Energy Tidbits

US Oil Production in July is Only +166,000 b/d vs Dec 2021

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https://www.accuweather.com/en/winter-weather/accuweather-2022-2023-us-winter-forecast/1252283

AccuWeather's 2022-2023 US winter forecast

Winter is fast approaching, but AccuWeather meteorologists say that it will shape up much differently than last winter in part due to a volcano that erupted on the other side of the globe.

By Brian Lada, AccuWeather meteorologist and staff writer
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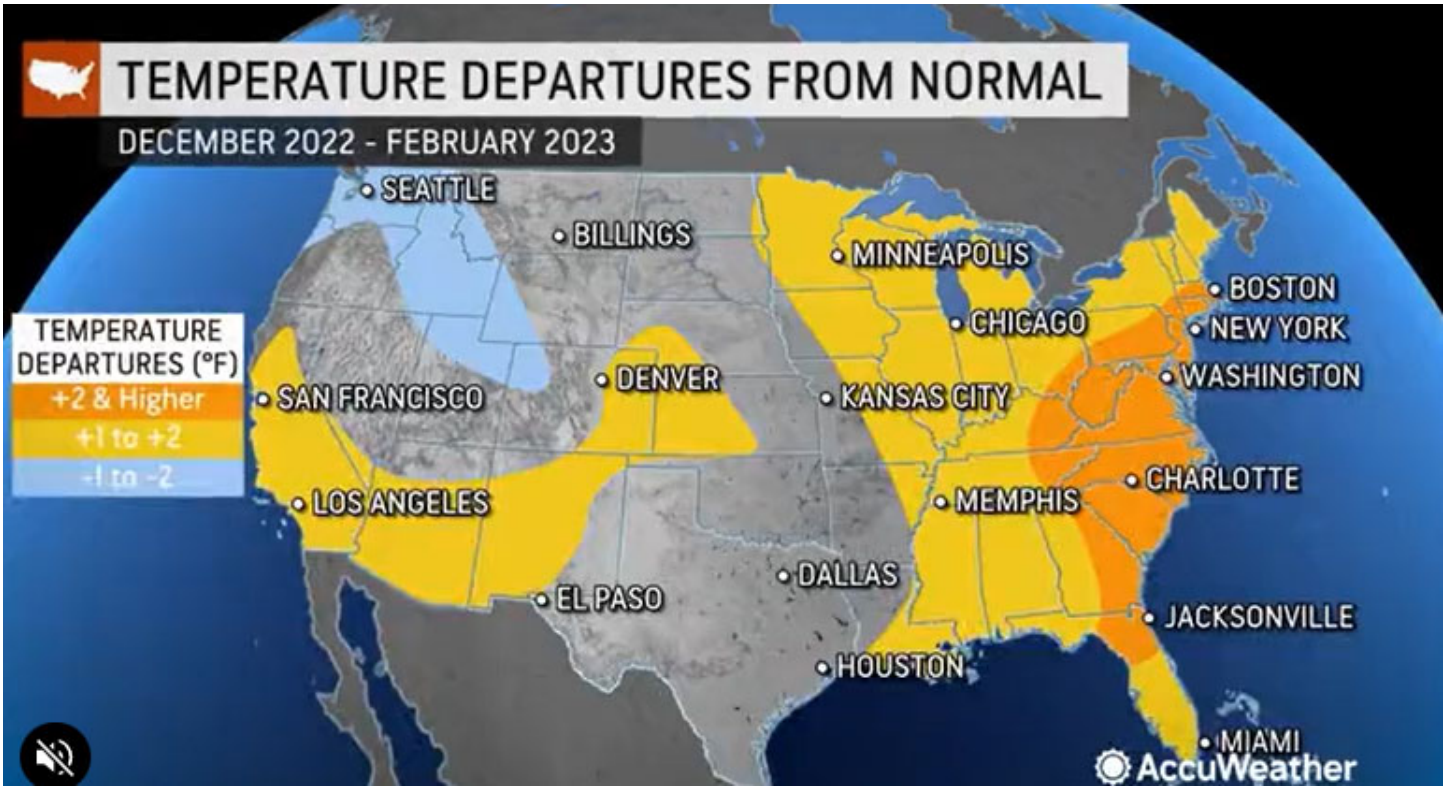


From the abundance of acorns in the fall to the bushiness of squirrel tails, there are many fanciful forecasting techniques have been used over the years as a means to glean a glimpse of what the weather will be like in the upcoming winter.

AccuWeather's approach to concocting the winter forecast, one of its most highly-anticipated seasonal outlooks, is a bit different: The process involves a team of veteran long-range forecasters analyzing computer models, looking at how previous winters have played out and using their own personal experience to determine if it's going to be a snowy winter, if and when the polar vortex will unleash Arctic air across North America and whether it will be a good season for skiers.

This winter is indeed looking like a snowy one across most of the northern tier of the contiguous United States, but AccuWeather senior meteorologist Paul Pastelok says, there is more to the forecast than just snowstorms.

Pastelok and his team of long-range forecasters are predicting a "triple dip La Niña," as it is the third winter in a row that La Niña will shape the weather patterns across the U.S. The regular climate phenomenon occurs when the water near the equator in the eastern Pacific Ocean is cooler than average, which in turn influences the jet stream and the overall weather patterns in North America. Despite what will be the third La Niña winter in a row, this winter will not necessarily be a carbon copy of the past two.
"These third-year La Niñas are very tricky," Pastelok said, with no two La Niña winters being exactly the same. The weather setup will be one of the most complicated and dynamic in recent memory due to all of the weather factors in play over the upcoming months, Pastelok said.

One of the more unusual factors that could influence the overall weather patterns this winter can be traced back to a cataclysmic volcano eruption that took place in the early weeks of 2022. The volcano spewed an unprecedented amount of debris high into Earth's atmosphere which, as Pastelok will explain, could still be having an effect on the weather on a global scale.

With this in mind, AccuWeather is ready to make its annual prognostication and unveil a detailed region-by-region breakdown of the U.S. winter forecast as well as seasonal snowfall predictions for six of the nation's biggest cold-weather cities:

Severe weather to follow hurricane season in Southeast

A mild winter is in the forecast for most of the southeastern U.S., but it's not the air temperature that AccuWeather meteorologists are keeping a close eye on. Instead, it's the water temperature in the Gulf of Mexico and along the Atlantic Seaboard that has meteorologists' attention.

"The water temperatures are going to have a big impact going forward this season," Pastelok said.

In addition to fueling an active final stretch of the Atlantic hurricane season, which officially lasts through Nov. 30, the warm waters off the coasts of the Southeast will promote frequent storms and downpours across the region as the autumn fades into winter. Some heavier rain events will be possible across the Gulf Coast states and into the Tennessee Valley from December into February, including the risk for some severe weather, Pastelok said.

Severe weather as a whole decreases across the U.S. during the winter months, but it can still be disastrous across the Southeast during this time of year. Last December, a catastrophic severe weather outbreak spawned tornadoes in nine states, causing 76 fatalities and $18 billion in damage just before the start of the holiday season. In 2012, a tornado outbreak across Louisiana, Mississippi and Alabama on Christmas Day spun up 34 twisters and 84 damaging wind reports and cut power to families as they tried to celebrate the holiday with their friends and families.

An overturned tree sits in front of a tornado-damaged home in Mayfield, Ky., on Dec. 11, 2021. (AP Photo/Mark Humphrey, File)

Hazards of a different and more traditionally winter variety could also develop this season. Last year, there were several snow events across the region that blanketed some southern cities. Huntsville, Alabama, measured 5.2 inches of snow last winter, more than double the annual average of 2.4 inches.
The best opportunity for snow or wintry precipitation across the interior Southeast will arrive in January and early February with one or two snowfall events possible in this timeframe. This is lower than last winter when there were four occasions on which snow accumulated across the region.

Pastelok added that if the water in the Gulf of Mexico and along the Atlantic coast remain warmer than usual, there is the chance for a "potentially big system" to develop during the second half of the winter that could impact the East Coast.

As for Floridians and reptilian inhabitants of the Sunshine State, the pushes of frigid air that do make it to the Southeast might come short of intruding deep into central or southern Florida.

In recent winters, there have been cold spells in Florida that sent the mercury dipping down into the 30s and 40s F, enough to cause frost and freeze in the typically warm state, which can endanger some of the state's temperature-sensitive citrus crops. Temperatures this low can also cause the cold-blooded iguanas that reside in Florida to become temporarily stunned by the cold to the point that they appear dead before the warmth reanimates the reptiles.
Pastelok said that the chance of a widespread frost or freeze is low this year, but if it does occur, it will likely take place in late January.

Will snow shovels gather dust in Northeast, Midwest?

A wave of chilly air swept across the Northeast and Midwest just in time for the arrival of astronomical autumn, which started on Sept. 22, but the arrival of astronomical winter on Dec. 21 may not start in a similar fashion.

Residents across the Northeast and Midwest will experience a few winter previews in November and December as waves of cold air dive down from Canada, but the biggest blasts of cold air will hold off until later in the winter. The clash of cold air with lingering

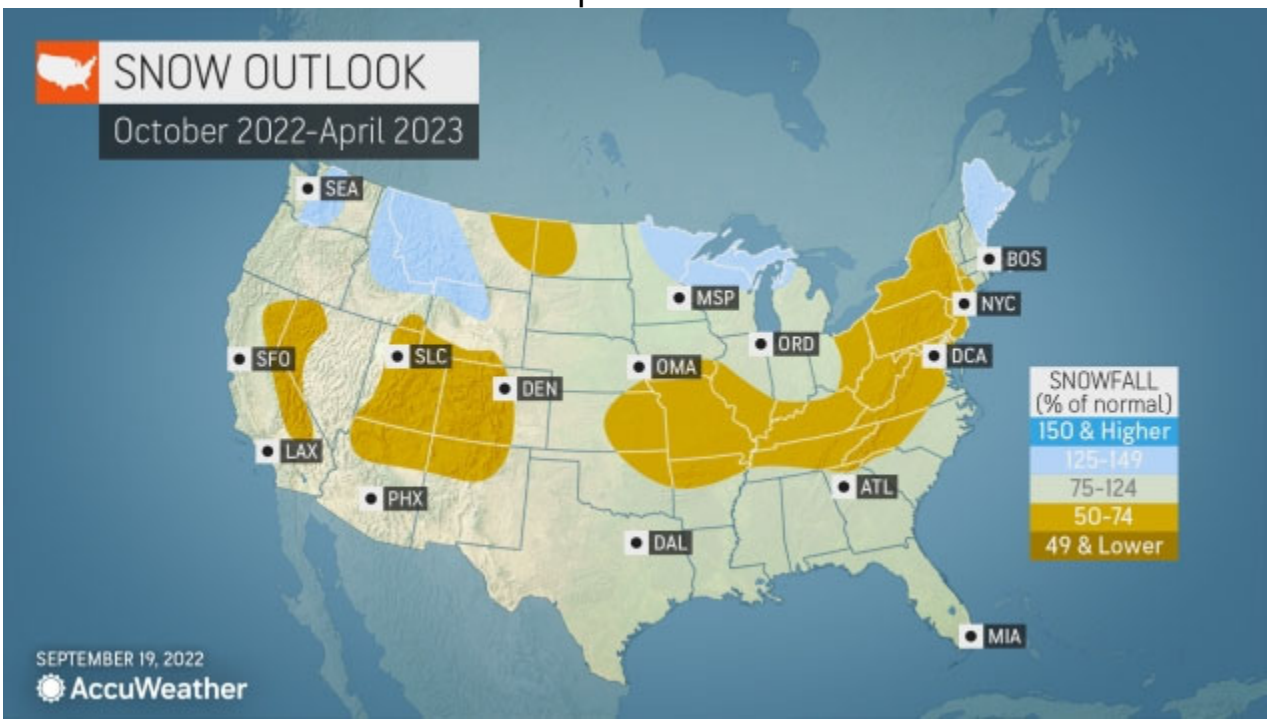
warmth could spark an out-of-season severe weather event in the Midwest or Ohio Valley late in November or in December.

These atmospheric ingredients will also be present to generate some early-season snow, but this will not be an indicator of how the entire winter will play out, but instead, the start of a bookend winter in terms of snowfall.

"I think going forward, even though we're in the La Niña [phase], it may be just too mild at the middle part of the season to get a lot of frequent [snow] events," Pastelok explained.

Snowfall for the season as a whole is likely to be below normal for most of the central Appalachians, Ohio Valley and interior mid-Atlantic, but precipitation could end up above normal with a few all-rain events likely to unfold throughout the winter.

Lake-effect snow will be less prolific in the eastern Great Lakes, including areas around Buffalo, New York; Erie, Pennsylvania; and Cleveland. Farther west, near- to above-normal lake-effect snow is expected.

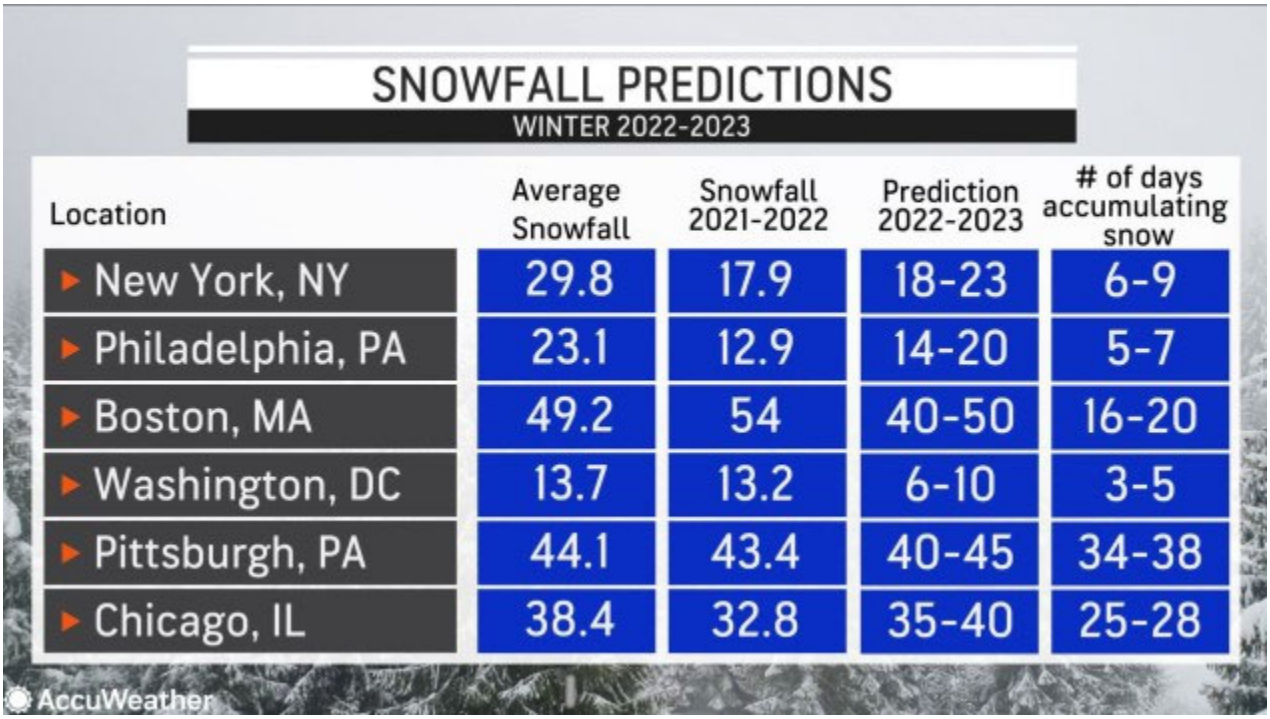


Outside of that region, New England is one of the only areas east of the Rocky Mountains where snowfall could end up being above normal. The snowfall totals will be boosted by a few nor'easters, with January and March bringing the highest chances of powerful coastal snowstorms.

Boston may end up being the only major city along the Interstate 95 corridor that finishes the winter with near-normal snowfall. AccuWeather long-range forecasters are predicting that 40 to 50 inches will accumulate in the city, around the average snowfall amount of 49.2 inches. Last winter, Boston finished the season with 54 inches of snow with 23.5 inches falling during a blizzard on Jan. 29.

In cities such as Washington, D.C., the emphasis is not on how much snow will fall, but on how often snow makes an appearance. Last January, accumulating snow was observed

on just four days throughout the month, amounting to 12.3 inches. This accounted for 93% of all of the snow that fell in the nation's capital throughout the entire winter.
This winter, AccuWeather is predicting that Washington, D.C., will experience accumulating snow on only three to five days throughout the season with total accumulations amounting to 6 to 10 inches, just below the average of 13.7 inches.



Location	Average Snowfall	Snowfall 2021-2022	Prediction 2022-2023	# of days accumulating snow
New York, NY	29.8	17.9	18-23	6-9
Philadelphia, PA	23.1	12.9	14-20	5-7
Boston, MA	49.2	54	40-50	16-20
Washington, DC	13.7	13.2	6-10	3-5
Pittsburgh, PA	44.1	43.4	40-45	34-38
Chicago, IL	38.4	32.8	35-40	25-28

Even when it does snow during the week, the impacts on daily routines may not be the same as they were a few years ago.

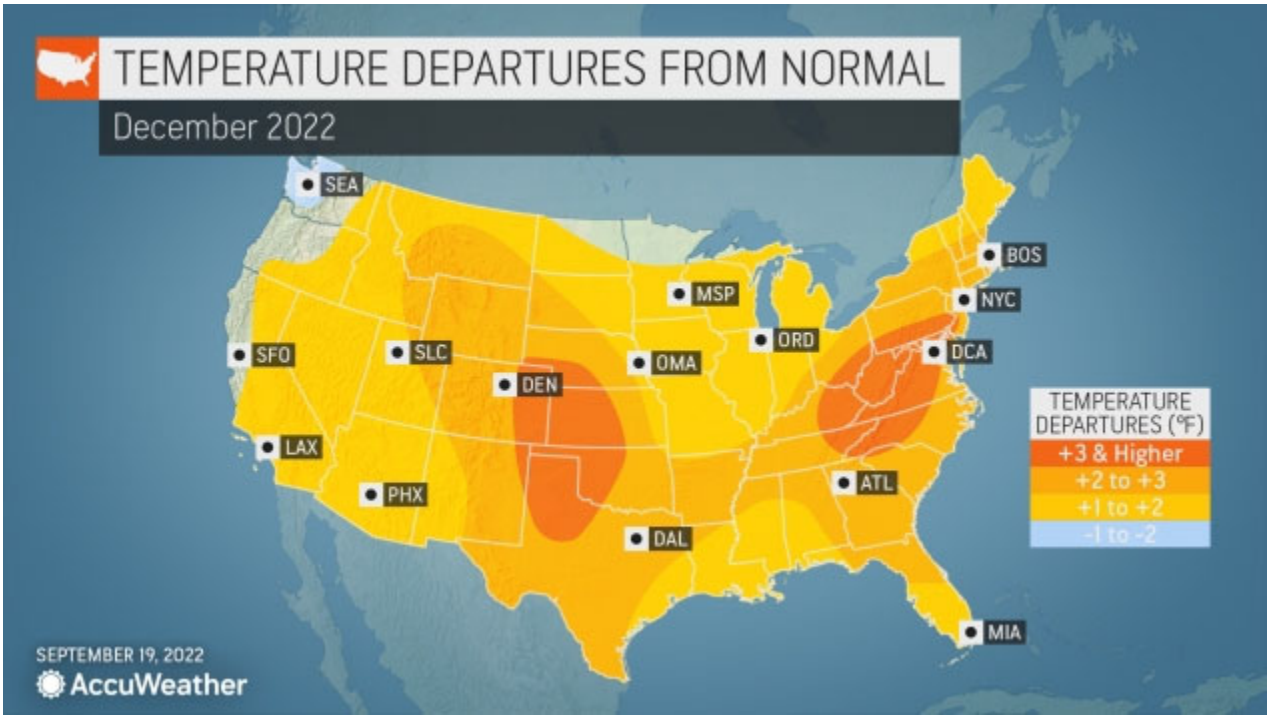
As students were heading back to the classroom for the start of the new school year, New York City School Chancellor David C. Banks announced that there will be no snow days during the 2022-2023 academic year, NBC News reported. "With the new technology that we have -- that's one of the good things that came out of COVID -- if a snow day comes around, we want to make sure that our kids continue to learn."

This controversial move is not being adopted across the board, with Philadelphia School District spokeswoman Christina Clark commenting on the matter shortly after the news broke about the decision made by the New York City schools. Clark said that in some instances, remote learning could be a possibility in the event of inclement weather, according to LocalToday. However, "in emergency situations where schools cannot adequately plan or prepare for distance learning, the district may close schools entirely," Clark said.
AccuWeather is forecasting seasonal snowfall totals of 18-23 inches for New York City this coming winter and 14-20 inches for Philadelphia, both of which would be below average for those cities.

Polar vortex may unleash late-season Arctic surge in Central US

AccuWeather meteorologists are predicting that most of the contiguous U.S. will experience a mild start to winter, but some of the warmest weather throughout December could be focused on the central Plains.

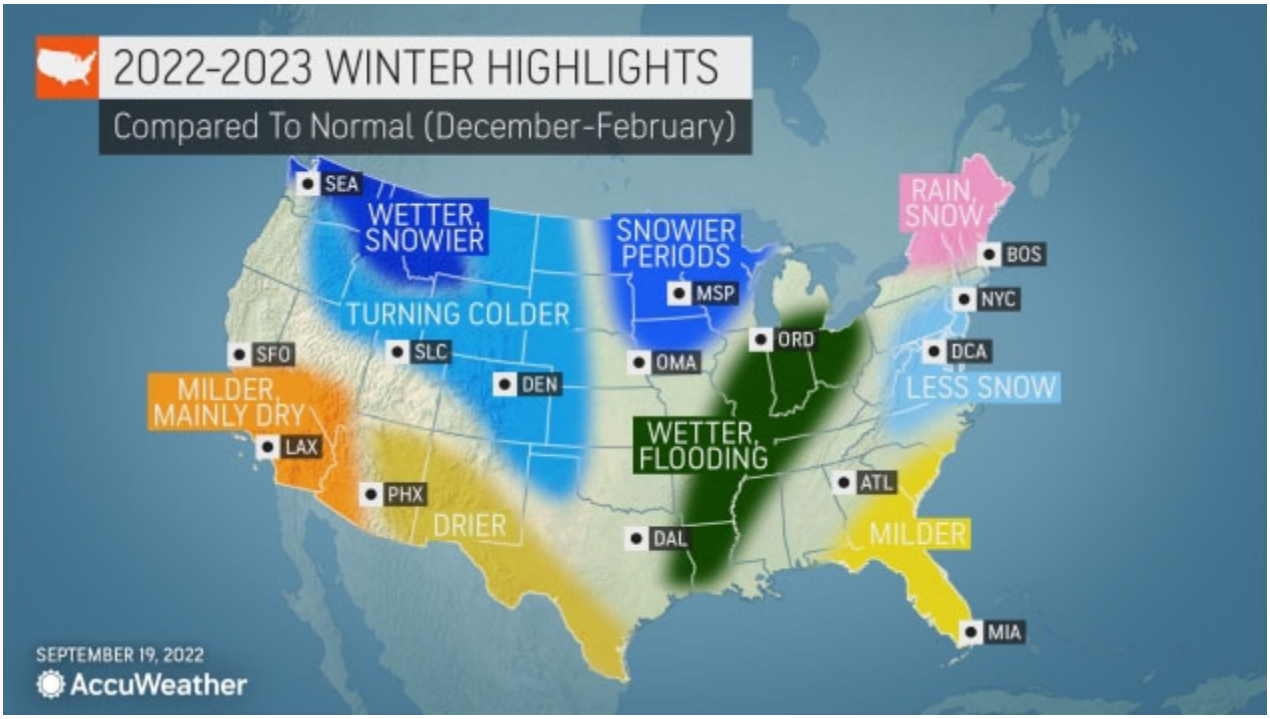
Temperatures throughout the final month of 2022 are forecast to run about 3 degrees Fahrenheit above normal across part of the nation's midsection, including areas around Oklahoma City, Oklahoma. The warmth will extend south across the border to places like Lubbock and Amarillo, Texas, as well as to the north and west as spots like Dodge City and Wichita, Kansas, and Denver could have above-normal temperatures. The mild start to the winter will not necessarily be indicative of what is foreseen to unfold across the region after the calendar flips to 2023.



One of the biggest players in the central U.S. this winter will be the polar vortex, a large pocket of frigid air that typically resides in the vicinity of the Arctic Circle. Occasionally, the polar vortex over the North Pole is displaced and can dive southward across a large swath of the U.S., unleashing the coldest air of the entire winter across dozens of states. In the northern Plains, this can result in AccuWeather RealFeel® Temperatures plummeting toward 50 degrees below zero.

Pastelok said that February is the month to watch for the polar vortex to usher in brutally cold Arctic air across the Rockies and most of the central U.S. and, in response, cause the energy demand across the regions to surge.

"The last two Februarys have featured significant cold waves for the central and southern Plains," Pastelok said. "There is a chance once again on this third La Niña winter, that cold air reaches this region." He added that if there is enough of the central U.S. is covered in snow, the strongest push of Arctic air could result in a frost or freeze in southern Texas.



Around the same time that the coldest air of the season freezes the Plains, AccuWeather meteorologists say, the overall track of storm systems across the U.S. could change.

The new storm track during the second half of the winter will focus on the eastern Plains and mid-Mississippi Valley, but bouts of heavy snow, and even blizzard conditions, cannot be ruled out on the northern and western sides of these storms.

As disruptive as the storms may be to travel and the normal daily routines of millions of people across the region, any precipitation, both liquid and frozen, will be welcomed across the central Plains.

Extreme drought conditions were present across New Mexico and western Texas at the start of the summer. The dryness concerns have eased in these areas in recent months, but pockets of extreme and exceptional drought have developed elsewhere in the region, including Nebraska, Kansas and Oklahoma. The late-winter storms could help alleviate the severity of the drought heading into the spring when farmers begin to prepare to plant their annual crops.

West Coast storms may do little for long-term drought

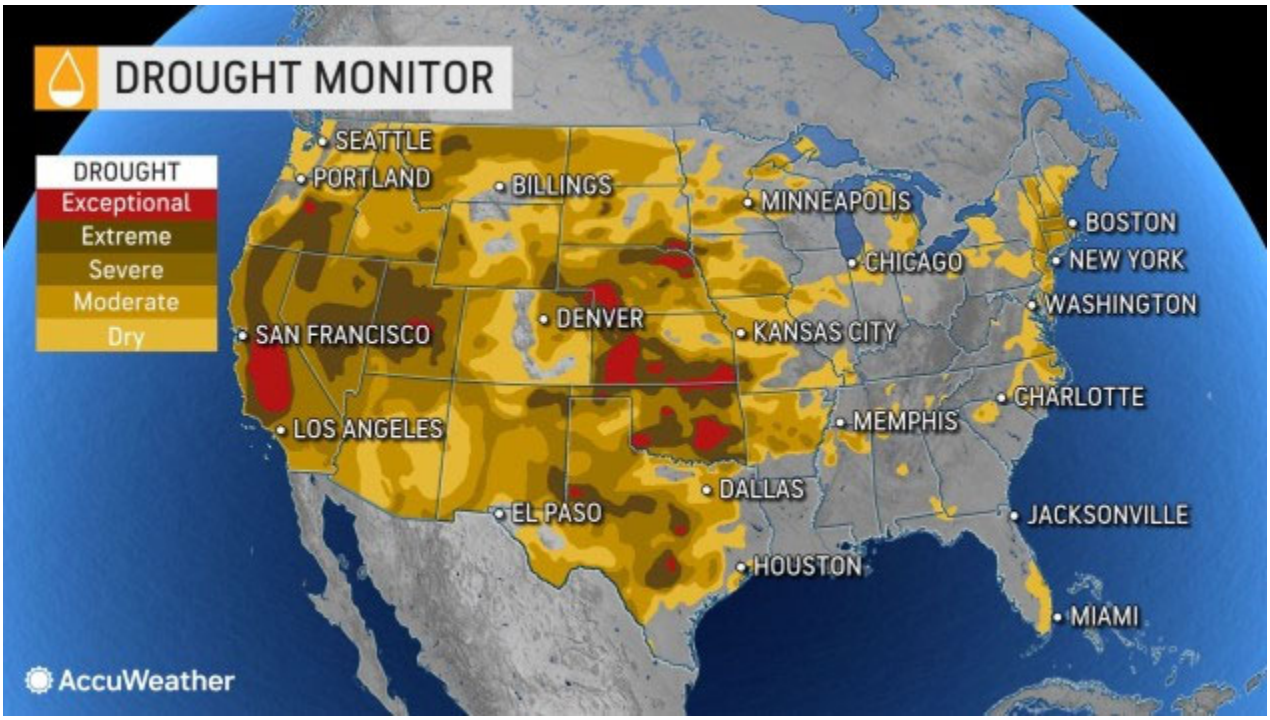
The triple-dip La Niña expected this winter is just the second of its kind in recent history, joining the winter of 2000-2001 as the only winters where the climate phenomenon persisted for so long. Despite the weather pattern shaping up in a similar matter as it has the past two years, Pastelok warns that this winter "will be a little different from last year, as far as the primary storm track across the West Coast."

Last winter started on a stormy note for most of California, Oregon and Nevada with storms in October and November delivering some early-season rain and blanketing ski resorts with snow. As the calendar turned to December, the storm track shifted northward,

directing the rain and mountain snow toward Washington and British Columbia, Canada. A repeat of last winter's early-season storms is unlikely, according to long-range forecasters.

"Unfortunately, we have bad news as far as the drought goes in parts of California, Nevada and the Southwest," Pastelok said. "The main storm track will be even farther north than it was the first half of the winter season last year including the late fall."

As of Tuesday, Sept. 20, 74% of the western U.S. was experiencing at least a moderate drought, 18% was experiencing extreme drought, and there were pockets of exceptional drought -- the most severe of drought categories -- in California's San Joaquin Valley, central Oregon and central Utah. Drought conditions could become worse in some regions of the West with the winter forecast to begin on a dry note.



The anticipated winter pattern will not necessarily mean a parade of non-stop storms for Washington, Oregon and Idaho, as Pastelok explained that the primary storm track will focus more on western Canada.

"We're not looking for the type of year that we had last year with these very, very long periods of heavy rain and snow across California, northern California and the Northwest," Pastelok said. "But we can see some moderate systems and occasionally one bigger period where it does get hit hard in the Northwest."

Central and Southern California still have a chance to receive beneficial rainfall and mountain snow this winter, but the storms are likely to hold off until after the start of 2023. This is different from 2022 when the middle part of the winter season in California turned drier then stormy again in the spring.

The La Niña phase is projected to weaken during the second half of the winter, which may open the door for storms to take a more southerly track into California, rather than

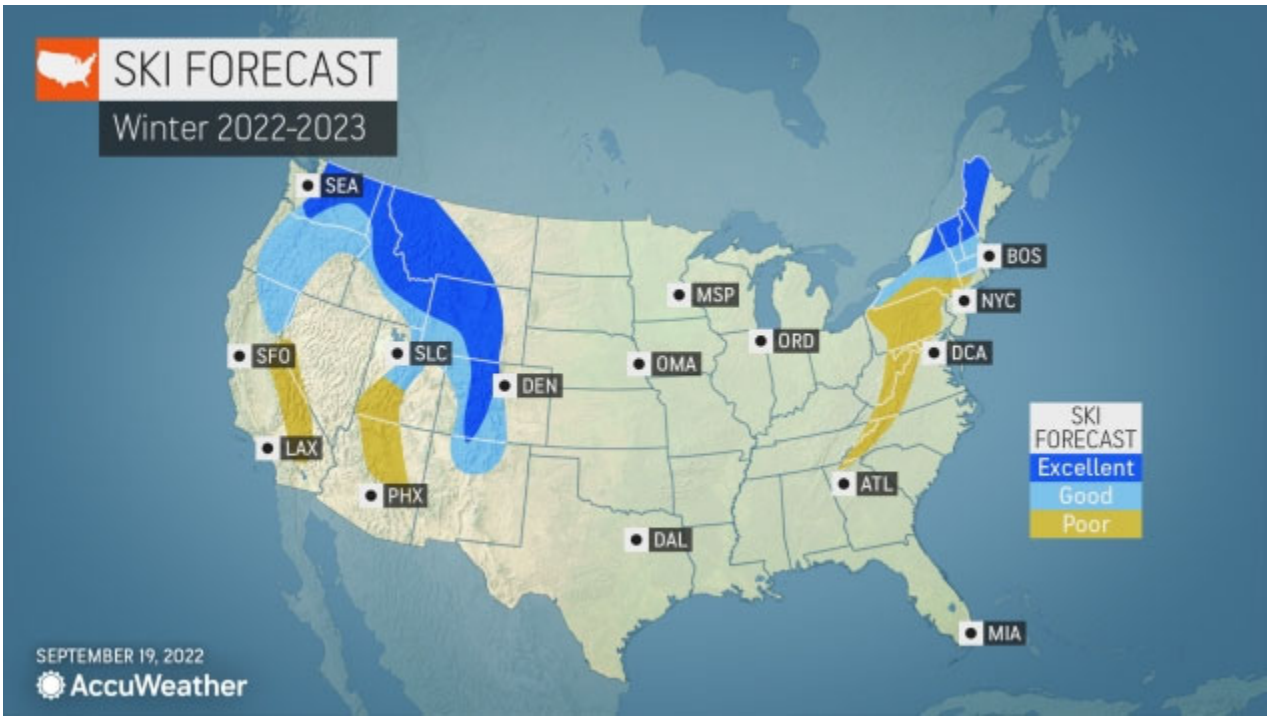
focusing on the Pacific Northwest and western Canada. This will present the best opportunities for rain in Los Angeles and San Diego, but even still, it will be far from enough to completely erase the long-term drought across the Southwest.

Excellent ski conditions predicted for popular resorts

Skiers and snowboarders across the West Coast who are awaiting the first opportunity to hit the slopes may want to consider traveling to the Cascades or the Rockies as resorts in these mountain ranges are projected to have the best of the early-season ski conditions.

Resorts in Central and Southern California, as well as Arizona and Utah, may be slow going early in the winter before natural snow picks up during the second half of the winter -- the exact opposite of what unfolded at the start of last winter.

Pastelok added that it should be a good year for the popular ski resorts across Colorado, but it might not necessarily be a banner year.



Ski resorts on the other side of the country may end up relying on artificial snow rather than natural snow this winter with below-normal snowfall in the forecast for the spine of the Appalachians from northern Georgia through Pennsylvania. Spells of colder weather during the early part of the ski season could help the resorts that are able to generate their own snow.

Better conditions are anticipated at ski slopes in New York and across New England where more frequent snow is anticipated. Resorts in Vermont and New Hampshire could end up being the best places to ski this winter across the eastern U.S. due to a boost from natural snowfall.

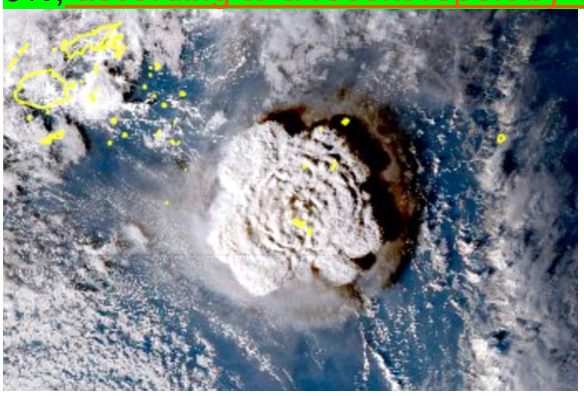
Volcano fallout a year later could factor into winter weather

La Niña will not be the only meteorological force at play that could shape the weather patterns across the U.S. during the upcoming winter.

On Jan. 15, 2022, the Hunga Tonga-Hunga Ha'apai volcano, an underwater volcano located about 2,200 miles northeast of Sydney, Australia, erupted in grand fashion, sending a significant plume of gas, ash and water vapor high into Earth's atmosphere.

The fallout from the eruption towered through the troposphere, the lowest layer of the atmosphere where most weather occurs, and reached into the stratosphere.

This "once-in-a-lifetime" eruption was so powerful that it sent shockwaves around the world and caused the amount of water vapor in the stratosphere to increase by around 5%, according to a recent report by The Associated Press.



This satellite image made by the Japanese weather satellite Himawari-8 shows the eruption of the Hunga Tonga-Hunga Ha'apai undersea volcano at the Pacific nation of Tonga on Saturday, Jan. 15, 2022. (Japan Meteorology Agency via AP)

"Volcanic eruptions rarely inject much water into the stratosphere," NASA said. "The sheer amount of water vapor could be enough to temporarily affect Earth's global average temperature."

Pastelok added that unlike volcanic ash, which reflects sunlight, the water vapor acts like a blanket and keeps warmer air trapped underneath. "Instead of cooling the surface, the reaction could be more warming. That could be one of the factors involved and we could see that hang over into the winter," Pastelok said.

Specifically, the lingering water vapor from the January eruption could indirectly help to fortify the polar vortex over the North Pole, preventing it from dipping down across North America. However, the jury is still out on whether or not the volcanic fallout will indeed have a significant impact on the winter forecast or other seasonal forecasts in the future.

Pastelok concluded by saying that the research is still ongoing and that there is lower confidence that the aftermath of the eruption will have a big impact on the winter forecast.

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	R239	R2,955	6	-248	581	R28	R3,321
February	3,363	2,985	R223	2,761	5	-216	545	R-37	R3,059
March	3,582	3,196	R239	R2,957	6	-284	53	R-10	R2,722
April	3,374	3,012	R225	2,786	5	-231	-311	R7	R2,257
May	3,285	2,927	R219	R2,708	5	-209	-454	R22	R2,072
June	3,217	2,873	R215	R2,658	5	-151	-363	R-21	R2,128
July	3,374	3,021	R226	2,795	5	-139	-165	R-33	R2,464
August	3,350	3,012	R225	2,786	5	R-149	-232	R-11	R2,400
September	3,265	2,918	R218	2,699	5	-221	-329	R-3	R2,151
October	3,364	2,992	R224	R2,768	5	-282	-96	R-79	R2,316
November	3,352	2,985	R223	2,761	5	R-317	-6	R-1	R2,442
December	3,490	3,089	R231	R2,858	5	-287	597	R9	R3,183
Total	**40,614**	**36,202**	**R2,710**	**R33,493**	**63**	**R-2,734**	**-180**	**R-129**	**R30,513**
2021									
January	R3,517	R3,118	R235	R2,884	R6	-279	R719	R16	R3,344
February	R2,950	R2,609	R196	R2,412	5	-152	R795	R40	R3,099
March	R3,518	R3,144	R237	R2,907	R6	-357	R64	R30	R2,649
April	R3,438	R3,069	R231	R2,838	5	-356	R-180	R-42	R2,265
May	R3,535	R3,168	R239	R2,930	R6	-373	R-424	R-21	R2,117
June	R3,400	R3,056	R230	R2,826	R5	-331	R-254	R-8	R2,238
July	R3,514	R3,182	R240	R2,943	R6	-338	R-175	R-23	R2,412
August	R3,545	R3,196	R241	R2,956	R6	-343	R-164	R-20	R2,434
September	R3,423	R3,087	R232	R2,854	R5	-315	R-398	R-4	R2,142
October	R3,600	R3,245	R244	R3,001	R6	-317	R-368	R-60	R2,263
November	R3,545	R3,170	R239	R2,931	6	-315	R137	R-66	R2,693
December	R3,680	R3,284	R247	R3,037	R6	-368	R330	R3	R3,007
Total	**R41,666**	**R37,328**	**R2,811**	**R34,518**	**R66**	**-3,845**	**R82**	**R-157**	**R30,665**
2022									
January	E3,591	RE3,199	246	RE2,953	R7	-314	994	R-28	R3,612
February	E3,227	RE2,870	223	RE2,647	R6	-286	658	R39	R3,064
March	E3,614	RE3,225	267	RE2,958	6	-377	163	R34	R2,785
April	E3,520	RE3,152	257	RE2,895	R6	-340	-214	R32	R2,379
May	RE3,667	RE3,296	266	RE3,030	R6	-382	-403	R-3	R2,248
June	RE3,553	RE3,211	259	RE2,952	2	R-320	R-324	R16	R2,327
July	E3,681	E3,321	275	E3,046	6	-298	-180	23	2,597
2022 7-month YTD	**E24,852**	**E22,274**	**1,793**	**E20,482**	**38**	**-2,316**	**695**	**114**	**19,013**
2021 7-month YTD	**23,873**	**21,346**	**1,607**	**19,739**	**38**	**-2,187**	**545**	**-9**	**18,126**
2020 7-month YTD	**23,793**	**21,208**	**1,587**	**19,621**	**37**	**-1,478**	**-114**	**-44**	**18,022**

[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): 212 for 2021; 209 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: 2017-2021: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2021*. January 2022 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*. Table 7 includes detailed source notes for Marketed Production. Appendix A, Notes 3 and 4, includes discussion of computation and estimation procedures and revision policies.

