	10,492	28,171	20,921	24,258	28,095	11,071	44,320
Spain	13,679	9,640	29,360	22,943	23,657	20,240	24,412
Taiwan	0	2,953	6,662	0	6,987	7,115	9,317
Thailand	3,254	0	7,397	11,049	3,783	3,435	0
Turkey	3,222	0	6,661	14,030	6,489	24,303	32,637
United Arab Emirates	3,277	0	3,474	0	0	0	0
United Kingdom	2,908	0	0	0	20,202	28,884	30,428
By truck							
Canada	0	0	0	0	0	0	2
Mexico	72	61	18	23	123	87	122
Re-exports							
By vessel							
Argentina	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	305
South Korea	0	0	0	0	0	0	305
United Kingdom	0	0	0	0	0	0	0
Total LNG exports	**96,200**	**109,002**	**182,438**	**210,466**	**244,269**	**225,786**	**250,305**
CNG							
Canada	37	43	39	35	38	34	33
Total CNG exports	**37**	**43**	**39**	**35**	**38**	**34**	**33**
Total exports	**349,167**	**338,486**	**395,472**	**420,767**	**497,437**	**454,245**	**510,444**

See footnotes at end of table.

Table 7. Marketed production of natural gas in selected states and the Federal Gulf of Mexico, 2017-2022

million cubic feet

Year and month	Alaska	Arkansas	California	Colorado	Kansas	Louisiana	Montana	New Mexico	North Dakota	Ohio
2017 total	**344,385**	**694,676**	**212,458**	**1,706,364**	**219,639**	**2,139,830**	**46,311**	**1,299,732**	**593,998**	**1,791,359**
2018 total	**341,315**	**589,985**	**202,617**	**1,847,402**	**201,391**	**2,832,404**	**43,530**	**1,493,082**	**706,552**	**2,403,382**
2019 total	**329,361**	**524,757**	**196,823**	**1,986,916**	**183,087**	**3,212,318**	**43,534**	**1,769,086**	**850,826**	**2,651,631**
2020										
January	30,018	42,187	15,908	178,066	14,623	274,755	3,527	162,016	78,798	203,701
February	28,537	39,093	14,649	166,620	13,636	255,885	3,340	155,323	77,940	190,559
March	29,219	43,677	15,376	175,202	14,486	276,544	3,527	169,244	83,892	203,701
April	27,513	39,748	14,906	168,438	13,595	264,869	3,148	156,722	72,059	193,050
May	27,076	40,463	15,172	163,768	14,012	281,636	2,692	147,782	52,874	199,485
June	25,545	38,742	14,837	159,601	13,321	264,072	2,667	153,276	52,626	193,050
July	26,779	39,855	15,061	167,105	13,674	264,875	3,322	165,335	64,860	201,686
August	26,846	40,295	13,344	165,091	13,504	260,226	3,248	168,311	74,940	201,686
September	26,978	38,734	12,857	162,531	13,030	255,690	3,009	165,008	78,195	195,180
October	29,080	40,172	13,059	164,462	13,461	263,120	3,204	171,376	82,649	201,097
November	29,575	38,565	12,934	159,409	12,917	267,312	3,143	167,213	80,112	194,610
December	31,161	39,452	12,475	160,168	13,097	277,178	3,135	166,561	83,498	201,097
Total	**338,329**	**480,982**	**170,579**	**1,990,462**	**163,356**	**3,206,163**	**37,963**	**1,948,168**	**882,443**	**2,378,902**
2021										
January	31,632	E39,964	E12,033	E159,820	E12,578	E271,751	E3,214	E179,574	E77,021	E206,660
February	28,365	E30,061	E10,749	E143,416	E9,965	E221,051	E2,790	E151,970	E65,685	E170,668
March	31,481	E39,947	E12,028	E156,534	E12,340	E281,406	E3,144	E187,274	E77,032	E189,405
April	29,514	E37,926	E11,685	E156,009	E12,316	E276,931	E3,096	E184,890	E76,209	E183,444
May	29,005	E38,775	E12,215	E162,200	E12,648	E284,347	E3,226	E196,174	E80,479	E187,668
June	27,715	E37,125	E11,787	E154,405	E12,276	E272,759	E2,932	E190,003	E78,111	E183,602
July	26,280	E38,273	E12,014	E160,065	E12,780	E284,504	E3,151	E201,572	E79,150	E189,223
August	27,864	E38,000	E11,930	E158,380	E12,793	E288,489	E3,168	E206,178	E81,659	E188,396
September	28,534	E36,706	E11,499	E153,067	E12,371	E285,313	E3,127	E203,500	E80,634	E180,630
October	30,458	E37,791	E11,565	E160,130	E12,775	E302,250	E3,249	E212,065	E83,166	E192,556
November	30,735	E36,440	E11,177	E155,466	E12,488	E301,451	E3,110	E209,466	E82,402	E194,200
December	33,039	E38,361	E11,321	E156,842	E12,638	E313,724	E3,039	E205,204	E83,905	E200,184
Total	**354,623**	**E449,371**	**E140,003**	**E1,876,335**	**E147,967**	**E3,383,977**	**E37,247**	**E2,327,871**	**E945,452**	**E2,266,636**
2022										
January	32,865	E37,302	E11,308	E151,645	E12,255	E311,659	E3,033	E196,234	E78,716	E196,005
February	30,014	E33,465	E9,438	E138,213	E10,930	E284,061	E2,749	E182,836	E71,712	E172,829
March	32,473	E37,518	E11,512	E155,071	E12,194	E313,101	E3,154	E218,420	E83,043	E187,872
April	30,910	RE36,247	E11,334	RE151,149	RE12,037	RE313,102	RE2,985	RE215,353	RE65,984	E179,444
May	31,677	RE36,988	E11,615	RE154,482	RE12,457	RE339,637	RE3,070	RE219,721	RE77,670	E189,140
June	28,631	E35,459	E11,329	E148,165	E12,071	E334,466	E3,359	E212,359	E82,245	E189,445
2022 6-month YTD	**186,569**	**E216,979**	**E66,536**	**E898,726**	**E71,946**	**E1,896,025**	**E18,350**	**E1,244,923**	**E459,370**	**E1,114,734**
2021 6-month YTD	**177,712**	**E223,799**	**E70,497**	**E932,384**	**E72,122**	**E1,608,245**	**E18,402**	**E1,089,885**	**E454,537**	**E1,121,447**
2020 6-month YTD	**167,910**	**243,909**	**90,849**	**1,011,695**	**83,673**	**1,617,762**	**18,901**	**944,363**	**418,189**	**1,183,546**

See footnotes at end of table.

Table 7. Marketed production of natural gas in selected states and the Federal Gulf of Mexico, 2017-2022

million cubic feet – continued

Year and month	Oklahoma	Pennsylvania	Texas	Utah	West Virginia	Wyoming	Other states	Federal Gulf of Mexico	U.S. total
2017 total	**2,513,897**	**5,453,638**	**7,223,841**	**315,211**	**1,514,278**	**1,590,059**	**517,698**	**1,060,452**	**29,237,825**
2018 total	**2,875,787**	**6,264,832**	**8,041,010**	**295,826**	**1,771,698**	**1,637,517**	**485,675**	**974,863**	**33,008,867**
2019 total	**3,036,052**	**6,896,792**	**9,378,489**	**271,808**	**2,155,214**	**1,488,854**	**456,024**	**1,015,343**	**36,446,918**
2020									
January	263,734	603,836	843,432	21,944	209,896	124,274	37,391	86,071	3,194,177
February	243,139	569,721	783,094	20,373	198,090	108,722	34,782	81,114	2,984,616
March	257,387	607,689	841,347	21,765	210,559	117,977	36,689	87,955	3,196,236
April	235,642	586,955	783,283	20,379	204,826	111,744	34,389	80,574	3,011,842
May	217,154	592,126	734,176	20,326	212,646	107,288	33,986	64,374	2,927,037
June	222,324	560,390	741,401	19,244	212,831	103,890	32,957	62,227	2,873,001
July	226,843	604,716	775,851	20,312	220,032	108,679	34,568	67,778	3,021,331
August	226,344	607,221	782,436	19,814	223,208	107,320	33,757	43,988	3,011,580
September	222,010	567,029	755,253	19,283	218,893	104,520	30,468	48,900	2,917,569
October	219,403	595,653	773,720	20,042	226,064	104,787	31,775	38,702	2,991,827
November	224,327	605,244	751,562	19,200	223,428	103,236	31,246	60,496	2,984,528
December	228,057	647,714	770,555	19,307	231,845	103,933	32,383	67,085	3,088,701
Total	**2,786,366**	**7,148,295**	**9,336,110**	**241,989**	**2,592,319**	**1,306,368**	**404,391**	**789,262**	**36,202,446**
2021									
January	E221,544	E657,704	E774,497	E19,235	E234,432	E106,649	E33,651	E68,393	E3,110,352
February	E163,094	E585,221	E588,035	E17,815	E208,571	E96,543	E30,083	E62,325	E2,586,408
March	E220,130	E647,681	E771,346	E20,356	E227,218	E107,236	E34,338	E72,867	E3,091,762
April	E214,334	E618,509	E775,796	E19,861	E229,075	E103,470	E33,044	E69,696	E3,035,804
May	E223,372	E640,431	E798,311	E20,312	E234,118	E105,441	E33,844	E67,642	E3,130,208
June	E213,314	E621,905	E781,294	E19,587	E227,987	E100,983	E32,490	E67,779	E3,036,055
July	E221,002	E642,894	E821,587	E20,363	E229,376	E104,558	E33,626	E70,488	E3,150,909
August	E222,329	E655,525	E820,135	E20,335	E241,373	E102,121	E33,126	E61,046	E3,172,847
September	E216,455	E633,963	E798,167	E19,841	E216,452	E102,262	E31,895	E35,503	E3,049,920
October	E223,093	E657,651	E833,481	E20,509	E240,446	E104,250	E33,056	E61,121	E3,219,612
November	E214,361	E651,361	E809,934	E20,061	E229,812	E101,430	E32,083	E65,329	E3,161,306
December	E218,805	E679,814	E844,079	E20,609	E241,569	E102,768	E32,693	E67,680	E3,266,272
Total	**E2,571,834**	**E7,692,658**	**E9,416,660**	**E238,884**	**E2,760,429**	**E1,237,709**	**E393,929**	**E769,870**	**E37,011,455**
2022									
January	E213,419	E660,345	E826,679	E20,836	E234,795	E100,356	E31,509	E65,117	E3,184,080
February	E192,596	E581,432	E742,604	E19,009	E209,707	E90,241	E29,038	E55,597	E2,856,472
March	E219,732	E635,076	E844,843	E21,363	E239,344	E99,329	E31,736	E63,221	E3,209,001
April	RE223,078	RE616,181	RE830,114	RE21,301	RE235,580	RE95,896	E29,910	RE65,472	RE3,136,077
May	RE233,415	RE640,189	RE861,115	RE22,914	RE246,567	RE97,403	RE31,164	RE62,194	RE3,271,417
June	E227,200	E616,649	E836,611	E22,433	E240,007	E95,767	E30,677	E63,082	E3,189,952
2022 6-month YTD	**E1,309,439**	**E3,749,873**	**E4,941,966**	**E127,856**	**E1,406,000**	**E578,991**	**E184,034**	**E374,682**	**E18,847,000**
2021 6-month YTD	**E1,255,790**	**E3,771,450**	**E4,489,279**	**E117,166**	**E1,361,400**	**E620,321**	**E197,450**	**E408,702**	**E17,990,589**
2020 6-month YTD	**1,439,381**	**3,520,718**	**4,726,733**	**124,030**	**1,248,848**	**673,894**	**210,194**	**462,314**	**18,186,908**

E Estimated data.

RE Revised estimated data.

Source: 2017-2020: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2020*, Bureau of Safety and Environmental Enforcement (BSEE), IHS Markit, and Enverus. January 2021 through current month: Form EIA-914, *Monthly Crude Oil and Lease Condensate, and Natural Gas Production Report*; and EIA computations.

Note: For 2021 forward, we estimate state monthly marketed production from gross withdrawals using historical relationships between the two. We collect data for Arkansas, California, Colorado, Kansas, Louisiana, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, Wyoming, and federal offshore Gulf of Mexico individually on the EIA-914 report. The "other states" category comprises states/areas not individually collected on the EIA-914 report (Alabama, Arizona, Federal Offshore Pacific, Florida, Idaho, Illinois, Indiana, Kentucky, Maryland, Michigan, Mississippi, Missouri, Nebraska, Nevada, New York, Oregon, South Dakota, Tennessee, and Virginia). Before 2021, Federal Offshore Pacific is included in California. We obtain all data for Alaska directly from the state. Monthly preliminary state-level data for all states not collected individually on the EIA-914 report are available after the final annual reports for these series are collected and processed. Final annual data are generally available in the third quarter of the following year. The sum of individual states may not equal total U.S. volumes because of independent rounding.

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August 19, 2022

Kimberly D. Bose Secretary
Federal Energy Regulatory Commission
888 First Street, N.W.
Washington, D.C. 20426

Re: **Corpus Christi Liquefaction, LLC**
CCL Midscale 8-9, LLC
Docket No. PF22-__-000
Request to Initiate Pre-Filing Review Process

Dear Ms. Bose:

Pursuant to the requirements in 18 C.F.R. §157.21 (2014), Corpus Christi Liquefaction, LLC ("CCL") and co-applicant CCL Midscale 8-9, LLC ("CCL Midscale 8-9"), collectively "CCL", submit this letter to request that the Federal Energy Regulatory Commission ("Commission" or "FERC") initiate the Commission's National Environmental Policy Act ("NEPA")[1] pre-filing review process for the proposed Corpus Christi Liquefaction Midscale Trains 8 & 9 Project ("Expansion Project" or "Project"). The proposed Project would expand the previously approved Liquefaction Project and Stage 3 Project facilities (approved in Docket Nos. CP12-507-000 and CP18-512-000, respectively), collectively "CCL Project". The Expansion Project consists of:

- two midscale liquefaction trains;
- a refrigerant storage facility;
- a full-containment, aboveground, 220,000m^3 Liquefied Natural Gas ("LNG") storage tank with loading capabilities;
- appurtenant connecting facilities and piping; and
- an increase in CCL's previously approved ship loading rates.

Feed gas will be supplied to the Project via a combination of the Corpus Christi Pipeline System (authorized by the Commission in Docket Nos. CP12-508-000 and CP18-513-000) and a non-jurisdictional intrastate pipeline

In compliance with the Commission's mandatory pre-filing procedures, CCL submits the following:

1. *Project Schedule*[2]

Upon completion of the Commission's mandatory 6-month pre-filing process, anticipated in February 2023, a formal application would be filed pursuant to Section 3 of the Natural Gas Act ("NGA")[3] which will request that the Commission issue an Order authorizing the siting, construction, operation and maintenance of the Project no later than August 2024. Upon

[1] 42 U.S.C. § 4321 et seq. (2012).
[2] 18 C.F.R. § 157.21(d)(1) (2014).
[3] 15 U.S.C. §§ 717c and 717f (2012).

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approval, CCL will file its project implementation plan requesting authorization to commence construction at the earliest time practicable.

The Project in-service date is targeted for the 2nd Half of 2031. Additional schedule detail is provided below.

Key Milestone Activities	Anticipated Schedule
Commence Pre-Filing Process	August 2022
File NGA Section 3 Application	February 2023
Issuance of Environmental Assessment/Environmental Impact Statement	February 2024
Issuance of Authorization	August 2024
File Initial Implementation Plan	September 2024
Commence Project Construction	October 2024
Project In-Service	2nd Half 2031

2. *Zoning and Availability*[4]

The proposed Project would be located approximately one mile southeast of the City of Gregory, Texas and will be integrated adjacent to or within the existing CCL Project. The Project area occurs within an industrial area on land previously used for aluminum production and currently utilized for CCL's existing operations. Additionally, the Project area is located in unincorporated San Patricio County and would not be subject to city or county zoning ordinances.

3. *Pre-Filing Request*[5]

As an LNG project, the pre-filing process is required to be utilized and a formal application will not be filed less than 180 days from the date of approval from the Commission to enter the pre-filing process.

4. *Project Description*[6]

The Project consists of the siting, construction, and operation of LNG facilities near Gregory, TX. Attachment 1 and Attachment 2 contain a vicinity map and plot plan of the Project, respectively.

[4] 18 C.F.R. § 157.21(d)(2).
[5] 18 C.F.R. § 157.21(d)(3).
[6] 18 C.F.R. § 157.21(d)(4).

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The Project will consist of (a) two midscale liquefaction trains, each capable of producing up to 1.64 million tons per annum ("MTPA") of LNG, (b) on-site refrigerant storage, (c) a full-containment, aboveground, 220,000 m^3 LNG storage tank with loading capabilities, and (d) an increase in the authorized LNG loading rate. The Project will be interconnected with the existing Liquefaction Project and Stage 3 Project facilities, which will require minor modifications for purposes of interconnection and integration of the expansion facilities.

Midscale Trains 8 & 9

CCL proposes to develop two midscale liquefaction trains that will consist of the following equipment:

- Facilities to remove carbon dioxide ("CO_2"), hydrogen sulfide ("H_2S") and other sulfur compounds from the feed gas;
- Facilities to remove water and mercury from the feed gas;
- Facilities to remove heavy hydrocarbons from the feed gas;
- A thermal oxidizer for combusting waste gas;
- Electric motor driven refrigerant compressors and associated cold boxes;
- Induced draft air coolers;
- Associated fire and gas and safety systems; and
- Associated control systems and electrical infrastructure

These two midscale liquefaction trains are near replicates of those reviewed and approved by the Commission in FERC Docket No. CP18-512-000.

Refrigerant Storage

CCL proposes to develop a refrigerant storage facility that will provide service to the seven midscale liquefaction trains authorized in Docket No. CP18-512-000 and the proposed additional two midscale liquefaction trains. Refrigerant storage will consist of one vessel for each of the four stored refrigerants (ethylene, propane, n-Butane and Iso-Pentane).

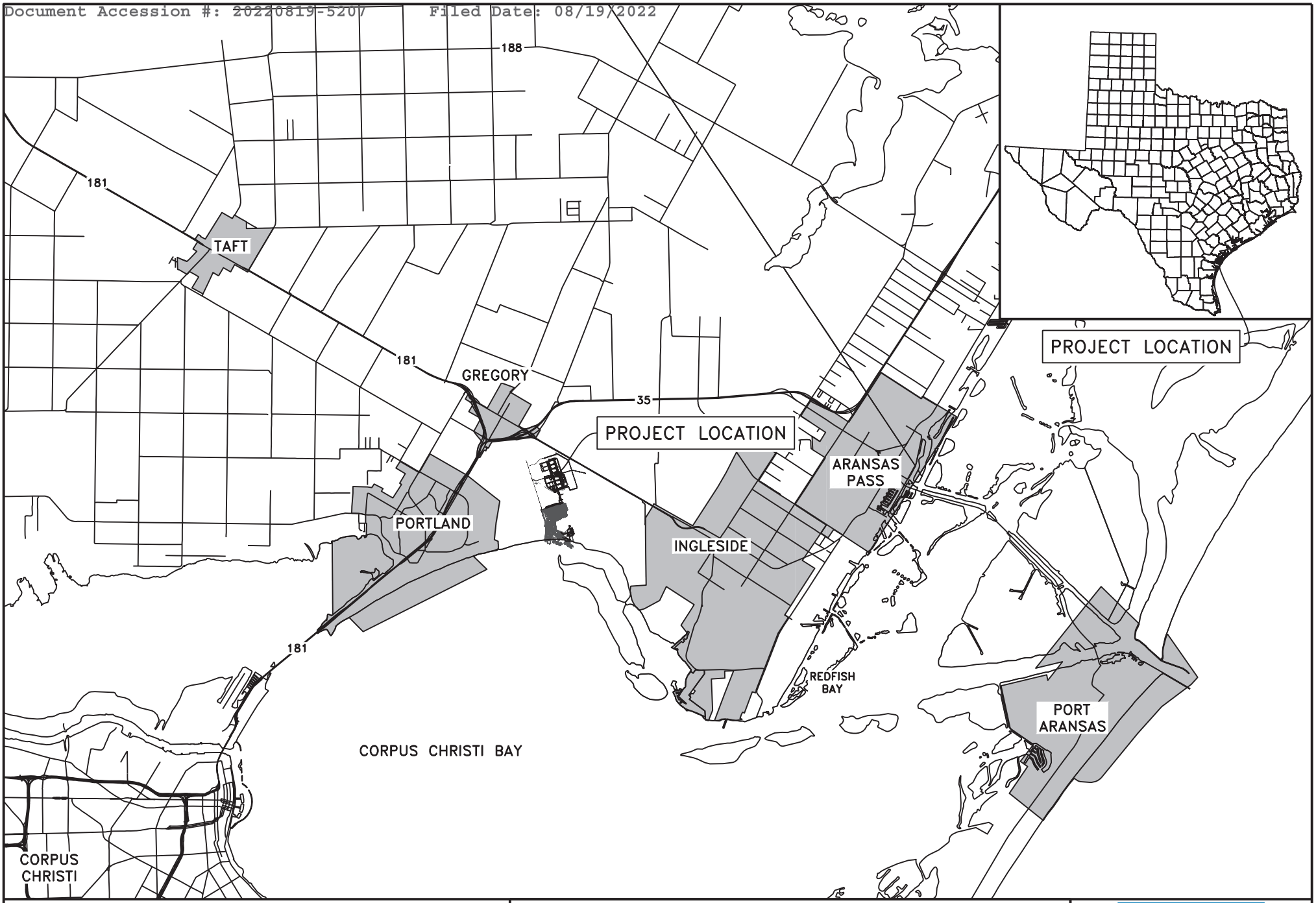
LNG Storage Tank

CCL proposes to add a full-containment, aboveground 220,000m^3 LNG storage tank with loading capabilities at the existing CCL marine berths (authorized in FERC Docket No. CP12-507-000).

Increased Ship Loading Rates

CCL currently utilizes two berths, authorized in FERC Docket No. CP12-507-00, for loading LNG onto LNG carriers ("LNGCs"). CCL's currently authorized loading rate is 12,000 m^3/hr. The 12,000 m^3/hr. represents the maximum authorized loading rate, whether it be for single or dual (combined) loading. CCL proposes to increase the authorized combined loading rate to 22,500 m^3/hr. as part of the Expansion Project. Increased loading rates would allow for simultaneous loading at both jetties. CCL also proposes to increase the maximum loading rate during single jetty loading from 12,000 m^3/hr. to 14,000 m^3/hr.

5. *List of Federal and State Agencies in the Project Area with Relevant Permitting Requirements, and Statement Indicating Agency Awareness of Applicant's Intention to*



CORPUS CHRISTI LIQUEFACTION
MIDSCALE TRAINS 8 & 9 PROJECT
PROJECT LOCATION MAP

SAN PATRICIO COUNTY TEXAS

CHENIERE

DRAWN BY: JLM	DATE: 8/5/22	REV
CHECKED BY: JLM	SCALE: AS NOTED	1

https://www.financialexpress.com/industry/bpcl-expects-mozambique-project-to-take-off-next-year/2648843/

Saturday, September 3, 2022

The Financial Express

BPCL expects Mozambique project to take off next year

BPCL has 10% stake in the project and has a 15-year term contract for 1 million tonne (mt) of LNG.

Written by **FE Bureau**
August 30, 2022 7:25:53 am

Apart from BPCL, state-owned ONGC and Indian Oil Corporation (IOC) also have 10% stake each in the multi-billion-dollar natural gas development project off the coast of Northern Mozambique.

With the law and order situation improving considerably, Bharat Petroleum Corporation's (BPCL's) 12.88 million tonne per annum (mtpa) Mozambique LNG project should take off in the first half of next year, BPCL said on Monday. BPCL has 10% stake in the project and has a 15-year term contract for 1 million tonne (mt) of LNG.

While construction activities to develop the initial two trains of the LNG project in Mozambique were progressing as per schedule, security incidents during March-end 2021 in the Cabo Delgado province in Northern Mozambique led the operator (Total) to withdraw all project personnel from the site and declare force majeure for the project.

"Now, with the efforts of the Government of Mozambique's forces, supported by a regional coalition, progress is being made in improving the security situation in the region, and the project will resume once the security situation is stabilised in a sustainable manner," BPCL CMD Arun Kumar Singh told shareholders of the company in the company's annual general meeting.

Singh said that the company was hopeful that the project should take off from the first half of 2023. Since India imports around half of its LNG needs to meet domestic demand, the operationalisation of the unit would help.

Apart from BPCL, state-owned ONGC and Indian Oil Corporation (IOC) also have 10% stake each in the multi-billion-dollar natural gas development project off the coast of Northern Mozambique. Total has a 26.5% stake, alongside Mozambique's state-owned ENH, which has 15%, Japan's Mitsui and Jogmec have 10% each and Thailand's PTT has 8.5%.

Singh said that BPCL will also invest $1.6 billion in the BM-SEAL 11 concession in Brazil. While BPCL holds 40% participatory interest in the project, the remaining is with state-owned Petrobras. The project is likely to start production in 2026-27. The company has already invested $1 billion in exploration in the project.

BPCL recently said it plans to invest Rs 1.4 trillion in the next five years in six "strategic" areas, including gas, renewable and e-mobility, aimed at diversifying and creating additional revenue streams that will hedge it against any future decline in the liquid fuel business.

The state-owned oil marketing company, which recorded a Rs 6,291-crore loss in the first quarter, mainly on marketing losses, said the current quarter should not be as bad as the first quarter, as things are improving.

"We have responsibility towards our people. This also stems from the fact that we can absorb some losses and ultimately with the hope that we will make up such losses when the good time comes. If you look at the oil companies, it is always a see-saw game," Singh said.

Stating that this is just a temporary phase, as the oil price should come down (Singh earlier predicted $90/barrel), he said that if the prices really do not come down, "then definitely we will take some steps in consultation with all stakeholders to make sure that we remain financially comfortable. So, it is just a matter of a few months; the first quarter is bad, the second quarter is not as bad as the first quarter. Things are improving."

Meanwhile, Singh said that oil marketing companies are in dialogue with different suppliers, including those in Russia, for entering into long-term sourcing of oil. Russia has been supplying crude to India at a discount and a term deal would help in ensuring cheap supplies.

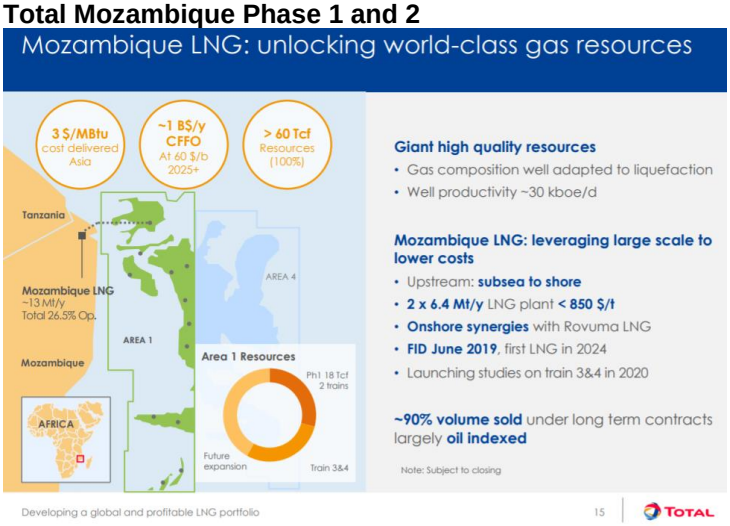
Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

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



Source: Total Investor Day September 24, 2019

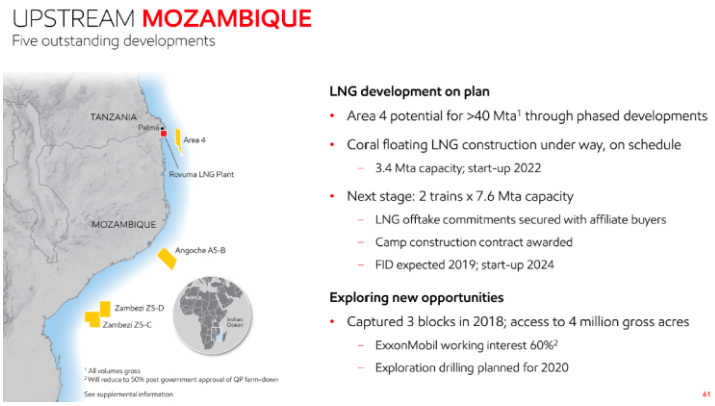
Total's Mozambique force majeure is no surprise, especially the need to the restoration of security and stability "in a sustained manner". Yesterday, Total announced [LINK] "*Considering the evolution of the security".* No one should be surprised by the force majeure or the sustained manner caveat. SAF 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 bf/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 timeline0 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



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

[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 wilt 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

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
Industry	Chemicals	Pulp and Paper
	Iron and Steel	Aluminum
	Cement	CCUS in Industry and Transformation
Transport	Electric Vehicles	Transport Biofuels
	Rail	Aviation
	Fuel Consumption of Cars and Vans	International Shipping
	Trucks and Busses	
Buildings	Building Envelopes	Lighting
	Heating	Appliances and Equipment
	Heat Pumps	Data Centres and Data Transmission Networks
	Cooling	
Energy Integration	Energy Storage	Demand Response
	Hydrogen	Direct Air Capture
	Smart Grids	

Source: IEA

On Track More Efforts Needed Not on Track

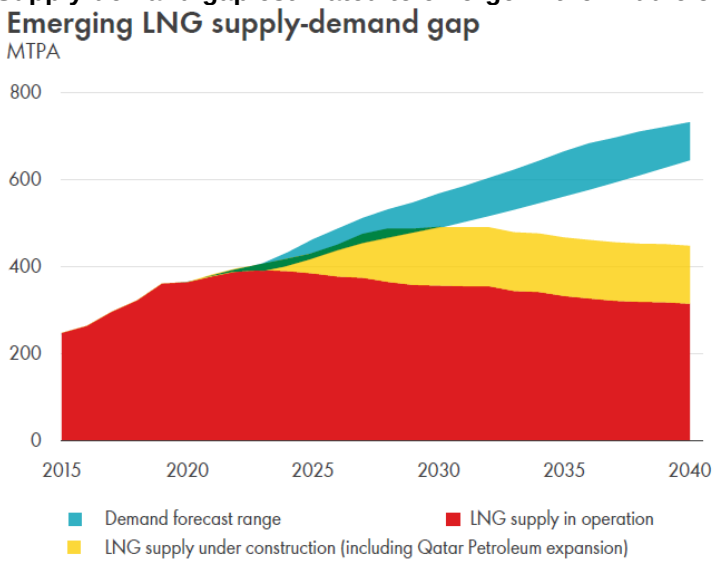
Source: IEA Tracking Clean Energy Progress, June 2020

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

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



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

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.

https://tass.com/economy/1500539

31 AUG, 09:00

Gazprom boosts gas supplies to China via Power of Siberia by 60% in 8 months — CEO

According to Alexey Miller, the Chinese market is the most dynamic market in the world, and over the next 20 years, the increase in gas consumption in China will be 40% of the growth in world gas consumption

© Kirill Kukhmar/TASS

MOSCOW, August 31. /TASS/. Gazprom managed to increase gas deliveries via the Power of Siberia to China by 60% in January-August, the company said in a statement following the results of a conference call dedicated to the day of workers in the oil and gas industry.

"We are consistently increasing supplies via the Power of Siberia gas pipeline to China. And this year, we have several times updated the record for daily gas supplies in excess of contractual obligations in terms of daily contractual quantities. Our gas supplies to the Chinese market in eight months of 2022 compared to 2021 grew by 60%," the company's CEO said Alexey Miller.

He added that Gazprom will definitely fulfill its obligations to supply gas to China in 2023, which needs more and more gas. A new resource base has also been prepared to increase supplies - gas from the Kovykta field will begin to flow in the Power of Siberia gas pipeline before the end of the year. The holding has also already begun to develop design and estimate documentation for the Far East gas supply route to China.

"Until the end of the year, we will be celebrating a very important, significant event. This is the beginning of the flow of gas from the Kovykta field to the Power of Siberia gas pipeline. We are already completing the linear part of the Kovykta-Chayanda. And, without a doubt, all contractual obligations for 2023, which we have to our Russian consumers and to our Chinese partners, to increase the volume of gas supplies to China, we will fully fulfill it," he added.

Miller recalled that the eastern program is largely aimed at expanding export opportunities and increasing gas supplies to the Chinese market. According to him, the Chinese market is the most dynamic market in the world, and over the next 20 years, the increase in gas consumption in China will be 40% of the growth in world gas consumption.

https://www.telegraph.co.uk/business/2022/08/30/rough-gas-storage-owner-pushes-funding-deal-taxpayer/

Rough gas storage owner pushes for funding deal from taxpayer

Mothballed facility cleared for reopening - but Centrica won't when it will be refilled

By Rachel Millard 30 August 2022 • 9:46pm

Rough was closed in 2017, leaving the UK's strategic reserves dangerously low CREDIT: Centrica

The owner of Britain's largest gas storage facility has refused to say when the site will be reopened despite winning approval from regulators, amid talks with ministers over taxpayer funding.

British Gas's parent company, Centrica, was on Tuesday night cleared by the North Sea Transition Authority to restart the mothballed Rough storage site off the Yorkshire coast as part of a scramble to improve the country's energy security.

Centrica is free to begin filling Rough immediately as a result, but the company refused to comment on when it would begin to pump in gas.

Chris O'Shea, Centrica's chief executive, has previously said it could re-open this winter, and this is understood to remain the plan.

However, the company remains in talks with the Government over some form of long-term taxpayer support for the site.

Centrica closed the site in 2017, citing a weak financial case, with margins for gas storage narrowing and high repair costs.

Expected pressure on gas markets in coming months may improve the case this winter, but the longer term is less clear.

A Whitehall source said: "Discussions on an appropriate financial mechanism that shares the risk and reward over the longer term are ongoing."

The facility can hold enough gas to meet winter demand for around 10 days when full, although it is only expected to return at around one quarter of capacity this winter.

Kwasi Kwarteng, the Business Secretary, said on Twitter: "After months of work, the UK oil and gas regulator has today granted the required approvals and consents to Centrica to open the Rough gas storage facility off the East Yorkshire coast."

As well as Rough and British Gas, Centrica owns North Sea oil and gas drilling sites and a 20pc stake in Britain's nuclear fleet.

The company posted £1.3bn profits in the first half of 2022, a five-fold increase on the £262m it made during the same period in 2021, helped by soaring oil and gas prices in the wake of Russia's invasion of Ukraine.

Huge profits made by oil, gas and electricity producers amid energy shortages have triggered windfall taxes in the UK and calls for further action.

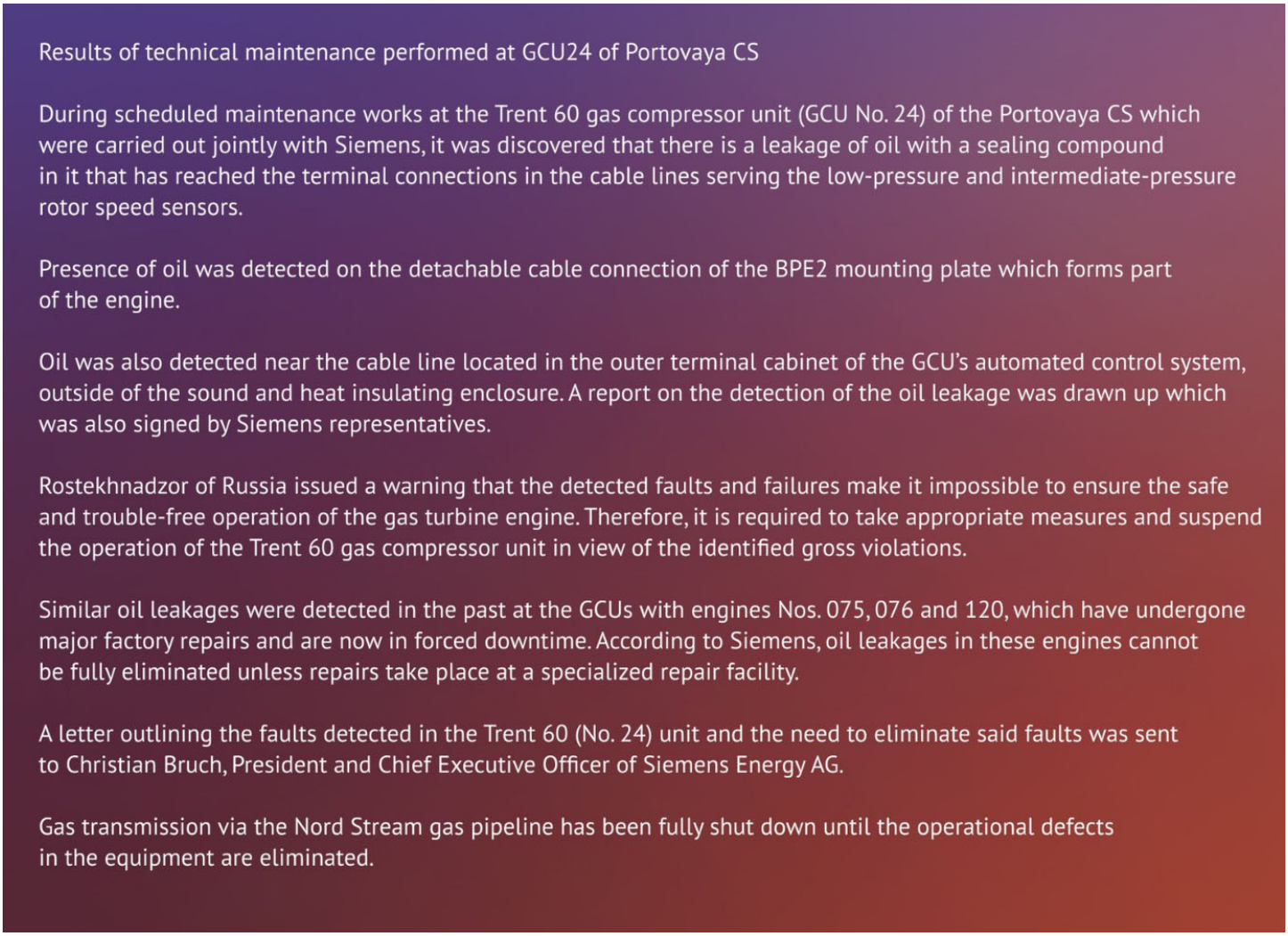
Last week, Centrica's retail division British Gas pledged to donate 10pc of its first half pre-tax profits to support customers, on top of existing support, with an immediate £12m donation.

