Energy Tidbits

Sept 11, 2022

Produced by: Dan Tsubouchi

Does Ukraine Fighting Success Create a Remote Chance For a Return of Russian Natural Gas To Europe This Winter?

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

This week's memo highlights:

1. Big Ukraine advancements makes us wonder if there is a remote chance for a return of Russian natural gas to Europe this winter ie. big price risk? (Click Here)
2. France, Germany, UK finally come out with clear JCPOA position – no haggling with Iran, it's take it or leave it (Click Here)
3. Baker Hughes continues it very bullish LNG view and accelerated need for new LNG FIDs (Click Here)
4. Drought conditions cause suspension of water permits for some NE BC Montney drilling (Click Here)
5. Great thought piece from Deutsche Bank CEO ie. RUS/UKR "destroyed a number of certainties on which we build our economic system over the past decades (Click Here)
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

Dan Tsubouchi
Principal, Chief Market Strategist
dtsubouchi@safgroup.ca

Ryan Dunfield
Principal, CEO
rdunfield@safgroup.ca

Aaron Bunting
Principal, COO, CFO
abunting@safgroup.ca

Ryan Haughn
Principal, Energy
rhaughn@safgroup.ca

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Natural Gas – Natural gas injection of +54 bcf, storage now -222 bcf YoY deficit

The YoY storage deficit started the winter at -282 bcf YoY at Oct 31 and is now -268 bcf YoY. The EIA reported a +54 bcf build (+55 bcf expectations) for the Sep 2 week, which was below the 5-yr average build of +65 bcf, and above last year's injection of +52 bcf. Storage is 2.694 tcf as of Sep 2, decreasing the YoY deficit to -222 bcf vs -228 last week and is -349 bcf below the 5-year average vs -338 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -222 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (09/02/21)		Historical Comparisons: 5-year average (2017-21)	
Region	09/02/22	08/26/22	net change	implied flow	Bcf	% change	Bcf	% change
East	635	614	21	21	699	-9.2	735	-13.6
Midwest	776	747	29	29	838	-7.4	843	-7.9
Mountain	159	157	2	2	191	-16.8	191	-16.8
Pacific	238	241	-3	-3	243	-2.1	274	-13.1
South Central	887	881	6	6	944	-6.0	1,001	-11.4
Salt	182	185	-3	-3	209	-12.9	238	-23.5
Nonsalt	705	696	9	9	735	-4.1	762	-7.5
Total	**2,694**	**2,640**	**54**	**54**	**2,916**	**-7.6**	**3,043**	**-11.5**

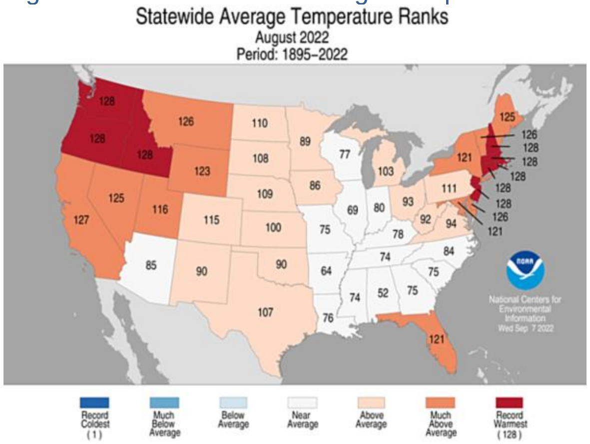
Source: EIA

Natural Gas – JJA was the 3rd hottest summer in the last 128 years in US

On Friday, we tweeted [LINK] "*Been a great summer for US HH #NatGas prices. Huge global #LNG prices flow back impact into US. And one of the best summers ever for heat driven #NatGas #Coal consumption in US. @NOAA says 3rd hottest Jun/Jul/Aug and 8th hottest Aug in last 128 years. #OOTT.*" On Wednesday, NOAA posted its recap of US weather for August [LINK]. August the 8th warmest in the last 128 years, and June/July/August as the 3dr hottest summer months in the last 128 years. Below is the NOAA's statewide average temperature maps for August 2022 and JJA.

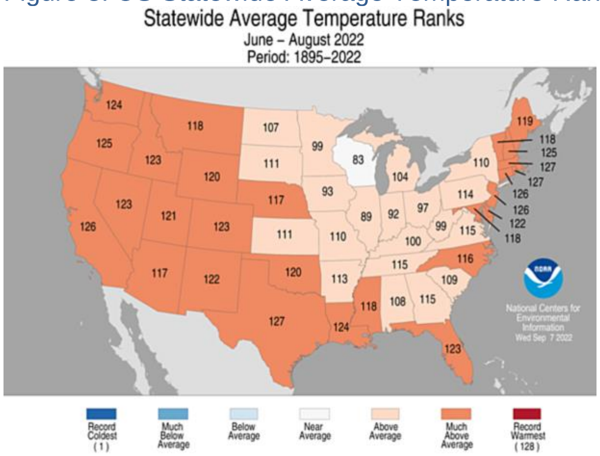
JJA weather recap

Figure 2: US Statewide Average Temperature Ranks August 2022



Source: NOAA

Figure 3: US Statewide Average Temperature Ranks JJA 2022



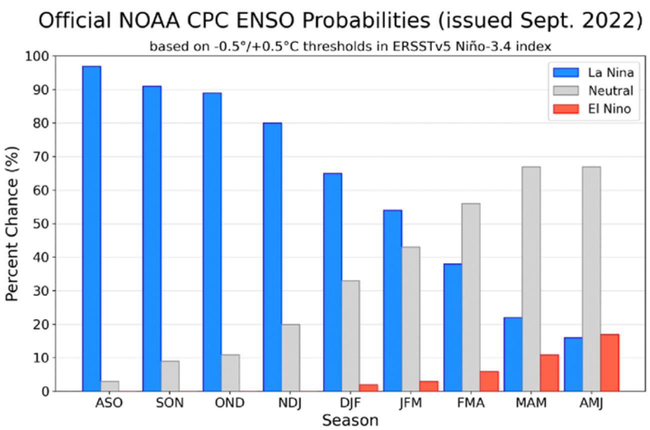
Source: NOAA

Natural Gas – La Nina/Normal conditions continue to support hurricane forecasts

La Nina/Normal for key ASO hurricane season

We are now about halfway thru the peak hurricane season from about mid Aug thru mid Oct, and it has been basically zero tropical storm/hurricane activity in the Gulf of Mexico. And this is in the face of forecasts for above average hurricane season. The CPC/IRI El Nino/La Nina outlook is issued on the 2nd Thurs of every month [LINK]. The new Sep forecast continue to show it will be a La Nina/normal set up for ASO, which is the peak period for Atlantic hurricane season. As we are seeing so far this summer, weather is never 100% in line with norms, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Below is the CPC/IRI official ENSO forecast.

Figure 4: Early-Sept NOAA El Nino/La Nina Outlook



Source: CPC/IRI

Natural Gas – Outlook also still calls for a La Nina/Neutral winter

Forecasts for La Nina winter

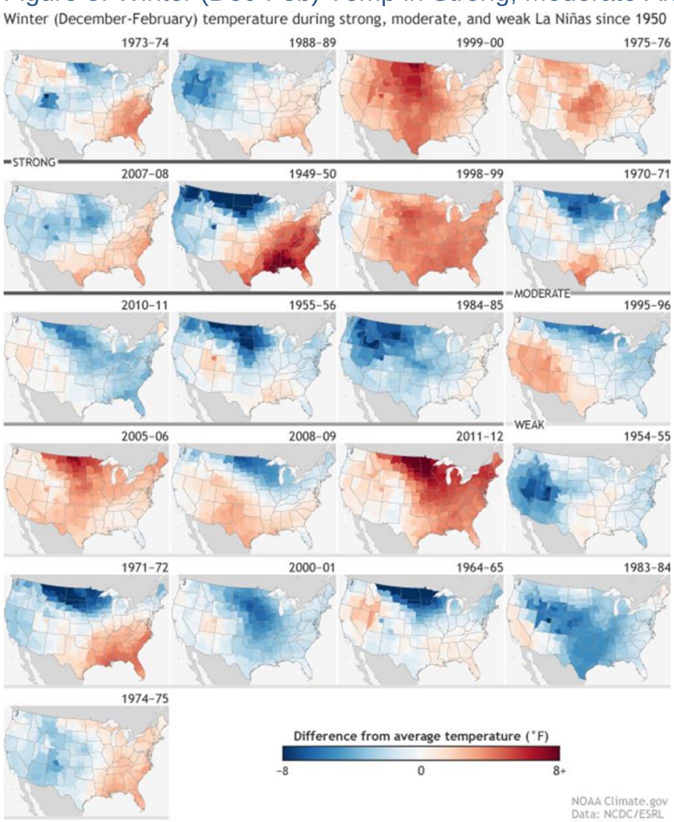
It's now less than 2 months away from the start of the Nov 1 winter natural gas season. So the weather focus for natural gas will soon be turning to winter and the peak Dec/Jan/Feb. The concern is always if its an El Nino winter that bring the risk (not 100% though) of a warm winter. This new probability forecast noted above still calls for a La Nina/Neutral winter and basically no expectation for El Nino conditions in DJF. Correlations are not 100% but the fear in El Nino winters is that it is warmer than normal. Whereas, La Nina winters are typically viewed more likely normal, however as noted below, La Nina winters can be warm.

Natural Gas – But La Nina correlations to cold winters are far from 100%

La Nina winters are unpredictable

La Nina winters are more often normal to colder than normal than a warmer winter. But we remind of an Oct 6, 2017 NOAA brief *"Temperature patterns during every La Niña winter since 1950"*, which looked at all La Nina winters from 1950 thru 2016/17, classified them as strong, moderate or weak La Ninas, and then showed the average winter (Dec thru Feb) temperature map. We checked this weekend and the link still works [LINK]. The bottom line is that it may slightly favor a normal to colder than normal winter, but there have some been near record high temperature La Nina winters. Below is the NOAA graphic.

Figure 5: Winter (Dec-Feb) Temp in Strong, Moderate And Weak La Ninas 1950 - 2017



Source: CPC

Natural Gas – EIA forecasts US gas production growth of ~3 bcf/d by year end 2022

The EIA released its monthly Short Term Energy Outlook Sep 2022 [LINK]. The EIA increased its 2022 and 2023 forecast for US natural gas production. ((i) The EIA's new forecast calls for ramp up in US growth from today, and it has been revised up slightly from last month's forecast. They forecast 96.9 bcf/d in Q2/22, up 0.9 bcf/d to 99.7 bcf/d in Q4/22, and then up another 1.00 bcf/d in a year to reach 101.7 bcf/d in Q4/23. That doesn't sound unreasonable given HH gas prices, but we remind all forecast models are based on assumptions. We think the next few months of actuals will be key to determining how much the US will grow its natural gas supply. We have been highlighting how US natural gas growth is only now getting back to Nov levels. The EIA's Q2/22 of 96.9 bcf/d is now above Q4/21 of 96.5 bcf/d. It's too early to assume the growth is in the bag, but we should get a better comfort level over the next few months if we start to see the ramp up in Q3/22. (iii) The EIA forecast shows US natural gas above the Q4/19 peak of 96.58 bcf/d, with Q4/22 US natural gas of 98.99 bcf/d (up 2.41 bcf/d from peak). (iv) For 2021, the EIA did not revise US natural gas production, which is flat at 93.55 bcf/d. (v) US natural gas production is expected to average 97.08 bcf/d in 2022 (96.59 bcf/d previously) and 2022 is up 3.52 bcf/d YoY. 2023 production estimates see Q1/23 production entering at 99.65 bcf/d (98.4 bcf/d previously) and exiting in Q4/23 at 100.67 bcf/d (100.51 bcf/d previously) for a 2023 average of 100.36 bcf/d. (vi) The EIA wrote *""Dry natural gas production has been rising relatively steadily since 1Q22, when it averaged 94.6 Bcf/d. We forecast U.S. dry natural gas production to average 99.0 Bcf/d in 4Q22 and then rise to 100.4 Bcf/d for 2023."* Our Supplemental Documents package includes excerpts form the STEO.

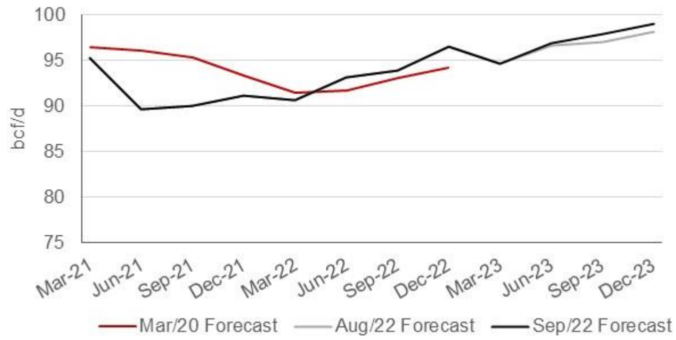
U.S. gas production +3.04 bcf/d in 2022

Figure 6: EIA STEO US Natural Gas Supply Forecasts by Forecast Month

bcf/d	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Sep-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.52	93.55	94.6	96.87	97.85	98.99	97.08	99.65	100.51	100.59	100.67	100.36
Aug-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.52	93.55	94.60	96.61	97.02	98.09	96.59	98.90	100.13	100.52	100.51	100.02
July-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.61	95.51	96.88	97.89	96.23	98.40	99.62	100.60	101.25	99.98
June-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.61	95.48	96.90	98.94	96.50	99.94	101.30	102.33	102.66	101.57
May-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.66	95.82	97.17	99.14	96.71	100.3	101.6	102.4	102.4	101.7
Apr-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.63	93.57	95.41	97.01	97.94	99.23	97.41	99.72	100.6	101.4	101.7	100.9
Mar-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.57	93.54	95.69	96.09	96.97	98.00	96.69	96.11	98.75	99.60	100.10	98.64
Feb-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.69	93.57	95.43	95.54	96.26	97.12	96.09	97.11	97.57	98.34	98.84	97.97
Jan-2022	95.29	89.59	89.99	91.14	91.50	90.59	93.15	93.89	96.33	93.49	95.94	95.55	95.96	96.69	96.04	96.71	97.13	97.89	98.45	97.55
Dec 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.01	95.59	93.32	95.22	95.35	96.1	97.21	95.97					
Nov 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.52	94.94	93.29	95.41	96.00	97.12	98.18	96.68					
Oct 2021	95.29	89.57	89.99	91.14	91.50	90.30	92.89	93.32	93.65	92.54	94.38	95.41	97.12	98.69	96.40					
Sept 2021	94.80	89.68	89.83	91.15	91.36	90.30	93.05	92.64	92.70	92.18	93.17	94.54	96.25	97.59	95.40					
Aug 2021	94.79	89.68	89.83	91.15	91.35	90.29	92.49	92.67	93.11	92.15	93.34	94.15	95.51	96.47	94.88					

Source: EIA STEO

Figure 7: EIA STEO US Natural Gas Supply Forecasts by Forecast Month



Source: EIA STEO

Natural Gas – EIA STEO forecasts Nov 1, 2022 storage to be down 236 bcf YoY

EIA STEO storage forecast

The EIA STEO also forecasts US gas storage. Its forecast is positive for natural gas. (i) Winter 2021/22. US gas storage started winter 2021/22 at 3.66 tcf, which was down -283 bcf YoY. But the EIA now forecasts end of winter (March 31, 2022) at 1.4 tcf, which is -395 bcf YoY and ~14% below the 5-yr average. (ii) Summer 2022. The EIA forecasts start of winter 2022/23 storage at 3.43 tcf, which is -236 bcf YoY. The start of 2022/23 winter forecast is -7% below the 5-yr average. This forecast has been increased due to the Freeport LNG shut-in. (iii) The EIA wrote *""U.S. natural gas inventories ended August at 2.7 trillion cubic feet (Tcf), which was 12% below the five-year average. We forecast that inventories will end the injection season (April through October) at more than 3.4 Tcf, which would be 7% below the five-year average."*

Figure 8: EIA STEO forecast US gas storage

	Storage	2016-2023				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,012.7	776.4	3,624.5	10.7%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,012.7	776.4	3,624.5	5.3%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,012.7	776.4	3,624.5	-10.7%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,012.7	776.4	3,624.5	3.8%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,012.7	776.4	3,624.5	8.4%
Mar 2021	1,800.6	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,664.6	4,012.7	348.1	3,838.6	-4.5%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,428.9	3,236.3	4,012.7	776.4	3,624.5	-5.4%
Mar 2023	1,564.0	1,184.9	2,486.3	1,301.4	1,835.6	-14.8%
Oct 2023	3,862.1	3,236.3	4,012.7	776.4	3,624.5	6.6%

Source: EIA

Natural Gas – EPA rejects Cheniere's request for a waiver on emissions

EPA rejects Cheniere's waiver

On Tuesday, we tweeted [LINK] *"#EPA rejects #Cheniere request. Feels like likely scenario will be staggered corrective shutdown by #LNG train. If so, not clear how much corrective time needed per train and if can be coordinated with a normal maintenance turnaround. #NatGas #OOTT*." Cheniere had requested a waiver on its exceeding emissions levels in their LNG projects and that was rejected by the EPA. As a result, Cheniere will have to comply and somehow reduce the emissions levels from its gas turbines. There has been no word yet on how and when it will be done. But, as in our tweet, we have to believe the Biden Administration doesn't shut down all of Cheniere's LNG at once. Rather, we would expect them to allow compliance on a train by train staggered basis. And, if so, we would expect Cheniere would try to coordinate with any planned maintenance to minimize any additional LNG supply downtime. On Tuesday, AP reported "*The Environmental Protection Agency on Tuesday denied a request by Cheniere Energy, a leading U.S. producer of liquefied natural gas, to exempt two Gulf Coast plants from a federal air pollution rule. An EPA spokesman says the agency on Tuesday denied Cheniere's request to waive a rule that limits emissions of cancer-causing formaldehyde released by gas-fired turbines. Dozens of turbine operators faced a Monday deadline to comply with the formaldehyde rule, which is being reinstated after an 18-year stay. "Controlling emissions of formaldehyde is important to protect public health. Though EPA is denying Cheniere's request for a special subcategory to comply with the turbines rule, the agency will continue to work with them and with other companies as needed to assure they meet Clean Air Act obligations," EPA spokesman Tim Carroll said in an e-mail Tuesday. Cheniere, the largest LNG exporter in the U.S., had warned that new requirements on LNG plants in Texas and Louisiana could disrupt gas supplies to Europe, which has struggled with surging energy prices following Russia's invasion of Ukraine. In a statement Tuesday, Cheniere said it strongly disagrees with EPA's decision but will work with state and federal regulators to "develop solutions that ensure compliance" with the hazardous-pollution rule. "Our conviction remains that these emissions do not pose a risk to public health, our workforce or the environment," company spokesman Eben Burnham-Snyder said in an email. "Although this decision may result in unwarranted expenditures, we believe that the steps needed to come into full compliance will not result in a material financial or operational impact. and that we will be able to continue to reliably supply LNG to customers and countries around the world."* Our Supplemental Documents package includes the AP report.

Cheniere's EPA emissions issue became public in July

The Cheniere EPA emissions issue became public in July. Here is what we wrote in our July 10, 2022 Energy Tidbits memo. *"Does Biden dare shut in Cheniere's 5.9 bcf/d LNG for emissions reasons. There was a great Reuters scoop on Friday "Exclusive: Top U.S. LNG producer Cheniere asks Biden admin to drop pollution rule" [LINK] that the title didn't necessarily reflect the potential huge impact on global, including US and Canada, natural gas and LNG markets. It's why we immediately tweeted [LINK] "Does #Biden dare shut in #Cheniere 5.9 bcfd #LNG in whole or staggered basis to force compliance to emissions? Would doom EU to #NatGas shortage & more massive prices, hammer US HH price. Or exempt for now & push supply interruption down the road? Great scoop @ValerieVolco! #OOTT". We believe the report raises the risk of a temporary shut-in or staggered by train temporary shut-in of Cheniere's 5.9 bcf/d LNG capacity. And if there is any shut-in, the impact would be huge given what happened to LNG, TTF, HH and AECO prices with the temporary shutdown of Freeport LNG's 2.2 bcf/d capacity. Cheniere's LNG export capacity is 5.9 bcf/d. Sabine Pass has six trains with ~30mm tpa or 3.95 bcf/d. Corpus Christi has three trains with ~15mm tpa or 1.97 bcf/d. We don't know who leaked the report, but we have to wonder if someone wanted to leak it to make sure there was an* *environmental push on Biden to not cave in and give Cheniere a waiver. Cheniere's natural gas turbines in all of its LNG trains put Cheniere offside emissions, so have asked for a waiver to comply. This wasn't an issue pre Biden, but in Feb 2020, the Biden admin removed the exemption for natural gas turbines from these emissions limits. The question is if Biden will give an exemption to Cheniere in the face of the global gas crisis and need for US LNG on global markets? Or will he hold Cheniere to the same emissions levels as others? If not, the turbines would have to be retrofitted. The below Reuters report says Cheniere reportedly said it would take several years to do so. That seems way too long. Although there is no question supply change issues would be adding months or a year, maybe more? We have just seen how Germany has been asking Canada to return the Siemens turbines so Russia won't have any excuse on resuming Nord Stream volumes. Can you imagine the pressure from Germany, France and others to make sure Cheniere isn't shut-in with the panic to try to fill storage and the need for US LNG all winter? It would be very tough to shut it in and still expect the EU partners to stay firm on Russia sanctions. If Cheniere is cut off for some period, it would lead EU to not longer worry about a shortage and a massive EU energy crisis, but to move to a shortage plan. And of course, Putin would love it. Environmentalists in the US would, if anything, see a win to the US in terms of impact on inflation. Force more US natural gas to stay within the US would lead to much lower HH gas prices. However, we should at least consider the potential for some sort of shut in. Again, think about what happened with Freeport LNG shut-in. If he doesn't give an exemption, in light of the EU crisis, we have trouble believing they would force a full shut down of Cheniere. Rather, I would expect to see some sort of short time to start implementing and more of a staggered temporary shut down on a train by train basis. Maybe if it is a staggered train by train basis, then the impact on prices would be smaller. But is there any other choice? And then we have the added issue of the mid-terms in less than four months. It's a big dilemma for Biden."* And "*We still wonder who leaked the report. Was it some anti fossil fuels Democrat who wanted to put Biden on the spot to pressure him to not give into fossil fuels? Or who? Regardless, we have to believe the Europeans will be putting huge pressure on Biden to kick the can down the road on Cheniere being offside the emissions limits. But now that this has raised its public profile, we have to believe there will be a needed retrofit someday, if not now. And we would still believe the most likely scenario would be some sort of staggered by train retrofit to ensure high level of LNG capacity is on line. Similar to what Australia did with Gorgon LNG on a staggered by train fix. So unless Biden gives a permanent pass to Cheniere, this will add some positive impact to mid term LNG and TTF prices and a negative impact to HH gas prices. Conceptually like seen with the Freeport LNG shutdown. But if it can be done on a train by train basis, the impact will be about 1/4 the impact of Freeport LNG."* And hopefully, they can coordinate with maintenance to minimize any impact.