Note: Data for 2017 through 2020 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 7-month YTD	2021 7-month YTD	2020 7-month YTD	2022 July	June	May	April	March
Exports								
Volume (million cubic feet)								
Pipeline								
Canada	554,636	537,347	540,931	68,521	R68,763	77,512	79,930	104,177
Mexico	1,228,552	1,265,123	1,106,362	187,559	181,120	185,349	175,878	169,271
Total pipeline exports	**1,783,188**	**1,802,470**	**1,647,293**	**256,080**	**R249,883**	**262,861**	**255,808**	**273,448**
LNG								
Exports								
By vessel								
Antigua and Barbuda	13	0	0	2	3	2	3	2
Argentina	64,737	65,059	12,819	9,448	25,246	20,111	9,933	0
Bahamas	276	281	123	45	47	42	34	43
Bangladesh	12,663	27,374	10,660	0	0	3,346	0	3,421
Barbados	92	151	157	0	0	0	0	34
Belgium	57,027	5,584	25,028	0	7,023	3,441	7,341	17,743
Brazil	58,017	159,499	25,762	5,192	3,857	15,303	3,448	2,236
Chile	26,766	85,432	50,028	6,917	0	9,943	3,530	3,214
China	29,214	243,578	63,732	784	7,329	0	10,217	7,527
Colombia	1,398	892	1,528	0	912	0	0	0
Croatia	46,142	20,619	0	4,600	7,925	8,543	6,763	3,358
Dominican Republic	34,156	32,825	7,264	6,532	5,838	4,964	3,645	6,530
Egypt	0	0	0	0	0	0	0	0
France	349,303	103,845	76,456	53,443	37,564	47,807	56,343	64,415
Greece	49,897	20,852	34,451	12,922	9,633	11,994	1,336	4,116
Haiti	86	74	61	8	13	9	11	10
India	70,443	123,127	65,267	13,902	10,653	7,152	14,223	10,438
Indonesia	717	0	0	0	0	0	0	0
Israel	0	6,051	9,791	0	0	0	0	0
Italy	79,743	30,809	58,636	7,637	7,137	21,696	15,519	7,088
Jamaica	738	16,752	9,554	121	48	144	135	92
Japan	126,444	228,768	139,751	18,189	21,561	24,024	13,231	17,697
Jordan	0	0	3,294	0	0	0	0	0
Kuwait	40,265	14,653	3,297	5,382	8,105	14,204	7,298	0
Lithuania	52,031	25,961	9,467	7,947	6,729	11,237	13,770	5,700
Malaysia	0	0	0	0	0	0	0	0
Malta	2,345	2,928	2,648	0	0	0	0	0
Mexico	3,292	14,112	16,968	0	3,292	0	0	0
Netherlands	199,421	107,227	65,298	34,913	34,420	28,902	28,395	24,922
Nicaragua	0	1	0	0	0	0	0	0
Pakistan	3,074	27,229	10,224	0	0	0	3,074	0
Panama	9,676	6,136	7,384	0	623	1,192	1,536	0
Poland	79,170	38,824	26,709	17,780	14,282	18,224	13,882	3,831
Portugal	39,813	30,317	16,964	6,412	5,582	3,888	6,632	10,728
Singapore	16,352	17,190	14,300	6,275	3,352	0	0	6,725
South Korea	159,349	269,182	167,328	34,342	25,054	17,538	13,813	19,289
Spain	292,591	69,682	143,930	34,396	29,639	40,337	40,259	59,224
Taiwan	66,249	64,271	33,035	9,353	6,892	15,975	9,541	12,161
Thailand	18,708	10,841	28,917	0	6,920	3,419	0	0
Turkey	126,866	59,537	87,341	0	7,542	7,281	6,637	16,629
United Arab Emirates	0	0	6,751	0	0	0	0	0
United Kingdom	199,666	97,682	82,422	3,797	3,326	10,608	39,775	56,799
By truck								
Canada	48	56	2	0	8	8	15	0
Mexico	866	463	506	76	105	115	122	144
Re-exports								
By vessel								
Argentina	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	0
Japan	0	0	305	0	0	0	0	0
South Korea	0	0	305	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0
Total LNG exports	**2,317,657**	**2,027,864**	**1,318,466**	**300,415**	**300,659**	**351,448**	**330,463**	**364,116**
CNG								
Canada	*	197	259	0	0	0	0	*
Total CNG exports	*****	**197**	**259**	**0**	**0**	**0**	**0**	*****
Total exports	**4,100,845**	**3,830,530**	**2,966,017**	**556,495**	**R550,542**	**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	August
Exports								
Volume (million cubic feet)								
Pipeline								
Canada	74,313	81,420	937,124	108,568	85,136	62,464	72,023	71,586
Mexico	154,484	174,892	2,154,457	166,956	165,449	184,472	178,746	193,710
Total pipeline exports	**228,797**	**256,311**	**3,091,580**	**275,524**	**250,585**	**246,936**	**250,769**	**265,296**
LNG								
Exports								
By vessel								
Antigua and Barbuda	0	2	8	3	2	0	3	0
Argentina	0	0	83,449	2,077	0	0	1,950	14,363
Bahamas	31	34	486	36	34	36	43	56
Bangladesh	5,896	0	37,734	0	0	0	3,276	7,085
Barbados	31	28	297	34	27	25	33	27
Belgium	7,691	13,786	5,584	0	0	0	0	0
Brazil	10,660	17,322	307,714	24,246	10,715	40,769	38,282	34,204
Chile	0	3,162	121,881	2,938	2,956	6,364	7,929	16,262
China	3,357	0	453,304	17,050	50,228	42,202	48,584	51,662
Colombia	0	486	2,247	0	0	0	436	919
Croatia	5,870	9,084	36,133	3,117	9,416	0	0	2,980
Dominican Republic	0	6,647	53,095	5,969	2,780	5,619	0	5,901
Egypt	0	0	0	0	0	0	0	0
France	39,646	50,084	170,780	33,892	10,021	9,333	6,578	7,111
Greece	8,094	1,802	39,708	5,305	7,629	1,515	799	3,607
Haiti	16	20	137	4	8	17	10	24
India	7,210	6,866	196,218	3,203	14,807	10,548	23,941	20,592
Indonesia	717	0	3,269	1,218	456	477	1,118	0
Israel	0	0	8,906	0	0	0	2,855	0
Italy	13,629	7,037	34,210	0	0	0	0	3,401
Jamaica	111	86	25,276	113	715	1,858	2,931	2,907
Japan	10,214	21,527	354,948	24,297	33,947	37,666	10,290	19,979
Jordan	0	0	0	0	0	0	0	0
Kuwait	5,277	0	34,476	0	0	6,193	10,333	3,298
Lithuania	3,131	3,518	30,919	0	0	0	3,282	1,677
Malaysia	0	0	0	0	0	0	0	0
Malta	2,345	0	5,427	0	0	0	2,498	0
Mexico	0	0	15,200	0	0	1,088	0	0
Netherlands	31,591	16,279	174,339	23,354	8,829	17,157	10,424	7,347
Nicaragua	0	0	1	0	0	0	0	0
Pakistan	0	0	45,818	0	2,490	3,138	9,642	3,319
Panama	3,069	3,255	8,436	0	0	911	0	1,390
Poland	7,475	3,695	56,320	7,159	7,068	3,270	0	0
Portugal	3,703	2,868	65,865	9,630	5,380	10,459	3,696	6,382
Singapore	0	0	20,918	0	3,728	0	0	0
South Korea	27,489	21,824	453,483	38,201	30,787	33,836	31,375	50,101
Spain	39,359	49,379	215,062	32,579	22,821	35,638	31,274	23,068
Taiwan	6,115	6,211	99,350	12,034	3,404	7,123	5,789	6,728
Thailand	4,880	3,490	14,548	0	0	0	0	3,707
Turkey	43,697	45,081	188,849	38,420	47,330	19,385	24,176	0
United Arab Emirates	0	0	0	0	0	0	0	0
United Kingdom	25,301	60,060	195,046	60,315	30,648	3,302	3,099	0
By truck								
Canada	4	13	128	20	8	8	19	18
Mexico	157	148	1,250	148	160	182	150	147
Re-exports								
By vessel								
Argentina	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	0	0
South Korea	0	0	0	0	0	0	0	0
United Kingdom	0	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**	**298,262**
CNG								
Canada	0	0	211	0	0	0	0	14
Total CNG exports	**0**	**0**	**211**	**0**	**0**	**0**	**0**	**14**
Total exports	**545,563**	**610,102**	**6,652,609**	**620,886**	**556,982**	**545,055**	**535,583**	**563,572**

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
	July	June	May	April	March	February	January	Total
Exports								
Volume (million cubic feet)								
Pipeline								
Canada	68,264	69,528	70,561	74,567	91,301	78,198	84,927	R903,520
Mexico	197,623	198,242	192,549	182,918	183,051	137,381	173,360	1,990,809
Total pipeline exports	**265,887**	**267,770**	**263,110**	**257,485**	**274,352**	**215,579**	**258,287**	**R2,894,329**
LNG								
Exports								
By vessel								
Antigua and Barbuda	0	0	0	0	0	0	0	0
Argentina	22,798	19,312	16,226	4,485	2,238	0	0	15,068
Bahamas	46	48	45	46	39	29	28	257
Bangladesh	0	3,493	6,948	10,219	3,566	0	3,148	10,660
Barbados	31	22	19	30	14	19	17	241
Belgium	0	0	2,100	0	3,484	0	0	31,946
Brazil	39,637	32,293	19,726	11,615	21,977	13,118	21,132	111,826
Chile	19,913	0	17,598	10,293	21,320	6,524	9,784	80,615
China	42,222	42,319	37,731	50,474	28,476	3,415	38,940	214,401
Colombia	0	0	0	892	0	0	0	4,626
Croatia	3,299	2,923	3,364	3,666	7,367	0	0	3,275
Dominican Republic	1,806	4,670	5,283	2,905	5,577	5,689	6,895	26,050
Egypt	0	0	0	0	0	0	0	0
France	0	3,683	11,926	36,120	33,678	14,851	3,587	90,237
Greece	6,651	0	6,796	0	6,805	0	600	48,403
Haiti	8	18	12	3	10	11	12	118
India	13,090	16,503	28,259	13,752	17,381	13,776	20,367	124,402
Indonesia	0	0	0	0	0	0	0	0
Israel	0	0	0	3,225	2,826	0	0	15,834
Italy	6,826	3,425	2,923	6,896	10,739	0	0	68,453
Jamaica	0	2,927	2,925	2,370	2,458	2,365	3,708	17,052
Japan	24,895	39,783	25,058	28,756	27,673	18,271	64,331	287,672
Jordan	0	0	0	0	0	0	0	6,872
Kuwait	0	7,126	0	3,705	3,821	0	0	17,293
Lithuania	6,469	3,285	3,049	3,078	3,228	6,851	0	28,879
Malaysia	0	0	0	0	0	0	0	0
Malta	0	0	0	2,928	0	0	0	2,648
Mexico	758	0	0	0	0	13,354	0	34,408
Netherlands	10,597	3,030	26,611	17,060	24,204	22,777	2,949	85,573
Nicaragua	1	0	0	0	0	0	0	0
Pakistan	13,428	3,376	0	3,323	3,421	0	3,682	36,934
Panama	0	0	2,341	0	3,279	0	516	12,764
Poland	6,619	10,635	3,581	7,382	3,507	7,099	0	36,900
Portugal	3,296	5,538	10,765	7,358	0	3,360	0	36,922
Singapore	3,449	0	3,089	3,660	3,303	0	3,688	28,341
South Korea	39,314	55,918	46,033	21,683	32,203	18,094	55,936	316,227
Spain	8,630	7,833	5,234	22,974	13,900	3,733	7,377	199,966
Taiwan	20,653	3,097	10,157	6,594	13,450	0	10,319	64,363
Thailand	0	0	3,453	7,388	0	0	0	32,622
Turkey	5,591	0	3,017	0	3,619	20,652	26,659	123,957
United Arab Emirates	0	0	0	0	0	0	0	10,110
United Kingdom	0	0	10,586	13,877	17,440	34,343	21,436	160,199
By truck								
Canada	16	7	18	15	0	0	0	10
Mexico	97	105	48	48	19	63	83	822
Re-exports								
By vessel								
Argentina	0	0	0	0	0	0	0	2,164
Brazil	0	0	0	0	0	0	0	82
Japan	0	0	0	0	0	0	0	387
South Korea	0	0	0	0	0	0	0	387
United Kingdom	0	0	0	0	0	0	0	0
Total LNG exports	**300,143**	**271,368**	**314,922**	**306,818**	**321,023**	**208,394**	**305,196**	**2,389,963**
CNG								
Canada	16	27	25	29	36	32	32	386
Total CNG exports	**16**	**27**	**25**	**29**	**36**	**32**	**32**	**386**
Total exports	**566,046**	**539,165**	**578,056**	**564,333**	**595,411**	**424,004**	**563,515**	**R5,284,678**

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							
	December	November	October	September	August	July	June	May
Exports								
Volume (million cubic feet)								
Pipeline								
Canada	84,307	81,358	72,833	62,211	R61,881	71,778	66,516	67,752
Mexico	164,577	166,135	185,799	182,068	185,867	181,152	162,927	145,242
Total pipeline exports	**248,884**	**247,493**	**258,632**	**244,279**	R**247,748**	**252,930**	**229,442**	**212,994**
LNG								
Exports								
By vessel								
Antigua and Barbuda	0	0	0	0	0	0	0	0
Argentina	0	0	0	0	2,249	2,218	2,229	8,372
Bahamas	36	31	25	20	21	15	18	20
Bangladesh	0	0	0	0	0	3,614	0	3,406
Barbados	25	15	17	14	14	15	20	20
Belgium	0	3,633	3,285	0	0	0	0	1,348
Brazil	29,927	30,191	22,427	0	3,520	0	0	0
Chile	9,793	3,252	6,836	3,277	7,428	1,515	3,313	11,068
China	45,525	45,083	35,115	11,245	13,699	10,358	0	14,535
Colombia	0	0	0	2,548	550	0	0	0
Croatia	3,275	0	0	0	0	0	0	0
Dominican Republic	5,000	5,106	5,909	0	2,772	0	0	2,554
Egypt	0	0	0	0	0	0	0	0
France	3,752	3,390	6,639	0	0	0	0	9,546
Greece	3,382	3,543	0	7,027	0	6,544	1,076	3,430
Haiti	17	11	9	8	11	8	7	10
India	10,241	10,299	17,762	10,514	10,319	7,404	10,100	10,534
Indonesia	0	0	0	0	0	0	0	0
Israel	0	0	0	3,041	3,001	3,317	3,277	0
Italy	0	3,083	0	0	6,734	3,232	12,998	6,452
Jamaica	2,374	0	2,514	2,610	0	0	0	0
Japan	54,004	32,967	31,554	6,855	22,541	10,618	21,836	13,729
Jordan	0	0	0	3,578	0	0	0	3,294
Kuwait	0	0	3,603	3,508	6,886	0	0	0
Lithuania	6,291	3,621	6,191	3,308	0	0	3,049	3,473
Malaysia	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	0	0
Mexico	0	3,056	7,398	3,285	3,701	0	0	0
Netherlands	3,316	6,684	3,603	6,671	0	6,746	6,870	6,826
Nicaragua	0	0	0	0	0	0	0	0
Pakistan	0	3,436	10,009	9,853	3,412	0	0	0
Panama	271	1,448	433	3,228	0	0	0	3,070
Poland	7,033	0	3,157	0	0	0	3,385	6,258
Portugal	3,711	5,830	3,564	6,853	0	0	0	0
Singapore	0	7,658	3,416	0	2,967	3,690	0	0
South Korea	39,617	49,103	14,239	32,126	13,814	10,492	28,171	20,921
Spain	13,583	9,907	14,118	15,206	3,222	13,679	9,640	29,360
Taiwan	12,470	6,216	3,636	9,007	0	0	2,953	6,662
Thailand	0	3,705	0	0	0	3,254	0	7,397
Turkey	20,188	12,817	0	3,611	0	3,222	0	6,661
United Arab Emirates	0	0	0	0	3,359	3,277	0	3,474
United Kingdom	30,378	26,544	17,191	3,664	0	2,908	0	0
By truck								
Canada	8	0	0	0	0	0	0	0
Mexico	46	52	68	73	78	72	61	18
Re-exports								
By vessel								
Argentina	0	0	0	0	2,164	0	0	0
Brazil	0	0	82	0	0	0	0	0
Japan	0	0	82	0	0	0	0	0
South Korea	0	0	82	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0
Total LNG exports	**304,263**	**280,682**	**222,963**	**151,128**	**112,462**	**96,200**	**109,002**	**182,438**
CNG								
Canada	29	35	26	17	20	37	43	39
Total CNG exports	**29**	**35**	**26**	**17**	**20**	**37**	**43**	**39**
Total exports	**553,176**	**528,210**	**481,621**	**395,424**	R**360,230**	**349,167**	**338,486**	**395,472**

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			
	April	March	February	January
Exports				
Volume (million cubic feet)				
Pipeline				
Canada	71,722	86,579	77,354	99,231
Mexico	138,544	166,550	151,071	160,875
Total pipeline exports	**210,266**	**253,130**	**228,425**	**260,106**
LNG				
Exports				
By vessel				
Antigua and Barbuda	0	0	0	0
Argentina	0	0	0	0
Bahamas	23	20	13	15
Bangladesh	0	0	0	3,640
Barbados	15	28	26	33
Belgium	3,324	3,724	9,872	6,761
Brazil	0	6,891	10,433	8,438
Chile	14,098	3,216	10,731	6,087
China	21,140	17,699	0	0
Colombia	0	0	1,003	525
Croatia	0	0	0	0
Dominican Republic	1,838	2,872	0	0
Egypt	0	0	0	0
France	16,336	23,491	20,520	6,563
Greece	3,233	8,892	0	11,276
Haiti	8	9	11	7
India	16,674	17,245	0	3,309
Indonesia	0	0	0	0
Israel	0	3,197	0	0
Italy	3,135	9,895	16,616	6,308
Jamaica	5,770	1	2,914	869
Japan	18,387	21,845	21,360	31,975
Jordan	0	0	0	0
Kuwait	3,297	0	0	0
Lithuania	2,945	0	0	0
Malaysia	0	0	0	0
Malta	0	0	48	2,600
Mexico	0	7,037	3,167	6,764
Netherlands	10,305	13,772	14,099	6,681
Nicaragua	0	0	0	0
Pakistan	3,334	0	3,567	3,323
Panama	0	906	3,408	0
Poland	3,523	3,583	6,677	3,282
Portugal	10,777	0	6,187	0
Singapore	0	10,610	0	0
South Korea	24,258	28,095	11,071	44,320
Spain	22,943	23,657	20,240	24,412
Taiwan	0	6,987	7,115	9,317
Thailand	11,049	3,783	3,435	0
Turkey	14,030	6,489	24,303	32,637
United Arab Emirates	0	0	0	0
United Kingdom	0	20,202	28,884	30,428
By truck				
Canada	0	0	0	2
Mexico	23	123	87	122
Re-exports				
By vessel				
Argentina	0	0	0	0
Brazil	0	0	0	0
Japan	0	0	0	305
South Korea	0	0	0	305
United Kingdom	0	0	0	0
Total LNG exports	**210,466**	**244,269**	**225,786**	**250,305**
CNG				
Canada	35	38	34	33
Total CNG exports	**35**	**38**	**34**	**33**
Total exports	**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	R31,667	R39,285	R11,467	R160,766	R12,900	R276,873	R3,292	R173,929	R83,193	R193,911
February	28,365	R30,183	R10,846	R143,192	R10,142	R223,268	R2,859	R144,804	R70,129	R175,146
March	R31,483	R42,466	R12,136	R157,254	R13,251	R282,668	R3,299	R180,669	R83,243	R193,911
April	29,514	R37,756	R11,791	R156,092	R12,842	R273,643	R3,078	R178,912	R82,917	R185,964
May	29,005	R38,563	R12,342	R162,416	R13,063	R283,576	R3,328	R187,994	R85,384	R192,163
June	27,715	R36,918	R11,885	R154,617	R12,716	R276,142	R2,975	R184,732	R82,520	R185,964
July	26,280	R38,045	R12,141	R160,287	R13,215	R299,939	R3,321	R195,904	R80,072	R189,515
August	27,864	R37,753	R12,076	R158,586	R13,224	R292,784	R3,343	R199,365	R84,297	R189,515
September	28,534	R36,508	R11,617	R153,270	R12,769	R290,606	R3,283	R194,290	R85,041	R183,401
October	30,458	R37,626	R11,655	R160,291	R13,213	R307,744	R3,460	R200,567	R87,446	R199,379
November	30,735	R36,079	R11,279	R155,653	R12,722	R310,363	R3,291	R195,365	R87,089	R192,947
December	33,039	R37,006	R11,371	R157,031	R12,928	R313,823	R3,163	R201,176	R87,692	R199,379
Total	**R354,660**	**R448,187**	**R140,604**	**R1,879,457**	**R152,986**	**R3,431,429**	**R38,693**	**R2,237,706**	**R999,025**	**R2,281,193**
2022										
January	32,865	E37,302	RE11,186	RE151,815	E12,255	RE311,786	RE3,092	RE196,780	RE81,699	E196,005
February	30,014	E33,465	RE9,336	RE138,369	E10,930	RE284,177	RE2,801	RE183,345	RE74,429	E172,829
March	32,473	E37,518	RE11,388	RE155,246	E12,194	RE313,229	RE3,214	RE219,028	RE86,190	E187,872
April	30,910	E36,247	RE11,212	RE151,319	E12,037	RE313,229	RE3,042	RE215,953	RE68,484	E179,444
May	31,677	RE37,042	RE11,489	RE155,982	RE12,469	RE340,363	RE3,152	RE223,843	RE80,563	RE189,214
June	28,631	RE35,510	RE11,206	RE149,364	RE12,080	RE335,015	RE3,443	RE214,357	RE85,309	RE189,970
July	29,140	E36,336	E11,641	E152,267	E12,511	E345,525	E3,459	E227,242	E87,518	E193,467
2022 7-month YTD	**215,709**	**E253,420**	**E77,458**	**E1,054,362**	**E84,477**	**E2,243,324**	**E22,203**	**E1,480,548**	**E564,191**	**E1,308,801**
2021 7-month YTD	**204,029**	**263,216**	**82,607**	**1,094,625**	**88,130**	**1,916,109**	**22,152**	**1,246,944**	**567,460**	**1,316,573**
2020 7-month YTD	**194,689**	**283,764**	**105,910**	**1,178,800**	**97,347**	**1,882,637**	**22,223**	**1,109,698**	**483,050**	**1,385,232**

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	221,544	R652,640	R798,426	R19,392	234,432	R97,657	R35,223	R71,772	R3,118,370
February	163,094	R585,371	R609,757	R18,126	208,571	R89,337	R31,366	R64,024	R2,608,580
March	220,130	R645,407	R826,381	R20,404	227,218	R95,164	R34,671	R74,200	R3,143,955
April	214,334	R615,899	R820,570	R19,783	229,075	R92,340	R34,427	R69,762	R3,068,700
May	223,372	R635,584	R844,723	R20,313	234,118	R94,341	R35,868	R72,053	R3,168,206
June	213,314	R616,270	R815,947	R19,502	227,987	R90,259	R29,234	R67,429	R3,056,126
July	221,002	R638,200	R858,526	R20,601	229,376	R93,644	R30,467	R71,744	R3,182,278
August	222,329	R646,169	R863,509	R20,347	241,373	R89,749	R32,659	R61,377	R3,196,320
September	216,455	R622,275	R855,425	R19,928	216,452	R91,662	R30,611	R34,559	R3,086,687
October	223,093	R645,126	R873,479	R20,457	240,446	R93,162	R37,663	R60,037	R3,245,301
November	214,361	R646,233	R836,104	R20,014	229,812	R90,176	R32,023	R65,610	R3,169,856
December	218,805	R677,331	R872,543	R20,538	241,569	R91,741	R36,962	R67,903	R3,283,998
Total	**2,571,834**	**R7,626,504**	**R9,875,390**	**R239,405**	**2,760,429**	**R1,109,232**	**R401,172**	**R780,471**	**R37,328,378**
2022									
January	E213,419	E660,345	RE853,214	RE20,789	E234,795	RE85,192	RE31,292	RE65,454	RE3,199,287
February	E192,596	E581,432	RE766,441	RE18,966	E209,707	RE76,605	RE28,839	RE55,884	RE2,870,165
March	E219,732	E635,076	RE871,961	RE21,315	E239,344	RE84,319	RE31,519	RE63,547	RE3,225,163
April	E223,078	E616,181	RE856,759	RE21,254	E235,580	RE81,405	RE29,705	RE65,810	RE3,151,649
May	RE237,032	E640,189	RE887,465	RE22,840	RE247,179	RE82,036	RE31,011	RE62,326	RE3,295,871
June	RE230,090	RE616,629	RE862,260	RE22,316	RE240,568	RE80,403	RE30,462	RE63,592	RE3,211,206
July	E233,468	E640,825	E889,759	E23,155	E251,625	E85,327	E31,520	E66,270	E3,321,056
2022 7-month YTD	**E1,549,415**	**E4,390,678**	**E5,987,860**	**E150,636**	**E1,658,799**	**E575,287**	**E214,347**	**E442,883**	**E22,274,398**
2021 7-month YTD	**1,476,792**	**4,389,370**	**5,574,329**	**138,121**	**1,590,777**	**652,742**	**231,255**	**490,984**	**21,346,215**
2020 7-month YTD	**1,666,224**	**4,125,435**	**5,502,584**	**144,343**	**1,468,880**	**782,572**	**244,762**	**530,092**	**21,208,240**

R Revised data.

E Estimated data.

RE Revised estimated data.

Source: 2017-2021: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2021*, Bureau of Safety and Environmental Enforcement (BSEE), IHS Markit, and Enverus. January 2022 through current month: Form EIA-914, *Monthly Crude Oil and Lease Condensate, and Natural Gas Production Report*; and EIA computations.

Note: For 2022 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 2022, 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.

Massive Shell-Led LNG Project Takes Shape on Canada's West Coast
2022-09-29 16:48:23.433 GMT

By Robert Tuttle
(Bloomberg) -- Near the tiny seaside fishing town of Kitimat on the coast of British Columbia, a colossal project is taking place that will profoundly alter the global liquefied natural gas market.
Billed as the largest private-sector construction project in Canada's history, the estimated C$40 billion ($29 billion) development includes a liquefaction plant, pipeline and gas drilling. Even after four years of construction, and with 9,000-ton LNG modules now rearing up amid the cloudy, forested landscape, completion isn't scheduled until the middle of the decade.
Yet amid a global energy crunch, and with Europe on the brink of the worst energy crisis in half a century, the operation of the LNG Canada project can't come soon enough.

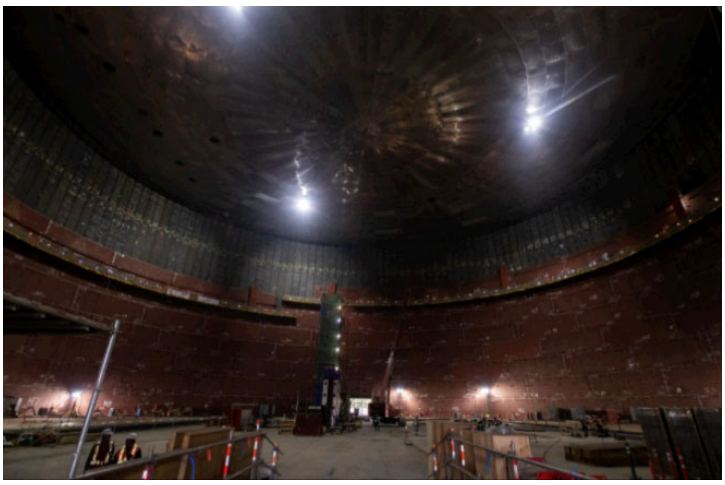

The LNG Canada facility under construction on Sept. 28.

Its first phase is expected to produce 14 million tons of chilled, liquefied natural gas per year for export by ship, almost equal the amount of gas used by Poland. An as-yet-unconfirmed second phase would double the plant's capacity. The business case for that "looks very compelling," said Jason Klein, chief executive officer of LNG Canada Development Inc., the global consortium led by Shell Plc that's behind the project. "We have substantially de-risked Phase Two by building Phase One."
Most of the gas will be sent to Asia but the added supply is expected to help Europe by displacing gas from other regions. The project has major advantages over production from the US Gulf Coast because it's so much closer to Asia and doesn't need to ship through the congested Panama Canal.
The partial use of hydropower to run the plant will help make it the lowest carbon-emitting LNG facility in the world, Klein said, a key attribute as Canada struggles to reconcile its climate ambitions with a world suddenly craving its fossil fuels.
Trudeau Environment Czar Counting On Carbon Capture and EV Push
Last month, Prime Minister Justin Trudeau told German

Chancellor Olaf Scholz that he'll consider easing regulations to allow new natural gas export facilities to be built on Canada's east coast to ship LNG to Europe -- but stressed that the business case for first moving that gas from the west of the country, where it's produced, may be difficult. During the same visit, the two leaders signed an agreement for green Canadian hydrogen, with a similar 2025 timeline for export, that will be produced and shipped from the east coast.

Work on the 1,000-acre LNG Canada site in British Columbia is a global endeavor. In addition to Shell, the consortium includes Mitsubishi Corp., PetroChina Co. Ltd., Korea Gas Corp. and Petroliam Nasional Bhd.

Massive steel machinery, shipped from China, Indonesia and Europe, is being offloaded from ships and slowly rolled into position. A 50-meter (164 foot) high steel-and-concrete tank -- the second-largest in the world -- will store the super-chilled LNG until tankers ship it away.



The interior of the storage tank.

The project has weathered a number of hurdles in a country where dozens of LNG projects have been proposed and many canceled. The start of construction, in 2018, followed years of regulatory delays. In July, TC Energy Corp. raised the price tag of the pipeline that will supply the plant by 70% to C$11.2 billion ($8.2 billion) after Covid-19-related delays and indigenous protests slowed construction.

Although the pipeline won't achieve the returns it initially expected, TC Energy said discussions with LNG Canada for a second phase are "well advanced" and will allow the project to generate a "competitive" return.

LNG Canada and TC Energy quarreled over the rising costs but the dispute has been resolved. Klein declined to say how much LNG Canada's own share of the costs has gone up.

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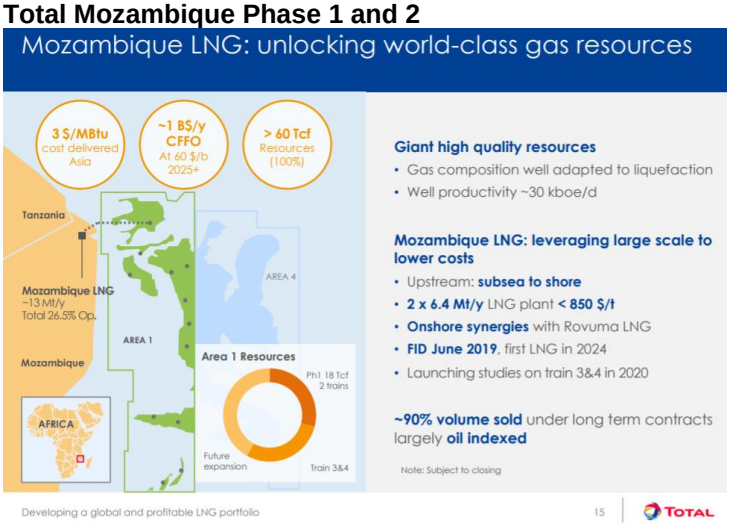
Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?

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

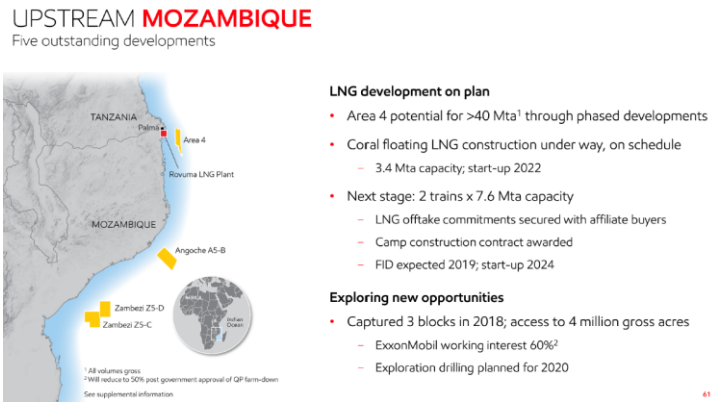
Total's Mozambique force majeure is no surprise, especially the need to the restoration of security and stability "in a sustained manner". Yesterday, Total announced [LINK] "*Considering the evolution of the security".* No one should be surprised by the force majeure or the sustained manner caveat. SAF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

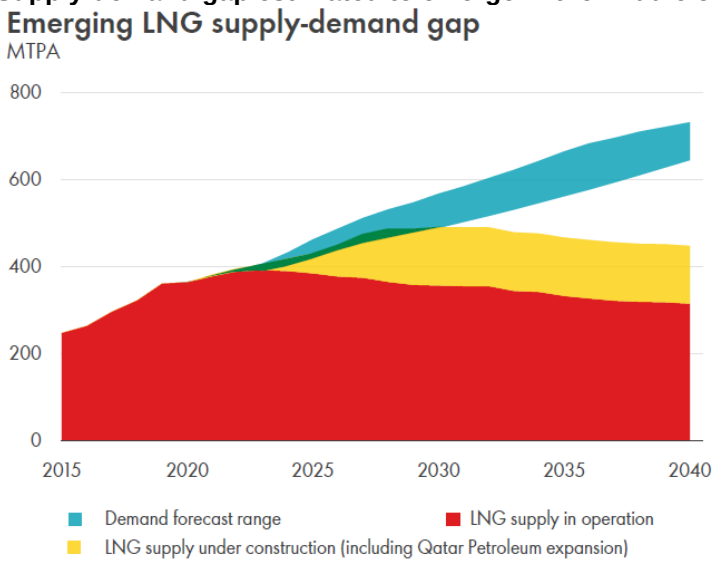
Source: IEA Tracking Clean Energy Progress, June 2020

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.

Germany's Federal Network Agency
https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/DE/2022/20220929_Verbrauchsdaten.html?nn=265778

Gas consumption of households is increasing too much at the moment

President *Müller*: "We need sustainable savings efforts"

Edition2022
Release date29.09.2022
Starting today, the Federal Network Agency will publish weekly figures on gas consumption in Germany.

"The gas consumption of households and businesses in the last week was well above the average consumption of previous years. This week's figures are therefore very sobering. Without significant savings, even in the private sector, it will be difficult to avoid a gas shortage in winter. Although the last week was colder than the weeks of the previous year and the consumption is always snapshots and can change quickly, savings must take place even with further falling temperatures and this is not a matter of course," says *Klaus Müller, President of the Federal Network Agency*. "In view of the well-filled storage facilities, we can get through the winter well under three conditions: First, the projects initiated to increase gas imports must be implemented. Secondly, gas supplies in our neighbouring countries must also remain stable. And thirdly, gas must be saved, even if it gets even colder in winter. It will depend on each individual."

Gas consumption in Germany

While the gas consumption of households and businesses until mid-September was in some cases well below the average consumption of previous years, last week it was 483 GWh/week, well above the average value of the years 2018 to 2021 (422 GWh/week; +14.5 percent). Although the week was significantly colder than the same week in previous years, the savings required to avoid a gas shortage must be achieved regardless of temperatures. The Federal Network Agency currently assumes that a reduction in consumption of at least 20 percent is required to avoid a gas shortage.

Private households and smaller commercial customers are responsible for around 40 percent of gas consumption in Germany. So far, private consumers have contributed little to the decline in gas consumption. However, this is due to the fact that gas is mainly used for heating here. How much gas is actually saved will therefore only become apparent in the heating season that has just begun.

The large industrial customers need around 60 percent of the gas. The consumption of these large consumers fell by 22 percent in August and was also significantly below the average consumption of previous years last week (1170 GWh/week versus an average of 1679 GWh/week in 2018-2021).

Current data on gas supply

The Federal Network Agency publishes a status report on the gas supply from Monday to Friday. It also contains up-to-date data on gas imports and exports, storage levels, gas consumption and current price developments. The data are published here: www.bundesnetzagentur.de/aktuelle-gasversorgung

Qatari Minister: No 'Quick Fix' to EU Gas Crisis

Published: Thu, Sep 22, 2022
Author Rafiq Latta, Doha
Editor Paul Merolli

There is not much Qatar can do to alleviate Europe's gas crisis in the short term due to contractual commitments, Qatari Energy Minister Saad al-Kaabi tells Energy Intelligence -- but further out, in five to seven years, new Qatari LNG exports to Europe should be significant. In an exclusive interview, al-Kaabi said production from the Golden Pass LNG project in the US, where QatarEnergy partners with Exxon Mobil, is due on stream in 2024 and is "already earmarked for Europe." Up to half of new output from Qatar's 48 million ton per year North Field mega-expansion could also go West of Suez when it starts up from 2026. Al-Kaabi also serves as head of state-owned QatarEnergy, which is in active discussions with customers for the new supplies. Significantly, targeted contract durations are shorter than the 20-year deals seen in Qatar's original LNG expansion, reflecting European reluctance to lock into gas supplies long-term. "I think 10-15-year deals are probably what are most acceptable to both sides. But for us, the long-term deal, it's not just about duration, it's about price," he said. Even with such supplies, al-Kaabi expressed skepticism about Europe's ability to completely wean itself off Russian gas. Europe will find it "very difficult" to completely forgo Russian pipeline gas for more than two winters. Despite storage, fuel switching and active efforts to expand LNG imports, "a quick fix" to the EU's dependency on Russian gas does not exist.

Qatar's North Field expansion is attracting enormous interest from foreign investors, with TotalEnergies tipped to become the first of the Phase-2 partners to be selected later this month. But investors in existing Qatari projects face a rocky ride when contracts on current joint ventures expire, as Exxon and Total discovered when their prized Qatargas-1 contract was not renewed last year. Al-Kaabi revealed that QatarEnergy came close to going it alone on the North Field expansion, too. Qatar, which is generating around 1 million barrels of oil equivalent per day of net output for Exxon, Total and Shell alone, is critical for the majors. However, "if there is no value, there is no partnership, very plain and simple," al-Kaabi said. Even if joint ventures are maintained after expiry, terms will be tougher. For Exxon, which has stakes in nine of Qatar's 14 trains, these contract renewals are especially strategic. Qatar knows the value of its LNG will likely drive a hard bargain. "An investment in Qatar is really an important downside-risk revenue maker" for partners, al-Kaabi said.

LNG is only part of a multifront, international investment drive now under way at QatarEnergy. Downstream, petrochemicals is a priority, with al-Kaabi touting QatarEnergy's planned US project with Chevron Phillips Chemical as "the largest polyethylene plant." It recently awarded construction

contracts for a 1.2 million ton/yr blue ammonia project, also tipped to be the biggest of its kind. But its global upstream drive is most significant. There were doubters when the strategy launched, but QatarEnergy has been vindicated over the past year by major exploration success in Namibia. QatarEnergy, by virtue of sizable stakes in both Total and Shell discoveries, is poised to be the largest reserves holder in a significant new oil province — Total's Venus discovery is described as the largest deepwater find ever. There have also been offshore gas discoveries in Cyprus and South Africa. And in Brazil, output at QatarEnergy's offshore Sepia field is set to more than double to 400,000 barrels per day in the next couple of years.

Despite confidence in long-term gas demand, QatarEnergy is taking steps to ensure its place in the energy transition. It is investing heavily in greenhouse gas emission mitigation technology at projects. Over $250 million is being spent on such measures at the LNG expansion alone — principally carbon capture and storage (CCS) and solar power. Some 11 million tons/yr of CCS is planned by 2035. "From an overall value chain, Qatari LNG will be the least carbon footprint LNG you can get," al-Kaabi said. "We think that our buyers, and our investors that have joined us in [North Field East expansion], see this as the Rolls-Royce of projects." Transition pressures are feeding into the urgency for developing projects. "I am a believer that you need to monetize what you can because the market conditions change, and there is a competitive advantage to go ahead of others," al-Kaabi stated.