The North Sea Transition Authority (NSTA) regulator said last night that Centrica has “now received all of the required NSTA regulatory approvals to commence gas storage operations.”

Dr Andy Samuel, NSTA chief executive, added: “It’s testament to the hard work and commitment of the teams that we have been able to move through the licensing and consent process both thoroughly and at pace, to bolster energy security by enabling Centrica to start injecting gas at the Rough storage facility.”

Centrica declined to comment.

Gazprom tweet at 11:51am MT on Sept 2 https://twitter.com/GazpromEN/status/1565759390782742529



https://tass.ru/ekonomika/15630727

September 2, 04:15, updated September 2, 04:30

Peskov said that the reliability of the Nord Stream is under threat through no fault of Gazprom

Press Secretary of the President of the Russian Federation Dmitry Peskov

© Sergey Bobylev/TASS

It is under threat due to the lack of technological reserves, said the Kremlin spokesman
MOSCOW, 2 September. /TASS/. The reliability of the Nord Stream gas pipeline is under threat due to the lack of technological reserves, said Dmitry Peskov, press secretary of the President of the Russian Federation.

"There are no technological reserves, only one turbine is working [on the Nord Stream pipeline]. Think about it," the Kremlin representative suggested to journalists. Thus, he answered in a press conversation on Friday the question of whether it is possible to expect new repair work on the Nord Stream in the coming months.

Peskov stressed that "reservation is missing through no fault of Gazprom." Therefore, the reliability of the entire system is under threat," he stressed.

Since July 27, the Nord Stream gas pipeline has been used at 20% of its maximum capacity due to the shutdown of several gas turbines. One of them (made in Canada by Siemens Energy) was sent to Montreal for repairs. Due to Ottawa's sanctions against Moscow, the manufacturer initially refused to return the repaired equipment to Germany, but after numerous requests from the FRG, he nevertheless decided to return it. On July 25, Gazprom announced the forced shutdown of another gas turbine engine at the Portovaya compressor station due to the end of the time between overhauls before overhaul.

Earlier, Gazprom announced a complete halt in supplies via Nord Stream for three days due to repairs at the only gas compressor unit remaining in operation. Upon completion of the work and in the absence of technical malfunctions of the equipment, gas transportation will be restored to the level of 33 million cubic meters. m per day. It is planned that gas supplies may resume from 03:00 Moscow time on September 3 after the completion of the repair of the only remaining gas pumping unit at the Portovaya compressor station, according to data from the operator of the German gas pipeline Nel.

https://tass.ru/ekonomika/15619865
September 1, 04:12,
updated September 1, 04:49

Peskov stated the lack of common sense of the European contractors of Gazprom"

Difficulties with maintenance of equipment installed at Nord Stream and legal problems due to sanctions "create a tangle of problems" for Russian gas supplies to Europe, Kremlin spokesman said

MOSCOW, 1 September. /TASS/. "Gazprom" wants and is ready to fulfill its obligations to supply gas to Europe, but this is hindered by the actions of the company's counterparties, Dmitry Peskov, press secretary of the President of the Russian Federation, said in an interview with reporters on Thursday.

Gazprom is ready and willing to continue fulfilling its obligations, but in this case, the European side has created legal and technological obstacles that prevent Gazprom from working," the Kremlin spokesman said.

"This is indeed a crisis situation," he stressed. “Of course, I would like to call to common sense these counterparties of Gazprom, but so far we can only state a large lack of common sense on their part,” Peskov concluded.

He forwarded a question to Siemens and Gazprom regarding the threat of a complete cessation of gas supplies through the pipeline due to problems with its maintenance. "The [equipment] manufacturer is Siemens, this is very high-tech equipment, it is unlikely that you can find many companies in the world that are able to service it. In addition, there are long-term service contracts," the Kremlin spokesman said.

He recalled that there is also "a legal problem" related to the fact that the contract was concluded with the British "daughter" of Siemens and it is difficult to fulfill it because of the "impressive package of sanctions" imposed by the British authorities against the Russian Federation.

“All this creates a tangle of problems for the work of the Gazprom company. This is not the tangle of problems that Gazprom itself created,” Peskov concluded.

https://tass.ru/ekonomika/15596293
August 30, 03:31,
updated August 30, 03:47

Peskov: only problems related to sanctions prevent gas supplies to the EU from Russia

Ordinary Europeans have to pay for EU gas decisions, Russian presidential spokesman said

MOSCOW, 30 August. /TASS/. Nothing hinders the supply of Russian gas to Europe, except for the technological problems associated with the sanctions, Russian presidential spokesman Dmitry Peskov told reporters on Tuesday.

Gas deliveries to Europe via the Nord Stream gas pipeline will be suspended for three days from August 31 due to the repair of the only gas pumping unit remaining in operation.

"There is a guarantee that nothing interferes with supplies, except for technological problems caused by sanctions. Russia was and remains ready to fulfill all its obligations," the Kremlin spokesman said in response to a question whether there are guarantees for the resumption of supplies along this route after the completion of work .

The decisions of the European Union in the gas situation are difficult to understand and impossible to explain, and ordinary Europeans have to pay for them, Peskov said. "This belongs to the sphere of those irrational actions of Europeans, which are very difficult to understand and, probably, impossible to explain, but for which ordinary citizens have to pay a lot," he said, speaking of the difficulties with the return of the turbine for the Nord Stream gas pipeline to Russia. Against the background of these problems and the shutdown of other units for repairs, only a part of the capacity of this gas pipeline is now being used.

https://www.transmountain.com/news/2022/trans-mountain-corporation-releases-second-quarter-2022-results?utm_source=Trans+Mountain+Updates&utm_campaign=9371d3563c-EMAIL_CAMPAIGN_12_2_2021_15_6_COPY_01&utm_medium=email&utm_term=0_f287e4f791-9371d3563c-30713878

Trans Mountain Corporation Releases Second Quarter 2022 Results

Aug. 29, 2022

In-line Quarterly Results and Continued Momentum on Expansion Project

Trans Mountain Corporation (TMC) today posted to its website the company's financial statements and associated management report for the three and six month periods ending June 30, 2022. The company's financial results were also included in Canada Development Investment Corporation's consolidated quarterly financial statements.

For the three-month period ended June 30, 2022, net income increased by $65.7 million to $128.8 million, as compared to $63.1 million in the same period of the prior year. The increase is due to the $76.6 million increase in equity AFUDC, the $8.9 million decrease in interest expense, net of capitalized interest, and the $0.4 million increase in Adjusted EBITDA, partially offset by the $21.5 million increase in income tax expense, and the $0.3 million increase in depreciation and amortization expense. The remaining movement in net income relates to changes in foreign exchange gains and losses, and other items.

Net income for the six-month period ended June 30, 2022, increased by $121.6 million to $236.0 million, as compared to $114.4 million in the same period of the prior year. The increase is due to the $143.7 million increase in equity AFUDC, and the $19.3 million decrease in interest expense, net of capitalized interest, partially offset by the $40.0 million increase in income tax expense, the $1.6 million decrease in Adjusted EBITDA and the $0.9 million increase in depreciation and amortization expense. The remaining movement in net income relates to changes in foreign exchange gains and losses, and other items.

The pipeline operated at full capacity for the quarter with an average daily throughput on the mainline of approximately 325,000 barrels per day, with 31,000 barrels per day to Westridge Marine Terminal and 218,000 barrels per day to Washington state on the Puget Pipeline. Pipeline capacity has been apportioned throughout 2022, as the barrels nominated to move on the system each month have exceeded available capacity.

"For the first half of 2022, the company's financial and operational performance remained strong. We continue to have steady demand for access to the markets Trans Mountain serves, including our unique access to tidewater," said Rob Van Walleghem, President (Interim), Trans Mountain Corporation. "We remain focused on safe construction of the Expansion Project and safe operations of the existing line while delivering on our strategic priorities for 2022."

"Work at our pump stations and facilities is more than 85 per cent complete, while construction in the Lower Mainland is approximately 70 per cent complete. Pipeline construction overall stands at over 50 per cent complete, with more than 550 kilometres of pipe in the ground. We are hitting significant milestones in each region," added Van Walleghem. "The Burnaby Mountain Tunnel, the 2.6-kilometre tunnel connecting Burnaby Terminal and Westridge Marine Terminal, is now more than halfway complete. Overall on the Project we anticipate substantial construction progress throughout summer and fall and we are targeting to be 80 per cent complete by year-end 2022."

As of June 30, 2022, the overall Project including upfront costs of permitting, regulatory approval, advance purchase of materials and financial carrying costs is approximately 65 per cent complete. Construction is more than 60 per cent complete, with $15.9 billion in capital spending incurred, including a total of $2.2 billion and $4.3 billion for the three and six months ended June 30, 2022, respectively. Trans Mountain expects that 2022 will see peak construction for the Expansion Project, with thousands of people working at hundreds of sites across Alberta and British Columbia. To date, Trans Mountain and our contractors have hired approximately 24,000 people, of which more than 10 per cent were Indigenous. As of June 30, 2022, 13,535 people are currently working on the Project in hundreds of communities across British Columbia and Alberta.

Trans Mountain anticipates completion of the Project in the fourth quarter of 2023. Trans Mountain's projected Adjusted EBITDA is expected to be approximately $1.7 billion in the first full year of the Expansion Project's operation and expected to grow annually thereafter. These projections are underpinned by long-term contractual commitments for 80 per cent of the system's 890,000 barrels a day of capacity.

During the quarter, Trans Mountain released its second environmental, social and governance report (ESG) report outlining the Corporation's results and aspirations through ESG principles. Although the greenhouse gas (GHG) emissions associated with operating a pipeline are relatively small, Trans Mountain is setting targets to reduce and/or offset scope 1 and scope 2 emissions, which will support the Government of Canada's ambition to reach net zero by 2050.

See the full financial statements and management report documents here. See Canada Development Investment Corporation's Quarterly Report here.

GAAP and Non-GAAP measures

We make use of certain financial measures that do not have a standardized meaning under U.S. GAAP because we believe they improve management's ability to evaluate our operating performance and compare results between periods. These are known as non-GAAP measures and may not be similar to measures provided by other entities. Adjusted EBITDA (earnings before interest, taxes, depreciation and amortization and equity AFUDC) is a non-GAAP measure we use to evaluate our operating performance absent the impact of financing decisions, non-cash depreciation and amortization, and non-cash equity AFUDC.

AFUDC (Allowance for Funds Used During Construction) is an amount recognized under U.S. GAAP by rate-regulated entities to reflect a return on the equity and debt components of capital invested in construction work in progress.

https://www.transmountain.com/news/2022/update-september-2022-capacity-announcement-for-the-trans-mountain-pipeline-system?utm_source=Trans+Mountain+Updates&utm_campaign=9371d3563c-EMAIL_CAMPAIGN_12_2_2021_15_6_COPY_01&utm_medium=email&utm_term=0_f287e4f791-9371d3563c-30713878

Update: September 2022 Capacity Announcement for the Trans Mountain Pipeline System

Aug. 31, 2022

Total system nominations for the Trans Mountain Pipeline system are apportioned by 8 per cent for September 2022.

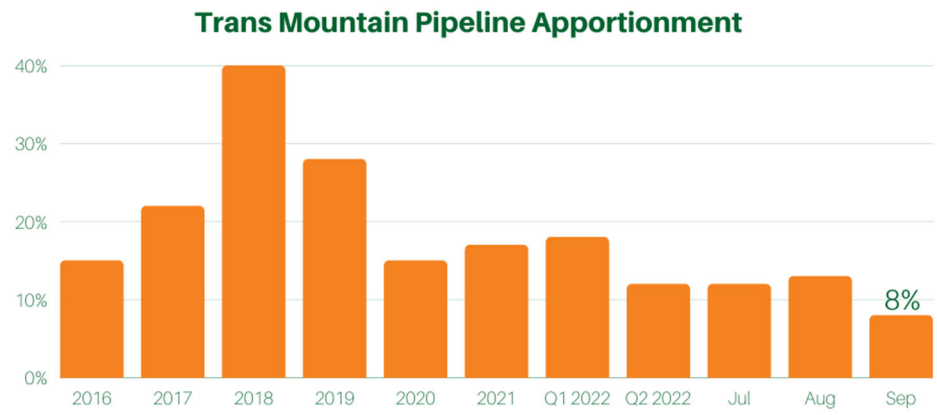
What is pipeline 'apportionment' and why is it important?

The energy sector around the world works on a monthly cycle. The Trans Mountain Pipeline is part of that cycle. Apportionment describes the amount of demand shippers place on the pipeline in excess of its available capacity. Here's a step-by-step guide to the apportionment determination that's carried out every month for the existing Trans Mountain Pipeline system.

- Each month our shippers submit requests for how much petroleum (crude oil and refined products) they want to ship through the pipeline to service their customers. These requests are called 'nominations'.
- Based on shippers' nominations, we then determine the 'capacity' available on the pipeline for the month. Determining pipeline capacity is complex. Capacity is affected by, among other things, the types of products that have been nominated, any pipeline system maintenance activities that will reduce flows that month and carry-over volumes that haven't completed their transit of the pipeline by month's end.
- Based on available pipeline capacity and the volume of shipper nominations we received, we calculate apportionment using a method accepted by the Canada Energy Regulator and forming part of our tariff. A tariff includes the terms and conditions under which the service of a pipeline is offered or provided, including the tolls, the rules and regulations, and the practices relating to specific services.
- If shipper nominations are less than pipeline capacity, the apportionment percentage to that destination is "zero" and all the product volumes nominated by shippers are accepted to be transported that month.
- If shipper nominations exceed pipeline capacity, the apportionment is a percentage greater than zero.

Trans Mountain Pipeline apportionment by the numbers

Apportionment of the Trans Mountain Pipeline system has been a regular monthly occurrence for the past decade. The chart below shows the apportionment for 2016, 2017, 2018, 2019, 2020, 2021 and apportionment to date for 2022.



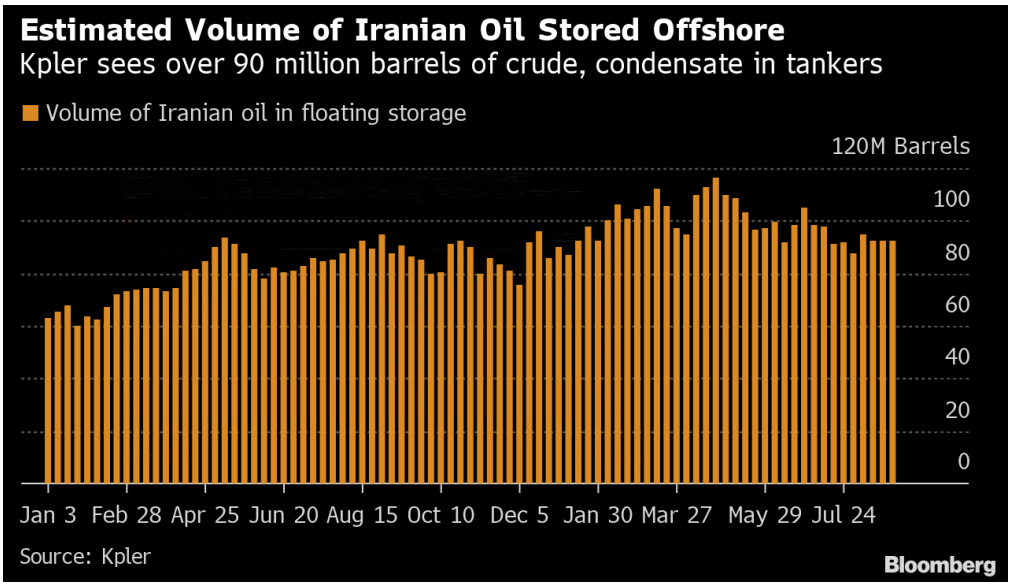
When a pipeline experiences significant and prolonged apportionment like in the case of the existing Trans Mountain Pipeline, it's one signal that more capacity is needed. Apportionment can bring with it a discounting of prices as producers compete to sell what they can through the pipeline before having to use another pipeline or other modes of transport to another, less profitable market. It can also mean the buyers at the end of the pipeline are forced to source their shortfall of supply from alternate, less desirable sources.

Business case for expansion is strong

There is a strong and clear business case supporting the Trans Mountain Expansion Project. Our shippers have made long-term contract commitments ranging from 15 to 20 years that will underpin the cost of construction and the operating costs. The additional capacity offered by the expansion will be used to supply more crude oil and refined products markets in British Columbia and Washington State and to offshore markets in the Asia Pacific. Pipeline design and operations, including emergency response and preparedness for tanker movements are world-class, providing a safe and reliable supply of petroleum products to the markets served by the Trans Mountain Pipeline.

Iran May Drain Offshore Crude Oil Cache If Nuclear Deal Reached
2022-08-28 23:34:37.544 GMT

By Sharon Cho
(Bloomberg) -- Progress toward an Iranian nuclear deal has thrown the spotlight onto a sizeable cache of crude held by Tehran that could be swiftly dispatched to buyers in the event an agreement gets hammered out.
About 93 million barrels of Iranian crude and condensate are currently stored on vessels in the Persian Gulf, off Singapore and near China, according to ship-tracking firm Kpler, while Vortexa Ltd. estimates the holdings at 60 to 70 million barrels. In addition, there are smaller volumes in onshore tanks.



“Iran has built up a sizable flotilla of cargoes that could hit the market fairly soon,” said John Driscoll, chief strategist at JTD Energy Services Pte. Still, it may take “a bit of time” to iron out insurance and shipping issues, as well as spot and term sales post-sanctions, he said.
The possible full readmittance of Iran to the global crude market, with the potential lifting of US sanctions, comes at complex moment for oil traders. Investors are juggling the countdown toward far tighter European Union curbs on Russian crude flows from December as part of the the bloc’s pushback against the war in Ukraine. In addition, the Biden administration’s mammoth sale from the Strategic Petroleum Reserve will end in October.
The potential return of Iranian barrels into global oil markets -- both from the volumes in floating storage and over the longer term -- has weighed on futures prices in recent weeks, offsetting signs of tightness elsewhere.
The focus for diplomats is the revival of a multinational accord that limited Iran’s nuclear program in exchange for the lifting of related sanctions, including on oil flows. The original deal collapsed after then-President Donald Trump

abandoned it. Last week, the US sent its response to the latest proposal, boosting speculation an agreement may soon be struck, although Tehran said Sunday that exchanges will now drag on into September.

Iran's offshore crude hoard compares with average daily global supply this year of about 100 million barrels a day, according to an estimate from the International Energy Agency. In the US, President Joe Biden has been releasing about 180 million barrels from the SPR over a six-month period.

Since former President Trump stopped granting waivers to import Iranian oil following American sanctions, Iran's daily shipments have held at about 1 million barrels, according to Emma Li, an analyst at Vortexa. China has remained among the top buyers, as other nations backed away.

Longer term after any deal is struck and the offshore cache is drained, Iran would seek to rebuild production and step up overseas sales. Goldman Sachs Group Inc., which is skeptical about a breakthrough in the near term, said even if a deal is reached, these wouldn't begin until 2023, according to a note.

While Iran may aim to fill the void left by Russia in Europe, namely in Spain, Italy, Greece and even Turkey, Tehran would also attempt to reclaim share in the prized Asian market, even if it takes a sweetening of terms, Driscoll said.

In 2017 and 2018, Europe consumed an average of 748,000 barrels and 528,000 barrels a day of Iranian oil, respectively, while Asia took 1.2 million and close to 1 million barrels a day, Kpler data showed.

"It's natural for Iran to want to supply Europe first to fill in the hole left by post-invasion sanctions against Russia," Driscoll said. "But in the longer run, they will be looking to place their barrels under long-term deals in Asia."

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SAF Group created transcript of comments by Mike Muller, Head Vitol Asia, on Gulf Intelligence Daily Energy Markets PODCAST hosted by Sean Evers, Managing Partner Gulf Intelligence, on Sept 4, 2022 at 10:30am (UAE time).
https://soundcloud.com/user-846530307/podcast-daily-energy-markets-september-4

Items in "*italics*" are SAF Group created transcript

On lack of oil spare capacity

At 9:50 min mark, Muller "*what we do need to keep in mind is that people do worry about spare capacity, not just geopolitical disruptions, but weather disruptions. And, of course, the entire sanctions picture. So I guess we will come back to price caps on Russia in awhile. But I think on the gas, the TTF, the market has had a very clear demonstration of what happens to price when there is a concern about capacity and effectively a rationing mindset. I mean that explosive move in TTF up to 343 euros per megawatt hour is something obviously we haven't seen in oil. But we have to bear in mind that in oil, there is less oil in the US SPR. That's at something like 20, 30 year lows after the interventionist measures that were enacted by the Biden Administration with a whole bunch of other countries acting in concert with that. And, at the same time, the period of price stabilization after Covid, OPEC+, is also over. and there is a big question mark over the what's next. So, by expressing a willingness to take oil off the market in response to either oil coming into the market from Iran sanctions being dropped or from lack of demand in China due to Covid repression measures, it's just serves as a reminder that we're not going to see everybody producing flat out. And therefore, I think we do need to bear in mind that there needs to be a risk premium for the lack of spare capacity in oil markets*."

On G7 oil price cap

At 16:50 min mark, Muller "*it's probably the most discussed topic in the last 24 hours on social media or specialist on-line media, and it's awfully hard to say Sean. The industry has obviously been aware of this desire to put in place such a cap for the last month and a bit. And has largely dismissed the possibility of doing so in a way that actually works. I think we have to bear in mind that Russia's production is a much larger number than Iran's production so you can't draw parallels about sanctions taking effect in Russia in the same way as Iran because Russia has the capability to produce 11 mmb/d of oil. That's 11% of global supply. And its exports of 7 plus mmb/d of crude oil and products combined are an even greater percentage of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that. Yes. If you look at what's happening with Nord Stream 1 and Nord Stream 2, there have been moments, days, weeks where all the Russian supply has been shut off to certain countries for various technical and I would argue political reasons. So a way must be found to allow Russian oil to continue to flow into markets because, unlike the inventory build of gas in Europe and people saying they might just get by with rationing, austerity measures and hopefully a mild winter than last year – That does not apply to oil. It's impossible for the world to get by without not having 7%, 7.5 mmb/d of exports. So what a price cap might seek to accomplish is the Russian oil goes to a larger number of markets under a framework that is actually more fungible. In so doing of course, the 1, 2, 3, 4 markets where most Russian crude oil is flowing now will flow once the sanctions take further effect later this year. will be spread out more widely. So thereffore discounts we are currently seeing in place on Russian crude oil and exports will possibly diminish at the same time that more participants are brought into the fold. But I have my own idea on how the price cap will actually be enforced. There is talk, of course, of exerting pressure on those pieces of the supply chain where the G7 that are driving this, have a certain degree of control such as shipping and insurance. I guess those are the levers that need to be further understood*."

On China

At 27:15 min mark, Muller "*so much to say and so little time, Sean. The 16th of October has come as a bit of a relief so we know when that Congress is taking place and everyone expects some degree of opening up of the travel restrictions we have seen. The world bereft of the Chinese tourists and businessmen which is so important here in Asia.*"

At 29:00 min mark, Muller "*now for China, the hope and my constant input into this meeting, as I am more of a China bull than most, is that things will get better and demand will improve. But right now, the headlines are going the other way with 10 plus million people locked down in various parts of China. The epicenter of Covid seems to be Shenzhen, just the hinterland of Hong Kong, the great tech megalopolis if you like; so that is weighing on sentiment for sure*."

At 30:15 min mark, Muller "*Many forces here. I mean as people know the demographics of China thanks to the one-child policy is not a rampant growth in the population. But there is a rampant growth in the affluence of the economy in the growth of the middle class and their consumption patterns. So I think you are going to see headlines dominated by the ever-present, ever-grand story and the fact that it was the Chinese construction sector, which is energy intensive of course, etc which weighed down on all the various indices we are looking at. But that's the very sector the government is now looking to boost and bolster with their very formidable reserves. So I think they are taking steps to counter that and I look forward to seeing evidence of greater outputs in industries like cement, ashphalt and paving, road building, etc which China still has some ways to go in certain provinces that haven't yet seen the huge wave of investments where literally in the last two decades, they have built a highway system equivalent to the interstates in the USA, criss-crossing various affluent provinces. So I think there is some running room to go in China."*

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

Oil price outlook – Snapshot: August 30, 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**	⇔	• Refinery margins were mixed over the past week, as stronger middle distillate cracks were offset by weaker product cracks in other parts of the barrel and higher natural gas input costs.
	Crude stocks	⇔	• In the week ending August 19, land crude-oil storage levels in BloombergNEF's tracked regions (the US, ARA and Japan) dropped by 1.0% to 533.7 million barrels (m bbl). The stockpile **deficit** against the five-year average (2015-19) **widened from 51.7m bbl to 53.5m bbl**. • Including global floating crude stockpiles from the same week, total crude oil inventories decreased by 0.9% to 643.5m bbl, with the stockpile **surplus narrowing from 19.7m bbl to 16.7m bbl.**
	Product stocks	↓	• In the week ending August 19, gasoline and light distillate stockpiles in BNEF's tracked regions (the US, ARA, Singapore, Japan and Fujairah) grew by 0.8% week-on-week to 263.2m bbl, with the stockpile **deficit** against the three-year average (2017-19) **narrowing from 9.5m bbl to 5.4m bbl**. Gasoil and middle distillate stockpiles in BNEF's tracked regions were up 0.4% to 141.7m bbl, with the stockpile **deficit** against the three-year average **narrowing from 43.4m bbl to 41.1m bbl**. • Oil product stockpiles in tracked regions grew by 1.3% to 962.5m bbl, with the stockpile **deficit** against the three-year seasonal average **narrowing from 65.6m bbl to 53.0m bbl**. Altogether, crude and product stockpiles rose by 0.4% to 1,605.9m bbl, with the stockpile **deficit narrowing from 45.9m bbl to 36.3m bbl.**
	Demand indicators	↑	• In the week to August 30, global jet fuel demand from commercial passenger flights fell by 0.5% to 5.71 million barrels per day. Jet fuel consumption by international passenger flight departures was up by 3,700 barrels per day (or +0.1%) week-on-week, while consumption by domestic passenger flight departures decreased by 32,400 barrels per day (or -1.3%). In the week to August 28, flight departures in the Eurocontrol area rose to 87.2% of the equivalent week in 2019, up from 86.4% last week. The four-week moving average, however, declined slightly to 87.5%, from 87.6%. Meanwhile, in the same week, US passenger throughput rose to 96.2% of the equivalent week in 2019, up from 91.1% last week. The four-week moving average increased to 91.6%, from 89.8%, the highest level since March 2020. • The global mobility index rose over the past week, according to BNEF's calculation based on Google mobility data. It increased by 1.6% in the week to August 25, driven by growth in Asia Pacific ex-China (+2.4%), Europe (+3.5%) and the Americas (+0.4%). Meanwhile, in the week to August 24, TomTom's peak congestion data showed surges in Asia Pacific ex-China (+10%), Europe (+16.5%) and North America (+7.4%). Road congestion in China's 15 key cities was up by 2.4 percentage points to 104.9% of January 2021 levels in the week to August 24, according to BNEF's calculation based on Baidu data. • In the week to August 23, global daily average Covid-19 cases fell by 9% to 758,000 new cases. The Americas number decreased by 23% to 134,000 daily cases, Europe dropped by 29% to 141,000 daily cases, and the Asia Pacific rose by 9% to 435,000 daily cases (with the number in **China more recently falling 38% to 1,821 cases** in the week to August 28).
Financial	**Macro indicators**	↓	• The dollar index averaged 108.7 over the past week and was 1.6% higher than the week before. The dollar is expected to be supported in the near term as US Federal Reserve Chairman Jay Powell affirmed his hawkish stance at the Jackson Hole symposium. • The flash US Manufacturing PMI fell to 51.3 in August, from 52.2 in July. The flash Eurozone Manufacturing PMI also dipped to 49.7, from 49.8 in the prior month.
	Hedge fund positioning	↑	• In the week to August 23, Managed Money net positioning in the oil complex was up by 70.4m bbl (or +17.0%) week-on-week to 484.5m bbl, and rose to the 14th percentile of the past five years. This was the largest increase in net length since the week to January 11, 2022.
	Options chains and volatility	↑	• Brent and WTI 1M volatility skews were higher over the past week.
Outlook	**Weekly call**	↑	• BNEF is bullish on oil prices for the week ahead, with Brent Nov-22 trading at $101.00/bbl and WTI Oct-22 trading at $95.40/bbl at the time of writing. • The global mobility index strengthened over the past week, with a slight uptick in year-on-year growth. The US Energy Information Administration (EIA) reported a 914,000-barrel-per-day decline in the weekly product supplied figure, the second largest of the year. Global jet fuel demand was flat week-on-week. The four-week moving average for air traffic in Europe remains capped below 90% of 2019 levels, while the four-week average passenger throughput in the US reached 91.6% of 2019 levels, **the highest point since March 2020**. • Weekly crude and oil product inventories saw a bearish move over the past week as their deficit levels against the seasonal averages shrunk. However, the middle distillate inventory deficit remains significant and could widen in the coming winter months in the Northern Hemisphere. • Comments from Saudi Arabian Energy Minister Prince Abdulaziz bin Salman that OPEC+ could consider cutting output in response to the downward volatility in oil flat prices has sent Brent prices back above the $100/bbl mark. With the next OPEC+ meeting due to take place on September 5, oil could see further buying pressure as the most "bearish" outcome seems to be keeping the group's production target unchanged. Traders are likely positioned for a rally as hedge fund's net positioning in the oil complex increased by the most since the week to January 11.

BloombergNEF

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
August 30	⇔	⇔	↓	↑	↑	↑	↑	Brent-Nov: 101.00 WTI-Oct: 95.40	
August 16	⇔	↓	⇔	↓	↓	⇔	↓	Brent-Oct: 93.65 WTI-Sep: 87.83	
August 9	⇔	↓	⇔	⇔	↓	↓	⇔	Brent-Oct: 97.60 WTI-Sep: 91.50	
August 2	⇔	↑	⇔	⇔	⇔	⇔	↓	Brent-Oct: 99.38 WTI-Sep: 93.42	
July 26	⇔	↓	⇔	↓	↑	⇔	⇔	Brent-Oct: 101.94 WTI-Sep: 98.46	
July 19	⇔	↓	↓	↓	⇔	⇔	↓	Brent-Sep: 105.88 WTI-Sep: 99.03	
July 11	↓	↓	↑	↓	↓	↓	↓	Brent-Sep: 105.18 WTI-Aug: 102.34	
July 5	↓	↑	↓	↑	↓	↓	⇔	Brent-Sep: 111.71 WTI-Aug: 107.91	
June 21	↑	↓	↑	↑	↓	↓	⇔	Brent-Aug: 115.81 WTI-Aug: 110.34	
June 13	⇔	↑	⇔	⇔	↑	⇔	⇔	Brent-Aug: 120.06 WTI-Jul: 118.58	
June 6	⇔	↑	↑	⇔	↑	⇔	⇔	Brent-Aug: 119.88 WTI-Jul: 118.94	
May 30	⇔	↑	↓	⇔	⇔	⇔	⇔	Brent-Aug: 116.46 WTI-Jul: 115.81	
May 23	↑	↑	↑	⇔	↑	↑	↑	Brent-Aug: 110.88 WTI-Jul: 111.11	
May 16	↓	↓	⇔	↑	↓	↓	⇔	Brent-Jul: 112.22 WTI-Jul: 109.69	

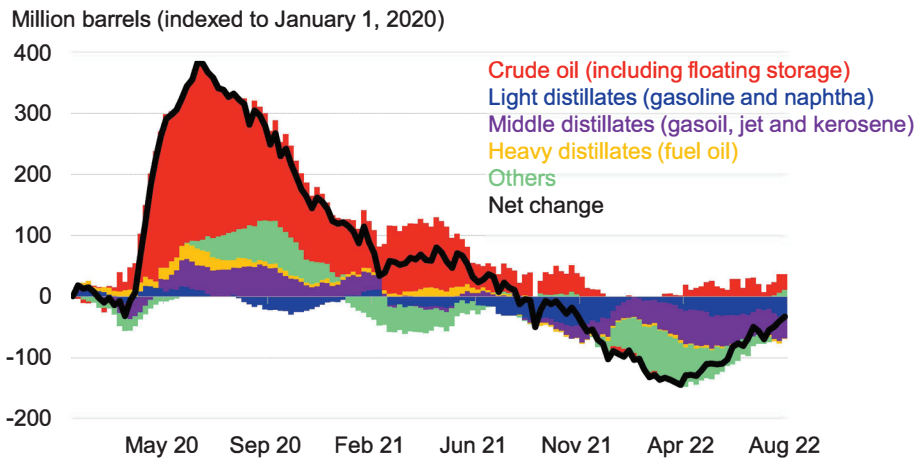
To view past reports on terminal, go to NI BNEFOIL, search for the report and click on the icon to the far right:

BloombergNEF

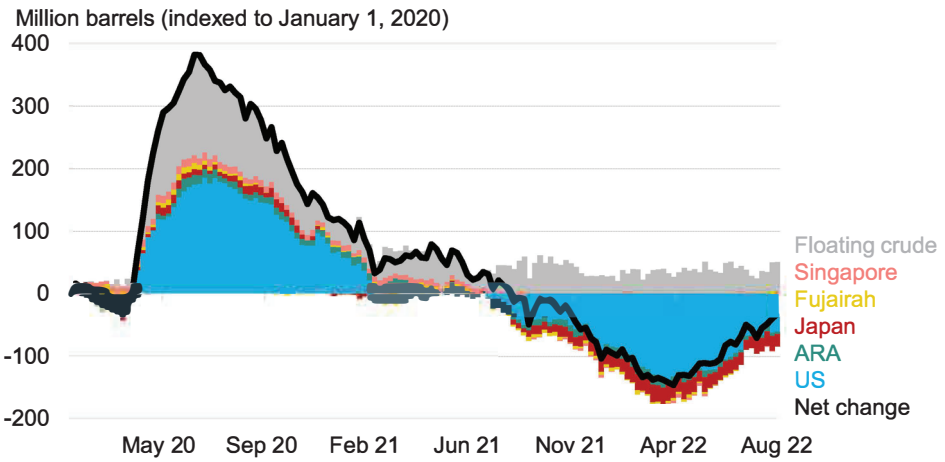
Weekly oil inventories

Uptrend in middle distillate stockpiles

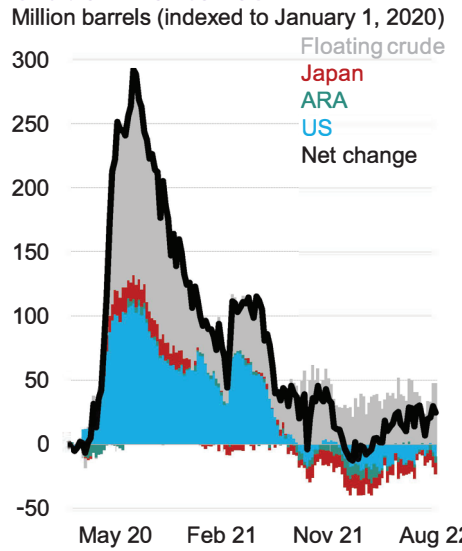
Weekly oil inventories by type



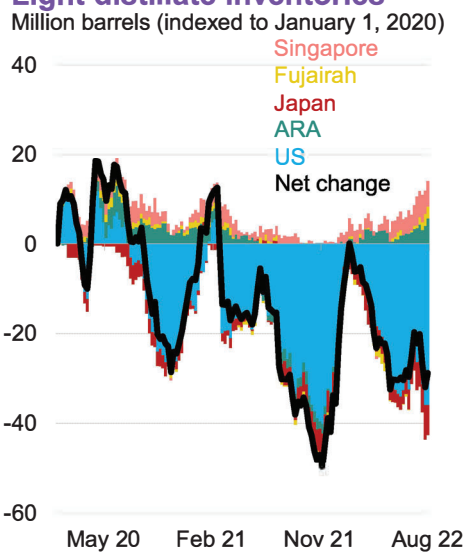
Weekly oil inventories by region



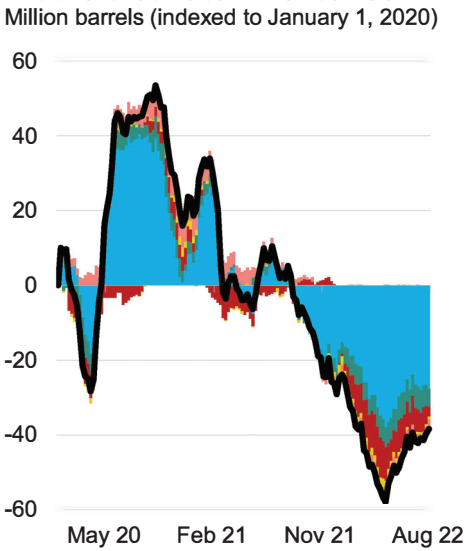
Crude inventories



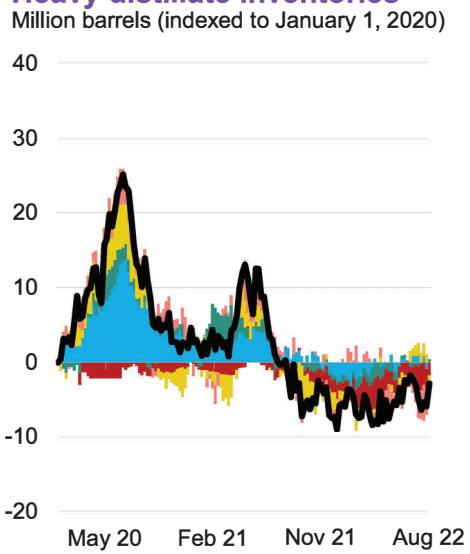
Light distillate inventories



Middle distillate inventories



Heavy distillate inventories



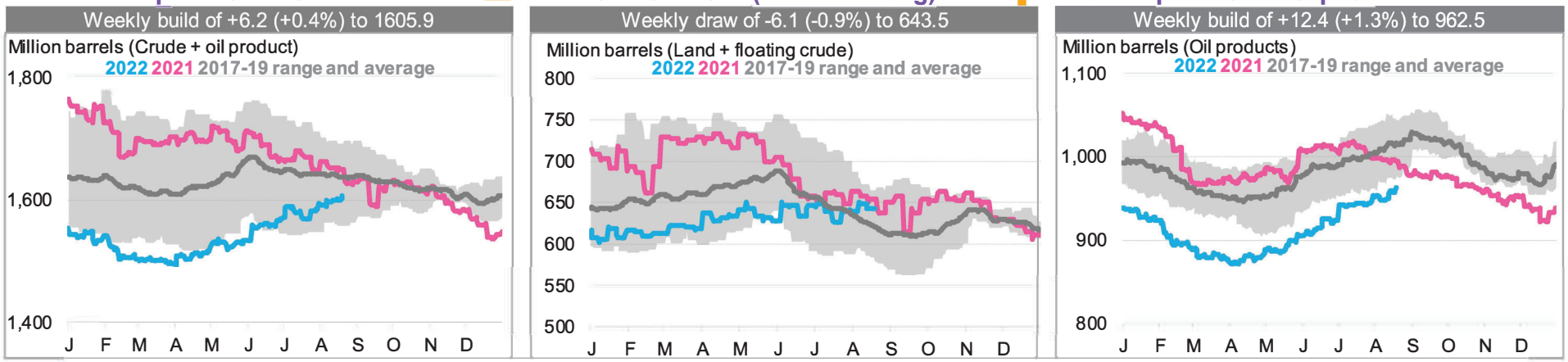
*Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ ,Vortexa, Genscape. Note: As of the week ending **August 19, 2022**.*

Aggregated oil stockpiles

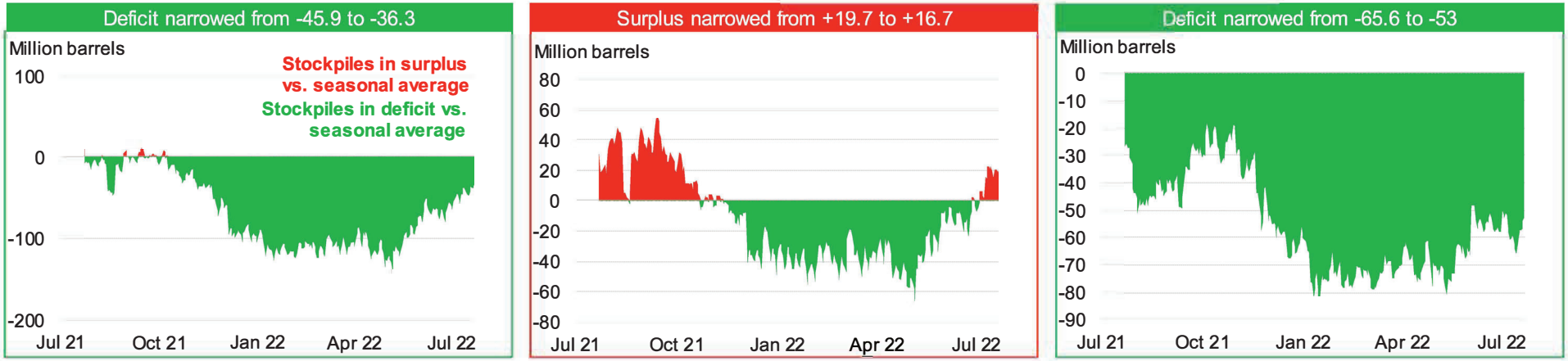
Bearish: Stockpiles deficit narrowed from 45.9m bbl to 36.3m bbl

- 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



*Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ ,Vortexa, Genscape. Note: As of the **week ending August 19, 2022.***

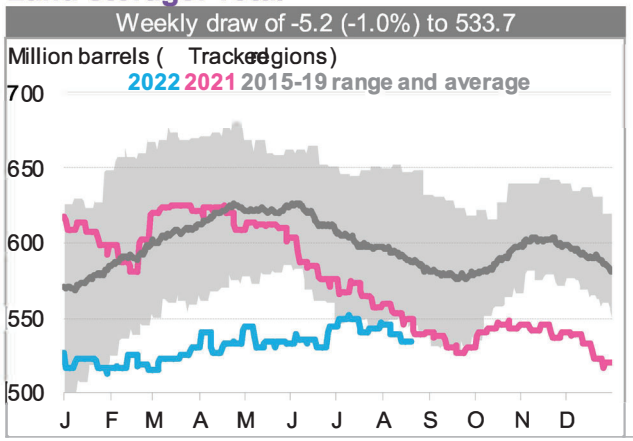
BloombergNEF

Crude stocks: Land

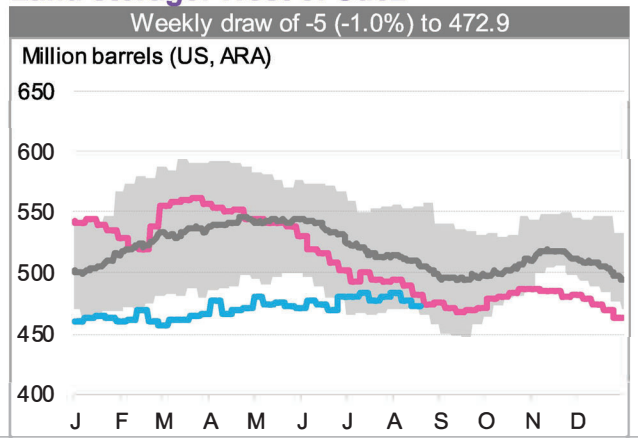
Neutral: Deficit widened from 51.7m bbl to 53.5m bbl against the seasonal average

- 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.

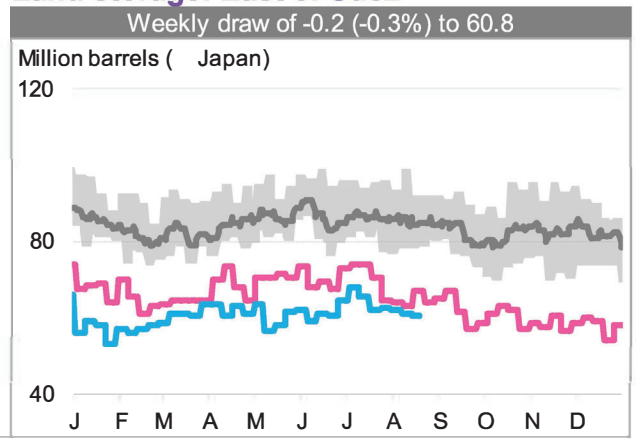
Land storage: Total



Land storage: West of Suez

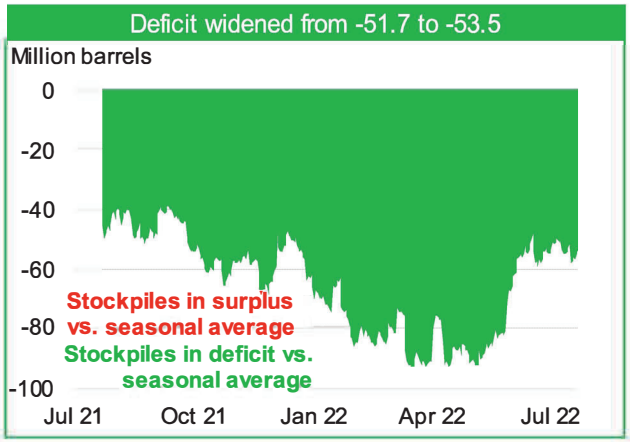


Land storage: East of Suez

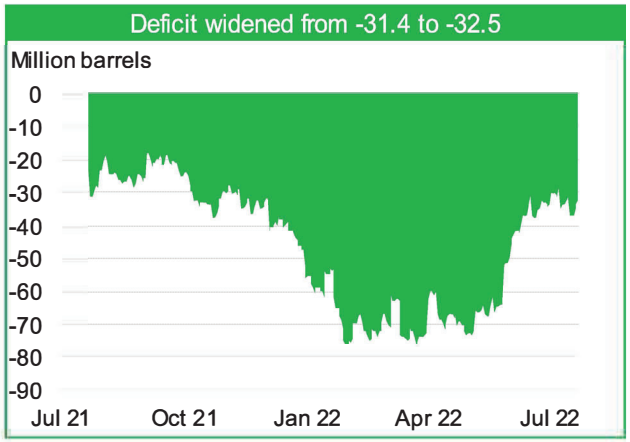


Charts below subtract current stockpiles by the 2015-19 (five-year) seasonal average

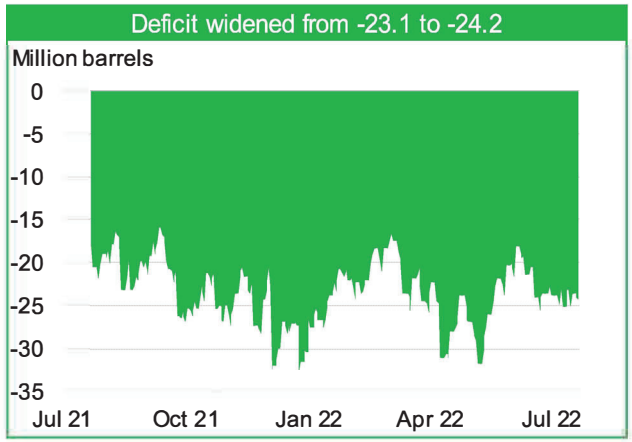
Deficit widened from -51.7 to -53.5



Deficit widened from -31.4 to -32.5



Deficit widened from -23.1 to -24.2



*Source: BloombergNEF, US EIA, Genscape, PAJ. Note: As of the **week ending August 19, 2022.***

BloombergNEF

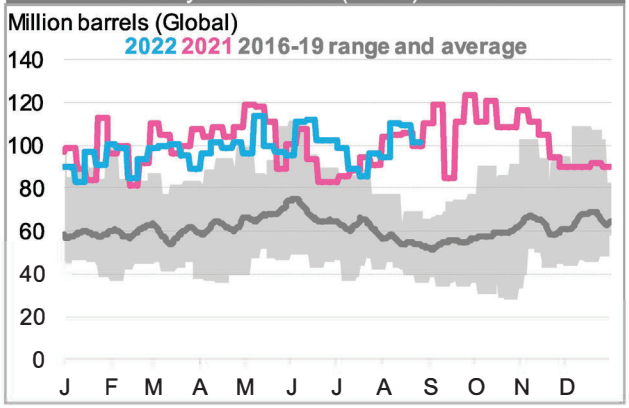
Crude stocks: Floating

Neutral: Surplus narrowed over the past week

- 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.

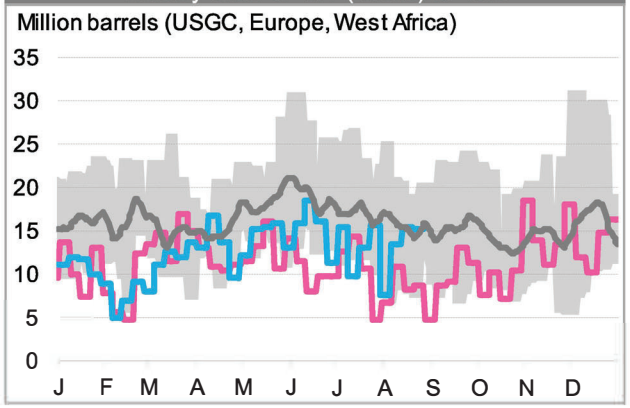
Floating storage: Total

Weekly draw of -8.1 (-7.3%) to 101.7



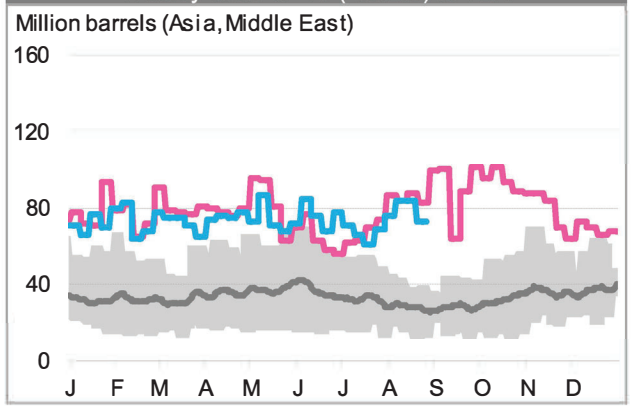
Floating storage: West of Suez

Weekly draw of -0.1 (-0.5%) to 15.3



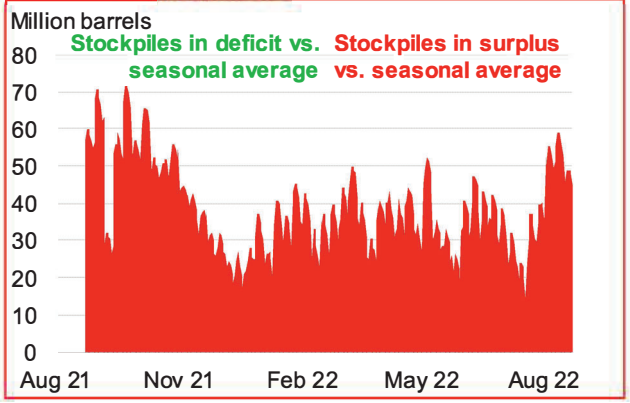
Floating storage: East of Suez

Weekly draw of -11 (-13.2%) to 72.4

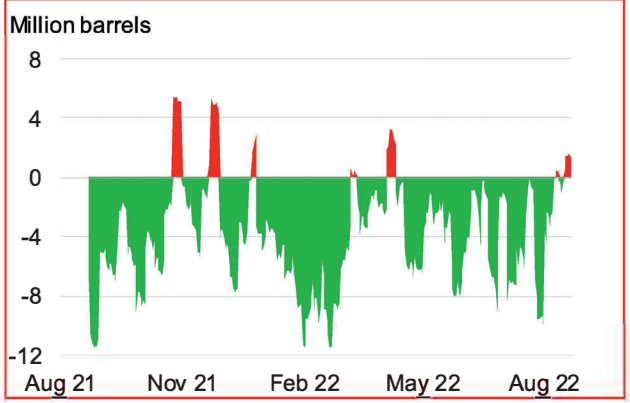


Charts below subtract current stockpiles by the 2016-19 (four-year) seasonal average

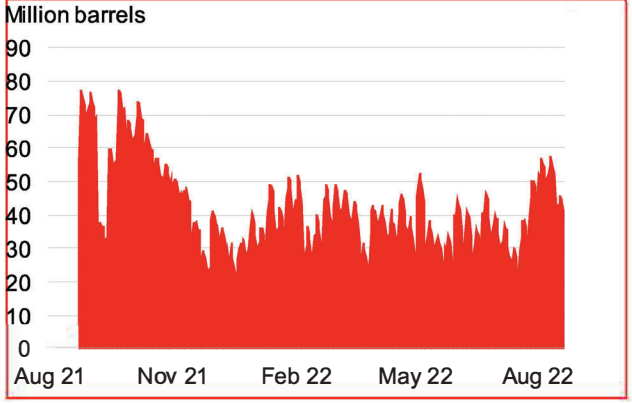
Surplus narrowed from +52.7 to +44.6



Flipped to surplus, from -1 to +1.3



Surplus narrowed from +52.7 to +41



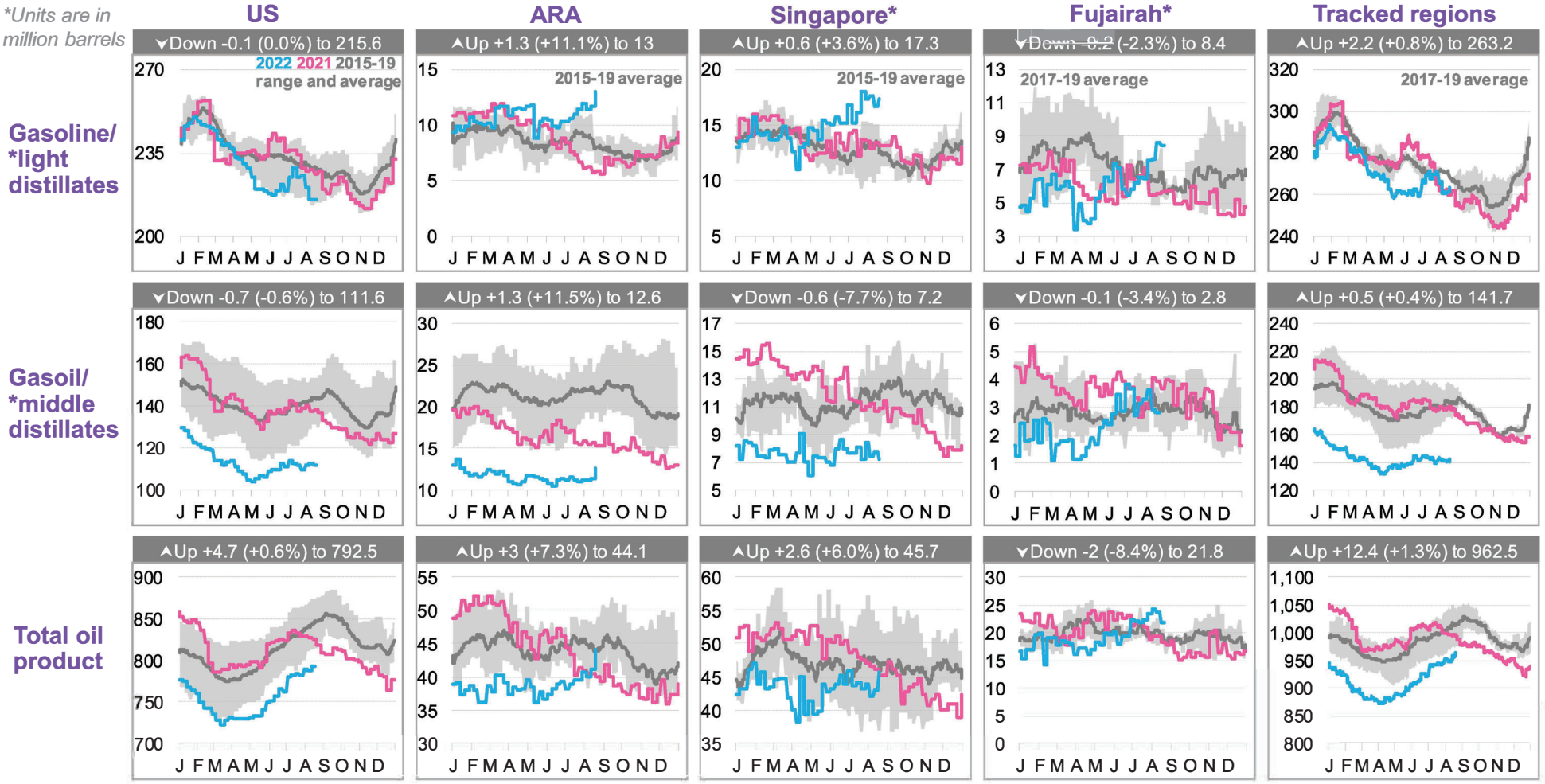
Source: BloombergNEF, Vortexa. Note: As of the ***week ending August 26, 2022****. *Raw data from Vortexa are revised frequently, so the data in this report might change week-to-week.*

Product stocks: Current versus seasonal average

Neutral: Oil product stockpiles in tracked regions grew by 1.3% 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 August 19, 2022.***

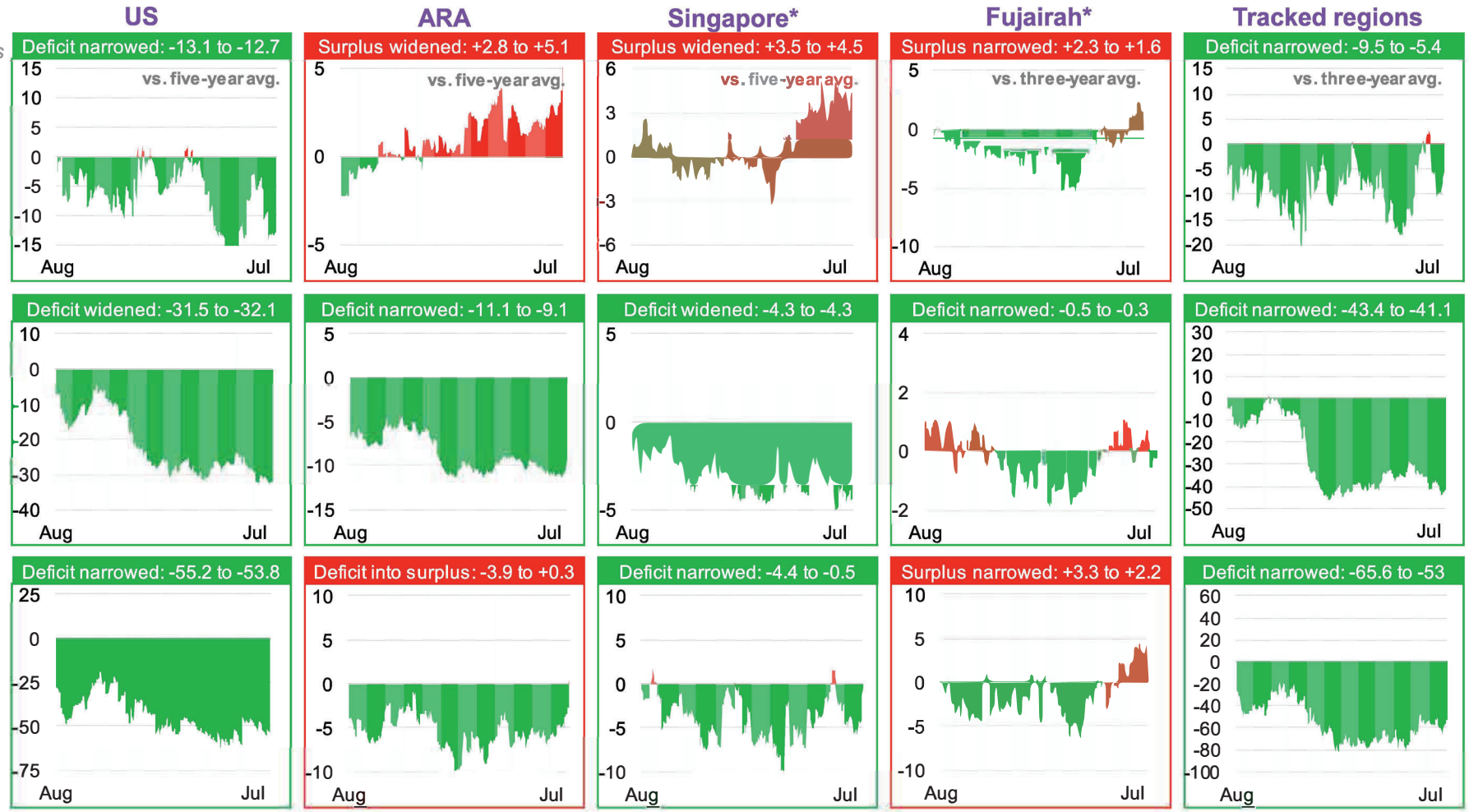
BloombergNEF

Product stocks: Current versus seasonal average

Neutral: Oil product stockpile deficit against the seasonal average narrowed from 65.6m bbl to 53.0m 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 August 19, 2022.***

BloombergNEF

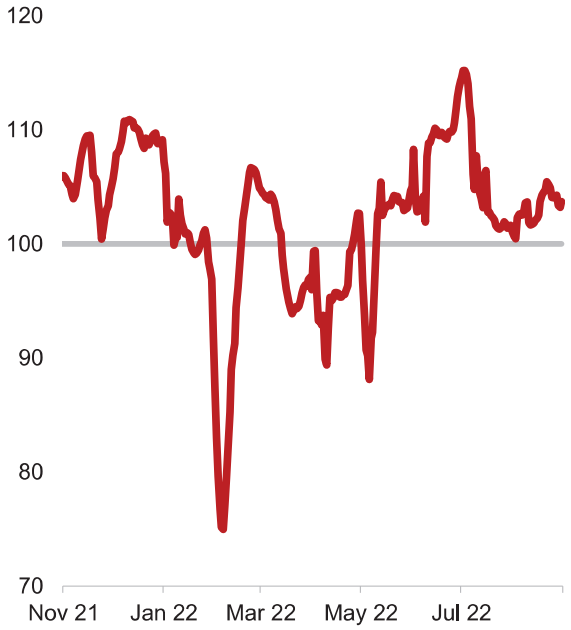
TomTom | Google | Baidu

Comparing the three mobility indicators

Europe and North America lead global uptick amid headwinds in China

China-15 (Baidu) congestion index

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

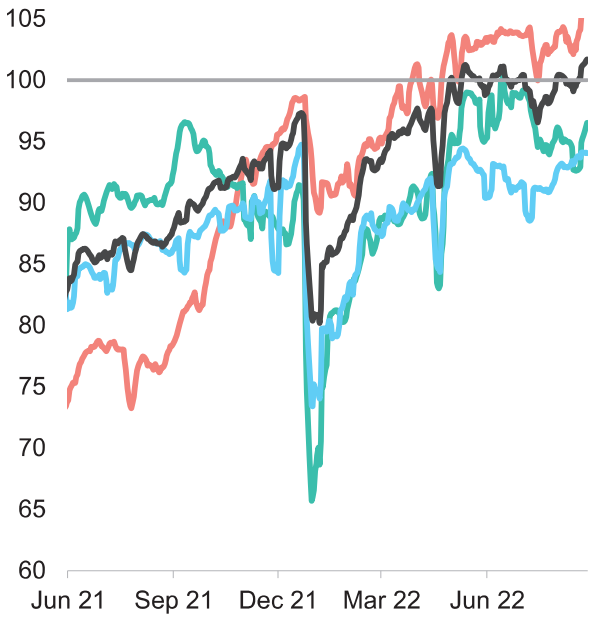


	Latest	Week Δ	Four-week Δ
China-15	103.70	-1.23 (-1.2%)	3.25 (+3.2%)

Source: BloombergNEF, calculated from Baidu's data.
*Note: Data updated to **August 31, 2022**.*

Google mobility index

Indexed to Jan – Feb 2020 (seven-day MA)

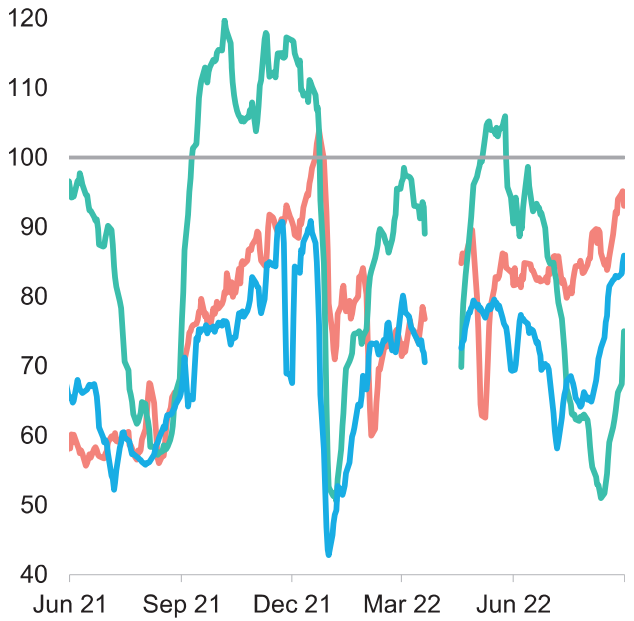


	Latest	Week Δ	Four-week Δ
Asia Pacific	106.3	2.3 (+2.2%)	3.5 (+3.4%)
World	101.7	1.6 (+1.6%)	2.5 (+2.5%)
Europe	96.5	3.8 (+4.1%)	1.3 (+1.4%)
Americas	94.1	0.26 (+0.3%)	2.1 (+2.3%)

*Source: Google Community Mobility Report, BloombergNEF. Note: **Data exclude China and Russia.** Calculation includes retail and recreation, workplaces, transport hubs. **Data updated to August 27, 2022.** The world index rating is weighted by the 2019 road fuels demand of each country.*

TomTom congestion index

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



	Latest	Week Δ	Four-week Δ
Asia Pacific	93.0	0.8 (+0.9%)	7.6 (+8.9%)
Europe	75.0	11.5 (+18.1%)	16.6 (+28.4%)
North America	85.9	2.9 (+3.5%)	20.8 (+31.9%)

*Source: TomTom road congestion data, BloombergNEF. Note: **Asia Pacific excludes China. Data updated to August 31, 2022.***

BloombergNEF

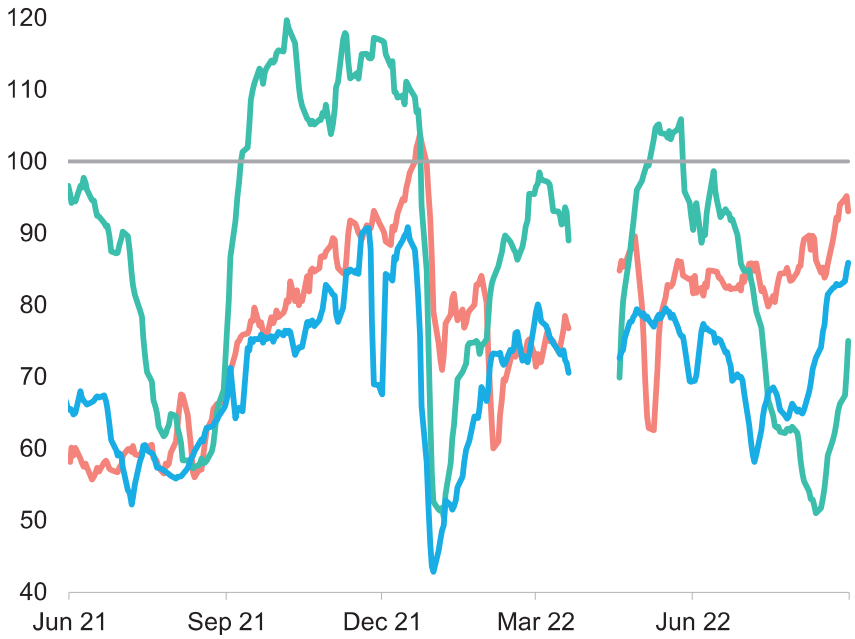
Apple Mobility reports were discontinued on April 14, 2022. We have resumed updating TomTom congestion data, which was previously updated to March 16.

TomTom congestion index

All regions continue upward trend, with strong surge in Europe

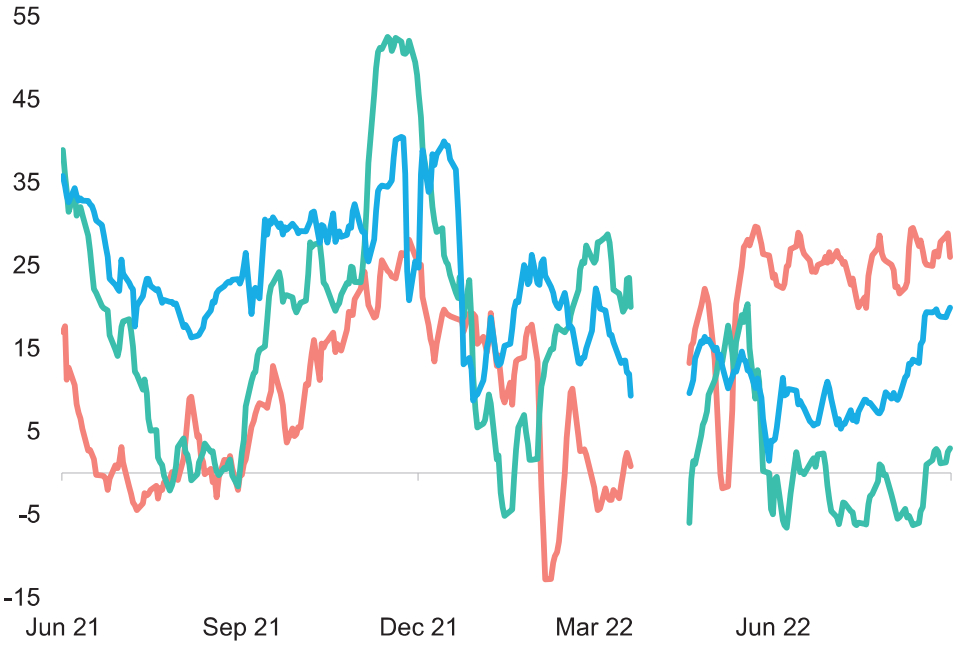
Regional road-congestion index

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	Index point Δ vs year before	Index point Δ vs year before (last week)
Europe	**75.0**	11.5 (+18.1%)	16.6 (+28.4%)	2.10	1.34
Asia Pacific	**93.0**	0.8 (+0.9%)	7.6 (+8.9%)	27.46	25.76
North America	**85.9**	2.9 (+3.5%)	20.8 (+31.9%)	19.18	19.37

Source: TomTom, BloombergNEF. Note: ***Asia Pacific excludes China. Data updated to August 31, 2022,*** *with weekly addition from August 24, 2022. Index point change versus the previous year is obtained by averaging the latest weekly values.*

Embargoed until 0945 CST (0145 UTC) 1 September 2022

Caixin China General Manufacturing PMI™

Power cuts weigh on manufacturing sector performance in August

China's manufacturing sector saw a slight deterioration in overall business conditions during August, as power cuts and temporary factory closures weighed on output and sales. Production rose at the softest pace for three months, while intakes of new work fell for the first time since May. Subdued demand conditions led firms to cut back slightly on their purchasing activity and inventory levels, while workforce numbers fell modestly. Lower prices for some raw materials, notably metals and chemicals, led to the first fall in input costs since May 2020, which led firms to cut their output charges for the fourth month in a row.

The headline seasonally adjusted *Purchasing Managers' Index™ (PMI™)* – a composite indicator designed to provide a single-figure snapshot of operating conditions in the manufacturing economy – fell from 50.4 in July to 49.5 in August, to signal the first deterioration in operating conditions since May. That said, the rate of decline was only marginal.