Natural Gas – Some NE BC fracking/completion delays due to drought

NE BC drought conditions

There should be some delays in NE BC fracking/completions due to continuing drought conditions in parts of NE BC. There is no indication how long this will last or which companies will be impacted. Normally, the most precipitation is in June/July/Aug so hopefully there will be more than normal in Sept/Oct. It is important to note that there may be local exemptions within the broader restrictions. On Wednesday, the BC Oil and Gas Commission issued its DIR2022-02 notice [LNK] "*Peace and Liard watersheds join Nicola Basin in Suspension of Water Diversions",* which said "*The BC Oil and Gas Commission (Commission) is requiring the oil and gas industry to immediately suspend all previously approved water diversions under Section 10 of the Water Sustainability Act, due to drought conditions. This includes rivers, streams and lakes in the following basins within the Peace River and Liard River watersheds."* The BCOGC directive also said "*Given local variability, it is possible some streams in the areas under suspension will have recovered sufficiently to allow some water withdrawal. The Commission will review new applications for diversion, or requests to use existing approvals, on a site-specific basis.*" Our Supplemental Documents package includes the BCOGC directive.

Natural Gas – Will we see Shell FID LNG Canada Phase 2 in September?

When will Shell FID LNG Canada Phase 2?

The following item in today's memo is on Baker Hughes extremely bullish view of the needed FIDs for LNG supply project. We have been big believers, and long before Russia invaded Ukraine, that Shell would FID the 1.8 bcf/d LNG Canada Phase 2 in 2022. We now have less than three weeks until the end of September to see if our view that the likely time period for Shell to FID the 1.8 bcf/d LNG Canada Phase 2 would be in September ie. a timing similar to when they FID LNG Canada Phase 1. We do not believe any FID would roll into the Q3 earnings release on Oct 27. We have not seen any specific Shell comments on LNG Canada since their Q2 earnings call on July 28. At that time, Shell specifically said that no LNG Canada Phase 2 FID decision was "imminent" and we wrote that we couldn't believe that didn't mean anything more than a few months ie. in line with our Sept expectations. Here is what we wrote in our July 31, 2022 Energy Tidbits on Shell's imminent comment. "*Shell held its Q2 call on Thursday, slightly before the TC Energy Q2 call. (i) It seemed like Shell was showcasing LNG Canada at first so no one would be surprised if a FID for Phase 2 happened in something like Sept (same time of year as Phase 1 FID). However, at 8:40am MT Shell CEO Van Beurden tried to throw some cold water on the timing for any FID. At 8:40am MT, Van Beurden was asked about pre FID LNG projects and said 'we have actually quite a big program going on at the moment. We are right in the middle of building the LNG Canada project, a very large project, and you are right, Henry, we see also potential to do a 3rd and a 4th train but that is not an imminent FID. We want to first of all, of course, finish trains 1 and 2." He seemed to try to put listeners to a FID in a couple years and not a couple months. We find that timing unrealistic as that would mean that LNG Canada would have released a lot of services and people only to then re-engage. The advantage of brownfield costs is to have a continuous construction cycle. (ii) Rather we think he was trying to deflect the attention as they go through their final FID decision making. TC Energy said they are working with LNG Canada on the FID process right now. (iii) Prior to this, we felt Shell was showcasing LNG Canada. (iv) At 8:28am MT, CEO Van Beurden talked about participating in US Gulf Coast as an offtaker and then said "but to invest, I'd much rather bet on the AECO vs the JKM delta than the Henry Hub to Europe at this point in time. For the long run, I believe that is a better bet for us to invest in, but it doesn't mean we wouldn't participate as an offtaker in North American projects." This certainly felt like a set up comment for a future FID on LNG Canada Phase 2. (v) At 8:31am MT, CEO Van Beurden said "But having said that though, I'm very mindful of the fact that we cannot continue to grow the LNG by without decarbonizing it either. So therefore, we have a very clear philosophy that whatever project we undertake so we built the assets, which is of course the portion of the value chain that could be at risk if all* *of a sudden, there is no carbon budget for it anymore. Whatever we build needs to be carbon competitive and therefore we are pursuing projects like LNG Canada and the projects that we are pursuing on top of it need to be having even better carbon credentials. Because the risk is indeed there, the risk to reality is going to be that when we get to net zero, we have to have indeed a reduction in LNG carbon intensity and then LNG itself as well." (vi) We appreciate CEO Van Beurden's approach but can't believe his comment that any FID on LNG Canada Phase 2 not being imminent is anything more than a few months.*"

Natural Gas – Baker Hughes keeps its hugely bullish LNG capacity demand forecast

Hugely bullish LNG view by Baker Hughes

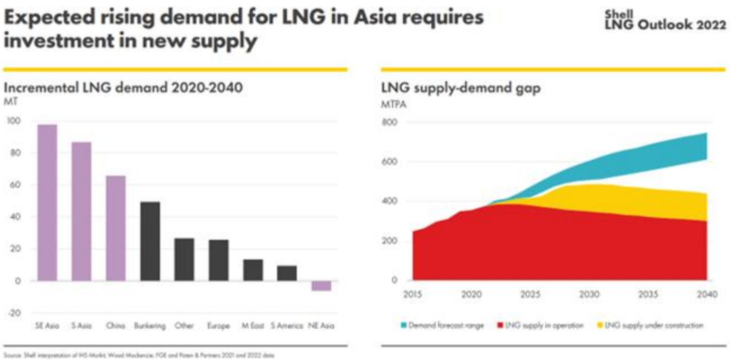
There is no other way to describe it but to say Baker Hughes is continuing its hugely bullish view for LNG and the need for massive LNG export FIDs over the next 3 years. Baker Hughes also highlights the need to accelerate the pace of LNG FIDs ie. need more FIDs sooner than later on LNG supply. On Tuesday, Baker Hughes spoke at a US sell side conference after being at the big Gastech conference in Milan on Monday. In the Q&A, mgmt. replied "*Definitely. And just so everybody knows in the room, it's just because of Dave that I actually left Milan yesterday evening from Gastech to be here today. And all the conversations yesterday at Gastech were all around the acceleration of LNG projects and imminent FIDs that are being explored. When you look at U.S. LNG as well as global LNG, we still firmly see that 800 MTPA by 2030, if not above that. I can say that, again this crisis has just accelerated the pace at which we need to bring LNG FIDs."*

Baker Hughes 800 MTPA LNG forecast from Q1 call on April 20

The Baker Hughes forecast for 800 MTPA (105 bcf/d) LNG capacity is not new. Rather they highlighted this in their Q1/22 call on April 20. Our April 24, 2022 Energy Tidbits memo was titled "*Baker Hughes' Hugely Bullish LNG Forecast Calls For 24 Bcf/d of New LNG FIDS by 2025 to Meet 2030 Required Capacity*." Here is what we wrote in our April 24, 2022 Energy Tidbits memo. "*There is no other way to describe it but to say Baker Hughes has a hugely bullish view for LNG and the need for massive LNG export FIDs over the next 3 years. We were on the Bloomberg terminal and missed the first 10 minutes of the Baker Hughes Q1 call on Wednesday morning, but jumped on the call as soon as we saw the headlines coming across the terminal on CEO Simonelli's opening comments. We had to tweet [LINK] "LNG growth is hugely more than expectations. On @business "Baker Hughes CEO Says Global LNG Capacity Will Exceed 800 MTPA By End Of This Decade". That's 105 bcf/d capacity. Recall Shell's LNG Outlook 2022 on 02/21 forecast #LNG demand of ~92 bcf/d in 2040. #LNGCanada #OOTT." Fortunately, we had recorded the call so was able to make a quick transcript and attach it to our followup tweet [LINK] "Must read transcript 👇. Huge #LNG growth fcast by #BakerHughes @simonelli_l. LNG capacity in 2030 >105 bcfd less current cap 61 bcfd less under construction 20 bcfd = FIDs needed by 2025 of 24 bcfd. Surely Shell will FID #LNGCanada Phase 2? Big plus to Cdn #NatGas. #OOTT". Baker Hughes sees the need for 24 bcf/d of LNG export FIDs by 2025 to meet their forecast. Here is the transcript we created of Simonelli's comments/ At 2:45 min mark. Simonelli "Recent geopolitical events have severely constrained what was already a tight global natural gas market and have refocused the world on the importance of energy security, diversity, and reliability. As the world reacts to the rapid changes in the global commodity market, governments are prioritizing natural gas and LNG as a key transition and destination* *fuel. We continue to see a focus on prioritizing LNG from stable, lower cost markets, and locations that can provide cleaner LNG. Given the current LNG price environment and the quickly changing dynamics, we believe that global LNG capacity will likely exceed 800 MTPA by the end of this decade to meet growing demand forecasts. This compares to the current global installed base of 460 MTPA and projects under construction totalling almost 150 MTPA. In order to be operational by 2030, this additional capacity will need to reach FID by around 2025." Note Simonelli is referencing capacity and not LNG demand. A higher level of capacity is always needed to meet certain levels of demand. This is a hugely bullish LNG forecast from the company that is likely the most plugged into what is happening on LNG export project planning and discussions. Our tweet highlighted LNG Canada Phase 2, which as readers know we have been bullish on the potential for Phase 2 FID in 2022 and still expect to see it happen."*

Baker Hughes LNG forecast for 2030 is about the same as Shell's for 2040
Here is another excerpt from our April 24, 2022 Energy Tidbits memo. "*Our tweets tried to put in perspective the Baker Hughes LNG forecast. Baker Hughes forecasts LNG capacity needed of 105 bcf/d by 2030. That is capacity, so it probably links to a LNG demand forecast of 90 to 95 bcf/d assuming an average across the board throughput of 85-90%. Shell had its LNG Outlook 2022 on Feb 21, 2022 and forecast LNG demand of approx. 92 bcf/d but for 2040. So Baker Hughes has about the same LNG demand forecast, but 10 years earlier than Shell. Below is Shell's LNG forecast.*

Figure 9: Shell LNG Outlook 2022 – Feb 21, 2022



Source: Shell

Natural Gas – Another long-term LNG deal, Commonwealth 20-yr deal with Woodside

Another long term LNG deal

The rush continues for LNG buyers locking up long term LNG supply as there has been 11.76 bcf/d of long-term LNG supply locked up since July 1, 2021. We say continues because it started in July 2021 and was well underway before Russia invaded Ukraine. But no question it accelerated post the invasion. Our March 13, 2022 Energy Tidbits memo noted Europe's plan to move away from Russian pipeline natural gas and LNG is a global game changer for energy for at least the 2020s. We were already seeing clear signals of the bullish LNG for 2020s call since the end of June 2021 with the abrupt shift of Asian LNG buyers to long term contracts. Now, with Russia, the rush continues and from more than Asian LNG buyers. There continues to be a consistent news flow of more long-term LNG supply deals, especially for the quickest to market LNG from the US Gulf Coast. On Monday, Commonwealth LNG announced [LINK] it entered into a 20-yr deal to supply Woodside Singapore with 0.33 bcf/d from Cameron Parish with first deliveries expected as early as 2026. Our Supplemental Documents package includes the Woodside release.

FOB in Gulf Coast is attracting major LNG suppliers to buy US LNG

The Woodside release reinforced one of the big LNG market changes in 2022 - major global LNG suppliers have stepped up as buyers of US Gulf Coast LNG to add to their portfolio. We have seen Chevron, Equinor, Exxon, Shell and Vitol step to do so in 2022. This is for two reasons: taking the LNG FOB in the Gulf Coast allows these global LNG players to take advantage of the global arbitrage in LNG and natural gas markets, and it gives them flexibility of supply to other LNG in the event of unplanned LNG supply outages. Woodside's release said "*the agreements secure for Woodside low-cost LNG volumes in the Atlantic Basin in a period of expected strong demand as Europe seeks alternatives to Russian pipeline gas*". On Wednesday, there were some replies to our LNG tweets and we replied [LINK] "*agreed. FOB in the Gulf Coast has also brought the global LNG players to want to add US Gulf Coast to their portfolio. especially since they get hit by LNG supply interruptions in their existing supply*." One of the major LNG stories of the past year has been LNG supply outages such as Chevron's Gorgon LNG and Shell's Prelude FLNG.

Asia is still well in front of Europe in securing long term LNG supply

Our March 13, 2022 Energy Tidbits memo noted that Europe LNG buyers were starting 9 months behind the wave of Asian LNG buyers who started to lock up long term LNG supply starting in July 2021. The LNG supply crunch is not a 2022 development. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much* *bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas."* Our Supplemental Documents package includes our April and July blogs.

There have been 11.76 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 11.76 bcf/d of long term LNG deals since July 1, 2021. 64% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. And as seen in the Shell deal this week, major LNG supply companies like Chevron, Equinor, Exxon, Shell and Vitol are locking up long term LNG supply to add to their portfolios for LNG supply to others. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

Figure 10: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country Buyer / Seller	Volume (bcf/d)	Duration Years	Start	End
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sept 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.20	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
July 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
July 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
July 26,2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
July 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
September 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**7.63**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
March 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
March 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
March 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.67	15.0	n.a.	n.a.
June 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
June 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
June 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.18	20.0	n.a.	n.a.
June 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
June 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
July 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
July 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
August 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
August 24, 2022	Shell	Energy Transfer	US/US	0.28	20.0	2026	2046
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**4.14**			
Total New Long Term LNG Contracts since Jul/21				**11.76**			
*Excludes Asian short term/spot deals							
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period							
Source: Bloomberg, Company Reports							

Source: Company reports, SAF Group

Natural Gas – Last minute delays in 1st LNG from Eni's Mozambique Coral FLNG

ENI FLNG offshore Mozambique

There were last minute delays at Eni's Mozambique 0.45 bcf/d Coral FLNG that are causing a delay to first LNG cargos. BP has the exclusive right to take all of the LNG supply. In early August, BP's British Mentor LNG tanker had signaled Coral South FLNG as its destination, arriving in the proximity on Aug 26, and then the LNG tanker sailed away after changing its destination to Oman. On Aug 28, Energy Intelligence reported [LINK] "*Mozambique's Coral South floating LNG plant is understood to have suffered technical issues, which could delay the start-up of the project, potentially further squeezing an already tight global LNG market.*

"Serious issues [were] reported at Coral FLNG with one critical distillation column (demethanizer) suspected of having internal damage. Shutdown is required for inspection and repair, which will delay the start-up schedule by several days, if not weeks," a source told Energy Intelligence." As noted above, BP sending the LNG tanker to Oman would signal that any issues weren't going to be fixed in a matter of days, otherwise they would have left the tanker waiting in Mozambique. We keep looking for comments from Eni or BP as to the delays or how long it will take for any repairs, but we have seen no such reports. Our Supplemental Documents package includes the Energy Intelligence report.

Eni hopes to FID in 2023 a 2nd FLNG for offshore Mozambique

Eni is focusing on small scale FLNG like Coral South FLNG as a key to their LNG supply strategy with short times to get to first LNG cargos. So unless there is a fundamental design flaw with the FLNG, we wouldn't expect to see this delay cause any change to this small scale FLNG strategy. Here is what we wrote in or Aug 7, 2022 Energy Tidbits. "*On Tuesday, Bloomberg interviewed Eni COO Guido Brusco, who advised that Eni is looking to move ahead with its second FLNG vessel offshore Mozambique as a way to develop more of the massive offshore Mozambique natural gas. This is in the Exxon operated block that has had its massive Rozuma LNG 2.0 bcf/d Phase 1 delayed due to the onshore violence that delayed TotalEnergies Mozambique LNG. Eni and Exxon are in the process of having 1st LNG cargos in Q4/22 from the Eni operated Coral FLN G in the Rozuma block. Bloomberg reported "If Eni decides to proceed by early 2023, output could begin even before TotalEnergies SE's $20-billion onshore project that abruptly halted construction last year due to security issues." Eni made it clear that, before any FID, they would need to have to have agreement with their partners – Exxon, CNPC and Mozambique state owned Empresa Nacional de Hidrocarbonetos. Eni looks at FLNG as an addition to develop the natural gas. Bloomberg wrote ""I believe that to fully develop Mozambique's considerable gas resources, the right decision is to move toward both an onshore concept and an offshore concept," Brusco said."*

Eni highlighted a 2nd Mozambique FLNG in the Q2 call

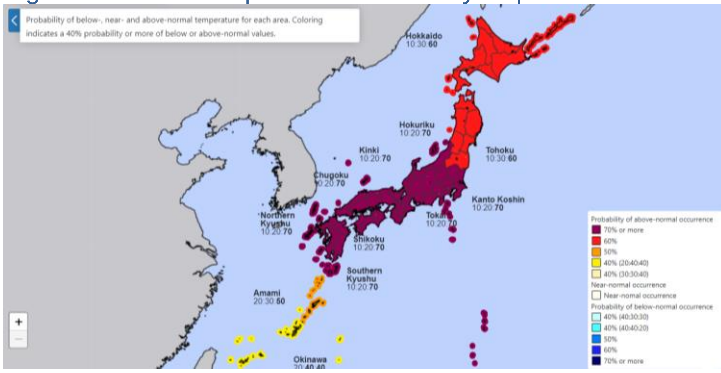
Here is what we wrote in our July 31, 2022 Energy Tidbits on this FLNG potential offshore Mozambique. "*There was an interesting Eni comment in the Q&A of the Q2 call on Friday with respect to their proposal to Exxon to move to or include small scale floating LNG (FLNG) in the offshore Mozambique lands. Eni is a partner in the big offshore Exxon Rozuma LNG 2.0 bcf/d Phase 1 that has been held up by the violence onshore Mozambique. Rozuma is to follow TotalEnergies Mozambique LNG, which put its project on hold in April 2021 due to the security situation. Eni's operated Coral FLNG, offshore Mozambique, has not been impacted by the onshore violence and is on track for its first cargo in late 2022. In the Q2 Q&A, Eni suggested moving to small scale FLNG with each FLNG capacity of 2.5 to 3.0 mtpa or 0.33 to 0.39 bcf/d ie. each about 1/5 the size of the Rozuma LNG Phase 1. In the Q&A, mgmt. said "So we are discussing, you know that we are working on the onshore, and in our joint venture, in our Company's with Exxon and the other company in charge of the upstream, and the offshore. Clearly, we are discussing, we are proposing a possible additional offshore development through LNG. The same fast LNG that we are developing in Congo's, so something that is very fast, as more size* *that we can replicate size that can range between 2.5 million ton and 3 million ton per year. So that is something that is on the table we are discussing. I can say that among our partners, there is a positive view, but we have to wait for final approval but that clearly an easy way to go faster and develop LNG in Mozambique. We have a huge amount of reserves there, its in our block we have about 80 test, so you can imagine that is the moment. So we are really focused and determined to go through these developments. For onshore, onshore is not in our hand, clearly is in the hand of Exxon, the big train, all the engineering and everything has been done. I think that is just a question to understand if we find a reasonable security condition to develop this activity. But if we think about small size, I seen that the offshore, we demonstrate*

Natural Gas – Continued warm weather to end the summer in Japan

Still above normal temperatures in Japan

It's been a hot summer in Japan and the warm temperatures are forecast to continue for the balance of September. The Japan Meteorological Agency (JMA) continues to expect warmer than normal temperatures to end September. But, because it's September, it means that much warmer than normal temperatures are not in the 30's, but high 20's ie. warm but not blistering hot and humid. AccuWeather forecasts daily highs for Tokyo for the next two weeks to be range from 27c to 30c. But anyone who has been in Japan in September knows it is humid so there weather is still expected to be a positive for power demand. The Japan Meteorological Agency posted its September 10 to October 9 weather forecast [LINK] calling for much warmer than normal temperatures. Note the below map is for the next month, but the maps for each of the next two weeks is the same depicting hot weather.