For more coverage of the Ukraine crisis, visit Ukraine Crisis: Energy Impact

BP Toledo Refinery Fire Repairs May Extend Into Early 2023
2022-09-27 19:36:20.350 GMT

By Barbara Powell
(Bloomberg) -- Repairing and then restarting BP Plc's fire damaged BP-Husky Toledo refinery in Ohio may not be completed until early 2023, people familiar with operations said.
U.S. safety inspectors are just beginning their inspection of the plant after a fire at its biggest crude unit Sept. 20 killed two BP employees, said the people, who asked to remain anonymous discussing internal matters. All contractors were sent home hours before the fire erupted at the 150,800 barrel-a-day refinery. BP workers are now onsite conducting cleanup and safety checks.
Any startup, whether in full or partially, would have to have the approval of safety inspectors, and may be done in phases.
"I have no direct knowledge of the damage but based on the seriousness of the incident, the two fatalities and the safety concerns in a restart, it would not surprise me if restart stretches into the next year," said John Auers, managing director of Refined Fuels Analytics, a division of RBN Energy. "The difficulties of restarting in winter and during the holiday season also complicates things."
BP didn't immediately respond to a request for comment and has not given an update on the status of the refinery in Oregon, Ohio, since early Wednesday. The company is in the process of selling its 50% stake in the Ohio refinery, known as BP-Husky Toledo, to its joint-venture partner Cenovus Energy Inc.
* READ: BP Toledo Workers Back in Refinery to Clean Up After Fire
* READ: BP Keeps Contractors Out of Fire-Damaged Toledo To October
* READ: Fire at 103-Year-Old BP Refinery Kills Two, Halts Work
* READ: BP to Sell Interest in BP-Husky Toledo Refinery to Cenovus

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https://www.reuters.com/business/energy/bp-lays-off-most-contractors-ohio-refinery-after-explosion-sources-2022-09-28/
September 28, 20223:26 PM MDTLast Updated 44 min ago

BP layoffs at Ohio refinery after fire indicate prolonged shutdown

By Laura Sanicola

Sept 28 (Reuters) - BP Plc laid off most contractors at the approximately 160,000 barrel-per-day Toledo, Ohio, refinery it owns with Cenovus Energy Inc (CVE.TO), according to sources familiar with the matter on Wednesday, indicating that the plant will experience a prolonged shutdown following last week's explosion and fire.

The explosion killed two United Steelworkers members, identified as brothers Max and Ben Morrissey.

The more than 100-year-old refinery has been offline since the middle of last week following the explosion and could be shut for several months.

At least one contracting company is on site assessing the damage. The U.S. Chemical Safety Board is also investigating the incident, which it said additionally caused the release of sulfur dioxide and hydrogen sulfide and significant property damage.

Cenovus has referred comment to BP, which has declined to comment further.

The outage caused Chicago gasoline cash differentials to reach new highs on Wednesday.

Chicago CBOB gasoline gained 7.75 cents, trading 80 cents per gallon above futures on the New York Mercantile Exchange, traders said, more than 700% higher than prices were a year ago.

The official cause of the explosion has not been reported. Leaking fumes from a crude unit may have caused the ignition in another unit at the facility, a source told Reuters. Multiple units were engulfed in flames, the source said.

Workers finished a maintenance turnaround at the facility in recent weeks and the plant had resumed operating.

In August, Cenovus said it would buy the remaining 50% stake it does not already own in the BP-Husky Toledo Refinery. The deal is expected to close by the end of 2022.

In 2008, Husky Energy Inc formed a joint venture with BP by acquiring a 50% stake in the Toledo refinery. The stake then moved to Calgary-based Cenovus when it combined with Husky in 2021.

Reporting by Laura Sanicola; Editing by Leslie Adler and Lisa Shumaker

CALIFORNIA
AIR RESOURCES BOARD

Regulatory Advisory: September 30, 2022

EARLY TRANSITION TO WINTER-BLEND GASOLINE

Scope and Applicability

The California Air Resources Board (CARB) is issuing a Regulatory Advisory (Advisory) today, September 30, 2022, effective immediately, regarding CARB requirements for gasoline Reid Vapor Pressure. In response to the Governor's September 30, 2022, directive that CARB allow an early transition to winter-blend gasoline, and as a matter of its enforcement discretion in light of CARB's determination of its regulatory enforcement priorities, CARB is allowing the manufacture, importation, distribution, and sale of winter blend gasoline. This Advisory will remain in effect only until midnight, Pacific Daylight Time, October 31, 2022, unless otherwise superseded by subsequent CARB regulatory action or advisory. This Advisory applies to any person who sells, offers for sale, supplies, offers for supply, or transports California gasoline.

Regulatory Framework for California Reformulated Gasoline

The California Reformulated Gasoline (CaRFG) regulations limit, among other properties, the Reid Vapor Pressure (RVP) of gasoline sold, offered or sale, supplied, offered for supply, or transported within the State (*title 13, California Code of Regulations (CCR), section 2262 et seq.*). In order to control evaporative emissions of hydrocarbons, the RVP of summertime gasoline is generally restricted to a production or importation limit of about 7.0 pounds per square inch (psi). These summertime RVP limits apply through October 31 for most of California, depending on the air basin. These RVP limits are lifted in the wintertime when ozone formation is less of a problem.

Steps Taken for Early Transition to Winter-Blend Gasoline

The gasoline market in California is currently experiencing very high prices for reasons that industry has not made clear, but that appear to include, in part, a recent refinery fire, West Coast refinery maintenance challenges, Hurricane Ian, and other geopolitical events.

In response to direction by the Governor to help address the above fuel-related issues, CARB will exercise its enforcement discretion to allow gasoline sold or supplied for use in the State that exceeds the RVP limits in title 13, CCR, section 2262, from the effective date of this Advisory through the end of October 31, 2022. This action is necessary to address the extreme and unusual fuel supply circumstance caused by the multiple events described above and is necessary for the immediate preservation of the public peace, health and safety or general welfare. Any impacts on air quality caused by this action are expected to be minimal and outweighed by the public interest in temporarily relaxing the RVP limits.

CARB will continue to enforce all other requirements of the CaRFG regulations, including other fuel properties, specifications, recordkeeping, and reporting requirements. In addition, nothing in this Advisory modifies, replaces, supersedes, or otherwise changes any other requirements applicable to gasoline under local, State, or federal law or regulation. Persons regulated by the CaRFG regulations should continue to sell or distribute gasoline meeting the current California RVP limits where such supplies are available.

For More Information

For any questions regarding this Advisory, please contact Ms. Carolyn Lozo, Chief, Oil, Gas, and Greenhouse Gas Mitigation Branch at (279) 208-7306 or via email at *carolyn.lozo@arb.ca.gov*.

https://en.irna.ir/news/84900559/Iran-says-Iraqi-FM-carried-a-message-from-US-to-Iran
Sep 30, 2022, 1:19 PM
Journalist ID: 1114 News Code: 84900559

Iran says Iraqi FM carried a message from US to Iran

New York, IRNA – Iranian Foreign Minister Hossein Amirabdollahian said on Thursday that some of his foreign counterparts tried to carry messages from the US side to Iran and vice versa over the past months among whom was the Iraqi Foreign Minister Fuad Hussein who carried a message from the US to Iran.

Speaking in an exclusive interview with IRNA correspondent to New York, Amirabdollahian also touched upon a meeting in New York between Iranian President Ebrahim Raisi and his French counterpart Emanuel Macron, where he said the French president raised his viewpoints about the issues which he believed could help the progress of talks between Iran and world powers.

He noted that the two presidents also exchanged views on the war in Ukraine, the regional developments and bilateral issues.

On the resolve on the US side for reaching a deal, the Iranian foreign minister said that the American side talks about goodwill but what is important for Iran is how this goodwill is translated on the ground.

Iran is determined to reach a good, strong and durable deal and will spare no effort in this regard, the Iranian foreign minister said, adding that now it is the US turn to show whether it is courageous enough to take the necessary decisions.

On the long course of talks with the Western sides and indirect talks with the American side, Amirabdollahian said that the thing important is that Iran has not negotiated for the sake of negotiations, rather it has been negotiating to reach a point where the removal of the sanctions are ensured and the country can benefit from the economic interests of a 2015 nuclear deal.

Noting that both sides have had enough negotiations, he said that now the ball is in the US court to make a decision.

“Reaching a deal is important but the implementation of the deal is more important if a durable deal is reached, even the next [US] administration, no matter from which party it may be, will have to respect that.”

When asked to comment on plans for a prisoner swap between Iran and the United States, the Iranian foreign minister said that the American side insisted to tie the issue to the Vienna talks on the removal of sanctions.

He said that the US even sought to make a prisoner swap between the two countries part of a deal that has been under negotiations for several months in Vienna but Iran does not insist on such a mechanism and is ready to extradite the prisoners with the US as a humanitarian measure whenever the US side is ready to do so.

As a new round of negotiations between Iran and Saudi Arabia is scheduled to begin in Iraq soon, the foreign minister was asked whether a thaw of relations between Tehran and Riyadh is subject to brokering a deal between Iran and the West or it is pursued independently.

Amirabdollahian said that Iran sees no link between regional cooperation and the talks on the removal of sanctions on Tehran.

He even added that Iran’s relations with a number of regional Arab countries which had been cut off as a result of icy relations between Tehran and Riyadh were restored over the past few weeks so that these countries sent back their ambassadors to the Iranian capital.

Whenever Saudi Arabia is ready to reopen its embassy in Iran and resume normal relations with the country, Tehran would welcome that, the foreign minister said, noting that the talks between the two countries are underway to reach this point.

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Oil price outlook – Snapshot: September 27, 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.

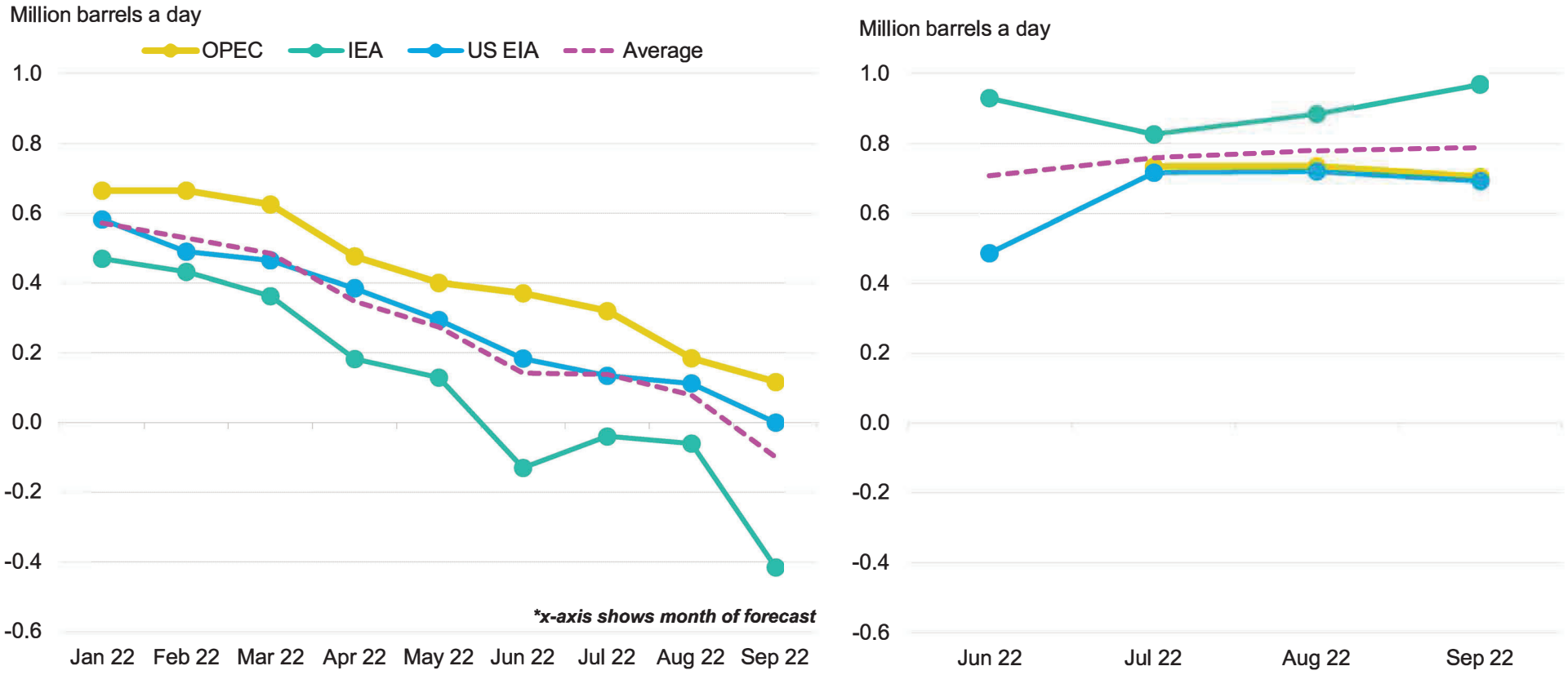
Category	Indicator	Signal	Comment
Fundamentals	**Refinery margins**	⇔	• Refinery margins were largely flat over the past week.
	Crude stocks	↓	• In the week ending September 16, land crude-oil storage levels in BloombergNEF's tracked regions (the US, ARA and Japan) rose by 1.5% to 548.8 million barrels (m bbl). The stockpile **deficit** against the five-year average (2015-19) **narrowed from 38.0m bbl to 29.5m bbl**. • Including global floating crude stockpiles from the same week, total crude oil inventories increased by 0.8% to 642.7m bbl, with the stockpile **surplus widening from 16.8m bbl to 25.3m bbl.**
	Product stocks	↓	• In the week ending September 16, gasoline and light distillate stockpiles in BNEF's tracked regions (the US, ARA, Singapore, Japan and Fujairah) grew by 0.1% week-on-week to 257.5m bbl, with the stockpile **deficit** against the three-year average (2017-19) **widening from 4.9m bbl to 5.5m bbl**. Gasoil and middle distillate stockpiles in BNEF's tracked regions were up 0.9% to 150.1m bbl, with the stockpile **deficit** against the three-year average **narrowing from 34.1m bbl to 30.1m bbl**. • Oil product stockpiles in tracked regions grew by 1.3% to 982.4m bbl, with the stockpile **deficit** against the three-year seasonal average **narrowing from 52.4m bbl to 38.0m bbl**. Altogether, crude and product stockpiles increased by 1.1% to 1,625.1m bbl, with the stockpile **deficit narrowing from 35.5m bbl to 12.8m bbl.**
	Demand indicators	↓	• In the week to September 27, global jet fuel demand from commercial passenger flights fell by 1.1% to 5.41 million barrels per day. Jet fuel consumption by international passenger flight departures was down by 43,200 barrels per day (or -1.4%) week-on-week, while consumption by domestic passenger flight departures decreased by 16,700 barrels per day (or -0.7%). In the week to September 27, flight departures in the Eurocontrol area rose to 86.9% of the equivalent week in 2019, up from 86.5% last week. The four-week moving average, however, remained flat at 87.3%. Meanwhile, in the same week, US passenger throughput rose to 94.3% of the equivalent week in 2019, up from 93.2% last week. The four-week moving average decreased to 95.0%, from 95.5%. • The oil-demand-weighted global mobility index (excluding China) fell over the past week, according to BNEF's calculation based on Google mobility data. It decreased by 1.4% in the week to September 22, led by declines in Asia Pacific ex-China (-1.1%), Europe (-1.4%) and the Americas (-1.6%). Meanwhile, in the week to September 21, TomTom's peak congestion data showed decreases in Asia Pacific ex-China (-7.0%) and North America (-2.9%), while Europe showed growth (+1.4%). Road congestion in China's 15 key cities was up by 3.7 percentage points to 111.5% of January 2021 levels in the week to September 22, according to BNEF's calculation based on Baidu data. • In the week to September 20, global daily average Covid-19 cases fell by 4% to 466,000 new cases. The Americas number decreased by 24% to 73,000 daily cases, while the Asia Pacific number declined by 5% to 199,000 daily cases (although the number in **China more recently fell by 14% to 830 cases** in the week to September 25). Europe saw cases rise by 11% to 128,000 daily cases.
Financial	**Macro indicators**	↓	• The dollar index averaged 111.0 over the past week and was 1.4% higher than the week before. The US Flash Manufacturing PMI rose to 51.8 in September, from 51.5 in August. The eurozone Flash Manufacturing PMI slipped to 48.5, from 49.6 in the prior month.
	Hedge fund positioning	↓	• In the week to September 20, Managed Money net positioning in the oil complex was down by 7.6m bbl (or -1.7%) week-on-week to 443.9m bbl, and fell to the 10th percentile (versus the 11th percentile in the prior week) of the past five years.
	Options chains and volatility	↓	• There was a significant increase in open interest for Brent puts. Brent and WTI 1M volatility skews were slightly lower over the past week.
Outlook	**Weekly call**	⇔	• BNEF is neutral on oil prices for the week ahead, with Brent Dec-22 trading at $83.99/bbl and WTI Nov-22 trading at $77.67/bbl at the time of writing. • The oil-demand-weighted global mobility index (excluding China) weakened over the past week, with year-on-year growth falling 0.6 percentage points to 13.2%. Global jet fuel demand fell week-on-week. The four-week moving average for air traffic in Europe has remained unchanged at 87.3% of 2019 levels for the fourth consecutive week, below the year-to-date high of 88.1% reached six weeks prior. Meanwhile, four-week average passenger throughput slipped to 95% of 2019 levels, but remained close to its post-pandemic highs. • Weekly crude and oil product inventories saw a bearish move over the past week as the crude stockpile surplus against its seasonal average increased significantly, while the oil product inventory deficit against its seasonal average narrowed. • Key agencies - OPEC, the International Energy Agency (IEA) and US Energy Information Administration (EIA) - see an oil supply surplus for 3Q 2022. While OPEC and the IEA expect this to persist in 4Q, the EIA, predicts a slight 0.1 million barrel a day deficit. On average, these key agencies now forecast an annual decline in China's oil demand in 2022 of about 100,000 b/d, versus an expectation of annual growth of 80,000 b/d in the prior month. Forecasts for China's 2022 oil demand have been steadily revised lower since January. By contrast, expectations for China's demand growth next year have been held relatively unchanged. • While oil prices have fallen significantly due to the weakening demand outlook, the prospect of OPEC+ cutting supply in its next meeting on October 5 could fend off further declines.

BloombergNEF

In the spotlight: Key agencies' outlooks

Expectations of China's oil demand recovery have not come into fruition

Evolution of forecasts for China's oil demand growth: 2022/21 (left) and 2023/22 (right)



Source: OPEC, EIA, US EIA, BloombergNEF.

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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
September 27	⇔	↓	↓	↓	↓	↓	⇔	Brent-Dec: 83.99 WTI-Nov: 77.67	
September 6	↓	↑	⇔	↓	⇔	↑	↓	Brent-Nov: 94.06 WTI-Oct: 87.83	
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	

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

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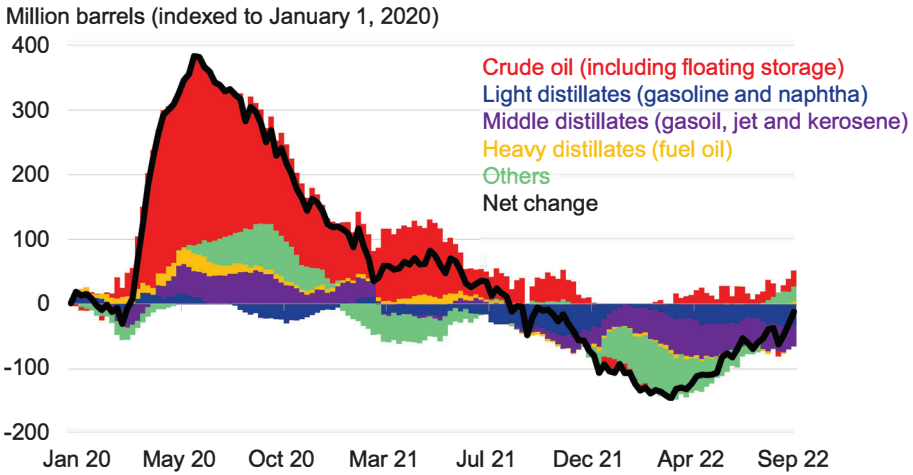
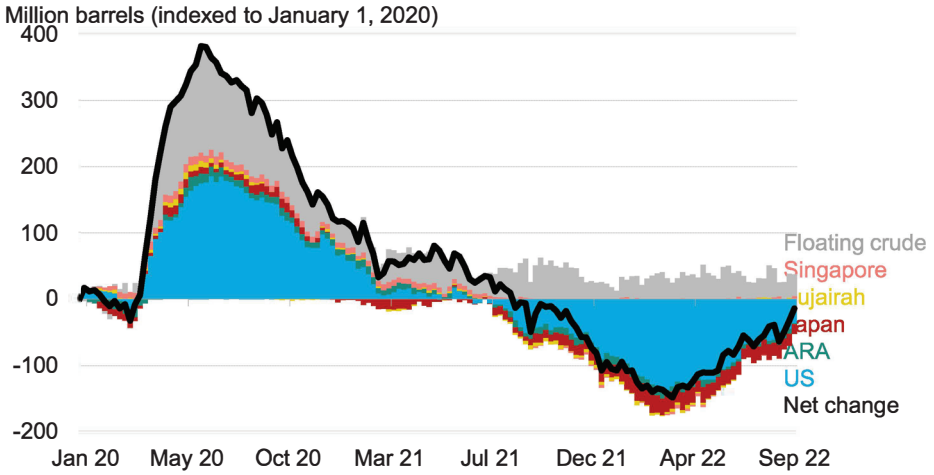
Weekly oil inventories

Uptrend in middle distillate stockpiles

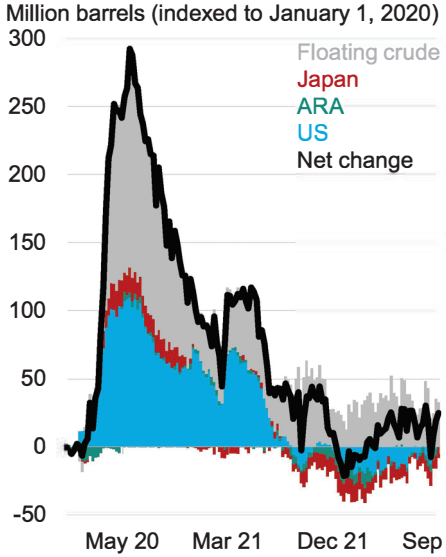
Weekly oil inventories by type



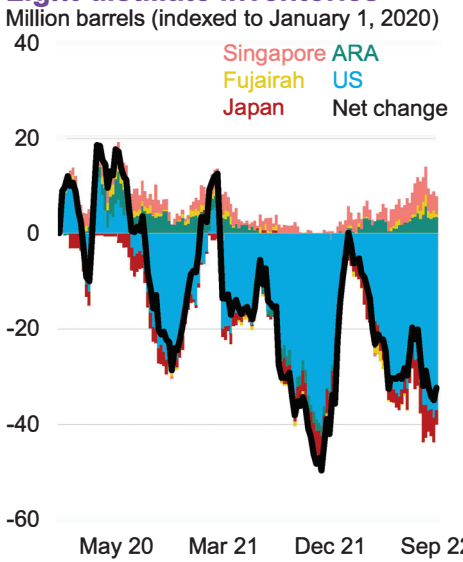
Weekly oil inventories by region



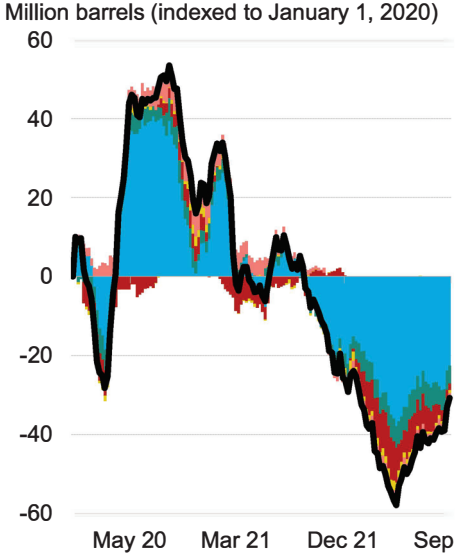
Crude inventories



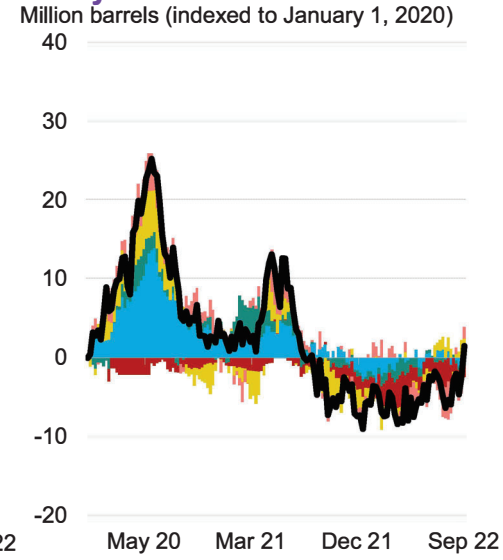
Light distillate inventories



Middle distillate inventories



Heavy distillate inventories



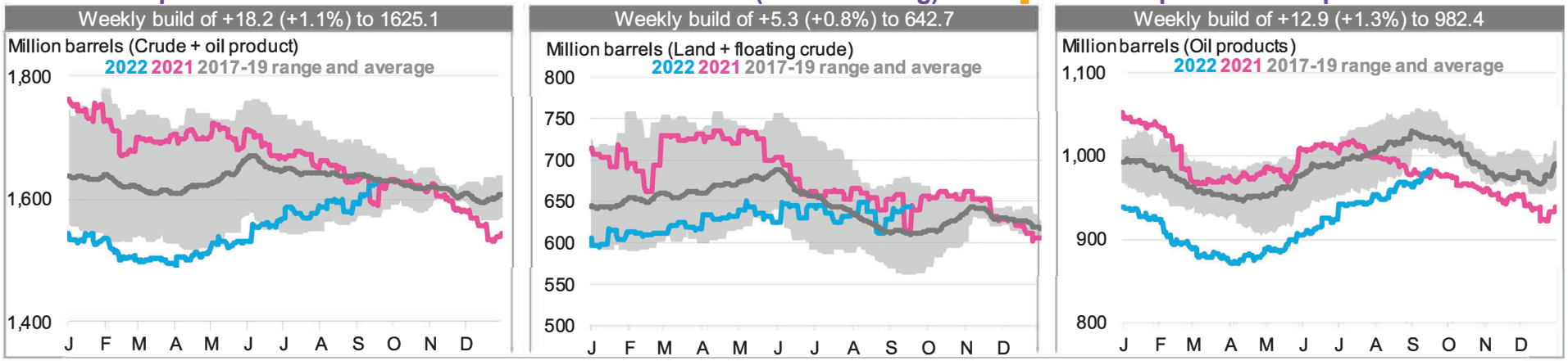
Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ ,Vortexa, Genscape. Note: As of the week ending ***September 16, 2022****.*

Aggregated oil stockpiles

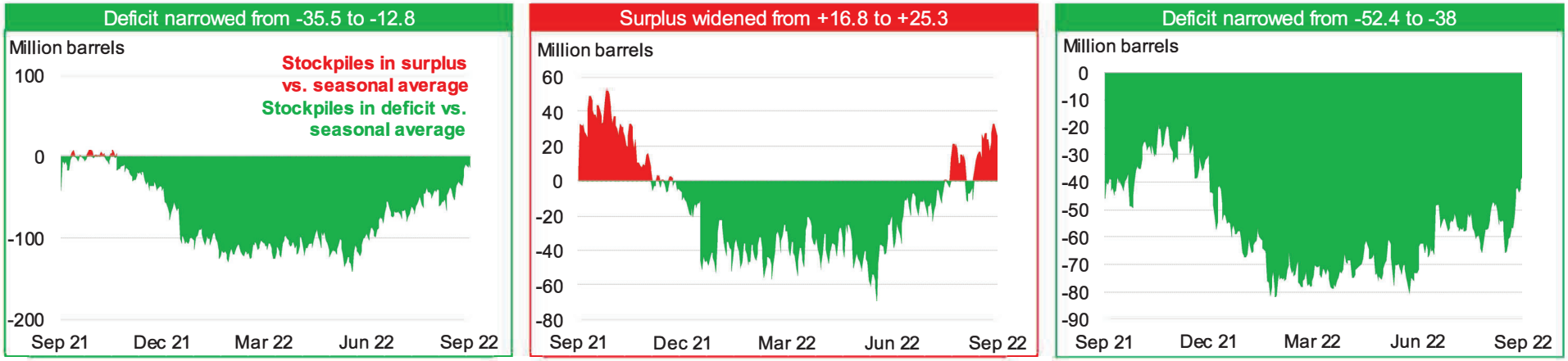
Bearish: Stockpiles deficit narrowed from 52.4m bbl to 38.0m bbl

- 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



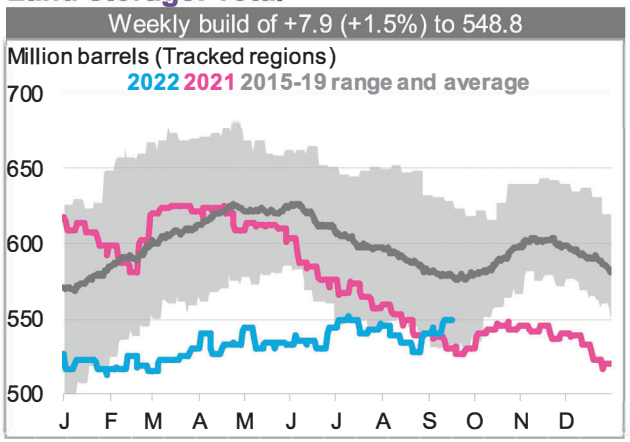
*Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ ,Vortexa, Genscape. Note: As of the **week ending September 16, 2022.***

Crude stocks: Land

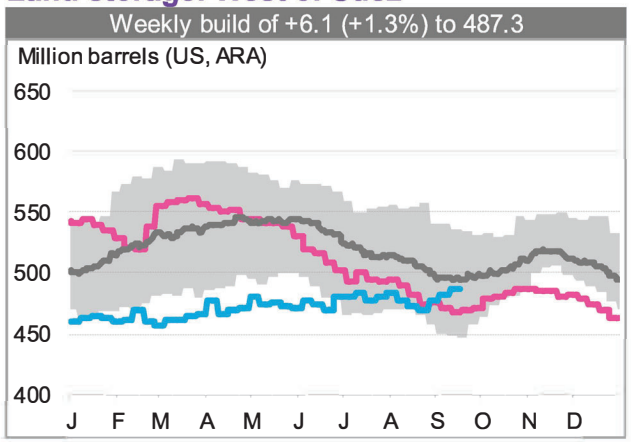
Bearish: Deficit narrowed from 38.0m bbl to 29.5m bbl against the seasonal average

- 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.

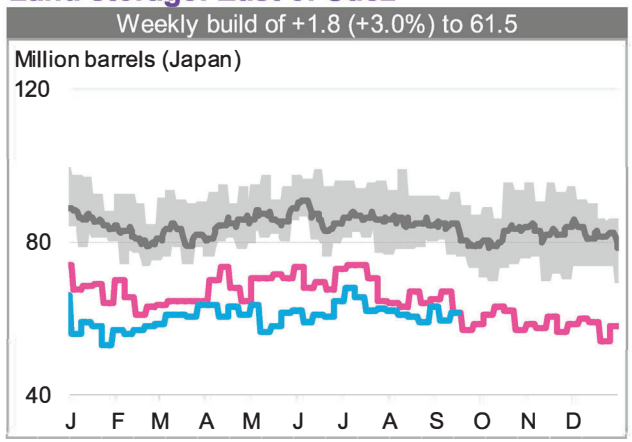
Land storage: Total



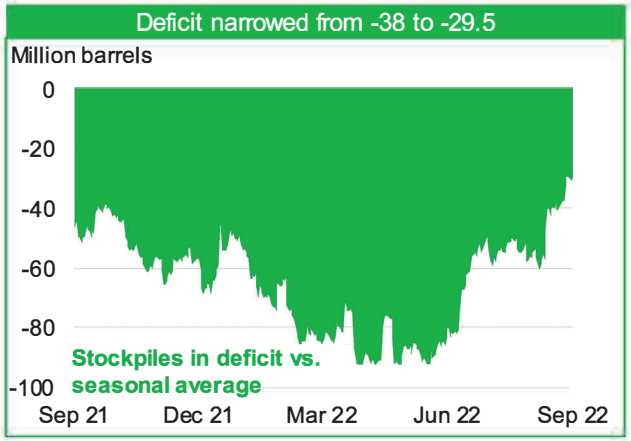
Land storage: West of Suez

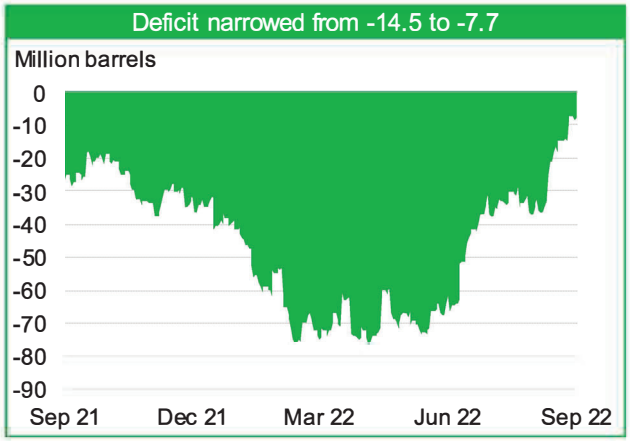


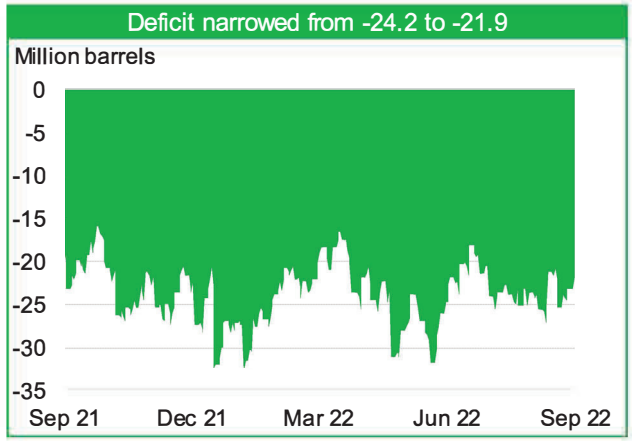
Land storage: East of Suez



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







*Source: BloombergNEF, US EIA, Genscape, PAJ. Note: As of the **week ending September 16, 2022.***

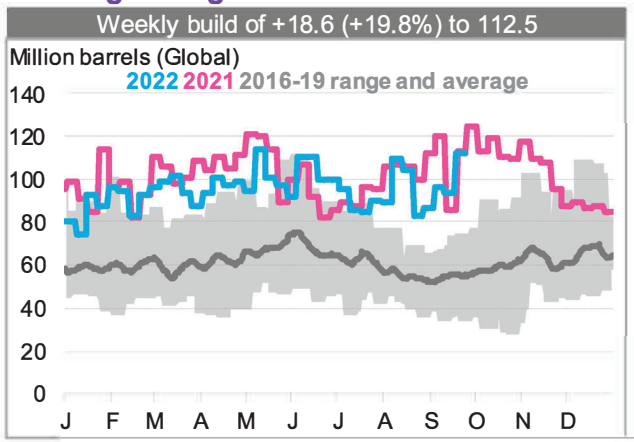
Crude stocks: Floating

Bearish: Surplus widened significantly over the past week

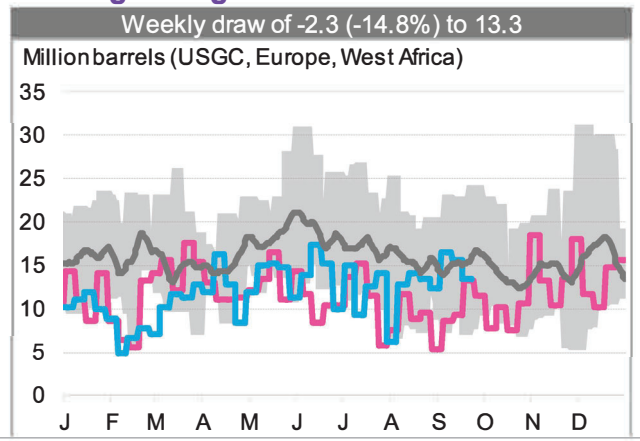
- Floating storage is only profitable if the strength of contango (future versus prompt price) is greater than the tanker costs. Therefore, tankers become floating storage when the profit from a storage play exceeds the cost of the forward freight agreement (FFA).
- The floating storage data used in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

*Note: *Figure used to aggregate total oil inventories on slide 8.*

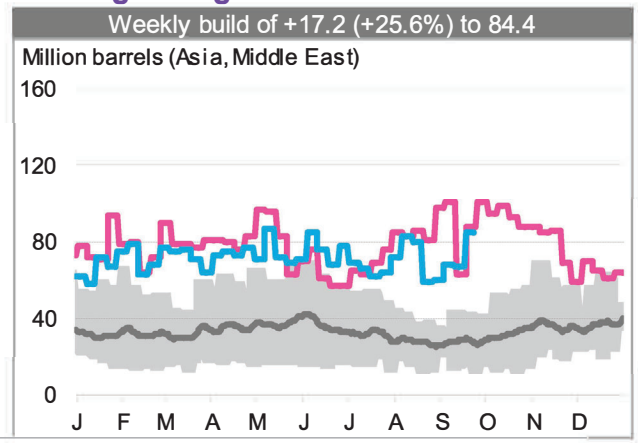
Floating storage: Total



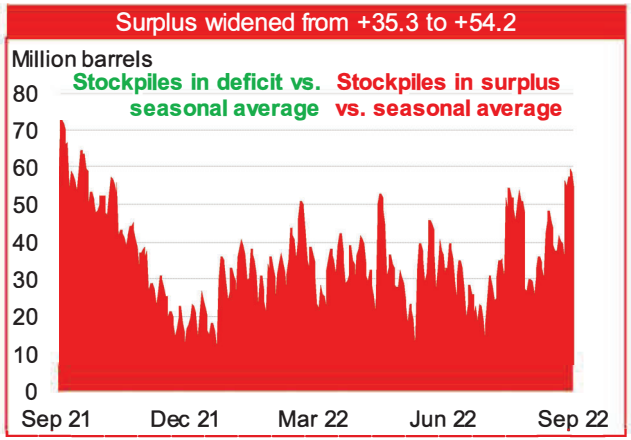
Floating storage: West of Suez

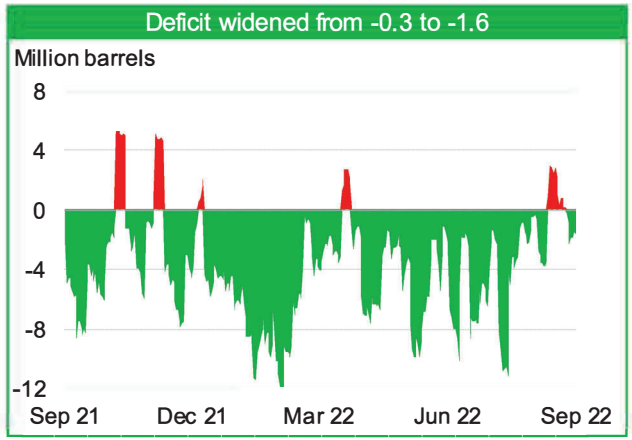


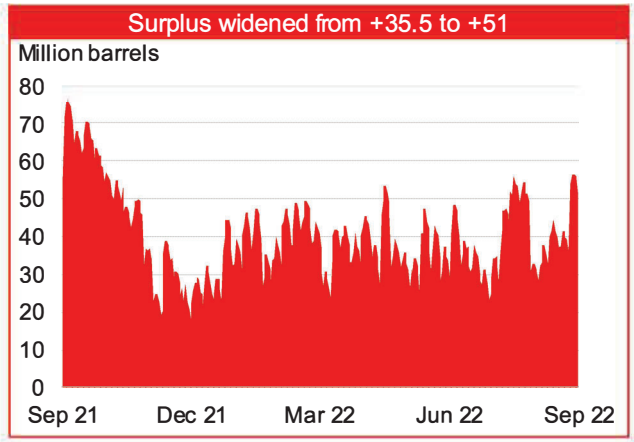
Floating storage: East of Suez



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







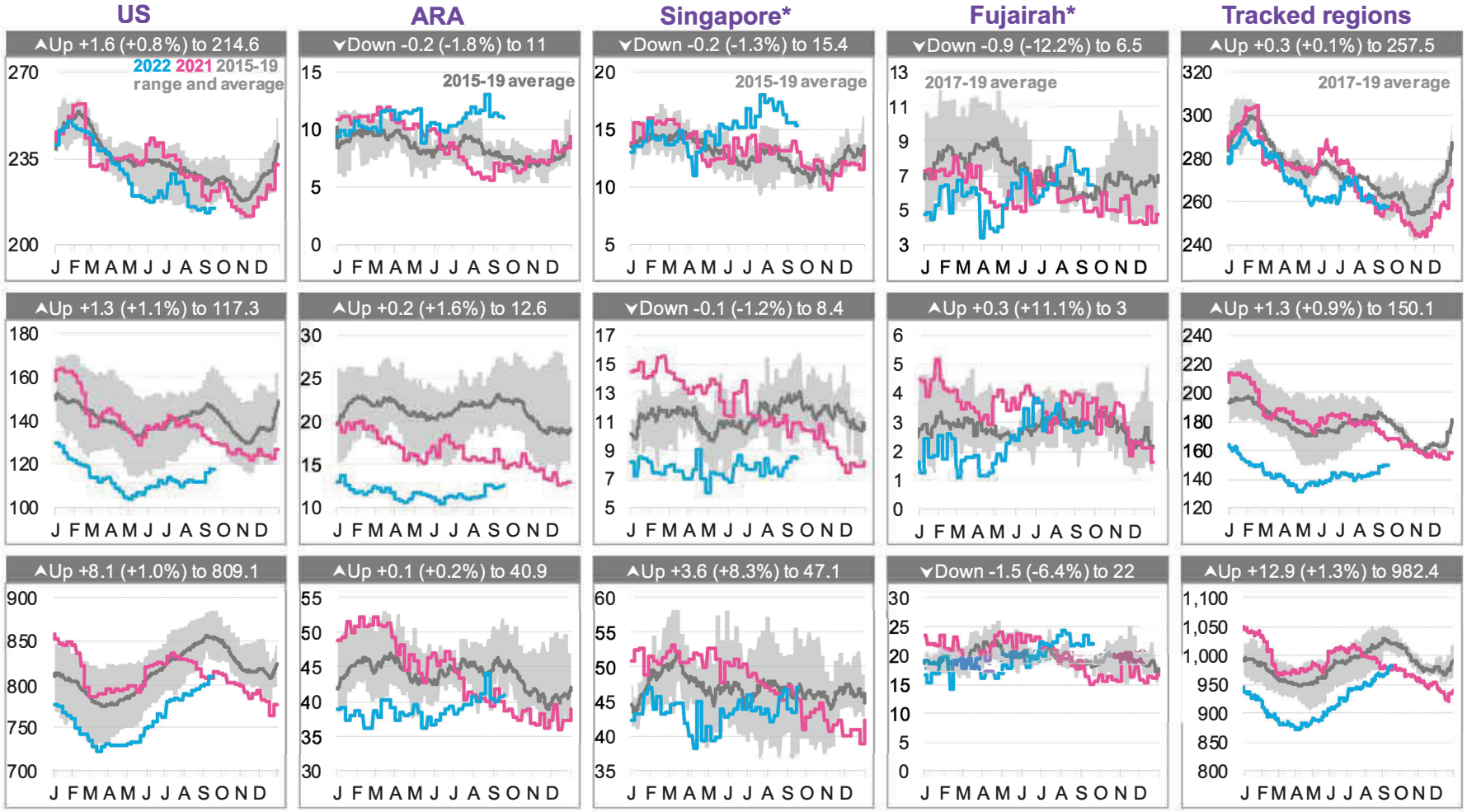
*Source: BloombergNEF, Vortexa. Note: As of the **week ending Sep. 23, 2022**. **Raw data from Vortexa are revised frequently, so the data in this report might change week-to-week.***