Contributing to the sub-50.0 PMI reading was a renewed fall in total new business at Chinese manufacturers. Though only slight, it marked the first drop in sales for three months. Panellists commented that generally subdued market conditions, power cuts and lingering COVID-19 impacts had all dampened overall sales. Foreign demand also fell back into contraction, with new export business decreasing modestly.

Production growth meanwhile eased to a marginal pace that was the softest seen for three months. While there were reports that output was still recovering from pandemic-related disruption, power supply issues and temporary factory closures due to the recent heatwave had constrained overall growth.

Staffing levels at Chinese manufacturers fell for the fifth month in a row, as a number of firms mentioned company downsizing policies due to lower intakes of new work. The rate of job shedding eased from July, however, and was only modest. At the same time, backlogs of work were stable in August, following two months of decline. According to panel members, disruption to power supplies and production schedules had limited their ability to process and complete outstanding business.

Muted customer demand impacted buying activity, which fell for the first time in three months, albeit only slightly. At the same time, firms readjusted their inventory levels and registered mild drops in stocks of both post- and pre-production goods.

Vendor performance deteriorated for the second month in a row, albeit at a marginal rate. Power cuts at suppliers and lingering COVID-19 disruption were cited as key factors weighing on vendor capacity and lead times in August.

Average input costs fell for the first time since May 2020 during August. Though modest, the rate of reduction was the quickest seen since the start of 2016. Firms often stated that lower prices for some raw materials had helped to pull down expenses, with metals and chemicals mentioned in particular. Efforts to boost competitiveness and attract sales meant that savings were partially passed onto clients, with selling prices falling at the quickest rate since May.

Although Chinese manufacturing firms were generally confident that output would rise over the next year, the level of sentiment was unchanged from July and below the historical trend. Panellists stated that concerns over how long the pandemic will disrupt operations, a deteriorating global economic outlook and sluggish demand conditions all weighed on their projections for the year ahead.

China General Manufacturing PMI

sa, >50 = improvement since previous month

Sources: Caixin, S&P Global

Key findings:

Output growth slows as firms face power supply disruption amid heatwave

New orders decline for first time in three months

Input costs fall at quickest rate since January 2016

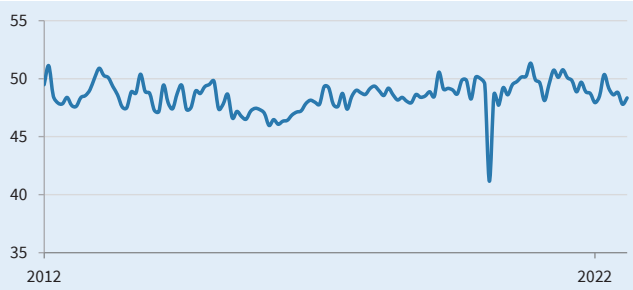
New Export Orders Index

sa, >50 = growth since previous month

Sources: Caixin, S&P Global

Employment Index

sa, >50 = growth since previous month



Sources: Caixin, S&P Global

Commenting on the China General Manufacturing PMI™ data, Dr. Wang Zhe, Senior Economist at Caixin Insight Group said:

"The Caixin China General Manufacturing PMI came in at 49.5 in August, down from 50.4 the previous month. A resurgence of Covid-19 infections, coupled with a prolonged heat wave, weighed on the manufacturing sector.

"Manufacturing supply expanded while demand shrank. Although output increased for the third successive month, the rate of expansion was marginal due chiefly to power cuts caused by the heat wave. The subindex for total new orders fell into contraction, with overall market demand dampened by high temperatures and the resurgence of Covid-19 infections in some parts of the country. For similar reasons, new export orders experienced their first drop for three months.

"Employment at manufacturers remained weak. The employment subindex recorded a contraction for the 12th time in the past 13 months, as firms cut staff to save costs. All three types of goods producers — which make consumer, investment and intermediate goods — registered varying degrees of staff reduction in August, with investment-goods makers recording the largest downsizing.

"On the other hand, inflationary pressure eased. Lower prices of some commodities, notably metals and chemicals, led to lower operating expenses and the first fall in average input costs since May 2020. This led to manufacturers cutting output prices for the fourth month in a row and at a steeper rate in an effort to boost sales in the face of subdued demand.

"Supply chains across the sector remained stable in August. The Covid-19 flare-ups and power cuts mildly affected logistics, with average lead times for inputs increasing at a marginal pace. Driven by weakness in the overall market, manufacturers kept lower stocks of raw materials and finished goods.

"Chinese manufacturers remained optimistic. The degree of positive sentiment was unchanged from July, albeit below the historical average. Concerns were raised by firms regarding the resurgence of Covid-19 and a deteriorating global economic outlook.

"Overall, the Covid-19 flare-ups, the extreme heat wave and restricted power usage resulted in a slight deterioration in overall business conditions in the manufacturing sector. Supply remained stronger than demand, with the latter recording a contraction. The job market remained weak, while lower input costs and output prices eased inflationary pressures. At the same time, firms were cautious about increasing purchases and inventory levels. Market sentiment remained optimistic, although some were worried about the global economic outlook.

"Right now, the economy is still slowly recovering from a widespread outbreak of Covid-19 in the first half of the year. Yet, local flare-ups and the punishing heat wave have disrupted the trend and created new downward pressures, posing a threat to the recovery. Although the central bank has recently cut key policy interest rates to guide banks to lower financing costs for companies and individuals, the effect will depend on market players' confidence about the future. In the face of adverse factors such as recurring Covid-19 cases and natural disasters, there needs to be further subsidies and assistance for poor and low-income groups amid a sluggish job market and shrinking consumer demand."

Excerpt Bloomberg terminal transcript

IAEA Director Addresses Media After Zaporizhzhia Nuclear Power Plant Visit; Gazprom Halts Gas Supplies Through Nord Str..
2022-09-03 10:32:10.493 GMT
<**Show: ISA SOARES TONIGHT**> <Date: September 2, 2022> <Time: 14:00:00> <Tran: 090201cb.k43> <Type: SHOW>
<**Byline: Isa Soares**, Sam Kiley, Anna Stewart, Kara Scannell, Stefano Pozzebon, Bianca Nobilo, Kristin Fisher>
[14:00:00]

RAFAEL GROSSI, DIRECTOR-GENERAL, INTERNATIONAL ATOMIC ENERGY AGENCY: The power plant which is controlled by the Russian-occupying forces, creating a situation whereby you have a co-habitation of the operators, people, Ukrainians, people and police, and professional experts that have been working there.

And there are -- there's also presence from Russian-nuclear experts and also medical reports. We don't put it for the record for one reason. Yes, and it is that the plant continues to operate and there's a professional modus vivendi, if I can put it like that. They work together, and the plant, as it is obvious, because it has been operating two units as of today, are still operating, including unit number 5, which was scrapped a couple of days ago, and now is back in operation.

So, all the physical conditions are there and the plant continues to operate. The same code we are applying to off-site power plant. This has also been a matter of enormous concern and interest around the world, because as you know, if you don't have off-site power supply, the cooling systems for the reactors cannot work.

If they -- and if they cannot work, these can lead to a major accident. We have seen on several occasions, that there have been blackouts or interruptions of one or two or three of the lines feeding the plant from outside. At the moment, there's -- there are two operational, and what we know also is that, when there was one situation of a total, complete blackout, that these are the generators operated normally.

We visited them. I saw them. I was talking to those in charge of that part of the operation of the plant. Logistical aspect supply chain. This is important in terms of the replacement. You have to think about Zaporizhzhia, which is the biggest nuclear power plant in Europe, also as a big industrial facility.

As any industrial facility needs spare parts, there are things that need to be replaced, and so on and so forth. Given the enormous situation of a war, it is obvious that logistical chains are interrupted. We were -- by probing about it -- about this, we were discussing with people on site, and the impression that they gave us is that, here, there are no major problems.

There are some interruptions, hence, the qualification we are putting here.

And in the case of the radiation, monitoring an emergency response, we have -- we have had some complete interruptions against the half-read situation, but also some systems are working well. So we do see a mixed back.

In terms of reliable communications with the regulator, it is also an operating function with some difficulties. So, this gives you a bird's eye view of a situation which we are, of course, not wanting to analyze in any way. We believe, and I continue to believe that the situation is extremely complex, extremely challenging, and it will continue to require the permanent support and the monitoring that we are trying to provide now that we are there.

So, now that I gave you this general overview, I am open to your questions. Thank you very much.

GROSSI: Well, you know, I think we have to be looking at the main points, and when it comes to the main points, first of all, it's the physical integrity. Why?

[14:10:00]
And here, I don't -- I will not get into that. But I will simply mention that it is obvious that there is a lot of fighting in the region in general, in this part of Ukraine. So, the military activity and operations are increasing in that part of the country. And this worries me a lot. This worries me a lot. There are references to offensives, counteroffensives, I don't want to get into that, because it's not my domain, but it is obvious, and we all know it and everybody acknowledges it on site.

So, it is obvious that the statistical possibility of more physical damage is present. Let me give you an example. The physical damage to the plant, with the exception of the event on the night of the 3rd to the 4th of March with this fire, the shelling actually started in August.

So, it is quite clearly a more recent trend, if I can call it like that. So, what we see with this increase of military activity is that the physical integrity is more compromised. And with that, we -- I take you to four. I take you to the power supply, because it is clear that those who have this aim, these military aims, know very well that the way to cripple or to do more damage is not to look into the reactors which are enormously sturdy and robust, but to, you know, hit where it hurts.

So, the plant becomes, you know, very problematic. So, my concern would be, you know, the physical integrity would be the power supply and of course, the staff. So, these are the areas, the rest are things that we can work on, radiation systems, supply chains all very important. All very important, but of course, they have a lesser degree, if you want dramatism, when it comes to what -- if I have to address your question directly. Thank you. Next.

UNIDENTIFIED MALE: (INAUDIBLE), how sure are you that there's a union, that both sides will be able to stay for long? And though, there will be a moment when it is (INAUDIBLE).

GROSSI: Well, how sure I am? You know, we can never be sure, what we need to do is always try and to improve. If you look at what we have now, it is far better that what we used to have, now I have my people. I was there. We have a big team there, we have people who are going to stay there, this has tremendous value. This is a huge difference,

And of course, if something happens or if any limitations comes, they are going to be reporting it, they'll be reporting it to us. It is no longer a matter of A said this, and B said the contrary. Now, the IAEA is there. And this is like I said, from night to day. In terms of the people being there, naturally for me, the safety of my people is the first thing.

You remember that I said I will never send somebody to a place where I don't go myself first. And this is what I have been doing. Now that we know that we have a certain degree, a system that is working, we have our people there. And it has been very challenging. Of course, we are -- we are looking at this, they are in constant communication with us if something happens of course, we will take the necessary measures. Thank you.

ISA SOARES, HOST, ISA SOARES TONIGHT: You have been listening to the Director-General of the IAEA, Rafael Grossi, who of course has just returned from Ukraine, from that Zaporizhzhia nuclear power plant. He's been inspecting it, he is just returning, he's speaking to us from Vienna, five members of his team remain at the power plant, as you just heard there, Mr. Grossi said.

[14:15:00]

And he had at the beginning, he had like a spotlight system where he was talking us through what he's seen, his team is seeing. He talked about the physical integrity of the nuclear power plant, the physical integrity of the facility. Said the physical integrity of the nuclear power plant, which of course, has been caught in the center of intense hostilities and fighting.

He said it's been violated several times. Because that's what he said. He said he saw impact, hole markings on buildings, all from shelling. He said the situation is complex and the situation is challenging. He's expected to release a report coming out over the weekend, that he's -- that's what he was talking about.

But he's worried about the shelling, and he's worried about, of course, the possibility of course, of further damage, given that of course, we've seen increased activity. He says situation is unprecedented at the power plant

and the damage at the facility, he said is unacceptable.

Let's go to Sam Kiley who is in the city of Zaporizhzhia for us this hour, and he was listening in. So, Sam, what stood out to you from what you heard there from Sam Grossi -- from Rafael Grossi, of course, who's just returned from Zaporizhzhia?

SAM KILEY, CNN SENIOR INTERNATIONAL CORRESPONDENT: I think the stand-down technical issue, which is one that we've been highlighting on CNN, is the issue that he drew attention to, and suggested that it was deliberate, which was the cutting of power supplies into the nuclear power station from the outside.

He said that in his view, military planners and military experts knew enough about the integrity of the plant. They knew that the reactors and other things were extremely robust. But if you wanted to be able to do damage to the plant, then you would sever the power supplies into the plant, which would drive the cooling systems.

Now, we know that, that has happened at least twice in the last seven days. Just while the IAEA were there on the ground, reactor number 5 was disconnected from the main power source, had to go to the backup diesel generators. And a few days prior to that, a similar incident affected both number 5 and the other working reactor there.

In all of these cases, if the power supply fails completely, in other words, the back-up generators fail, run out of diesel, break down, something like that, then you could end up with a Fukushima o Chernobyl-type situation. A meltdown of the radioactive core within the reactors. So, he's very concerned about that, it was interesting he didn't draw attention to any of the video that we've seen emerging from their visit.

In which, the Russians have got trucks parked inside the facility, the Ukrainians have said that they could even be carrying explosives on those trucks. He made no judgments and point any fingers, very studiously avoided apportioning blame, didn't identify where the shelling was coming from. But did say that having the inspectors there puts an end to the A says something and B says something else against them, that the he said, she said-type activity that we've seen in terms of claim and counterclaim over the last couple of weeks.

SOARES: Yes, exactly. What he said is being there, the difference of being there, of inspecting, of being on the grounds, the difference between night and day. Of course, what we have seen for weeks on end, that you have seen, you've been reporting on this, Sam, is the fact that the both sides have been blaming each other. In the meantime, we -- from what I understand, and correct me if I'm wrong, Sam, we still have five members from the IAEA, they're still on the ground, they continue to inspect, is that correct?

KILEY: Actually, he said six. So the IAEA had said that they'd left five, he's updated that figure to six. They may stay just through the weekend as part of the initial reporting team, and then he said that the longer term, there will be at least a minimum of two inspectors on the plant permanently in the future, of course.

Whether they're able to stay there during periods of intense combat, this is a dangerous area, there have also been widespread allegations against the Russians for the disappearance, torture, and other pressure being put on Ukrainians in and around the nuclear power plant. It's going to be very difficult indeed to operate there as independent observers and work freely of the Russian military occupied forces.

This is a country that invaded a democratic nation in order to seize territory, topple its government and to seize the nuclear power station. This is completely without historic precedents.

SOARES: Yes, talks of course, about how the both sides seem professional inside the plant, but clearly, tensions palpable. Sam Kiley for us there this hour in Zaporizhzhia, Ukraine, thanks very much, Sam, appreciate it. Well, Russian energy giant Gazprom says that it will indefinitely halt gas supplies through the Nord Stream 1 pipeline due to an oil leak.

Now, it follows, if you remember, a 72-hour shutdown of the pipeline earlier this week. The news comes on the same day that G7 nations agreed to impose a cap on the price of Russian oil.

Independent Statistics & Analysis
U.S. Energy Information Administration

Country Analysis Executive Summary: China

Last Updated: August 8, 2022

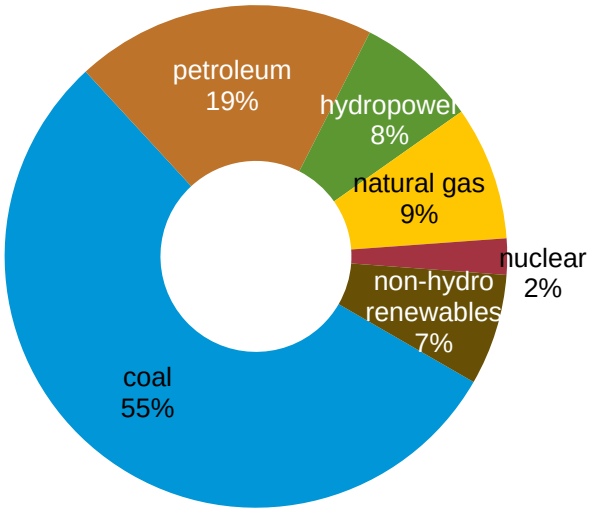
Overview

- China is the world's most populous country (1.4 billion people in 2020) and has a fast-growing economy. It was the largest energy consumer and producer in the world in 2020.[1] We expect that China's energy demand will continue to increase.
- China's real GDP grew by 8.1% in 2021, which is a significant increase from the 2.2% growth in 2020 during the height of global COVID-19 lockdowns. The global coronavirus pandemic decreased industrial and economic activity and energy use within China, and the resurgence of COVID-19 cases and China's policy of localized lockdowns are likely to make the Chinese government's 2022 target GDP growth of 5.5% more difficult to achieve.[2] Prior to 2020, China's economy grew by an average 8.9% per year between 2010 and 2019.[3]
- China issued the *14th Five-Year Plan* (2021–2025) *for National Economic and Social Development of the People's Republic of China* (the Plan) in 2021. The Plan, which sets out China's strategy for industry planning and policy through 2025, covers the following energy-related themes:
  - Increasing and advancing the country's technology innovation and manufacturing sectors, which include innovative energy technology focused on making renewables more efficient, cost competitive, and reliable. Hydrogen for both energy and energy storage is one of the focal points of the Plan. Innovation for fossil fuels, as well as nuclear, will be targeting efficiency.[4]
  - Prioritizing China's low-carbon and carbon-neutral initiatives to achieve its 2030 and 2060 climate goals of peak carbon emissions and carbon neutrality. Unlike the previous *Five-Year Plan,* coal consumption does not have a targeted cap, but instead it increases the target for flexible power sources (24%) and demand-side response capacities (3%-5% of maximum load).[5] The Plan sets a goal for annual natural gas production to increase to 8.1 trillion cubic feet (Tcf) and installed generation capacity to increase to 3.0 terawatts (TW). The Plan also sets targets to increase non-fossil energy to reach 20% of primary consumption and 39% of power generation.[6]

- Increasing building energy efficiency and green building development, primarily through installed capacity of building integrated photovoltaics (BIPV) on new buildings to exceed 50 gigawatts (GW) by 2025.[7]

- Coal supplied about 55% of China's total energy consumption in 2021, down from 56% in 2020 and 70% in 2001.[8] Petroleum and other liquids is the second-largest fuel source, accounting for 19% of the country's total energy consumed in 2021. Although China has diversified its energy supplies and has replaced some oil and coal use with cleaner burning fuels in recent years, hydroelectric sources (8%), natural gas (9%), nuclear power (2%), and non-hydro renewables (7%) accounted for relatively small shares of China's energy mix. However, natural gas, nuclear power, and renewable energy consumption steadily increased between 2001 and 2021, which offset the drop in coal use[9] (Figure 1).

Figure 1. Total primary energy consumption in China by fuel type, 2021



Data source: BP Statistical Review of World Energy 2022
Note: Total may not equal 100% because of independent rounding.
Includes only commercial fuel sources and does not account for

Petroleum and other liquids

Exploration and production

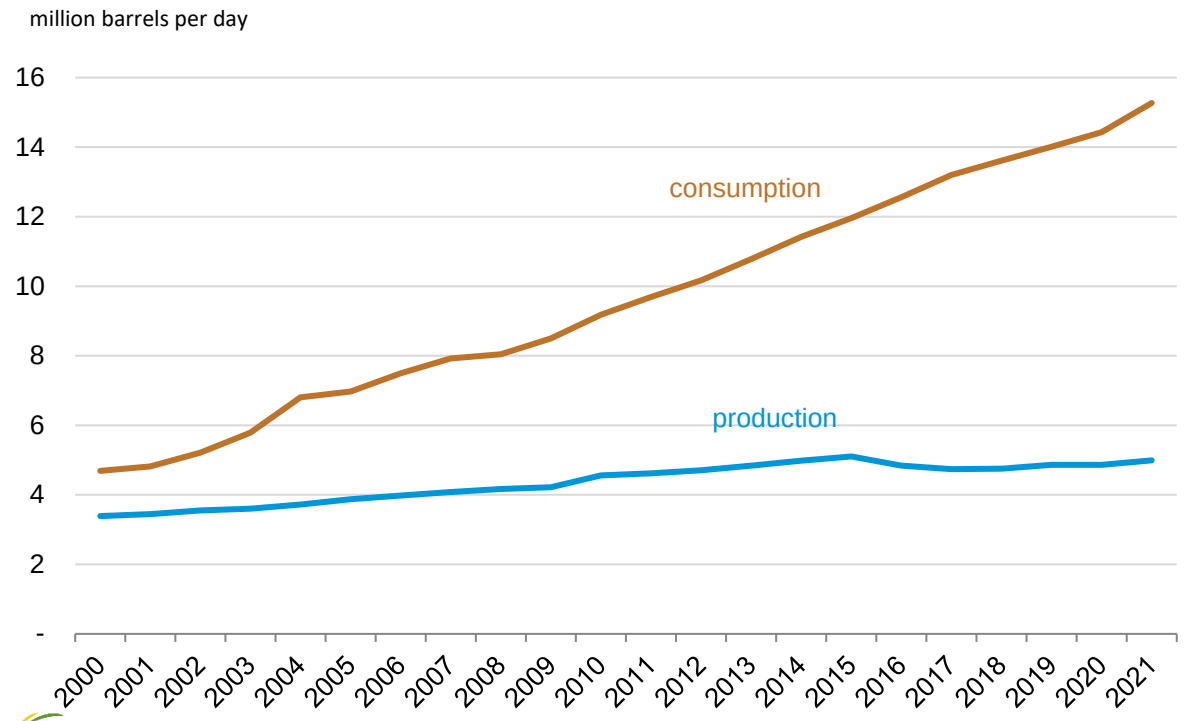
- Although China was the fifth-largest petroleum and other liquids producer in the world in 2021, most of the production came from legacy fields that required expensive enhanced oil recovery techniques to sustain production. In 2021, production increased by 130,000 barrels per day (b/d) to just under 5 million b/d (Figure 2). Nearly 80% of the total liquids production was from crude oil, and the remainder was from converting coal and methanol to liquids, biofuels, and refinery processing gains.[10]
- Coal-to-liquids (CTL) production was an estimated 124,000 b/d, and methanol-to-liquids production was around 508,000 b/d in 2021.[11] China is attempting to monetize its vast coal reserves by converting some of the coal into cleaner-burning liquid fuels to bolster its petroleum sector.
- After the government expressed the importance of exploration and production of crude oil in May 2022, China's National Energy Agency set a domestic crude oil production target of approximately 1.5 billion barrels for 2022.[12] This target is a 2% increase from 2021's target.[13]
- In response to China prioritizing energy security, the national oil companies (NOCs) have announced that capital expenditures (CAPEX) will increase by 4.6% in 2022 compared with 2021. If realized, PetroChina and Sinopec will have the second- and third-highest CAPEX globally for 2022 of any national oil company, behind only Saudi Aramco. Sinopec's $31 billion in expenditures would be the highest in its history.[14] Sinopec's target for crude oil production is 281.2 million barrels in 2022, an increase of almost 1.5 million barrels from the previous year.[15] PetroChina is targeting 898 million barrels, a 1.2% increase from 2021.[16] CNOOC's planned CAPEX is similar to last year at approximately $14.1 billion.[17] CNOOC has several projects slated for startup in 2022 that will add 38 million barrels annually to the company output.[18]
- The Bohai oil field, China's largest producing field, is located offshore in the northeast and produced over 603,000 b/d in 2021. Bohai surpassed the Daqing field for the first time in 2021. Daqing field was the country's largest oil field for several decades, and its output was slightly less than Bohai's, at 600,000 b/d in 2021[19]

Consumption

- An estimated 15.3 million b/d of petroleum and other liquids were consumed in China in 2021, up 840,000 b/d, or approximately 6%, from 2020 (Figure 2). [20]
- Diesel (24%) and gasoline (23%) accounted for the largest shares of oil products consumed since 2000. However, the pace of oil demand growth in the transportation sector has declined since 2015.[21] In 2020, main drivers of an overall decrease in oil use for transportation were:
  - China's lockdown measures in response to COIVD-19 outbreaks
  - An economic slowdown

  Other drivers that contributed to the decline were:
  - Stricter environmental measures
  - Restrictions on urban vehicle use
  - A higher penetration of alternative fuel vehicles (electric vehicles, compressed natural gas vehicles, and trucks and trains running on liquefied natural gas)[22]
- China's battery electric, plug-in hybrid electric, and fuel cell electric vehicle industry, set a record in sales in 2021, when sales increased 181% from 2020.[23] China implemented national fuel emission standards equivalent to Euro VI.[24] These fuel emission standards, which were first introduced in 2005, will be fully implemented by 2030.[25]

Figure 2. China's petroleum and other liquids production and consumption, 2000–2021



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

Refining

- China's refining sector has undergone some changes recently that include eliminating market advantages for some refiners and improving efforts to decarbonize. In 2021, the government imposed a consumption tax on imported mixed aromatics and light-cycle oil.[26]
- China's oil refining capacity has increased during the past decade to meet growing demand for petroleum products and to improve the sector's capability to process a wider range of crude oil types. Some of the new projects have integrated refining and petrochemical facilities into one complex. China's installed crude oil refining capacity reached about 18.2 million b/d in 2021.[27]
- An additional 1.1 million b/d of capacity will be added by the end of 2022. Zhejiang's Rongsheng facility's Phase II began commercial operation in early 2022 with 400,000 b/d of capacity.[28] Shenghong's refinery in Lianyungang, with a capacity of 320,000 b/d, started its trial operation in 2022.[29] PetroChina's Jieyang refinery, with a capacity of 400,000 b/d, will start operations in the second half of 2022.[30]

Petroleum and other liquids storage

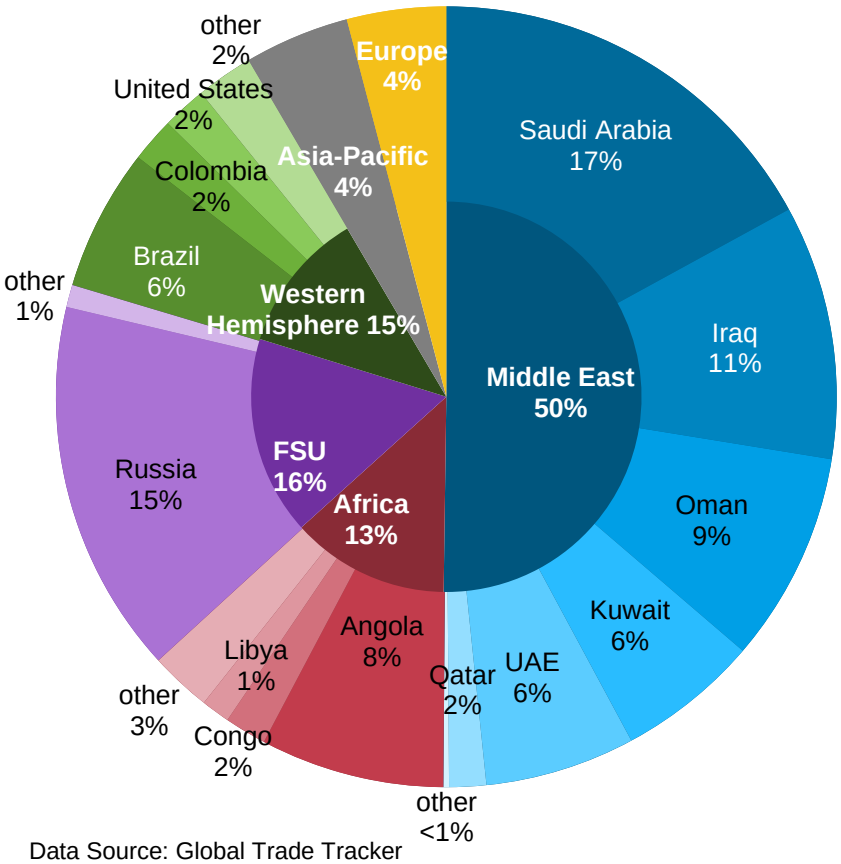
- China releases limited information on its crude oil inventories and stockbuilding progress. Industry and trade press outlets assess that Beijing has been swiftly filling its strategic petroleum reserves (SPR) since 2016, and estimate that China has more than 300 million barrels of crude oil stored in at least 12 SPR facilities.[31] In addition, China has a sizeable amount of commercial storage capacity that when combined with the country's strategic reserves totaled 1.2 billion barrels at the end of 2020, according to industry analysts.[32]

- In September 2019, China's government announced that it had 80 days of crude oil inventories to cover its imports. [33] Analysts believe China's goal for its SPR program of 90 days of import coverage was likely achieved by the end of 2021.[34] Industry analysts suggest that China continued to build its oil storage reserves through the first half of 2020 to take advantage of the low crude oil prices.[35] In 2021, crude oil imports decreased from the previous year by approximately 5%.[36]
- In 2021, China's National Strategic Oil Reserve Centre had its first-ever public crude oil reserves auction, which was for about 7.4 million barrels.[37]

Trade

- China has diversified its sources of crude oil imports in recent years. Although oil imports have greatly increased during the past decade, imports in 2021 decreased for the first time since 2001. China, which became the world's largest crude oil importer in 2017, imported 10.3 million b/d of crude in 2021, a more than 500,000 b/d decrease from 2020.[38]
- Saudi Arabia, which historically has been a significant source of China's crude oil imports, became the largest source of imports in 2021, with a 17% share.[39] Saudi Aramco signed new long-term crude oil supply agreements with Chinese companies in early 2019.[40] Since then, imports from Saudi Arabia have increased by 86,000 b/d. [41]
- Russia was China's second-largest source of crude oil imports in 2021 (Figure 3). [42] Crude oil imports from Russia began to increase following new upstream production from Eastern Siberian fields, construction of pipeline and transmission infrastructure between the countries, and China lifting a crude oil import ban on independent oil refineries in the country's northeastern region in 2015. In early 2022, China National Petroleum Corp (CNPC) and Russian oil producer Rosneft extended an existing 10-year contract, which was signed in 2013. Rosneft will supply approximately 200,000 b/d to China over 10 years as part of the contract extension.[43]
- Countries in the Middle East made up 50% of all crude oil imports in 2021, including Saudi Arabia, Iraq, United Arab Emirates, Kuwait, Qatar, and Oman. [44]
- Sanctions on Iran's crude oil and condensate exports have significantly reduced China's imports of oil from Iran, starting in the latter half of 2018. Imports of oil from Iran fell to less than 1% of China's imports in 2021 compared with 8% in 2016, according to China's official import data. [45] However, in April 2022, analysts estimate imports from Iran ranged between 575,000 and 650,000 b/d, which would account for approximately 7% to 8% of imports for that month.[46]
- Imports from United Arab Emirates (UAE) has more than doubled in the past three years, increasing from 307,000 b/d in 2018 to 642,000 b/d in 2021.[47] The increased imports from the UAE have, in part, offset the decrease in Iran's share of China's imports.
- Crude oil imports from the United States declined significantly from the 2020 average of 481,000 b/d to 248,000 b/d in 2021. [48]

Figure 3. China's crude oil imports by source, 2021



Data Source: Global Trade Tracker
Note: Total may not equal 100% because of independent rounding. FSU refers to

Natural gas

Exploration and production

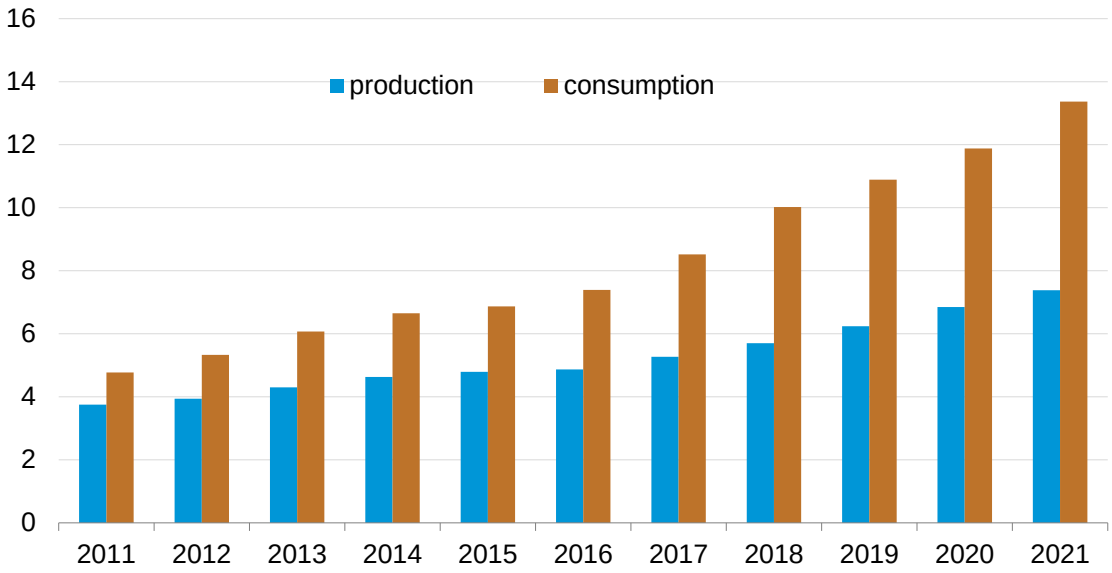
- China's natural gas production has been steadily rising during the past several years. China's NOCs produced an estimated 7.4 trillion cubic feet (Tcf) of natural gas in 2021, 8% higher than in 2020 (Figure 4).[49] China's shale gas production in 2021 reached 803 Bcf and has grown annually at 21% since 2017. Coalbed methane reached 365 Bcf in 2021, which was 5% of total production.[50]
- China's 14th Five-Year Plan (2021–2025) for National Economic and Social Development of the People's Republic of China (the Plan) and its *Energy Works Guidance* 2022 targets natural gas production to reach 7.6 Tcf in 2022 and 8.1 Tcf by 2025. However, to reach production targets set in 2022 and beyond, China will have to overcome certain obstacles.[51] Although China has significant natural gas reserves, estimated at 235 Tcf at the end of 2021,[52] much of the reserves have low permeability and porosity. Another challenge is technical difficulty associated with China's shale gas. To date, only a few shale gas projects are ongoing, despite the government's push to develop these resources.[53]

- Sinopec plans to increase domestic natural gas production to 1.26 Tcf in 2022.[54] PetroChina's target of 4.6 Tcf in 2022 includes increased production from the Tarim Bozi-Dabei region, the central Sichuan province, and the shale development in southern Sichuan.[55]
- China's offshore natural gas production increased 11% from 2020 to 407 Bcf in 2021, mostly from production growth in the South China Sea. CNOOC, China's major offshore producer, has two offshore projects coming online in 2022, which are expected to add 11 Bcf.[56]

Consumption

- Natural gas accounted for 9% of total energy consumption in 2021.[57] China's natural gas consumption rose by 13% in 2021 to 13.4 Tcf from 11.9 Tcf in 2020.[58] Between 2011 and 2021, China's natural gas demand increased by about 11% per year on average, making it the world's third-largest natural gas consumer behind the United States and Russia (Figure 4).[59] Weather-based factors and a rebounding economy drove the demand growth in 2021.[60]
- Several factors have contributed to growth in natural gas consumption during the past few years. Poor air quality (particularly in urban areas of northeastern China, where heightened coal use in the winter causes smog and dangerous levels of pollution) prompted the government to enforce fuel switching from coal to natural gas for industrial use, power generation, and residential and commercial heating. In 2021, main drivers of consumption growth were a decrease in the availability of hydropower combined with a cold winter and a summer that was warmer than average which increased residential demand. Increased industrial production also added to higher demand for the year.[61]
- China's coal-to-gas switching for heating has been an important factor in demand growth. China's *Clean Winter Heating Plan*, which spanned from 2017 to 2021, had a target of 70% clean heating through natural gas-fired or electric-powered boilers.[62] In 2020, the Ministry of Ecology and Environment (MEE) set a target goal for over 7 million households to switch from coal to natural gas in 28 northern cities.[63]

Figure 4. China's natural gas production and consumption, 2011-2021
trillion cubic feet

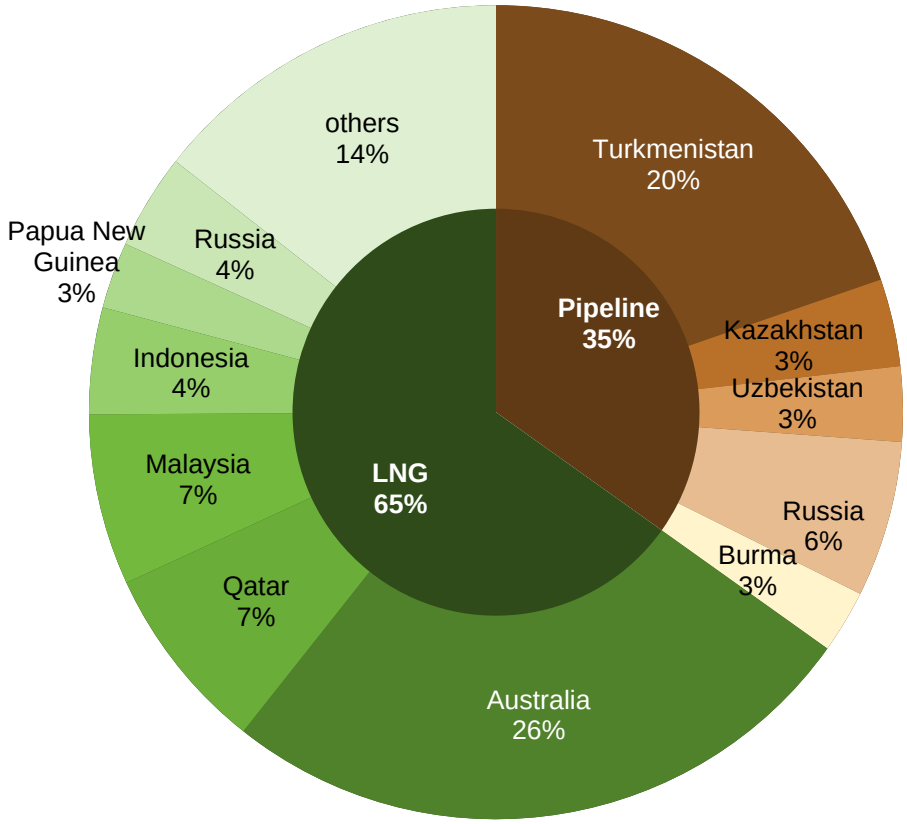


Data Source: BP Statistical Review of World Energy 2022

Liquefied natural gas

- To fill the widening gap between China's domestic natural gas production and demand, both pipeline and liquefied natural gas (LNG) trade has increased. China, the largest natural gas importer in the world, became the largest LNG importer in 2021, surpassing Japan.[64] LNG imports accounted for 65% of total imports, and pipeline imports, mostly from Turkmenistan, accounted for 35% (Figure 5).[65]
- LNG imports climbed to 3.8 Tcf in 2021, rising 19% compared with 2020. LNG imports have increased each year from 2015 to 2021 as a result of lower global LNG prices and China's coal-to-gas switching policies.[66] Even as China's economic growth slowed in 2020 and COVID-19 outbreaks caused lockdowns, LNG imports still grew by 11% from the previous year. China's LNG import facilities had their highest recorded regasification utilization in 2021, reaching 84%.[67]
- China has diversified its LNG suppliers during the past few years, and Australia has been its largest supplier, accounting for 40% of LNG imports in 2021.[68] Purchases from new natural gas liquefaction projects in Australia began in 2016.
- In 2019, China raised the tariffs on LNG imports from the United States from 10% to 25%.[69] In 2021, several long-term contracts to purchase LNG from the United States were signed, including a 20-year contract between Sinopec and U.S. Venture Global LNG to purchase 194 Bcf of LNG annually.[70] LNG imports from the United States grew and reached 1.2 Bcf/d in 2021.[71] The United States was also the largest spot LNG supplier to China in 2021.
- As of 2022, China had 23 LNG regasification terminals, with a combined capacity of 4.8 Tcf.[72] China completed expansions on three terminals in Qidong, Zhejiang Ningbo, and Shanghai in 2020, adding 235 Bcf in capacity. Companies in China are quickly building various terminals, and another 3.6 Tcf of import capacity is slated to come online by 2024.[73]
- China's rapidly growing natural gas demand during the past five years has opened up opportunities for independent, or non-NOC, energy companies in China to operate in the LNG market. Several local state-owned municipalities, natural gas distributors, and power developers own stakes in existing LNG terminals. Private company Chaozhou Huafeng Group converted one of its liquefied petroleum gas terminals into an LNG-receiving terminal.[74]
- China's government has initiated policies to promote LNG bunkering along its waterways. LNG bunkering is when LNG is transferring from distribution point to a ship as fuel (rather than fuel oil). In 2022, Shanghai Port became China's first port to provide this capability.[75]
- In late 2021, Shanghai Petroleum and Natural Gas Exchange started China's first spot LNG price index. Both state-owned enterprises and independent LNG importers approve of a China-based spot price.[76]

Figure 5. China's natural gas import by source, 2021



Data source: Global Trade Tracker

Note: Total may not equal 100% because of independent rounding. LNG refer to liquid natural gas.