Figure 11: JMA Temperature Probability Sep 10 to Oct 9



Source: Japan Meteorology Agency

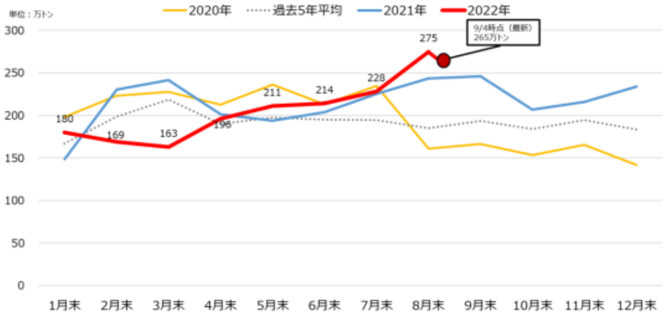
Natural Gas – Japan's LNG stocks up +0.1% from last week

Japan LNG stocks +0.1% WoW

The risk for Japan in the winter is that they need full storage and continued LNG imports to avoid natural gas outages. That's because Japan's LNG stockpiles are not huge relative to LNG imports that have ranged from 7 to 14 bcf/d since Jan 1, 2021. Even at the high LNG stocks levels, it's only ~10 days of winter LNG imports. A cold winter or interruption in LNG imports could easily lead to a shortage. LNG stockpiles held by Japanese power producers have exceeded both last year's level and the 4-year average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks at Sep 4 were ~127 bcf, +0.1%

WoW from 126 bcf and slightly up from the 5-yr average of 118 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 12: Japan's LNG Stocks



Source: METI

Natural Gas – Japan/JERA resumes 5 natural gas fueled thermal plants for winter

We realize that Japan and other countries have been trying to minimize natural gas generation in the summer due to the sky-high LNG prices. But it looks like Japan is gearin gup to use more LNG if needed to maintain power this winter. Last week, Bloomberg reported "J*era, a joint venture between Tokyo Electric Power and Chubu Electric Power, will resume operation of 5 idled thermal power units this winter to help Japan secure supply. * Was chosen in a public auction to provide capacity from Jan. 4 to Feb. 28 * Will restart the Anegasaki No. 5, Chita No. 5, Chita Daini No. 1 and Yokkaichi No. 4 and 5 units, which are all under long-term planned shutdown."* Note we went to the JERA website to review these five "thermal" plants and all of these "thermal" plants are fueled by natural gas, either from steam generation from natural gas/LNG or from combined cycle power plants that are fueled by natural gas/LNG. Our Supplemental Documents package includes JERA's "*Types and Mechanism of Thermal Power Generation".* [LINK]

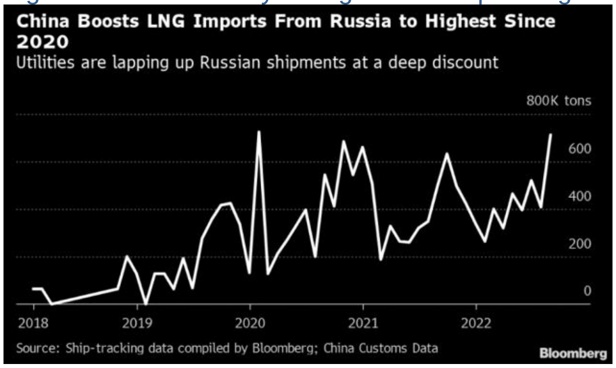
Japan resumes natural gas plants

Natural Gas – China buying Russian LNG at "nearly half" the current LNG spot price

Just in case anyone was looking for a reason why China is maximizing its natural gas and LNG imports from Russia, China is getting a massive discount on Russian LNG. On Thursday, Bloomberg reported "*China's LNG imports from Russia surged to the highest level in at least two years in August, according to ship-tracking data compiled by Bloomberg. Meanwhile, deliveries from the US have slumped as Chinese importers divert cargoes to Europe at a hefty profit."* And Bloomberg is reporting it's at a huge discount – nearly half the current spot price. Bloomberg wrote "*China is lapping up liquefied natural gas shipments from Russia on the cheap. The Sakhalin-2 LNG export plant in Russia's Far East sold several shipments to China for delivery through December at nearly half the current spot price in a tender that closed earlier this week, according to traders with knowledge of the matter. Still, global rates have soared so much this year that the project can profit from those sales."* Our Supplemental Documents package includes the Bloomberg report.

China gets half priced Russian LNG

Figure 13: China 7-day rolling coal-fired power generation



Source: Bloomberg

Natural Gas – RUS/UKR, is there remote potential for return of RUS natural gas to EU?

Remote risk to winter natural gas prices?

There was some big news yesterday with the big Ukraine military successes in recapturing large swaths of territory from Russian forces. As of our 7am MT news cut off, the expectations are broadly that this is expected to lead to Putin directing Russian military retaliation and keep natural gas squeeze on Europe. But one of the principles I have tried to maintain over the more than 20 years writing the Energy Tidbits memo is to present two sides and also risks to calls. So earlier this morning, I tweeted [LINK] "*Hmm! is there remote (<5%) potential for large #NatGas #LNG winter price risk? Expectation Putin escalates attacks, keeps #NatGas shut-in even if RUS retreat. But is there remote potential RUS/Putin negotiate & #NatGas flows to fund reparations? #OOTT*." Ukraine's success feels like it could be a tipping point in the war. But the question is what does Putin and Russia do if they retreat and effectively lose the war? The expectation is that he keeps the natural gas squeeze on as it is his key weapon on Europe overall. But, if there is a sea change in the war, there is also a remote (call it less than 5%) chance that Putin or someone in Russia negotiates, which is why I posted the tweet. If there is a negotiation, a key area that comes to mind is natural gas as a priority, but also oil and products. Whether its reparations (tough pill for Putin to swallow if it's just a retreat) or just part of the negotiations, return of Russian natural gas deliveries to Europe will likely be front and center. It would seem like a logical area for reparations funding would be natural gas and oil revenues, but one that is also something that can deal with the #1 problem for Europe – the high cost of energy and fear of shortages this winter. So what if there was return of Russian natural gas or oil or petroleum products to Europe but a portion of the revenues are directly allocated to a reparations fund? Or if Russia just agrees to a price cap as a way to move on from Ukraine loss? No one may be saying this, but I wanted to at least raise the possibility to think about the potential (albeit remote) for a big drop in natural gas prices and possibly oil this winter if we can somehow see a return of Russian natural gas, oil and petroleum products exports. Likely very low probability but you never know.

Natural Gas – Nord Stream shut down, Putin says they messed things up big time

Nord Stream is fully shut down

There isn't much doubt now that Nord Stream won't be supplying gas for any time soon and that the squeeze play is on Europe for the winter. And most, if not all, believe that the only way Nord Stream will flow natural gas for winter is if there is a total sanctions deal on Russia. (i) On Monday, we tweeted [LINK] *"ICYMI. why working assumption should be #NordStream*

#NatGas deliveries stay at zero. "According to Kommersant's sources, supplies via Nord Stream can be resumed only if sanctions are lifted, which is possible ONLY IF a more general political settlement is reached." #OOTT." That was the first real indication that Nord Stream natural gas depends on more than just giving back any turbines for Nord Stream. (ii) Gazprom. On Tuesday, we tweeted [LINK] "*Expect #NordStream #NatGas flows to stay at zero indefinitely. Mon: 👎Kommersant resumption "ONLY IF a more general political settlement is reached". Just now: 👎#Gazprom, RUS law says can't operate due to explosion risk. #OOTT.*" Gazpom had tweeted that they had to comply "with the requirements on providing explosion safety" and that any operation of the station would be in direct conflict with Russian law. (iii) Putin also answered a question at his Eastern Economic Forum plenary session speech and Q&A on Wed. [LINK]. Putin gave a long answer to question that didn't specifically say all Russian sanctions have to be removed, but seemed to warn that the politicians backed themselves into a corner on sanctions and now Germany people want Russian natural gas. Putin said "*Regarding Nord Stream 1, our German partners have agreed that all technical aspects of Nord Stream 1, including the maintenance of gas-pumping turbine units, are subject to British law because – I myself was unaware of this and learned about this from Mr Miller – Gazprom had to sign a contract for the maintenance of these units made by Siemens not with the Siemens main office but with its subsidiary based in the United Kingdom, which slapped sanctions on Gazprom, and agreed to repair the turbines at a Siemens plant in Canada. What do we have to do with all of that? Canada finally took it but yielded to numerous requests coming from Germany and gave it to Germany, whereas under an agreement with a Siemens subsidiary in the UK, the turbines were to be shipped straight to St Petersburg. Logistics arrangements have changed and the contract has to be revised. The British-based Siemens subsidiary will not even respond to Gazprom's inquiries. You can take as many photos with the turbine as you want, but give us the documents, for crying out loud. This is our property. We need to understand the legal status of this property and its technical condition. They give us nothing but chit-chat. The last turbine is now out of order, so Siemens representatives came to look at it. There is an oil leak, which is an explosion and fire hazard. There is no way for the turbine to remain operational given its current condition. Give us the turbines, and we will turn on Nord Stream 1 overnight. They do not give us anything. They say we are weaponising it. What are they talking about? They themselves messed things up big time and are now not sure what to do about it. They drove themselves into a sanctions dead end. There is only one way out. In Germany, people are rallying to turn on Nord Stream 2. We are supportive of the demands by German consumers and we are ready to turn it on as early as tomorrow. All we need to do is press the button, but we are not the ones who imposed sanctions on Nord Stream 2. It was done under pressure from the United States. Why is it exerting pressure? Because it wants to sell its gas for a pretty penny. We are aware of the position of the former US administration as well. They said, "Yes, we sell at a higher price, but let them buy ours because we offer them protection." Let them buy then if they choose to. We will sell our product.*" Our Supplemental Documents package includes the Kommersant report and Gazprom Sept 6 tweet.

Natural Gas – Making it more likely to call Nord Stream pipeline the Nordstrom pipeline

The "Nordstrom" pipeline

We made the mistake of clicking on one of the many videos making fun of White House Press Secretary Jean-Pierre referring to the Nord Stream pipeline as the Nordstrom pipeline [LINK]. The mistake being once you hear Jean-Pierre say Nordstrom and not Nord Stream, it becomes stuck in your mind and you are more likely to make the same mistake, especially if you are a Nordstrom shopper. At her Tuesday press briefing, Jean-Pierre said "*So you've heard us say this: that what -- what we see Russia's doing -- and we've been very clear about this – is that they're using energy. They're weaponizing energy, and it's choosing to -- to -- one of the things that has been out there, the shutdown, the pipeline of Nordstrom One (sic). So the sanction we've imposed we believe do stand in the way of the pipeline to continuing operating. So the U.S. and Europe have been collaborating to ensure sufficient supplies are available. As a result of these efforts, European gas shortage will be full by the critical winter heating season. So we have more work to do, but again, we're working closely with our allies on this.*"

Natural Gas – Germany calls it "hard industrial savings", we call it forced savings

EU industrial natural gas demand

Last week's (Sept 4, 2022) Energy Tidbits highlighted our view that EU industrial natural gas demand response to sky-high natural gas prices was already big and getter bigger. Please note the industrial demand response isn't because they voluntarily cut natural gas – they are cutting natural gas consumption because they can't afford the sky-high prices. This is a big (and growing) hit to Europe economic activity, which is the key reason why Europe gas storage is filling ahead of schedule. We didn't see Germany energy regulator head, Klaus Mueller's Sept 3 afternoon tweet before the memo. Mueller tweeted [LINK] "*With 85.02% DE already reached on September 2nd. the October target for its #Gasspeicher. We were able to save even when #NordStream1 was "waiting", but the heating season is approaching. Now, after the hard industry savings, it is all about our private heating behavior: -20%!*" When we saw the tweet last Sunday night, we tweeted [LINK] "*Europe #NatGas storage fill up is ahead of schedule thanks to "Hard industry SAVINGS". Yes, but forced savings as sky-high #NatGas prices forced reduced/closed production of fertilizer, metals, ceramic tiles, etc). Economic activity is getting hammered. #LNG #OOTT* ." This forced industrial savings is the key factor that has led to Europe storage filling up faster than prior years. So good news there, but the economy keeps taking more body blows.

Natural Gas – Record heat this summer in Europe

Record hot summer in Europe

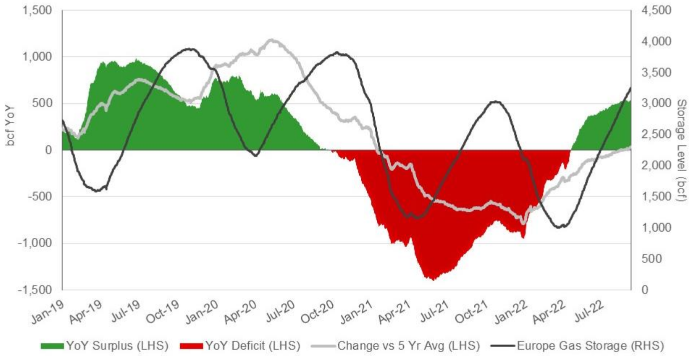
It was record heat this summer in Europe. We have spoken to several people who traveled to the continent this summer and they all noted the high temperatures but also how their hotels had their A/C at much higher levels than normal and not just in the public areas. The problem is that they all stayed in bigger hotels that have central control of A/C so they couldn't set their rooms to lower temperatures. On Thursday, Copernicus Climate Change Services reported [LINK] "*Summer 2022 Europe's hottest on record*" and "*The average temperature over Europe in 2022 was: • the highest on record for both August and summer (June – August) by substantial margins of 0.8°C over 2018 for August and 0.4°C over 2021 for summer".* Our Supplemental Documents package includes the Copernicus recap.

Natural Gas – Europe storage is now +13.46% YoY ie. 82.77% full vs 69.31%

Europe storage now 82.77% full

It looks like the continued strong LNG imports and massive industrial demand response to sky-high natural gas prices are having a big impact. Even with the reduced volumes on Nord Stream, Europe storage continues to have increasing YoY levels. Europe gas storage began the year in a YoY deficit, but the YoY Europe storage gap changed to a YoY storage surplus and it continues to build this week. Europe gas storage started the winter down 18.52% YoY and is now a YoY surplus of 13.46%. Inventories are rising all across Europe, as is normal during spring and early summer. Europe gas storage started 2020 winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr/21. Europe storage levels bottomed in late Apr/22 at 29%, which was the lowest level since Apr 2018. This winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has turned to surplus after months of the deficit tightening. Thanks to the warm weather and US LNG, storage as of Sep 7 is at 82.77%, which is +13.46% greater than last year levels of 69.31% and are +0.92% above the 5-year average of 81.85%. Below is our graph of Europe Gas Storage Level.

Figure 14: Europe Gas Storage Level



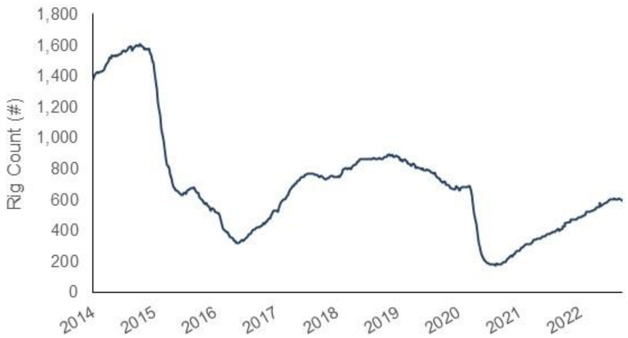
Source: Bloomberg

Oil – US oil rigs -5 at 591 oil rigs at Sep 9

US oil rigs -5 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. This week US oil rigs were -5 at 591 oil rigs. It looks like US oil companies are working towards a world of ~$90 oil instead of ~$100 oil. US oil rigs have hit a 12-week low at 591 rigs after being rangebound between 594 to 605 oil rigs for the past 11 weeks. Oil rigs are +419 off the bottom of 172 in Aug14/2020 week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by -92 to 591 oil rigs (-13%). The post-Covid peak is 605 oil rigs, which has been hit twice in the past 12 weeks, on July 29 and Aug 26. US gas rigs were +4 WoW at 166 rigs as HH still continues to be above $8 and promote increased rig activity in the Haynesville and other gas plays.

Figure 15: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – No US frac spread updated posted this week

Note that Mark Rossano (C6 Capital Holdings) did not have his weekly US frac spread recap for the week ending Sept 9 on the Primary Vision network. His last publicly available US frac spread data was that frac spreads were -5 to 282 spreads for the week ending Sept 2. YouTube video is at [LINK].

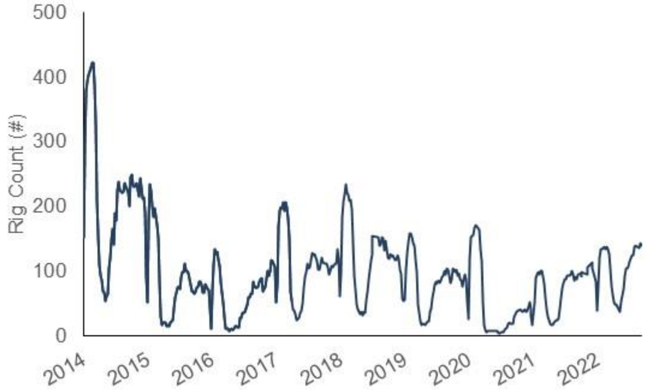
Frac spreads -5 to 282

Oil – Total Cdn rigs down -3 WoW at 205 total rigs, +62 rigs YoY

Total Cdn rigs were down at 205 total rigs. Cdn oil rigs were -3 at 140 rigs. Cdn gas rigs were flat at 65 rigs. Cdn rigs have been in a bit of a pause with WTI ~$90 and weak AECO. Total rigs are now +192 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 87 and Cdn gas rigs were 56 for a total Cdn rigs of 143, meaning total Cdn oil rigs are +62 YoY and total rigs are +71 vs 2019.

Cdn rigs down WoW

Figure 16: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat at 12.1 mmb/d

US oil production was flat at 12.1 mmb/d for the week ended Sep 2 after n increase last week. US oil production has been range bound between 11.9 to 12.1 mmb/d for the past 17 weeks. Lower 48 production drove total production and was flat at 11.7 mmb/d this week, with Alaska having immaterial change. US oil production is up YoY at +2.1 mmb/d but is still down significantly at -1.0 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

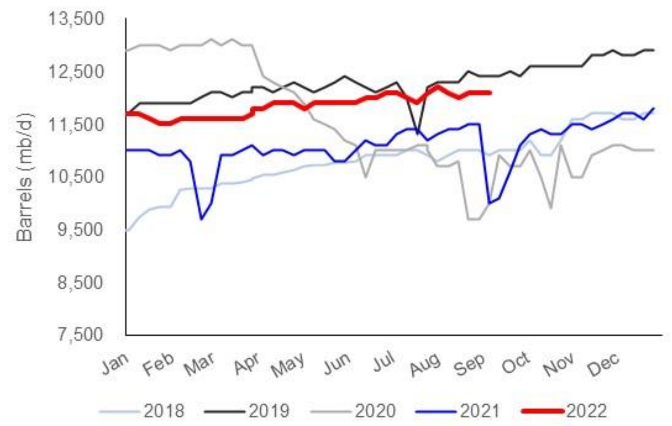
US oil production flat WoW

Figure 17: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1 End Date	Week 1 Value	Week 2 End Date	Week 2 Value	Week 3 End Date	Week 3 Value	Week 4 End Date	Week 4 Value	Week 5 End Date	Week 5 Value
2020-Jan	01/03	12,900	01/10	13,000	01/17	13,000	01/24	13,000	01/31	12,900
2020-Feb	02/07	13,000	02/14	13,000	02/21	13,000	02/28	13,100		
2020-Mar	03/06	13,000	03/13	13,100	03/20	13,000	03/27	13,000		
2020-Apr	04/03	12,400	04/10	12,300	04/17	12,200	04/24	12,100		
2020-May	05/01	11,900	05/08	11,600	05/15	11,500	05/22	11,400	05/29	11,200
2020-Jun	06/05	11,100	06/12	10,500	06/19	11,000	06/26	11,000		
2020-Jul	07/03	11,000	07/10	11,000	07/17	11,100	07/24	11,100	07/31	11,000
2020-Aug	08/07	10,700	08/14	10,700	08/21	10,800	08/28	9,700		
2020-Sep	09/04	10,000	09/11	10,900	09/18	10,700	09/25	10,700		
2020-Oct	10/02	11,000	10/09	10,500	10/16	9,900	10/23	11,100	10/30	10,500
2020-Nov	11/06	10,500	11/13	10,900	11/20	11,000	11/27	11,100		
2020-Dec	12/04	11,100	12/11	11,000	12/18	11,000	12/25	11,000		
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200	08/12	12,100	08/19	12,000	08/26	12,100		
2022-Sep	09/02	12,100								

Source: EIA

Figure 18: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA lowers 2022 and 2023 oil production forecast

EIA forecasts US 2022 oil exit at 12.28 mmb/d

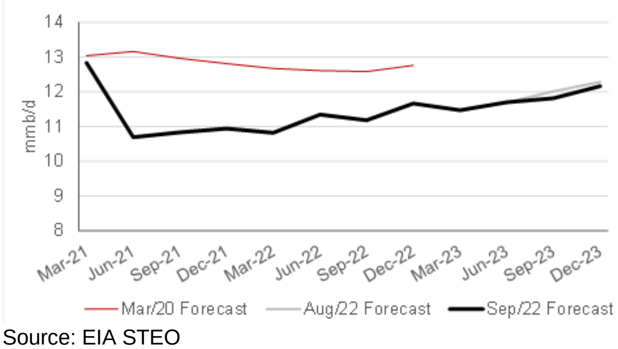
The EIA STEO slightly decreased its forecast for US oil production for 2022 and 2023. The EIA notes that their forecasts are subject to greater uncertainty amid the rapidly evolving conflict in Europe, production decisions of OPEC+, and the rate at which U.S. oil and natural gas producers increase drilling. (i) Similar to our view on US natural gas growth, we also believe the first real test for growth in US oil production will be Q3/22 and to see if we start to see a ramp up in oil production. We have previously noted how the EIA's numbers for US tight/shale oil were basically flat for months and only started to show modest growth in June. It's why we think Q3/22 oil production will be the first real ramp up in oil production. (ii) The EIA forecast kept flat its US crude expectations in Q4/21, still not returning anywhere near the Q4/19 peak of 12.88 mmb/d, with Q4/21 US crude of 11.66 mmb/d (down 1.20 mmb/d from peak). Full year 2020 US oil production was flat at 11.32 mmb/d but is down 0.97 mmb/d YoY from 12.29 mmb/d in 2019. (iii) Full year 2021 was flat after last months upward revision to 11.25 mmb/d, which is down -0.07 mmb/d YoY from 2020. (iv) The EIA forecasts a shift back to YoY growth in 2022 with production averaging 11.79 mmb/d, +0.54 mmb/d YoY (was 11.86 mmb/d previously), with Q4/22 production of 12.16 mmb/d, is still down -0.43 mmb/d from Q4/19. (v) The 2023 outlook projects crude production to begin Q1/23 at 12.42 mmb/d and close the year in Q4/23 at 12.87 mmb/d for an average of 12.63 mmb/d in 2023.