Product stocks: Current versus seasonal average

Bearish: 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 September 16, 2022.***

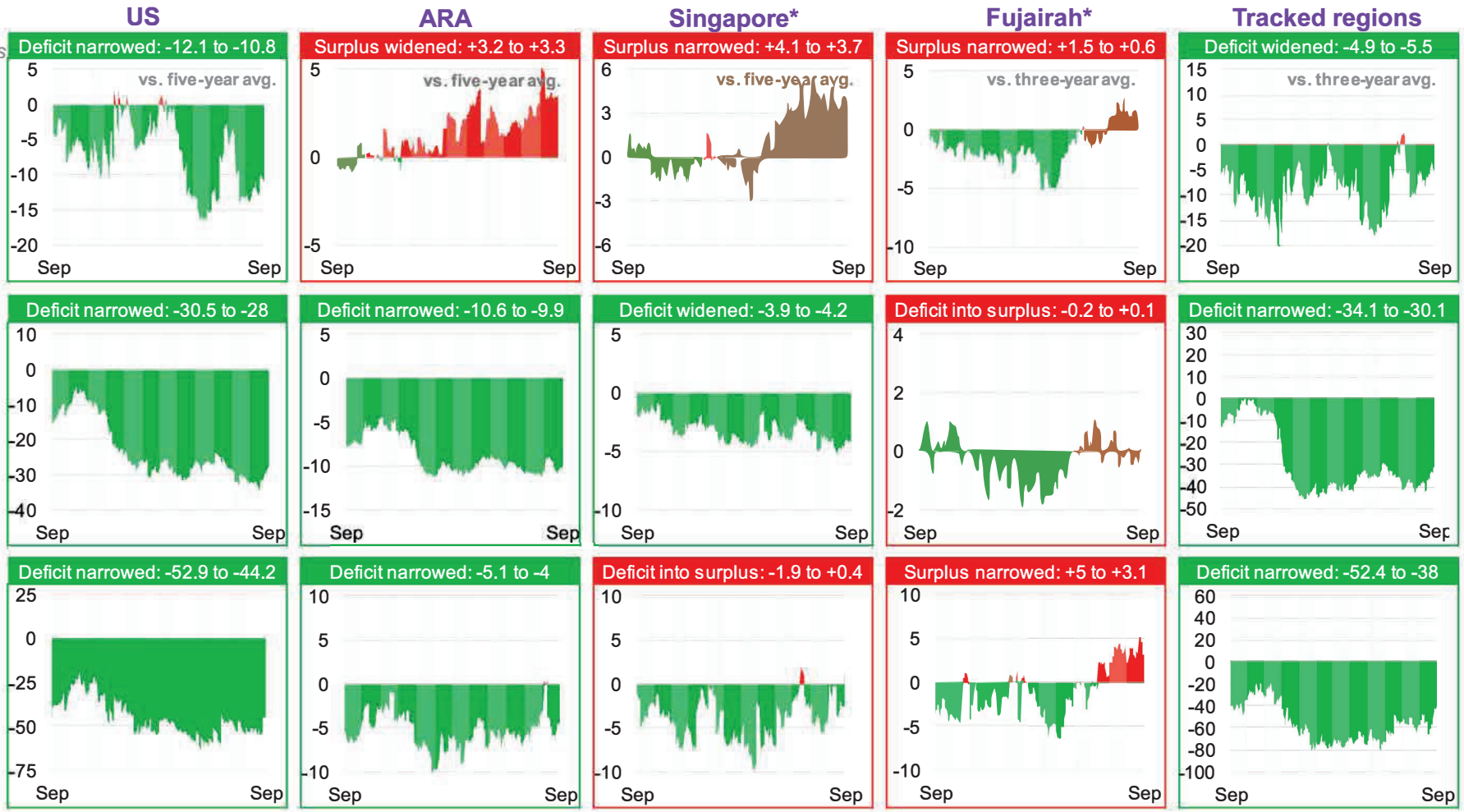
BloombergNEF

Product stocks: Current versus seasonal average

Bearish: Oil product stockpile deficit against the seasonal average narrowed from 52.4m bbl to 38.0m 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 September 16, 2022.***

BloombergNEF

OIL DEMAND MONITOR: China Lagging US Airline Passenger Count (1)

- Covid rules continue to stymie Chinese international travel
- Indian road fuel demand recovery complete; Europe is mixed

By Stephen Voss

(Bloomberg) --
China boasts fewer airline passengers than the US, with the outlook for aviation fuel demand -- and that of the broader oil market -- clouded by uncertainty over when the Asian nation's coronavirus policy will allow more normal economic activity.

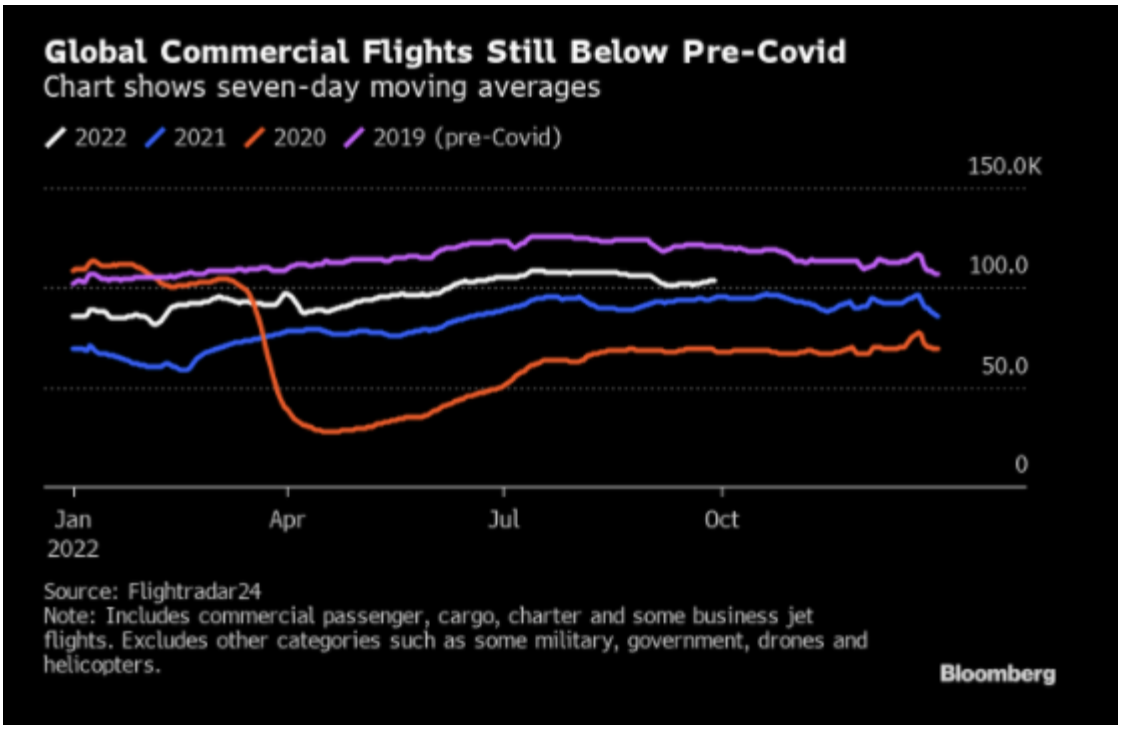
US jet fuel consumption recently jumped above 2019 levels, according to weekly estimates from the Energy Department. China's appetite remains way down with most international flights still canceled, and Hong Kong only recently unwinding some of its pandemic restrictions.

The world's two largest air travel markets have shown very different recovery paths from Covid-19. While China was initially quick to rally through the summer of 2020, it peaked at about 50 million passengers a month in October, then again in April-May 2021 before fading amid a series of coronavirus lockdowns in major cities that stifled travel. The US, meantime, endured a slower -- but steadier -- recovery.

European flight activity nudged down over the past month, according to daily tracking by Eurocontrol, an organization that assists governments with air traffic management.

The past week's average of about 30,000 flights a day in the total European network area was about 12% below the equivalent period of 2019. One of the strongest performers was Greece, measuring 7% higher than the 2019 period last week, notwithstanding an overall drop since the country's summertime peak in July-August.

With Europe limping along and China not fully participating in international travel, it's not surprising that the global number of commercial flights is currently closer to last year's level than the Covid-free numbers seen in 2019, according to tracking data from Flightradar24.



The global lag behind 2019 is 14%, according to both the Flightradar24 statistics and another analysis by OAG Aviation that measures the number of seats offered by airlines.

Road Fuel Trends

Separately, road fuel consumption trends are mixed around the world, and in most countries government statistics are released only on a monthly basis. UK data for late August shows gasoline and diesel sales both below a pre-Covid baseline, as they have been for months, while US gasoline demand last week was also down, by about 6%.

Elsewhere in Europe, Portugal used very similar amounts of gasoline, diesel and jet fuel in August as it did three years earlier, while French consumption of gasoline was up and diesel down.

Consumption was buoyant in India last month, though, with gasoline up 21% from 2019 and diesel 12% higher, according to a survey of refinery officials.

A snapshot of inner city traffic in 13 major world cities on the morning of Monday Sept. 26 showed three with higher levels of congestion than in 2019 -- London, Taipei and Tokyo -- while another, Paris, was unchanged. The data, from TomTom NV, showed lower levels of congestion in the other nine cities, including New York, which was down 50%.

The same analysis for the Monday two weeks prior, Sept. 12, had shown five out of 13 cities with higher congestion than the 2019 average, which was the most since November last year.

In an entirely separate analysis for China, an aggregate congestion index for 15 cities in the country rose to 116 on Sept. 26, gaining 12% over a four-week period, according to calculations by BloombergNEF, based on Baidu data. That’s a sign that commuting and general road activity is on the mend again with fewer major urban areas under lockdown.

Chengdu Roads Fill Up

For example, Chengdu, a city of 21 million that endured a strict lockdown in the first half of September, has staged a dramatic recovery as its streets fill up again. The congestion index in Chengdu was 100 in mid-August, before sinking to 73 and staying at that level during Sept. 10-16. It rose to 79 on Sept. 19 and has since jumped higher again to 121 as of Sept. 26.

Still, passenger road trips may dip again in early October during the Golden Week national holiday in China, according to a government briefing earlier Thursday.

The Bloomberg oil-demand monitor uses a range of high-frequency data to help identify emerging trends.

Following are the latest indicators. The first three tables shows fuel demand and road congestion, the next shows air travel globally and the fifth is refinery activity:

Demand Measure	Location	% y/y	% vs 2020	% vs 2019	% m/m	Freq	Latest Date	Latest Value	Source
Gasoline product supplied	US	-6.1	+3.5	-5.6	+2.7	w	Sept. 23	8.83m b/d	EIA
Distillates product supplied	US	+5.2	+14	+7.2	+17	w	Sept. 23	4.18m b/d	EIA
Jet fuel product supplied	US	+33	+122	+27	+4.3	w	Sept. 23	1.9m b/d	EIA
Total oil products supplied	US	+1.9	+19	-2	+3.5	w	Sept. 23	20.77m b/d	EIA
All motor vehicle use index	UK	-1.8	+5.7	+12	-0.9	w	Sept. 18	112	DfT
Car use	UK	-1.8	+4.9	+7	-0.9	w	Sept. 18	107	DfT
Light commercial vehicle (vans)	UK	unch	+12	+35	+3.1	w	Sept. 18	135	DfT
Heavy goods vehicle use	UK	-17	-10	+12	-8.2	w	Sept. 18	112	DfT
Gasoline (petrol) avg sales per filling station	UK	-6.5	+0.6	-9.5	+0.7	m	Aug. 22-28	6,483 liters/d	BEIS
Diesel avg sales per station	UK	-9.5	-8	-17	-1.1	m	Aug. 22-28	8,594 liters/d	BEIS
Total road fuels sales per station	UK	-8.2	-4.5	-14	-0.4	m	Aug. 22-28	15,077 liters/d	BEIS
China 15 cities congestion	China				+12	d	Sept. 26	116	Baidu / BNEF
Gasoline	India	+16		+21	+6	2/m	Aug. 1-31	2.82m tons	Bberg
Diesel	India	+24		+12	-5	2/m	Aug. 1-31	6.12m tons	Bberg
LPG	India	+5		+2.5	-1	2/m	Aug. 1-31	2.44m tons	Bberg
Jet fuel	India	+51		-14	+1.1	2/m	Aug. 1-31	541k tons	Bberg
Total Products	India	+16	+24	+4	+1.1	m	August	17.8m tons	PPAC

Toll roads volume	France	+3.5		+2.1		m	August	n/a	Atlantia
Toll roads volume	Italy	-1.7		unch		m	August	n/a	Atlantia
Toll roads volume	Spain	-4.1		-3		m	August	n/a	Atlantia
Toll roads volume	Brazil	+3.6		+5.8		m	August	n/a	Atlantia
Toll roads volume	Chile	-4.7		+4.9		m	August	n/a	Atlantia
Toll roads volume	Mexico	+11		+10		m	August	n/a	Atlantia
Gasoline	Spain	+6.5			+8.3	m	August	601 m3	Exolum
Diesel (and heating oil)	Spain	+2.7			+2.7	m	August	2266k m3	Exolum
Jet fuel	Spain	+38			-2.5	m	August	631 m3	Exolum
Total oil products	Spain	+8.4			+1.5	m	August	3459 m3	Exolum
Road fuel sales	France	-2.3			-3.6	m	August	4.114m m3	UFIP
Gasoline	France	+4.8		+17		m	August	n/a	UFIP
Road diesel	France	-5		-6.3		m	August	n/a	UFIP
Jet fuel	France	+38		-16	+3.8	m	August	714k m3	UFIP
All petroleum products	France	-0.6			+2.1	m	August	4.638m tons	UFIP
All vehicles traffic	Italy	-2			-0.5	m	August	n/a	Anas
Heavy vehicle traffic	Italy	-0.6			-14	m	August	n/a	Anas
Gasoline	Portugal	+9.3	+18	+1	+20	m	August	112k tons	ENSE
Diesel	Portugal	+7.3	+13	+0.4	+15	m	August	453k tons	ENSE
Jet fuel	Portugal	+59	+161	+1	+1	m	August	159k tons	ENSE
Total fuel sales	Italy	-2.4	+4.3	-8.7	+1.7	m	July	4.6m tons	Ministry
Gasoline	Italy	-2.1	+11	+4.3	+5.6	m	July	731k tons	Ministry
Diesel /gasoil	Italy	-2.7	+4.4	-4.2	+4.4	m	July	2.403m tons	Ministry
Jet fuel	Italy	+61	+169	-21	+6.3	m	July	403k tons	Ministry

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

In DfT UK daily data, which is updated once a week, the column showing versus 2019 is actually showing the change versus the first week of February 2020, to represent the pre-Covid era. Table uses data for Sept. 18 because Sept. 19 was a holiday.

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

Atlantia is publishing toll road data on a monthly basis, rather than the weekly format seen in 2021, and the US DoT also switched to monthly data after the week ended April 3.

City congestion:

Measure	Location	% chg vs avg 2019	% chg m/m	Sept 26	Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	Jul 25
		(for Sept. 26)		Congestion mins added to 1 hr trip at 8am* local time									
Congestion	Tokyo	+2	+17	38	7	34	31	32	35	8	32	31	32
Congestion	Taipei	+5	+29	37	34	45	37	29	29	26	27	26	26
Congestion	Jakarta	-12	-5	34	36	38	37	36	38	39	37	37	34
Congestion	Mumbai	-43	-4	28	38	30	22	29	32	3	26	25	26
Congestion	New York	-50	-7	16	33	38	zero	17	13	14	17	20	17
Congestion	Los Angeles	-24	-24	27	37	38	2	35	33	31	19	18	16
Congestion	London	+29	+2600	49	4	43	37	2	20	18	17	17	21
Congestion	Rome	-17	+235	40	54	42	41	12	5	zero	8	19	25
Congestion	Madrid	-19	+220	29	29	27	17	9	4	zero	3	5	zero
Congestion	Paris	unch	+80	44	46	47	45	25	14	1	10	13	25
Congestion	Berlin	-23	+5	26	28	30	28	25	25	19	16	13	15
Congestion	Mexico City	-18	-9	40	45	47	50	44	37	37	32	26	23
Congestion	Sao Paulo	-13	-3	38	31	32	32	39	31	33	40	26	20

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

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

NOTE: m/m comparisons are Sept. 26 vs Aug. 29. The large monthly changes shown for London, Rome, Madrid and Paris are the result of reduced traffic flows on Aug. 29, due to public and religious holidays. US cities had a holiday on Sept. 5. TomTom has been unable to provide Chinese data since April 2021. Taipei and Jakarta were added to the table in December 2021.

Chinese City Congestion:

Measure	Location	% chg vs Jan. 2021	% chg m/m	% chg w/w	Sept 26	Sept. 19	Sept. 12	Sept. 5	Aug. 29	Aug. 22	Aug. 15	Aug. 8	Aug. 1	Jul. 25
		(compare vs Sept. 19)												
Congestion	Beijing	+28	+7	+5.9	128	121	124	127	120	124	111	109	114	109
Congestion	Chengdu	+21	+30	+53	121	79	73	77	93	97	100	93	86	90
Congestion	Chongqing	+22	+67	+12	122	109	107	100	73	84	83	88	93	96
Congestion	Guangzhou	+18	-1.9	-1.7	118	120	118	118	121	114	111	112	109	105
Congestion	Shanghai	+31	+6.6	-7.6	131	142	128	140	123	120	112	113	108	105
Congestion	China-15	+16	+12	+4	116	111	107	107	103	105	102	103	101	101

Source: BNEF calculations based on Baidu congestion data, showing a seven-day moving average indexed against a January 2021 baseline of 100. China-15 is the weighted average of the 15 cities with the highest number of vehicle registrations. m/m comparisons are Sept. 26 vs Aug. 29.

Air Travel:

Measure	Location	y/y	vs 2 yrs ago	vs 2019	m/m	w/w	Freq.	Latest Date	Latest Value	Source
		changes shown as %								
Airline passenger throughput per day	US	+38	+223	-27	+4.6	-2.8	d	Sept. 27	1.84m	TSA
Airline passenger throughput (7d avg)	US	+25	+192	-6.9	+3.7	+0.1	d	Sept. 27	2.15m	TSA
All flights	Worldwide	+5	+43	+3.9	-3.8	-6.1	d	Sept. 28	206,930	Flightradar24
Commercial flights	Worldwide	+8.9	+50	-14	-2.4	-2	d	Sept. 28	103,302	Flightradar24
Air traffic (flights)	Europe			-12	-5.1	-0.5	d	Sept. 28	29,894	Eurocontrol
Air traffic (flights)	UK			-13	-4.8	-2.3	d	Sept. 28	5,496	Eurocontrol
Air traffic (flights)	Germany			-21	+3.1	-2.8	d	Sept. 28	5,143	Eurocontrol
Air passenger traffic per month	China	+44	-30	-47	-1.7		m	August 2022	32.3m	CACC
Seat capacity	Worldwide	+24	+68	-14	-2	+0.7	w	Sept. 26-Oct. 2	98.07m	OAG
Seat capacity	North America			-6.9		+0.8	w	Sept. 26-Oct. 2	n/a	OAG
Seat capacity	North East Asia			-22		+5.4	w	Sept. 26-Oct. 2	n/a	OAG
Seat capacity	South East Asia			-31		+0.3	w	Sept. 26-Oct. 2	n/a	OAG
Seat capacity	South Asia			-7.2		+0.7	w	Sept. 26-Oct. 2	n/a	OAG
Seat capacity	Western Europe			-9.9		-1.2	w	Sept. 26-Oct. 2	n/a	OAG
Seat capacity	Central America			+5.6		-1.4	w	Sept. 26-Oct. 2	n/a	OAG
Heathrow airport passengers	UK	+171	+326	-21	-4.3		m	August 2022	6.04m	Heathrow

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

Refineries:

Measure	Location	y/y	chg vs 2019	m/m chg	Latest as of Date	Latest Value	Source
		Changes are in ppt unless noted					
Crude intake	US	+2.2%	-4.6%	-3%	Sept. 23	15.8m b/d	EIA
Utilization	US	+2.5	+0.8	-2.1	Sept. 23	90.6 %	EIA
Utilization	US Gulf	+7.3	+1.2	-0.7	Sept. 23	93.7 %	EIA
Utilization	US East	-1.2	+21	-8.2	Sept. 23	89.4 %	EIA
Utilization	US Midwest	-3.9	-3.2	-3.4	Sept. 23	89.3 %	EIA
Apparent Oil Demand	China	-9.7%	+5.5%	-6.7%	July 2022	12.16m b/d	NBS
Utilization (indep. refs)	Shandong, China	-3.1	+0.2	+2.7	Sept. 23	64.0 %	Oilchem

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

PMI

Caixin China General Manufacturing PMI Press Release

2022.09

财新 Caixin

Embargoed until 0945 CST (0145 UTC) 30 September 2022

Caixin China General Manufacturing PMI™

Output and demand dampened by COVID-19 containment measures

Business conditions across China's manufacturing sector deteriorated modestly in September, as efforts to contain the COVID-19 virus weighed on performance. Total new business dropped for the second month in a row, which led to a renewed fall in output, while firms also trimmed their purchasing activity and inventories. Reduced demand for inputs placed further downward pressure on prices, with input costs falling at the quickest rate since the start of 2016. Companies often looked to pass on any cost savings to clients to help improve sales, which led to the quickest fall in selling prices since December 2015.

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 – declined from 49.5 in August to 48.1 in September, to signal a back-to-back deterioration in the overall health of the sector. The reading was consistent with only a mild rate of contraction, however.

A key factor driving the headline index lower was a faster fall in new orders during September. New business fell for the second month in a row, and at the quickest rate since April, with panel members often commenting that restrictions around travel and operations had dampened customer demand. Foreign sales also fell again, and at a solid rate that was the fastest for four months.

Disruptions to operations due to COVID-19 restrictions, including temporary closures, alongside softer customer demand led to the first fall in output for four months, albeit one that was only modest. There were also reports of difficulties sourcing inputs due to restrictions around logistics.

Subdued demand conditions and lower production requirements led firms to cut back on their purchasing activity in September, with the rate of decline the quickest in four months. Inventories of both purchased and finished goods also fell, though rates of depletion were only marginal.

The reduction in operational requirements also impacted employment across the sector, which fell for the sixth month running. Though modest, the rate of decline was the quickest seen since April 2020. There were also reports that some staff were unable to go to their workplace due to COVID-19 restrictions.

Although workforce numbers fell, firms reported little pressure on operating capacities, as backlogs of work fell slightly at the end of the third quarter. Panel members often mentioned that reduced intakes of new orders had enabled them to work through outstanding business.

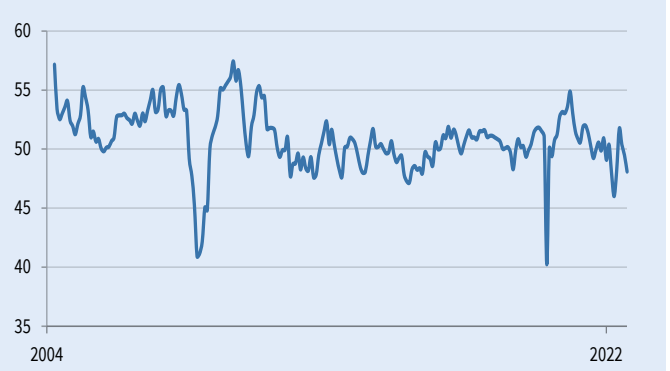
Measures to contain the COVID-19 virus also weighed on supplier performance in September. Though only modest, the rate at which lead times lengthened was the most pronounced for three months.

Cost pressures continued to ease in September, with a number of firms commenting that market prices for some materials had fallen due to weaker demand. The rate of decrease quickened slightly on the month, and was the fastest seen since January 2016. Companies often looked to pass on lower costs to clients to help stimulate sales, with the rate of discounting accelerating to a solid pace that was the steepest since the end of 2015.

Concerns over potential repeated outbreaks of COVID-19 and the prolonged use of containment measures weighed on optimism towards future output. Notably, the level of positive sentiment slipped to its lowest since November 2019.

China General Manufacturing PMI

sa, >50 = improvement since previous month



Sources: Caixin, S&P Global

Key findings:

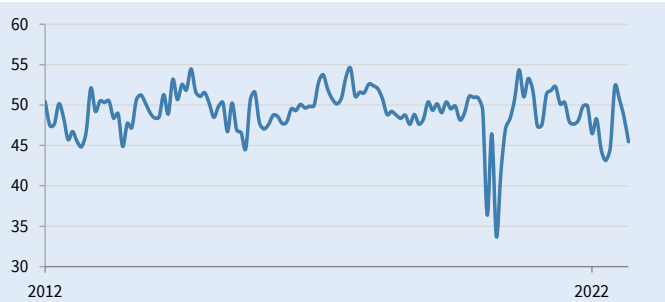
Production falls for first time in four months amid quicker drop in sales

Firms cut back on purchasing activity and inventories

Selling prices fall at quickest rate since December 2015

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 in September fell 1.4 points from the previous month to 48.1, marking the second consecutive month of contraction. Surveyed enterprises said the pandemic was still the greatest factor of impact.

"Manufacturing supply and demand contracted simultaneously. Although the Covid situation improved in Hainan province, the severity of outbreaks worsened in many other areas ¬and containment measures limited the supply and demand in manufacturing.

"The gauges for production and total new orders were both lower than 50, and recorded new lows in the past four and five months, respectively. External demand also contracted sharply, with the reading for new export orders the lowest since May.

"Employment continued to contract, as firms cut staff on weak demand, and some employees couldn't return to work on time due to Covid controls. In September, the reading for employment fell below 50 for the sixth consecutive month and for the 13th time in the past 14 months.

"Price indices continued to fall. With declines in the prices of bulk commodities, especially steel, input costs for producers of intermediate and investment goods fell sharply, and the gauge for input prices sank to the lowest reading since January 2016.

"Due to the impact of the market slump, firms, especially investment goods manufacturers, were eager to promote sales by cutting prices. In September, the gauge for output prices remained below 50 for the fifth consecutive month, and recorded the lowest reading since December 2015.

"Both purchases and inventories fell. Due to limited market demand, manufacturers reduced the volume of purchases and at the same time cut inventories. The readings for quantity of purchases, inventories of purchased items, and stocks of finished goods all remained below 50. Covid controls also affected logistics, and suppliers needed more time to deliver their goods than the previous month.

"Entrepreneurs were much less optimistic. The measure for future output expectations, although still in expansionary territory, declined more than 3 points and marked the lowest reading since November 2019. The concerns of surveyed entrepreneurs still stemmed from reoccurring Covid outbreaks and the impact of related controls on the market.

"In general, the pandemic situation is still severe and complex, and the negative impact of Covid controls on the economy is still pronounced. In September, supply and demand in the manufacturing industry both contracted, the job market was weak, logistics and transportation were slightly sluggish, cost of production and prices charged continued to decline, and purchases and inventories fell slightly. Market optimism also dwindled significantly due to concerns about the economic outlook.

"Recently, there have been more factors that negatively affect economic development and the downward pressure on the economy has increased. Since September, there have been Covid outbreaks in many regions, with the number of confirmed cases shooting up in some key areas compared with the previous month. Demand in the manufacturing industry has been under pressure, while economic recovery has stood on shaky ground.

"At present, major problems in the economy are insufficient employment, sluggish demand, and unstable expectations. In view of this, policy implementation should focus on promoting employment, granting subsidies, boosting demand, and fostering market confidence by sending policy signals."

Survey methodology

The Caixin China General Manufacturing PMI™ is compiled by S&P Global from responses to questionnaires sent to purchasing managers in a panel of around 650 private and state-owned manufacturers. The panel is stratified by detailed sector and company workforce size, based on contributions to GDP. For the purposes of this report, China is defined as mainland China, excluding Hong Kong SAR, Macao SAR and Taiwan.

Survey responses are collected in the second half of each month and indicate the direction of change compared to the previous month. A diffusion index is calculated for each survey variable. The index is the sum of the percentage of 'higher' responses and half the percentage of 'unchanged' responses. The indices vary between 0 and 100, with a reading above 50 indicating an overall increase compared to the previous month, and below 50 an overall decrease. The indices are then seasonally adjusted.

The headline figure is the Purchasing Managers' Index™ (PMI). The PMI is a weighted average of the following five indices: New Orders (30%), Output (25%), Employment (20%), Suppliers' Delivery Times (15%) and Stocks of Purchases (10%). For the PMI calculation the Suppliers' Delivery Times Index is inverted so that it moves in a comparable direction to the other indices.

Underlying survey data are not revised after publication, but seasonal adjustment factors may be revised from time to time as appropriate which will affect the seasonally adjusted data series.

For more information on the survey methodology, please contact: economics@ihsmarkit.com.

Survey dates and history

Data were collected 12-22 September 2022.

Data were first collected April 2004.

About PMI

Purchasing Managers' Index™ (PMI™) surveys are now available for over 40 countries and also for key regions including the eurozone. They are the most closely watched business surveys in the world, favoured by central banks, financial markets and business decision makers for their ability to provide up-to-date, accurate and often unique monthly indicators of economic trends.

https://ihsmarkit.com/products/pmi.html

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PMI™ by S&P Global

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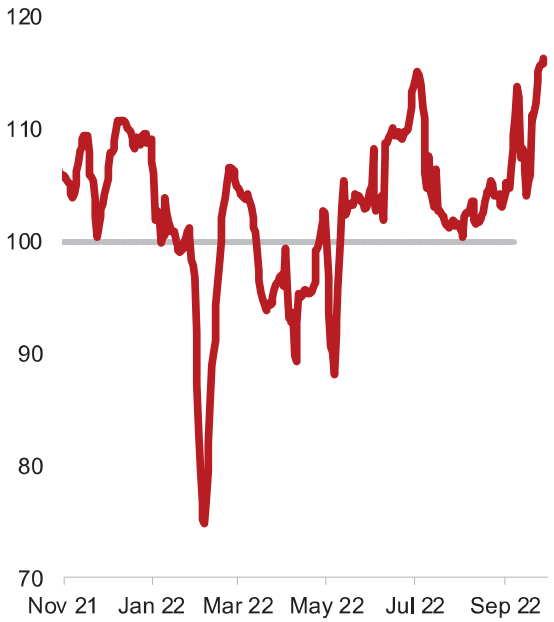
Comparing the three mobility indicators

Bullish week for China amid global retreat

China-15 (Baidu) congestion index

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

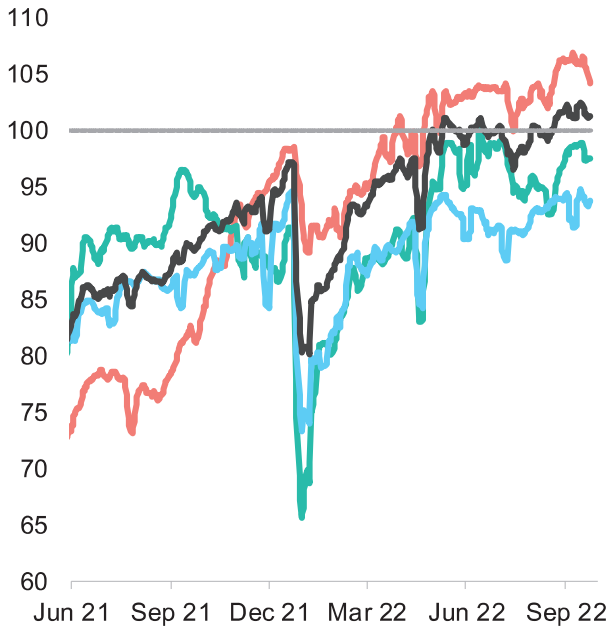


	Latest	Week Δ	Four-week Δ
China-15	**116.40**	4.9(+4.4%)	12.7(+12.3%)

Source: BloombergNEF, calculated from Baidu's data.
*Note: Data updated to **September 28, 2022**.*

Google mobility index

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

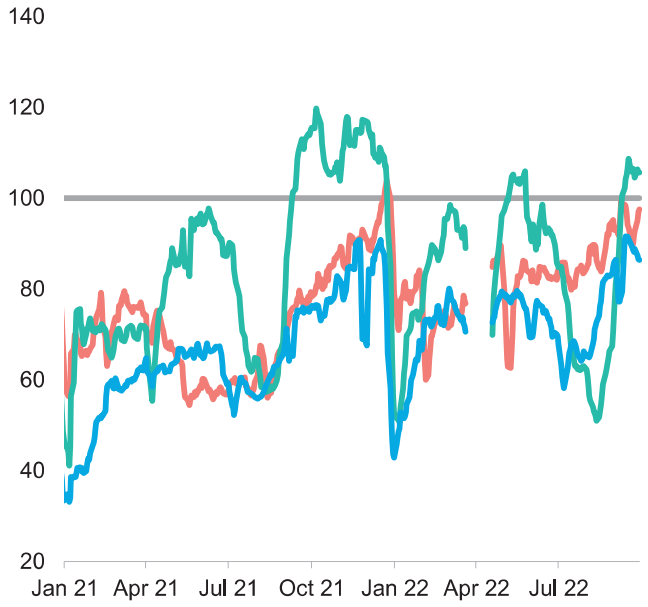


	Latest	Week Δ	Four-week Δ
Asia Pacific	**104.2**	-2.5 (-2.4%)	-2.1 (-1.9%)
World	**101.3**	-1.0 (-1.0%)	-0.4 (-0.4%)
Europe	**97.6**	-1.4 (-1.4%)	1.0 (+1.1%)
Americas	**93.9**	-0.23 (-0.2%)	-0.1 (-0.1%)

*Source: Google Community Mobility Report, BloombergNEF. Note: **Data exclude China and Russia.** Calculation includes retail and recreation, workplaces, transport hubs. **Data updated to September 24, 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
Europe	**105.7**	-0.8 (-0.8%)	30.7 (+40.9%)
Asia Pacific	**97.5**	7.6 (+8.5%)	4.5 (+4.8%)
North America	**86.4**	-2.3 (-2.6%)	0.5 (+0.6%)

*Source: TomTom road congestion data, BloombergNEF. Note: **Asia Pacific excludes China. Data updated to September 28, 2022.***

BloombergNEF

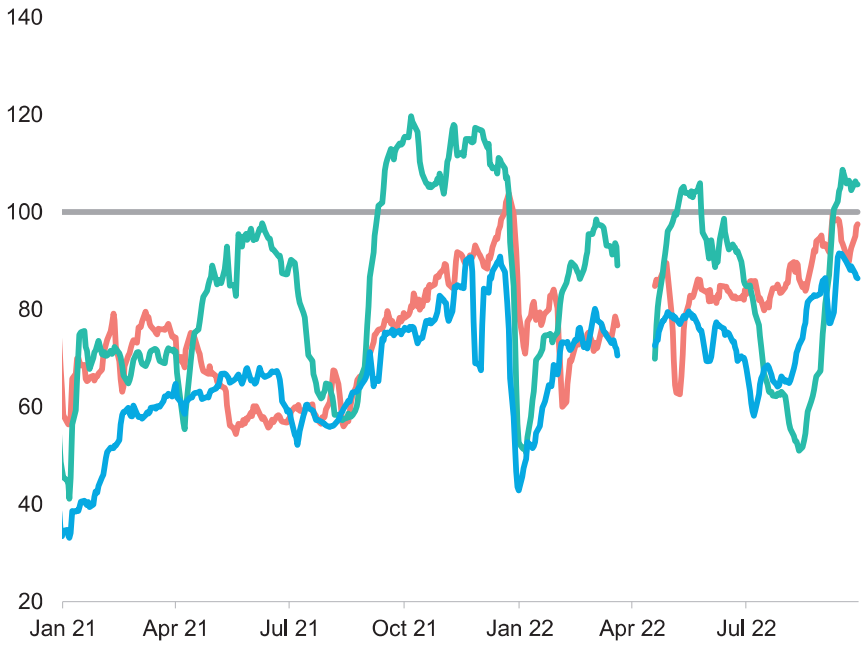
Apple Mobility reports were discontinued on April 14, 2022. We have resumed updating TomTom congestion data, which was previously updated to March 16.