Pipeline imports and infrastructure

- China's domestic pipeline infrastructure is undergoing significant development, and the government's goals are to increase the country's natural gas pipeline coverage and to improve market competition along the value chain of natural gas sales. The government created a national oil and natural gas pipeline company, the China Oil & Gas Pipeline Network Corporation (PipeChina), in December 2019. Its purpose is to centralize control of China's oil and natural gas pipelines and storage facilities from NOCs China National Petroleum Corp (CNPC), China Petroleum and Chemical Group (Sinopec), and China National Offshore Oil Company (CNOOC). Centralizing control of these three companies will allow open access to non-state-owned entities to the infrastructure, which will create competition.[77] In 2020, PipeChina purchased pipelines and storage facilities from PetroChina and Sinopec for $55.9 billion.[78]
- In late 2021, PipeChina began construction on the middle segment of the West-to-East natural gas pipeline project. The pipeline's full length is just short of 1,300 miles, which runs from the Ningxia Hui region to Jiangxi province and has an annual transmission capacity of 883 Bcf.[79]

- Natural gas pipeline imports increased in 2021 to 2 Tcf, after a slight decline in 2020. Most of the imports were from Turkmenistan, which accounted for 57% of pipeline imports.[80] In addition to the natural gas pipeline imports from Central Asia and Burma, China began to import natural gas from Russia through the Power of Siberia pipeline in December 2019. The Power of Siberia line delivered 353 Bcf to China in 2021.[81] China and Russia signed a natural gas agreement in 2014, which has China importing an average of 1.3 trillion cubic feet per year (Tcf/y) of natural gas from Gazprom's East Siberian fields during a 30-year period.[82] This agreement was amended in early 2022 to add an additional 0.35 Tcf/y of imports for a total of approximately 1.7 Tcf/y.[83]
- Line D, the pipeline that is slated to increase capacity from Turkmenistan by 1.1 Tcf/y to 2.3 Tcf/y, has encountered several delays over the years.[84] This project has no announced completion date at this time.[85]
- In 2019, China extended a contract with Kazakhstan and doubled the amount of imported natural gas to 350 Bcf/y until 2023.[86]

Coal

Exploration and production

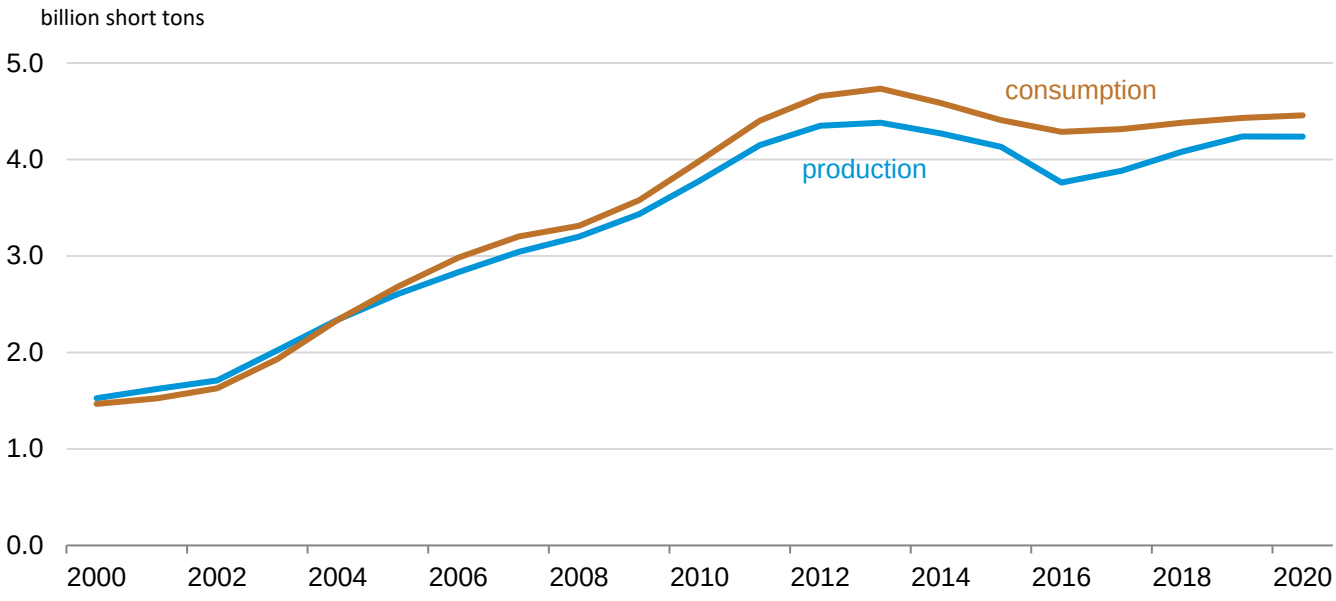
- Coal production, which declined for three consecutive years through 2016, rose each year since then until 2019, and remained flat at 4.2 billion short tons in 2020 (Figure 6).[87] China's Premier, Li Keqiang, stated the country will increase coal production capacity by 331 million short tons in 2022.[88] The target for coal production is approximately 5 billion short tons for 2022.[89]
- China continues to replace outdated coal capacity with new, more efficient mine capacity and to close smaller mines in the eastern and southern regions.[90] Furthermore, China's recent expansion of long-range railway capacity, such as the Haoji Railway which opened in October 2019, to connect the coal-producing centers in the interior to eastern demand centers is instrumental to increasing domestic production and responding to coal demand.[91]

Consumption

- After several years of declines, China's coal consumption grew by nearly 2% in 2018 (4.38 billion short tons), then slowed to 1% in 2019 (4.43 billion short tons), and less than 1% in 2020 (4.46 billion short tons) (Figure 6).[92] According to the National Bureau of Statistics of China, coal consumption increased by approximately 5% in 2021.[93] China is the world's largest coal consumer, accounting for 55% of the world's coal consumption in 2020.[94]
- The electric power sector accounted for nearly 61% of China's coal consumption in 2020, and the remainder of China's coal consumption is from industry, such as steel and cement production, and residential heating.[95]
- China's consumption of thermal coal for non-power uses, such as residential heating, decreased by 4% in 2020.[96] However, China is still the world's largest consumer, by a significant amount, of thermal coal for non-power use. China is also the largest global metallurgical coal consumer.[97] The majority of the metallurgical coal China consumes is used in steel production.
- China's coal demand over the next few years is likely to be determined by the magnitude of the COVID-19 pandemic in China and how it effects the electricity and industrial demand growth and how China balances its energy needs with its commitments to reduce carbon emissions. Expanding both its renewable and nuclear energy capacity (integral to China's carbon emissions targets and programs, such as the national emissions trading scheme [ETS]) will likely lessen coal

demand. However, coal is still a primary component of China's energy structure and is important to energy security.

Figure 6. China's coal supply and demand, 2000–2020



Data source: U.S. Energy Information Administration, *International Energy Statistics*

Trade

- China's coal imports, the largest in the world, rose from about 335 million short tons (MMst) in 2020 to about 357 MMst in 2021.[98] The increase in imports was in response to electric power shortages that occurred throughout the country and rising domestic coal prices. China's government did not impose an unofficial import cap in 2021 as it had done in the prior two years.[99]
- Indonesia remains China's largest source of imported coal, and it increased its share of China's total coal imports to 60% in 2021 from 46% the previous year.[100] Indonesia offers a low quality coal that blends well with China's domestic coal.[101] Russia (18%) and Mongolia (5%) were China's second- and third-largest coal suppliers, passing Australia, which had been second for a few years prior to 2021.[102] In 2020, China issued trade restriction on several Australian imports and an unofficial ban on coal from Australia.[103]
- China's imports of coal from the United States rose to 11.7 MMst in 2021, which was over 10 times higher than in 2020.[104]

Electricity

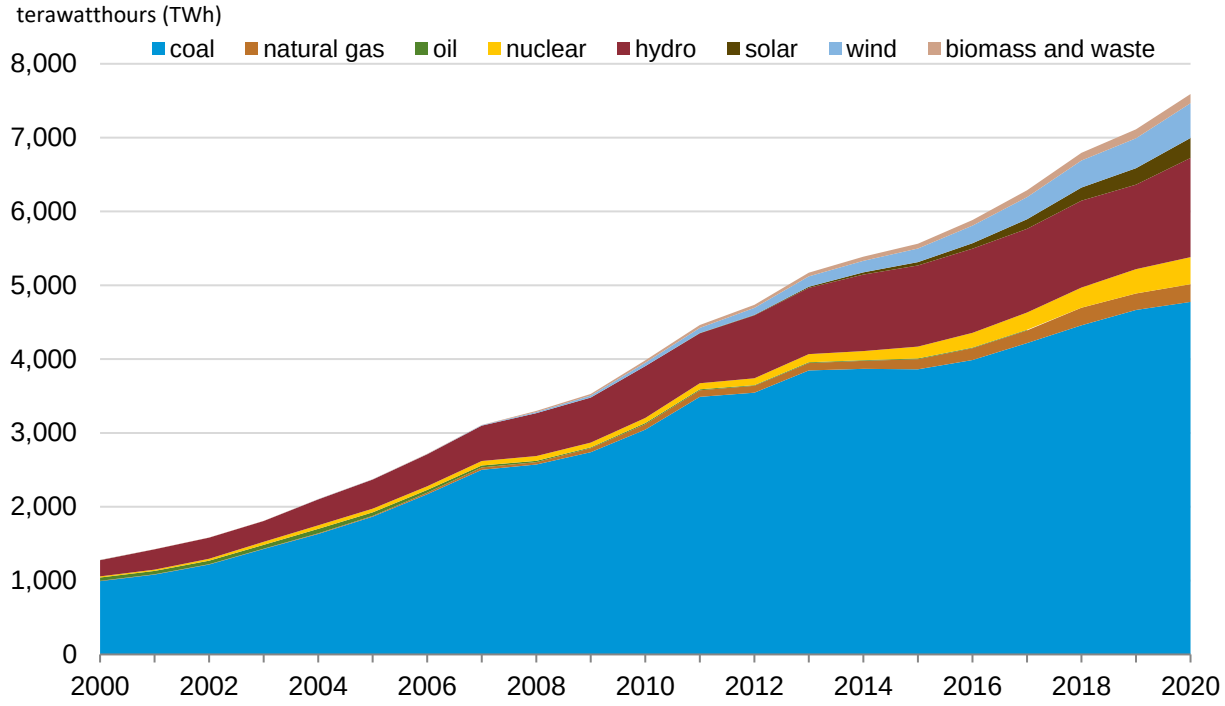
- China plans to reach its CO_2 emissions peak by 2030 and to reach carbon neutrality by 2060. As part of this goal, plans include increasing the share of non-fossil fuels in primary energy consumption to 25% and to bring the total installed wind and solar capacity to 1,200 GW by

2025.[105] However, China's *14th Five-Year Plan* considers coal a necessary energy source for the next several years for energy security and economic efficiency.[106]

Generation

- China generated about 7,600 terawatt hours (TWh) of net electricity in 2020, an increase of approximately 5% from 2019.[107] China's statistics indicate that power consumption grew by approximately 10% in 2021.[108] Power generation growth continued in spite of COVID-19 lockdowns. Primary sector consumption grew by 10% from the prior year. This growth is attributed to upgraded rural power grids and to poverty alleviation programs. Electricity consumption by the manufacturing sector grew by 3%, and the residential sector electricity consumption grew by 7% in 2020.[109]
- Fossil fuels, primarily coal, accounted for 67% of power generation sources in 2020 (Figure 7).[110] Coal will remain an important fuel in China's electric power sector in the coming years; 46.1 GW of coal-fired projects were approved in 2020.[111] Natural gas is replacing some of the coal-fired capacity in the eastern part of the country, where power demand is higher than in the rest of the country, and in the northeastern region, where stricter environmental regulations have reduced coal-fired power production.[112] Natural gas is gradually gaining share in electricity generation, but it still accounted for less than 3% of total generation in 2020.[113] The government intends to replace older coal-fired units with ultra-low emission technology and allow cities to build clean-coal heating systems.[114]
- Hydropower and other renewable projects generated more than 2,200 TWh of net electricity in 2020, an 11% increase from 2019 levels.[115]
- In 2020, most of the world's wind generation, at about 471 TWh, was in China, which was 16% higher than in 2019.[116] The government has encouraged investment in grid development and measures to improve flexibility in the transmission system, especially during peak hours. Several ultrahigh voltage (UHV) transmission lines that carry electricity over long distances began operating in 2014, and in 2020, China had 14 UHV alternating-current lines and 16 UHV direct-current lines in operation.[117]
- Solar power is the fastest-growing electric generation source in China. Net generation in 2020 was 270 TWh, 21% higher than in 2019.[118] Most of the solar equipment used globally is produced in China.
- Although nuclear generation is a small share of the total power generation portfolio, China is actively promoting nuclear power as a clean, efficient, and reliable source of electricity generation. China generated about 366 TWh of net nuclear power in 2020. Although nuclear generation only accounted for about 5% of total generation, it was an 11% increase from 2019.[119]

Figure 7. China's net electricity generation by fuel type, 2000–2020

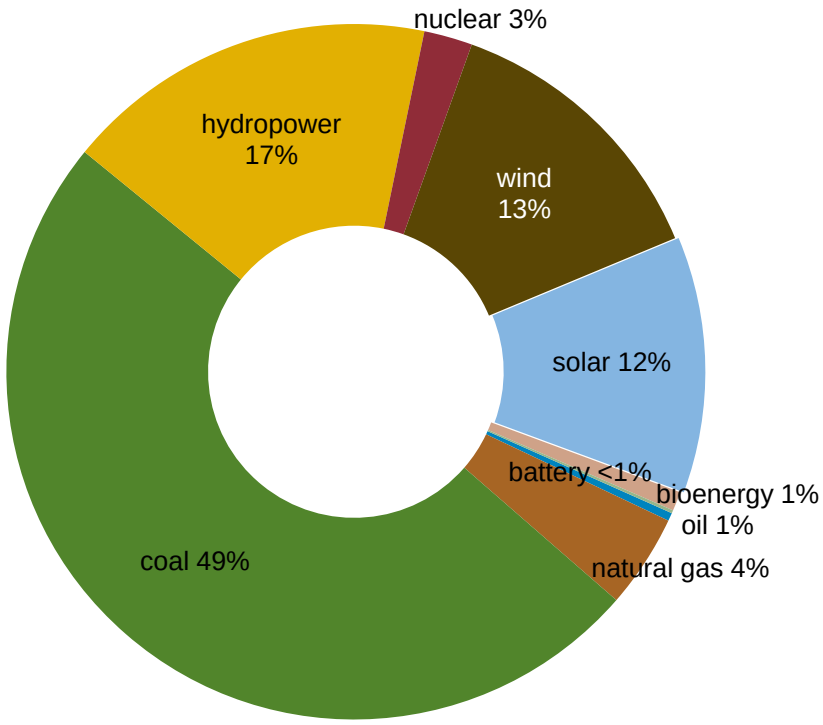


Data source: U.S. Energy Information Administraion, *International Energy Statistics*

Capacity

- China's installed electricity generating capacity increased 10% from 2019 to an estimated 2.2 terawatts (TW) at the end of 2020. According to China's estimates, capacity grew almost 8% in 2021.[120] China's generating capacity became the highest in the world in 2013.[121]
- Fossil fuel-fired power capacity has historically accounted for the bulk of installed capacity in China; however, its share dropped by almost 3 percentage points in 2020 to 56% of total capacity (Figure 8).
- Of the 194 GW of installed capacity added in 2020, renewables, including hydroelectricity, accounted for 71% of the additions. China leads the world in renewable energy capacity, with 894 GW of installed capacity in 2020.[122]
- China's government's goal in the *14th Five-Year Plan* is to add at least 570 GW of solar and wind in the 2021–2025 period, along with over 1,200 GW of installed wind and solar capacity by 2030.[123] The country's solar manufacturing association expects China to add between 75 GW to 90 GW of solar capacity in 2022. China could average between 83 GW and 99 GW of new solar capacity per year through 2025, according to the China Photovoltaic Industry Association.[124]
- China approved the construction of six nuclear reactors in 2022 as a step toward its goal to increase nuclear capacity to 70 GW by 2025 and to between 120 GW and 150 GW by 2030. At the end of 2021, China had 55 GW of installed capacity.[125]

Figure 8. China's installed electricity generating capacity by type, 2020



Data source: International Energy Agency, World Energy Outlook 2021

Notes

- Data presented in the text are the most recent available as of August 8, 2022.
- Data are EIA estimates unless otherwise noted.

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Draft ISO/EDC/LDC Problem Statement and Call to Action on LNG and Energy Adequacy
Federal Energy Regulatory Commission New England Winter Gas-Electric Forum, September 8, 2022

ISO New England and the New England gas and electric distribution companies agree that, as the region transitions to a clean energy future, there is a need to develop and execute a plan to reduce dependence on ***imported*** LNG. This plan could include accelerated development of clean energy resources, additional transmission to access electrical energy, increased in-region liquefaction and dual-fuel resources, long duration storage, and green fuels.

In the meantime, the region needs to secure and stabilize the imported LNG supply chain to supply customers of natural gas. Most immediately, ***the region must ensure the continued operation of the Everett LNG Facility to maintain reliable electric and natural gas service for New England consumers.*** The need for the Everett LNG Facility will extend for a finite period beyond June 2024, when ISO New England's retention of the related Mystic Generating Station expires, and until the required infrastructure investments are made to reliably enable the envisioned clean energy future.

Everett Facilitates the Initial Stage of the Clean Energy Transition

Ultimately, renewable resources will provide electricity to meet both current needs and additional future demand related to home heating and transportation. The region will also develop the clean, long duration resources needed to balance renewables' variable production characteristics.

Until that time, however, the region will depend on gas to ensure the reliable provision of heat and electricity. Specifically, on the electricity side, we will continue to need natural gas to fuel the current gas-fired generation fleet until sufficient clean energy resources and alternative forms of long duration energy storage are built. Regarding the gas infrastructure, LNG is needed to meet home heating needs and, more fundamentally, to maintain pressure on the gas pipeline system.

In sum, we believe that, ***for the clean energy transition to be successful, the region must continue to have reliable supplies of gas for home heating and electricity***. Without adequate gas, the region may not be able to meet the demand for home heating and electricity – and, when reliability suffers, the clean energy transition suffers. We have seen that story play out in Europe, Australia and, closer to home, in California and Texas. In sum, it is critical to the region's decarbonization goals that the lights and heat stay on in New England – and, for the foreseeable future, that requires gas.

Everett Provides Critical Gas Supply

The natural gas pipelines that serve New England operate at maximum capacity during the winter. During very cold weather, and for extended periods, the pipelines cannot fully supply heating demand or provide enough fuel to power gas generators without significant injections of LNG on the eastern and northern parts of the New England gas system. Because New England is at the end of the interstate pipeline system and lacks large scale, long duration energy or fuel storage, both the gas distribution

system and the electric power system have a dependence on imported LNG, and this reality will persist until the region invests in access to alternative long duration energy storage infrastructure.[1]

The only LNG import facility in regular use in New England is Everett.[2] Everett has LNG storage capacity equivalent to 3.4 billion cubic feet of natural gas and includes equipment for the import, storage, local transportation and regasification of LNG that is delivered to the facility by ship. Everett has the capacity to make firm gas deliveries of up to 435 million cubic feet per day[3] to two of the five interstate natural gas pipelines in New England for use by generators and gas utilities.[4] These injections from Everett help maintain pipeline pressures on high demand gas days.

The Current Lack of a Regional Plan to Ensure Energy Adequacy, including the Absence of a State or Federal Regulatory Solution, Endangers the Reliability of the Electric Power System

While the reliability of New England's electric power system is dependent on a reliable gas system, the regulatory oversight of the two systems is not fully compatible. Specifically, the electricity markets are not designed to spur investments in supporting infrastructure needed to ensure a reliable clean energy transition. While the region is in the process of developing a plan and cost allocation methodology for assuring investments in the transmission infrastructure required to integrate renewable resources, there is no comparable plan to ensure the region has sufficiently robust, long duration, sources of balancing energy (including for the meantime, sufficient supplies of natural gas). In essence, the prevailing assumption is that the fuel markets will ensure sufficient fuel supply in response to high prices in the electricity markets. For a variety of reasons, this assumption is proving to be flawed.

Fuel suppliers, including LNG providers, will not maintain and invest in infrastructure and fuel supplies without a long-term financial commitment. However, the counter-party for such a long-term commitment does not exist in New England, particularly for fuel to supply electric generators. Specifically, the majority of wholesale and retail buyers of electricity in New England generally have a short position in the market and are not making long-term commitments to electric energy suppliers, nor do these suppliers have a "firm fuel" obligation under the ISO's FERC-regulated Tariff.

The result of this structure is that fossil-fired electric generators do not have sufficient guaranteed long-term incomes on which to rely when making fuel arrangements. As a result, they will, at best, engage in seasonal contracting for fuel to cover their expected supply obligations and rely on spot fuel markets for the additional supplies to cover unexpected events. Pipelines or suppliers of imported LNG cannot rely on this limited contracting to invest in infrastructure, or ensure stable supplies of LNG.

In 2014, some of the New England states and the Electric Distribution Companies (EDCs), recognizing the risks of this structure, considered requiring the EDCs to become the contracting counterparty to stabilize regional gas supplies for gas generators, but that path was stymied when the Massachusetts Supreme Judicial Court ruled that the Massachusetts Department of Public Utilities did not have the authority to

[1] Given the growing uncertainties in the global LNG markets as a result of the war in Ukraine, this dependence is increasingly fraught.

[2] The region also depends on regular LNG injections from the St John facility located in New Brunswick, Canada, which is outside of U.S. jurisdiction.

[3] This translates to about 2,700 MW per day of capacity.

[4] Everett also has the capability to deliver 100,000 MMBtu per day by truck, which supports local storage refills for gas utilities throughout the region.

approve this proposal. In short, there is a structural problem that encompasses the gas and electric systems and there is a bifurcated state and federal regulatory system for addressing it.

As the clean energy transition progresses, this reliability and regulatory dilemma will become more pronounced. In simple terms, renewables will displace fossil fuels, but the need for balancing energy (and in particular the long duration, peaking requirement for balancing energy) will increase. The recent Future Grid Reliability Study, which was a product of a collaborative effort between the ISO, the states and NEPOOL, illustrates the issue.[5] Cost recovery for the infrastructure that provides this balancing energy will be difficult, especially if it is only used intermittently, and it is unlikely that these costs can be recovered through an electricity market structure that drives electricity suppliers to short-run marginal costs. This problem currently applies to fossil fuel providers, but it will also likely apply to clean, long-duration balancing energy providers with high capital and/or carrying costs (*e.g.,* providers of clean hydrogen or long duration batteries).

Solving the Energy Adequacy Problem Is a Critical Element of a Clean and Reliable Energy Future

While the region has been discussing and attempting to mitigate energy adequacy concerns for many years, ISO New England and the New England gas and electric distribution companies believe we are at a critical juncture given the impending retirement of a key piece of shared fuel infrastructure. The need to find a solution to this issue is vitally important to a reliable and clean energy future.

As the region seeks to decarbonize its economy, a robust solution should move the region toward a reliable and clean energy future by increasing the amounts of clean energy on the system, developing the transmission to interconnect and deliver those resources, maintaining the balancing resources to manage the variability of those resources, and ensuring energy adequacy through an energy reserve to manage through extended periods of severe weather or energy supply constraints.

An energy reserve would cover unusual events, including combinations of major contingencies, or extreme weather, or both. It does not refer to the daily balancing energy requirement to maintain short-term reliability of the bulk power system, but rather to provide a supplementary, "stand-by" quantity of energy to fill in when input energy supply chains are disrupted. In essence, "energy adequacy" or an "energy reserve" can be viewed as regional insurance to cover relatively low probability risks. The ISO is presently working with the Electric Power Research Institute to study and quantify extreme weather risks. Results from this study should be available in early 2023 and will inform the discussion on the magnitude of the risks, and potentially, how best to solve for these risks.

Preliminarily, an energy reserve could be achieved through some or all of the following:

- State regulated cost-of-service infrastructure investments coupled with contracting for the necessary energy

[5] The study shows that approximately 73-90 GW of wind, solar and storage will be needed in 2040 for reliability depending on the amount of available dispatchable resources. https://www.iso-ne.com/static-assets/documents/2022/07/2021_economic_study_future_grid_reliability_study_phase_1_report.pdf at page 3.

- FERC regulated cost-of-service rates for recovering investments in infrastructure and forward energy supply chain arrangements
- FERC regulated wholesale electric market tariffs that rely on uniform clearing price mechanisms to incent investments in infrastructure and forward energy supply chain arrangements

At this stage, given the region's experience over the past two decades, the region needs to determine how much insurance to buy, and which options, or combinations of options, will be the most effective and efficient. Defining and quantifying the risk/cost tradeoff will in turn depend on the potential solutions and we recognize this is an important step to achieving regulatory approval in either, or both, regulatory venues.

It is clear that the New England Governors are concerned about these issues, as indicated in their recent letter to Secretary Granholm. The New England states have a major role in determining the nature and extent of any regional risk mitigation solution, since they represent the end consumers who will have to pay for the insurance, and further, control the siting and permitting of the necessary infrastructure.

To this end, ***the region should undertake a comprehensive study of both the energy adequacy problem and the potential solutions for addressing the problem***. Any solution that involves the ISO and revisions to its Tariff will require deliberation in the appropriate NEPOOL forum and ultimately, approval by the FERC.

Due to the urgency of this issue, we believe it is incumbent upon the region to expeditiously move forward with practical and feasible short-term actions while studying long-term solutions. Therefore, the ISO will work with the New England states and stakeholders to accelerate actions that will help reduce the region's long-term dependency on Everett and imported LNG, mitigate the energy adequacy problem, and continue the transition to a clean energy future. Such short-term actions include identifying expedient investments in transmission and ISO tariff-based or market-based solutions. Clear guidance from the FERC and the states will be critical to finding a feasible solution.

We hope that this problem statement will help inform the discussions at the September 8th FERC Winter Gas-Electric Forum and subsequent discussions with the New England states and NEPOOL.

Korea Pares Back Renewables as It Taps Nuclear for Climate Goal
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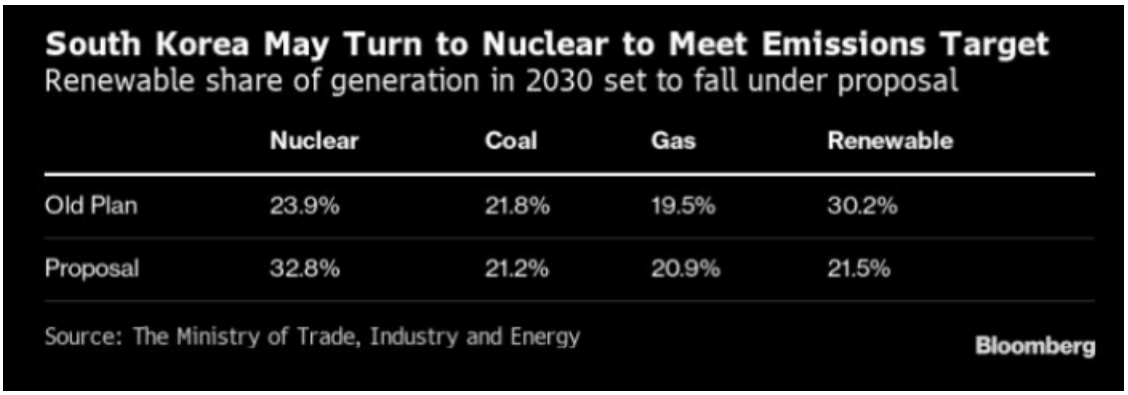
By Heesu Lee
(Bloomberg) -- South Korea plans to scale down its reliance on renewable energy sources and boost nuclear generation to meet its tougher climate goal.
Renewable energy should account for 21.5% of generation capacity by the end of the decade, according to a draft of the nation's long-term power supply plan, down from 30.2% under the previous version, the energy ministry said Tuesday in a statement, citing a government advisory group. Most of the gap would be met by nuclear while coal and gas are little changed from the prior proposal.



If the draft is finalized, it will mark a turning point under the new government led by President Yoon Suk Yeol that focuses on nuclear energy rather than renewables to meet climate goals. Yoon touted atomic energy throughout his presidential campaign and said there was a need to build more reactors, in a clear reversal of former President Moon Jae-in's anti-nuclear policies.
The proposal will go through government discussions, parliament and public hearing before it's finalized, the energy ministry said. South Korea bolstered its official emissions target, known as the nationally determined contribution, in 2021 to cut emissions 40% by 2030 from 2018 levels.

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https://www.npr.org/2022/09/01/1119778975/california-lawmakers-extend-the-life-of-the-states-last-nuclear-power-plant?utm_source=twitter.com&utm_medium=social&utm_term=nprnews&utm_campaign=npr

California lawmakers extend the life of the state's last nuclear power plant

September 1, 20225:53 AM ET

NATHAN ROTT
TwitterInstagram

The Diablo Canyon Nuclear Power plant at the edge of the Pacific ocean in San Luis Obispo, Calif., as seen on March 31, 2015.
Michael Macor/The San Francisco Chronicle via Getty Images

Citing searing summer temperatures and expected energy shortages, California lawmakers approved legislation aimed at extending the life of the state's last-operating nuclear power plant.

The Diablo Canyon plant - the state's largest single source of electricity - had been slated to shutter by 2025. The last-minute proposal passed by the state legislature early Thursday could keep it open five years longer, in part by giving the plant's owner, Pacific Gas and Electric (PG&E), a $1.4 billion forgivable loan.

California, like other U.S. states and countries, has been struggling to reduce its climate-warming emissions while adapting to a rapidly warming world. Record-breaking heat waves have stressed the state's increasingly carbon-free electrical grid in recent years, triggering rolling blackouts as recently as 2020. Grid operators, fearing a similar crash, issued a statewide alert to conserve energy last month.

The state has set the goal of getting 100 percent of its electricity from clean and renewable sources by 2045. Advocates for Diablo Canyon claim that target will be difficult to achieve without the 2,250 megawatt nuclear power plant. Diablo Canyon generated nearly 9 percent of the state's electricity last year and roughly 15 percent of the state's clean energy production.

"Maintaining operations at Diablo Canyon will keep our power on while preventing millions of tons of carbon from being released into the atmosphere," said Isabelle Boemeke of the group Save Clean Energy. "This is a true win-win for the people of California and our planet."

Nuclear power has seen a resurgence in recent years as the climate crisis has worsened and governments increase efforts to cut climate-warming emissions. The Biden administration launched a $6 billion effort earlier this year aimed at keeping the country's aging nuclear plants running.

"Have no doubt, President Biden is serious about doing everything possible to get the U.S. to be powered by clean energy,"Assistant Secretary for Nuclear Energy Kathryn Huff told attendees at a nuclear energy assembly in Washington, D.C., earlier this summer. "Nuclear energy is really essential to this," she said.

Roughly one-fifth of the country's electricity comes from nuclear power plants. That's as much as all other clean energy sources combined. But nuclear power isn't without its warts.

Despite decades of debate and billions of dollars spent, the U.S. still does not have a permanent storage site for its growing amount of nuclear waste. Diablo Canyon, located on California's Central Coast, sits near several seismic fault lines, inspiring long-held fears of a nuclear disaster similar to the kind experienced in Fukushima, Japan in 2011.
PG&E has long maintained that Diablo Canyon is safe from tsunamis, earthquakes and flooding. But concerns remain.
Juliet Christian-Smith, a regional director at the Union of Concerned Scientists estimates an earthquake-induced accident could cause more than $100 billion in damages and 10,000 cancer deaths.

"The bill ignores the plant's environmental impacts and vulnerability to earthquakes," she said. "Safety cannot take a back seat in our quest to keep the lights on and reduce global warming emissions."

The bill now heads to Governor Newsom's desk where he's expected to sign it.

California ISO

NEWS RELEASE

Sept. 1, 2022

Contact: ISOMedia@caiso.com

Intensifying heat leads to another conservation call

Flex Alert extended to a third consecutive day to help balance electrical grid

FOLSOM, Calif. – For the third straight day, high heat and heightened demand for electricity has resulted in the California Independent System Operator (ISO) issuing a statewide call for voluntary electricity conservation. The most recent Flex Alert has been issued for tomorrow, Friday, Sept. 2., from 4 p.m. to 9 p.m.

With triple-digit temperatures in much of California and the West, the power grid operator is again expecting high electricity demand, primarily from air conditioning use, and needs voluntary conservation steps to help balance supply and demand.

Flex Alerts have been resulting in some helpful conservation and grid operators and an emergency proclamation from Gov. Gavin Newsom, requested by the ISO, has also freed up some additional resources.