Figure 19: Estimated US Crude Oil Production By Forecast Month

(million b/d)	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Sep-2022	12.83	10.69	10.83	10.94	11.32	10.82	11.34	11.18	11.66	11.25	11.47	11.70	11.81	12.16	11.79	12.42	12.55	12.70	12.87	12.63
Aug-2022	12.83	10.69	10.83	10.94	11.32	10.82	11.34	11.18	11.66	11.25	11.46	11.69	12.01	12.28	11.86	12.39	12.50	12.82	13.10	12.70
July-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.46	11.75	12.08	12.34	11.91	12.45	12.58	12.87	13.17	12.77
June-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.45	11.71	12.08	12.43	11.92	12.64	12.82	13.07	13.33	12.97
May-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.42	11.78	12.07	12.35	11.91	12.56	12.71	12.94	13.18	12.85
Apr-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95
Mar-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.62	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99
Feb-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.13	11.69	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60
Jan-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.12	11.54	11.16	11.58	11.70	11.88	12.05	11.8	12.26	12.33	12.46	12.58	12.41
Dec-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.11	11.63	11.18	11.67	11.72	11.91	12.09	11.85					
Nov-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.07	11.47	11.13	11.69	11.77	11.97	12.16	11.90					
Oct-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	10.98	11.13	11.02	11.54	11.64	11.78	11.96	11.73					
Sept 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.06	11.28	11.08	11.42	11.58	11.81	12.06	11.72					
Aug 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.22	11.26	11.30	11.12	11.46	11.62	11.86	12.11	11.77					

Source: EIA STEO

Figure 20: Estimated US Crude Oil Production By Forecast Month



Source: EIA STEO

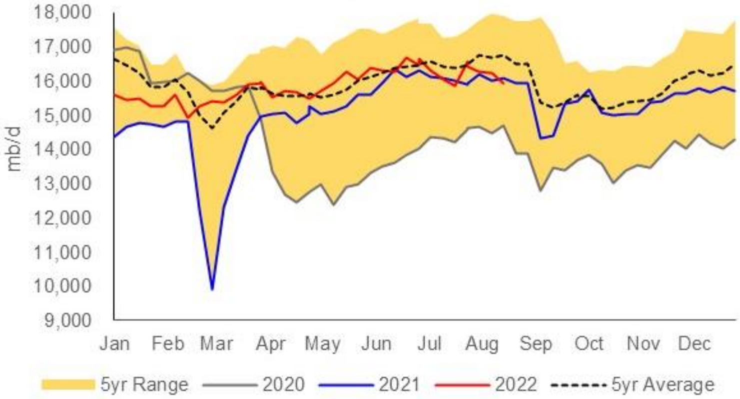
Oil – Refinery inputs -0.310 mmb/d WoW at 15.929 mmb/d

Refinery inputs down WoW

September is normally a turnaround month for refineries in the US and that means less crude oil inputs into refineries. The EIA crude oil input to refinery data is for the week ended Sep 2.

The EIA reported crude oil inputs to refineries down -0.310 mmb/d to 15.929 mmb/d for the week ended Sep 2 and are +1.626 mmb/d YoY. Note last year's was impacted by the aftermath of Hurricane Ida that saw crude inputs to refineries were down -1.636 mmb/d for the week ended Sept 3, 2021. Total products supplied (i.e., demand) increased WoW, down 0.181 mmb/d to 19.892 mmb/d, and Motor gasoline was up +0.136 mmb/d at 8.727 mmb/d from 8.591 mmb/d last week. The 4-week average for Motor Gasoline was down -0.748 mmb/d YoY to 8.775 mmb/d. The 4-week average of Total Demand was down -1.382 mmb/d YoY to 20.131 mmb/d.

Figure 21: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – US "net" oil imports up +1.358 mmb/d WoW at 3.346 mmb/d

US "NET" imports were up +1.358 mmb/d to 3.346 mmb/d for the Sep 2 week. US imports were up 0.824 mmb/d to 6.779 mmb/d. US exports were down -0.534 mmb/d to 3.433 mmb/d. The WoW decrease in US oil imports was driven by US's Top 10 imports by country which were up by 0.634 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was up this week by 0.445 mmb/d to 3.538 mmb/d. (ii) Saudi Arabia was up 0.093 mmb/d to 0.423 mmb/d this week. (iii) Colombia was down 0.028 at 0.261 mmb/d. (iv) Ecuador was down -0.087 mmb/d at 0.144 mmb/d. (v) Iraq was down 0.179 mmb/d to 0.222 mmb/d. (vi) Mexico was up +0.525 mmb/d to 0.965 mmb/d.

US "net" oil imports up WoW

Figure 22: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	June 24/22	July 1/22	July 8/22	July 15/22	July 22/22	July 29/22	Aug 5/22	Aug 12/22	Aug 19/22	Aug 26/22	Sep 2/22	WoW
Canada	2887	3803	3827	3481	3308	3,673	3,351	3,455	3,834	3,093	3,538	445
Saudi Arabia	701	398	634	242	516	500	412	244	247	330	423	93
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	743	702	610	877	639	815	710	661	503	440	965	525
Colombia	215	213	213	405	150	328	174	214	143	289	261	-28
Iraq	76	362	302	454	165	369	181	163	225	401	222	-179
Ecuador	59	142	149	57	150	243	212	36	278	231	144	-87
Nigeria	201	171	79	136	143	57	161	253	72	137	2	-135
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	4,882	5,791	5,814	5,652	5,071	5,985	5,201	5,026	5,302	4,921	5,555	634
Others	1,116	1,048	861	867	1,093	1,357	970	1,106	869	1,035	1,224	189
Total US	5,998	6,839	6,675	6,519	6,164	7,342	6,171	6,132	6,171	5,956	6,779	823

Source: EIA

Oil – Vitol, it is impossible for the world to get by without all of RUS 7 mmb/d exports

Vitol on Russia oil & products exports

We had a lot of feedback on an item from last week's (Sept 4, 2022) Energy Tidbits memo on Vitol Asia Head Mike Muller's comments on the early morning Sept 4 Gulf Intelligence Daily Energy Markets PODCAST. Their 1st Sunday podcast of each month features Vitol Asia Head Mike Muller, who always provides some different oil market insights. Here is what we wrote last week on Muller's comments on Russia oil. "*There is a major oil risk coming up over the next few months – what will happen with Russia's 7+ mmb/d of oil and products exports and can the West find a way for Russia oil to keep flowing (their Russian price cap idea) and for Putin to not stop oil & products exporting? (i) It is impossible for the world to get buy without Russian oil and products exports. Earlier this morning, we tweeted [LINK] "#Vitol's @michaelwmuller "[RUS] exports of 7+ mmbd of crude oil & products combined are an even greater % of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that". Great podcast @sean_evers . #OOTT." Mike Muller is Vitol's Asia Head and said "I think we have to bear in mind that Russia's production is a much larger number than Iran's production so you can't draw parallels about sanctions taking effect in Russia in the same way as Iran because Russia has the capability to produce 11 mmb/d of oil. That's 11% of global supply. And its exports of 7 plus mmb/d of crude oil and products combined are an even greater percentage of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that." (ii) Absent some resolve, Europe's sanctions on Russia oil kick in in early December. Our Aug 14, 2022 Energy Tidbits noted RBC Helima Croft view that it will mean 2 mmb/d of Russian oil that will cut out of Europe market and either looking for a home or shut in. (iii) G7's price cap on Russia oil seeks to keep Russia oil flowing but forcing an effective lower price to Russia. The challenge will be how many countries will also sign on to this price cap concept. (iv) And then the big question is what will Russia do? Surely no one expects they won't do something. Look at what they are doing on natural gas. Russia said this week they wouldn't deliver oil to any country supporting the price cap. And then we have to ask if Russia will do non-oil actions against these countries? (v) If we loop back to Muller's point that the world needs "all" of Russia's 7 plus mmb/d exports of oil and products, it's why we think there is a major risk to oil coming up over the next few months."*

Oil – OPEC+ decreases October production -100,000 b/d

OPEC+ decreases October production

OPEC has determined to revert back to the August production levels after briefly increasing their quotas by +100,000 b/d in September. OPEC+ had it's 32nd ministerial meeting on Wednesday [LINK] which adjusted production levels downward by 100,000 b/d for October. The Meeting noted that higher volatility and increased uncertainties require continuous assessment of market conditions and readiness to make immediate adjustment to production in different forms. (i) OPEC stated, "*Reaffirm the decision of the 10th OPEC and non-OPEC Ministerial Meeting on 12 April 2020 and further endorsed in subsequent meetings including the 19th OPEC and non-OPEC Ministerial Meeting on the 18 July 2021.*" (ii) In addition, OPEC+ stated, "*Revert to the production level of August 2022 for OPEC and non-OPEC Participating Countries for the month of October 2022 as per the attached table, noting that the upward adjustment of 0.1 mb/d to the production level was only intended for the month of September 2022.*". (iii) They also stated "*Reiterate the critical importance of adhering to full conformity and to the compensation mechanism. Compensation plans should be submitted in accordance with the statement of the 15th OPEC and non-OPEC Ministerial Meeting*". Our Supplemental Documents package includes the OPEC+ release.

Figure 23: OPEC+ October 2022 Required Production

October 2022 Required Production	
Algeria	1055
Angola	1525
Congo	325
Eq.Guinea	127
Gabon	186
Iraq	4651
Kuwait	2811
Nigeria	1826
Saudi Arabia	11004
UAE	3179
Azerbaijan	717
Bahrain	205
Brunei	102
Kazakhstan	1706
Malaysia	594
Mexico	1753
Oman	881
Russia	11004
Sudan	75
South Sudan	130
OPEC 10	26689
Non-OPEC	17165
OPEC+	43854

Source: OPEC

Oil – OPEC+ requests Abdulaziz to call OPEC+ meetings if necessary

Abdulaziz is The Man

We have called Saudi Energy Minister "The Man" who saved oil markets. There was one new inclusion in the OPEC press release announcing the results of the OPEC and non-OPEC Ministerial Meeting that would support his OPEC and non-OPEC partners also believing in this view. The OPEC and non-OPEC members *"request the Chairman to consider calling for an OPEC and non-OPEC Ministerial Meeting anytime to address market developments, if necessary."* OPEC+ has monthly meetings so this is requesting Abdulaziz to call meetings within that short time frame if he believes it is necessary to do so.

Oil – Next OPEC and non-OPEC ministerial meeting (ONOMM) is October 5

OPEC+ meeting October 5

The short press release said that the next meeting, the 33rd OPEC and non-OPEC Ministerial Meeting, will be on Wednesday October 5, 2022. We assume it will be via videoconference again. It wasn't in the press release, but there were press reports after the meeting indicating OPEC+ was planning for their Dec meeting to be an in-person meeting in Vienna.

Oil – JCPOA, E3 hope for a deal is over unless Iran takes deal & resumes IAEA work

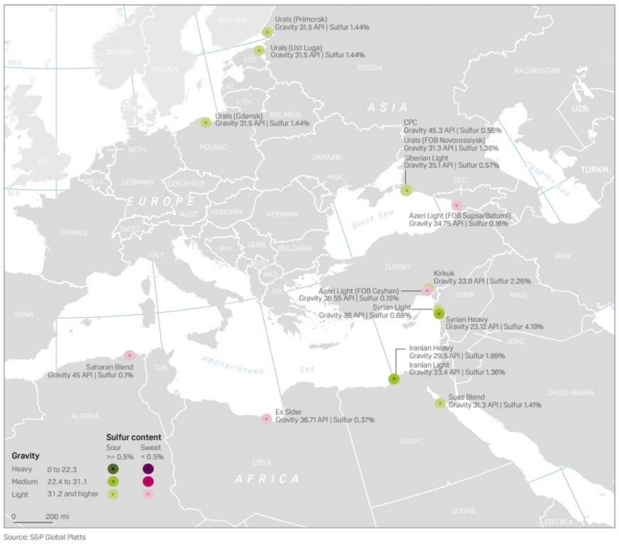
E3 joint statement yesterday

Big news yesterday morning on the JCPOA, when the E3 (France, Germany and UK) issued a joint press release on the JCPOA. We don't know the motivation for the statement now. Were they just sick and tired of Iran's haggling on items outside the main points. Did they figure this was the best way to get Iran to stop haggling and take the deal or leave it? Who knows? Regardless, it is big news that the E3 have moved away from trying to bridge the gap. Yesterday morning, we tweeted [LINK] "*Finally FR, DE, UK take clear stance on*

#JCPOA. Hope for deal is over unless Iran takes offered deal & resumes IAEA cooperation. Wasn't easy decision as means EU must scramble for oil as Iran #Oil can't fill the gap when EU Dec 5 sanctions on RUS oil kick in. #OOTT." It was a clear statement and different from how the E3, in particular France, have been trying to find a way to bridge the gap between the US and Iran. The E3 made it clear that there are only two options for Iran. The first is no deal. The second is a return to the deal by taking the proposed deal and also Iran must fully cooperate with the IAEA. Our Supplemental Documents package includes the E3 joint statement. [LINK]

Not an easy decision for E3 with Russian oil sanctions kicking in on Dec 5
Our tweet said that this wasn't an easy decision for France, Germany and UK. The EU sanctions on Russian oil kick in on Dec 5. And many, including us, believed a key benefit or motivation was that the E3 viewed the return of Iran oil to the market as being the primary substitute for Russian oil. That will be gone if the JCPOA doesn't get revived. Here is what we first wrote on this Iran substitute for Russian oil in our March 13, 2022 Energy Tidbits. "*On Wednesday, we tweeted [LINK] on a good reminder from the Gulf Intelligence daily Podcast [LINK] that Iran's crude oil quality would be a good replacement for Russian Urals crude oil to Europe. We tweeted "#JCPOA. Good reminder from @gulf_intel podcast. Matt Stanley @starfuels reminds Iran light matches API and H2S very well and is a good substitute RUS Urals. See below @SPGlobalPlatts crude specs map. #OOTT". Our tweet included the below Platts map that noted crude qualities for Russia were Urals (Primorsk) 31.5 API 1.44% H2S, Urals (Ust Luga) 31.5 API 1.44% H2S, and Urals Gdansk 31.5 API 1.44% H2S, which compares to Iranian Light 33.4 API 1.36% H2S*."

Figure 24: Platts Specifications Guide Europe and Africa Crude Oil



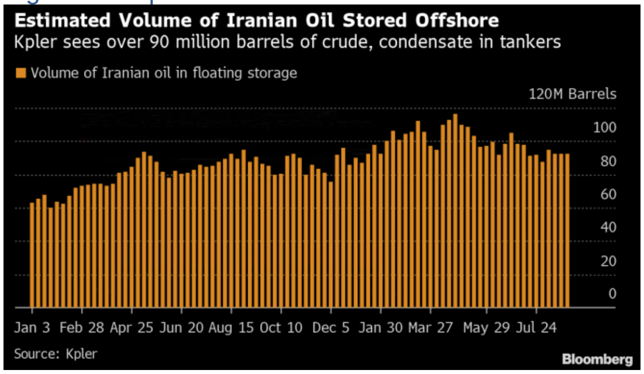
Source: Platts

Oil – Positive for oil markets if no JCPOA, then no wave Iran oil from floating storage

Iran floating oil storage

Perhaps the key benefit to oil markets if no JCPOA is that there won't the first flood of Iran oil and condensate hitting the markets from being in floating storage. Last week's (Sept 4, 2022) Energy Tidbits memo wrote on the then positive momentum for a return to JCPOA. "*There are various estimates for how oil and condensate is in floating storage, but we reference Kpler estimates. Last Sunday night, we tweeted [LINK] "IF a #JCPOA, the first wave of Iran #Oil & #Condensate will come from floating storage. @Kpler estimates 93 mmb of oil + condensate in floating storage. Per @iamsharoncho report "Iran May Drain Offshore Crude Oil Cache If Nuclear Deal Reached". #OOTT". Note the 93 mmb is both oil and condensate. Our Supplemental Documents package includes the Bloomberg report."*

Figure 25: Kpler Estimated Volume of Iranian Oil + Condensate Stored Offshore



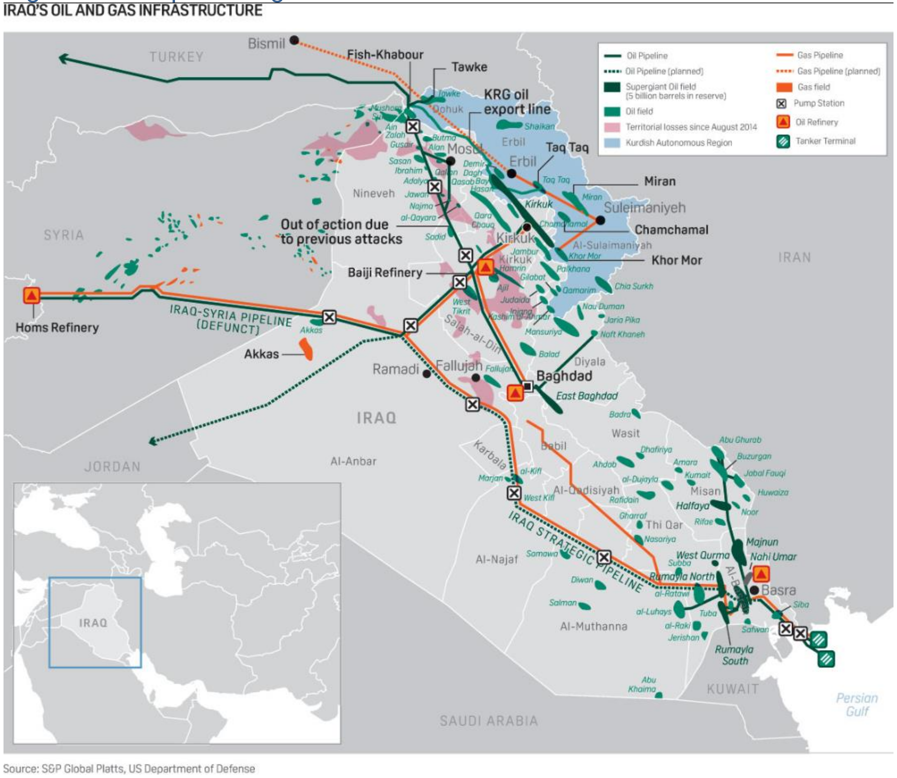
Source: Bloomberg, Kpler

Oil – Relative calm in Iraq this week

Relative calm in Iraq this week

It was a week of relative calm with respect to any fighting with Iraq, although there was another munitions fire/explosion on Monday. Whereas the prior week saw ~50 people killed in some violence/fighting. However, no one expects the potential powder keg to be put to rest. Rather, yesterday Bloomberg reported "*Iraq's top court rejected a bid by influential cleric Moqtada Al-Sadr to dissolve parliament in the OPEC member state, a move that could spark further unrest after last month's deadly clashes over the political standoff in Baghdad. The Federal Supreme Court rebuffed the demand on Wednesday, Iraq's state news agency said. Iraq has been at a political impasse since Sadr's party won the most seats in parliamentary elections last October. He has not formed a government with his Iran-backed Shiite rivals, and a fragile caretaker government has been in place. The recent clashes erupted late last month when Sadr said he was quitting politics in protest at the deadlock. His supporters stormed the government palace. That violence didn't spread to the oil-producing hub of Basra or other important oil-rich areas to the north of Baghdad. But the general turmoil has fueled unease about Iraq's stability. The Iraqi military enforced a nationwide curfew."* And we haven't seen any reports of risks to Iraq's major oil production and exports in the South. Below is the Platts Iraq oil and gas infrastructure map.