TomTom congestion index

Europe's rally ends, while Asia Pacific ticks up

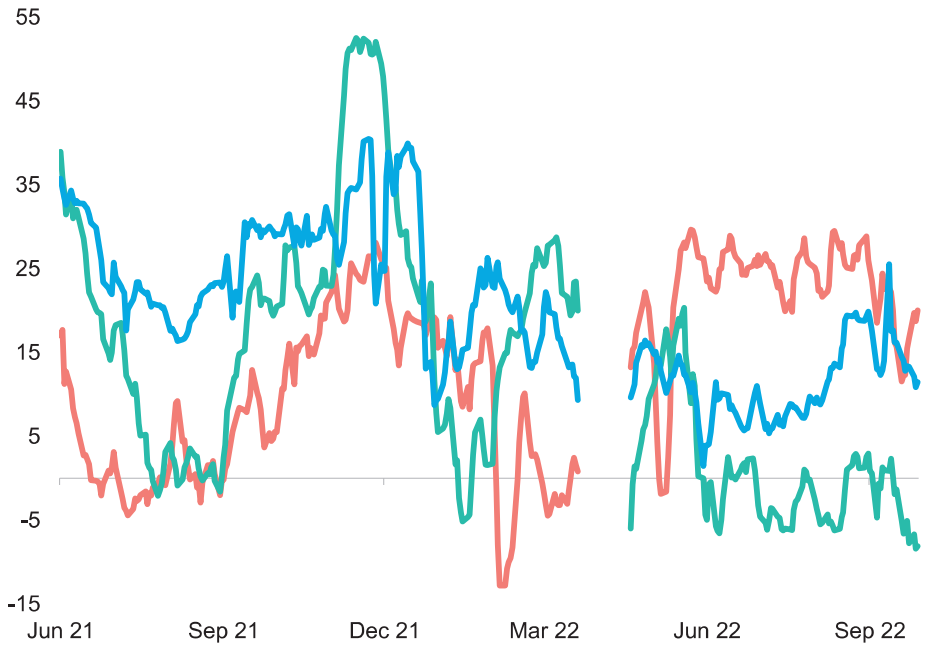
Regional road-congestion index

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	**105.7**	-0.8 (-0.8%)	30.7 (+40.9%)	-7.22	-4.20
Asia Pacific	**97.5**	7.6 (+8.5%)	4.5 (+4.8%)	18.13	13.61
North America	**86.4**	-2.3 (-2.6%)	0.5 (+0.6%)	12.23	14.73

Source: TomTom, BloombergNEF. Note: ***Asia Pacific excludes China. Data updated to September 28, 2022,*** *with weekly addition from September 21, 2022. Index point change versus the previous year is obtained by averaging the latest weekly values.*

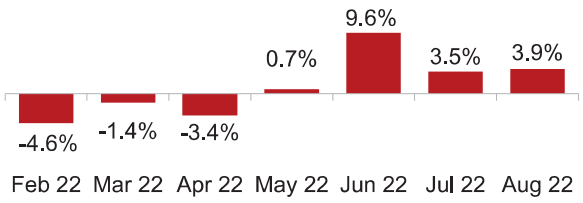
China (Baidu) congestion index

Upward momentum as major hubs are emerging from lockdown

China congestion index (calculated from Baidu data)

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

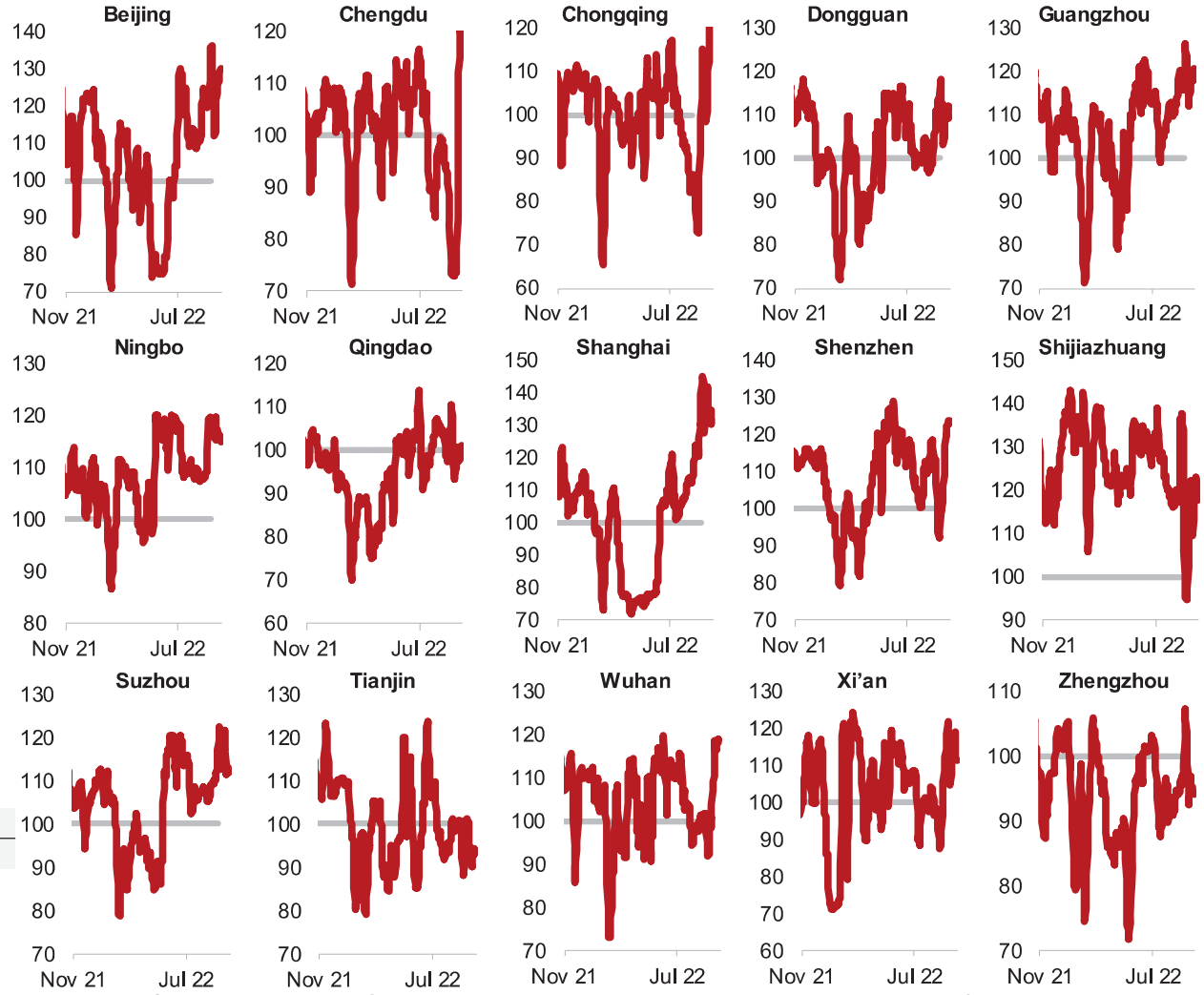
Monthly % change from January 2021 level



	Latest	Week Δ	Four-week Δ
China - 15	116.40	4.9 (+4.4%)	12.7 (+12.3%)

Road traffic in China in the week ending September 28 was up 4.93 percentage points to 116.40% of January 2021 levels.

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



Source: BloombergNEF, calculated from Baidu's data. Note: ***Data updated to September 28, 2022****. City-level charts display the 15 cities with the highest number of vehicle registrations (excluding two- and three-wheelers). The China-15 congestion level is calculated by taking the weighted average of the congestion levels in the 15 cities and their vehicle registration numbers.*

Third Quarter | September 28, 2022

Oil and Gas Expansion Continues; Cost Pressures, Supply-Chain Delays Persist

What's New This Quarter

Special questions this quarter focus on prospects for significant oil market tightening; whether the era of inexpensive U.S. natural gas will end; expectations for financial investors returning to the oil and gas sector; the impact of the increased 45Q tax credit on profitability of proposed carbon capture, utilization and storage projects; and the net firm-level impact of the methane tax in the 2022 Inflation Reduction Act.

Activity in the oil and gas sector expanded at a strong pace in the third quarter, according to oil and gas executives responding to the Dallas Fed Energy Survey. The business activity index—the survey's broadest measure of conditions facing Eleventh District energy firms—remained elevated at 46.0 but below the 57.7 record-breaking reading last quarter. This suggests the pace of the expansion decelerated slightly but remains solid.

Oil and natural gas production increased at a similar pace compared with the prior quarter, according to executives at exploration and production (E&P) firms. The oil production index held fairly steady at 31.7 in the third quarter. The natural gas production index was essentially unchanged at 35.6.

Costs increased for a seventh straight quarter, with the indexes near historical highs. Among oilfield services firms, the index for input costs remained elevated but slipped from its series high to 83.9. None of the 58 responding oilfield services firms reported lower input costs. Among E&P firms, the index for finding and development costs was 64.7, down slightly from its high last quarter of 70.6. Additionally, the index for lease operating expenses was 70.2, easing slightly from the high last quarter of 74.1.

It is taking longer for firms to receive materials and equipment. The supplier delivery time index remained elevated at 28.4 in the third quarter, down slightly from a series high of 31.9 in the second quarter. Among oilfield service firms, the measure of lag time in delivery of services declined from 36.0 to 21.1 but remained well above average.

Oilfield services firms reported broad-based improvement, with key indicators remaining in solidly positive territory. The equipment utilization index remained elevated but fell from 66.7 in the second quarter to 55.2 in the third. The operating margin index remained positive but declined from 32.7 to 25.4. The index of prices received for services inched higher, from 62.7 to 64.9—a record high.

All labor market indexes in the third quarter remained elevated, pointing to strong growth in employment, hours and wages. The aggregate employment index posted a seventh consecutive positive reading, increasing from 22.6 in the second quarter to a record 30.0. The aggregate employee hours index was 33.3, close to its historical high. The aggregate wages and benefits index remained elevated and was largely unchanged at 47.3.

Optimism waned somewhat this quarter as the company outlook index posted a ninth consecutive positive reading but fell 33 points to 33.1. The overall outlook uncertainty index jumped from 12.4 to 35.7, suggesting uncertainty became much more pronounced this quarter, especially among E&P firms. The uncertainty index was 17.8 for services firms versus 45.2 for E&P firms, with 53 percent of E&P firms reporting an increase in uncertainty.

On average, respondents expect a West Texas Intermediate (WTI) oil price of $89 per barrel by year-end 2022; responses ranged from $65 to $122 per barrel. Survey participants expect Henry Hub natural gas prices of $7.97 per million British thermal units (MMBtu) at year-end. For reference, WTI spot prices averaged $85.49 per barrel during the survey collection period, and Henry Hub spot prices averaged $8.16 per MMBtu.

Next release: December 29, 2022

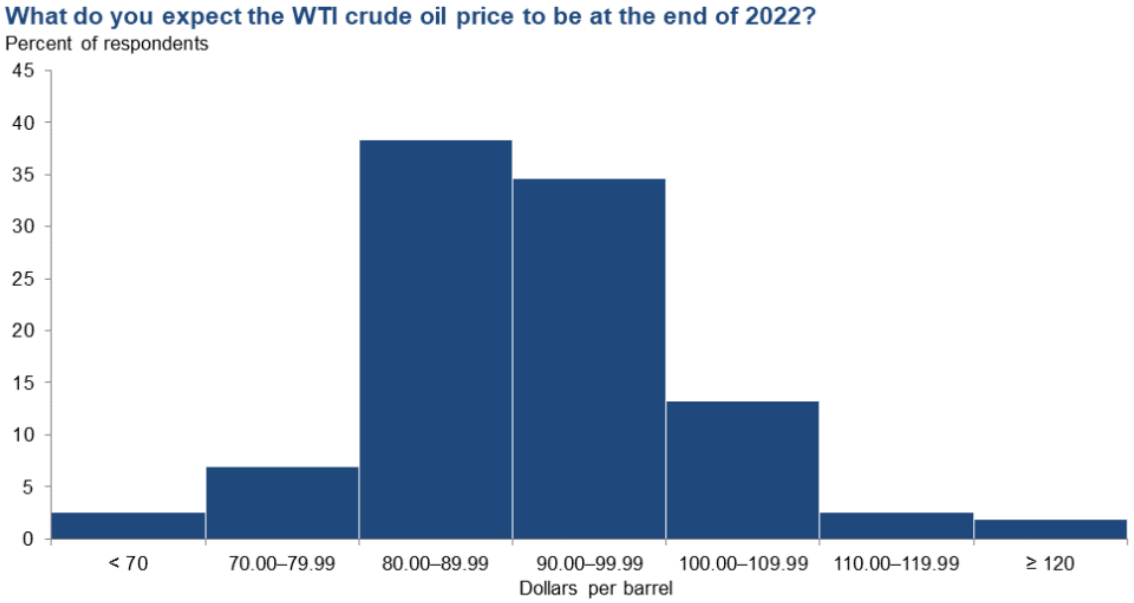
Data were collected Sept. 14–22, and 163 energy firms responded. Of the respondents, 105 were exploration and production firms and 58 were oilfield services firms.

The Dallas Fed conducts the Dallas Fed Energy Survey quarterly to obtain a timely assessment of energy activity among oil and gas firms located or headquartered in the Eleventh District. Firms are asked whether business activity, employment, capital expenditures and other indicators increased, decreased or remained unchanged compared with the prior quarter and with the same quarter a year ago. Survey responses are used to calculate an index for each indicator. Each index is calculated by subtracting the percentage of respondents reporting a decrease from the percentage reporting an increase. When the share of firms reporting an increase exceeds the share reporting a decrease, the index will be greater than zero, suggesting the indicator has increased over the previous quarter. If the share of firms reporting a decrease exceeds the share reporting an increase, the index will be below zero, suggesting the indicator has decreased over the previous quarter.

Third Quarter | September 28, 2022

Price Forecasts

West Texas Intermediate Crude



NOTES: Executives from 159 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022. For reference, WTI (West Texas Intermediate) spot prices averaged $85.49 per barrel during the period.
SOURCES: Federal Reserve Bank of Dallas; Energy Information Administration (reference price).

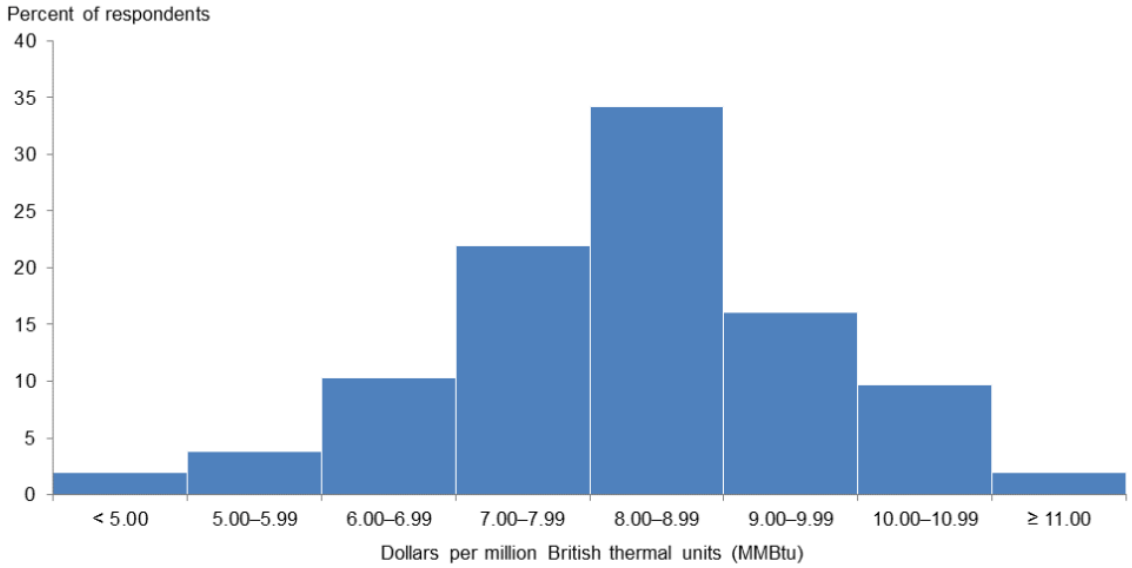
West Texas Intermediate crude oil price (dollars per barrel), year-end 2022

Indicator	Survey Average	Low Forecast	High Forecast	Price During Survey
Current quarter	$88.74	$65.00	$122.00	$85.49
Prior quarter	$107.93	$65.00	$160.00	$119.56

NOTE: Price during survey is an average of daily spot prices during the survey collection period.
SOURCES: Energy Information Administration; Federal Reserve Bank of Dallas.

Henry Hub Natural Gas

What do you expect the Henry Hub natural gas price to be at the end of 2022?



NOTES: Executives from 155 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022. For reference, Henry Hub spot prices averaged $8.16 per MMBtu during the period.
SOURCES: Federal Reserve Bank of Dallas; *Wall Street Journal* (reference price).

Henry Hub natural gas price (dollars per MMBtu), year-end 2022

Indicator	Survey Average	Low Forecast	High Forecast	Price During Survey
Current quarter	$7.97	$3.80	$12.50	$8.16
Prior quarter	$7.55	$2.90	$12.00	$8.38

NOTE: Price during survey is an average of daily spot prices during the survey collection period.
SOURCES: Federal Reserve Bank of Dallas; *Wall Street Journal*.

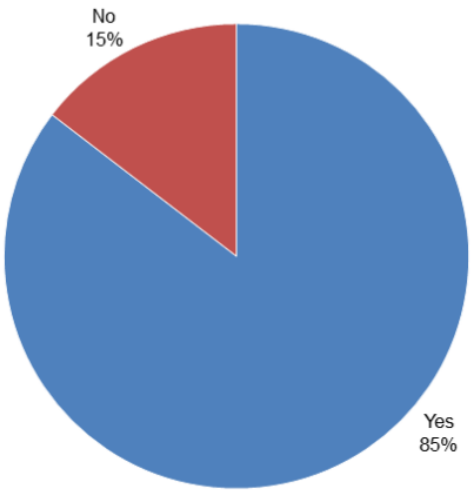
Special Questions

Data were collected Sept. 14–22; 153 oil and gas firms responded to the special questions survey.

All Firms

Do you expect a significant tightening of the oil market by the end of 2024, given the current underinvestment in exploration?

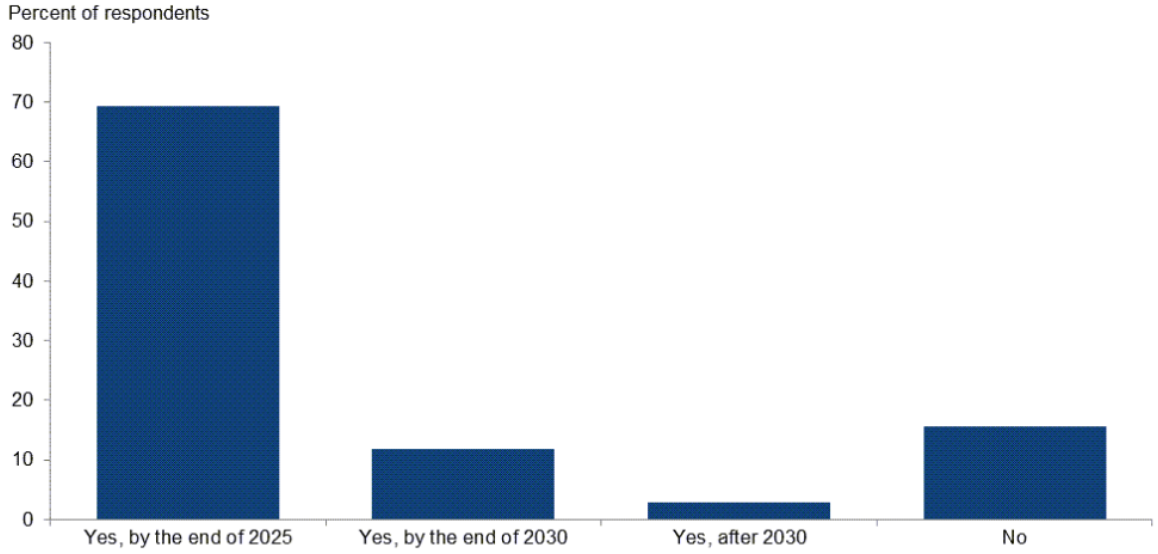
Eighty-five percent of executives said they expect a significant tightening of the oil market by the end of 2024.



NOTE: Executives from 144 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022.
SOURCE: Federal Reserve Bank of Dallas.

Do you expect the age of inexpensive U.S. natural gas to come to an end as liquefied natural gas exports to Europe expand?

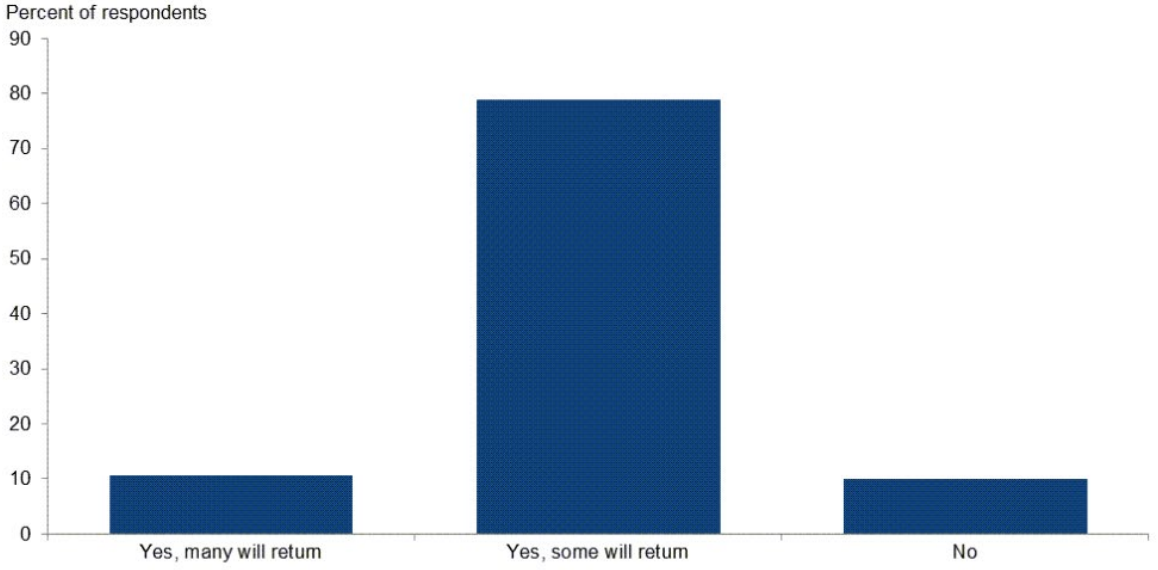
Most executives (69 percent) expect the age of inexpensive U.S. natural gas to end by year-end 2025. An additional 12 percent of executives think it will happen by year-end 2030 and 3 percent expect it to occur after 2030. The remaining 16 percent don't expect the age of inexpensive U.S. natural gas to end.



NOTE: Executives from 134 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022.
SOURCE: Federal Reserve Bank of Dallas.

Do you expect financial investors to return to the oil and gas sector?

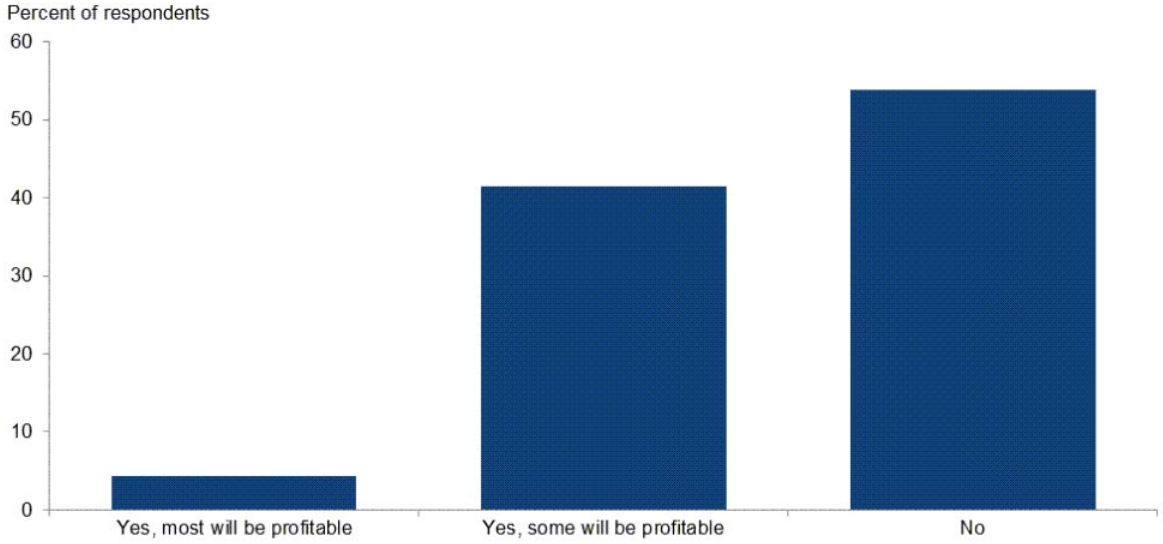
The majority of the executives—79 percent—said they expect some financial investors to return to the oil and gas sector. Eleven percent expect many will return, while 10 percent expect investors will not return.



NOTE: Executives from 148 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022.
SOURCE: Federal Reserve Bank of Dallas.

In your opinion, will proposed carbon capture, utilization and storage projects be profitable with the increase in the 45Q tax credit in the 2022 Inflation Reduction Act?

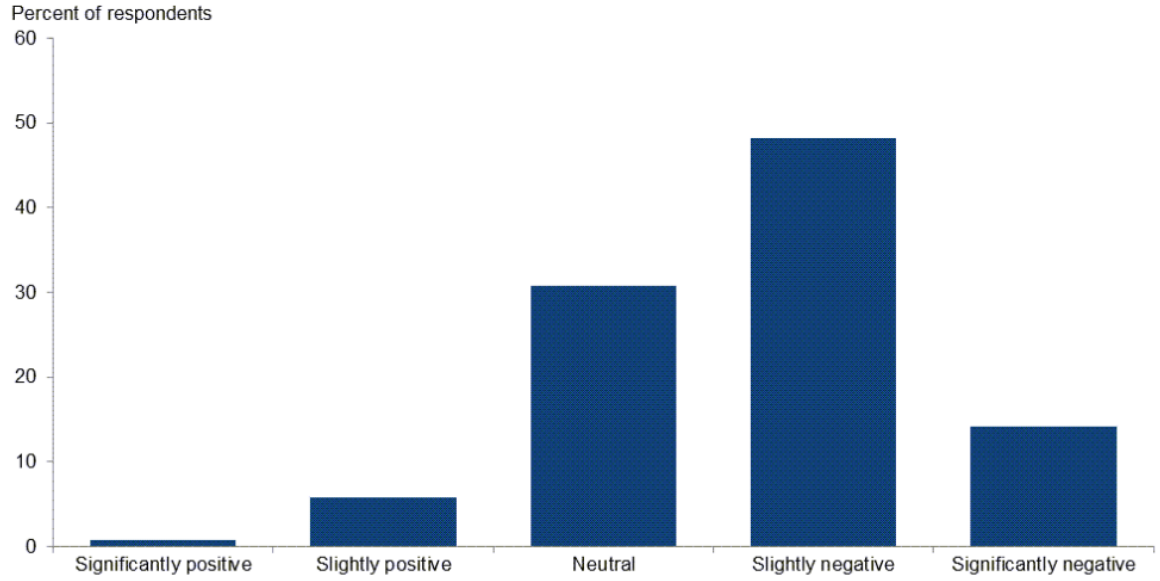
Slightly over half—54 percent—of executives expect most proposed carbon capture, utilization and storage projects won't be profitable despite the increase in the 45Q tax credit in the 2022 Inflation Reduction Act. Forty-two percent expect some proposed projects to be profitable and 4 percent expect most projects to be profitable.



NOTE: Executives from 113 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022.
SOURCE: Federal Reserve Bank of Dallas.

What net impact will the methane tax in the 2022 Inflation Reduction Act have on your firm?

Most executives expect a negative net impact on their firm from the methane tax in the 2022 Inflation Reduction Act. Forty-eight percent of executives said they think the net impact will be slightly negative, and an additional 14 percent anticipate it will be significantly negative. Thirty-one percent expect a neutral impact. Seven percent anticipate a positive impact. A breakdown of the data for exploration and production (E&P) versus oil and gas support services can be found in the table below.



NOTE: Executives from 120 oil and gas firms answered this question during the survey collection period, Sept. 14–22, 2022.
SOURCE: Federal Reserve Bank of Dallas.

Response	Percent of respondents (among each group)		
	All firms	E&P	Services
Significantly positive	1	1	0
Slightly positive	6	3	12
Neutral	31	28	37
Slightly negative	48	54	37
Significantly negative	14	14	15

NOTES: Executives from 79 exploration and production firms and 41 oil and gas support services firms answered this question during the survey collection period, Sept. 14–22, 2022. The "All firms" column reports the percentage out of the total 120 responses. Percentages may not sum to 100 due to rounding..
SOURCE: Federal Reserve Bank of Dallas.

Special Questions Comments

Exploration and Production (E&P) Firms

- Nothing good can come out of the 2022 "Inflation Reduction" Act. I expect the result of that legislation will be an expansion of inflation. Extra taxes on the industry will further dampen the amount of money available to spend on new projects. There is nothing happening in the current administration that would encourage anyone to be in the oil and gas business. And that is exactly what they want. I am seriously questioning whether or not to remain in the oil and gas business.
- Specific contradictory statements and positions by the White House and like-minded politicians following that political agenda are very harmful for our energy security and are undermining the country's ability to help with the needs of allies in Europe and around the world.
- It's tough to tell where these crosscurrents are headed. On one hand, we don't know if anyone has noticed, but the two-year to 10-year Treasury yield curve is inverted, implying recession, and China is on lockdown basically every other day, so that means lower prices in the near term (probably). But long-term demand is strong, OPEC is underperforming/cutting output, and substitutes like batteries are becoming more expensive daily (e.g., lithium prices). Shale core exhaustion and inventory concerns are mainstream and well-documented issues. Shale will likely tip over in five years, and U.S. production will be down 20 to 30 percent quickly. When it does—this feels like watching the steam roller scene in *Austin Powers*. Oil prices in the late 2020s will be something to behold.
- I'm still trying to find out more information on the methane tax in the 2022 Inflation Reduction Act and how it may impact my company. This administration is bent on adding taxes and fees and regulations at an incredible rate and is completely clueless about their impact on the oil and gas industry's ability to deliver the oil and gas that they pontificate that this nation needs.
- As long as the playing field is level, there should be little negative impact to oil and gas from the Inflation Reduction Act. Ideally, a carbon tax should be imposed at the wellhead, mine mouth or port of entry.
- The price of natural gas has increased solely due to the reduction of Russian supplies. The price we have received the past several years has been below replacement cost since the market was flooded with new supply from "growth" companies. I would assume the price will drop very quickly if the Russia–Ukraine situation is ever resolved. The methane tax is a bureaucratic nightmare to smaller oil and gas companies. The tax will not be as much of a burden as the compliance issues. More regulation results in less productivity. I think it was put in the bill as a retaliation for the high energy prices the world is experiencing. The truth is that oil and gas have brought the economies of the world to the level that we currently enjoy and neither is going to be supplanted anytime soon.

- "Inexpensive" is a subjective view relative to natural gas prices. Over the past five-plus years, natural gas commodity pricing has materially impacted supply much greater than demand in the U.S. This has resulted in abnormally low natural gas pricing over this period. As liquefied natural gas exports grow and natural gas volume growth in the U.S. moderates, natural gas pricing has increased and a new higher-floor pricing has emerged. While this pricing is higher in the U.S. relative to nearly all other areas around the world, U.S. gas consumers (individual and commercial) still enjoy the benefit of lower fuel cost inputs than others. Even at a hypothetical $7 per million British-thermal-units price, U.S. power generation still provides a material cost advantage to U.S. manufacturers. So, yes, it is more apparent that very low natural gas pricing is unlikely to return. However, the U.S. natural gas price for consumers is still highly competitive and in many ways advantageous relative to other western countries. Our supply assurance is materially higher at this still-competitive price.
- Oil and gas industry activity has flatlined. We should incentivize equipment and material manufacturers and suppliers to increase supplies. Sustained double-digit inflation is not the solution for a healthy industry, and projects are becoming uneconomical. A pragmatic energy and environmental solution is required; otherwise, the "first world" can become the "third world" with respect to energy. Nascent energy-transition technologies are too early to be of scale, and the world is starved of the necessary oil and gas expenditure needed for economic development.
- As to the question regarding natural gas, the age of inexpensive gas has already ended.
- In my opinion, our country is on the wrong track concerning carbon capture and climate change. As a trained soil scientist, [I think] there is twice as much carbon in the soil as in the atmosphere. The best method to store carbon is in the soil through plant capture of carbon dioxide. Enrichment of soil organic matter would greater benefit agricultural productivity.
- Just as the U.K. has allowed fracking to increase supply, natural gas production will be increased in the U.S. to meet demand. It may take a couple of years, but certainly [it should happen] by 2030.

Oil and Gas Support Services Firms

- August revenues were the best month for our company since before COVID-19. Hopefully, we will finish out super strong in the fourth quarter as well.
- Carbon capture, utilization and storage (CCUS) will cost more than $300 per metric ton. An $85-per-metric-ton tax credit will not come close to making these facilities profitable. A unified multinational carbon trading platform could help to stabilize the value of carbon captured, but this will require significant new definitions on how to measure and regulate the carbon sequestered. This might be more impactful, but still very difficult.
- The question regarding expectations of a significant tightening of the oil market by the end of 2024 is an interesting question, and I wonder why you've chosen 2024. I believe the market is already "tight," and I struggle to understand why spot oil prices are as low as they are today and why there is still backwardation in the forward curve. It appears to me that the world is very short on supply, with big draws in Organization for Economic Cooperation and Development inventories still taking place even after a significant increase (and now leveling off) in North American drilling and completion activity. Additional reasons include China still enforcing an unsustainable zero COVID-19 policy that will drive up demand once removed, more Russian barrels that will likely be coming off the market, and OPEC effectively acknowledging for the first time ever that there is no spare capacity.
- CCUS is driving our seismic licensing business at this time. We expect some improvement in the E&P business as investment in oil and gas exploration and drilling will need to improve in the near term and into the future.
- If market forces are allowed to work, U.S. natural gas supply will be able to supply Europe and the U.S. as we continue to expand the use of this natural resource as a viable transition fuel.
- On the question regarding natural gas, it depends on whether we can build more pipelines to move natural gas from the northeast to the Gulf Coast for exportation.

Third Quarter | September 28, 2022

Historical data are available from first quarter 2016 to the most current release quarter.

Business Indicators: Quarter/Quarter

Business Indicators: All Firms
Current Quarter (versus previous quarter)

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	46.0	57.7	50.9	44.2	4.9
Capital Expenditures	47.3	52.5	57.7	31.9	10.4
Supplier Delivery Time	28.4	31.9	42.6	43.2	14.2
Employment	30.0	22.6	33.7	62.6	3.7
Employee Hours	33.3	31.4	35.2	63.0	1.9
Wages and Benefits	47.3	48.6	48.5	50.3	1.2

Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	33.1	65.9	45.2	42.7	12.1

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Uncertainty	35.7	12.4	46.3	43.1	10.6

Business Indicators: E&P Firms
Current Quarter (versus previous quarter)

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	37.2	49.4	42.9	51.4	5.7
Oil Production	31.7	32.6	45.2	41.3	13.5
Natural Gas Wellhead Production	35.6	35.3	45.2	45.2	9.6
Capital Expenditures	47.6	48.2	58.1	31.4	10.5
Expected Level of Capital Expenditures Next Year	43.8	54.2	53.3	37.1	9.5
Supplier Delivery Time	27.9	26.2	45.2	37.5	17.3
Employment	17.2	13.0	21.0	75.2	3.8
Employee Hours	20.2	20.0	22.1	76.0	1.9
Wages and Benefits	38.0	36.9	39.0	60.0	1.0
Finding and Development Costs	64.7	70.6	65.7	33.3	1.0
Lease Operating Expenses	70.2	74.1	73.1	24.0	2.9

Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	25.0	63.3	39.0	47.0	14.0

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Uncertainty	45.2	21.2	52.9	39.4	7.7

Business Indicators: O&G Support Services Firms
Current Quarter (versus previous quarter)

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	62.1	71.2	65.5	31.0	3.4
Utilization of Equipment	55.2	66.7	58.6	37.9	3.4
Capital Expenditures	46.6	59.6	56.9	32.8	10.3
Supplier Delivery Time	29.3	41.1	37.9	53.4	8.6
Lag Time in Delivery of Firm's Services	21.1	36.0	24.6	71.9	3.5
Employment	53.5	38.5	56.9	39.7	3.4
Employment Hours	56.9	50.0	58.6	39.7	1.7
Wages and Benefits	63.8	67.3	65.5	32.8	1.7
Input Costs	83.9	88.0	83.9	16.1	0.0
Prices Received for Services	64.9	62.7	66.7	31.6	1.8
Operating Margin	25.4	32.7	43.6	38.2	18.2

Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	47.3	70.0	56.1	35.1	8.8

Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Uncertainty	17.8	–1.9	33.9	50.0	16.1

Business Indicators: Year/Year

Business Indicators: All Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	66.0	66.2	72.4	21.2	6.4
Capital Expenditures	69.6	64.3	76.1	17.4	6.5
Supplier Delivery Time	39.3	49.2	58.7	21.9	19.4
Employment	39.4	27.9	45.2	49.0	5.8
Employee Hours	42.5	38.2	46.4	49.7	3.9
Wages and Benefits	63.2	65.7	67.1	29.0	3.9

Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	66.6	80.9	74.1	18.4	7.5

Business Indicators: E&P Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	55.5	55.3	63.6	28.3	8.1
Oil Production	49.0	48.7	58.2	32.7	9.2
Natural Gas Wellhead Production	46.4	45.4	53.6	39.2	7.2
Capital Expenditures	69.4	62.3	76.5	16.3	7.1
Expected Level of Capital Expenditures Next Year	58.8	63.6	67.0	24.7	8.2
Supplier Delivery Time	41.8	50.0	61.2	19.4	19.4
Employment	27.6	16.7	32.7	62.2	5.1
Employee Hours	28.2	25.6	31.3	65.6	3.1
Wages and Benefits	58.6	58.4	61.6	35.4	3.0
Finding and Development Costs	78.8	79.5	79.8	19.2	1.0
Lease Operating Expenses	85.9	77.3	86.9	12.1	1.0

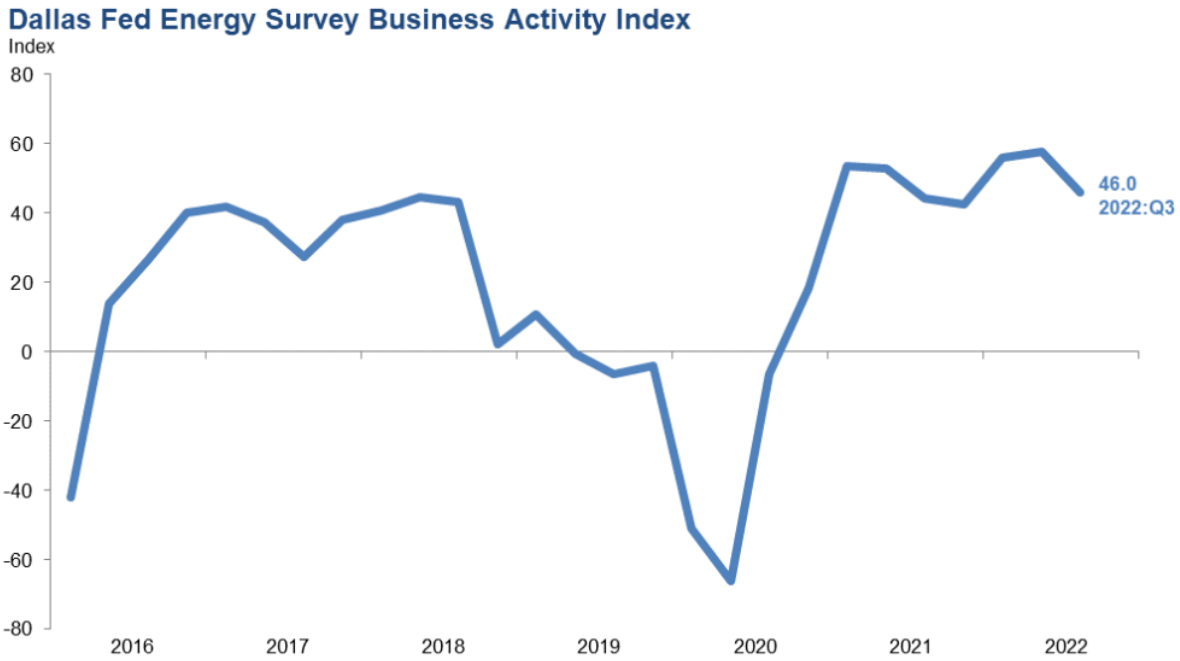
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	63.1	82.7	69.6	23.9	6.5

Business Indicators: O&G Support Services Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	84.2	82.3	87.7	8.8	3.5
Utilization of Equipment	82.5	73.5	86.0	10.5	3.5
Capital Expenditures	70.1	67.3	75.4	19.3	5.3
Supplier Delivery Time	35.1	48.0	54.4	26.3	19.3
Lag Time in Delivery of Firm's Services	33.9	40.8	39.3	55.4	5.4
Employment	59.7	45.1	66.7	26.3	7.0
Employment Hours	66.6	58.0	71.9	22.8	5.3
Wages and Benefits	71.4	76.4	76.8	17.9	5.4
Input Costs	92.6	89.8	92.6	7.4	0.0
Prices Received for Services	82.5	76.0	82.5	17.5	0.0
Operating Margin	52.8	50.0	67.9	17.0	15.1

Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	72.7	78.3	81.8	9.1	9.1

Third Quarter | September 28, 2022

Activity Chart



SOURCE: Federal Reserve Bank of Dallas.

Comments from Survey Respondents

These comments are from respondents' completed surveys and have been edited for publication. Comments from the Special Questions survey can be found below the special questions.

Exploration and Production (E&P) Firms

- The cost of supplies and wait times for delivery have increased substantially.
- The availability of services and supplies is the chief constraint on expanding my business.
- The labor issue will provide a restraint on any major increase in oil and gas production for the domestic market—this, as well as the regulations from the present administration as they chase green energy policy. Permitting, soaring materials costs and the negative propaganda from the federal government will suppress most sources of outside capital to increase production. Now, with our oil storage depleted for political gain, oil replacement will further stress supply.
- The uncertainty over future inflation and/or a recession weighs heavily upon us. The executive branch's policy toward the E&P industry is also a serious overhang. Poor energy policy from the executive branch may, in the short run, be good for our business but bad for our country.
- No one is interested in giving capital to E&P firms. It's wonderful news for long-term prices.
- Uncertainty on the political front continues to be a major concern. The withdrawal of leases that have already been issued is an example. Inflationary pressure is eating significantly into discretionary cash flow, limiting the amount of money allocated to new projects.
- The biggest challenge for us is adding employees. We are trying to add qualified staff, with little success, and that will negatively impact growth. Second is the rising cost of services.
- The biggest issue we have in our industry is the federal government, which advocates for our extinction. This has affected our ability to hire new, young talent from colleges because they've been brainwashed into believing that our industry is bad and that our industry is disappearing, with no future for them. This will be an issue in our industry and the public will pay with higher commodity costs. The capital being chased out of our industry is leading to less supply, and that always leads to higher prices.
- We are having a hard time with rig availability and supplies.
- Oilfield service inflation has increased, uncertainty has increased and oil prices have decreased. This is a recipe for lower to flat industry spending in 2023.
- The biggest issue that our company is facing is a shortage of personnel and equipment from our oilfield service vendors. Another impediment is a shortage of steel tubulars and a corresponding increase in their price. Most tubular prices have increased 500–600 percent from two to three years ago, and that is if you can find them. This will definitely affect smaller producers and will ultimately cause many stripper wells to be shut-in and delay the drilling of many new wells unless it is resolved soon.