A Restricted Maintenance Operations (RMO) remains in place through Tuesday, Sept. 6, each day from noon to 10 p.m. The declaration orders market participants to avoid any scheduled routine maintenance during those times to ensure all available resources are in service. View the Emergency Notifications fact sheet for more information.

The Flex Alert covers that time of day when the grid is most stressed from higher demand and less solar energy. During that time, consumers are urged to conserve power by setting thermostats to 78 degrees or higher, if health permits, avoiding use of major applicances and turning off unnecessary lights.

To minimize discomfort and help with grid stability, consumers are also encouraged to pre-cool their homes and use major appliances and charge electric vehicles and electronic devices before 4 p.m., when conservation begins to become most critical.

Reducing energy use during a Flex Alert can help stabilize the power grid during tight supply conditions and prevent further emergency measures, including rotating power outages.

For information on Flex Alerts, and to find more electricity conservation tips, visit the ISO's Flex Alert website.

Flex Alert Conservation Actions

Before 4 p.m.:

- Pre-cool home by setting the thermostat to as low as 72 degrees
- Use major appliances, including:
  - Washer and dryer
  - Dishwasher
  - Oven and stove for pre-cooking and preparing meals
  - Adjust blinds and drapes to cover windows

From 4 p.m. to 9 p.m.:

- Set thermostat to 78 degrees or higher, if health permits
- Avoid using major appliances
- Turn off unnecessary lights

About Flex Alerts

A Flex Alert is issued by the ISO when the electricity grid is under stress because of generation or transmission outages, or from persistent hot temperatures.

Click here to learn more about emergency notifications. Follow grid conditions in real time at ISO's Today's Outlook, download the free ISO Today mobile app, and follow us on Twitter at @California_ISO.

# # #

California ISO | 250 Outcropping Way | Folsom, CA 95630 | www.caiso.com

https://www.electrifying.com/blog/knowledge-hub/energy-price-rises-does-an-electric-car-still-make-financial-sense

Energy price rises – does an electric car still make financial sense?

m Barnard
27.8.2022

In a word, yes. But the gap is narrowing and you'll need to do some sums and make sure you choose how and where to charge to make you make the most of the possible savings.

A year ago, the average electric car driver would see the cost to fuel their car drop by about 75% after making the switch, even when charging at peak rates during the day. Now the saving is just 27% on an average car.

The latest Ofgem cap of 52p/kWh means that drivers who do 10,000 miles each year and charge on a standard energy tariff will still save £34 each month on fuel in a Volkswagen ID.3, compared to filling up a VW Golf with petrol at £1.70 per litre.

At the higher end of the market, those who choose a Tesla Model Y over a Mercedes GLC300 will still save £113 each month in fuel costs.

The break-even point is when electricity costs reach 71p/kWh, which is expected to happen at some public charge points in the coming months. This means electric car owners will only use them in 'emergency' situations to get them home or to a cheaper source.

With an average car like an ID.3, charging becomes more expensive than petrol at 71p/kWh

PHEV owners will also need to be careful with their sums. If a car has a 15kWh battery it will cost £7.80 to charge at the 52p/kWh Ofgem peak rate during the day – almost exactly the same as a gallon of fuel currently. As the PHEV is likely to do less than 30 miles on a charge, it may be actually cheaper to run the car on petrol.

This means for all drivers it's now more important than ever to seek out electricity tariffs which will allow you to charge using lower overnight rates while your car is parked. This can boost your savings by an extra £81 per month on a VW ID.3 and you'll pay a whopping £116 per month less than you would running the petrol Golf.

The PHEV driver would also be able to charge for £1.13 – much cheaper than petrol.

Electrifying.com's founder and CEO Ginny Buckley said: "Drivers who are able to access a charger and cheaper tariff at night are still able to make big savings, but for anyone who has to rely on public charging networks the savings in fuel costs are disappearing rapidly.

"This is why I'm calling for the 20% VAT currently imposed on public chargers to be cut to 5%, and for energy providers to introduce cheaper off-peak tariffs at public charge points to help balance the supply grid. Without taking these steps, we risk leaving people behind and creating a two-tiered nation when it comes to electric car ownership."

https://news.delta.com/delta-dg-fuels-partner-pivotal-expansion-sustainable-fuel-market

Delta, DG Fuels partner in pivotal expansion of sustainable fuel market

Staff Writer

Aug 30, 2022 11:30am

Under a new agreement, DG Fuels, LLC plans to establish a new SAF supply stream that could provide Delta with 385 million gallons of unblended sustainable aviation fuel, while helping to expand availability of SAF in the underserved marketplace.

- *DG Fuels will provide Delta with 385 million gallons of a new low-emissions sustainable aviation fuel, a vital resource needed for aviation to reach its sustainability goals.*
- *The production of DG Fuels SAF is up to 85% lower in lifecycle greenhouse gas emissions versus conventional jet fuel.*
- *The agreement will help accelerate SAF production, which remains nascent – current existing supply would only operate a fleet Delta's size for a single day.*
- *SAF provided under the partnership advances Delta toward its recently validated science-based carbon emissions reduction target approved by Science Based Targets initiative.*

Delta and DG Fuels, LLC are taking an important step together to expand the availability of sustainable fuel, with a new low-emissions SAF, which is critical to achieving a more sustainable future for aviation.

Under a new agreement, the low-emissions fuel company plans to establish a new SAF supply stream that could provide Delta with 385 million gallons of unblended sustainable aviation fuel, while helping to expand availability of SAF in the underserved marketplace.

"Achieving a sustainable future for travel will require us all to work together across industries and encourage innovations like DG Fuel's new low-emissions SAF option," said Pam Fletcher, Delta's Chief Sustainability Officer. "SAF is essential to our industry's more sustainable future, and new supply chain streams will help ensure sustainable fuel becomes more available and affordable."

Anticipated to begin delivery by the end of 2027, DG Fuels is planning to deliver 55 million gallons of SAF annually for seven years. The SAF will likely use timber waste, corn stover and cotton gin waste as feedstock and is expected to reduce lifecycle greenhouse gas emission by between 75%-85% compared to conventional jet fuel, which aligns with **Delta's goal as a founding member of the First Movers Coalition**.

The agreement also moves Delta toward its recently validated Science Based Targets initiative goal to reduce well-to-wake scope 1 and 3 jet fuel greenhouse gas emissions by

45% per revenue tonne kilometer by 2035 from a 2019 base year.* Science Based Targets initiative is a coalition that defines and promotes emissions reductions goals that climate scientists predict is needed to keep global warming to well below 2 degrees Celsius.

“DG Fuels is committed to developing and supporting initiatives that provide practical and sustainable benefits to businesses, the environment and local communities,” said Michael C. Darcy, Chief Executive Officer of DG Fuels. “We are proud to take this next long-term step alongside Delta Air Lines in supporting the lasting sustainability of our planet by reducing the impact of airline travel on the environment.”

SAF is among the most impactful solutions on the market today for reducing aviation’s carbon emissions, but availability remains limited – the current existing supply would only operate a fleet Delta’s size for a single day. The new agreement reflects Delta’s dedication to driving the growth of sustainable fuels as it works toward reducing aviation's carbon emissions over the long term.

“Cellulosic biomass feedstock SAF is the key to scaled deployment that moves the needle for the aviation industry in reducing its carbon footprint,” said Christopher J. Chaput, President and CFO of DG Fuels. “Delta is a known innovator in the airline industry so we’re excited to work with them on implementing this long-term partnership.”

In SAF and other emerging technologies, Delta is also partnering with corporate, agency and cargo customers on SAF agreements to encourage the growth of the alternative fuels markets. Those efforts have resulted in more than 1 million gallons of purchased SAF so far. More information on Delta’s sustainability efforts are available in its **2021 Environmental, Social and Governance Report**.

**Non-CO2e effects which may also contribute to aviation induced warming are not included in this target. Delta Air Lines commits to publicly report on non-CO2e impacts of aviation over its target timeframe.*

https://www.reuters.com/business/energy/elon-musk-says-world-still-needs-oil-gas-2022-08-29/?taid=630c897747502200013ecedb&utm_campaign=trueAnthem:+Trending+Content&utm_medium=trueAnthem&utm_source=twitter

August 29, 20223:05 AM MDTLast Updated 2 hours ago

Elon Musk says world still needs oil and gas

Reuters

STAVANGER, Norway, Aug 29 (Reuters) - The world must continue to extract oil and gas in order to sustain civilisation, while also developing sustainable sources of energy, Tesla (TSLA.O) founder Elon Musk told reporters at a conference in Norway on Monday.

"Realistically I think we need to use oil and gas in the short term, because otherwise civilisation will crumble," Musk said on the sidelines of an energy conference in the southern city of Stavanger.

Asked if Norway should continue to drill for oil and gas, Musk said: "I think some additional exploration is warranted at this time."

"One of the biggest challenges the world has ever faced is the transition to sustainable energy and to a sustainable economy," he said. "That will take some decades to complete."

He said offshore wind power generation in the North Sea, combined with stationary battery packs, could become a key source of energy. "It could provide a strong, sustainable energy source in winter," he said.

He also voiced concerns over birth rates, echoing remarks he made in a Twitter post late last week on the risks of "population collapse".

"One of my less obvious things to be concerned about is the birth rate, and I think its important that people have enough babies to support civilisation so that we don't dwindle away," Musk said.

Reporting by Terje Solsvik; Editing by Gwladys Fouche and Jan Harvey

Our Standards: The Thomson Reuters Trust Principles.

https://www.icelandairgroup.com/newsroom/news/the-first-passenger-flight-of-an-electric-airplane?utm_source=twitter&utm_medium=social&utm_campaign=Global_w35_electric_plane
Date: 24/08/2022 Time: 07:14 am

The first passenger flight of an electric airplane

This week, Icelandair participated in a significant event in Icelandic aviation history when the President of Iceland and the Prime Minister were the first passengers to fly in a 100% electric airplane. These are the first steps in an important journey towards more environmentally friendly aviation. The opportunities for Iceland are great due to short domestic flight routes, access to green energy and Iceland's location between Europe and North America.

The first electric airplane in Iceland, bearing the registration TF-KWH is a two-seater Pipistrel, manufactured in Slovenia. It is of similar size as the planes that the flight academies use for flight training.

Cooperation is the key to successful energy exchange

The company Rafmagnsflug ehf. (Electric Flight) brought the first electric plane to Iceland with the aim of taking an initiative towards the energy exchange of aviation, training staff in this new technology and introducing it to the nation. Rafmagnsflug ehf. was originally founded by Matthías Sveinbjörnsson and Friðrik Pálsson in the end of 2021, but they have been working for the past three years to get the first electric plane to Iceland. Behind Rafmagnsflug ehf. are companies and individuals who want to contribute to speeding up the energy exchange in aviation and introduce the latest technological innovations.

Cooperation between stakeholders is a key factor when it comes to energy exchange, and it is therefore important that the largest sponsors are from aviation, airport operations, energy production and tourism; Icelandair, Isavia, Landsvirkjun and Hotel Rangá. Other sponsors are Landsbankinn, Geirfugl ATO, The Reykjavik Flight Academy, and the Iceland Aviation Academy, together with Matthías, Friðrik and Herjólfur Guðbjartsson.

The airplane will be used for flight training, but it is also expected that the public will be able to purchase sightseeing flights with this first electric plane in Iceland and experience traveling the skies on a Zero-Emission plane.

Icelandair's commitment to net zero emissions by 2050

Icelandair has set ambitious new goals to reduce carbon emissions:

- In line with the airline industry's goals, we have made a commitment to reach net zero emissions by 2050.
- In addition, we have set a medium-term target to reduce our carbon emissions by 50% per operational ton kilometer (OTK) by 2030 compared to 2019 levels. This is a measurement of carbon emissions relative to carried passengers and cargo loads.

https://simpleflying.com/iceland-1st-electric-aircraft-passenger-flight/

Iceland Celebrates Its 1st Passenger Flight Of An Electric Aircraft

BY**DANIEL MARTÍNEZ GARBUNO**
PUBLISHED 1 DAY AGO

The flight was operated onboard a Pipistrel Velis Electro aircraft.

Photo: Icelandair

Icelandair participated in a landmark event in Icelandic aviation last week when the company Rafmagnsflug ehf. operated the first commercial flight of an electric airplane in the country. During these flights, the President and the Prime Minister of Iceland were the first passengers.

The first electric flight in Iceland

Iceland's first commercial electric flight took place last week. The company Rafmagnsflug ehf. (Electric Flight) brought the first electric plane to Iceland with the aim of taking the initiative towards the energy exchange of aviation, training staff in this new technology, and introducing it to the nation, explained Icelandair in a press release.

This electric airplane is a two-seater Pipistrel manufactured in Slovenia and a registration TF-KWH. According to the Icelandic Transport Authority, this aircraft was manufactured in 2021; it has a maximum weight of 600 kilograms and can only carry one passenger at a time. The electric plane is of similar size as the aircraft that flight academies use for flight training.

Icelandair said the commercial service last week represented the first step *"in an important journey towards more environmentally friendly aviation. The opportunities for Iceland are great due to short domestic flight routes, access to green energy, and Iceland's location between Europe and North America."*

The airplane will be used for flight training. Still, it is also expected that the public will be able to purchase sightseeing flights with this first electric plane in Iceland and experience traveling the skies on a Zero-Emission plane. Icelandair was only one of the many local companies involved in bringing the first electric flight to Iceland. The Icelandic airport administrator, Isavia, was also involved in the project.

Icelandair's commitment to net zero emissions

Like many other airlines around the world, Icelandair has set new goals to reduce carbon emissions. The carrier made a commitment to reach net zero emissions by 2050. In addition, Icelandair set a medium-term target to reduce its carbon emissions by 50% per operational ton kilometer by 2030, compared to 2019 levels, improving its sustainability.

Reaching these goals will require a combination of measures, such as new aircraft technologies, continued operational improvements, the introduction of sustainable aviation fuels, as well as carbon offsetting. Introducing the Boeing 737 MAX aircraft into Icelandair's fleet is an important contributor to reducing carbon emissions. Icelandair currently has 14 MAX aircraft (ten MAX 8s and four MAX 9s).

Pipistrel developed the Velis Electro, the first electric-powered airplane to receive a Type Certificate. Photo: Pipistrel.

The Velis Electro

Pipistrel has developed the Velis Electro, the first electric-powered airplane to receive a Type Certificate. This is the model that was used on Iceland’s first electric flight. The aircraft is equipped with a 57.6kW liquid cooled electric engine, which provides power and produces no combustion gases. It has an endurance of up to 50 minutes and can reach a maximum horizontal speed at sea level of 98 KCAS (around 182 km/h). This endurance was designed to cover for typical flight school utilization for local flying. According to Pipistrel, it is a compromise between performance, environmental robustness, and battery system lifetime.

https://www.fao.org/worldfoodsituation/foodpricesindex/en/

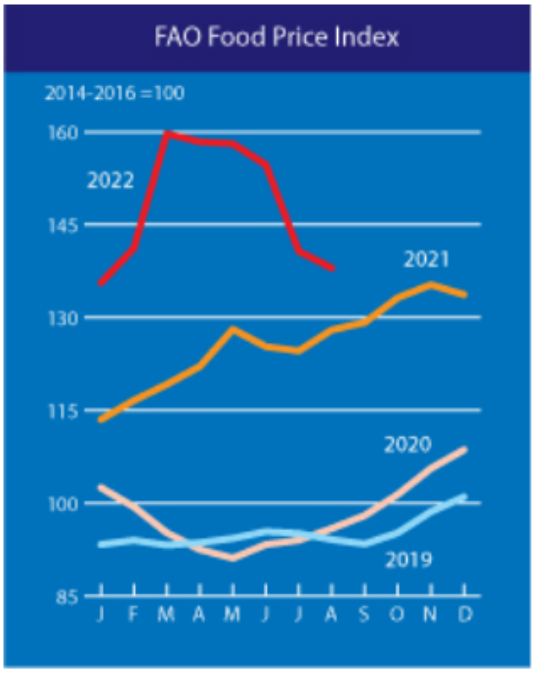
FAO Food Price Index

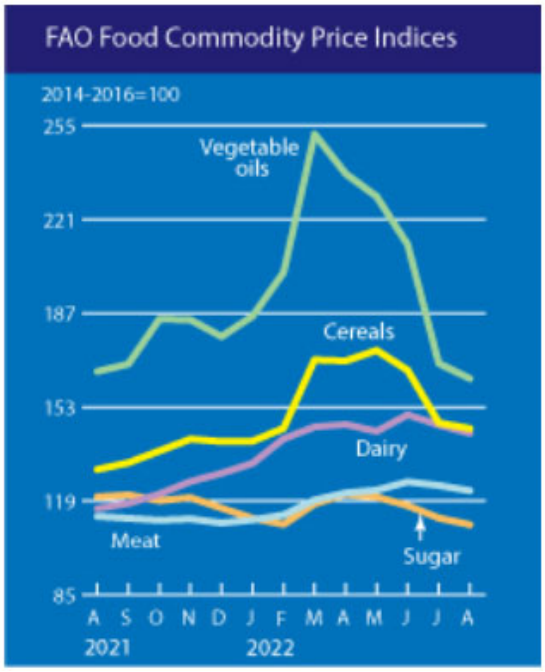
The FAO Food Price Index (FFPI) is a measure of the monthly change in international prices of a basket of food commodities. It consists of the average of five commodity group price indices weighted by the average export shares of each of the groups over 2014-2016. A feature article published in the June 2020 edition of the Food Outlook presents the revision of the base period for the calculation of the FFPI and the expansion of its price coverage, to be introduced from July 2020. A November 2013 article contains technical background on the previous construction of the FFPI.

Monthly release dates for 2022: 6 January, 3 February, 4 March, 8 April, 6 May, 3 June, 8 July, 5 August, 2 September, 7 October, 4 November, 2 December.

FAO Food Price Index drops for the fifth consecutive month in August

Release date: 02/09/2022





» The **FAO Food Price Index*** (FFPI) averaged 138.0 points in August 2022, down 2.7 points (1.9 percent) from July, registering its fifth consecutive monthly decline. Despite the latest drop, the index remained 10.1 points (7.9 percent) above its value a year ago. All the five sub-indices of the FFPI fell moderately in August, with monthly percentage declines ranging from 1.4 percent for cereals to 3.3 percent for vegetable oils.

» The **FAO Cereal Price Index** averaged 145.2 points in August, down 2.0 points (1.4 percent) from July, but still 14.8 points (11.4 percent) above its August 2021 value. In August, international wheat prices fell by 5.1 percent, marking the third consecutive monthly decline, driven by improved production prospects, especially in Canada, the United States of America and the Russian Federation, and higher seasonal availability as harvests continued in the northern hemisphere as well as the resumption of exports from the Black Sea ports in Ukraine for the first time in over five months of interruption. Nevertheless, global wheat prices remained 10.6 percent above their values in August last year. International prices of coarse grains increased marginally (+0.2 percent) in August and averaged 12.4 percent above their values a year ago. World maize prices firmed slightly, up 1.5 percent, largely influenced by lower production prospects in the European Union and the United States of America due to hot, dry conditions, while the resumption of exports from Ukraine prevented prices from increasing further. By contrast, global barley and sorghum prices decreased by 3.8 percent and 3.4 percent, respectively. The FAO All Rice Price Index held steady in August, as slight declines in quotations of the most widely traded Indica varieties compensated for mild price gains in other rice market segments.

» The **FAO Vegetable Oil Price Index** averaged 163.3 points in August, down 5.5 points (3.3 percent) month-on-month, pushing the index value slightly below its year-earlier level. The continued decline of the index was driven by lower world

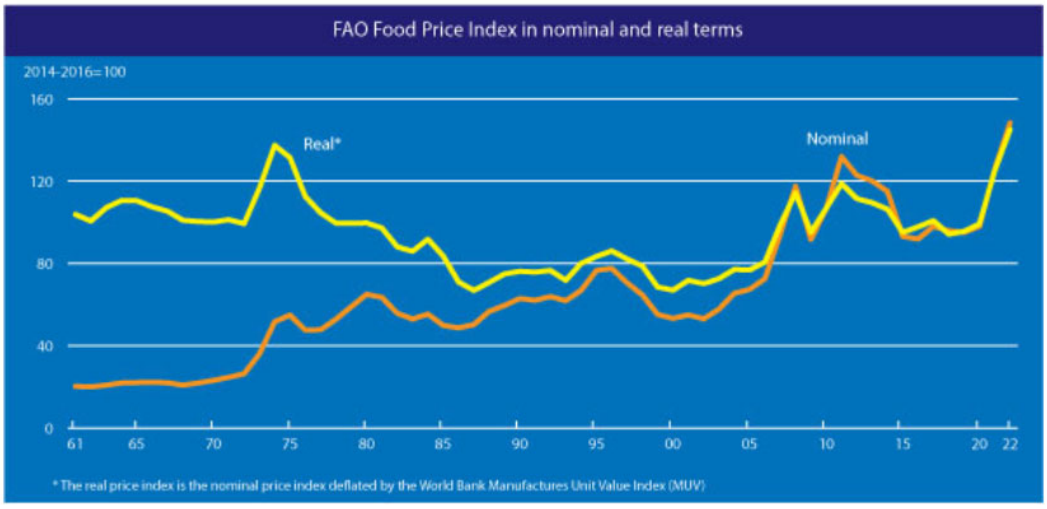
prices of palm, sunflower and rapeseed oils, which more than offset higher soyoil quotations. International palm oil prices fell for the fifth consecutive month in August, driven by increasing export availabilities from Indonesia, mainly thanks to lower export taxes, as well as seasonally rising outputs in Southeast Asia. In the meantime, world sunflower oil values declined on lingering subdued global import demand that coincided with the gradual resumption of shipments from Ukraine's seaports. International quotations for rapeseed oil also dropped in August, due to prospects of ample supplies for the upcoming 2022/23 season. By contrast, world soyoil prices rebounded only moderately, mainly because of concerns over the impact of unfavourable weather conditions on soybean production in the United States of America.

» The **FAO Dairy Price Index** averaged 143.5 points in August, down 3.0 points (2.0 percent) from July, marking the second consecutive monthly decline, but still 27.3 points (23.5 percent) above its value a year ago. In August, international price quotations for butter and milk powders declined, principally due to weaker demand for spot supplies from most leading importers, as inventories remained adequate to cover their immediate needs. Market expectations for increased supplies from New Zealand in the new production season also weighed on international prices, notwithstanding milk production tracking lower in several key producing regions, including Western Europe and the United States of America. By contrast, world cheese prices increased for the tenth consecutive month, reflecting steady global import demand and robust internal sales, especially in European tourist destinations.

» The **FAO Meat Price Index*** averaged 122.7 points in August, down 1.8 points (1.5 percent) from July, also marking the second consecutive monthly decline from an all-time high reached in June 2022, but it remained 9.3 points (8.2 percent) above its corresponding value a year ago. In August, international quotations for poultry meat fell, driven by lower import purchases by leading importers and somewhat elevated global export availabilities. Meanwhile, world bovine meat prices declined on weak domestic demand in some leading exporting countries, raising export supplies, and a modest increase in Australian supplies. By contrast, price quotations for pig meat rose due to the continued low supply of slaughter-ready pigs, while ovine meat prices recovered moderately, owing to increased import demand from some European countries, compensating for lower purchases by China.

» The **FAO Sugar Price Index** averaged 110.4 points in August, down 2.4 points (2.1 percent) from July, marking the fourth consecutive monthly decline and reaching its lowest level since July 2021. The August decline was mainly triggered by an increase in the sugar export cap in India, and lower ethanol prices in Brazil, which raised expectations of a greater use of sugarcane to produce sugar. However, the lower-than-earlier expected sugar production in Brazil in the first half of August due to adverse weather, along with persisting concerns over the impact of dry conditions on the 2022 crop in the European Union, prevented more substantial sugar price declines. The strengthening of the Brazilian real against the United States dollar also contributed to limiting the fall in world sugar prices (expressed in US dollars).

** Unlike for other commodity groups, most prices utilized in the calculation of the FAO Meat Price Index are not available when the FAO Food Price Index is computed and published; therefore, the value of the Meat Price Index for the most recent months is derived from a mixture of projected and observed prices. This can, at times, require significant revisions in the final value of the FAO Meat Price Index which could in turn influence the value of the FAO Food Price Index.*



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FAO food price index

		Food Price Index [1]	Meat [2]	Dairy [3]	Cereals [4]	Vegetables Oils [5]	Sugar [6]
2004		**65.6**	**67.6**	**69.8**	**64.0**	**69.6**	44.3
2005		**67.4**	**71.8**	**77.2**	**60.8**	**64.4**	61.2
2006		**72.6**	**70.5**	**73.1**	**71.2**	**70.5**	91.4
2007		**94.3**	**76.9**	**122.4**	**100.9**	**107.3**	62.4
2008		**117.5**	**90.2**	**132.3**	**137.6**	**141.1**	79.2
2009		**91.7**	**81.2**	**91.4**	**97.2**	**94.4**	112.2
2010		**106.7**	**91.0**	**111.9**	**107.5**	**122.0**	131.7
2011		**131.9**	**105.3**	**129.9**	**142.2**	**156.5**	160.9
2012		**122.8**	**105.0**	**111.7**	**137.4**	**138.3**	133.3
2013		**120.1**	**106.2**	**140.9**	**129.1**	**119.5**	109.5
2014		**115.0**	**112.2**	**130.2**	**115.8**	**110.6**	105.2
2015		**93.0**	**96.7**	**87.1**	**95.9**	**89.9**	83.2
2016		**91.9**	**91.0**	**82.6**	**88.3**	**99.4**	111.6
2017		**98.0**	**97.7**	**108.0**	**91.0**	**101.9**	99.1
2018		**95.9**	**94.9**	**107.3**	**100.8**	**87.8**	77.4
2019		**95.1**	**100.0**	**102.8**	**96.6**	**83.2**	78.6
2020		**98.1**	**95.5**	**101.8**	**103.1**	**99.4**	79.5
2021		**125.7**	**107.7**	**119.1**	**131.2**	**164.9**	109.3
2021	August	**128.0**	113.4	116.2	130.4	165.9	120.5
	September	**129.2**	112.7	118.1	132.8	168.6	121.2
	October	**133.2**	112.0	121.5	137.1	184.8	119.1
	November	**135.3**	112.5	126.0	141.4	184.6	120.2
	December	**133.7**	111.0	129.0	140.5	178.5	116.4
2022	January	**135.6**	112.1	132.6	140.6	185.9	112.7
	February	**141.2**	113.9	141.5	145.3	201.7	110.5
	March	**159.7**	119.3	145.8	170.1	251.8	117.9
	April	**158.4**	121.9	146.7	169.7	237.5	121.5
	May	**158.1**	122.9	144.2	173.5	229.2	120.4
	June	**154.7**	125.9	150.2	166.3	211.8	117.3
	July	**140.7**	124.6	146.5	147.3	168.8	112.8
	August	**138.0**	122.7	143.5	145.2	163.3	110.4

1 Food Price Index: Consists of the average of 5 commodity group price indices mentioned above, weighted with the average export shares of each of the groups for 2014-2016: in total 95 price quotations considered by FAO commodity specialists as representing the international prices of the food commodities are included in the overall index. Each sub-index is a weighted average of the price relatives of the commodities included in the group, with the base period price consisting of the averages for the years 2014-2016.

2 Meat Price Index: Based on 35 average export unit values/market prices of four meat types (bovine, pig, poultry and ovine) from 10 representative markets. Within each meat type, export unit values/prices are weighted by the trade shares of their respective markets, while the meat types are weighted by their average global export trade shares for 2014-2016. Quotations for the two most recent months may consist of estimates and be subject to revision.

3 Dairy Price Index: Computed using 8 price quotations of four dairy products (butter, cheese, SMP and WMP) from two representative markets. Within each dairy product, prices are weighted by the trade shares of their respective markets, while the dairy products are weighted by their average export shares for 2014-2016.

4 Cereals Price Index: Compiled using the International Grains Council (IGC) wheat price index (an average of 10 different wheat price quotations), the IGC maize price index (an average of 4 different maize price quotations), the IGC barley price index (an average of 5 different barley price quotations), 1 sorghum export quotation and the FAO All Rice Price Index. The FAO All Rice Price Index is based on 21 rice export quotations, combined into four groups consisting of Indica, Aromatic, Japonica and Glutinous rice varieties. Within each varietal group, a simple average of the relative prices of appropriate quotations is calculated; then the average relative prices of each of the four rice varieties are combined by weighting them with their (fixed) trade shares for 2014-2016. The Cereal Price Index combines the relative prices of sorghum, the IGC wheat, maize and barley price indices (re-based to 2014-2016) and the FAO All Rice Price Index by weighing each commodity with its average export trade share for 2014-2016.

5 Vegetable Oil Price Index: Consists of an average of 10 different oils weighted with average export trade shares of each oil product for 2014-2016.

6 Sugar Price Index: Index form of the International Sugar Agreement prices with 2014-2016 as base.

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Market Watch

August 2022

For All TRREB Member Inquiries:
416-443-8152

For All Media/Public Inquiries:
416-443-8158

Toronto Regional Real Estate Board

Economic Indicators

Real GDP Growth		
Q2	2022	3.3% ▲
Toronto Employment Growth		
July	2022	7.0% ▲
Toronto Unemployment Rate (SA)		
July	2022	5.9% ▼
Inflation (Yr./Yr. CPI Growth)		
July	2022	7.6% ▼
Bank of Canada Overnight Rate		
July	2022	2.5% ▲
Prime Rate		
August	2022	4.7% —

Mortgage Rates	August 2022
1 Year	— 5.19%
3 Year	— 5.64%
5 Year	— 6.14%

Sources and Notes

i - Statistics Canada, Quarter-over-quarter growth, annualized.
ii - Statistics Canada, Year-over-year growth for the most recently reported month.
iii - Bank of Canada, Rate from most recent Bank of Canada announcement.
iv - Bank of Canada, Rates for most recently completed month.

GTA REALTORS® Release August Stats

TORONTO, ONTARIO, September 2, 2022 – There were 5,627 home sales reported through the Toronto Regional Real Estate Board's (TRREB) MLS® System in August 2022, representing a year-over-year dip of 34.2 per cent – a lesser annual rate of decline compared to the previous four months. The August sales result also represented a month-over-month increase compared to July.

Sales represented a higher share of new listings compared to the previous three months. If this trend continues, it could indicate some support for selling prices in the months ahead. On a year-over-year basis, the MLS® Home Price Index (HPI) was up by 8.9 per cent and the average selling price for all home types combined was up by 0.9 per cent to $1,079,500. The average selling price was also up slightly month-over-month, while the HPI Composite was lower compared to July. Monthly growth in the average price versus a dip in the HPI Composite suggests a greater share of more expensive home types sold in August.

"While higher borrowing costs have impacted home purchase decisions, existing homeowners nearing mortgage renewal are also facing higher costs. There is room for the federal government to provide for greater housing affordability for existing homeowners by removing the stress test when existing mortgages are switched to a new lender, allowing for greater competition in the mortgage market. Further, allowing for longer amortization periods on mortgage renewals would assist current homeowners in an inflationary environment where everyday costs have risen dramatically," said TRREB President Kevin Crigger.

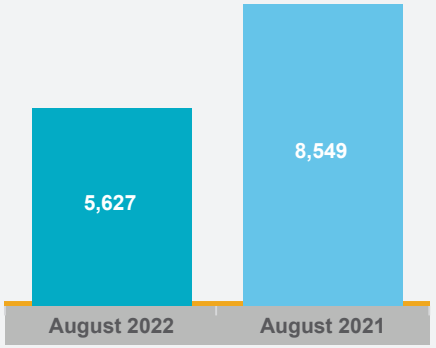
"The Office of the Superintendent of Financial Institutions (OSFI) should weigh in on whether the current stress test remains applicable. Is it reasonable to test home buyers at two percentage points above the current elevated rates, or should a more flexible test be applied that follows the interest rate cycle? In addition, OSFI should consider removing the stress test for existing mortgage holders who want to shop for the best possible rate at renewal rather than forcing them to stay with their existing lender to avoid the stress test. This is especially the case when no additional funds are being requested," said TRREB CEO John DiMichele.

"There are other issues beyond borrowing costs impacting housing affordability in the Greater Golden Horseshoe. The ability to bring on more supply is the longer-term challenge. However, we are moving in the right direction on this front. The strong mayor proposal from the province coupled with the recent commitment from Toronto Mayor John Tory to expand ownership and rental housing options are examples of this. TRREB looks forward to hearing additional initiatives from candidates vying for office in the upcoming municipal elections," said TRREB Chief Market Analyst Jason Mercer.