Figure 26: Iraq oil and gas infrastructure



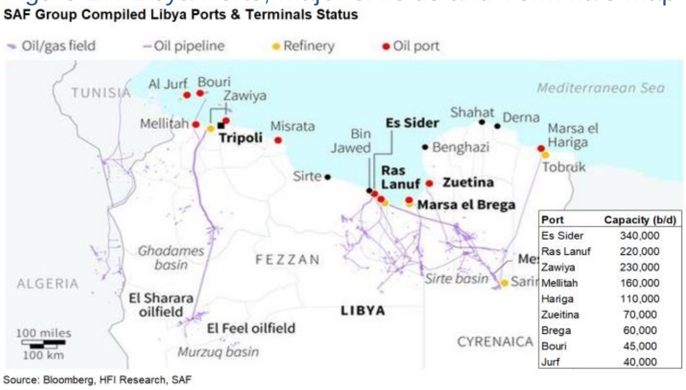
Source: Platts

Oil – Also a week of relative calm in Tripoli & oil production back up

Also relative calm in Tripoli

Last week's Libya story was all about increased fighting on the south and west outskirts of Libya, and also reports of what appears to be increased preparedness for fighting. This week, we didn't see many reports of violence after some fighting last weekend. However, we continue to see reports of armed group mobilizing, which sounds like preparedness for some potential future conflict. It wasn't necessarily linked to any Tripoli conflicts, but Libya oil production dipped a bit but seems to be almost back to where it was a few weeks ago. On Tuesday, Bloomberg reported "*Libyan crude production has temporarily dropped by about 100,000 barrels a day due to technical issues at two fields, the OPEC member's oil minister said. The North African country is now pumping a little over 1.1 million barrels a day, Mohamed Oun said. That's down from the 1.226 million daily barrels the state-run National Oil Corp. reported Friday.*" Yesterday, the Libya Observer reported [LINK] "*The National Oil Corporation (NOC) announced, on Friday, that the production of crude oil in the country reached 1.194 million barrels during the past 24 hours, and the production of condensate reached 55,000 barrels. Production increased by 31,000 barrels per day, compared to the last production statistic issued by the NOC, last Monday, as it reached 1.163 million barrels per day, and 48,000 barrels of condensate.*"

Figure 27: Libya Ports, Major oilfields and Terminals map



Source: SAF Group

Oil – Vitol Mike Muller oil insights last Sunday on spare capacity and China

Vitol Asia Head Mike Muiller

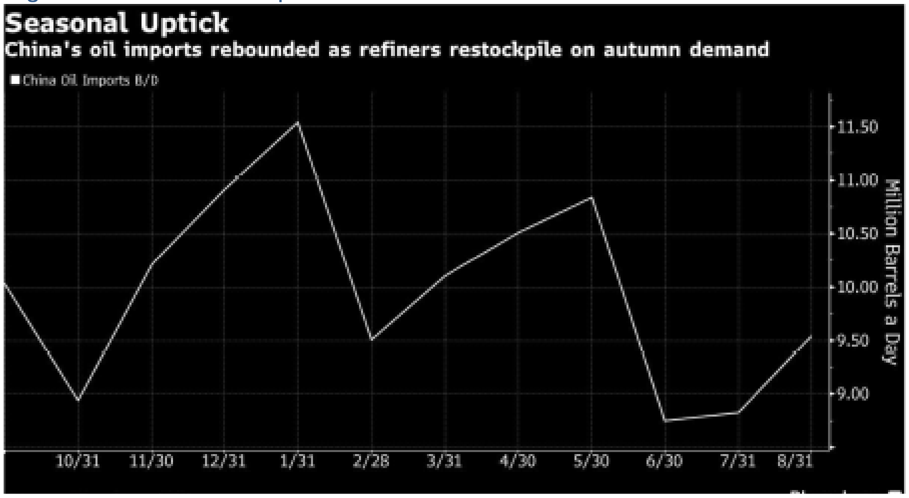
We had a lot of feedback on an item from last week's (Sept 4, 2022) Energy Tidbits memo on Vitol Asia Head Mike Muller's comments on the early morning Sept 4 Gulf Intelligence Daily Energy Markets PODCAST. Their 1st Sunday podcast of each month features Vitol Asia Head Mike Muller, who always provides some different oil market insights. Here is what we wrote last week "*There were three oil insights that jumped out at us this morning. (i) Earlier in the memo, we noted Muller's statement that "It is impossible, let me repeat, it is impossible for the world to get by without all of that" referring to Russia's 7 plus mmb/d of oil and products exports. (ii) Lack of oil spare capacity. Earlier this mornng, we tweeted [LINK] ""there needs to be a risk premium for the lack of spare capacity in #Oil markets" reminds #Vitol @michaelwmuller as Abdulaziz expressing a willingness to take oil off the market is a reminder "we're not going to see everybody producing flat out". Great podcast @sean_evers #OOTT". Muller said "But we have to bear in mind that in oil, there is less oil in the US SPR. That's at something like 20, 30 year lows after the interventionist measures that were enacted by the Biden Administration with a whole bunch of other countries acting in concert with that. And, at the same time, the period of price stabilization after Covid, OPEC+, is also over. and there is a big question mark over the what's next. So, by expressing a willingness to take oil off the market in response to either oil coming into the market from Iran sanctions being dropped or from lack of demand in China due to Covid repression measures, it's just serves as a reminder that we're not going to see everybody producing flat out. And therefore, I think we do need to bear in mind that there needs to be a risk premium for the lack of spare capacity in oil markets." (iii) Muiler recognizes that the headlines on China right now are negative to demand driven by Covid, but looks for China strengthening energy consumption to end the year. Earlier this morning, we tweeted [LINK] "Usual great China insights from #Vitol @michaelwmuller China #Oil views. Yes headlines right now are Covid impact, but post Oct 16 Congress opening up of travel restrictions & CN using very formidable reserves to crank up industries like cement, asphalt, road building, etc. #OOTT." Muller said "So I think you are going to see headlines dominated by the ever-present, ever-grand story and the fact that it was the Chinese construction sector, which is energy intensive of course, etc which weighed down on all the various indices we are looking at. But that's the very sector the government is now looking to boost and bolster with their very formidable reserves. So I think they are taking steps to counter that and I look forward to seeing evidence of greater* *outputs in industries like cement, ashphalt and paving, road building, etc which China still has some ways to go in certain provinces that haven't yet seen the huge wave of investments where literally in the last two decades, they have built a highway system equivalent to the interstates in the USA, criss-crossing various affluent provinces. So I think there is some running room to go in China." (iv) Our Supplemental Documents package includes the transcript we created for Muller's comments this morning."*

Oil – China's Oil imports increased in August on restocking activities

China August Oil Imports

After months of lockdowns in China posted a MoM gain in their oil imports to a three-month high in August. Bloomberg reported on Wednesday that China imported 9.54 mmb/d over the course of the month, up 8% from July but still well below the 2021 average of 10.3 mmb/d. The rise in inflows is partially attributed to refiners replenishing their stockpiles ahead of the winter season. Domestic demand in the coming months remains unclear as the uncertainty associated with Covid-19 lockdown measures remains a key threat to China's oil demand. Rystad Energy expects China's oil use to stay flat at an average of 15.7 mmb/d this year. The country procures about 70% of its crude oil needs from overseas, while also tapping on supplies from domestic fields. China's net oil-product exports rebounded to 0.68 mmb/d in August, the highest since June 2021. State refiners are expected to ship about 0.13 mmboe/d of gasoline and 0.25 mmboe/d of diesel this month, which is a rise of ~18% from a month ago,

Figure 28: China Oil Imports



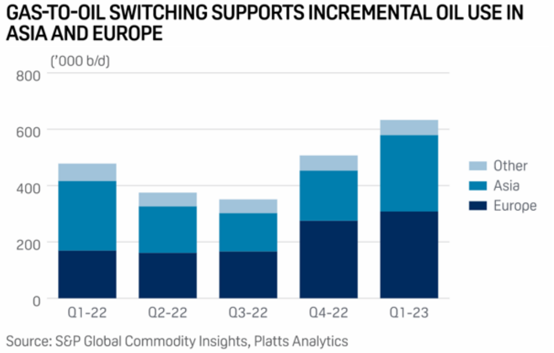
Source: Bloomberg

Oil – Platts an incremental 0.283 mmb/d gas-to-oil switching in next six months

Natural gas to oil switching

There are different estimates of the level of fuel switching to oil and petroleum products from sky-high natural gas and LNG prices. But what is clear is that the fuel switching will increase going into the winter. On Wednesday, we tweeted [LINK] "*#NatGas to #Oil switching is increasing. #PlattsAnalytics estimates refiners, power producers & major industries will have 633,000 b/d incremental liquids demand in Q1/23 vs ~350,000 b/d incremental demand in Q3/22. Thx @RobPana #OOTT [LINK].*" This above are for Asia and Europe. Platts provided a split "*In Europe, refiners, power producers, and major industries will account for a 308,000 b/d growth in liquids demand in the first quarter of 2023, according to Platts Analytics, equivalent to about half the global share of gas-to-oil switching. The growth figure surpasses the 166,000 b/d, or 47%, in Q3 2022. Asian gas-to-oil switching demand growth will reach 271,000 b/d, or 43% of the total, according to the estimates, up from 136,000 b/d in the current quarter.*" Our Supplemental Documents package includes the Platts report.

Figure 29: Gas-to-Oil switching in Asia and Europe



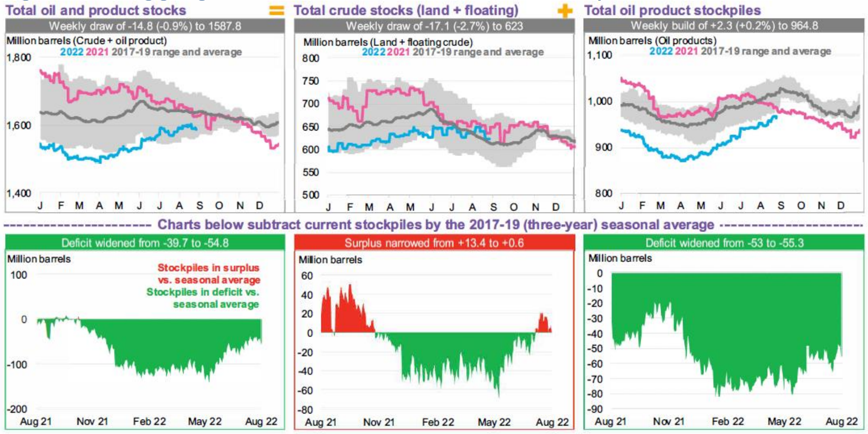
Source: Platts

Oil - BNEF: global oil and product stocks deficit narrowed

For those with a Bloomberg terminal we recommend flipping thru BloombergNEF's "Oil Price Indicators" weekly that comes out on Mondays as it provides good charts depicting near-term global oil demand and supply indicators. The global oil and products stockpile deficit widened for crude and products from 53.0 mmb to 54.8 mmb. The stockpile deficit against the five-year average (2015-19) widened from 53.5 mmb to 57.5 mmb. Total crude inventories decreased by 2.7% to 623.0 mmb, including global floating inventories. Product stocks were up 0.5% WoW with the stockpile deficit against the 3-year average narrowing from 39.1 to 38.0 mmb. Gas oil and middle distillate stocks have narrowed against their three-year average deficit (2017-2019) from 39.1 mmb to 38.0 mmb. Jet fuel consumption by international departures decreased by 25,400 b/d WoW while consumption by domestic passenger departures decreased by 60,200 b/d. The global mobility index increased over the past week, up 0.8% in the week to Sep 1. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

BNEF's global oil inventories

Figure 30: Aggregate Global Oil and Product Stockpiles



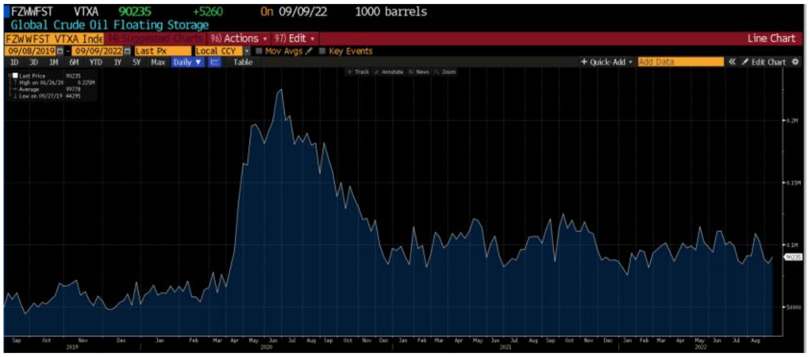
Source: BloombergNEF

Oil – Vortexa crude oil floating storage 90.24 mmb as of Sept 9, +5.26 mmb WoW

Vortexa crude oil floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of Noon MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments today on the new estimates are compared to the prior weeks Vortexa estimates posted on Bloomberg on Sept 10 at noon MT. (i) As of 2pm MT yesterday, Bloomberg has posted Vortexa crude oil floating storage estimate for Sept 9 was 90.24 mmb, which is +5.26 mmb vs revised down Sept 2 of 84.98 mmb. Note Sept 2 of 84.98 mmb was revised down -5.74 mmb vs the 90.72 mmb posted on Bloomberg as of noon MT on Sept 3. (II) Note that the last six weeks were revised down. Comparing yesterday's estimates vs the estimates posted on Sept 3 at noon MT: Sept 2 revised -5.74 mmb. Aug 26 revised -7.92 mmb. Aug 19 revised -5.53 mmb. Aug 12 revised -1.09 mmb. Aug 5 revised -1.35 mmb. July 29 revised -3.54 mmb. (iii) With the revisions, crude oil floating storage over the past two months looks to be +/- 90 mmb, but with a couple of recent weeks above 100 mb. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) Sept 9 estimate of 90.24 mmb is -134.75 mmb vs June 26, 2020 peak of 224.99 mmb. (vi) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in Q2/20 as Covid started to have a huge impact. Sept 9 estimate of 90.24 mmb is +41.00 mmb vs pre-Covid on Sept 9, 2019 of 49.24 mmb. Sept 9 estimate of 90.24 mmb is -30.58 mmb YoY vs 120.82 mmb on Sept 10, 2021. (vii) Below are the last several weeks of estimates made as of today 2pm MT, Sept 3 at noon MT and Aug 27 at noon MT.

Figure 31: Vortexa Floating Storage as of Sept 9 posted on Bloomberg 2pm MT yesterday



Source: Bloomberg, Vortexa

Figure 32: Vortexa Estimates Posted Sept 10 2pm MT, Sept 3 noon MT, Aug 27 noon MT

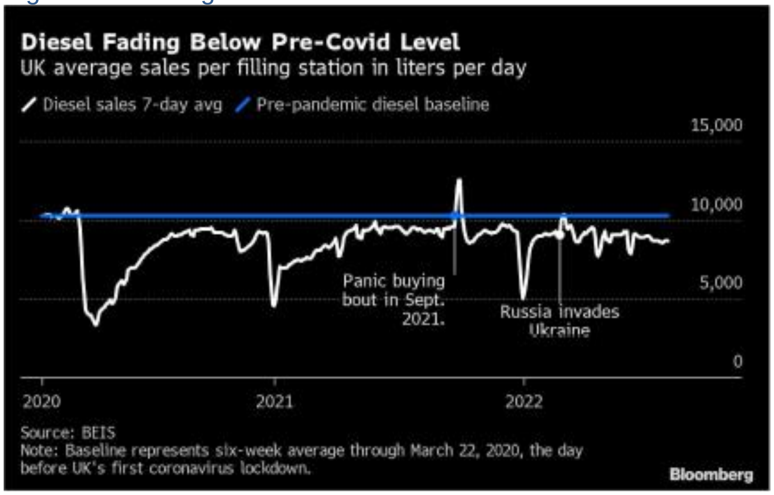
Posted Sept 10, 2pm MT		Sept 3, noon MT		Aug 27, noon MT	
FZWWFST VTXA Index 09/08/2019 - 09/09/2022		FZWWFST VTXA Index 09/01/2019 - 09/02/2022		FZWWFST VTXA Index 08/25/2019 - 08/26/2022	
Date	Last Px	Date	Last Px	Date	Last Px
Fr 09/09/2022	90235	Fr 09/02/2022	90721	Fr 08/26/2022	99094
Fr 09/02/2022	84975	Fr 08/26/2022	96602	Fr 08/19/2022	110.429k
Fr 08/26/2022	88677	Fr 08/19/2022	107.78k	Fr 08/12/2022	110.706k
Fr 08/19/2022	102.252k	Fr 08/12/2022	110.311k	Fr 08/05/2022	94431
Fr 08/12/2022	109.215k	Fr 08/05/2022	92630	Fr 07/29/2022	96372
Fr 08/05/2022	91280	Fr 07/29/2022	94907	Fr 07/22/2022	87209
Fr 07/29/2022	91381	Fr 07/22/2022	83291	Fr 07/15/2022	89237
Fr 07/22/2022	84546	Fr 07/15/2022	89341	Fr 07/08/2022	99286
Fr 07/15/2022	87008	Fr 07/08/2022	99602	Fr 07/01/2022	102.682k
Fr 07/08/2022	99025	Fr 07/01/2022	102.815k	Fr 06/24/2022	102.696k
Fr 07/01/2022	102.525k	Fr 06/24/2022	103.064k	Fr 06/17/2022	111.583k

Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: Diesel fuel sales slump around the world

We recommend reading the Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The key headlines this week are that the demand for diesel is significantly down in several key areas of the worlds as the summer months came to a close on the northern hemisphere and the lockdowns in China continue to impact air travel internationally. The post-pandemic recovery in diesel demand lags that for gasoline, according to comparable road fuel data from three European nations. UK and Portuguese gasoline consumption is lower than before Covid struck, using data for the latest available periods, while Italian usage is up 4.3%. All three show a worse performance for diesel, though, and figures for France also show lower-than-2019 usage. Diesel deficits across those four European countries range from -4.2% to -17%. New diesel vehicle registrations in the UK were down 49% YoY while the same number for petrol engines were down just 19%. Battery electric vehicles were up 50%. Diesel accounted for 57% of total UK road fuel sales in the last week of August, down from about 59% in early 2020. Demand for both diesel and gosoline had fallen and is struggling to keep pace with the same period of 2020. City congestion stayed around average levels this week with three of thritreen tracked cities with congestion above 2019 levels. Airlines around the world have scheduled 97.3 million seats on planes in the week starting Sept. 5. A sizeable chunk of the reduction, though, was due to a large week-on-week decline in North East Asia, including China. More than 30 Chinese cities, including Chengdu, have been fully or partially locked down to contain the spread of coronavirus. The seven-day average for Sept. 4 was 103,387 worldwide flights a day, or 14% lower than the same period of 2019, according to tracking by Flightradar24. A separate estimate for European flights alone, from Eurocontrol, was 12% down. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 33: Average Diesel Sales in the UK



Source: Bloomberg

Oil – Yellen says Biden's actions reduced gas prices 17 to 42 cents

Yellen on gas prices

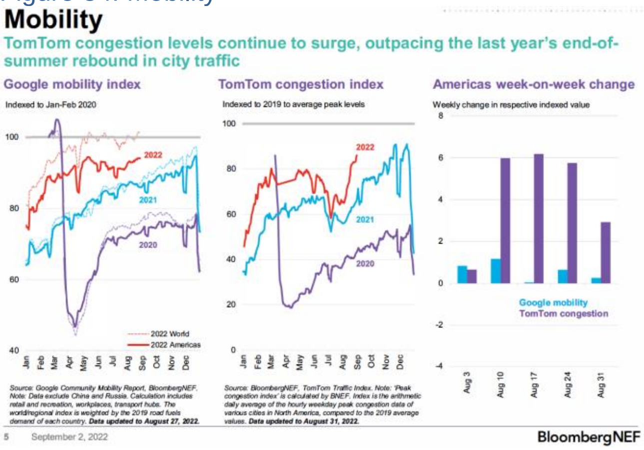
Yesterday, we tweeted [LINK] on Secretary of Treasury Yellen's US gasoline prices comments in her big Sept 8 speech [LINK]. We tweeted "*Give @SecYellen credit, not trying to give all credit to @POTUS for $1.28 drop from $5.01 peak in #Gasoline price. "By Treasury estimates, the President's decision has reduced the price of gas by between around 17 and 42 cents per gallon this year". #OOTT."* AAA's national average unleaded gas prices peaked at $5.02 on June 14 and were down to $3.73 on Sept 8 ie. a drop of $1.29. Note we put $5.01 and not $5.02 in our tweet. Politicians are good at not being specific but Yellen, being a career economist and not a career politician, is more likely to give some data. She said "*We also have released a million barrels of oil per day from our Strategic Petroleum Reserve. By Treasury estimates, the President's decision has reduced the price of gas by between around 17 and 42 cents per gallon this yea*r." Our Supplemental Documents package includes the Yellen speech.