- Power providers continue to be a material source of potential project delay. The overall supply-chain pressures are more stable today than in the second quarter but remain at a challenging level overall. Steel tubular products are at or above all-time highs in terms of cost due to lack of manufacturing capacity in the market. As goods and services cost pressures continue to move upward and commodity prices moderate, the outlook for moderated (lower) development activity in 2023 grows. Until the labor market improves and pricing pressures moderate, lower capital investment in new wells becomes a more attractive option.
- I steered my company back into some Permian Basin projects in West Texas, and now the U.S. Environmental Protection Agenda (EPA) is wanting to label the Permian Basin as a "non-compliance" area based upon one air sampling station outside of Carlsbad, New Mexico. The overreach of the federal government never ceases to amaze me. Delays in delivery of contracted frac [hydraulic fracturing] sand, pumps, oil country tubular goods and even drilling rigs are impairing project timing. Worker availability is hampering project timing also, along with a dearth of truckers.
- Extreme volatility in commodity prices causes long-term planning challenges and increases the cost of financial hedging.
- Oilfield service firms' investment has lagged E&P firms' investment. It is really tough for smaller operators to fit and squeeze into the oilfield service firms' schedules, which are dominated by larger companies.
- The government needs to significantly improve permitting and infrastructure.
- Our outlook remains positive but is becoming more uncertain given continued monetary and fiscal tightening coupled with persistent inflationary pressure. If the Federal Reserve overtightens and creates a deep recession, then demand will suffer and, as a result, prices. If, at the same time, inflation is persistent, then drilling economics will suffer as well, setting up a cycle of extreme volatility. We are counting on OPEC+ to put a floor on oil prices in order to maintain stability in the global oil markets.
- Senseless political stances such as the administration's weaponizing and undermining of the U.S. Bureau of Land Management leasing and Gulf Coast licensing rounds, as well as one governor's arbitrary dictations, represent a terrible step forward. The policies are not helpful in achieving any positive effect for their agendas in the short or long term but are proffered simply for votes. The current political pandering for votes sets dangerous precedents for our ongoing operations and the success of the entire industry.
- The administration is trying their best to destroy our energy economy.
- Increased capital expenditures are due more to higher costs than to more activity.
- It is safe to assume that there will be volatility in all energy markets. The variables are almost uniformly political, supply, military and lack of available capital for development from traditional sources.
- Cost inflation and increased delivery/contractor arrival times to complete wells are affecting our business. Oil and gas price volatility, regulatory uncertainty and higher costs of compliance are negatively impacting our planning and execution.
- The probability of a worldwide economic recession is casting a long shadow on the demand for oil that is offset by the Russia–Ukraine conflict. Europe will most likely be forced to dramatically increase coal consumption to alleviate natural gas curtailments from Russia. High global interest rates will dampen investor appetite for risk. The unknown outcome of the upcoming midterm elections in the U.S. creates a lot of anxiety in the oil community. Our investment in new projects will await greater clarity of the road ahead.

Oil and Gas Support Services Firms

- The administration's lack of understanding of the oil and gas investment cycle continues to result in inconsistent energy policies that contribute to rising energy costs. This continued inconsistency increases uncertainty and decreases investments in energy infrastructure. We are in an energy death spiral that will lead to higher highs and lower lows. Volatility will increase, and the public is in for a very difficult ride.
- Steel tariffs and import quotas are adversely affecting our business. We desperately need additional tubulars (casing) to be made available to the market. Numerous customers have delayed drilling due to the price of oil country tubular goods.
- The administration is holding us back, with no love of oil.
- With activity increasing, it is a battle to cover input cost inflation with price increases. We are experiencing two steps forward, one step back, on product pricing to our clients, and that is affecting our margins.
- The U.S. EPA and other regulatory agencies are being used as a tool to constrain the domestic supply of critical hydrocarbon production as we are promising politically to stand by our allies' quest to choke off the supply of Russian hydrocarbon imports. It is very difficult to square up.
- Cement supply issues finally seem to be getting a little better. Large cement plants (owned by others) have been getting cut off due to instability of the electric grid, which doesn't help.
- I think it's really a waiting game on how businesses and the market react to the Federal Reserve interest rate hikes. We all know that interest rates are going up more. So, I'm not sure why it seems to surprise people. This should be baked into our models by now. The biggest thing for our business is whether we can have a soft landing recession-wise. That's the only thing that could really adversely impact our growth, absent something more catastrophic (of course).
- Issues with specialty components continue to cause difficulty. Emissions components will fail and have eight- to 12-week backorder delays. Without these components, equipment is idle. The purchase of high-horsepower diesel engines (800–1200 horsepower) is very difficult, if not impossible, to source. Lead times for large construction equipment remain very delayed, for four to 10 months. Bank financing has not been an issue for operational lines or for purchases. Labor for trucking and skilled construction positions is difficult to source.
- Meeting demand has been hampered by the availability of qualified people to work and, more importantly, whether they stay working in the oilfield. We are seeing a greater percentage of hires, who are new to the industry as of last quarter, with many wanting regular hours and a work/life balance not typical of hourly employees in oilfield services.
- Uncertainty is rampant because of the capital necessary to redeploy and upgrade equipment, with no long-term contracts to support the expenditures. Wages are at all-time highs with continual upward pressure. Technical services and support are strained and delayed. Spare parts are becoming very scarce.
- We continue to struggle to hire drivers with a commercial driver's license that have oilfield experience, as well as skilled crew labor for construction and maintenance.
- As always, the prices of oil and natural gas are all over the roulette wheel. There are so many factors in play that petroleum product prices are nothing more than a guess.

- The supply chain is slowly improving, but it's still far from prepandemic levels. We still see significant lead times for electrical equipment, heavy industrial items and refined petroleum products. Labor shortages will continue to drive up wages as competition for skilled workers continues to increase. There simply are not enough skilled workers for the positions available.
- Once the midterm elections are over, we expect the energy market to return to fundamentals rather than being manipulated by the current administration in an effort to gain votes.

Independent Statistics & Analysis
U.S. Energy Information Administration

Country Analysis Executive Summary: Iraq

Last Updated: September 28, 2022

Overview

- Iraq (Federal Iraq and Kurdistan Regional Government) is the second-largest crude oil producer in OPEC after Saudi Arabia. It holds the world's fifth-largest proved crude oil reserves, at 145 billion barrels, representing 17% of proved reserves in the Middle East and 8% of global reserves.[1] Most of Iraq's major known fields—all of which are located onshore—are producing or are in development.[2]

- Iraq's crude oil production grew by 1.7 million barrels per day (b/d) from 2013 through 2019, and it averaged 4.7 million b/d in 2019, an all-time high over a year. In 2020, Iraq's crude oil output fell to less than 4.1 million b/d.[3] Iraq voluntarily reduced crude oil output in the second quarter of 2020 to comply with the OPEC+ agreement. Because the OPEC+ members are reversing the significant production cuts made in 2020, Iraq's crude oil production rose to an average of nearly 4.4 million b/d in the first half of 2022. These production estimates include crude oil produced in the semi-autonomous northeast region in Iraq governed by the Kurdistan Regional Government (KRG).

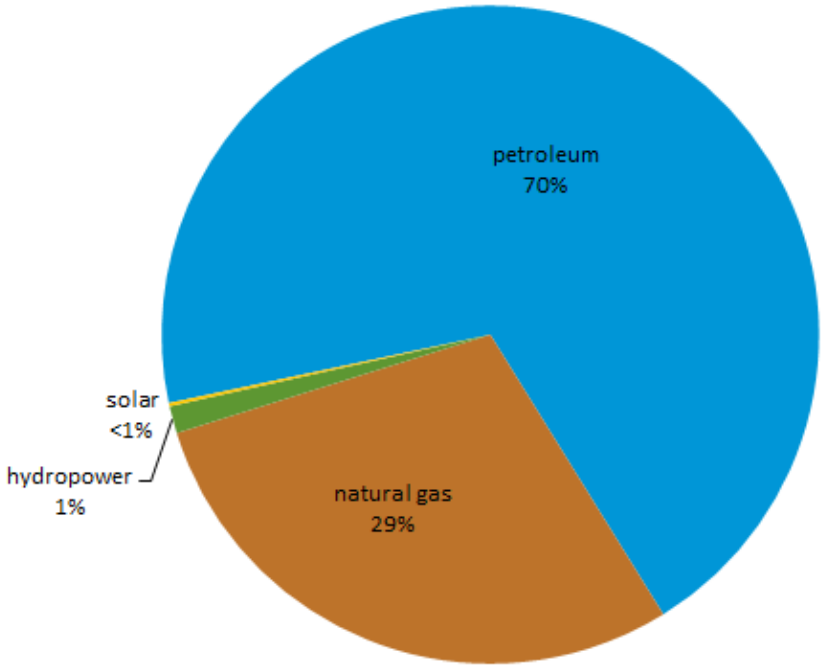
- We estimate that Iraq's crude oil production capacity was 4.6 million b/d as of mid-2022, down from 4.8 million b/d in 2020. Export infrastructure at the southern oil terminals is constrained, and midstream projects are often delayed because of insufficient investment and bureaucratic hurdles. Iraq's rising oil production since the second half of 2020 depleted its spare capacity to less than 200,000 b/d by mid-2022.[4]

- Crude oil export revenues account for a large part of Iraq's economy. In 2019, crude oil export revenue accounted for an estimated 92% of Iraq's total government revenues, according to the International Monetary Fund (IMF).[5] After falling to $42 billion in 2020, Iraq's oil revenues rose to more than $75 billion in 2021, driven by higher oil prices.[6] We expect that the further increases in oil prices in 2022 and higher crude oil production in Iraq, following the reversal of the OPEC+ agreement cuts, will significantly increase Iraq's oil export revenues and offset some of the cost inflation of petroleum products and other goods and services.[7]

- Federal Iraq held parliamentary elections in October 2021. Although the party of Moqtada al-Sadr won the general election, the party could not form a consensus government nor elect a president. As of August 2022, Federal Iraq still has no government in place, which it needs to pass the annual budget. Because it does not have a ratified federal budget, Iraq runs the risk that project financing and investment decisions it made with companies under the interim government could be delayed or overturned once a new government forms.[8]

- Iraq consumed an estimated 2 quadrillion British thermal units of total primary energy in 2021, making it the fourth-largest energy consumer in the Middle East behind Iran, Saudi Arabia, and the United Arab Emirates.[9] Natural gas and oil accounted for almost all of Iraq's total primary energy consumption; hydropower and solar energy contributed marginally (Figure 1). Iraq will continue to mostly use oil to meet demand until it develops more natural gas processing capacity and pipeline infrastructure.

Figure 1. Iraq's total primary energy consumption, share by fuel, 2021



Data source: *BP Statistical Review of World Energy 2022*
Note: Chart does not include traditional biomass and waste, such as burning firewood and waste.

Kurdistan Regional Government and Federal Iraq

- Federal Iraq refers to the political entity that is governed by the central government of Iraq in Baghdad. KRG, the official ruling body of the semi-autonomous region in northern Iraq that is predominantly Kurdish, has been involved in disputes with the central government related to sovereignty. The KRG held a non-binding independence referendum on September 25, 2017, in which more than 90% of voters preferred independence.

- In October 2017, following the referendum, Iraq's central government forces took over some oil fields in the Kirkuk area, along with other vital infrastructure such as border crossings and airports. Subsequently, Federal Iraq's North Oil Company (NOC) took over operations of the Avana Dome, Baba Dome, and Bai Hassan oil fields. The NOC continues to operate the Qubbet Baba, Jambour, and Khabaza oil fields located near Kirkuk.[10]

- By the end of October 2017, northern Iraq production (including production from both the KRG and from Federal Iraq) had decreased to about half of the pre-referendum volume of nearly 600,000 b/d. Northern Iraq production has mostly returned to pre-referendum averages during the past few years because small oil firms increased production at existing fields and brought several small fields online in the KRG-controlled area. KRG oil production declined slightly after reaching nearly 470,000 b/d in 2019 because of a decline in international oil company (IOC) investment in exploration and field development and challenges resulting from the COVID-19 pandemic. ExxonMobil withdrew from its last license in Kurdistan in 2021.[11]

- Control over rights to the reserves is a source of considerable controversy between the ethnic Kurds and other groups in the area. According to Rystad estimates, as of May 2022, the KRG-controlled areas held about 3.7 billion barrels of oil resources.[12] The KRG estimate of 45 billion barrels is likely higher because they include both unproven reserves and the disputed Kirkuk area fields.[13]

- In February 2022, Federal Iraq's Supreme Court ruled that the KRG does not have the authority to produce or to market oil and natural gas and that all contracts the KRG signed with international oil companies and oil service companies are illegal. The KRG government rejected the ruling and asserted that it has a constitutional right to export oil produced in Kurdistan. The dispute is ongoing, and Federal Iraq has put legal pressure on several companies operating in Kurdistan.[14] This legal conflict could slow Kurdistan's oil and natural gas production if several oil companies decide to permanently halt their operations in the region in response to the court ruling.

Petroleum and Other Liquids

- Iraq's crude oil production (excluding condensates) averaged 4.1 million barrels per day (b/d) in 2020 and 2021, which was 600,000 b/d lower than in 2019 (Figure 2). More than 3.6 million b/d was produced under the central government in Baghdad, and about 445,000 b/d was produced at the northern fields currently operated by the KRG.[15] Iraq created a fourth crude oil grade, Basra Medium, by separating it from the Basra Light grade in January 2021. Basra Light, which used to account for Iraq's largest crude oil stream, accounted for nearly 1.2 million b/d of Iraq's total production in 2021. Iraq's state oil marketer ended exports of Basra Light in January 2022 and now produces the grade solely for domestic refineries.[16]

- Iraq is a participant in the OPEC+ agreement. Under the April 2020 agreement, Iraq agreed to reduce its production to 3.6 million b/d from May to July 2020 and to 3.8 million b/d for the remainder of 2020. When the OPEC+ members began to reverse their production cuts in the latter half of 2020, Iraq gradually raised its crude oil production to 4.1 million b/d in 2021 and 4.4 million b/d in the first half of 2022.[17]

- Iraq's oil ministry intends to lift its crude oil production capacity to 8 million b/d by 2028 and will target several upstream expansion projects from fields in southern Iraq to boost the country's output (Table 1).[18] Some of these projects are likely to be delayed by Iraq's political struggles in forming a government, the lack of a budget, and the international oil companies' uncertainty about the investment climate.

Table 1. Crude oil projects in Iraq, 2022

Field name	Operator or project investor	Additional capacity (thousands of barrels per day)	Announced start date	Notes
Faihaa	China's United Energy Group	70	2024	Located on the border with Iran. Plans include expanding field capacity to 130,000 barrels per day (b/d).[19]
Missan Cluster (Bazergan, Fakka, and Abu Gharb fields)	China's CNOOC	100	end of 2022	Planned expansion of the Missan Cluster's capacity to 300,000 b/d.[20]
Majnoon	Basra Oil Company	200	2025[21]	
West Qurna-1	ExxonMobil and Basra Oil Company	330	2027	Iraq awarded a drilling contract to services firm, Schlumberger. Iraq's dispute with ExxonMobil over the company's exit of the field's partnership and the uncertainty of Basra Oil Company's ability to invest in the expansion are likely to delay this project.[22]
West Qurna-2	Russia's Lukoil	350	2027	Capacity expansion plans announced in 2018 but no progress as of August 2022.[23]
Ratawi	TotalEnergies	125	2026	Field expansion is part of TotalEnergies' $27 billion deal signed in September 2021 with Iraq. Agreement is not finalized as of August 2022. Planned expansion of field capacity to 210,000 b/d.[24]
Fields in the Dhi Qar province (Nasariya, Gharaf, and Subba)	Iraq National Oil Company (INOC)	~380	2028	Iraq began negotiations with Chevron in 2020 to explore and develop more fields in the Dhi Qar province. These fields produced an aggregate of about 220,000 b/d at the end of 2021, and Iraq targets a total production of 600,000 b/d.[25]

Data source: *Middle East Economic Survey*, FACTS Global Energy Services, Rystad Energy, Al Arabiya News, and company websites
NA = not available

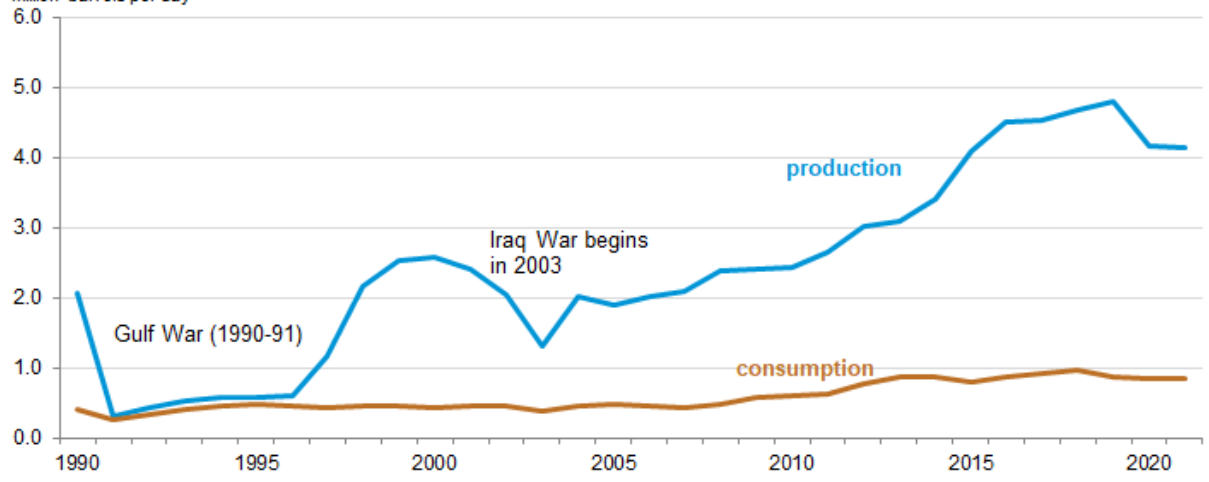
- Iraq's oil production requires more water injection to maintain its reservoir pressures and increase oil production. TotalEnergies intends to invest in a 7.5 million b/d seawater conversion project as part of its energy deal with Iraq to bolster oil production from mature fields in southern Iraq.[26] The seawater conversion project has been delayed for several years, and if the

agreement with TotalEnergies is not finalized by the next government, it could incur further delays.

- Iraq consumed about 850,000 b/d of petroleum and other liquids in 2021. Liquids consumption in Iraq has grown by an average 3% per year during the past decade. Domestic refineries meet most of Iraq's petroleum product needs; however, Iraq imports some petroleum products, primarily gasoline and diesel.[27] Iraq also uses crude oil for electric power generation.[28]

- Iraq's total effective refining capacity is about 900,000 b/d. The Iraqi government plans to reduce petroleum product imports by rehabilitating the refining sector and building new refineries, but the government has struggled in its efforts to attract the foreign investment needed in the downstream sector. Iraq's refineries produce more heavy fuel oil than is needed domestically and not enough gasoline and diesel to meet domestic demand. Several new refineries are planned, along with capacity expansion and upgrades at a number of existing refineries, to alleviate domestic product shortages, reduce government import costs for oil products, and eventually increase exports of refined products. Iraq expects to commission two refinery projects by 2023. The South Refineries Company is expanding its Basra refinery by 70,000 b/d.[29] Also, Iraq's oil ministry may begin operations at the new 150,000 b/d Karbala refinery in central Iraq by 2023.[30] Other refinery projects are still in the planning stages, although Iraq's regulatory challenges and economic issues are hurdles for potential investors.

Figure 2. Iraq's total petroleum and other liquids production and consumption, 1990–2021



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

Crude Oil Exports

- Iraq's total seaborne-traded crude oil exports averaged nearly 3.5 million b/d in 2021, which was slightly higher than the previous year, based on tanker loadings data.[31] During 2021, approximately 87% of Iraq's seaborne exports were shipped from the southern terminals in the Persian Gulf, which exports Basra light, medium, and heavy crude oil grades (Figure 3).[32] Crude oil from Iraq's northern region is sent by pipeline to Ceyhan, Turkey, where it ships from the port of Ceyhan.

- Asia (led by India, China, and South Korea) was the main regional destination for Iraq's crude oil, importing 64% of Iraq's crude oil exports in 2021 (Figure 4). China and India each imported almost 1 million b/d of crude oil from Iraq (more than half of Iraq's total exports), making them the top buyers of Iraq's crude oil during the year. Outside of Asia, Turkey and Italy imported the most crude oil from Iraq, at 217,000 b/d each (6% each of Iraq's total exports). Collectively, European countries imported 24% of Iraq's crude oil exports in 2021. Iraq's oil exports to the United States have declined each year since 2017 because of higher U.S. crude oil production, higher U.S. imports from heavy oil sands in Canada, and a decline in U.S. 2020 oil consumption as a result of the COVID-19 pandemic.

- Russia's full-scale invasion of Ukraine and the partial sanctions on Russia's oil supplies to Europe in 2022 have diverted a significant portion of Russia's oil from Europe to Asia and created more opportunities for Middle Eastern crude oil suppliers to send more volumes to Europe. As a result, Iraq is likely to send more crude oil to Europe. Iraq significantly reduced the price of its crude oil loadings to Europe for July 2022. Some of Iraq's crude oil exports to India and China are likely to be replaced by discounted volumes from Russia in 2022.[33]

- Infrastructure export capacity at its southern ports in Basra remains constrained and requires investment to rebuild and restore. Iraq's export capacity has declined over the past few years, which limits the country's capacity to produce crude oil. Operational export capacity fell from 3.7 million b/d before 2020 to about 3.3 million b/d in early 2022.[34] Oil exports in southern Iraq will likely be constrained in the second half of 2022, until Iraq can upgrade its infrastructure. SOMO, Federal Iraq's oil marketer, announced that new pumping stations would add 250,000 b/d of export capacity to the Basra Oil Terminal in mid-2022. However, the project was delayed by several months.[35]

- Iraq also intends to replace aging and malfunctioning subsea pipelines critical to oil export infrastructure offshore of Basra. Sealine 3, with a capacity of 700,000 b/d, is under construction and expected to come online by 2023. It will connect the new, fifth single mooring point to the Basra Oil Terminal. The Basra Oil Company plans to start operations of the pipeline leading to the Khor Al-Amaya Oil Terminal by 2023. This terminal halted operations in 2017 because of pipeline leaks. The repaired pipeline will be able to transport 600,000 b/d to the terminal, adding to the export capacity in southern Iraq. Two other pipelines are slated to replace existing and outdated pipelines by 2024.[36]

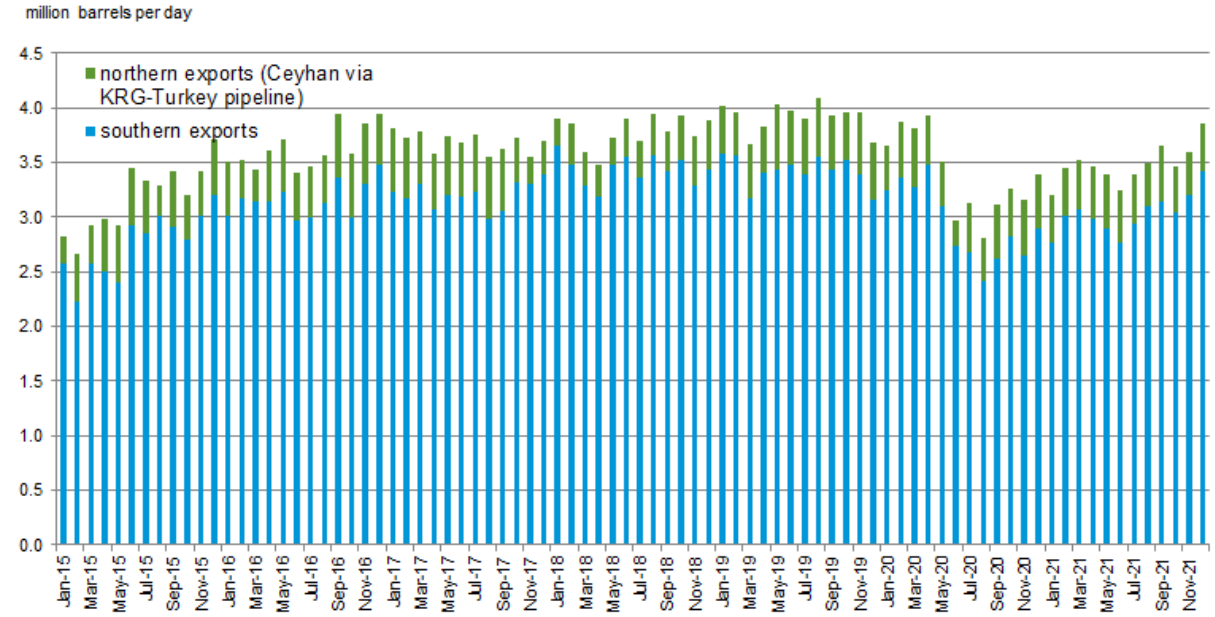
- In addition to its seaborne shipments, Iraq also exports relatively small volumes of crude oil by truck to Jordan[37] and by inland routes to Turkey via an onshore pipeline from the Ceyhan terminal to Turkey's Kirikkale refinery, near Ankara. The Ceyhan-Kirikkale pipeline has a capacity of 145,000 b/d.[38]

- The Federal Iraq government and the KRG signed an agreement in November 2018 that allows Iraq to transport up to 100,000 b/d of Federal Iraq's crude oil through the KRG's pipeline to Turkey and to export its crude oil from the Kirkuk fields through the Ceyhan port.[39] Iraq exported nearly 100,000 b/d of crude oil from Kirkuk through the KRG pipeline in 2021.[40]

- Another outlet that Federal Iraq established temporarily for its northern crude oil was a swap deal with Iran in 2017. Iraq trucked about 30,000 b/d of crude oil from its Kirkuk fields to Iran,

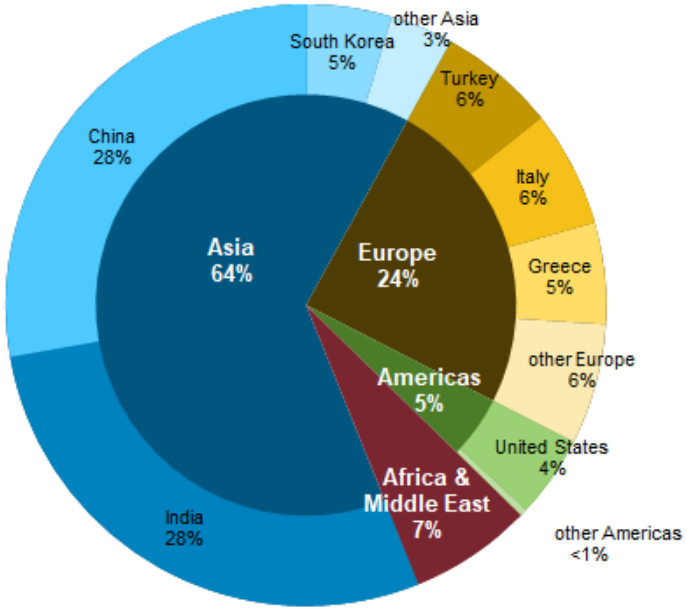
and Iran shipped the equivalent volume of crude oil from the Kharg oil terminal to Basra. However, this arrangement ended by November 2018, when U.S. sanctions took effect on Iran.[41]

Figure 3. Iraq's monthly seaborne crude oil exports, by location, January 2015–December 2021



Data source: ClipperData
Note: Exports only include seaborne-traded crude oil, not crude oil transported by trucks or onshore pipelines. KRG=Kurdistan Regional Government

Figure 4. Iraq's seaborne crude oil exports in 2021, by destination



Data source: ClipperData
Note: Total crude oil exports were 3.5 million barrels per day in 2021. Exports only include seaborne-traded crude oil, not crude oil exported by truck or crude oil exported onshore to Turkey via the Ceyhan-Kirikkale pipeline to a refinery near Ankara.
Totals may not equal the sum of components because of independent rounding.

Natural Gas

- At nearly 131 trillion cubic feet (Tcf), Iraq's proved natural gas reserves at the end of 2021 were the 12th largest in the world.[42] The majority of Iraq's natural gas reserves are associated with oil, and most of the associated natural gas is located in large oil fields in southern Iraq.[43]

- After reaching a record-high 378 billion cubic feet (Bcf) in 2019, Iraq's dry natural gas production fell to 328 Bcf in 2020. Production cuts from Iraq's oil fields in early 2020, following the OPEC+ agreement, lowered associated natural gas output. In 2021, natural gas production returned to about 353 Bcf as Iraq's associated gas began to return to production. Iraq consumed 650 Bcf of dry natural gas in 2021,[44] much of which the electricity sector consumed.

- According to the World Bank, Iraq flared nearly 630 Bcf of natural gas in 2021, ranking as the second-largest source country of flared natural gas in the world, behind Russia.[45] Natural gas is flared because of insufficient pipeline capacity and other midstream infrastructure to move the natural gas from crude oil production areas. Iraq delayed its target to eliminate natural gas flaring to 2027.[46] If Iraq can mobilize the investment for capturing its associated gas, it could reduce the use of crude oil and petroleum products for generating electricity, especially during the peak summer season, and reduce its natural gas imports from Iran.

- Nearly all of Iraq's natural gas output is associated natural gas, which is a byproduct of oil production. Iraq is pursuing several projects to capture its associated natural gas production and is negotiating several agreements with various companies to raise the country's natural gas processing capacity from about 550 Bcf in 2021 to nearly 1.5 Tcf in 2027 (Table 2).[47]

- Federal Iraq aims to not only capture and sell more associated gas but also to develop natural gas fields not associated with oil production (Table 2). The government is prioritizing the Akkas field in western Iraq and the Mansuriya field north of Baghdad as key nonassociated gas projects. Although Iraq is keen to develop these fields and the required natural gas processing infrastructure for them, these projects have encountered several delays over the past decade because of issues related to security, investment, contract terms, and commitment by international partners.

- The KRG has one nonassociated gas field, Khor Mor, with an operational capacity of 164 Bcf/y, which supplies power plants in Kurdistan. UAE's Dana Gas, the operator of Khor Mor, began work on an expansion project that is slated to provide natural gas for domestic use in the electric power sector. Once domestic power demand is satisfied, additional capacity from the project could be exported to Turkey and the European Union or sent to power plants in northern Federal Iraq. However, new natural gas pipelines would be required to send the natural gas outside of the KRG. A series of rocket attacks in the summer of 2022 has caused a temporary suspension of work on the expansion project.[48]

Table 2. Major natural gas projects in Iraq, 2022

Project	Operator or project investor	Additional capacity (billion cubic feet per year)	Announced start date	Notes
Associated gas projects				
Halfaya natural gas processing plant	China's CNPC	70	2023	Expansion of the Halfaya natural gas processing facility from a capacity of nearly 30 billion cubic feet per year (Bcf/y) to 110 Bcf/y. Designed to capture flared gas from the large Halfaya oil field in Maysan province. Natural gas will replace all of the oil use in the region's electric power sector.[49]
Basra Natural Gas Liquids project	Basra Gas Company	73 in Phase 1 and 73 in Phase 2	2023 and 2024	The Basra Gas Company intends to add 73 Bcf/y each year in 2023 and 2024 at its BNGL project to process natural gas from the Majnoon, West Qurna-2, and Ratawi oil fields.[50]
Nassariya and Gharraf natural gas project[51]	South Gas Company and Baker Hughes	73	2024	
Gas Growth Integrated Project	TotalEnergies	219	2027	As part of TotalEnergies' deal in Iraq, the company would build a natural gas facility in two phases to gather and treat natural gas from the West Qurna-2, Majnoon, Ratawi, Tuba and Luhais oil fields.[52]
Nonassociated gas projects				
Khor Mor expansion project	UAE's Dana Gas	90 in Phase 1 and 100 in Phase 2	2023 and 2025	The KRG's sole nonassociated gas field, Khor Mor, has a capacity of 164 Bcf/y, which supplies power plants in Kurdistan. Dana Gas intends to expand capacity by 90 Bcf/y by mid-2023 in the first phase and 100 Bcf/y in phase 2.[53]
Akkas gas field	INOC	146	2027	Located in the remote western province, Anbar. INOC is seeking a partner to develop the field and plans to conduct more reservoir assessments.[54]
Mansuriya gas field	Sinopec	110		Sinopec and Iraq's interim government agreed on contract for Mansuriya gas field in January 2022, but deal must be finalized by Iraq's new government.[55]

Data source: *Middle East Economic Survey*, Argus Media, Rystad Energy, Reuters, and Shafaq News

- Iraq began importing natural gas from Iran in July 2017 to fuel electric power plants near Baghdad, including the Al-Besmaya, Al-Quds, Al-Mansuriyah, and Al-Sadr stations. Iraq opened a second natural gas pipeline from Iran in July 2018 to feed power plants near Basra. Annual natural gas imports averaged 297 Bcf in 2021, down from 331 Bcf in 2020.[56] Iran limited natural gas exports to Iraq in 2021 because of high summer demand for natural gas in Iran, a regional drought causing low hydroelectric power and higher use of fossil fuels, and the challenge that Iraq faces in making payments to Iran.[57]

Electricity

- Iraq's net electricity generation grew by an annual average of about 7% each year between 2010 and 2020, reaching an estimated 92 terawatthours (TWh) (Figure 5). Rising power demand from the oil sector, population growth, higher natural gas supply, and some improvements in generation capacity and transmission networks drove increases in electricity output through 2020.[58] We expect that electricity output in 2021 will continue to increase due to economic recovery following the COVID-19 pandemic and higher demand from the oil industry because of the upturn in oil production after the OPEC+ production cuts expired.

- Nearly all (almost 95%) of Iraq's electricity generation is from oil and natural gas.[59] According to the International Energy Agency, natural gas use in the electric power sector increased from 25% in 2016 to nearly 60% in 2020 because Iraq began importing natural gas from Iran to increase its own supplies. Hydroelectricity accounts for most of the remaining share of electricity production.[60]

- Although solar generation accounted for an insignificant share of total power generation, Iraq plans to develop renewable energy projects to replace some of its oil and natural gas-fired capacity and to reduce natural gas and electricity imports from Iran. Iraq plans to install 12 GW of renewable energy capacity by 2030 and has signed agreements with several international companies to develop 4.5 gigawatts (GW) of utility-scale solar projects in 2021.[61]

- Federal Iraq's available peak electricity generation supply was 21 GW for 2021. The available supply in 2021 was much lower than the installed capacity of 37 GW and the 33 GW needed to meet peak summer demand.[62] Iraq's electricity use is very seasonal and reaches peak capacity in the summer months. Generation plants run at low utilization rates, and the available or effective production capacity is much lower than installed capacity because of poor transmission infrastructure, inefficient or damaged power plants, and insufficient natural gas supply and infrastructure. Peak summer demand typically exceeds actual generation, resulting in power shortages that sparked protests in southern Iraq and Baghdad in the summers of 2020, 2021 and 2022.[63]

- Distribution losses remain an issue in Iraq. From 2011 to 2020, distribution losses averaged 58% of total electricity supply, compared to an average of 8% for the world during this time period.[64] High distribution losses are the result of inefficiencies on the grid, poor system design, and high rates of electricity theft.

- Iraq burns crude oil directly at power plants to make up for its limited feedstock of other power generation fuels. At its highest, direct use of crude oil reached more than 220,000 b/d in the

summer of 2015 (Figure 6).[65] Reported average crude oil used at power stations fell from an average of 169,000 b/d in 2016 to an average of 24,000 barrels per day (b/d) in 2021 as a result of increased natural gas-fired electricity generation. Although Iraq's official reports of crude oil burn have been low during the past few years, we estimate that much higher amounts of crude oil are used for power generation.[66]

- Iraq's electricity sector imports a significant amount of its supplies from Iran. In 2021, about 35% of Iraq's electricity was generated by a combination of natural gas produced in Iran and electricity imported from Iran.[67] Iran significantly reduced its natural gas exports to Iraq in 2021 and 2022 because of higher domestic demand in Iran, hotter than average summer temperatures, reduced natural gas production in Iran, and payment issues from Iraq. In addition, Iran has lowered its electricity exports to Iraq since summer 2021 because of its own power shortages.[68]

- Iraq is looking for ways to diversify its sources of imported electricity. Sources under consideration include the Gulf Cooperation Council (GCC), Saudi Arabia, Turkey, and Jordan. Iraq finalized an agreement with the GCC, which will supply Iraq with 500 megawatts (MW) of electricity starting in mid-2024 from a power line from Kuwait. If realized, the project's ultimate capacity will reach 1.8 GW.[69] Two power lines with 500 MW of combined capacity from Turkey to Iraq were completed in the first half of 2022, and imports from Turkey expected to begin later in 2022.[70] Jordan plans to begin exporting up to 150 MW of electricity to Iraq through a new transmission line in 2023, barring any project delays.[71]

Figure 5. Electricity net generation and distribution losses in Iraq, 2000–2020

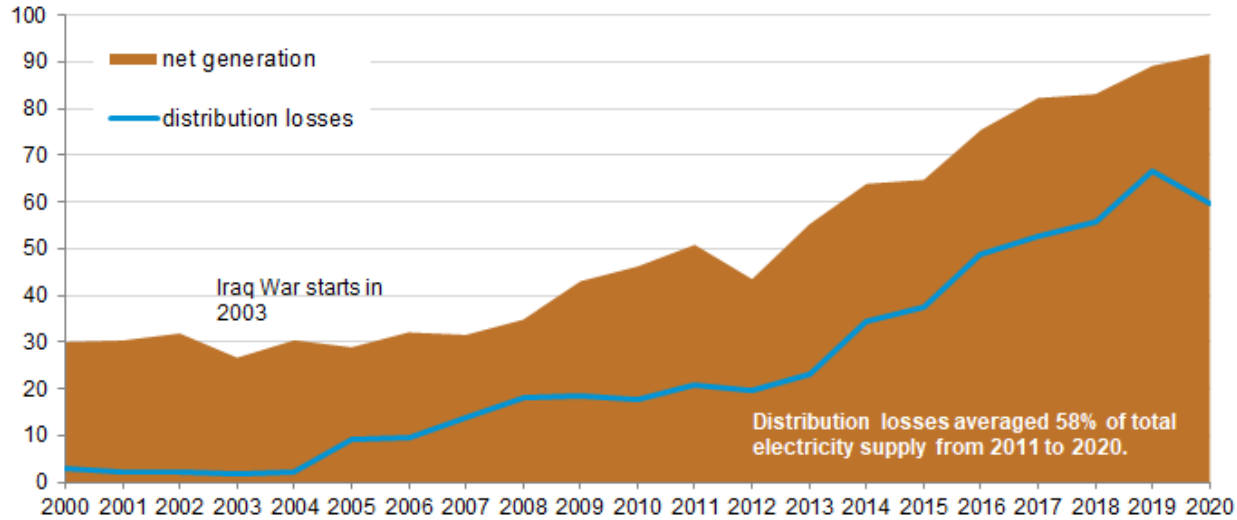
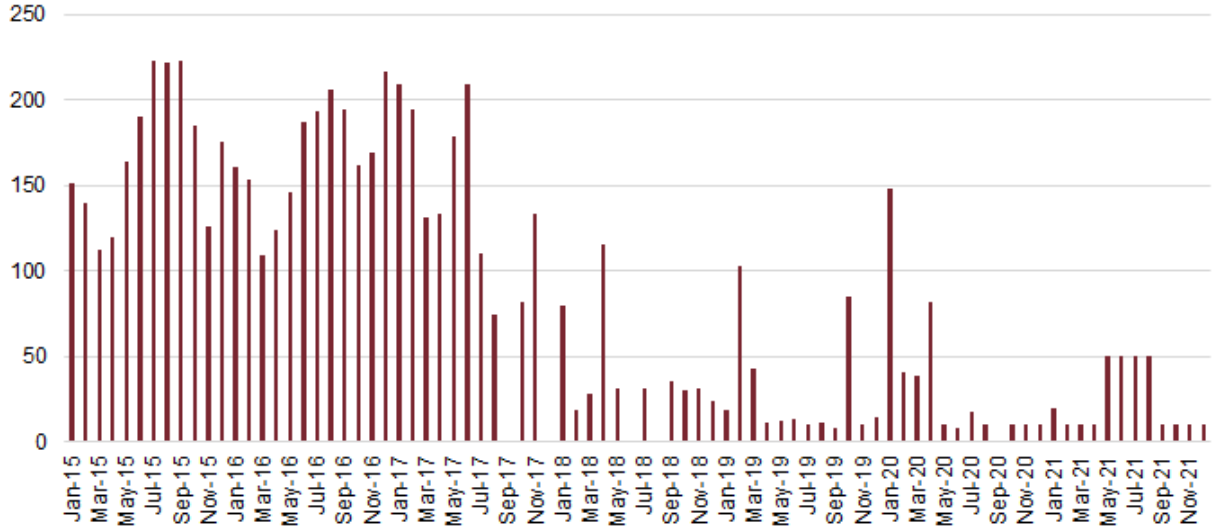


Figure 6. Crude oil used at power stations in Iraq, 2015–2021

thousand barrels per day



eia Data source: Joint Oil Data Initiative

Notes

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

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Denmark unveils plan to make aviation sustainable

Published 20-09-2022

The government's plan aims to ensure that Denmark has a domestic 100 percent green flight route by 2025 and that all domestic aviation will be green by 2030. The transition will be financed by imposing a flat passenger fee of 13 DKK.