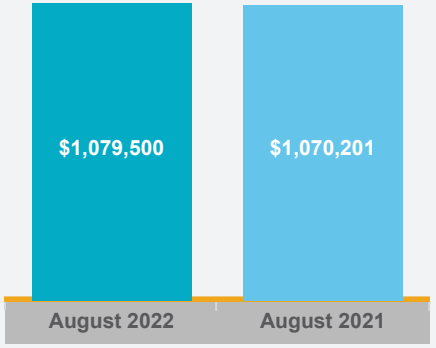
Sales & Average Price by Major Home Type

	Sales			Average Price		
August 2022	**416**	**905**	**Total**	**416**	**905**	**Total**
Detached	511	2,084	2,595	$1,648,298	$1,313,839	$1,379,700
Semi-Detached	159	367	526	$1,127,429	$942,628	$998,490
Townhouse	182	753	935	$913,410	$897,140	$900,307
Condo Apt	1,028	479	1,507	$736,940	$656,339	$711,321
YoY % change	**416**	**905**	**Total**	**416**	**905**	**Total**
Detached	-26.0%	-30.3%	-29.5%	-1.7%	-3.7%	-3.1%
Semi-Detached	-29.6%	-28.7%	-29.0%	-7.3%	-1.1%	-3.4%
Townhouse	-44.0%	-35.9%	-37.7%	0.4%	3.7%	2.9%
Condo Apt	-40.6%	-40.5%	-40.6%	2.6%	6.0%	3.6%

TRREB MLS® Sales Activity



TRREB MLS® Average Price



Year-Over-Year Summary

	2022	2021	% Chg
Sales	5,627	8,549	**-34.2%**
New Listings	10,537	10,615	**-0.7%**
Active Listings	13,305	8,199	**62.3%**
Average Price	$1,079,500	$1,070,201	**0.9%**
Avg. LDOM	22	16	**37.5%**
Avg. PDOM	34	21	**61.9%**

SALES BY PRICE RANGE AND HOUSE TYPE — August 2022

	Detached	Semi-Detached	Att/Row/Townhouse	Condo Townhouse	Condo Apartment	Link	Co-Op Apartment	Detached Condo	Co-Ownership Apt	Total
$0 to $99,999	0	0	0	0	1	0	0	0	0	1
$100,000 to $199,999	0	0	0	0	0	0	0	0	0	0
$200,000 to $299,999	0	0	0	0	2	0	2	0	0	4
$300,000 to $399,999	4	0	0	0	7	0	2	0	0	13
$400,000 to $499,999	7	1	1	9	92	0	3	0	2	115
$500,000 to $599,999	33	6	1	40	419	0	1	0	0	500
$600,000 to $699,999	72	39	19	93	421	3	0	0	0	647
$700,000 to $799,999	156	35	74	109	260	9	0	0	0	643
$800,000 to $899,999	225	99	121	80	130	9	0	1	0	665
$900,000 to $999,999	289	137	131	42	60	10	1	4	0	674
$1,000,000 to $1,249,999	609	157	108	21	58	13	0	1	0	967
$1,250,000 to $1,499,999	480	30	51	9	30	3	0	0	0	603
$1,500,000 to $1,749,999	268	10	14	5	10	0	0	0	0	307
$1,750,000 to $1,999,999	166	7	1	3	5	0	0	0	0	182
$2,000,000+	286	5	3	0	12	0	0	0	0	306
Total Sales	2,595	526	524	411	1,507	47	9	6	2	5,627
Share of Total Sales (%)	46.1%	9.3%	9.3%	7.3%	26.8%	0.8%	0.2%	0.1%	0.0%	100.0%
Average Price	$1,379,700	$998,490	$987,308	$789,386	$711,321	$946,706	$445,159	$950,833	$434,000	$1,079,500

SALES BY PRICE RANGE AND HOUSE TYPE — Year-to-Date 2022

	Detached	Semi-Detached	Att/Row/Townhouse	Condo Townhouse	Condo Apartment	Link	Co-Op Apartment	Detached Condo	Co-Ownership Apt	Total
$0 to $99,999	2	0	0	0	8	0	0	0	0	10
$100,000 to $199,999	0	0	0	0	4	0	0	0	0	4
$200,000 to $299,999	3	0	0	1	29	0	3	0	0	36
$300,000 to $399,999	21	0	2	3	108	0	13	0	7	154
$400,000 to $499,999	52	4	3	32	543	0	16	0	25	675
$500,000 to $599,999	123	11	10	187	2,488	0	4	1	6	2,830
$600,000 to $699,999	314	98	67	486	4,590	7	10	1	8	5,581
$700,000 to $799,999	731	208	284	894	3,815	27	5	6	3	5,973
$800,000 to $899,999	1,167	424	629	1,022	2,101	42	5	4	1	5,395
$900,000 to $999,999	1,846	797	1,145	923	1,067	58	9	15	0	5,860
$1,000,000 to $1,249,999	4,578	1,693	1,565	640	909	90	2	16	0	9,493
$1,250,000 to $1,499,999	5,349	1,311	1,070	189	392	77	1	9	0	8,398
$1,500,000 to $1,749,999	4,172	427	315	70	153	26	2	3	1	5,169
$1,750,000 to $1,999,999	2,460	171	78	26	100	4	1	3	0	2,843
$2,000,000+	4,824	199	63	14	154	0	0	0	0	5,254
Total Sales	25,642	5,343	5,231	4,487	16,461	331	71	58	51	57,675
Share of Total Sales (%)	44.5%	9.3%	9.1%	7.8%	28.5%	0.6%	0.1%	0.1%	0.1%	100.0%
Average Price	$1,598,670	$1,222,442	$1,126,385	$892,206	$770,358	$1,113,181	$655,506	$1,104,402	$523,631	$1,224,216

SUMMARY OF EXISTING HOME TRANSACTIONS

All Home Types, August 2022

ALL TRREB AREAS

	Sales	Dollar Volume	Average Price	Median Price	New Listings	SNLR Trend	Active Listings	Mos Inv (Trend)	Avg. SP/LP	Avg. LDOM	Avg. PDOM
All TRREB Areas	5,627	$6,074,349,229	$1,079,500	$930,000	10,537	57.6%	13,305	1.3	98%	22	34
Halton Region	589	$711,101,449	$1,207,303	$1,002,000	1,044	58.7%	1,334	1.2	96%	25	37
Burlington	211	$225,771,014	$1,070,005	$965,000	384	62.2%	442	1.1	96%	24	36
Halton Hills	58	$66,813,400	$1,151,955	$995,500	124	55.9%	153	1.3	96%	24	39
Milton	153	$153,384,673	$1,002,514	$960,000	197	57.0%	227	1.0	98%	21	34
Oakville	167	$265,132,362	$1,587,619	$1,237,120	339	57.8%	512	1.3	95%	28	42
Peel Region	1,058	$1,124,637,410	$1,062,984	$970,000	2,117	56.6%	2,646	1.2	97%	22	35
Brampton	508	$517,468,365	$1,018,639	$959,000	896	55.8%	1,037	1.1	97%	21	35
Caledon	63	$82,624,999	$1,311,508	$1,040,000	174	48.4%	260	1.9	95%	26	40
Mississauga	487	$524,544,046	$1,077,092	$975,000	1,047	58.5%	1,349	1.2	97%	23	34
City of Toronto	1,892	$1,952,505,116	$1,031,979	$820,000	3,785	58.2%	5,135	1.5	98%	23	34
Toronto West	445	$427,501,062	$960,677	$842,500	1,004	58.9%	1,425	1.4	98%	24	36
Toronto Central	978	$1,076,638,369	$1,100,857	$770,000	1,865	56.0%	2,699	1.7	97%	24	37
Toronto East	469	$448,365,685	$956,004	$940,000	916	62.1%	1,011	1.0	100%	20	28
York Region	1,063	$1,345,362,442	$1,265,628	$1,170,000	1,785	55.7%	2,315	1.5	98%	23	36
Aurora	82	$97,677,880	$1,191,194	$1,071,000	106	55.2%	125	1.4	97%	23	35
East Gwillimbury	42	$53,632,500	$1,276,964	$1,162,500	89	53.0%	105	1.6	99%	24	35
Georgina	65	$56,026,883	$861,952	$840,000	118	53.0%	155	1.6	97%	22	40
King	24	$51,949,831	$2,164,576	$1,825,000	79	46.6%	125	2.8	91%	23	54
Markham	270	$343,825,604	$1,273,428	$1,215,500	409	59.3%	431	1.2	101%	21	29
Newmarket	80	$84,086,388	$1,051,080	$964,000	120	61.7%	126	1.0	97%	21	33
Richmond Hill	187	$255,702,650	$1,367,394	$1,300,000	310	54.8%	436	1.6	100%	26	42
Vaughan	260	$331,342,709	$1,274,395	$1,203,000	443	54.1%	657	1.5	97%	23	37
Stouffville	53	$71,117,997	$1,341,849	$1,288,888	111	52.4%	155	1.7	97%	21	38
Durham Region	806	$741,736,706	$920,269	$854,000	1,275	62.1%	1,121	0.9	100%	17	26
Ajax	104	$101,907,457	$979,879	$930,000	170	61.3%	134	0.8	102%	16	24
Brock	14	$10,473,000	$748,071	$705,000	36	51.6%	55	1.9	96%	28	31
Clarington	153	$141,302,300	$923,544	$840,000	241	63.4%	192	0.8	98%	17	27
Oshawa	237	$188,835,097	$796,773	$745,000	358	63.1%	281	0.8	102%	16	25
Pickering	95	$94,050,750	$990,008	$895,000	170	60.3%	179	1.0	99%	17	27
Scugog	24	$22,777,376	$949,057	$930,000	41	63.0%	59	1.3	100%	20	28
Uxbridge	22	$29,482,900	$1,340,132	$1,218,500	33	64.0%	45	1.2	97%	19	24
Whitby	157	$152,907,826	$973,935	$910,000	226	61.9%	176	0.8	100%	15	27
Dufferin County	44	$36,480,400	$829,100	$792,000	64	61.5%	90	1.1	99%	28	44
Orangeville	44	$36,480,400	$829,100	$792,000	64	61.5%	90	1.1	99%	28	44
Simcoe County	175	$162,525,706	$928,718	$835,000	467	48.7%	664	1.7	96%	25	40
Adjala-Tosorontio	10	$12,930,900	$1,293,090	$1,117,500	26	46.1%	54	2.5	95%	44	57
Bradford	34	$37,043,300	$1,089,509	$1,037,500	92	48.3%	104	1.5	95%	24	38
Essa	29	$23,671,900	$816,272	$710,000	66	52.9%	79	1.5	97%	22	40
Innisfil	53	$46,807,950	$883,169	$791,000	157	45.5%	238	2.0	96%	24	45
New Tecumseth	49	$42,071,656	$858,605	$825,000	126	51.2%	189	1.6	96%	23	34

Historic Annual Statistics

Year	Sales	Average Price
2010	85,860	$431,262
2011	89,110	$464,989
2012	85,488	$497,073
2013	87,047	$522,951
2014	92,776	$566,611
2015	101,213	$622,116
2016	113,040	$729,824
2017	92,340	$822,510
2018	78,017	$787,842
2019	87,747	$819,153
2020	95,066	$929,636

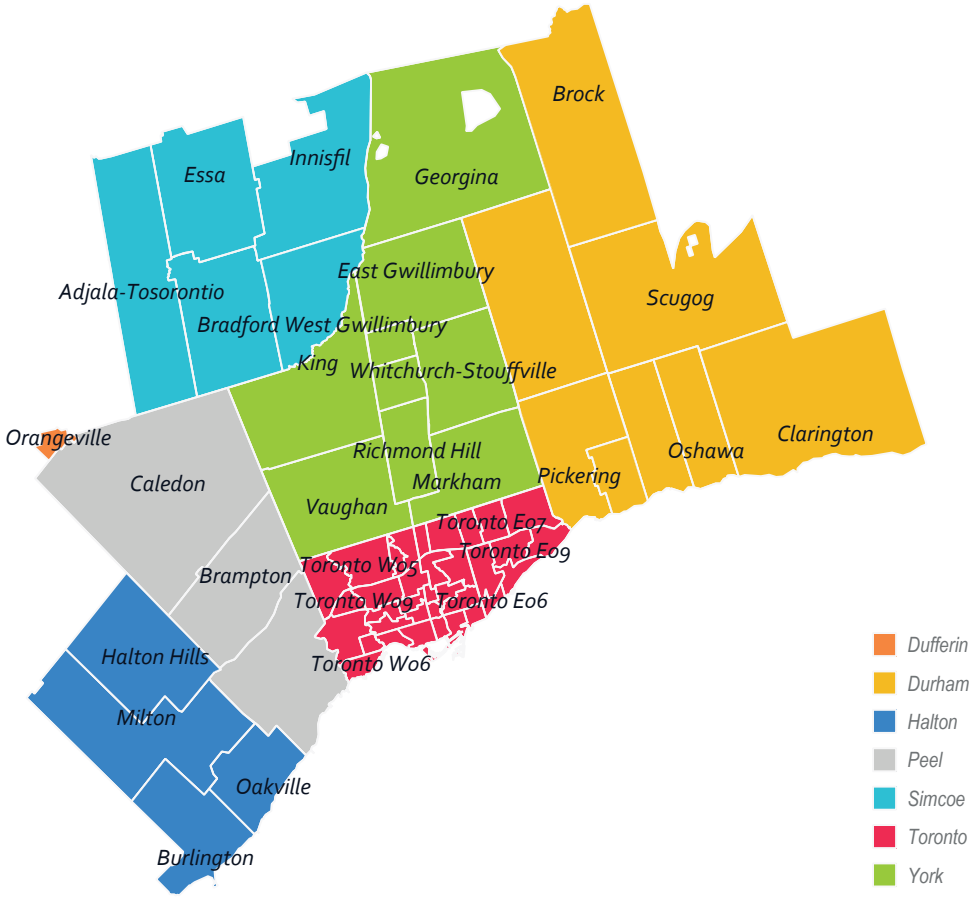
For historical annual sales and average price data over a longer time frame, go to: https://trreb.ca/files/market-stats/market-watch/historic.pdf

Monthly Statistics 2021

January	6,887	$966,001
February	10,925	$1,044,910
March	15,627	$1,097,319
April	13,613	$1,090,414
May	11,903	$1,108,124
June	11,052	$1,089,012
July	9,339	$1,061,724
August	8,549	$1,070,201
September	9,010	$1,135,027
October	9,743	$1,155,624
November	8,980	$1,162,539
December	6,014	$1,157,861
Annual	**121,642**	**$1,095,339**

Monthly Statistics 2022

January	5,595	$1,242,076
February	9,032	$1,334,123
March	10,876	$1,299,470
April	7,955	$1,253,435
May	7,245	$1,211,888
June	6,445	$1,146,249
July	4,900	$1,073,730
August	5,627	$1,079,500
September		
October		
November		
December		
Year to Date	**57,675**	**$1,224,216**

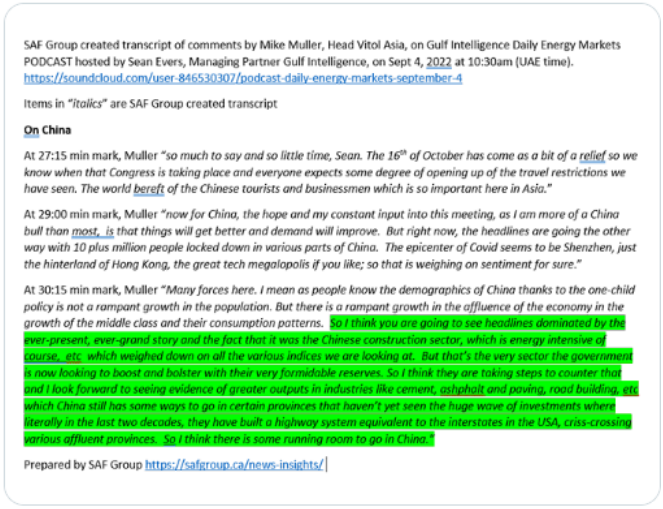


Notes

1. Sales, dollar volume, average sale prices and median sale prices are based on firm transactions entered into the TRREB MLS® System between the first and last day of the month/period being reported.
2. New listings entered into the TRREB MLS® System between the first and last day of the month/period being reported.
3. Active listings at the end of the last day of the month/period being reported.
4. Ratio of the average selling price to the average listing price for firm transactions entered into the TRREB MLS® System between the first and last day of the month/period being reported.
5. Average Listing Days on Market (Avg. LDOM) refers to the average number of days sold listings were on the market. Average Property Days on Market (Avg. PDOM) refers to the average number of days a property was on the market before selling, irrespective of whether the property was listed more than once by the same combination of seller and brokerage during the original listing contract period.
6. Active Listings at the end of the last day of the month/period being reported.
7. Past monthly and year-to-date figures are revised on a monthly basis.
8. SNLR = Sales-to-New-Listings Ratio. Calculated using a 12 month moving average (sales/new listings).
9. Mos. Inv. = Months of Inventory. Calculated using a 12 month moving average (active listings/sales).
10. "Bradford West Gwillimbury" is referred to as "Bradford" and "Whitchurch-Stouffville" is referred to as "Stouffville" in the report.

Dan Tsubouchi @Energy_Tidbits · 1h

Usual great China insights from #Vitol @michaelwmuller China #Oil views. Yes headlines right now are Covid impact, but post Oct 16 Congress opening up of travel restrictions & CN using very formidable reserves to crank up industries like cement, asphalt, road building, etc. #OOTT



SAF Group created transcript of comments by Mike Muller, Head Vitol Asia, on Gulf Intelligence Daily Energy Markets PODCAST hosted by Sean Evers, Managing Partner Gulf Intelligence, on Sept 4, 2022 at 10:30am (UAE time).
https://soundcloud.com/user-846530307/podcast-daily-energy-markets-september-4

Items in "*italics*" are SAF Group created transcript

On China

At 27:15 min mark, Muller "*so much to say and so little time, Sean. The 16th of October has come as a bit of a relief so we know when that Congress is taking place and everyone expects some degree of opening up of the travel restrictions we have seen. The world bereft of the Chinese tourists and businessmen which is so important here in Asia.*"

At 29:00 min mark, Muller "*now for China, the hope and my constant input into this meeting, as I am more of a China bull than most, is that things will get better and demand will improve. But right now, the headlines are going the other way with 10 plus million people locked down in various parts of China. The epicenter of Covid seems to be Shenzhen, just the hinterland of Hong Kong, the great tech megalopolis if you like; so that is weighing on sentiment for sure.*"

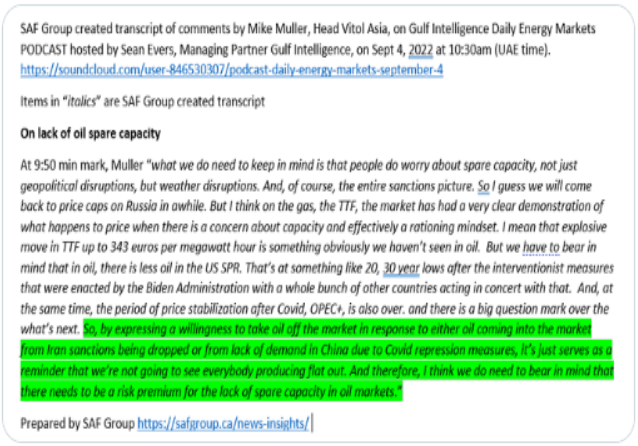
At 30:15 min mark, Muller "*Many forces here. I mean as people know the demographics of China thanks to the one-child policy is not a rampant growth in the population. But there is a rampant growth in the affluence of the economy in the growth of the middle class and their consumption patterns. So I think you are going to see headlines dominated by the ever-present, ever-grand story and the fact that it was the Chinese construction sector, which is energy intensive of course, etc which weighed down on all the various indices we are looking at. But that's the very sector the government is now looking to boost and bolster with their very formidable reserves. So I think they are taking steps to counter that and I look forward to seeing evidence of greater outputs in industries like cement, ashphalt and paving, road building, etc which China still has some ways to go in certain provinces that haven't yet seen the huge wave of investments where literally in the last two decades, they have built a highway system equivalent to the interstates in the USA, criss-crossing various affluent provinces. So I think there is some running room to go in China.*"

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

1 6

Dan Tsubouchi @Energy_Tidbits · 1h

"there needs to be a risk premium for the lack of spare capacity in #Oil markets" reminds #Vitol @michaelwmuller as Abdulaziz expressing a willingness to take oil off the market is a reminder "we're not going to see everybody producing flat out". Great podcast @sean_evers. #OOTT



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On lack of oil spare capacity

At 9:50 min mark, Muller "*what we do need to keep in mind is that people do worry about spare capacity, not just geopolitical disruptions, but weather disruptions. And, of course, the entire sanctions picture. So I guess we will come back to price caps on Russia in awhile. But I think on the gas, the TTF, the market has had a very clear demonstration of what happens to price when there is a concern about capacity and effectively a rationing mindset. I mean that explosive move in TTF up to 343 euros per megawatt hour is something obviously we haven't seen in oil. But we have to bear in mind that in oil, there is less oil in the US SPR. That's at something like 20, 30 year lows after the interventionist measures that were enacted by the Biden Administration with a whole bunch of other countries acting in concert with that. And, at the same time, the period of price stabilization after Covid, OPEC+, is also over. and there is a big question mark over the what's next. So, by expressing a willingness to take oil off the market in response to either oil coming into the market from Iran sanctions being dropped or from lack of demand in China due to Covid repression measures, it's just serves as a reminder that we're not going to see everybody producing flat out. And therefore, I think we do need to bear in mind that there needs to be a risk premium for the lack of spare capacity in oil markets.*"

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

1 1 14

Dan Tsubouchi @Energy_Tidbits · 1h

#Vitol's @michaelwmuller "[RUS] exports of 7+ mmbd of crude oil & products combined are an even greater % of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that". Great podcast @sean_evers. #OOTT

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On G7 oil price cap

At 16:50 min mark, Muller *"it's probably the most discussed topic in the last 24 hours on social media or specialist on-line media, and it's awfully hard to say Sean. The industry has obviously been aware of this desire to put in place such a cap for the last month and a bit. And has largely dismissed the possibility of doing so in a way that actually works. I think we have to bear in mind that Russia's production is a much larger number than Iran's production so you can't draw parallels about sanctions taking effect in Russia in the same way as Iran because Russia has the capability to produce 11 mmb/d of oil. That's 11% of global supply. And its exports of 7 plus mmb/d of crude oil and products combined are an even greater percentage of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that. Yes. If you look at what's happening with Nord Stream 1 and Nord Stream 2, there have been moments, days, weeks where all the Russian supply has been shut off to certain countries for various technical and I would argue political reasons. So a way must be found to allow Russian oil to continue to flow into markets because, unlike the inventory build of gas in Europe and people saying they might just get by with rationing, austerity measures and hopefully a mild winter than last year – That does not apply to oil. It's impossible for the world to get by without not having 7%, 7.5 mmb/d of exports. So what a price cap might seek to accomplish is the Russian oil goes to a larger number of markets under a framework that is actually more fungible. In so doing of course, the 1, 2, 3, 4 markets where most Russian crude oil is flowing now will flow once the sanctions take further effect later this year. will be spread out more widely. So thereffore discounts we are currently seeing in place on Russian crude oil and exports will possibly diminish at the same time that more participants are brought into the fold. But I have my own idea on how the price cap will actually be enforced. There is talk, of course, of exerting pressure on those pieces of the supply chain where the G7 that are driving this, have a certain degree of control such as shipping and insurance. I guess those are the levers that need to be further understood."*

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

1 · 2 · 16

Dan Tsubouchi @Energy_Tidbits · 19h

#Vortexa crude #Oil floating storage at 09/02 est 90.72 mmb, -5.88 mmb WoW vs revised down 08/26 of 96.60 mmb. Last six weeks were revised lower. Thx @Vortexa @business. #OOTT

Vortexa Crude Oil Floating Storage Estimate Posted Sept 3 at noon MT

Source: Bloomberg, Vortexa

Posted Sept 3, noon MT

Date	Last Px
Fr 09/02/2022	90721
Fr 08/26/2022	96602
Fr 08/19/2022	107.78k
Fr 08/12/2022	110.311k
Fr 08/05/2022	92630
Fr 07/29/2022	94907
Fr 07/22/2022	83291
Fr 07/15/2022	89341
Fr 07/08/2022	99602
Fr 07/01/2022	102.815k
Fr 06/24/2022	103.064k

Aug 27, noon MT

Date	Last Px
Fr 08/26/2022	99094
Fr 08/19/2022	110.429k
Fr 08/12/2022	110.706k
Fr 08/05/2022	94431
Fr 07/29/2022	96372
Fr 07/22/2022	87209
Fr 07/15/2022	89237
Fr 07/08/2022	99286
Fr 07/01/2022	102.682k
Fr 06/24/2022	102.696k
Fr 06/17/2022	111.583k

Aug 20, noon MT

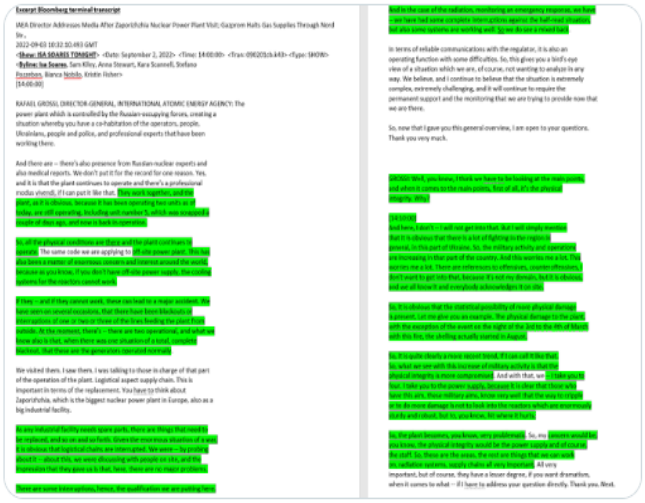
Date	Last Px
Fr 08/19/2022	104.631k
Fr 08/12/2022	111.571k
Fr 08/05/2022	91956
Fr 07/29/2022	91904
Fr 07/22/2022	84582
Fr 07/15/2022	86346
Fr 07/08/2022	95063
Fr 07/01/2022	94835
Fr 06/24/2022	93158
Fr 06/17/2022	103.26k
Fr 06/10/2022	101.878k

Source: Bloomberg, Vortexa

4 · 11

Dan Tsubouchi @Energy_Tidbits · Sep 3

ICYMI, @rafaelmgrossi post #ZaporizhzhiaNPP visit. Yes worries a lot military action could cause physical damage. But access to off-site power is "matter of enormous concern" as needed or "cooling systems for the reactors cannot work". Thx @IsaCNN @business. #OOTT



Excerpt: Bloomberg terminal transcript

IAEA Director Addresses Media After Zaporizhzhia Nuclear Power Plant Visit; Gazprom Halts Gas Supplies Through Nord Str...

2022-09-03 10:32:10.493 GMT

<Show: ISA SOARES TONIGHT> <Date: September 2, 2022> <Time: 14:00:00> <Trax: 09020/b443> <Type: SHOW>

<Byline: Isa Soares, Sam Kiley, Anna Stewart, Kara Scannell, Stefano Pozzebon, Bianca Nobilo, Kristin Fisher>

[14:00:00]

RAFAEL GROSSI, DIRECTOR-GENERAL, INTERNATIONAL ATOMIC ENERGY AGENCY: The power plant which is controlled by the Russian occupying forces, creating a situation whereby you have a co-habitation of the operators, people, Ukrainians, people and police, and professional experts that have been working there.

And there are -- there's also presence from Russian nuclear experts and also medical reports. We don't put it for the record for one reason. Yes, and it is that the plant continues to operate and there's a professional modus vivendi, if I can put it like that, they work together, and in fact, as it is obvious, because it has been operating two units as at today, are still operating, including unit number 5, which was scrapped a couple of days ago, and now is back in operation.

So, all the physical conditions are that a will for plant continues to operate. The same code we are applying to off-site power plant. This has also been a matter of enormous concern and covered around the world, because as you know, if you don't have off-site power supply, the cooling systems for the reactors cannot work.

I they -- and if they cannot work, these can lead to a major accident. We have seen on several occasions, that there have been blackouts or interruptions of one or two or three of the lines feeding the plant from outside. At the moment, there's -- there are two operational, and what we know also is that, when there was one situation of a total, complete blackout, that these are the generators operated normally.

We visited them. I saw them. I was talking to those in charge of that part of the operation of the plant. Logistical aspect supply chain. This is important in terms of the replacement. You have to think about Zaporizhzhia, which is the biggest nuclear power plant in Europe, also as a big industrial facility.

As any industrial facility needs spare parts, there are things that need to be replaced, and so on and so forth. Given the enormous situation of a war, it is obvious that logistical chains are interrupted. We were -- by printing about it -- about this, we were discussing with people on site, and the impression that they gave us is that, here, there are no major problems.

There are some interruptions, hence, the qualification we are putting here.

And in the case of the radiation, monitoring an emergency response, we have -- we have had some complete interruptions against the half-next situation, but also some systems are working well. So we do see a mixed bag.

In terms of reliable communications with the regulator, it is also an operating function with some difficulties. So, this gives you a bird's-eye view of a situation which we are, of course, not wanting to analyze in any way. We believe, and I continue to believe that the situation is extremely complex, extremely challenging, and it will continue to require the permanent support and the monitoring that we are trying to provide now that we are there.

So, now that I gave you this general overview, I am open to your questions. Thank you very much.

[14:09:18]

And here, I don't -- I will not get into that. But I will simply mention that it is obvious that there is a lot of fighting in the region in general, in this part of Ukraine. So, the military activity and operations are increasing in that part of the country. And this worries me a lot. This worries me a lot. There are references to offensives, counter-offensives, I don't want to get into that, because it's not my domain, but it is obvious, and we all know it and everybody acknowledges it on this.

So, it is obvious that the statistical possibility of more physical damage is present. Let me give you an example. The physical damage to the plant, with the exception of the event on the night of the 3rd to the 4th of March with this fire, the shelling actually started in August.

So, it is quite clearly a more recent trend. If I can call it like that. So, what we see with this increase of military activity is that the physical integrity is more compromised. And with that, we -- I take great fear. I refer you to the severe supply, because it is clear that those who have this aim, these military aims, know very well that the way to crystallize its more damage is not to look into the reactors which are enormously sturdy and robust, but to, you know, hit where it hurts.

So, the plant becomes, you know, very problematic. So, my answers would be, you know, the physical integrity would be the power supply and of course, the staff. So, these are the areas, the cost are things that we can work on, radiation systems, supply chains all very important. All very important, but of course, they have a lesser degree, if you want dramatism, when it comes to what -- if I have to address your question directly. Thank you. Next.

2 1

Dan Tsubouchi @Energy_Tidbits · Sep 2

#NordStream is NOT resuming supply tonight. It is shut down. No ETA for how long it will be down or if it will resume any supply before the winter. #NatGas #LNG #OOTT

> **Gazprom** @GazpromEN · Sep 2
>
> Results of technical maintenance performed at GCU24 of Portovaya CS
>
> During scheduled maintenance works at the Trent 60 gas compressor unit (GCU No. 24) of the Portovaya CS which were carried out jointly with Siemens, it was discovered that there is a leakage of oil with a sealing compound in it that has reached the terminal connections in the cable lines serving the low-pressure and intermediate-pressure rotor speed sensors.
>
> Presence of oil was detected on the detachable cable connection of the BPE2 mounting plate which forms part of the engine.
>
> Oil was also detected near the cable line located in the outer terminal cabinet of the GCU's automated control system, outside of the sound and heat insulating enclosure. A report on the detection of the oil leakage was drawn up which was also signed by Siemens representatives.
>
> Rostekhnadzor of Russia issued a warning that the detected faults and failures make it impossible to ensure the safe and trouble-free operation of the gas turbine engine. Therefore, it is required to take appropriate measures and suspend the operation of the Trent 60 gas compressor unit in view of the identified gross violations.
>
> Similar oil leakages were detected in the past at the GCUs with engines Nos. 075, 076 and 120, which have undergone major factory repairs and are now in forced downtime. According to Siemens, oil leakages in these engines cannot be fully eliminated unless repairs take place at a specialized repair facility.
>
> A letter outlining the faults detected in the Trent 60 (No. 24) unit and the need to eliminate said faults was sent to Christian Bruch, President and Chief Executive Officer of Siemens Energy AG.
>
> Gas transmission via the Nord Stream gas pipeline has been fully shut down until the operational defects in the equipment are eliminated.

5

Dan Tsubouchi @Energy_Tidbits · Sep 2

CA may not say it, but realize reliable, available #Electricity needs #NatGas #Nuclear.
09/01/22 CA SB-846 extends Diablo Nuclear power for 5 yrs to 2030.
08/17/21 California Energy Commission order for 5 temp #NatGas plants for min 5 yrs operations.
See 👇 12/09/21 tweet. #OOTT

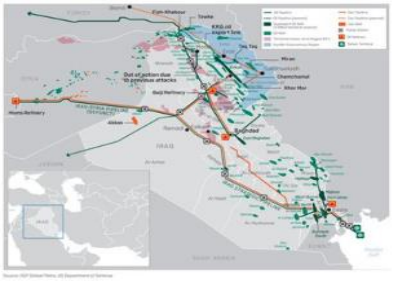
> **Dan Tsubouchi** @Energy_Tidbits · Dec 9, 2021
>
> Time for #2022Predictions. My #1 is more #EnergyTransition #NetZero leaders come out of closet, have a #MacronMoment ie. have "transition" not self inflicted shortage so 2021 energy crisis isn't every year. A return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT twitter.com/Energy_Tidbits...

1 1 6

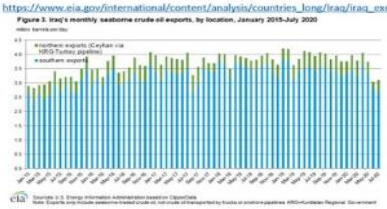
Dan Tsubouchi @Energy_Tidbits · Sep 2

Need to keep our eye on Iraq with @Reuters reporting "Clashes in Iraq's Basra kill four as crisis flares in oil-rich south". Basra and surrounding south region is the heart of Iraq oil production and #Oil exports. Thx @SPGlobal for map, @EIAgov for export split. #OOTT

https://www.spglobal.com/commodityinsights/plattscontent/_assets/_images/latest-news/20190624-iraq-oil-gas-infrastructure.jpg



https://www.eia.gov/international/content/analysis/countries_long/iraq/iraq_exe.pdf



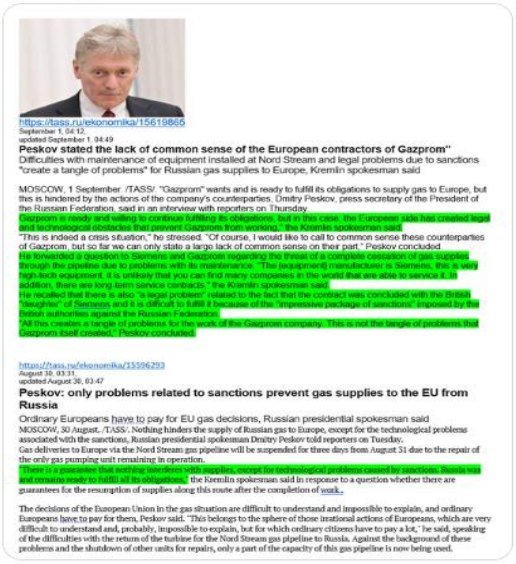
Dan Tsubouchi @Energy_Tidbits · Sep 2

Huge daily temp swing tomorrow in #Calgary with forecast Sat high 35c/95f and low 14c/57f. And then next Thurs, a forecast high of 14c/57f and low 8c/46f. better than two years ago when we had a skiff of snow on sept 7/2020.

1 2

Dan Tsubouchi @Energy_Tidbits · Sep 1

#NordStream. Peskov is an experienced spokesman. His 👇 comments today vs Aug 30 seem to increase the risk that Nord Stream doesn't resume Sept 3. Europe will know on the weekend one way or another. #NatGas #LNG #OOTT



https://tass.ru/ekonomika/15619865
September 1, 04:12,
updated September 1, 04:49

Peskov stated the lack of common sense of the European contractors of Gazprom"

Difficulties with maintenance of equipment installed at Nord Stream and legal problems due to sanctions "create a tangle of problems" for Russian gas supplies to Europe, Kremlin spokesman said

MOSCOW, 1 September. /TASS/. "Gazprom" wants and is ready to fulfill its obligations to supply gas to Europe, but this is hindered by the actions of the company's counterparties, Dmitry Peskov, press secretary of the President of the Russian Federation, said in an interview with reporters on Thursday.

Gazprom is ready and willing to continue fulfilling its obligations, but in this case, the European side has created legal and technological obstacles that prevent Gazprom from working," the Kremlin spokesman said.

"This is indeed a crisis situation," he stressed. "Of course, I would like to call to common sense these counterparties of Gazprom, but so far we can only state a large lack of common sense on their part," Peskov concluded.

He forwarded a question to Siemens and Gazprom regarding the threat of a complete cessation of gas supplies through the pipeline due to problems with its maintenance. "The [equipment] manufacturer is Siemens, this is very high-tech equipment, it is unlikely that you can find many companies in the world that are able to service it. In addition, there are long-term service contracts," the Kremlin spokesman said.

He recalled that there is also "a legal problem" related to the fact that the contract was concluded with the British "daughter" of Siemens and it is difficult to fulfill it because of the "impressive package of sanctions" imposed by the British authorities against the Russian Federation.

"All this creates a tangle of problems for the work of the Gazprom company. This is not the tangle of problems that Gazprom itself created," Peskov concluded.

https://tass.ru/ekonomika/15596293
August 30, 03:31,
updated August 30, 03:47

Peskov: only problems related to sanctions prevent gas supplies to the EU from Russia

Ordinary Europeans have to pay for EU gas decisions, Russian presidential spokesman said

MOSCOW, 30 August. /TASS/. Nothing hinders the supply of Russian gas to Europe, except for the technological problems associated with the sanctions, Russian presidential spokesman Dmitry Peskov told reporters on Tuesday.

Gas deliveries to Europe via the Nord Stream gas pipeline will be suspended for three days from August 31 due to the repair of the only gas pumping unit remaining in operation.

"There is a guarantee that nothing interferes with supplies, except for technological problems caused by sanctions. Russia was and remains ready to fulfill all its obligations," the Kremlin spokesman said in response to a question whether there are guarantees for the resumption of supplies along this route after the completion of work.

The decisions of the European Union in the gas situation are difficult to understand and impossible to explain, and ordinary Europeans have to pay for them, Peskov said. "This belongs to the sphere of those irrational actions of Europeans, which are very difficult to understand and, probably, impossible to explain, but for which ordinary citizens have to pay a lot," he said, speaking of the difficulties with the return of the turbine for the Nord Stream gas pipeline to Russia. Against the background of these problems and the shutdown of other units for repairs, only a part of the capacity of this gas pipeline is now being used.

1 4

Dan Tsubouchi @Energy_Tidbits · Sep 1

China Covid lockdowns aren't stopping. China locks down Chengu (Sichuan), in addition to multiple places across CN ie. Central CN Henan Province, Dalian in NE CN Liaoning, Lanxi in S NE CN Heilongjiang, parts of Shenzhen in south CN Guangong. #OOTT

Stay informed
This Tweet links to a China state-affiliated media website.
Find out more

globaltimes.cn
Chengdu in SW China's Sichuan tightens management to curb the fas...
Chengdu, capital city of Southwest China's Sichuan Province tightened its COVID-19 epidemic prevention and control starting Tuesday by ...

1

Dan Tsubouchi @Energy_Tidbits · Sep 1

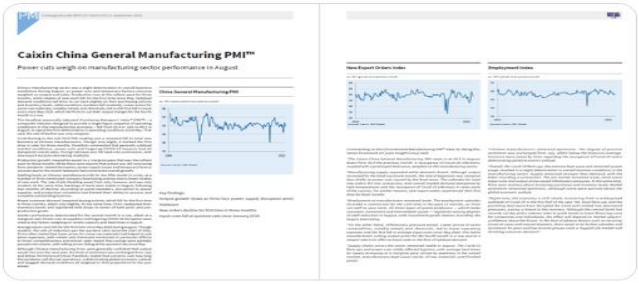
A 1-day Pilots strike forces #Lufthansa to cancel all departures from German airports on Sept 2. long distances fliers will be rebooked, wonder what the math is for #Diesel #Gasoline consumption is from local fliers who will take a train or drive? #OOTT

lufthansagroup.com
Despite Very Good Offer: Pilots' Union VC Announ...
Affected: Lufthansa and Lufthansa Cargo departures at German airports on 2 September ...