Oil – US drivers hit the road w/ gas <$4, TomTom congestion levels continue to surge

US drivers show demand "response"

We remind there is a difference between demand response vs demand destruction. It wasn't demand "destruction" when US drivers reduce driving when gasoline went to $5. It was a demand "response". We have seen support for this with US mobility data that supports US drivers have been hitting the road with the drop in gasoline prices, especially as they have stayed below $4 for the past few weeks. On Tuesday, we tweeted on the Bloomberg US Weekly Oil Indicators report. BNEF's comments on mobility were bullish. BNEF wrote "*TomTom congestion levels continue to surge, outpacing the last year's end-of-summer rebound in city traffic*", and "*airport activity continues to stave off typical seasonal declines as it approaches 2019 levels, boosting demand and sinking inventories to an 8-year seasonal low".* BNEF included the below TomTom graph.

Figure 34: Mobility

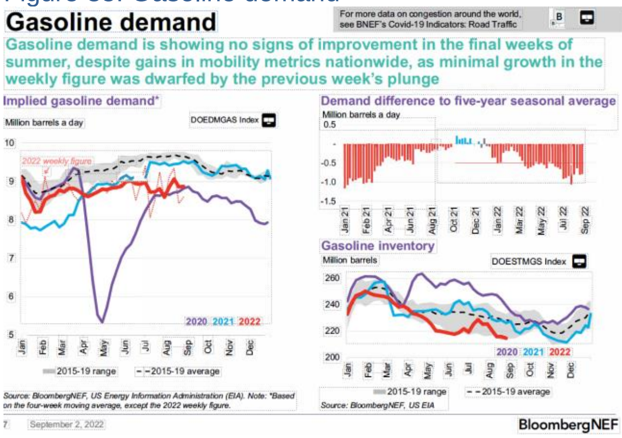


Source: BloombergNEF

But "implied gasoline demand" data doesn't show this mobility increase.

BNEF US Oil Indicators Weekly also highlighted the big market issue from the summer – the EIA's gasoline product supplied data hasn't been reflecting the same trend as the mobility data. Recall this controversy led to the EIA posted an Aug 10 blog [LINK] "*EIA's Weekly Petroleum Status Report provides a snapshot of petroleum balances"* to explain how they estimate their weekly gasoline supplied data and that their estimate is NOT what people buy at the gas station. We tweeted We tweeted [LINK] "*US drivers responded as #Gasoline prices went sub $5 & now $3.80. #TomTom congestion levels continue to surge. BNEF doesn't use retail gas pump sales, rather uses @EIAgov implied gasoline demand which "is showing no signs of improvement." Thx @BloombergNEF Danny Adkins. #OII #OOTT.* We have previously confirmed with BloombergNEF that their "implied gasoline demand" is the EIA motor gasoline product supplied data. BNEF included the below chart and wrote "*gasoline demand is sowing no signs of improvement in the final weeks of summer, despite gains in mobility metrics nationwide, as minimal growth in the weekly figure was dwarfed by the previous week's plunge*." And BNEF included a specific slide *"Spotlight: Making sense of gasoline demand's disconnect to traffic and mobility* *indicators*." Our Supplemental Documents package includes excerpts from BNEF US Oil Indicators Weekly .

Figure 35: Gasoline demand



Source: BloombergNEF

Difference between gasoline retail sales vs gasoline supplied to gas stations

Here is what we wrote in our Aug 7, 2022 Energy Tidbits memo. "*We remind that we have to be careful to not read too much into two data points that are interpreted to be the same but are different. In this case, it's the difference between the EIA "motor gasoline product supplied" vs how much gasoline drivers are buying at the pump. (i) The controversy started with this week's EIA Weekly Petroleum Status Report [LINK] and its sentence "Over the past four weeks, motor gasoline product supplied averaged 8.6 million barrels a day, down by 8.8% from the same period last year." This is for the week ending July 29, 2022. The headlines then immediately jumped out on how this was even below the same period in 2020. And how this was interpreted as Americans are now driving less than they were in the same period during Covid. And we saw commentators on the business channels coming up with reasons such as increasing mileage efficiency of cars. (ii) The jumping to the conclusion of less driving than in 2020 is based on the reader assuming "product supplied" is the same as how much gasoline is being bought at the pump. When they are different numbers. The EIA product supplied is the amount of gasoline that is supplied to the gas stations ie. how much the gas stations are buying to put in their tanks at their gas station. (iii) The EIA product supplied is not the same as how much gasoline drivers are pumping into their cars. Most, including us, reference Gas Buddy estimates of how gasoline drivers are buying at the pump ie. how much gasoline we buy when we fill up our cars. Over time, these two different data points should work out to be the same ie. how much gasoline is supplied to the gas stations vs how much gasoline is sold by the gas stations. But, there will be periods when they are different. (iv) As of our 7am MT news cut off, we have not seen the Gas Buddy detail for the week ending July 31. But last Sunday, Gas Buddy Guy, Patrick DeHaan tweeted [LINK] "According to GasBuddy data, weekly US gasoline demand reached the highest level of 2022 for the week of 7/24, rising 2.0% from the prior* *week and was 3.0% above the rolling four week average, to 9.52mbpd." There is only a partial overlap to the EIA data, but the estimated retail sales of gasoline is strong and the opposite direction as the motor gasoline supplied to gas stations. (v) Is this possible? Yes. One possible explanation is that gas station owners see the declining oil price and are holding off, as much as possible, buying motor gasoline as they expect the prices to go lower ie. why buy higher priced gasoline that has to be resold to drivers. (vi) We are in the camp that finds it hard to believe Americans are driving less in Aug 2022 than in the first Covid summer in Aug 2020. However, we also believe that gasoline prices, even if down $1, are holding back some US driving or changing driving habits. This brings up the question if this is a turning point or is there just a lot more demand to come back if gasoline prices stay below $4/gallon?? And it's also why we the EIA motor gasoline product supplied data over the next couple reporting weeks will be closely scrutinized*."

US gas stations hold a lot of gasoline in their tanks ie 96 to 125 million barrels

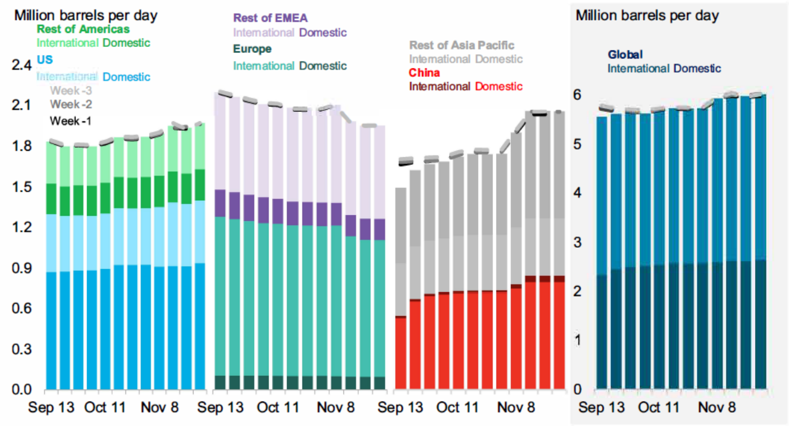
Here is another item from our Aug 7, 2022 Energy Tidbits on gasoline sales at gas stations. We then wrote "*The controversy on how strong is US gasoline consumption brought up the issue of how US gas stations will order more or less gasoline for delivery depending on their view of immediate term gasoline prices. It brings up the question of how gasoline is in inventory at US gas stations. We could not find any EIA inventory data with this estimate. [As an aside, if anyone knows where to get that data, please send me where I can find that data.] But we can come up with a rough estimate of normal gasolines stocks at US gas stations. (i) There are were 131,467 gas stations (gas stations and convenience stores that sell gasoline) in the US. NASC (The Association for Convenience & Fuel Retailing) fact sheet [LINK] estimates there were 148,026 convenience stores operating in the US at the end fo 2020 and 116,641 of these stores sold motor fuels. In addition, NACS estimates there were 14,826 "gas station/kiosk" stores that sell fuel but not enough of an in-store product assortment to be considered convenience stores. (ii) API estimates "a typical gasoline station has a storage capacity of 30,000 to 40,000 gallons in underground tanks." [LINK] At one barrel = 42 gallons, a typical gas station would hold 714 to 952 barrels. (iii) Therefore a rough estimate of the gasoline held in stocks at the 131,467 US gas stations would be 95.9 to 125.2 million barrels. Our Supplemental Documents package includes the NACS and API facts*."

Oil – Declines in jet fuel demand with end of summer peak air travel

Jet fuel demand

On Monday, BloombergNEF posted its "*Aviation Indicators Weekly*" report, which si a good report to flip thru to get a picture of global jet fuel demand indicators. The report was titled "*global jet fuel demand continues to decline*". This is a weekly report so the BNEF comments are compared to last week. Overall, there is a negative WoW trend to jet fuel, but a drop off on a WoW basis in Europe/US air passenger traffic is expected as summer peak travel ended. Ie. BNEF says "*In Europe, departures in the Eurocontrol area were down by 0.5% against the previous week as the summer travel season ends, in line with seasonal norms."* BNEF estimates "*global passenger jet fuel demand across August 25-31 decreased by 2% from a week earlier*." BNEF estimates August 25-31 global fuel demand was 5.622 mmb/d. BNEF also has a look forward at jet fuel demand based on scheduled flights – "*based on the* *number of passenger flights scheduled, jet fuel demand over the next four weeks will average 5.60 million barrels per day."*

Figure 36: Jet fuel demand implied by scheduled flights



Source: BloombergNEF

Oil & Natural Gas - A must read Deutsche Bank CEO keynote speech

Deutsche Bank CEO views

We weren't certain where to put this item, but we believe the Deutsche Bank CEO Christian Sewing views of the world, if correct, will be positive for oil and natural gas thru the 2020s. The headlines on his Wednesday comments were all about his warning a recession is coming for Germany. (i) We tweeted [LINK] "*1/2. Must Read @DeutscheBank CEO. RUS/UKR "destroyed a number of certainties on which we build our economic system over the past decades". NEXT UP, "awkward question on how to deal with China" in light of increasing CN/US isolation/tension, reducing China dependency will .. #OOTT*", and [LINK] "2/2.."*require a change no less fundamental than decoupling from RUS energy". Globalization gone, labor a global bottleneck. Extremely expensive #Electricity #NatGas s a threat to economy. the longer inflation remains high the higher the potential for social unrest, etc. #OOTT."*. (ii) As you can see from our tweets, there are many thoughts. We tend to agree with a lot of what he is saying unless there is a social revolt to say enough is enough. (iii) The real theme of his theme of his speech is excellent – the world has changed for the foreseeable future. The norms of the past decades are gone. Globalization gone. China dependency must be reduced. Global value and supply chains disrupted. Workforce a worldwide bottleneck. Electricity/natural gas will be expensive in EU for a long time.. The truth is that 30 years of presumed calm will now be followed by a period of heightened volatility with economic uncertainty, regular crises and geopolitical conflicts that are also likely to drag on for decades. Trouble spots are not cut off from the rest of the world; they impact other regions in a number of ways. (iv) And he doesn't say much about it, but says "*But the longer inflation remains high, the greater the strain and the higher the potential for social conflict*." We still wonder about social conflict and if there will be Arab Spring type revolt within Germany and other European countries to how people feel they are getting hit by the Russian sanctions. (v) His views are relevant to longer term capital allocation. It's not just Germany has a terrible economic outlook. He raises issues like we have noted about China is the next Russia type target even if they don't invade Taiwan. Germany affects more than itself. And think about it, if Germany can hold the line on Russian sanctions on energy, then it probably says most of Europe can hold the line other than a handful like Hungary, etc. (vi) There is much more in this short viewpoint. Our Supplemental Documents package includes the CEO viewpoint.

Oil & Natural Gas – sector/play/market insights from return of sell side conferences

Sector insights from energy conferences

It's now past Labor Day, which meant the return of sell side energy conferences and oil and gas presentations and updated slide decks. This week, we note a handful of energy sector updates from the transcripts, where available, and new slide decks. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts, or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls and webcasts, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks. Plus, we tend to get the best E&P sector insights from services, pipelines, refineries, and utilities

EOG – See US oil growth 0.7 to 0.8 mmb/d YoY in 2022, little lower in 2023

EOG held a Q&A at a US sell side conference on Thursday. (i) EOG still sees US oil growth at the lower end of forecasts. Mgmt said "*And so, entering the year, we had forecast U.S. growth our internal models kind of on the lower end of most of the forecast that are out there. And things have started to trend down a little bit to kind of the 700,000, 800,000 barrels per day, kind of year-over year type of growth range. And that's what we think is really going to continue forward And probably headed into '23, we'd be a little bit lower also, not only do you have these supply chain constraints, but you also have the inflationary pressure. I think, what we're seeing as out of the public companies, we're really are seeing discipline stick. And you're seeing discipline being rewarded. And I think the companies that have ourselves included emerge from the pandemic and much stronger shape are really revaluating the old business model and how much they want to lean in to an inflationary environment. And then on top of that, like I said, you've got these supply chain constraints. I think U.S. oil growth is probably going to end up being our model is a little bit on the lower end of the growth cycle.*" (ii) Questions how much privates will grow. Mgmt said "*Then yes, it's basically being a bottleneck kind of downstream moving upwards, whether it's access to sand or trucks or things of that nature or just is horsepower also frack spreads. So while the rigs are being dominated, especially in the Permian Bay, a lot of private operators. It'll be curious and interesting to see how much of that really translates into U.S. growth in the next couple of years. And part of the reason to is a lot of those private companies are really small scale, right? That's why they're having a difficult time getting some of these supply chain issues worked out And these private companies are also a little bit, they're kind of latecomers to the basin and so often time their acreage position or where they actually have their rigs is not necessarily on, what we would say is growth inventory, right or high-quality acreage. So definitely acreage where you can drill some oils and journey of returns at these prices, but is it the type of quality acreage that can actually grow significant volumes. And that's not really what we're seeing like that evidenced again by a bit of a disconnect with the whole historical kind of rig versus oil growth rate coming out of the Permian.*"

Liberty Energy – No available frac capacity
Liberty Energy, a frac company, held a Q&A at a US sell side conference on Tuesday (i) Continue to be very bullish for the outlook for oil. They had a slide on their macro outlook. Mgmt said "*We're in a situation today where OPEC-plus has underperformed on quota commitments for 18, 19 months in a row. I think the last chart I saw, we were just looking at it the other day, it shows them 350 million barrels cumulatively behind quota since the start of '21. And so, I think we're in a place where we know that the possibility of bringing on additional supply from elsewhere in the world is certainly limited. And so we believe that means that as demand continues to progress, albeit, maybe with a bit of a hiatus through a recession over the coming years that call on additional supply is going to come from North America. And so, I think if we think about it from a long-term standpoint, we remain incredibly bullish."* (ii) Customers are worried about service sector capacity. Mgmt said "*Yeah. Certainly, we work for the full gamut from the small privates to the very, very large publics. I think it's fair to say at least talking to the sales team right now that at this point in time, there are not conversations around a change in activity level. If anything, our customers remain concerned about access to the necessary services they're going to require to meet the programs that they have laid out not only for the remainder of this year, but headed into next year. And so I think today, we're still in a situation where there is way more call or demand for work than we have availability to supply and no conversation to the contrary and that's true from top to bottom."* (iii) One of our big concerns about US oil production growth is that there isn't frac capacity to drive any big increase in well completions. No spare frac capacity especially as capacity is down about 1/3 since 2019. Mgmt said "a*nd so I think if you looked across the pressure pumping spectrum, we're probably maybe some of the last remaining capacity to come off the bench, I just don't think there's a lot more sitting out there. But we find ourselves today in a market where there is significantly more demand for frac capacity than there is available supply." "We went from a market that had maybe 21 or 22 million horsepower to something that's got 14 or 15 million horsepower available today, a lot of which is still decade old legacy equipment, very little of which is next generation assets. That's happening in an environment where we have supply chain challenges that include not only the supply chain that feeds into frac fleets and chemicals and whatnot, we have an incredibly labor -- incredibly challenged labor market alongside of that."* Our Supplemental Documents package includes excerpts from the Liberty slide deck.

Patterson UTI – zero slack in frack capacity, very little in drilling rigs
Patterson UTI held a Q&A at a US sell side conference on Wednesday. (i) Not seeing any concern from customers with recent oil price volatility. Mgmt said "*Let me just clarify, we're still seeing very strong demand. We're still seeing opportunities to push pricing in both drilling and pressure pumping and other services that we have. So the market is definitely still in our favor."* (ii) Seeing increasing activity in 2023. Mgmt said "*Pricing in drilling rigs, pricing in pressure pumping, pricing in directional drilling, continues to go up. The demand is still strong. We see increasing activity in '23 and pricing is going to continue to move up."* (iii) Expects large E&Ps to start to pick up activity. Mgmt said "*We think that the demand is there. When you look across the*

types of operators and E&Ps that have been bringing out rigs for the last 1.5 years, it was really the privates that led the way, then you've got mid-tier publics, but what's missing in the equation, and you're going to see more of in '23, are the large major E&Ps. And so you're going to start to see increasing activity from that group. It doesn't mean the privates aren't going to continue to add because I think some of them will, especially the large privates, but you're going to see a little bit of shift more towards the major E&Ps as well." (iv) A very tight Tier 1 super spec rigs. Mgmt went thru a story to emphasize the tightness and how customers are willing sign term contracts to keep the best rigs. (v) No spare frac capacity. Mgmt said "*We're very encouraged by how tight this market is, a little bit different from the drilling market, where the drilling market just has discipline around it, the pressure pumping market is literally sold out. If an E&P needs a frac spread tomorrow, it's just not available*." Our Supplemental Documents package includes excerpts from the Patterson UTI transcript.

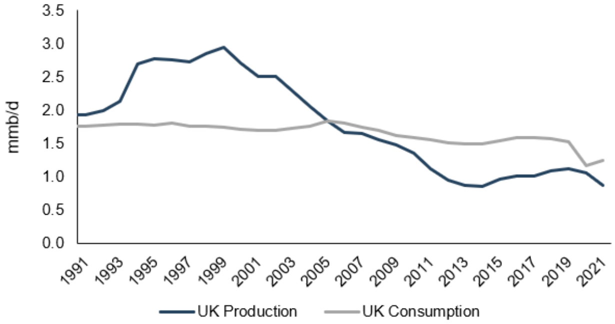
Schlumberger – Oil & gas companies worried about service sector capacity
Schlumberger held a Q&A at a US sell side conference on Thursday. (i) The transcript is one of the worst we have ever seen and we suspect part of it is that CEO Olivier Le Peuch, while fluent in English, does have an accent that looks like it caused a lot of problems for the transcribers. (ii) Oil and gas companies are worried about service sector capacity. Le Peuch didn't specifically say that, but his comments express that view. Le Peuch was asked if customers are worried about recessions or global oil demand falling, and replied "*If you look at the customer meet and I've been meeting quite a few in the last 10 days, they're not worried about this. They're worried about securing capacity from us, assuring performance, assuring that they would have delivery of their committed gas and committed oil production that they have put in the pipeline. So that's their concern. The concern is not whether the old price will let tip up or tip down, and whether the recession will impact somehow in one region, the demand outlook."* (ii) Middle East is increasing both short cycle and long cycle projects. Le Peuch said "*Directionally, I think the trend of investment internationally, the pace of mobilization of rigs and of -- and commitment to both short and long cycle offshore Middle East is something that I've not seen for, for, for quite some time*." (iii) Reminds that Middle East has to drill to offset declines. We believe one of the overlooked fundamentals by investors is that oil and natural gas production declines and the first challenge is the need to add productive capacity to keep production flat. Le Peuch didn't specifically say this, but said "*This year, offshore have been the first to accelerate, but Middle East has come true and is already, I think passed inflection point, I would say. Because you have two things happening at the same time in the list. You have short cycle activity that is necessary to supply the production that is now of quarter, that I would have to keep holding at capacity for -- particularly for liquid production. This has been resumed in the last 18 months, 24 months. And now, it's almost back to the level it was before."* Our Supplemental Documents package includes excerpts from the transcript.