Aviation literally connects Denmark. It is essential for both our business community and tourism industry. People will continue to travel by plane in the years to come, but we must make aviation sustainable.

Today, sustainable aviation fuels are far more expensive than fossil-based jet fuels. Consequently, the Danish government proposed to allocate more than 1.8 billion DKK to increase demand for sustainable aviation fuels. Starting in 2025, we will provide financing for a single domestic route and we will have a model in place that will allow us to fuel every single domestic flight by 2030.

To determine which airports that will become home to Denmark's first green domestic route, the government will launch a tendering proces for the aviation- and fuel industry.

"This plan delivers on the Prime Minister's pledge to first create a domestic flight route, before making domestic aviation fully green. Though starting domestically, we hope to have a global impact by paving the way for the development of sustainable aviation fuels. We have already invested a significant amount of money in boosting the supply of sustainable fuels and now we are creating a demand-pull that kicks-start our domestic market", says Minister for Climate, Energy and Utilities, Dan Jørgensen.

A green commercial route will be among the first of its kind and could make Denmark a role model for the decarbonization of the global aviation industry.

The green transition of Denmark's domestic aviation will be financed by imposing a 13 DKK flat fee per passenger on both domestic and international flights. Transfer and transit passengers are exempted from paying the fee.

The Danish government has already allotted 3 billion DKK to the production of sustainable fuels. Furthermore, the green tax reform will make it more expensive to use fossil fuels for aviation and more attractive to choose sustainable fuels.

https://www.msn.com/en-us/weather/topstories/editorial-battery-fire-at-moss-landing-a-stark-reminder-of-new-technology-risks/ar-AA12b6KO

Santa Cruz Sentinel

EDITORIAL: Battery fire at Moss Landing a stark reminder of new technology risks

Opinion by Santa Cruz Sentinel, Calif. - 6h ago

Sep. 23—If you were trying to get into, or out of Monterey County, on Highway 1 Tuesday, then you know what it's like to be caught in gridlocked traffic.

Or if you were looking for a little peace and quiet in the final days of summer, then a sudden warning to shelter-in-place became 12 hours of anxiety.

The cause of the shelter-in-place advisory and closing Highway 1 was a battery fire at the PG&E battery storage facility in Moss Landing.

A Tesla Megapack was destroyed by the fire that was reported early Tuesday morning. Sirens at the former Moss Landing power plant started blaring sending a warning to residents in Moss Landing as firefighters showed up to put out the blaze.

The advisory was lifted and the highway reopened later in the day after Environmental Protection Agency officials said it was safe. The cause of the fire remained unknown Thursday and fortunately no injuries were reported.

The mega battery that caught fire is one of 256 Tesla batteries at the PG&E-owned Elkhorn Battery Storage facility maintained by the utility and Tesla. The PG&E plant just opened in April and according to a utility spokesman, the facility is capable of storing enough energy to power 275,000 homes for up to four hours — about the number of homes in the city of San Francisco, for instance.

The fire eventually burned out five hours after it was first reported, but it continued to smolder, raising concerns the lithium-ion batteries might be releasing toxins into the air. Lithium-ion battery fires are notoriously hard to extinguish because they burn at extremely high temperatures and produce dangerous fumes.

The fire led to the shelter-in-place order for Moss Landing and the surrounding area. Highway 1 through the area was shut down and businesses and storefronts were never allowed to open. Monterey County officials sent a message to residents to "Please shut your windows and turn off your ventilation systems."

The fire's out, but the incident raises questions about California's electric grid and the drive to move away from fossil fuels to combat climate change.

PG&E and other utilities have been installing large-scale batteries to back up renewable energy sources, to ensure power can still be provided once the sun goes down.

But batteries, we're learning, can have their own reliability issues. In Tuesday's Moss Landing event, when PG&E's massive 182.5 megawatt Tesla battery caught fire, the site had to be disconnected from the grid.

And, as news sources have reported, the PG&E facility is located adjacent to another 400 megawatt battery storage site, which has experienced two overheating incidents in the past year that forced part of the system to shut down.

The move to energy storage will continue, but the Moss Landing fire was also a reminder that battery blazes are becoming increasingly common and destructive —and safety measures, including fire drills, for residents around storage facilities will have to be put in place and widely disseminated.

For PG&E, which filed for bankruptcy in 2019 amid tens of billions of dollars in liabilities for wildfires linked to its equipment, this is another fire-and-equipment risk. So add battery storage to fire dangers —as if we don't already have enough wildfire risks in our area. A fire last July at a Tesla battery storage site in Australia required three days and a hazmat firefighting team to put out. Australians were fortunate the fire didn't occur during their summer when it might have been even harder to control.

Central Coast residents should likewise be grateful Tuesday's battery fire didn't occur during the heat wave two weeks ago when the state power supply was tight and PG&E warned blackouts might be necessary. For now, the PG&E facility is shut down indefinitely and the utility estimates the damage will exceed $50,000.

Again, the takeaway is not that utilities should stop the conversion from fossil fuels to renewables and battery storage, but that all energy sources, including solar and wind power, carry costs and risks.

THE INVESTMENT FUNDS INSTITUTE OF CANADA | L'INSTITUT DES FONDS D'INVESTISSEMENT DU CANADA

IFIC Monthly Investment Fund Statistics – August 2022

Mutual Fund and Exchange-Traded Fund Assets and Sales

September 23, 2022 (Toronto) – The Investment Funds Institute of Canada (IFIC) today announced investment fund net sales and net assets for August 2022.

Mutual fund assets totalled $1.827 trillion at the end of August 2022. Assets decreased by $37.6 billion or 2.0% compared to July 2022. Mutual funds recorded net redemptions of $3.1 billion in August 2022.

ETF assets totalled $298.7 billion at the end of August 2022. Assets decreased by $5.0 billion or 1.6% compared to July 2022. ETFs recorded net sales of $1.5 billion in August 2022.

Mutual Fund Net Sales/Net Redemptions ($ Millions)*

Asset Class	Aug. 2022	Jul. 2022	Aug. 2021	YTD 2022	YTD 2021
Long-term Funds					
Balanced	(2,429)	(3,278)	4,390	(9,298)	49,071
Equity	(338)	(1,377)	2,532	1,800	30,374
Bond	(379)	(308)	1,680	(6,834)	13,136
Specialty	89	(80)	337	1,214	4,323
Total Long-term Funds	(3,056)	(5,043)	8,939	(13,118)	96,904
Total Money Market Funds	(52)	500	63	2,814	(6,483)
Total	(3,108)	(4,543)	9,002	(10,305)	90,420

Mutual Fund Net Assets ($ Billions)*

Asset Class	Aug. 2022	Jul. 2022	Aug. 2021	Dec. 2021
Long-term Funds				
Balanced	896.5	917.0	998.9	1,024.9
Equity	648.2	661.4	725.2	747.7
Bond	230.6	234.5	261.5	261.5
Specialty	22.0	22.0	20.0	22.2
Total Long-term Funds	1,797.3	1,835.0	2,005.7	2,056.3
Total Money Market Funds	29.7	29.7	27.3	26.4
Total	1,827.1	1,864.7	2,033.0	2,082.7

* Please see below for important information regarding this data.

ETF Net Sales/Net Redemptions ($ Millions)*

Asset Class	Aug. 2022	Jul. 2022	Aug. 2021	YTD 2022	YTD 2021
Long-term Funds					
Balanced	17	202	273	1,384	2,893
Equity	1,190	(730)	3,379	10,003	23,914
Bond	(347)	719	1,137	3,147	8,804
Specialty	21	375	300	1,160	6,373
Total Long-term Funds	881	566	5,088	15,695	41,983
Total Money Market Funds	594	938	(62)	3,324	(1,278)
Total	1,475	1,505	5,026	19,019	40,705

ETF Net Assets ($ Billions)*

Asset Class	Aug. 2022	Jul. 2022	Aug. 2021	Dec. 2021
Long-term Funds				
Balanced	11.8	12.1	11.0	12.1
Equity	191.2	194.1	209.0	225.2
Bond	75.8	77.7	87.0	89.6
Specialty	10.3	10.7	11.8	13.6
Total Long-term Funds	289.1	294.7	318.8	340.5
Total Money Market Funds	9.6	9.1	6.0	6.6
Total	298.7	303.7	324.8	347.1

* Please see below for important information regarding this data.

IFIC direct survey data (which accounts for approximately 85% of total mutual fund industry assets and approximately 83% of total ETF industry assets) is complemented by estimated data to provide comprehensive industry totals.

IFIC makes every effort to verify the accuracy, currency and completeness of the information; however, IFIC does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current.

*** Important Information Regarding Investment Fund Data:**

1. Mutual fund data is adjusted to remove double counting arising from mutual funds that invest in other mutual funds.
2. Starting with January 2022 data, ETF data is adjusted to remove double counting arising from Canadian-listed ETFs that invest in units of other Canadian-listed ETFs. Any references to IFIC ETF assets and sales figures prior to 2022 data should indicate that the data has not been adjusted for ETF of ETF double counting.
3. The Balanced Funds category includes funds that invest directly in a mix of stocks and bonds or obtain exposure through investing in other funds.
4. Mutual fund data reflects the investment activity of Canadian retail investors.
5. ETF data reflects the investment activity of Canadian retail and institutional investors.

About IFIC

The Investment Funds Institute of Canada is the voice of Canada's investment funds industry. IFIC brings together approximately 150 organizations, including fund managers, dealers, professional and back-office service providers, to strengthen the integrity of the investment funds industry, foster public confidence in investment funds, and enable investors to achieve good outcomes. By connecting savers to Canada's economy, our industry contributes significantly to Canadian economic growth and job creation. To learn more about IFIC, please visit www.ific.ca.

[Combined State and Federal Corporate Tax Rates in 2022 (taxfoundation.org)]

Combined Federal and State Corporate Income Tax Rates in 2022

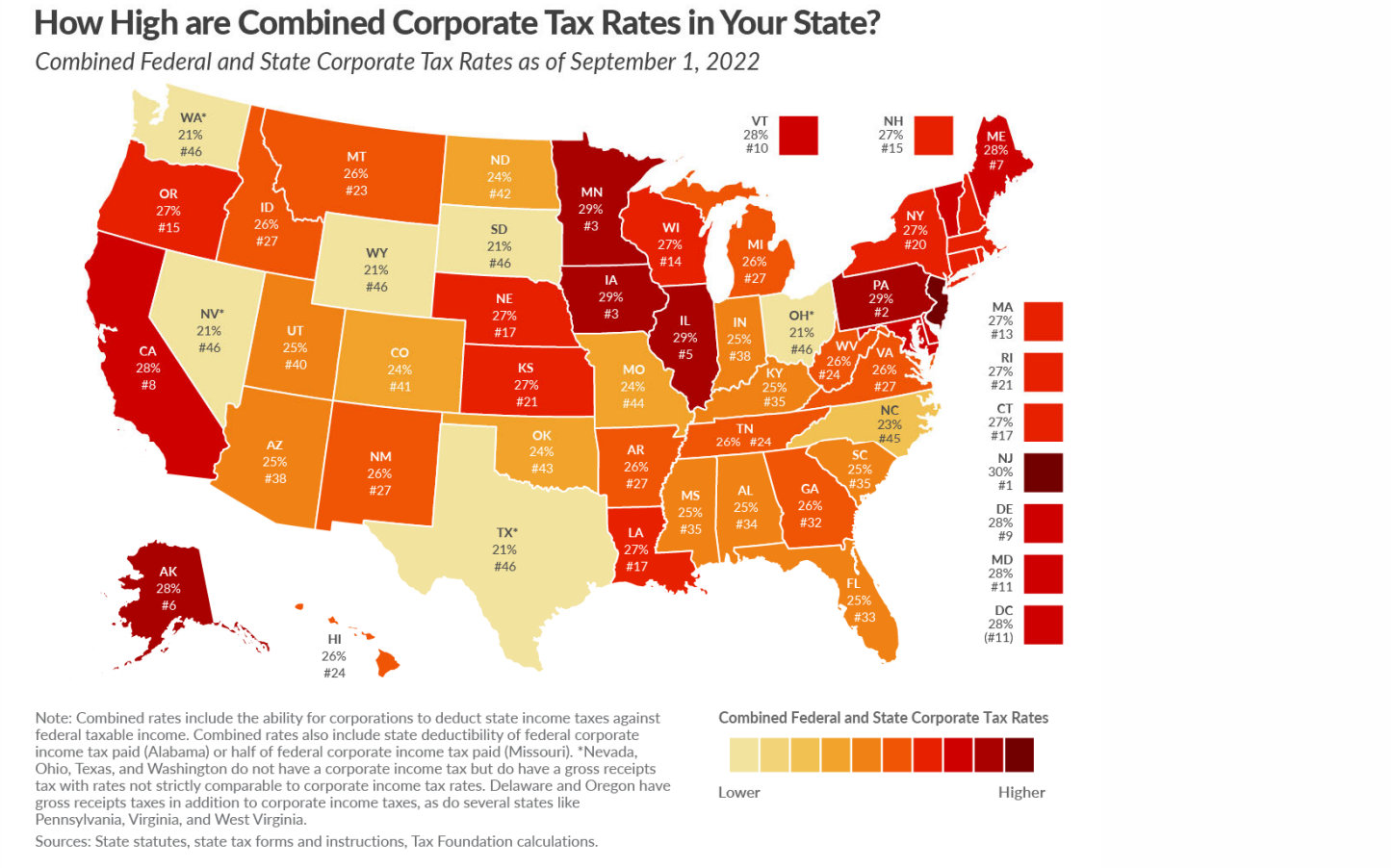
September 27, 2022

Garrett Watson

Corporations in the United States pay federal corporate income taxes levied at a 21 percent rate. Forty-four states and D.C. also levy taxes on corporate income, with top marginal rates ranging from 2.5 percent in North Carolina to 11.5 percent in New Jersey. Fifteen of the states levy graduated corporate income tax rates, while the remaining 29 states and D.C. levy a flat rate on corporate income.

In Nevada, Ohio, Texas, and Washington, corporations are subject to gross receipts taxes instead of corporate income taxes. Delaware, Oregon, and Tennessee impose a tax on corporate income and a separate levy on gross receipts. Pennsylvania, Virginia, and West Virginia levy gross receipts taxes at the local (but not state) level too.

The state with the highest combined state and federal corporate tax rate is New Jersey at 30.1 percent. Corporations in Alaska, California, Illinois, Iowa, Maine, Minnesota, and Pennsylvania face combined corporate tax rates at or above 28 percent. Six states—Ohio, Nevada, South Dakota, Texas, Washington, and Wyoming—face no state corporate income tax and only face the federal tax rate of 21 percent.



Corporations may deduct state corporate income tax paid against federal taxable income, lowering the effective federal corporate income tax rate. For example, a corporation in Rhode Island may deduct tax paid at a 7 percent flat rate against the 21 percent federal corporate income tax, reducing its federal rate to 19.53 percent and a combined rate of 26.53 percent.

Additionally, two states allow corporations to deduct federal corporate income tax against some portion of state corporate income tax. Alabama allows full deductibility of federal corporate income tax liability against state liability, while Missouri permits a 50 percent deduction of federal corporate income tax liability. This lowers the effective corporate income tax rate faced by corporations in these states.

Louisiana provided a full deduction for federal corporate income taxes before January 1, 2022, but it repealed deductibility last year. Iowa also previously permitted a 50 percent deduction for federal corporate income taxes, but this provision expired in 2021.

When examining tax burdens on businesses, it is important to consider both federal and state corporate taxes. Corporate taxes are one of the most economically damaging ways to raise revenue and are a promising area of reform for states to increase competitiveness and promote economic growth, benefiting both companies and workers.

https://www.goalcast.com/jim-morris/

Jim Morris | The Unbelievable True Story of Baseball's Oldest Rookie

By Goalcast

Jim Morris – Nothing is Impossible

Jim Morris' life was so remarkable, they made a Disney movie out of it. This is the unbelievable true story of how one man made the big leagues at the age of 35.

Transcript:

You're not smart enough. You're not good enough. Why do you even try? Why don't you quit now before you embarrass yourself and everybody else? You'll never make it.

For 15 years, I watched my parents say the worst things they could possibly say to each other, throw things, hit each other. The next three years, I learned from my grandparents it doesn't have to be that way.

I worked for my grandfather in the stores for three summers, and he taught me a lot. Every day pretty much, I got a lesson. Jimmy, you're born with your name and you die with your name. What you do with it in between is a legacy you leave behind for everybody else. Who do you want to be?

These lessons from my grandparents added up over time. Eventually, I took those college entry exams that everybody loves to take, and the scores came back and my counselor stops me in the hallway. He's got my scores in his hand. He goes, "Jimmy, what are you going to do with your life?" I looked at my counselor and I said, "I'm gonna be a baseball player. Everybody knows that." He goes, "I hope so. You're too stupid to go to college."

Same period of time, I find out the person I love more than anybody in my life, the mentor, the person I held high up here on this pedestal, my grandfather, Ernest, was diagnosed with ALS. No grades, no scholarships, watching my grandfather get sicker and sicker.

I was playing a summer league game. After the game, this man came to talk to me. He goes, "I'm the coach at Ranger Junior College. I want you to come play baseball for me. I know about your dream. I know about your grandfather. I know about your grades. I'm gonna get you classes that you can pass," which was important, "you're gonna pitch for me during the week, and on the weekends during the Fall, you're going to go home and spend time with your grandparents in the hospital every weekend." I would pitch, and on the weekends, I would go home. I did that for 4-1/2 months. On the last Sunday in November of '82, I kissed my grandparents good-bye at midnight. I had to get back for eight o'clock Monday class, told them I loved them. I got back to school at 1:00. At 3:00, my coach woke me up. He said, "You need to go home. Ernest has passed away. I've already talked to all of your professors. Don't worry about it. Your finals will be taken care of when you get back. You go home. You take care of your grandmother. You take care of the funeral. She does not lift another finger." So I did.

To this day, in Brownwood, there's never been a larger funeral take place. People came from all over the country. Everybody got to say their good-byes to my grandfather, who lived for everybody else but himself.

No grades, no scholarships, nowhere to go. Call my mom. "Mom, I need a horrible mistake. I don't know what I was thinking. I'm quitting. I'm coming home. I'm done. It's time to go out in the world and start teaching and coaching kids."

That's when I found myself at Reagan County High School in Big Lake, Texas. I inherited a baseball team that had won one game each year for the three years before I got there. The first thing I did as a head coach was I kept that one team on the schedule. "You're going to respect this game. As long as you're on my field, you're playing for my team. We're going to do things the right way." Athletic director and head football coach at Reagan County High School pulled me aside one day to tell me, "If it's ever close or they're ever behind, they're gonna find a way to lose. Their parents are losers. They're losers. It's just in their DNA. They're not even gonna graduate from high school. They're gonna work in the oil fields and gas fields like their dads and their granddads did, and there's nothing you or anybody else can do about it. You have taken these kids as far as you can."

The problem with that little talk was that two of my kids were behind the lockers changing. Before I get to my field, spread through my team like wildfire. The guy not only in charge of all the coaches, but all the kids, thought they were losers. I walked down the left field line. Not one kid's looking at me. I started talking about hopes and dreams and setting goals. Then my catcher looked at me dead in the eye and he goes, "Why are you telling us to chase our dreams if you're not willing to do it yourself? We think you still wanna play." I said, "No, sir. I wanna stay married. Thank you very much." "But, Coach, the way you teach us the game, we know your heart's still in it. You teach us how to act and react to every situation that comes up. We know what the other team's gonna do before they do it."

What came out of the deal was if they want a district championship, which the school had never done in baseball, I had to try out again, but forget about the bet, but in the district championship game, we're down by three runs in the last inning and history would dictate we're not meant to come back and win that game. I watched this group of kids that nobody believed in, including themselves, come back to score four runs, winning. It is one of the best sites I've ever seen in my life. They're hugging each other. They're hugging the trophy. They're hugging their parents. This kid on my team could even see tears in my eyes, and when he sees me, he starts giggling. Big, fat coach in the driver's seat crying like a baby. Pats me on the shoulder, walks by, he goes, "We did our part. Now, it's your turn." I have to go do this. Every kid on the bus, "Coach, we did our part. Now, it's your turn."

I finally try out. My dad helps me find it. I made a promise to a group of kids that if they did something nobody thought they could do, I would try to do something I know I can't do. Embarrassing, humiliating, I can't do anything about that. I made a promise. I'm living up to it. Young guy catching me, he just graduated from high school, gives me a sign for a fastball. I lined up. I throw it as hard I can. I looked over the catcher's head behind the screen. [inaudible 00:04:58]. I did not even throw hard enough to register. [inaudible 00:05:03] scout meets me in my car. He said, "Well, son, I don't know. You've done your time off, but the first pitch you threw without warming up was 94. Everything after that went up to 98." The last thing he said to me as I got ready to drive home was, "Don't be surprised if you get a phone call."

The kids were right. I didn't embarrass myself. Drive an hour and 10 minutes home. Wasn't one phone call. It was 12. We were not the first ones home. My ex-wife hangs up the phone, turns around and said, "So, where have we been?" My oldest daughter, who was four at the time, holds onto me every time she can, is holding onto my pants and she looks up at her mother and goes, "We're not

supposed to tell you." She looked back at me and she said, "What were you thinking?" I said, "I'm a man. I'm not supposed to think." She said, "What are you doing now?" I said, "The same thing I was going to do before. I'm good at coaching these kids. I trained for that. I'm successful at that. I win everywhere I go. That's what I'm good at. This thing over here, this baseball dream, has never, ever worked. I've wanted to play since I was five. It's never worked." She said, "You better listen to the phone calls."

They wanted me to come back in two days and throw again to see if I could actually throw that hard or if my arm had fallen off. I'm telling my kids they wanted me to come back and throw again. My kids go, "Coach, you told us if we ever had our dreams in front of us, you chase it no matter what." Two days later, I go back and throw again. It rained so hard, they had to hand me a brand new baseball every pitch, sunk me up to my knee in mud every time. I landed 98 every pitch.

Our Big League general manager's there. He goes, "You could smile. You're gonna be in Texas tomorrow." I just looked at him and I was stunned. I was like, "What?" He goes, "You're in the Big Leagues." I'm trying to process how, in three months, I've lost 60 pounds, I've gone from grading papers, science papers, and report cards to autographs and doing interviews, all because of a group of kids who when I pushed them, they pushed back. They got their coach to go to the Big Leagues, who couldn't even believe in himself at the time.

My grandfather had this saying. Every day, I heard it for three years. "Remember who you are." It took me until years later to get what he meant. Remember who you are is simple. Don't do anything you wouldn't have anybody see you do. It's not what you do when you know people are watching that makes you who you are. It's what you do when nobody's watching at all. That makes you who you are. That's character. That's my grandparents. If you make it just about you, you're never going to go anywhere. It's when you make it about something bigger than you and be a mentor for somebody, be a dream maker, be a team player. Nothing is impossible in this world.

Dan Tsubouchi @Energy_Tidbits · 4h

Hmmm! Food for thought! Will any #OPEC+ cut be a REAL across the board production cut from ALL countries even those producing < quota? Surely that can happen if The Man, Saudi Energy Minister Abdulaziz starts to call in his huge # of IOUs? Thx @sean_evers. #OOTT

> **Sean Evers** @sean_evers · 11h
>
> Replying to @gulf_intel @Jorgecomments and 3 others
>
> so basically those countries that are actually pumping at their quota (Gulf OPEC: UAE, Iraq, Kuwait, Saudi) want in-person meeting because they want to make it crystal clear that they aren't going to cut from their QUOTA level unless rest agree to cut from PRODUCTION! #OPEC #OOTT

1 1 6

Dan Tsubouchi @Energy_Tidbits · 15h

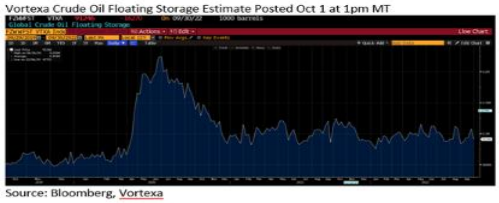
this must be a good sign for this couple. a mountain wedding on oct 1 and a perfect dry day for pictures by the old coal mine entrance by the Bow River in #Canmore. got to be the last wedding pictures until late May.

2 1 21

Dan Tsubouchi @Energy_Tidbits · 19h

#Vortexa crude #Oil floating storage at 09/30 est 91.25 mmb, -16.27 mmb vs revised up 09/23 of 107.52 mmb. Last several weeks had mix of + or - revisions. With revisions, floating storage more +/- 90 mmb vs last week +/-100 mmb. Thx @Vortexa @business . #OOTT

Vortexa Crude Oil Floating Storage Estimate Posted Oct 1 at 1pm MT



Source: Bloomberg, Vortexa

Posted Oct 1, 1pm MT

Date	Last Px
Fr 09/30/2022	91246
Fr 09/23/2022	107.516k
Fr 09/16/2022	93751
Fr 09/09/2022	93139
Fr 09/02/2022	86098
Fr 08/26/2022	83843
Fr 08/19/2022	107.837k
Fr 08/12/2022	111.944k
Fr 08/05/2022	90967
Fr 07/29/2022	91221
Fr 07/22/2022	86950

Sept 24, 1pm MT

Date	Last Px
Fr 09/23/2022	105.366k
Fr 09/16/2022	95328
Fr 09/09/2022	96979
Fr 09/02/2022	86287
Fr 08/26/2022	82484
Fr 08/19/2022	104.557k
Fr 08/12/2022	109.8k
Fr 08/05/2022	89171
Fr 07/29/2022	89908
Fr 07/22/2022	85072
Fr 07/15/2022	85720

Sept 18, 4pm MT

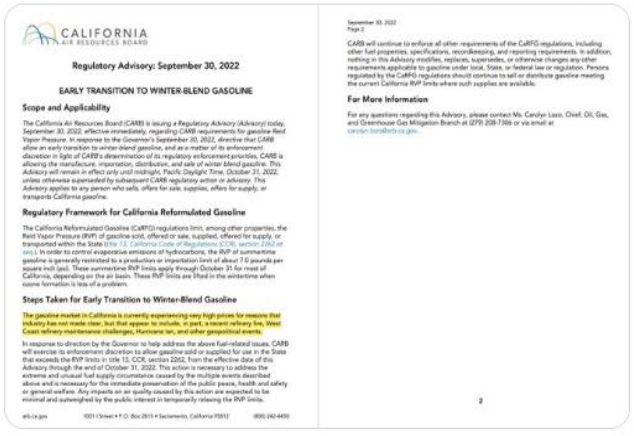
Date	Last Px
Fr 09/16/2022	81925
Fr 09/09/2022	91989
Fr 09/02/2022	82464
Fr 08/26/2022	83003
Fr 08/19/2022	100.524k
Fr 08/12/2022	107.464k
Fr 08/05/2022	88461
Fr 07/29/2022	90773
Fr 07/22/2022	83754
Fr 07/15/2022	86219
Fr 07/08/2022	97950

Source: Bloomberg, Vortexa

1 1 6

Dan Tsubouchi @Energy_Tidbits · Oct 1

Hmm! #CARB says industry haven't made clear why very high #Gasoline prices, yet then lists the key factors increasing gas prices ie. "a recent refinery fire, West Coast refinery maintenance challenges, Hurricane Ian, and other geopolitical events". #OOTT ww2.arb.ca.gov/sites/default/...



CALIFORNIA AIR RESOURCES BOARD

Regulatory Advisory: September 30, 2022

EARLY TRANSITION TO WINTER-BLEND GASOLINE

Scope and Applicability

The California Air Resources Board (CARB) is issuing a Regulatory Advisory (Advisory) today, September 30, 2022, effective immediately, regarding CARB requirements for gasoline Reid Vapor Pressure. In response to the Governor's September 20, 2022, directive that CARB allow an early transition to winter-blend gasoline, and as a matter of its enforcement discretion in light of CARB's determination of its regulatory enforcement priorities, CARB is allowing the manufacture, importation, distribution, and sale of winter blend gasoline. This Advisory will remain in effect only until midnight, Pacific Daylight Time, October 31, 2022, unless otherwise superseded by subsequent CARB regulatory action or advisory. This Advisory applies to any person who sells, offers for sale, supplies, offers for supply, or transports California gasoline.

Regulatory Framework for California Reformulated Gasoline

The California Reformulated Gasoline (CaRFG) regulations limit, among other properties, the Reid Vapor Pressure (RVP) of gasoline sold, offered or sale, supplied, offered for supply, or transported within the State (title 13, California Code of Regulations (CCR), section 2262 et seq.). In order to control evaporative emissions of hydrocarbons, the RVP of summertime gasoline is generally restricted to a production or importation limit of about 7.0 pounds per square inch (psi). These summertime RVP limits apply through October 31 for most of California, depending on the air basin. These RVP limits are lifted in the wintertime when ozone formation is less of a problem.

Steps Taken for Early Transition to Winter-Blend Gasoline

The gasoline market in California is currently experiencing very high prices for reasons that industry has not made clear, but that appear to include, in part, a recent refinery fire, West Coast refinery maintenance challenges, Hurricane Ian, and other geopolitical events.

In response to direction by the Governor to help address the above fuel-related issues, CARB will exercise its enforcement discretion to allow gasoline sold or supplied for use in the State that exceeds the RVP limits in title 13, CCR, section 2262, from the effective date of this Advisory through the end of October 31, 2022. This action is necessary to address the extreme and unusual fuel supply circumstance caused by the multiple events described above and is necessary for the immediate preservation of the public peace, health and safety or general welfare. Any impacts on air quality caused by this action are expected to be minimal and outweighed by the public interest in temporarily relaxing the RVP limits.

September 30, 2022
Page 2

CARB will continue to enforce all other requirements of the CaRFG regulations, including other fuel properties, specifications, recordkeeping, and reporting requirements. In addition, nothing in this Advisory modifies, replaces, supersedes, or otherwise changes any other requirements applicable to gasoline under local, State, or federal law or regulation. Persons regulated by the CaRFG regulations should continue to sell or distribute gasoline meeting the current California RVP limits where such supplies are available.

For More Information

For any questions regarding this Advisory, please contact Ms. Carolyn Laco, Chief, Oil, Gas, and Greenhouse Gas Mitigation Branch at (279) 208-7306 or via email at carolyn.laco@arb.ca.gov.

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Dan Tsubouchi @Energy_Tidbits · Oct 1

DE holds firm v RUS despite. @c_lindner warns Energy War & Inflation endanger DE prosperity. Need #Coal #Nuclear to ensure grid stability. 03/03/22, Habeck, against ban on RUS #NatGas "because we are endangering social peace in the republic" #OOTT spiegel.de/wirtschaft/unt...

> Christian Lindner @c_lindner · Oct 1
>
> #Energiekrieg und #Inflation gefährden unseren Wohlstand. Jetzt muss alles ans Netz, was Existenzen sichert: Kohle- und #Kernkraft - auch in #Niedersachsen. So sichern wir die Netzstabilität und senken die hohen Preise. CL #EsKommtAufUnsAn

2 1

Dan Tsubouchi @Energy_Tidbits · Oct 1

Oops! Abdulaziz wants to some gamblers on #Oil price "ouching like hell".

Last minute change to a 1st post-Covid in-person #OPEC+ Oct 5 meeting. Must want visuals for something significant ie. a bigger #Oil supply cut.

That's why he is "The Man".

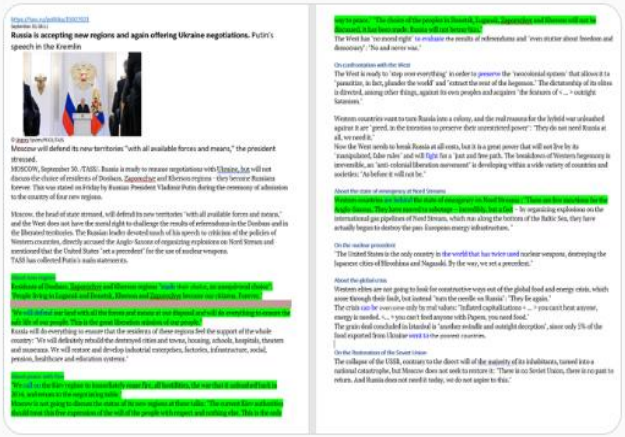
Thx @Amena_Bakr. #OOTT twitter.com/Amena_Bakr/st...

> This Tweet was deleted by the Tweet author. Learn more

5 17

Dan Tsubouchi @Energy_Tidbits · Sep 30

#Putin's warning. Will negotiate with UKR but not about 4 Russian regions. "will defend our land with all the forces & means at our disposal". Re #NordStream, western countries "have moved to sabotage - incredibly, but a fact". "can't heat anyone, energy is needed". #OOTT #NatGas



Russia is accepting new regions and again offering Ukraine negotiations. Putin's speech in the Kremlin

Moscow will defend its new territories "with all available forces and means," the president stressed.

MOSCOW, September 30. /TASS/. Russia is ready to resume negotiations with Ukraine, but will not discuss the choice of residents of Donbass, Zaporozhye and Kherson regions - they become Russians forever. This was stated on Friday by Russian President Vladimir Putin during the ceremony of admission to the country of four new regions.

Moscow, the head of state stressed, will defend its new territories "with all available forces and means," and the West does not have the moral right to challenge the results of referendums in the Donbass and in the liberated territories. The Russian leader devoted much of his speech to criticism of the policies of Western countries, directly accused the Anglo-Saxons of organizing explosions on Nord Stream and mentioned that the United States "set a precedent" for the use of nuclear weapons. TASS has collected Putin's main statements.

About new regions

Residents of Donbass, Zaporozhye and Kherson regions "made their choice, an unequivocal choice." People living in Lugansk and Donetsk, Kherson and Zaporozhye become our citizens, forever.

We will defend our land with all the forces and means at our disposal and will do everything to ensure the safe life of our people. This is the great liberation mission of our people.

Russia will do everything to ensure that the residents of these regions feel the support of the whole country: "We will definitely rebuild the destroyed cities and towns, housing, schools, hospitals, theaters and museums. We will restore and develop industrial enterprises, factories, infrastructure, social, pension, healthcare and education systems."

About peace with Kyiv

We call on the Kiev regime to immediately cease fire, all hostilities, the war that it unleashed back in 2014, and return to the negotiating table.

Moscow is not going to discuss the status of its new regions at those talks: "The current Kiev authorities should treat this free expression of the will of the people with respect and nothing else. This is the only way to peace." "The choice of the peoples in Donetsk, Lugansk, Zaporozhye and Kherson will not be discussed, it has been made. Russia will not betray them."

The West has "no moral right" to evaluate the results of referendums and "even stutter about freedom and democracy". "No and never was."

On confrontation with the West

The West is ready to "stop over everything" in order to preserve the "neocolonial system" that allows it to "parasitize, in fact, plunder the world" and "extract the rent of the hegemon." The dictatorship of its elites is directed, among other things, against its own peoples and acquires "the features of <...> outright fascism."

Western countries want to turn Russia into a colony, and the real reasons for the hybrid war unleashed against it are "greed, in the intention to preserve their unrestricted power": "They do not need Russia at all, we need it."

Now the West needs to break Russia at all costs, but it is a great power that will not live by its "manipulated, false rules" and will fight for a "just and free path. The breakdown of Western hegemony is irreversible, an "anti-colonial liberation movement" is developing within a wide variety of countries and societies: "As before it will not be."

About the state of emergency at Nord Stream

Western countries are behind the state of emergency on Nord Stream: "There are two sterlings for the Anglo-Saxons. They have inserted a sabotage - incredibly, but a fact - by organizing explosions on the international gas pipelines of Nord Stream, which run along the bottom of the Baltic Sea, they have actually begun to destroy the pan-European energy infrastructure."

On the nuclear precedent

"The United States is the only country in the world that has twice used nuclear weapons, destroying the Japanese cities of Hiroshima and Nagasaki. By the way, we set a precedent."

About the global crisis

Western elites are not going to look for constructive ways out of the global food and energy crisis, which arose through their fault, but instead "turn the needle on Russia": "They lie again."

The crisis can be overcome only by real values: "Inflated capitalizations <...> you can't heat anyone, energy is needed, <...> you can't feed anyone with Papers, you need food."

The grain deal concluded in Istanbul is "another reshuffle and outright deception", since only 1% of the food exported from Ukraine went to the poorest countries.

On the Restoration of the Soviet Union

The collapse of the USSR, contrary to the direct will of the majority of its inhabitants, turned into a national catastrophe, but Moscow does not seek to restore it: "There is no Soviet Union, there is no past to return. And Russia does not need it today, we do not aspire to this."

1 3

Dan Tsubouchi @Energy_Tidbits · Sep 30

#JCPOA - hard to see a deal if this is a must have. "“Reaching a deal is important but the implementation of the deal is more important if a durable deal is reached, even the next [US] administration, no matter from which party it may be, will have to respect that.” #OOTT

Iran says Iraqi FM carried a message from US to Iran

Sep 30, 2022, 1:19 PM
Journalist ID: 1114 News Code: 84900599

New York, IRNA – Iranian Foreign Minister Hossein Amirabdollahian said on Thursday that some of his foreign counterparts tried to carry messages from the US side to Iran and vice versa over the past months among whom was the Iraqi Foreign Minister Fuad Hussein who carried a message from the US to Iran.

Speaking in an exclusive interview with IRNA correspondent to New York, Amirabdollahian also touched upon a meeting in New York between Iranian President Ebrahim Raisi and his French counterpart Emanuel Macron, where he said the French president raised his viewpoints about the issues which he believed could help the progress of talks between Iran and world powers.

He noted that the two presidents also exchanged views on the war in Ukraine, the regional developments and bilateral issues.

On the resolve on the US side for reaching a deal, the Iranian foreign minister said that the American side talks about goodwill but what is important for Iran is how this goodwill is translated on the ground.

Iran is determined to reach a good, strong and durable deal and will spare no effort in this regard, the Iranian foreign minister said, adding that now it is the US turn to show whether it is courageous enough to take the necessary decisions.

On the long course of talks with the Western sides and indirect talks with the American side, Amirabdollahian said that the thing important is that Iran has not negotiated for the sake of negotiations, rather it has been negotiating to reach a point where the removal of the sanctions are ensured and the country can benefit from the economic interests of a 2015 nuclear deal.

Noting that both sides have had enough negotiations, he said that now the ball is on the US court to make a decision.

"Reaching a deal is important but the implementation of the deal is more important if a durable deal is reached, even the next [US] administration, no matter from which party it may be, will have to respect that."

When asked to comment on plans for a prisoner swap between Iran and the United States, the Iranian foreign minister said that the American side insisted to tie the issue to the Vienna talks on the removal of sanctions.

He said that the US even sought to make a prisoner swap between the two countries part of a deal that has been under negotiations for several months in Vienna but Iran does not insist on such a mechanism and is ready to extradite the prisoners with the US as a humanitarian measure whenever the US side is ready to do so.

As a new round of negotiations between Iran and Saudi Arabia is scheduled to begin in Iraq soon, the foreign minister was asked whether a thaw of relations between Tehran and Riyadh is subject to brokering a deal between Iran and the West or it is pursued independently.

Amirabdollahian said that Iran sees no link between regional cooperation and the talks on the removal of sanctions on Tehran.

He even added that Iran's relations with a number of regional Arab countries which had been cut off as a result of icy relations between Tehran and Riyadh were restored over the past few weeks so that these countries sent back their ambassadors to the Iranian capital.

Whenever Saudi Arabia is ready to reopen its embassy in Iran and resume normal relations with the country, Tehran would welcome that, the foreign minister said, noting that the talks between the two countries are underway to reach this point.

9341**7129

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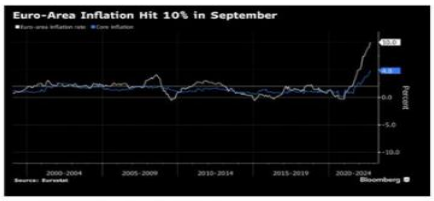
1 3

Dan Tsubouchi @Energy_Tidbits · Sep 30

Euro-zone inflation hits 10% for 1st time ever. Also note correlation of countries well above 10% inflation are those most dependent on Russia #Oil #NatGas. Reminder the EU sanctions on Russian oil start Dec 5, petroleum products Feb 5. Thx @CraigStirling. #OOTT



2 5

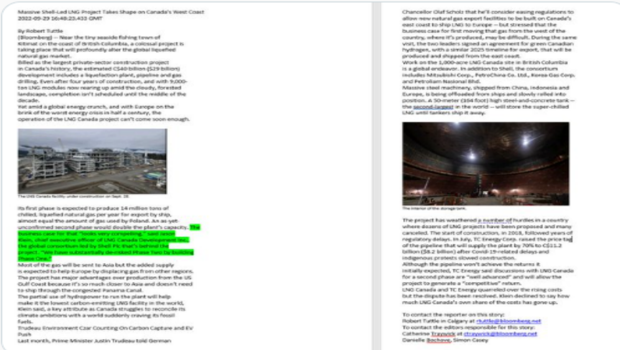
Dan Tsubouchi @Energy_Tidbits · Sep 29

never get tired of seeing wildlife. looks like all the local elk gang are having their evening meal by the Bow River in #Canmore.