1 1

Dan Tsubouchi @Energy_Tidbits · Aug 31

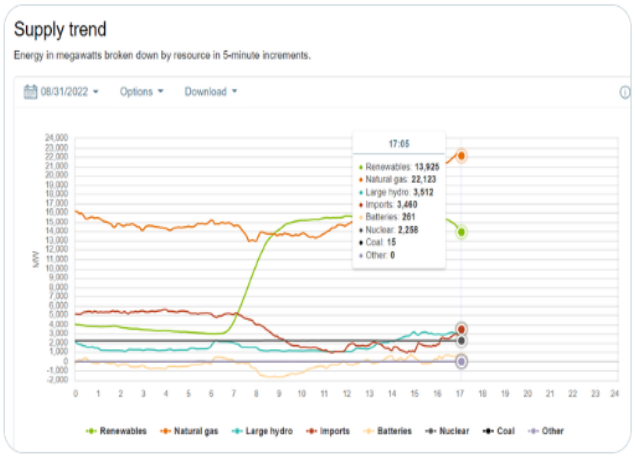
China Caixin PMI for Aug 49.5 v Est 50.2 & July 50.4. "renewed fall in total new business at Chinese manufacturers" "1st drop in sales for 3 months" "generally subdued mkt conditions, power cuts & lingering COVID-19 impacts had all dampened overall sales" Thx @IHSMarkitPMI #OOTT



3 1

Dan Tsubouchi @Energy_Tidbits · Aug 31

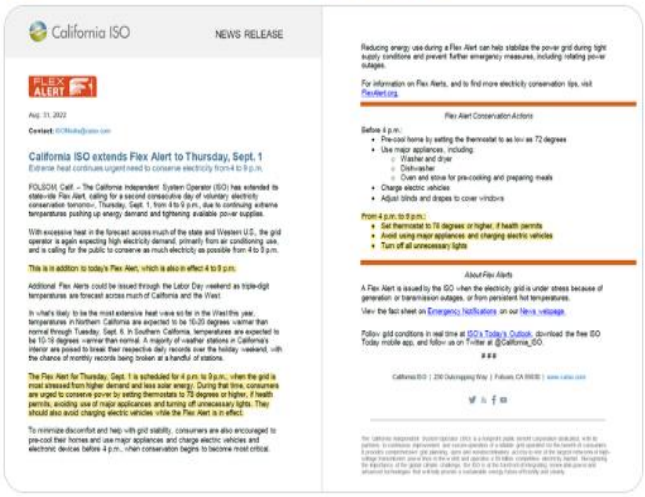
#NatGas stepping up as usual to carry the load during peak California power demand as #Solar starts to quickly decline. Below is the link to live @California_ISO power supply by fuel updated as of 5:05pm PT. #OOTT caiso.com/TodaysOutlook/...



8 15

Dan Tsubouchi @Energy_Tidbits · Aug 31

. @California_ISO extends #FlexAlerta to Thurs Sept 1 ie. from 4-9pm, set thermostat to 78F or higher, avoid using major appliances and charging #EVs, turn off all unnecessary lights. #NatGas #OOTT


California ISO

NEWS RELEASE

FLEX ALERT

Aug. 31, 2022

Contact:

California ISO extends Flex Alert to Thursday, Sept. 1

Extreme heat continues urgent need to conserve electricity from 4 to 9 p.m.

FOLSOM, Calif. – The California Independent System Operator (ISO) has extended its statewide Flex Alert, calling for a second consecutive day of voluntary electricity conservation tomorrow, Thursday, Sept. 1, from 4 to 9 p.m., due to continuing extreme temperatures pushing up energy demand and tightening available power supplies.

With excessive heat in the forecast across much of the state and Western U.S., the grid operator is again expecting high electricity demand, primarily from air conditioning use, and is calling for the public to conserve as much electricity as possible from 4 to 9 p.m.

This is in addition to today's Flex Alert, which is also in effect 4 to 9 p.m.

Additional Flex Alerts could be issued through the Labor Day weekend as triple-digit temperatures are forecast across much of California and the West.

In what's likely to be the most extensive heat wave so far in the West this year, temperatures in Northern California are expected to be 16-20 degrees warmer than normal through Tuesday, Sept. 6. In Southern California, temperatures are expected to be 10-16 degrees warmer than normal. A majority of weather stations in California's interior are poised to break their respective daily records over the holiday weekend, with the chance of monthly records being broken at a handful of stations.

The Flex Alert for Thursday, Sept. 1 is scheduled for 4 p.m. to 9 p.m., when the grid is most stressed from higher demand and less solar energy. During that time, consumers are urged to conserve power by setting thermostats to 78 degrees or higher, if health permits, avoiding use of major appliances and turning off unnecessary lights. They should also avoid charging electric vehicles while the Flex Alert is in effect.

To minimize discomfort and help with grid stability, consumers are also encouraged to pre-cool their homes and use major appliances and charge electric vehicles and electronic devices before 4 p.m., when conservation begins to become most critical.

Reducing energy use during a Flex Alert can help stabilize the power grid during tight supply conditions and prevent further emergency measures, including rotating power outages.

For information on Flex Alerts, and to find more electricity conservation tips, visit FlexAlert.org.

Flex Alert Conservation Actions

Before 4 p.m.:

- Pre-cool home by setting the thermostat to as low as 72 degrees
- Use major appliances, including:
  - Washer and dryer
  - Dishwasher
  - Oven and stove for pre-cooking and preparing meals
- Charge electric vehicles
- Adjust blinds and drapes to cover windows

From 4 p.m. to 9 p.m.:

- Set thermostat to 78 degrees or higher, if health permits
- Avoid using major appliances and charging electric vehicles
- Turn off all unnecessary lights

About Flex Alerts

A Flex Alert is issued by the ISO when the electricity grid is under stress because of generation or transmission outages, or from persistent hot temperatures.

View the fact sheet on Emergency Notifications on our News webpage.

Follow grid conditions in real time at ISO's Today's Outlook, download the free ISO Today mobile app, and follow us on Twitter at @California_ISO.

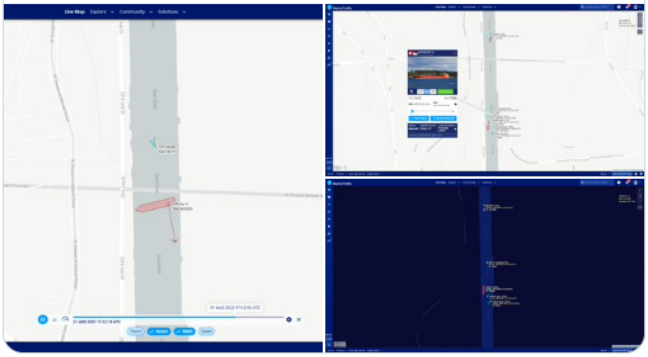
###

2 2

Dan Tsubouchi @Energy_Tidbits · Aug 31

#SuezCanal. looks like tanker is now moving again with tugboat assistance. Thx @TankerTrackers. #OOTT #LNG

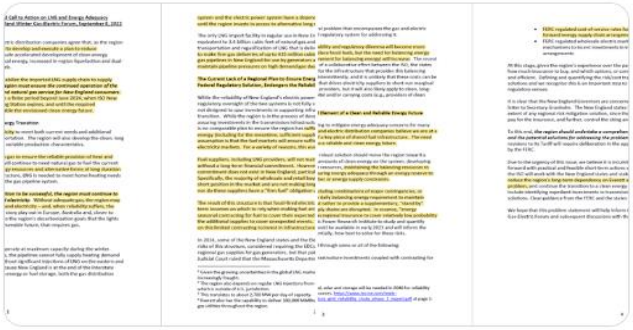
> **TankerTrackers.com, Inc.** @TankerTrackers · Aug 31
>
> At around 17:00 UTC today (2022-08-31), the Aframax tanker AFFINITY V (9645401) seemed to have lost control in the Suez Canal while heading southbound. She temporarily clogged up traffic and is now facing south again, but moving slowly by tugboat assistance. via @MarineTraffic
>
> Show this thread



1

Dan Tsubouchi @Energy_Tidbits · Aug 31

Must read# #EnergyTransition reality check from @isonewengland. "In sum, we believe that, for the clean #EnergyTransition to be successful, the region must continue to have reliable supplies of #NatGas for home heating & electricity". Fits 👇 12/09/21 tweet 2022 Predictions #OOTT



> **Dan Tsubouchi** @Energy_Tidbits · Dec 9, 2021
>
> Time for #2022Predictions. My #1 is more #EnergyTransition #NetZero leaders come out of closet, have a #MacronMoment ie. have "transition" not self inflicted shortage so 2021 energy crisis isn't every year. A return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT twitter.com/Energy_Tidbits…

3 10

Dan Tsubouchi @Energy_Tidbits · Aug 31

For those not near their laptop, @EIAgov just released #Oil #Gasoline #Distillates inventory as of Aug 26. Table below compares vs expectations and @APIenergy yesterday. Prior to release, WTI was $90.50. #OOTT

ir.eia.gov/wpsr/overview....

Inventory Aug 26: EIA, Bloomberg Survey Expectations, A			
s)	EIA	Expectations	
	-3.33	-0.95	
	-1.17	-1.00	
	0.11	-0.75	
	-4.39	-2.70	

ommercial so builds in impact of 3.1 mmb draw from SPR for A

d in the oil data, Cushing had a draw of 0.52 mmb for Aug 26

Bloomberg

SAF Group https://safgroup.ca/news-insights/

Dan Tsubouchi @Energy_Tidbits · Aug 31

#NordStream watch now starts with planned 3-day shutdown for maintenance. Note 👇 Kremlin Aug 30 guarantee of restart on Sept 3 "except for technological problems caused by sanctions". #NatGas #LNG #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Aug 30
>
> Hmmm! Will #Gazprom resume #NordStream deliveries on Sept 3? Kremlin says "There is a guarantee that nothing interferes with supplies, EXCEPT for technological problems caused by sanctions". what a confidence builder. #NatGas #OOTT

https://tass.ru/ekonomika/15596293

August 30, 03:31,
updated August 30, 03:47

Peskov: only problems related to sanctions prevent gas supplies to the EU from Russia

Ordinary Europeans have to pay for EU gas decisions, Russian presidential spokesman said

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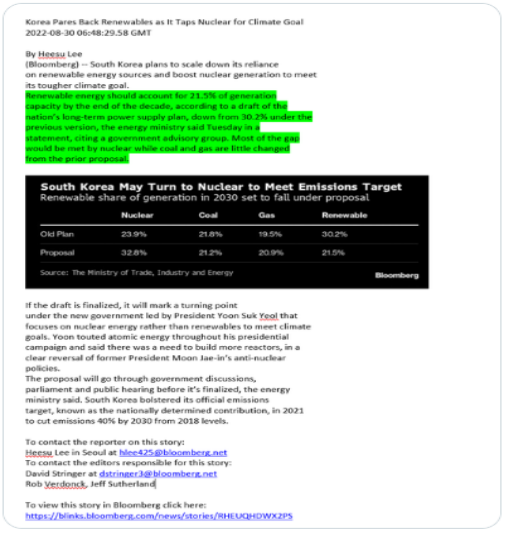
3 1

Dan Tsubouchi @Energy_Tidbits · Aug 31

#Korea to slash #RenewableEnergy share of 2030 energy mix target from 30.2% to 21.5%. #Coal down 21.8% to 21.2%. #NatGas up 19.5% to 20.9%. #Nuclear big winner 23.9% to 32.8%. Adds to #LNG demand as all imports are via LNG. Thx @HEESU_LEE.
#OOTT



Korea Pares Back Renewables as It Taps Nuclear for Climate Goal
2022-08-30 06:48:29.58 GMT

By Heesu Lee
(Bloomberg) -- South Korea plans to scale down its reliance on renewable energy sources and boost nuclear generation to meet its tougher climate goal.
Renewable energy should account for 21.5% of generation capacity by the end of the decade, according to a draft of the nation's long-term power supply plan, down from 30.2% under the previous version, the energy ministry said Tuesday in a statement, citing a government advisory group. Most of the gap would be met by nuclear while coal and gas are little changed from the prior proposal.

South Korea May Turn to Nuclear to Meet Emissions Target
Renewable share of generation in 2030 set to fall under proposal

	Nuclear	Coal	Gas	Renewable
Old Plan	23.9%	21.8%	19.5%	30.2%
Proposal	32.8%	21.2%	20.9%	21.5%

Source: The Ministry of Trade, Industry and Energy — Bloomberg

If the draft is finalized, it will mark a turning point under the new government led by President Yoon Suk Yeol that focuses on nuclear energy rather than renewables to meet climate goals. Yoon touted atomic energy throughout his presidential campaign and said there was a need to build more reactors, in a clear reversal of former President Moon Jae-in's anti-nuclear policies.
The proposal will go through government discussions, parliament and public hearing before it's finalized, the energy ministry said. South Korea bolstered its official emissions target, known as the nationally determined contribution, in 2021 to cut emissions 40% by 2030 from 2018 levels.

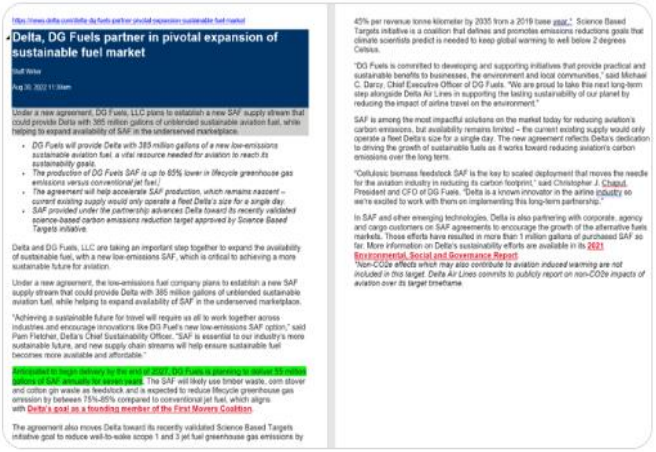
To contact the reporter on this story:
Heesu Lee in Seoul at hlee425@bloomberg.net
To contact the editors responsible for this story:
David Stringer at dstringer3@bloomberg.net
Rob Verdonck, Jeff Sutherland

To view this story in Bloomberg click here:
https://blinks.bloomberg.com/news/stories/RHEUQHDWX2PS

4 6

Dan Tsubouchi @Energy_Tidbits · Aug 30

#JetFuel will be hard to decarbonize is an understatement. #DeltaAirlines sustainable aviation fuel deal, 55 mn gal/yr, or ~3,600 b/d is enough SAF for ~ten 1-way flights London-NYC per day. vs Delta flies >70 trans Atlantic per day. #OOTT
flightdeckfriend.com/ask-a-pilot/ho….



https://news.delta.com/delta-dg-fuels-partner-pivotal-expansion-sustainable-fuel-market

Delta, DG Fuels partner in pivotal expansion of sustainable fuel market

Staff Writer
Aug 30, 2022 11:30am

Under a new agreement, DG Fuels, LLC plans to establish a new SAF supply stream that could provide Delta with 385 million gallons of unblended sustainable aviation fuel, while helping to expand availability of SAF in the underserved marketplace.

- *DG Fuels will provide Delta with 385 million gallons of a new low-emissions sustainable aviation fuel, a vital resource needed for aviation to reach its sustainability goals.*
- *The production of DG Fuels SAF is up to 65% lower in lifecycle greenhouse gas emissions versus conventional jet fuel.*
- *The agreement will help accelerate SAF production, which remains nascent – current existing supply would only operate a fleet Delta's size for a single day.*
- *SAF provided under the partnership advances Delta toward its recently validated science-based carbon emissions reduction target approved by Science Based Targets initiative.*

Delta and DG Fuels, LLC are taking an important step together to expand the availability of sustainable fuel, with a new low-emissions SAF, which is critical to achieving a more sustainable future for aviation.

Under a new agreement, the low-emissions fuel company plans to establish a new SAF supply stream that could provide Delta with 385 million gallons of unblended sustainable aviation fuel, while helping to expand availability of SAF in the underserved marketplace.

"Achieving a sustainable future for travel will require us all to work together across industries and encourage innovations like DG Fuel's new low-emissions SAF option," said Pam Fletcher, Delta's Chief Sustainability Officer. "SAF is essential to our industry's more sustainable future, and new supply chain streams will help ensure sustainable fuel becomes more available and affordable."

Anticipated to begin delivery by the end of 2023, DG Fuels is planning to deliver 55 million gallons of SAF annually for seven years. The SAF will likely use timber waste, corn stover and cotton gin waste as feedstock and is expected to reduce lifecycle greenhouse gas emission by between 75%-85% compared to conventional jet fuel, which aligns with Delta's goal as a founding member of the First Movers Coalition.

The agreement also moves Delta toward its recently validated Science Based Targets initiative goal to reduce well-to-wake scope 1 and 3 jet fuel greenhouse gas emissions by 40% per revenue tonne kilometer by 2035 from a 2019 base year." Science Based Targets initiative is a coalition that defines and promotes emissions reductions goals that climate scientists predict is needed to keep global warming to well below 2 degrees Celsius.

"DG Fuels is committed to developing and supporting initiatives that provide practical and sustainable benefits to businesses, the environment and local communities," said Michael C. Darcy, Chief Executive Officer of DG Fuels. "We are proud to take this next long-term step alongside Delta Air Lines in supporting the lasting sustainability of our planet by reducing the impact of airline travel on the environment."

SAF is among the most impactful solutions on the market today for reducing aviation's carbon emissions, but availability remains limited – the current existing supply would only operate a fleet Delta's size for a single day. The new agreement reflects Delta's dedication to driving the growth of sustainable fuels as it works toward reducing aviation's carbon emissions over the long term.

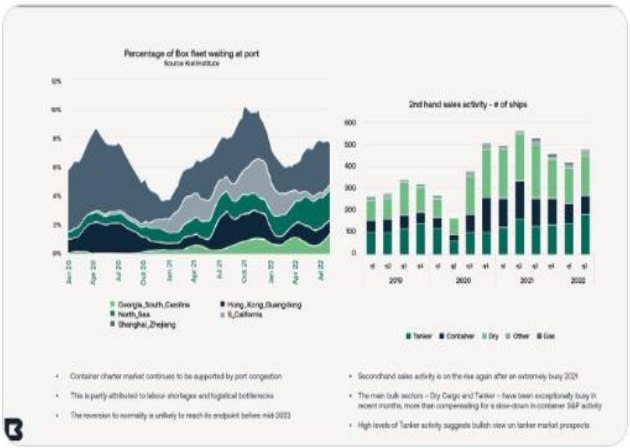
"Cellulosic biomass feedstock SAF is the key to scaled deployment that moves the needle for the aviation industry in reducing its carbon footprint," said Christopher J. Chaput, President and CFO of DG Fuels. "Delta is a known innovator in the airline industry so we're excited to work with them on implementing this long-term partnership."

In SAF and other emerging technologies, Delta is also partnering with corporate, agency and cargo customers on SAF agreements to encourage the growth of the alternative fuels markets. Those efforts have resulted in more than 1 million gallons of purchased SAF so far. More information on Delta's sustainability efforts are available in its 2021 Environmental, Social and Governance Report.
**Non-CO2e effects which may also contribute to aviation induced warming are not included in this target. Delta Air Lines commits to publicly report on non-CO2e impacts of aviation over its target timeframe.*

2 5 13

Dan Tsubouchi @Energy_Tidbits · Aug 30

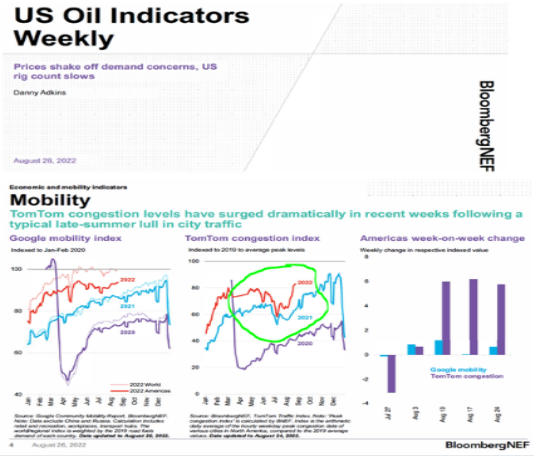
Continued strong #BunkerFuel demand. @BraemarPLC "shipping sector is the most exciting it has been in years" "growth in ton-mile..." Also get your Xmas shopping early as port congestion "reversion to normality is unlikely to reach its endpoint before mid-2023". #OOTT



3 2

Dan Tsubouchi @Energy_Tidbits · Aug 30

should have said, it's a reminder of demand "response" but not demand "destruction" in the short/mid term. #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Aug 30
>
> #Gasoline demand response. #TomTom congestion index shows YoY gap narrowed to almost zero as US gas prices went >$5, but drivers went back on the road & YoY gap widened as soon as gas prices went below $5 on way to $4 and now $3.85. Thx @BloombergNEF Danny Adkins. #Oil #OOTT
>
> 
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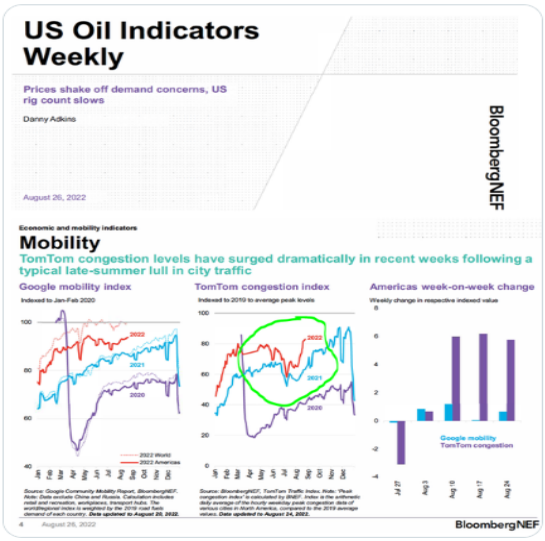
1 3

Dan Tsubouchi @Energy_Tidbits · Aug 30

#Gasoline demand response. #TomTom congestion index shows YoY gap narrowed to almost zero as US gas prices went >$5, but drivers went back on the road & YoY gap widened as soon as gas prices went below $5 on way to $4 and now $3.85. Thx @BloombergNEF Danny Adkins. #OII #OOTT



1 10 20

Dan Tsubouchi @Energy_Tidbits · Aug 29

#LNGSupplyGap. #Cheniere wants to expand #CorpusChristiLNG by adding Trains 8 & 9 (capacity 0.215 bcfd per train) projected in-service mid-2031. Will we see a late Sept FID for #LNGCanada Phase 2 to help fill the gap or can it be the rare brownfield that doesn't go? #NatGas #OOTT

Here is excerpt from Cheniere's aug 19 FERC filing
Corpus Christi Liquefaction, LLC
CCL Midscale 8-9, LLC
Docket No. PF22-__-000
Request to Initiate Pre-Filing Review Process

"The Project will consist of (a) two midscale liquefaction trains, each capable of producing up to 1.64 million tons per annum ("MTPA") of LNG, (b) on-site refrigerant storage, (c) a full-containment, aboveground, 220,000 m3 LNG storage tank with loading capabilities, and (d) an increase in the authorized LNG loading rate. The Project will be interconnected with the existing Liquefaction Project and Stage 3 Project facilities, which will require minor modifications for purposes of interconnection and integration of the expansion facilities.

Midscale Trains 8 & 9
CCL proposes to develop two midscale liquefaction trains that will consist of the following equipment:
- *Facilities to remove carbon dioxide ("CO2"), hydrogen sulfide ("H2S") and other sulfur compounds from the feed gas;*
- *Facilities to remove water and mercury from the feed gas;*
- *Facilities to remove heavy hydrocarbons from the feed gas;*
- *A thermal oxidizer for combusting waste gas;*
- *Electric motor driven refrigerant compressors and associated cold boxes;*
- *Induced draft air coolers;*
- *Associated fire and gas and safety systems; and*
- *Associated control systems and electrical infrastructure*

These two midscale liquefaction trains are near replicates of those reviewed and approved by the Commission in FERC Docket No. CP18-512-000."

"The Project in-service date is targeted for the 2nd Half of 2031. Additional schedule detail is provided below.

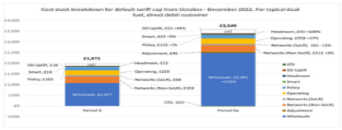
Key Milestone Activities	***Anticipated Schedule***
Commence Pre-Filing Process	*August 2022*
File NGA Section 3 Application	*February 2023*
Issuance of Environmental Assessment/Environmental Impact Statement	*February 2024*
Issuance of Authorization	*August 2024*
File Initial Implementation Plan	*September 2024*
Commence Project Construction	*October 2024*
Project In-Service	*2nd Half 2031*

4 4

Dan Tsubouchi @Energy_Tidbits · Aug 29

Looks like UK #EVs will soon lose op cost saving vs #ICE. @TomBarnardWords linked report, yr ago save 75% in switch, now just 27%. But @ofgem 👇 Aug 26 warned energy price cap "could get significantly worse through 2023". #NatGas #OOTT

electrifying.com/blog/knowledge...

> **Dan Tsubouchi** @Energy_Tidbits · Aug 26
>
> Buckle up! UK energy price cap increase +80% or +$1,870 to $4,200 per year for average household from Oct 1. And it gets even worse come Jan 1. Note @ofgem warms "the market for #NatGas in Winter means that prices could get significantly worse through 2023". #OOTT
>
> ofgem
>
> Excerpt https://www.ofgem.gov.uk/publications/ofgem-updates-price-cap-level-and-tightens-rules-suppliers
>
> **Ofgem updates price cap level and tightens up rules on suppliers**
>
> Today (26 August 2022) Ofgem has announced the energy price cap will increase to £3,549 per year for dual fuel for an average household from 1 October 2022.
>
> This comes as Ofgem's CEO warns of the hardship energy prices will cause this winter and urges the incoming Prime Minister and new cabinet to provide an additional and urgent response to continued surging energy prices.
>
> The new price cap level is based on a transparent methodology and calculations by Ofgem. The data is published on the Default tariff cap level: 1 October 2022 to 31 December 2022 publication.
>
> The increase reflects the continued rise in global wholesale gas prices, which began to surge as the world unlocked from the Covid pandemic and have been driven still higher to record levels by Russia slowly switching off gas supplies to Europe.
>
> The price cap, as set out in law, puts a maximum per unit price on energy that reflects what it costs to buy energy on the wholesale market and supply it to our homes. It also sets a strict and modest profit rate that suppliers can make from domestic energy sales. However, unlike energy producers and extractors, most domestic suppliers are currently not making a profit.
>
> The price cap protects against the so called 'loyalty premium' where customers who do not move suppliers or switch to better deals can end up paying far more than others. Ultimately, the price cap cannot be set below the true cost of buying and supplying energy to our homes and so the rising costs of energy are reflected in it.
>
> Although Ofgem is not giving price cap projections for January because the market remains too volatile, the market for gas in Winter means that prices could get significantly worse through 2023.
>
> 4. Breakdown of costs in the energy price cap
>
> Dual fuel customer paying by direct debit, typical energy use (GB £)
>
> 

2 3

Dan Tsubouchi @Energy_Tidbits · Aug 29

Did @elonmusk's reality check replay Putin's Nov 2019 warning that without #NatGas, humanity will once again end up in caves. without hydocarbons humanity will not be able to preserve its civilisation. See 👇 SAF Group 11/24/19 Energy Tidbits excerpt. #OOTT

> 
>
>
> **Excerpt SAF Group Nov 24, 2019 Energy Tidbits memo https://safgroup.ca/news-insights/**
>
> **Natural Gas – Putin: abandoning natural gas may put humans back in caves**
>
> Last week's (Nov 17, 2019) Energy Tidbits memo noted the FT report [LINK] the European Investment Bank was phasing out lending to fossil fuel projects by 2021 including natural gas. We tend to agree with Putin that if the environmental push means puts natural gas at risk along with coal, then there is a real risk to the future reliability of the electricity supply around the world. We just wouldn't describe the way he did. On Wed, we tweeted [LINK] *"How could i not note Putin's comments "discarding the purest hydrocarbon like gas seems utterly bizarre", re the complete abandonment of hydrocarbons "it seems to me that the human race may find itself again in caves". Hope not!"* Putin had a lengthy Q&A at the Russian Investment Forum on Wed. And he jumped in on the potential abandonment of natural gas. Putin said *"In this sense, neglecting a pure hydrocarbon such as natural gas is, in my opinion, uncalled for, because it is the purest hydrocarbon out there. When ideas like this are promoted, it sounds like humanity will once again end up in caves, but this time because it will consume nothing. If all energy is reduced to zero, or if we rely solely on solar energy or wind energy or tidal energy. Today's technology is such that without hydrocarbons, nuclear energy or hydropower, humanity will not be able to survive or preserve its civilisation. This must be taken seriously or, as people say, in an adult-like manner."* Later in the memo, we note his comments on US oil production and Russia not going to use technologies that drive fracking. Our Supplemental Documents package includes Putin's energy references from his long Q&A session. [LINK]
>
> > **Dan Tsubouchi** @Energy_Tidbits · Aug 29
> >
> > 
> >
> > Reality check from @elonmusk "Realistically I think we need to use oil and gas in the short term, because otherwise civilisation will crumble", #EnergyTransition "will take some decades to complete". #Oil #NatGas #LNG are stronger for longer. Thx @terjesolsvik. ...

3 6

Dan Tsubouchi @Energy_Tidbits · Aug 29

See 👇 good reminder that being full on #NatGas storage is needed but isn't enough to ensure no gas shortages in the winter. Germany also needs #LNG inflows, weather break and cutting back on consumption. Thx @BurggrabenH. #OOTT

> **Alexander Stahel** @BurggrabenH · Aug 28
>
> Saving gas is 3x more important than filling storages.
>
> GER (below; by extension most of EU) needs 3x more gas in winter than it has storage. With 80% reduced NS1 flows, GER must save up to 33% of gas & subject to LNG inflows (Feb regas terminals?) & temperatures.
>
> #LNG #TTF

Germany Gas Storing vs Saving Gas	Unit	2022/23 Worst Case	2022/23 Best Case
Storage Capacity	TWh	245	245
Filling percentage as at 28 Aug	in %	82%	82%
German Storage as at 28 Aug	TWh	201	201
Consumption October - March	TWh/month	120	100
Inflow per month (was 80TWh)	TWh/month	50	56
Storage reduction	TWh/month	70	44
Implied Storage 31 March 2023	**TWh**	**(179)**	**(23)**
Storing 20% more by October	TWh	241	241
Gas Addition	TWh	40	40
In days of consumption	**days**	**10**	**12**
Saving 20% Consumption	TWh/month	24	20
Saving 20% bw Oct - March	TWh	144	120
In days of consumption	**days**	**36**	**36**
Saving 20% vs Storing 20% more		**3.6x**	**3.0x**
Savings Requirement at Current Storage Level			
Demand: Gas Use Oct - March	TWh	720	600
Supply: Storage (-10%) plus Inflows	TWh	481	517
Saving Requirement	**TWh**	**(239)**	**(83)**
Saving Requirement	**in %**	**-33%**	**-14%**

4 7

Dan Tsubouchi @Energy_Tidbits · Aug 29

Buckle Up. #NatGas #LNG price big hit is still to come. Friday settle, Dutch TTF $101.19/mmbtu for Oct contract, JKM LNG $76.32/mmbtu for Nov contract. Thx @MessageAnnKoh @SStapczynski. #OOTT

Source: Bloomberg LNG Wrap Aug 29, 2022

1 6

Dan Tsubouchi @Energy_Tidbits · Aug 29

Reality check from @elonmusk "Realistically I think we need to use oil and gas in the short term, because otherwise civilisation will crumble", #EnergyTransition "will take some decades to complete". #Oil #NatGas #LNG are stronger for longer. Thx @terjesolsvik. #OOTT

https://www.reuters.com/business/energy/elon-musk-says-world-still-needs-oil-gas-2022-08-29/?taid=630d97747302200013ece8&utm_campaign=trueAnthem:+Trending+Content&utm_medium=trueAnthem&utm_source=twitter

August 29, 2022 05 AM MDT Last Updated 2 hours ago

Elon Musk says world still needs oil and gas

Reuters

STAVANGER, Norway, Aug 29 (Reuters) - The world must continue to extract oil and gas in order to sustain civilisation, while also developing sustainable sources of energy, Tesla (TSLA.O) founder Elon Musk told reporters at a conference in Norway on Monday.

"Realistically I think we need to use oil and gas in the short term, because otherwise civilisation will crumble," Musk said on the sidelines of an energy conference in the southern city of Stavanger.

Asked if Norway should continue to drill for oil and gas, Musk said: "I think some additional exploration is warranted at this time."

"One of the biggest challenges the world has ever faced is the transition to sustainable energy and to a sustainable economy," he said. "That will take some decades to complete."

He said offshore wind power generation in the North Sea, combined with stationary battery packs, could become a key source of energy. "It could provide a strong, sustainable energy source in winter," he said.

He also voiced concerns over birth rates, echoing remarks he made in a Twitter post late last week on the risks of "population collapse".

"One of my less obvious things to be concerned about is the birth rate, and I think its important that people have enough babies to support civilization as that we don't dwindle away," Musk said.

Reporting by Terje Solsvik; Editing by Gwladys Fouche and Jan Harvey

Our Standards: The Thomson Reuters Trust Principles.

1 10 20

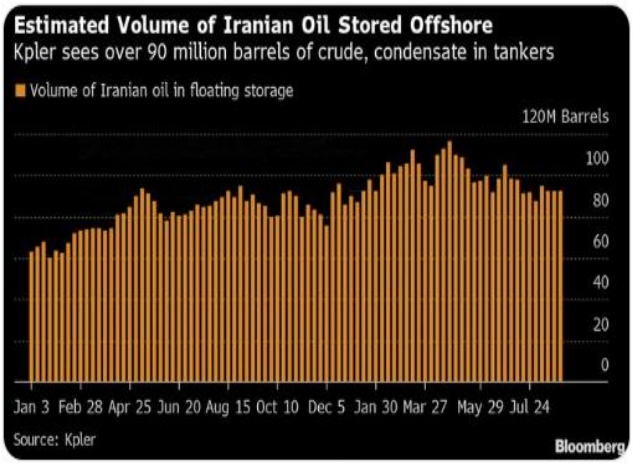
Dan Tsubouchi @Energy_Tidbits · Aug 29

No impact yet on Libya #Oil production from Tripoli fighting. @NOC_Libya says oil production 1.219 mmb/d plus condensate 0.053 mmb/d on Aug 27/28. Thx @Google translate. #OOTT

2 3

Dan Tsubouchi @Energy_Tidbits · Aug 28

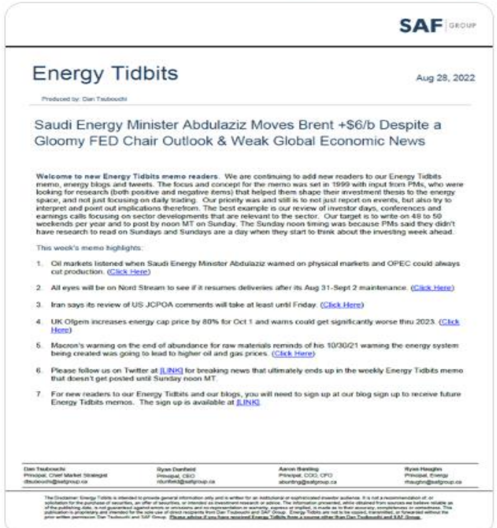
IF a #JCPOA, the first wave of Iran #Oil & #Condensate will come from floating storage. @Kpler estimates 93 mmb of oil + condensate in floating storage. Per @iamsharoncho report "Iran May Drain Offshore Crude Oil Cache If Nuclear Deal Reached". #OOTT



2 6 13

Dan Tsubouchi @Energy_Tidbits · Aug 28

Our weekly SAF Aug 28, 2022 Energy Tidbits memo is posted on SAF Group website. this 49-pg energy research memo expands upon & covers more items than tweeted this week. See news/insights section of SAF website #Oil #OOTT #LNG #NatGas #EnergyTransition safgroup.ca/news-insights/



SAF GROUP

Energy Tidbits

Aug 28, 2022

Produced by: Dan Tsubouchi

Saudi Energy Minister Abdulaziz Moves Brent +$6/b Despite a Gloomy FED Chair Outlook & Weak Global Economic News

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. Our target is to write on 48 to 50 weekends per year and to post by noon MT on Sunday. The Sunday noon timing was because PMs said they didn't have research to read on Sundays and Sundays are a day when they start to think about the investing week ahead.

This week's memo highlights:

1. Oil markets listened when Saudi Energy Minister Abdulaziz warned on physical markets and OPEC could always cut production. (Click Here)
2. All eyes will be on Nord Stream to see if it resumes deliveries after its Aug 31-Sept 2 maintenance. (Click Here)
3. Iran says its review of US JCPOA comments will take at least until Friday. (Click Here)
4. UK Ofgem increases energy cap price by 80% for Oct 1 and warns could get significantly worse thru 2023. (Click Here)
5. Macron's warning on the end of abundance for raw materials reminds of his 10/30/21 warning the energy system being created was going to lead to higher oil and gas prices. (Click Here)
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK]

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