Oil & Natural Gas – Can UK modestly grow its oil and natural gas production?
One of new UK PM Truss's priorities is to have increased UK oil and natural gas production. We aren't big believers onshore shale will amount to anything significant assuming local

UK oil and gas production

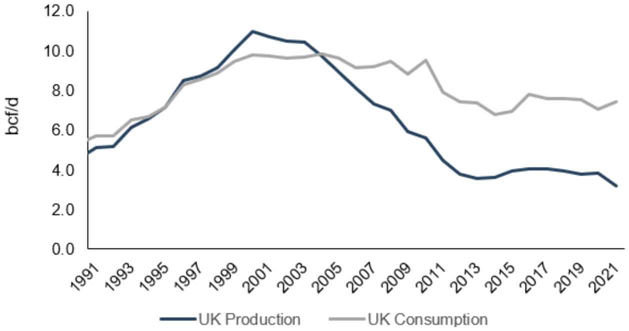
governments sign off on fracking. Any growth in production will depend on North Sea production additions more than offsetting declines. It will depend on drilling and the fiscal regime, but we have to believe there is chance for some modest growth in production. Not as much as post the 2012-2014 period of $100 oil that saw UK production grow by about 250,000 b/d. Below are the UK oil and natural gas production graphs that remind the North Sea has been in decline for the past 20 years other than some smaller spurts.

Figure 37: UK Oil production vs consumption



Source: BP

Figure 38: UK Natural Gas production vs consumption



Source: BP

Oil & Natural Gas – Importing countries also getting hit by stronger US dollar

One item that is still overlooked by many is how the strong US dollar make imports of LNG and oil much more expensive to energy importing countries. It's very expensive and makes a huge difference for countries like Japan and Pakistan. On Tuesday, we tweeted [LINK] "*Reminder, Japan in particular is getting hit by strong US$ adding to its cost to import #LNG #Oil. Since Feb 28, US $ appreciation: +23.8% vs Yen, +13.3% vs Euro, +10.3% vs Renminbi, +6.0% vs Rupee. #OOTT*". These have moved a little bit since Tuesday, but based on the Friday close, the US appreciation since Feb 28 is +28.8% vs Pakistan Rupee, +24.0% vs Yen, +11.0% vs Euro, +9.8% vs Renminbi, and +6.1% for India Rupee. No wonder Pakistan has had trouble stepping up to buy spot LNG cargos.

Strong US$ hits energy importing countries

Figure 39: US Dollar vs Japan Yen and Pakistan Rupee

Source: GoogleFinance

Oil & Natural Gas – Poilievre easily wins Conservatives leadership, highlights oil

Poilievre new Conservatives leader

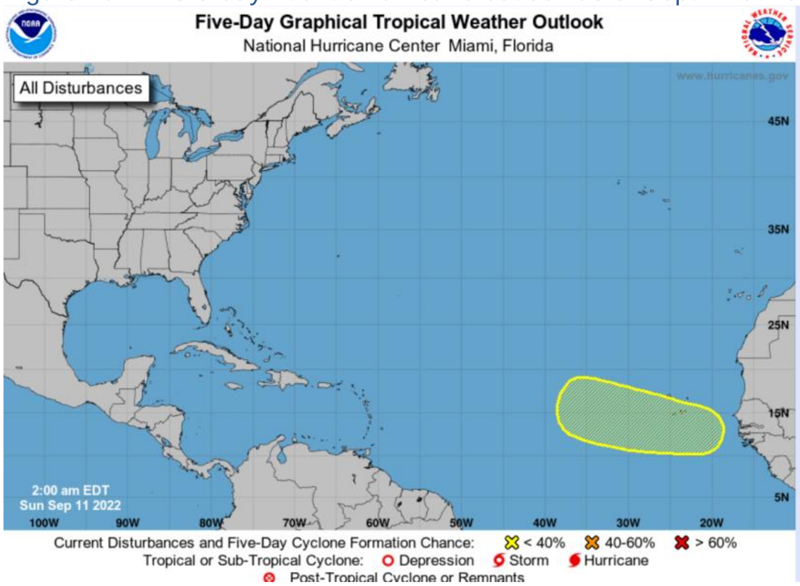
We have to believe the Liberals aren't likely to call a national election for some time considering the size of Pierre Poilievre's victory yesterday. The next Canada election doesn't have to come before October 20, 2025 and we wouldn't expect the Liberals to call an election anytime soon. No question that cost of living is the key reason why, but also because Trudeau would be facing a united Conservatives party who voted convincingly for Poilievre as new leader. He won 330 of 338 ridings. He had 70.7% of the vote compared to Jean Charest with 11.6% and Leslyn Lewis with 11.1%. We listened to his acceptance speech yesterday [LINK]. We couldn't find a transcript but he made a number of shout outs to oil and gas and mining. He also tried to set the stage for a broadening the appeal by acknowledging climate change and, while not specific, gay marriage. Earlier this morning, we tweeted [LNK] "*ICYMI. @PierrePoilievre acceptance speech after blow out win to be Conservatives leader. "fighting climate change with technology and not with taxes". "produce more energy right here in Canada", replace imported #Oil in eastern Canada, mine critical minerals for EVs. #OOTT".* We made a transcript of some of his quotes. 12:20 min *"it means fighting climate change with technology and not with taxes*". 13:55 min "*and produce more energy right here in Canada".* 15:20 min "*mine critical minerals for electric cars*". 15:30 min "*right now, we lose wages because we import 130,000 barrels of overseas oil, mostly from dictators, every single day even though we have the third largest supply right here in Canada. And that is all because our government prefers dirty dictator oil to responsible Canadian energy. We will repeal this government's anti-energy laws and replace them with a law that protects our environment, consults First Nations, and gets things built. We will greenlight Newfoundland and Labrador's planned increase in oil production, which will allow us to fully replace every single barrel of oil we are importing from abroad. And within five years, we will set the goal to end dictator oil in Canada altogether*". 17:15 min. "*we will greenlight mining and manufacture of minerals like lithium, cobalt and copper to make electric cars and batteries*". 22:55 min "*we will restore Canada's promise in a country where it doesn't matter who you love, or if your name is Smith or Singh, Martin or Mohammed, Chang or Charles*."

Oil & Natural Gas – Puerto Rico tends to be a good marker for GoM hurricane risk

Hurricane risk GOM vs Atlantic

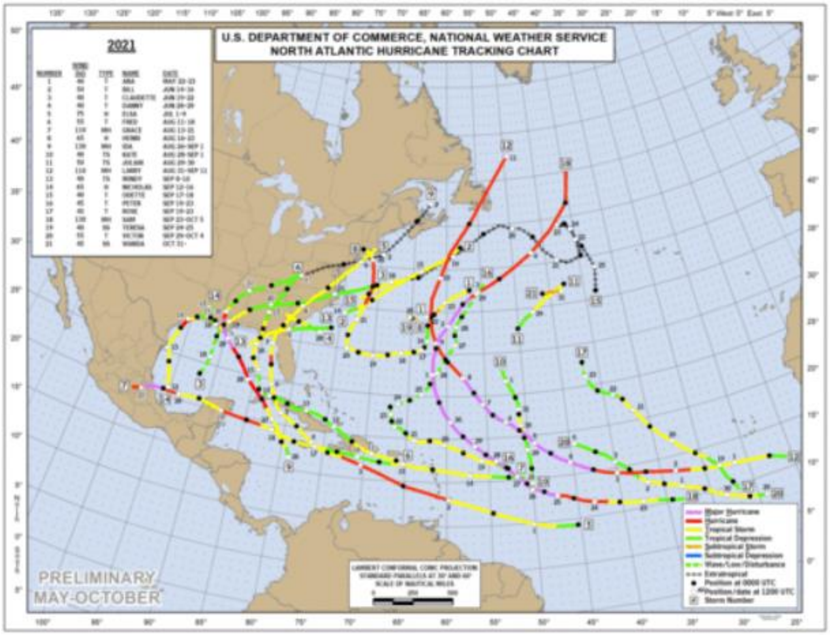
It may have been very hot this summer in Texas and Louisiana, but the good weather news is that it continues to be another week of no hurricane activity in the Gulf of Mexico. And the good news this weekend is that the NHC's 5-day outlook this morning shows that any potential Tropical Storm or Hurricane developments are likely not to come into the Gulf of Mexico but move into the Atlantic. There is also a reminder that potential storm development doesn't always develop into storms. On Friday, there were three potential storms on the NOAA 5-day graphical tropical weather outlook and that is down to one this morning. On Friday, we tweeted [LINK] "*Three potential storms off Africa. Forecasting Atlantic hurricane paths is impossible even for experts. But hurricane risk to GoM #Oil #NatGas #LNG #Refinery tends to increase if hurricanes are south of Puerto Rico. See 👇 excerpt SAF Group Dec 5, 2021 Energy Tidbits #OOTT*." Here is what we wrote in the Dec 5, 2021 Energy Tidbits "*Is normally not a perfect correlation but the 2021 Atlantic hurricane season was for the early indicator for risk to the GoM oil and gas being if the tropical storm/hurricane hits north of Puerto Rico or not. This year, all the storms/hurricanes that were north of Puerto Rico went into the Atlantic and all that were south of Puerto Rico went into the GoM. Below is NOAA's 2021 tracking map*."

Figure 40: NHC 5-day Atlantic hurricane outlook as of Sept 11 at 2am MT



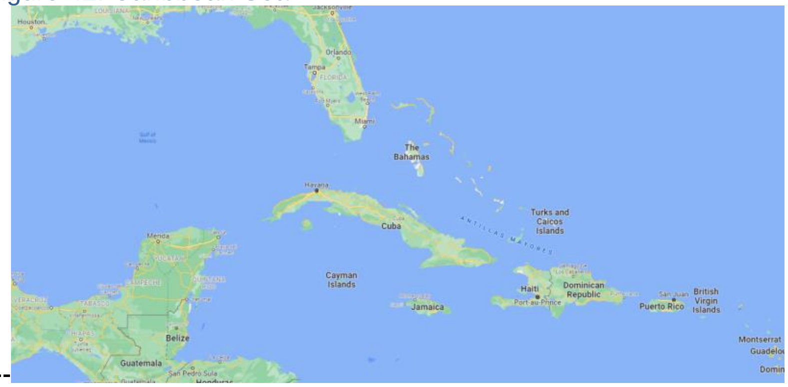
Source: NHC

Figure 41: North Atlantic Storm Tracking Map in 2021



Source: National Hurricane Center

Figure 42: Caribbean Sea



Source: Google Maps

Oil & Natural Gas – Putin highlights growth in Northern Sea Route shipping

There was 23 pages of transcript so Putin spoke for a long time in his Sept 7 Eastern Economic Forum plenary session address and Q&A. But he gives long answers, which is good for understanding his position. There should be no surprise that Putin highlighted the growing importance/value of the Northern Sea Route. One thing that caught our attention was how Putin talks about being able to properly service ships at all the ports along the route. When we hear that, it also means having the naval capacity to protect/control the entire route. Putin highlighted Russia's focus on increasing its "*ice-class ships, for the further*

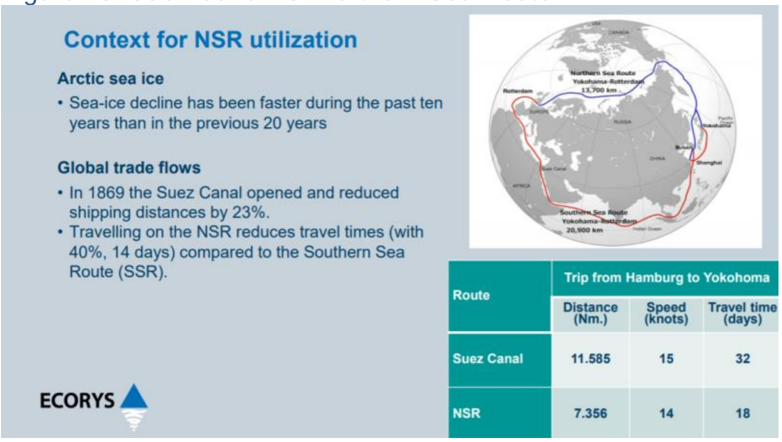
Northern Sea Route is fastest passage

expansion of the Northern Sea Route as a potent transport corridor of national and global importance with, I want to stress this, year-round navigation. The state-of-the-art icebreakers that we are designing and building make it possible for us to do this already now." Putin also said "*This year, a container vessel made its first run between Murmansk and Kamchatka along the Northern Sea Route to reaffirm the reliability and safety of shipping operations in the Arctic zone. Notably, the point is not just about authorising the passage of ships in the Arctic or simply connecting two destinations. What we need to do is make sure that ships are properly serviced and cargo is properly handled at each port along the route, and the traffic schedule is sustainable, predictable and reliable. Then, every Northern Sea Route waypoint and region will benefit from the logistics corridor. That is what we should be striving for. The Government has approved a development plan for the Northern Sea Route until 2035 with plans to allocate 1.8 trillion rubles from various sources to implement it. As forecasted, the cargo traffic along this corridor will go from the current 35 million tonnes per year to the targeted 220 million tonnes per year."* That is approx. $30 billion.

Russia's Northern Sea Route shortens shipping time by 14 days

Our October 17, 2021 Energy Tidbits was our last reminder on the Northern Sea route but our primary highlighting this year was in our April 4, 2021 Energy Tidbits at the time of the Suez Canal shutdown. The Northern Sea route is a much sorter and faster sea route. Time is money and this is a huge savings in time and cost even if there could be added insurance costs in the northern route. This was very topical as at the time of writing the Evergiven was stuck, blocking the Suez Canal. We noted that we had to believe that the Suez Canal stoppage got shippers thinking more about the utilization of Russia's Northern Sea Route. We also noted in our Jan 24, 2021 Energy Tidbits that Russia would be attempting the earliest ever LNG shipment to Asia through the Northern Sea Route in May, as the transit season is getting longer for the NSR. The NSR is a much shorter route from Europe to Asia than through the Suez, with a trip from Hamburg to Yokohoma taking 14 days less using the NSR and is ~4,000 Nm shorter. Below is a good graphic from the ECORYS discussion paper at the International Transport Forum. [LINK]

Figure 43: Suez Canal vs. Northern Sea Route



Source: International Transport Forum, ECORYS

ISO New England's reality check

Energy Transition – Baker Hughes sees more pragmatic approach on energy transition

Our only concern about western politicians using the Russia invasion as the cover for any partial backing off their energy transition efforts is that we worry that there could be the set up for a longer period of high energy prices for people. If politicians don't admit the set up was a big negative prior to Russia, then we worry they won't address the problem.The energy theme highlighted by Baker Hughes at its Tuesday US sell side energy conference presentation was the energy transition and how it wasn't working. But they see a more pragmatic approach now being taken to the energy transition. Here were mgmt's opening comments "*A year ago, the world was emerging from the Covid-19 pandemic with an optimistic view towards oil demand recovery and higher commodity prices. At the same time, governments accelerated their policy efforts to deemphasize oil and gas and stimulate broader investments in new energy technologies. However there was very little focus or coordination on the practicality of the policy steps being taken to replace hydrocarbons with renewables, address the risk of underinvestment in oil and gas or the broader concept of energy security. Today recent world events have refocused the world's policymakers on energy security, reliability and affordability and how these needs can be met in parallel with the long-term goal of energy sustainability. While it's clear that the world wants and needs to reduce greenhouse gases, it is also apparent that the pace of the energy transition needs to be balanced and thoughtful. If the balance is neglected, energy may become unaffordable and inaccessible for millions and potentially billions of people. Thankfully, we have started to see the emergence of a more pragmatic approach on the energy transition. And as part of that, an enhanced outlook for natural gas and how it can play a larger role in a decarbonizing world. As we go forward, this 3-way push, pull of security, sustainability and affordability or the energy trilemma will redraw the world's energy map. Heightened energy security and affordability demands will likely enable an increase in near to intermediate-term spending for hydrocarbons. At the same time, the urgency for lower carbon emissions will also drive new energy spending in the decades to come. And because of the role natural gas plays as a critical transitional fuel, the trilemma will be a critical driver for increasing LNG infrastructure spending."*

Fits our #1 2022 Prediction, leaders admit energy transition isn't working

The Baker Hughes comments fit our #1 prediction for 2022 - energy leaders will have to admit the energy transition wasn't working as planned and changes were needed. This was before Russia invaded Ukraine. Our Dec 12, 2021 Energy Tidbits memo was titled "*Time for 2022 Predictions: Our #1 is More Leaders Have a #MacronMoment & Admit Energy "Transition" Needs Changes*." In that memo, we wrote "*Its December and so analysts will soon be coming out with 2022 predictions, so we thought we would beat them with one of our main 2022 predictions. On Thursday, we tweeted [LINK] "Time for #2022Predictions. My #1 is more #EnergyTransition #NetZero leaders come out of closet, have a #MacronMoment ie. have "transition" not self inflicted shortage so 2021 energy crisis isn't every year. A return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT." This should not surprise readers as we have been noting the start of energy transition leaders starting to admit, in a politician's manner, that the energy transition isn't working as per aspirations and energy costs will be a lot higher than aspired. We* *have said for years that the energy transition will happen, but it will take longer, be bumpy road and cost more than the aspirations. Last week's (Dec 5, 2021) Energy Tidbits wrote on the ADNOC CEO speech There was much more in the speech, which is why we tweeted [LINK] "If more leaders have a "Macron Moment" in 2022, maybe COP28 UAE in 2023 can be catalyst for getting down to work on practical, commercial, sustainable energy solutions: pro climate/pro growth? See SAF Group transcript of @SultanAhmedalj8 #ADIPEC keynote. #EnergyTransition #OOTT." We do wonder if we will see more world leaders accept that the energy transition isn't working according to their aspirations and that there is an increasing risk of a decade of energy crisis like seen in Europe in H2/21 unless the world puts in an achievable energy transition plan." We think COP26 will turn out to be turning point, but a turning point to force energy transition leaders into changing their plan. It why we think we will more of the energy transition leaders come out of the closet and admit this in 2022. But what got us to tweet this week was after seeing Saudi Aramco CEO Nasser speech at the WPC in Houston. Nasser said "There is one more thing that can no longer remain unsaid. A majority of key stakeholders agree with these realities as much as they believe in addressing climate change. We know this, because they say so in private. They should say it publicly too. I understand their dilemma. Publicly admitting that oil and gas will play an essential and significant role, during the transition and beyond, will be hard for some." So our #1 2022 Prediction is that we will see leaders come out of the close and admit, in a politician's way, that the energy transition plan needs to be changed. The key result will be that fossil fuels are needed for way longer and the outlook for oil, natural gas and LNG will be stronger thru 2030 and beyond".*

A #MacronMoment can take three forms

In the Dec 12, 2021 Energy Tidbits, we also wrote "*We use the term "Macron Moment" and the #MacronMoment as when an energy transition leaders come to the realization that the energy transition will take longer, be bumpy and cost more ie. it just won't be ready for prime time and they need to change their plans on how quickly they get rid of oil and natural gas. We are already seeing politicians start to publicly have a #MacronMoment but, so far, it has come in three forms of admission as noted below*."