2 11

Dan Tsubouchi @Energy_Tidbits · Sep 29

"We have substantially de-risked Phase 2 by building Phase 1" #LNGCanada CEO. Surely FID coming by #Shell Q3 release 10/27? See 👇 06/11 tweet, LNG Canada is a game changer for 🇨🇦 #NatGas, Phase 1 is >10% of AB/BC #NatGas, Phase 2 doubles that. Thx @roberttuttle. #OOTT



Massive Shell-Led LNG Project Takes Shape on Canada's West Coast
2022-09-29 16:48:23.433 GMT

By Robert Tuttle

(Bloomberg) -- Near the tiny seaside fishing town of Kitimat on the coast of British Columbia, a colossal project is taking place that will profoundly alter the global liquefied natural gas market.

Billed as the largest private-sector construction project in Canada's history, the estimated C$40 billion ($29 billion) development includes a liquefaction plant, pipeline and gas drilling. Even after four years of construction, and with 9,000-ton LNG modules now rearing up amid the cloudy, forested landscape, completion isn't scheduled until the middle of the decade.

Yet amid a global energy crunch, and with Europe on the brink of the worst energy crisis in half a century, the operation of the LNG Canada project can't come soon enough.

The LNG Canada facility under construction on Sept. 28.

Its first phase is expected to produce 14 million tons of chilled, liquefied natural gas per year for export by ship, almost equal the amount of gas used by Poland. An as-yet-unconfirmed second phase would double the plant's capacity. The business case for that "looks very compelling," said Jason Klein, chief executive officer of LNG Canada Development Inc., the global consortium led by Shell Plc that's behind the project. "We have substantially de-risked Phase Two by building Phase One."

Most of the gas will be sent to Asia but the added supply is expected to help Europe by displacing gas from other regions. The project has major advantages over production from the US Gulf Coast because it's so much closer to Asia and doesn't need to ship through the congested Panama Canal.

The partial use of hydropower to run the plant will help make it the lowest carbon-emitting LNG facility in the world, Klein said, a key attribute as Canada struggles to reconcile its climate ambitions with a world suddenly craving its fossil fuels.

Trudeau Environment Czar Counting On Carbon Capture and EV Push

Last month, Prime Minister Justin Trudeau told German Chancellor Olaf Scholz that he'll consider easing regulations to allow new natural gas export facilities to be built on Canada's east coast to ship LNG to Europe -- but stressed that the business case for first moving that gas from the west of the country, where it's produced, may be difficult. During the same visit, the two leaders signed an agreement for green Canadian hydrogen, with a similar 2025 timeline for export, that will be produced and shipped from the east coast.

Work on the 1,000-acre LNG Canada site in British Columbia is a global endeavor. In addition to Shell, the consortium includes Mitsubishi Corp., PetroChina Co. Ltd., Korea Gas Corp. and Petroliam Nasional Bhd.

Massive steel machinery, shipped from China, Indonesia and Europe, is being offloaded from ships and slowly rolled into position. A 50-meter (164 foot) high steel-and-concrete tank -- the second-largest in the world -- will store the super-chilled LNG until tankers ship it away.

The interior of the storage tank.

The project has weathered a number of hurdles in a country where dozens of LNG projects have been proposed and many canceled. The start of construction, in 2018, followed years of regulatory delays. In July, TC Energy Corp. raised the price tag of the pipeline that will supply the plant by 70% to C$11.2 billion ($8.2 billion) after Covid-19-related delays and indigenous protests slowed construction.

Although the pipeline won't achieve the returns it initially expected, TC Energy said discussions with LNG Canada for a second phase are "well advanced" and will allow the project to generate a "competitive" return.

LNG Canada and TC Energy quarreled over the rising costs but the dispute has been resolved. Klein declined to say how much LNG Canada's own share of the costs has gone up.

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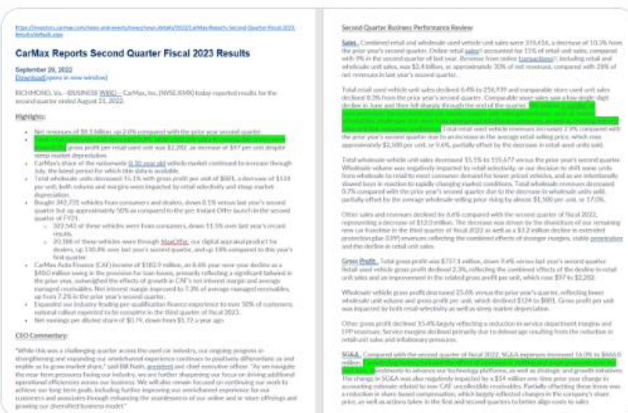
Danielle Bochove, Simon Casey

> **Dan Tsubouchi** @Energy_Tidbits · Jun 11
>
> #LNGCanada Phase 1 is 1.8 bcfd already sets up Cdn #NatGas supply squeeze like in US. >10% of BC/AB #NatGas supply 16 bcfd ie. like US #LNG exports now ~12 bcfd vs ~100 bcfd total supply. LNG Canada Phase 2 adds another 1.8 bcfd. Cdn nat gas looks very good thru 2030. #OOTT twitter.com/Energy_Tidbits...

2 6 16

Dan Tsubouchi @Energy_Tidbits · Sep 29

Near-term #Oil tone to stay impacted by real world slowdown. CarMax Q2 big miss from a number of macroeconomic factors "such as vehicle affordability challenges that stem from widespread inflationary pressures, as well as climbing interest rates and low consumer confidence" #OOTT



CarMax Reports Second Quarter Fiscal 2023 Results

September 29, 2022

Highlights:

CEO Commentary:

Second Quarter Business Performance Review

2 2 11

Dan Tsubouchi @Energy_Tidbits · Sep 29

1/2. Expected impact of protecting consumers from price. Last week, German households/businesses "well above average consumption of previous years" (1st Oktoberfest?) But now need to cut #NatGas consumption by >20% to avoid a gas shortage even if it gets colder. #OOTT

1 2 4

Dan Tsubouchi @Energy_Tidbits · Sep 29

2/2.Vs Germany industry getting creamed. How much of big German #NatGas industrial demand reduction turns into permanent demand destruction as DE moves from cheap piped RUS gas to #LNG. Aug industrial consumption -22% YoY, -30% vs 2018-21 average. #OOTT

Germany's Federal Network Agency
https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/DE/2022/20220929_Verbrauchsdaten.html?nn=265778

Gas consumption of households is increasing too much at the moment

President *Müller*: "We need sustainable savings efforts"

Edition2022
Release date29.09.2022
Starting today, the Federal Network Agency will publish weekly figures on gas consumption in Germany.

"The gas consumption of households and businesses in the last week was well above the average consumption of previous years. This week's figures are therefore very sobering. Without significant savings, even in the private sector, it will be difficult to avoid a gas shortage in winter. Although the last week was colder than the weeks of the previous year and the consumption is always snapshots and can change quickly, savings must take place even with further falling temperatures and this is not a matter of course," says *Klaus Müller, President of the Federal Network Agency*. "In view of the well-filled storage facilities, we can get through the winter well under three conditions: First, the projects initiated to increase gas imports must be implemented. Secondly, gas supplies in our neighbouring countries must also remain stable. And thirdly, gas must be saved, even if it gets even colder in winter. It will depend on each individual."

Gas consumption in Germany

While the gas consumption of households and businesses until mid-September was in some cases well below the average consumption of previous years, last week it was 483 GWh/week, well above the average value of the years 2018 to 2021 (422 GWh/week; +14.5 percent). Although the week was significantly colder than the same week in previous years, the savings required to avoid a gas shortage must be achieved regardless of temperatures. The Federal Network Agency currently assumes that a reduction in consumption of at least 20 percent is required to avoid a gas shortage.

Private households and smaller commercial customers are responsible for around 40 percent of gas consumption in Germany. So far, private consumers have contributed little to the decline in gas consumption. However, this is due to the fact that gas is mainly used for heating here. How much gas is actually saved will therefore only become apparent in the heating season that has just begun.

The large industrial customers need around 60 percent of the gas. The consumption of these large consumers fell by 22 percent in August and was also significantly below the average consumption of previous years last week (1170 GWh/week versus an average of 1679 GWh/week in 2018-2021).

Current data on gas supply

The Federal Network Agency publishes a status report on the gas supply from Monday to Friday. It also contains up-to-date data on gas imports and exports, storage levels, gas consumption and current price developments. The data are published here: www.bundesnetzagentur.de/aktuelle-gasversorgung

8 15

Dan Tsubouchi Retweeted

Dan Tsubouchi @Energy_Tidbits · Sep 29

2.5 million customers without power in Florida out of 11.1 million tracked by @PowerOutage_us. Hoping the best for Floridians on the Gulf Coast as they start to pick up after #HurricaneIan. Will need #Diesel for temp power. #OOTT

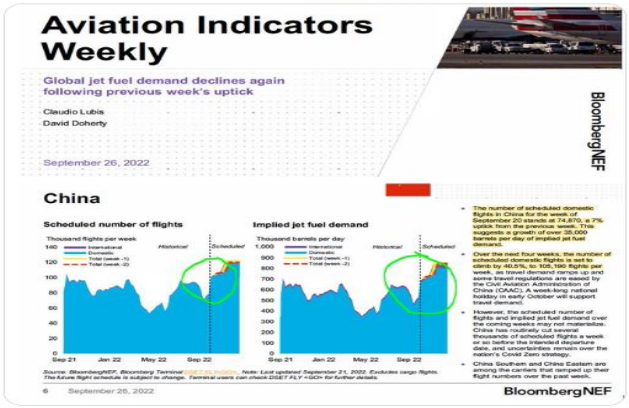
Electric Providers for Florida

Provider	Customers Tracked	Customers Out	Last Updated
Central Florida Electric Cooperative	33,657	1,492	2022-09-29 04:01:51 AM
Choctawhatchee Electric Coop	64,110	0	2022-09-29 04:01:55 AM
City of Tallahassee	105,408	0	2022-09-29 03:12:08 AM
Clay Electric Coop	186,532	20,590	2022-09-29 04:02:00 AM
Duke Energy	1,936,607	561,809	2022-09-29 04:00:04 AM
Escambia River Electric Coop	12,068	115	2022-09-29 04:01:55 AM
Florida Keys Electric Coop	33,509	0	2022-09-28 03:52:30 PM
Florida Power & Light Company	5,732,166	1,189,251	2022-09-29 04:01:59 AM
Florida Public Utilities	29,725	10	2022-09-29 04:02:06 AM
Fort Pierce Utilities Authority	28,872	3,544	2022-09-29 04:01:56 AM
Gainesville Regional Utilities	106,600	503	2022-09-29 04:01:58 AM
Glades Electric Cooperative	17,324	12,806	2022-09-29 04:01:57 AM
Gulf Coast Electric Coop	20,816	0	2022-09-29 04:01:54 AM
Jacksonville Electric Authority	509,949	4,939	2022-09-29 04:01:55 AM
Keys Energy Services	31,673	586	2022-09-29 04:01:50 AM
Kissimmee Utility Authority	90,000	12,332	2022-09-29 04:01:58 AM
Lake Land Electric	142,841	62,570	2022-09-29 04:02:05 AM
Lee County Electric Coop	219,084	203,164	2022-09-29 04:01:58 AM
New Smyrna Beach Utilities	29,942	15,482	2022-09-29 04:01:52 AM
Ocala Electric Utility	52,146	1,492	2022-09-29 04:01:59 AM
Okefenoke REMC	11,332	967	2022-09-29 04:01:30 AM
Orlando Utilities Commission	259,070	57,363	2022-09-29 04:01:55 AM
Peace River Electric Coop	55,257	48,345	2022-09-29 04:01:53 AM
SECO Energy	224,322	9,332	2022-09-29 04:02:05 AM
Suwannee Valley Electric Cooperative	27,963	46	2022-09-29 04:01:54 AM
Talquin Electric Cooperative	34,245	38	2022-09-29 04:01:56 AM
Tampa Electric	797,571	290,451	2022-09-29 04:02:05 AM
Tri-County Electric Coop	19,609	0	2022-09-29 04:01:53 AM
West Florida Electric	36,540	0	2022-09-28 06:52:27 PM

1 3

Dan Tsubouchi @Energy_Tidbits · Sep 28

China air flights +7% WoW to 74,870 flts in Sept 20 week. # of scheduled flts set to climb +40.5% to 105,190 flts over next 4 weeks. Incl 09/20 wk, would add ~300,000 b/d #JetFuel demand. See 👇 09/20 tweet, China airlines maybe knew something! Thx @BloombergNEF. #OOTT



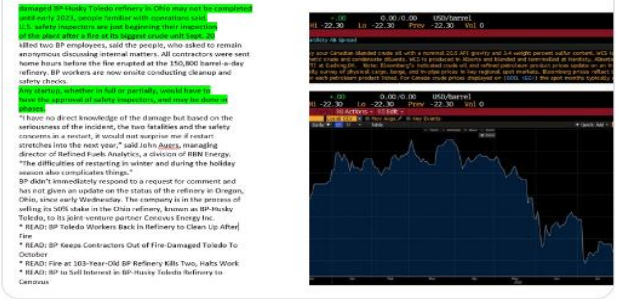
> **Dan Tsubouchi** @Energy_Tidbits · Sep 25
>
> China reopening. @ChloecLoNews reports tour group travel to Macau from mainland China to resume as early as Nov. See 👇 09/20 tweet, maybe the Chinese airlines knew something? #OOTT twitter.com/Energy_Tidbits…

1 12 37

Dan Tsubouchi @Energy_Tidbits · Sep 28

More indicators #BP Toledo 160,000 b/d refinery will be shut down for extended time. @LauraSanicola reports BP laid off most contractors according to sources indicating will experience a prolonged shutdown following last week's explosion and fire." #OOTT reuters.com/business/energ…

> **Dan Tsubouchi** @Energy_Tidbits · Sep 27
>
> #BP Toledo refinery shut down. @barbarajpowell8 reports repairing & restarting @bp_plc Toledo refinery "may not be completed until early 2023, people familiar with operations said." Negative to Cdn #Oil diffs, See 👇 WCS/WTI diffs hit ~$1.25 since 160,000 b/d refinery fire. #OOTT twitter.com/Energy_Tidbits…

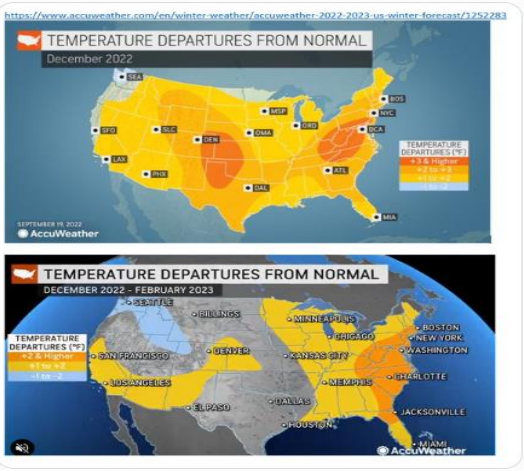

damaged BP-Husky Toledo refinery in Ohio may not be completed until early 2023, people familiar with operations said.
U.S. safety inspectors are just beginning their inspection of the plant after a fire at its biggest crude unit late on
killed two BP employees, said the people, who asked to remain anonymous discussing internal matters. All contractors were sent home hours before the fire erupted at the 150,800 barrel-a-day refinery. BP workers are now onsite conducting cleanup and safety checks.
Any restart, whether in full or partially, would have to have the approval of safety inspectors, and may be delayed
process.
"I have no direct knowledge of the damage but based on the seriousness of the incident, the two fatalities and the safety concerns in a restart, it would not surprise me if restart stretches into the next year," said John Auers, managing director of Refined Fuels Analytics, a division of IBN Energy.
"The difficulties of restarting in winter and during the holiday season also complicates things."
BP didn't immediately respond to a request for comment and has not given an update on the status of the refinery in Oregon, Ohio, since early Wednesday. The company is in the process of selling its 50% stake in the Ohio refinery, known as BP-Husky Toledo, to its joint venture partner Cenovus Energy Inc.
* READ: BP Toledo Workers Back In Refinery to Clean Up After Fire
* READ: BP Keeps Contractors Out of Fire-Damaged Toledo To October
* READ: Fire at 163-Year-Old BP Refinery Kills Two, Halts Work
* READ: BP to Sell Interest in BP-Husky Toledo Refinery to Cenovus

1 1 3

Dan Tsubouchi @Energy_Tidbits · Sep 28

Warm start to a warmer than normal winter 2022-23, @accuweather's 2022-2023 US winter forecast. A warm start to winter is not good for #NatGas prices, but global #NatGas #LNG shortage is pulling ~12 bcf/d of US gas production offshore. #OOTT

accuweather.com/en/winter-weat...

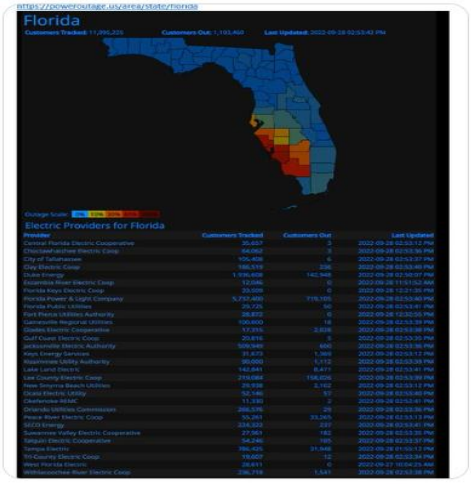


1 7

Dan Tsubouchi @Energy_Tidbits · Sep 28

1.1 million now with power in Florida and expected to go much higher in the aftermath. Hope some #Diesel can be quickly moved in to get some temporary power. And hoping our best for all our friends in Florida. #OOTT

poweroutage.us/area/state/flo...



Dan Tsubouchi @Energy_Tidbits · Sep 28

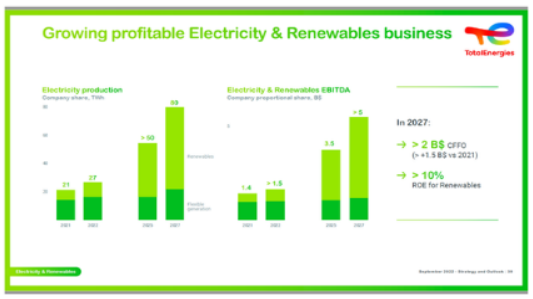
should have said #TotalEnergies just put the "for sale" sign up for next six months. Hard to believe many of their shareholders want spinco shares of a Cdn #OilSands company. #OOTT

> **Dan Tsubouchi** @Energy_Tidbits · Sep 28
>
> Another new public Cdn #OilSands company in 2023. #TotalEnergies spinco of Cdn oil sands to be voted at May 2023 shareholder meeting.2022 CFFO >$1.5b. #OOTT

1 2 2

Dan Tsubouchi @Energy_Tidbits · Sep 28

"Renewables, if you compete with others, you lose money! Okay, I said that, I declared it." says @PPouyanne. It's why #TotalEnergies is selective to ensure their renewables deliver >10% ROE ie. uses its advantage to farm-down, merchant, trading, to enhance returns. #OOTT



SAF Group created transcript of TotalEnergies CEO Patrick Pouyanne comments at TotalEnergies 2022 Strategy & Outlook webcast Sept 28, 2022 https://edge.media-server.com/mmc/p/npue3i5z

Any items in *"italics"* are SAF Group created transcript

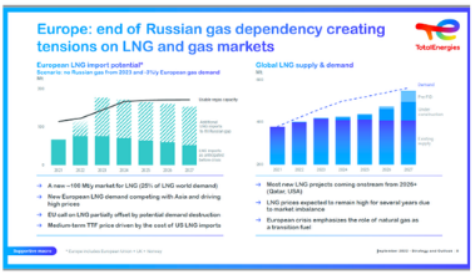
8:48. am MT. Pouyanne *"Renewables, If you compete with others, you lose money! Okay, I said that, I declared it." "I say to my colleagues, stop spending your time to go to this because we face competitions with financial institutions, when clearly I am not ready to pay NPV 4 or NPV 5."*

Prepared by SAF Group

1 5

Dan Tsubouchi @Energy_Tidbits · Sep 28

Common sense view. "my view is if we want to exit from this war and to find peace on this continent again, the #NatGas business will have to be part of the peace between RUS and EU" @PPouyanne. Thinks eventually 50 bcm (~5 bcfd) comes back of 150 bcf (~15 bcfd). #LNG #OOTT



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Any items in *"Italics"* are SAF Group created transcript

9:59 am MT. Pouyanne is asked if thinks some Russian gas eventual comes back and works back into Europe. PP, *"my view is if we want to exit from this war and to find peace on this continent again, the gas business will have to be part of the peace between Russia and Europe. But not as it was before. Not at 150 bcm, but I would not be not be surprised to see 50 bcm continuing to flow. Is it LNG, is it piped gas, I don't know. LNG offers more flexibility to everybody."*

Prepared by SAF Group

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Dan Tsubouchi @Energy_Tidbits · Sep 28

#TotalEnergies Namibia oil discovery might be a giant oil discovery. @PPouyanne "but I like to see the appraisal coming in order to be able to speak about it. But it seems to be quite a lot, a very large discovery, or giant one even!" #OOTT

SAF Group created transcript of TotalEnergies CEO Patrick Pouyanne comments at TotalEnergies 2022 Strategy & Outlook webcast Sept 28, 2022 https://edge.media-server.com/mmc/p/npue3i5z

Any items in *"Italics"* are SAF Group created transcript

7:57am MT. PP new oil projects slide 29. *"we have a natural decline in oil around 4 to 5%".* I would assume that still includes oil sands. *"And also we have in Namibia, it's only one well. I know there is a lot of excitement around this discovery, but I like to see the appraisal coming in order to be able to speak about it. But it seems to be quite a lot, a very large discovery, or giant one even."*

Prepared by SAF Group News & Insights – SAF Group

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Dan Tsubouchi @Energy_Tidbits · Sep 28

Another new public Cdn #OilSands company in 2023. #TotalEnergies spinco of Cdn oil sands to be voted at May 2023 shareholder meeting.2022 CFFO >$1.5b. #OOTT

8 11

Dan Tsubouchi @Energy_Tidbits · Sep 28

#TotalEnergies just posted #LNG slides for today's investor day. Not planning a quick restart to Mozambique LNG as NO volumes are included in LNG growth until AFTER 2027. #OOTT #NatGas

> **Dan Tsubouchi** @Energy_Tidbits · Sep 28
>
> 
>
> #TotalEnergies Mozambique LNG. See 👇SAF Sept 25 Energy Tidbits memo. Their country manager on potential restart of project said "visible signs of people coming back to the region but we are not there yet". Investor day starts in 10 min. #OOTT #LNG #NatGas

2 5

Dan Tsubouchi @Energy_Tidbits · Sep 28

#TotalEnergies Mozambique LNG. See 👇SAF Sept 25 Energy Tidbits memo. Their country manager on potential restart of project said "visible signs of people coming back to the region but we are not there yet". Investor day starts in 10 min. #OOTT #LNG #NatGas

Excerpt SAF Group Sept 25, 2022 Energy Tidbits Memo

Natural Gas – TotalEnergies says "not yet there" to restart its Mozambique LNG

Last week's (Sept 16, 2022) Energy Tidbits highlighted Mozambique President Nyusi's update on the security situation and "*"In this context, we expect that development activities will be resumed by the concessionaires of area 1," the consortium led by TotalEnergies and which suspended the construction of the gas liquefaction plant due to deteriorating safety conditions. Similarly, Nyusi advocated the final decision to invest in area 4, led by ENI and Exxon, "as soon" as possible."* The latest Cabo Ligado Weekly: 12-18 September 2022 was posted on Tuesday. [LINK] The weekly highlighted Nyusi's comments from last week. But interestingly, the weekly also had comments from TotalEnergies Mozambique country manager. Cabo Ligado Weekly wrote "*This recognition that there is still much work to be done was echoed by her colleague Stéphane Le Galles, Director of TotalEnergies' Mozambique, liquefied natural gas (LNG) project, who said there are "visible signs of people coming back to the region but we are not there yet." "The journey is long but the direction is very good," he concluded.*" Our Supplemental Documents package includes the Cabo Ligado Weekly.

A TotalEnergies restart sets in motion 5 bcf/d of Mozambique LNG

It is important to remember that a restart of TotalEnergies Mozambique Phase 1 is more than a restart of the 1.7 bcf/d for Phase 1 – it's really sets in motion 5.0 bcf/d of Mozambique LNG. This is why we have highlighting TotalEnergies force majeure on its Mozambique LNG Phase 1 for the past 17 months as the game changing event for LNG markets. TotalEnergies Mozambique Phase 1 at 1.7 bcf/d is significant, but our view has been because TotalEnergies delaying Phase 1 of 1.7 bcf/d is actually leading to a delay of 5.0 bcf/d. This was the reason why, on April 28 2021, we posted a 7-pg blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [LINK] We thought, and still think, there has been a major change to the outlook for LNG supply in the 2020s and one that is still being overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. We saw Total's April 27, 2021 announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d was much more significant that viewed. We just didn't see market focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow, and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022 at the earliest. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We had been warning that Mozambique has a major LNG market impact and its why we posted the April 28 blog. Its also why earlier we said that this is starting the clock running for other LNG projects wanting to go FID to make their mind up ie. like LNG Canada Phase 2. Our Supplemental Documents package includes our 7-pg April 28, 2021 blog.

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

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Dan Tsubouchi Retweeted

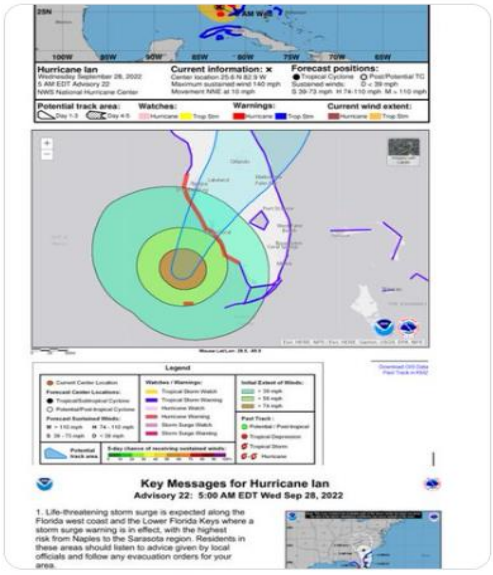
Dan Tsubouchi @Energy_Tidbits · Sep 28

unfortunately a good reminder more near term negative economic news. "but the problems evolving worldwide are just bubbling to the surface in a much more profound way over the last couple weeks" says @FerroTV to @lisaabramowicz1. #OOTT

1 2

Dan Tsubouchi @Energy_Tidbits · Sep 28

Hurricane Ian now Cat 4 at 140 mph. Movement slowed from 14 mph Mon to 10 mph Tues/Wed ie. stays longer over an area to do more harm. hope everyone in south Florida ca be safe. #OOTT



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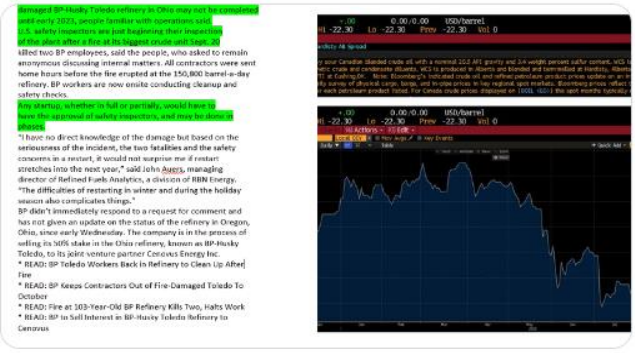
Dan Tsubouchi @Energy_Tidbits · Sep 27

#BP Toledo refinery shut down. @barbarajpowell8 reports repairing & restarting @bp_plc Toledo refinery "may not be completed until early 2023, people familiar with operations said." Negative to Cdn #Oil diffs, See 👇 WCS/WTI diffs hit ~$1.25 since 160,000 b/d refinery fire. #OOTT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* READ: BP Toledo Workers Back in Refinery to Clean Up After Fire
* READ: BP Keeps Contractors Out of Fire-Damaged Toledo To October
* READ: Fire at 103-Year-Old BP Refinery Kills Two, Halts Work
* READ: BP to Sell Interest in BP-Husky Toledo Refinery to Cenovus

Dan Tsubouchi @Energy_Tidbits · Sep 23

Sounds like @bp_America Toledo 160,000 b/d Refinery will down at least thru month end. Negative to Cdn #Oil differentials as Cdn crude supplies Toledo. Thx @barbarajpowell8. #OOTT twitter.com/Energy_Tidbits…

1 4 14

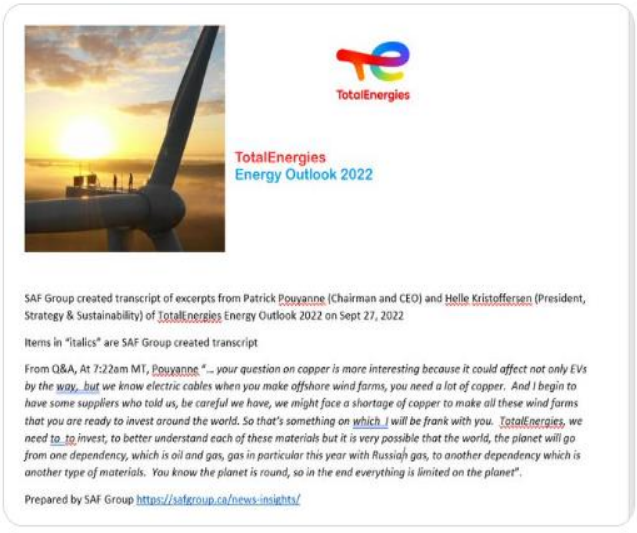
Dan Tsubouchi @Energy_Tidbits · Sep 27

Reality check. @PPouyanne if make Sustainable Aviation Fuel from all animal waste + all the municipal waste in the world, it is ~1/2 of SAF to decarbonize #JetFuel. See 👇 Delta Airlines CEO Bastian reminded SAF is 3-4x cost of jet fuel. Air travel will be $$$$. #OOTT

1 2 7

Dan Tsubouchi @Energy_Tidbits · Sep 27

Exponential growth in offshore #Wind is in all #CleanEnergy plans. @PPouyanne reminds a lot of #Copper needed for electric cables from offshore #Wind, some suppliers already warned might be facing copper shortage for offshore wind. #NatGas will be needed for longer. #OOTT



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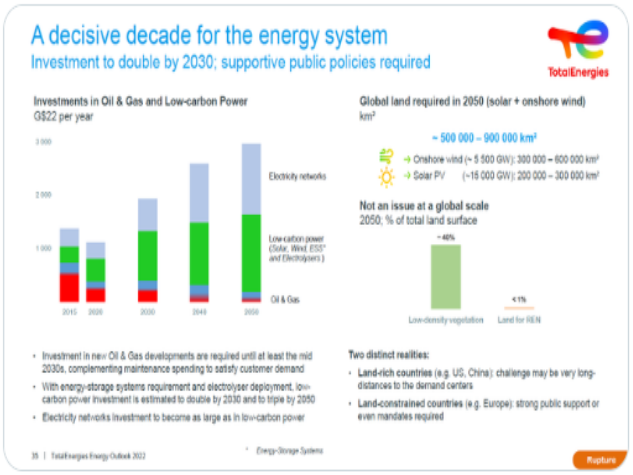
Dan Tsubouchi @Energy_Tidbits · Sep 27

It's only math! Here's why the cost of energy will probably double under #EnergyTransition - @TotalEnergies reminds need to keep spending on #Oil #NatGas to keep the lights on during transition & double the capex on low carbon to reduce emissions for the transition. #OOTT



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Dan Tsubouchi @Energy_Tidbits · Sep 27

If so, next questions.

Who did it?

If not false flag, what will Putin do?

#OOTT #NordStream #NatGas

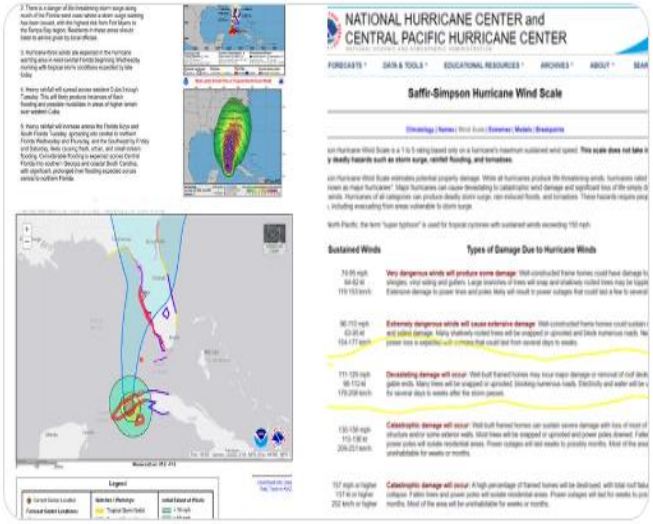
> **Jorge Liboreiro** @JorgeLiboreiro · Sep 27
>
> Danish PM Mette Frederiksen doesn't rule out sabotage as reason behind #NordStream leaks: "We cannot rule it out. It is too early to conclude yet, but it is an extraordinary situation, and there are three leaks. It is difficult to imagine that it could be accidental." twitter.com/JorgeLiboreiro...

3 1 8

Dan Tsubouchi Retweeted

Dan Tsubouchi @Energy_Tidbits · Sep 27

#Hurricanelan hitting western Cuba right now, still expected to hit around Tampa. Currently Cat 3 at 125 mph. Hope people can stay safe! #OOTT



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Dan Tsubouchi @Energy_Tidbits · Sep 27

Buckle up! No #NatGas coming to DE/EU on 5.3 bcfd #NordStream pipeline. "unprecedented" destruction, "impossible now to estimate the timeframe for restoring operations". Will need to keep #LNG to EU this winter. Thx @ja_herron. #OOTT

pipeline to Germany is "unprecedented" and it's impossible to say when flows could resume.

It's the clearest signal yet that Nord Stream flows won't resume this winter, after European Union leaders have repeatedly accused Moscow of weaponizing energy. Germany is probing the incidents in the Baltic Sea on the two idled Nord Stream gas pipelines from Russia, while Denmark steps up security on its energy installations.

"The destruction that happened within one day at three lines of the Nord Stream pipeline system is unprecedented," the operator of Nord Stream said Tuesday. "It's impossible now to estimate the timeframe for restoring operations of the gas shipment infrastructure."

The almost simultaneous pressure drop at the two lines of Nord Stream and one line of Nord Stream 2 can't impact gas supplies to Europe as the pipelines are idled amid Moscow's invasion of Ukraine. However, markets will be watching for any indications of sabotage.

Denmark's energy and climate ministry has registered gas leaks from both the Nord Stream 1 and the Nord Stream 2 pipelines in the country's and Sweden's exclusive economic zones in the Baltic Sea. The nation is strengthening security, it said.

Benchmark European gas prices climbed as much as 6.4% on Tuesday, after four days of losses.

--With assistance from Christian Wienberg and Lars Paulsson.

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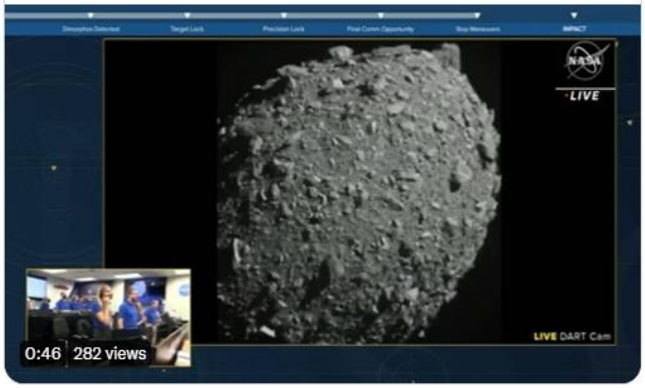
3 8 22

Dan Tsubouchi @Energy_Tidbits · Sep 26

ICYMI, #NASA #DART impact right on target. Great pictures of asteroid. Kudos to @NASA DART team!

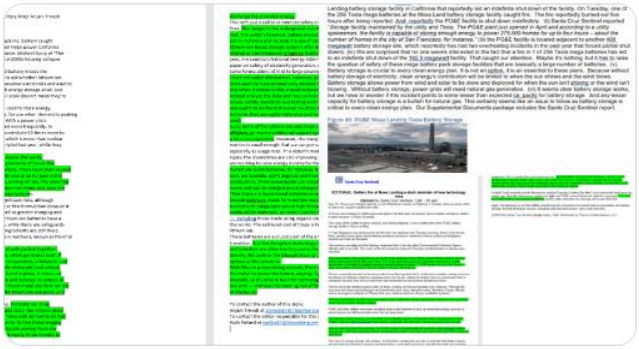
> **Anchors to Infinity, LLC** @ATI_LLC · Sep 26
>
> We Have Impact! > anchorstoinfinity.com/2022/09/26/bre...
>
> Credit: NASA Live Recording
>
> #NASADART #DART #Asteroid #Orbit #History



1

Dan Tsubouchi @Energy_Tidbits · Sep 26

Hmmm! #CleanEnergy plans assume large-scale lithium-ion battery storage is about to start exponential growth phase. Will PG&E Tesla mega-battery storage shut down be high enough profile to cause a rethink of that assumption? If so, bullish for #NatGas. Thx @anjani_trivedi. #OOTT

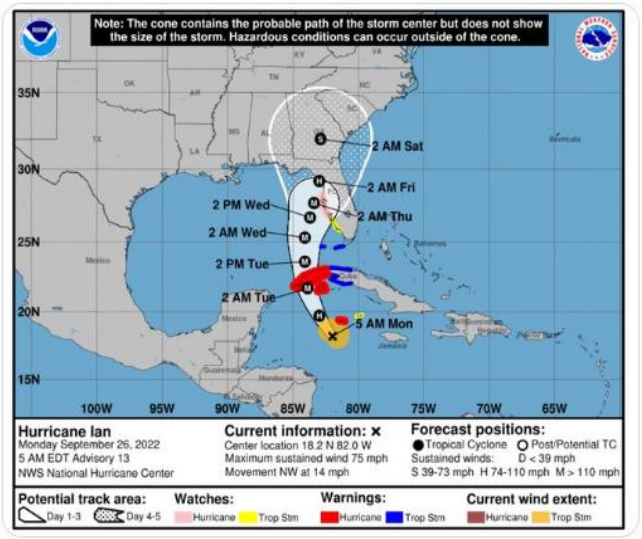


> **Dan Tsubouchi** @Energy_Tidbits · Sep 23
>
> 
>
> Must read! @scsentinel reports #PGE big Moss Landing battery storage shut indefinitely post fire at 1 of 256 Tesla mega batteries. Any risk to battery storage potential limits #Wind #Solar non-peak contribution & creates need for #NatGas. #OOTT ...

1 9 15

Dan Tsubouchi @Energy_Tidbits · Sep 26

Ian now #Hurricane strength. Still targets western Cuba and west coast of Florida. Also still east of major GoM offshore #Oil #NatGas fields, and of major Gulf Coast refineries, export terminals incl LNG. Hope everyone stays safe. #OOTT



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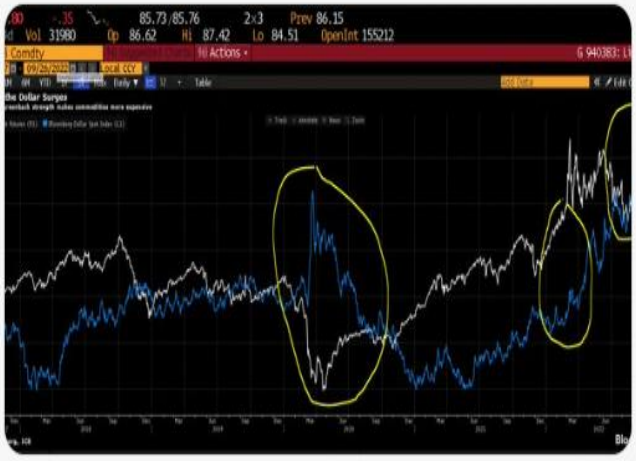
Dan Tsubouchi @Energy_Tidbits · Sep 26

Stronger US$ = negative to #Oil as drives up imported cost of #Oil. Also when there is global economic crisis, US$ becomes to go-to place to be & oil gets hurt ie. Covid in H1/20. Q3/22 global slowdown dominates, for now, tight global oil supply post RUS/UKR. #OOTT



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