Energy Transition – Repsol/EIG Upstream deal has two major energy transition trends

Repsol/EIG upstream deal

The Repsol/EIG deal may have been a big upstream deal, but it really highlighted two major energy transition trends that we have highlighted in our Energy Tidbits memos. We tweeted [LINK] "*Repsol sells 25% in upstream, reduces its emissions, but retains operational control ie. trading profits leverage. #EIG believes this upstream #Oil #NatGas partnership is "well positioned to help meeting the GROWING global demand for accessible, efficient & safe energy" #OOTT."* (i) The Repsol/EIG deal. On Wed, Repsol announced it was selling a 25% interest in its upstream oil and gas business to US institutional investor EIG for $4.8b. A key condition is "*Repsol will retain operational control of this business".* (ii) Repsol reduces emissions by selling a portion of their assets but retains the trading revenue upside on all of the assets. We have been highlighting that the way major oil companies reduce emissions is to sell assets. That is happening here, but the big benefit to this structure to sell an interest in its assets and not sell 100% of certain assets is that Repsol is retaining the trading revenue upside. (ii) The other more significant energy transition trend in 2022 is that a number of major global institutional investors have made a big pivot in how they decarbonize their portfolio. We have seen major investors (ie. CPPIB, Norway's wealth fund) shift to a focus on keeping investing in oil and gas but saying they will be a catalyst to help these oil and gas companies decarbonize. EIG said "*EIG is a provider of institutional capital to the global energy and infrastructure sectors and committed to influencing ESG industry best practices across its portfolio*" and "*energy transition informs every decision we make, and we are thrilled to partner with a global leader of Repsol's stature on this compelling opportunity to lead change in our industry*." Our Supplemental Documents package includes the Eni/Repsol release. [LINK]

CPPIB led the new investor focus to helping oil and gas decarbonize

Our Dec 19, 2021 Energy Tidbits highlighted CPPIB's Dec 15 "new" investment approach. In that memo, we wrote "*There was a significant positive to oil and gas investing this week and one that we expect others to follow, and this will lead to more long term investor capital allocation to oil and gas. On Wednesday, CPPIB announced its "new" investment approach in its release "CPP Investments highlights importance of decarbonizing hard-to-abate sectors in addressing climate change". [LINK] This is a significant change for a couple of reasons and one that we have been expecting based on the feedback we hear from long term investors. CPPIB calls it a "new investment approach" including on oil and gas. (i) CPPIB is a leader and is providing the messaging framework that we expect others to follow. Big long term investors like CPPIB have mostly all come out plans on how they taking their investment strategy to Net Zero. But, in discussions, more are realizing the Energy Transition isn't happening as fast as expected so their challenge is how to slow play their capital allocation to Net Zero. CPPIB provide the messaging on how they will do so. (ii) CPPIB now calls oil and gas a "strategic sector" and one for capital allocation. CPPIB said "helping businesses decarbonize is critical to addressing climate change, according to a recent perspective published by Canada Pension Plan Investment Board (CPP Investments). The perspective, "Investing to enable an economy-wide evolution to a low-carbon future," highlights the opportunity decarbonization presents for long-term investors, noting the need to address a particularly serious obstacle to decarbonization: strategic sectors that are essential, high-emitting and hard-to-abate. The perspective also outlines CPP Investments' new investment approach which aims to identify, fund and support companies that are committed to creating value by lowering their emissions over time, consistent with CPP Investments' time horizon advantage. "High-emitting companies that successfully navigate the economy-wide evolution to a low-carbon future will preserve and deliver embedded value for patient long-term investors like CPP Investments," said Deb Orida, Global Head of Real Assets & Chief Sustainability Officer. "This new investment approach complements the Fund's ongoing commitment to investing in companies that have the potential to develop innovative climate technologies around the world and furthers our existing capabilities in technologies that enable the energy evolution." Strategic sectors that are essential, high emitting and hard-to-abate within this investment approach include agriculture, chemicals, cement, conventional power, oil and gas, steel and heavy transportation. The successful decarbonization of these sectors is not only essential to meet wider* *net-zero ambitions, but also to sustain economic growth, stability and a responsible transition."*

Energy Transition – Biden playing catch-up, US emissions back to 2019 levels in 2021

US emissions +6% YoY in 2021

Secretary of Treasury Yellen's big Sept 8 speech [LINK] also included her comments on the Biden Administration being on track to meet its goal to reduce US emissions by 40% relative to 2005 levels by 2030. Yellen said "*In policy terms, experts estimate this law puts the United States on a path to reducing emissions relative to 2005 levels by approximately 40% within the next eight years. That places President Biden's goal of cutting our emissions in half by 2030 well within reach. While there is much more work to do, we can finally say to ourselves and to the world that we are on a path to a net-zero emissions economy*." We think Yellen is one of the straight talkers in the Biden Administration, but her 40% emissions reductions didn't mention a couple of items. First, Biden's first year in office reversed the emissions savings from the pandemic. When the world came to a halt in 2020, it meant that 2020 was the year that saw big emissions reductions. However, that was reversed in 2021. Climate Action Tracker is not an anti-climate change group. In August, they wrote [LINK] "*Following a steep decrease in emissions in 2020 as a result of the COVID 19 pandemic, emissions bounced back as the US economy recovered in 2021. The CAT estimates that US GHG emissions in 2021 increased by 6% above 2020 levels (excl. LULUCF), returning to pre-pandemic levels*." Second, Biden's goal to reduce emissions by 40% relative to 2005 levels isn't him making a 40% cut. Rather, emissions had already been cut by ~20% and he was taking it from 20% to 40%.

Democrat coastal cities would get hurt if Biden played climate change card

Yellen also highlighted economic fairness that she sees is a goal of policy and it's a moral issue. She said "*And it boosts growth by tapping all our resources. In layman's terms, this approach embraces the notion that some of the best opportunities for growth occur when we invest in people and places that have been forgotten and overlooked. We know that a disproportionate share of economic opportunity has been concentrated in major coastal cities. Investments from the Biden economic plan have already begun shifting this dynamic."* The reality is that Biden could influence this disproportionate share of economic fairness by playing a climate change card on rising sea levels and moving to restrict or take away development in the lower lying coastal area. Later in the memo, we note the Climate Central mapping tool to see the impact of rises in "high tide line".

Energy Transition – No wonder India's EV focus is on mopeds

Motor vehicles per 1,000 peo

On Monday, we were reading a New York Times report "*India's Electric Vehicle Push Is Riding on Mopeds and Rickshaws*" that reminded why India's electric focus is on mopeds. They wrote "*Here in India, those are all out of reach of the vast majority of families, whose median income is just $2,400. But an electric vehicle movement is taking place nonetheless, not on four wheels, but on two and three. Electric mopeds and three-wheeled rickshaw taxis that sell for as little as $1,000 are zipping along India's congested urban thoroughfares, cheered on by environmentalists and the government as a way to clear some of the oppressive smog*." And they noted "*There are just 22 cars per 1,000 people in India, compared with 980 per 1,000 Americans."* They didn't note the source for the per capita data. We were curious to see where other large countries ranked and found a

Wikipedia list that had fairly current data. Whereas most other reports were using data that was about 10 years or more old. We created the below table to show the world ranking of countries with more than 40 million motor vehicles and also included Canada. When you look at motor vehicles per 1,000 people and remember the growing middle class in countries like China, it's easy to see why EV makers are focused on China.

Figure 44: Motor vehicles per 1,000 people

Motor Vehicles per 1,000 People, Countries With Min 30 Million Vehicles + Canada

Ranking	Country	Motor vehicles per 1,000 people	Total	Year of Data
6	United States	868	290,800,000	2022
12	Italy	756	44,999,681	2020
16	Canada	730	27,022,635	2021
17	France	667	44,944,450	2020
25	Germany	628	52,275,833	2020
27	Japan	624	78,461,953	2020
31	United Kingdom	594	40,400,000	2022
55	Russia	397	57,812,037	2020
58	Mexico	391	50,400,000	2020
65	Brazil	366	77,977,443	2021
90	China	219	307,000,000	2022
141	India	62	86,811,575	2021

Source: Wikipedia

Energy Transition – Big money to whoever can figure out solar panel recycling

Solar panel recycling issue

We have to believe governments will have to provide incentives to encourage solar panel recycling. However, we also think there is some big money to be made if someone can redesign solar panels to make it cost effective to recycle or if someone can find some other way to make solar panel recycling pay off without governments incentive to at least make it profitable. We were surprised to see the recent (July 14, 2022) LA Times report "*California went big on rooftop solar. Now that's a problem for landfills*" as we had assumed the massive price spikes in precious metals and lithium would have led to big returns to solar panel recycling. The LA Times says that is not the case. The LA Times writes "*Sam Vanderhoof, a solar industry expert and chief executive of Recycle PV Solar, says that only 1 in 10 panels are actually recycled, according to estimates drawn from International Renewable Energy Agency data on decommissioned panels and from industry leaders. The looming challenge over how to handle truckloads of waste, some of it contaminated, illustrates how cutting-edge environmental policy can create unforeseen problems down the road. "The industry is supposed to be green," Vanderhoof said. "But in reality, it's all about the money."* The LA Times also writes on the math of why this is happening. They wrote "*Although 80% of a typical photovoltaic panel is made of recyclable materials, disassembling them and recovering the glass, silver and silicon is extremely difficult." And ""Only about $2 to $4 worth of materials are recovered from each panel. The majority of processing costs are tied to labor, and Orben said even recycling panels at scale would not be more economical.*
Most research on photovoltaic panels is focused on recovering solar-grade silicon to make recycling economically viable. That skews the economic incentives against recycling. The National Renewable Energy Laboratory estimated that it costs roughly $20 to $30 to recycle a panel versus $1 to $2 to send it to a landfill." Our Supplemental Documents package includes the LA Times report.

Climate Change – "Doomsday glacier" could raise sea levels by several feet

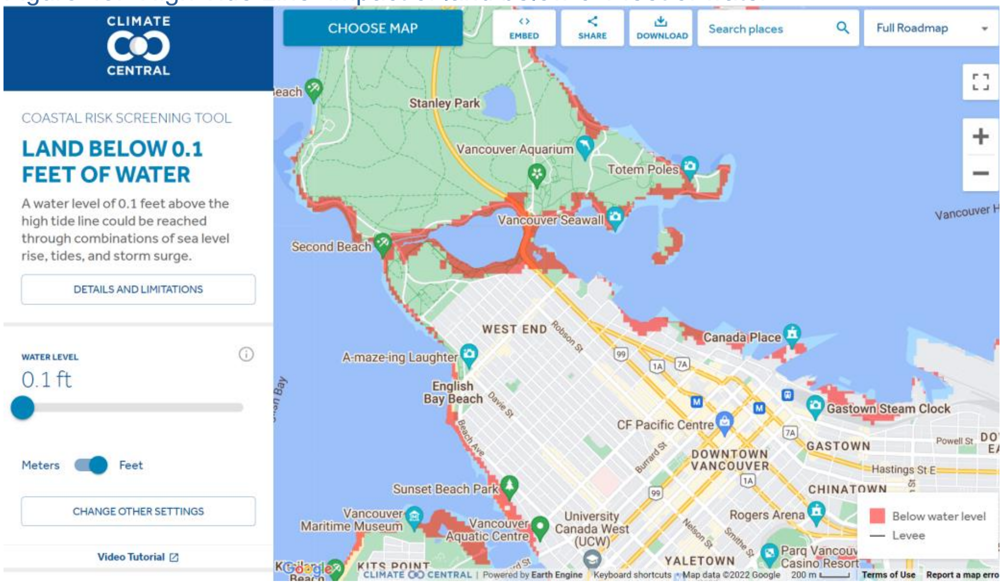
Thwaites Glacier

One of our climate change reminders is that it only takes sea levels to rise by an inch or two to have a material impact – it doesn't take a sea level rise of a foot or even half a foot. One of the interesting things on a holiday like Labor Day is to see the news stores that fill the space. One such story was CNN's "*'Doomsday glacier,' which could raise sea level by several feet, is holding on 'by its fingernails,' scientists say*". [LINK] It reminded us to write again on sea levels. We have no idea if their math on the sea level rise from a break-off of the Thwaites Glacier is right. But they don't need to be right with several feet of sea level rise to have a disaster. A sea level rise of a foot would be a disaster. CNN wrote "*Antarctica's so-called "doomsday glacier" -- nicknamed because of its high risk of collapse and threat to global sea level -- has the potential to rapidly retreat in the coming years, scientists say, amplifying concerns over the extreme sea level rise that would accompany its potential demise. The Thwaites Glacier, capable of raising sea level by several feet, is eroding along its underwater base as the planet warms. In a study published Monday in the journal Nature Geoscience, scientists mapped the glacier's historical retreat, hoping to learn from its past what the glacier will likely do in the future. They found that at some point in the past two centuries, the base of the glacier dislodged from the seabed and retreated at a rate of 1.3 miles (2.1 kilometers) per year. That's twice the rate that scientists have observed in the past decade or so.*" Our Supplemental Documents package includes the CNN report

Good mapping tool to see the impact of an increase in high tide levels

The reason why we added the CNN Thwaites Glacier report is not because of the risk of a several feet rise in sea levels, but to remind that a 1 or 2 inch increase in high tide levels would be a huge economic hit. Our concern is that sea level rises sneak up over a 20, 30 or 40 year period. Surprisingly time flies. And a 1 or 2 inch increase in high tide line would hit the entire world. For good perspective on what this means, there is a good mapping tool from Climate Central, which we first highlighted in or Nov 15, 2015 Energy Tidbits memo. Note that these are estimates and estimates for the impact on "high tide line". The mapping tool is found at [LINK]. We don't know the level of accuracy, but the estimates don't look too crazy. Again, this is for the impact on "high tide line. But here is the mapping for downtown Vancouver for an 0.1 ft rise in sea levels impact on the high tide line.

Figure 45: "High Tide Line" impact of land below 0.1 feet of water



Source: Climate Central

Demographics – Putin slams "golden billion" wealthy west nations

The Golden Billion

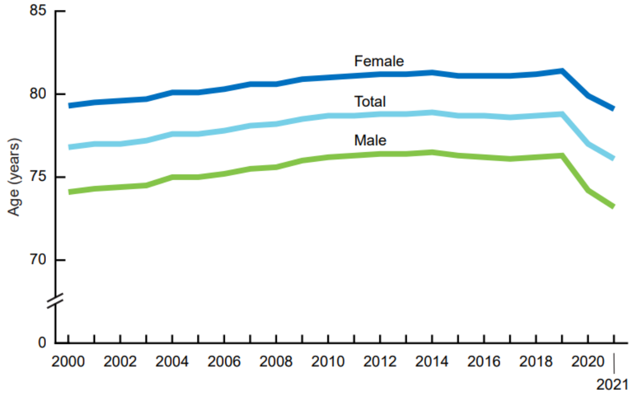
Putin slams "golden billion". We must have missed Putin's prior use of the "golden billion" in how he describes the wealthy western countries leading to the rest of the world feeling a tougher economic hit. In his Sept 7 comments at the Eastern Economic Forum plenary session, Putin said "*What I am saying is, many European countries today continue to act as colonisers, exactly as they have been doing in previous decades and centuries. Developing countries have simply been cheated yet again and continue to be cheated"*. He also said "*Moreover, the poorest states have completely lost access to the most essential foods as developed countries are buying up the entire supply, causing a sharp increase in prices".* And then his golden billion comment "*I would like to stress once again that this situation has been caused by the reckless steps taken by the United States, the UK and the European Union, which are obsessed with illusory political ideas. As for the wellbeing of their own citizens, let alone people outside the so-called golden billion, they have been pushing it to the backburner. This will inevitably lead Western countries into a deadlock, an economic and social crisis, and will have unpredictable consequences for the whole world."*

Demographics – US life expectancy dropped 2.7 years from 2019 to 2021

US life expectancy down 2.7 yrs since 2019

There was a big drop in US life expectancy from pre-Covid 2019 to 2021 of 2.7 years, which is the biggest two year decline in almost a century. Plus there is a growing gap in the life expectancy for male vs female, which is now 5.9 years. Two weeks ago, the CDC National Center for Health Statistics (NCHS) released "*Provisional Life Expectancy Estimates for 2021*" [LINK] No surprise, the number one factor contributing to the drop in life expectancy was Covid. The NCHS wrote "*Life expectancy at birth represents the average number of years a group of infants would live if they were to experience throughout life the age-specific death rates prevailing during a period. In 2021, life expectancy at birth was 76.1 years,* *declining by 0.9 year from 77.0 in 2020 (3). Life expectancy at birth for males in 2021 was 73.2 years, representing a decline. of 1.0 year from 74.2 years in 2020. For females, life expectancy declined to 79.1 years, decreasing 0.8 year from 79.9 years in 2020 (Figure 1). Excess deaths due to COVID-19 and other causes in 2020 and 2021 led to an overall decline in life expectancy between 2019 and 2021 of 2.7 years for the total population, 3.1 years for males, and 2.3 years for females."* Our Supplemental Documents package includes excerpts from the NCHS report.

Figure 46: Life expectancy at birth, by sex, United States, 2000-2021



Source: CDC National Center for Health Statistics

Twitter – Look for our first comments on energy items on Twitter every day

@Energy_Tidbits on Twitter

For new followers to our Twitter, we are trying to tweet on breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. Our Twitter handle is @Energy_Tidbits and can be followed at [LINK]. We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos for over 20 consecutive years. Please take a look thru our tweets and you can see we aren't just retweeting other tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

I can also be reached on Linkedin and plan to use it as another forum to pass on energy items in addition to our weekly Energy Tidbits memo and our blogs that are posted on the SAF Energy website [LINK].

Misc Facts and Figures.

During our weekly review of items for Energy Tidbits, we come across a number of miscellaneous facts and figures that are more general in nature and often comment on sports.

21 years ago, 9/11 changed the world

I have trouble believing it's been 21 years since 9/11. It feels more recent but I think it's because I had the opportunity to live in the US, travelled dozens of times to NYC on business including meetings at the World Trade Center in June 2021 and had friends working right there in other buildings of the World Trade Center complex on 9/11. It was the day that changed the world. And I can't help but feel for the all the families and friends of the thousands who died that day and in the aftermath in the fight against terrorism.

The phenomenal story of Gander Newfoundland on 9/11

9/11 was a brutal day for tragic stories But, among, the tragedy, there were many stories of heroism on people rescuing people. And there is one of what I think is one of the most amazing stories of 9/11 – the story of Gander, Newfoundland. When the US and Canada closed down North America air space, it meant that overseas planes were forced to land in Newfoundland with an immediate stranding of ~17,000 international travellers. Gander was the major airport landing with 39 jumbo jets. It was then a town of ~9,000 and they took in ~6,600 travellers overnight. The town basically doubled. That is unbelievable. It would be like Calgary taking in 1 million people overnight. And the story of how the locals took in, fed, gave them friendship, love is an amazing story and a tribute to Newfoundlanders. On the bucket list is to hopefully get to Appleton, the adjoining town to Gander, Newfoundland for their 9/11 memorial service just to be able to see some of the amazing Gander and Appleton citizens who stepped up during 9/11. If you haven't seen it, I highly recommend the documentary movie "*You Are Here Trailer - A Come From Away Story*" about Gander on 9/11 and for the week after. Its available on Crave in Canada, and the trailer is at [LINK]. I have probably seen this documentary movie a dozen times or more.

Must see musical "Come From Away", about Gander, Newfoundland on 9/11

The timing couldn't be better for the acclaimed musical "Come from Away" to be playing in Calgary this week. It's a musical about the story of Gander on 9/11 and it's played to huge applause wherever it played. What was really great was in hearing the reaction of Gander Police Chief Oswald Fudge on the musical, saying they nailed it. We had the opportunity to go on Thursday and join the crowd in saying it is a great musical and deserved of all the descriptions. With today being the 21st anniversary of 9/11, we are going again this afternoon as a reminder of what happened on 9/11 and the phenomenal story of the people of Gander. The musical trailer is at [LINK]. A good clip of he Broadway cast performing "Welcome to the Rock" at the Olivier Awards 2019 is at [LINK].

Queen Elizabeth II passes away on Sept 8 at the age of 96

It was a sad day for many around the world, especially in Canada, to see Queen Elizabeth II pass away on Thursday. When you think about her 70+ years reign and her 22 visits to Canada, it's easy to see why many Canadians, especially baby boomer age bracket, were very sad to hear of her passing. On Feb 6, 2022, she just had her 70th anniversary of ascending to the throne. That's pretty amazing. And no question she looked a little frail but she looked peppy with a great smile when she appointed Liz Truss as the new UK PM on Tuesday. What a great picture at the age of the 96.

Figure 47: Queen Elizabeth II and UK PM Truss on Sept 6, 2022

Source: Newsweek

Queen Elizabeth II souvenirs, Bank of Canada bank notes from 1954 series

Here is what we wrote in the Feb 6, 2022 Energy Tidbits. "*The Queen's anniversary reminded of some older Cdn bank notes. The Bank of Canada was founded in 1934 and its first bank notes were its 1935 Series. Its second series was the 1937 Series, a classic setup featuring King George VI in the middle of the bank note, who was on all denominations excerpt for the $100 and $1,000 notes that featured former Cdn Prime Ministers. The third series was the 1954 Series that featured Queen Elizabeth with her picture offset to the right. Not sure what year the bills were, but the Queen Elizabeth bills were sometime after 1956. I have some of each so pasted a picture of most of, but not all of the bills. I didn't put the entire bill in to avoid any potential issues*. "

Figure 48: Canadian $2 & $50 bills from 1954 series, $10 & $50 from 1937 series

Source: DTT

The Bank of Canada 1954 Series was known as the "Devil's Head" note

Here is another item from the Feb 6, 2022 Energy Tidbits. "*The reason why I say the Queen Elizabeth bills are after 1956 is that her hair looks normal. The Bank of Canada writes [LINK] "The term "Devil's Head" is commonly used to describe this series. The notes caused quite a controversy because, in the engraving of the portrait, an area of the Queen's hair gave the illusion of a grinning devil. Modifications* *to the printing plates for all denominations were made in 1956 to exorcise the demon!" The Bank of Canada doesn't say the negatives for the picture were tampered, but it seems like they were. Agence TOPO wrote [LINK] "It was only in 1984 that the scandal re-erupted with the death of the photographer and the recovery of the negatives from the 1952 photo shoot, events which coincided with the publication of Peter-Dirk Uys, memoirs (Uys, Peter-Dirk, Her Majesty's Image - The Life Of The Official Photographer Of Elisabeth The Second, Yellow Sheets Books, London (UK), 1985). In his account, Mister Uys writes openly of his homosexuality and his long relationship with John Rietveld, Her Majesty,s hairdresser from 1947 to 1962. Even more surprising is the revelation that Uys flirted with certain circles of initiates before holding his job at Buckingham Palace. We learn in the book that he was one of Aleister Crowley's (an eccentric, writer and devil-worshiper) disciples, as well as Kenneth Anger's (a photographer and filmmaker) lover during the 1940's, just before his final dedication to the trade of portrait photographer."*

Figure 49: Canadian 1954 series notes before and after modifying Queen Elizabeth

Source: PMG

Qatar warns alcohol drinking will only be designated areas at World Cup

It sounds like a warning to the England faithful for the upcoming World Cup in Qatar starting Nov 20 thru Dec 18. On Thursday, ESPN reported [LINK] on comments by Col. Jassim Abdulrahim Al Sayed of the safety and security operations for the World Cup. His warnings were a few such as there will be no alcohol being allowed brought into the country. There will be alcohol served at the stadiums but only within certain times as they want to give families and children some alcohol-free zones for certain parts of the day. But back to our English fans, who have a reputation for public drinking ahead of or after matches. The ESPN report reminded *"Although alcohol is strictly restricted in Qatar -- drinking in public can lead to fines of up to 3,000 riyal (£720) or prison sentences up to six months*."