Energy Tidbits

July 31, 2022

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What Does It Mean To Saudi's ~12 mmb/d Maximum Sustainable Capacity If Super Giant Ghawar Oilfield Is In Decline?

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. Very bullish and surprising Arab News report on challenges for Saud Arabia's oil production capacity [LINK]

2. Exxon reminds that the global oil and natural gas production supply base declines at ~7% per year [LINK]

3. Great reminder from Shell CEO that seeing demand "response" to high oil/gasoline prices, but not demand "destruction" [LINK]

4. Russia can only produce gas turbines with max capacity 25MW vs Siemens SGT-A65 65MW for Nord Stream and Baker Hughes LM9000 73.5MW used for LNG [LINK]

5. Is Shell saying FID is not "imminent" for LNG Canada 1.8 bcf/d Phase 2 just to push away attention for a couple months? [LINK]

6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.

7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

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Table of Contents

Natural Gas – Natural gas injection of +15 bcf, storage now -293 bcf YoY deficit

The YoY storage deficit started the winter at -282 bcf YoY at Oct 31 and is now -293 bcf YoY. The EIA reported a +15 bcf build (+18 bcf expectations) for the July 22 week, which was below the 5-yr average build of +32 bcf, and below last year's injection of +36 bcf. Storage is 2.416 tcf as of July 22, increasing the YoY deficit to -293 bcf vs -270 bcf last week and is -345 bcf below the 5-year average vs -328 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -293 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons			
					Year ago (07/22/21)		5-year average (2017-21)	
Region	07/22/22	07/15/22	net change	implied flow	Bcf	% change	Bcf	% change
East	532	521	11	11	580	-8.3	606	-12.2
Midwest	625	608	17	17	699	-10.6	690	-9.4
Mountain	144	144	0	0	184	-21.7	175	-17.7
Pacific	253	253	0	0	246	2.8	275	-8.0
South Central	862	874	-12	-12	999	-13.7	1,015	-15.1
Salt	195	206	-11	-11	270	-27.8	272	-28.3
Nonsalt	667	669	-2	-2	728	-8.4	743	-10.2
Total	**2,416**	**2,401**	**15**	**15**	**2,709**	**-10.8**	**2,761**	**-12.5**

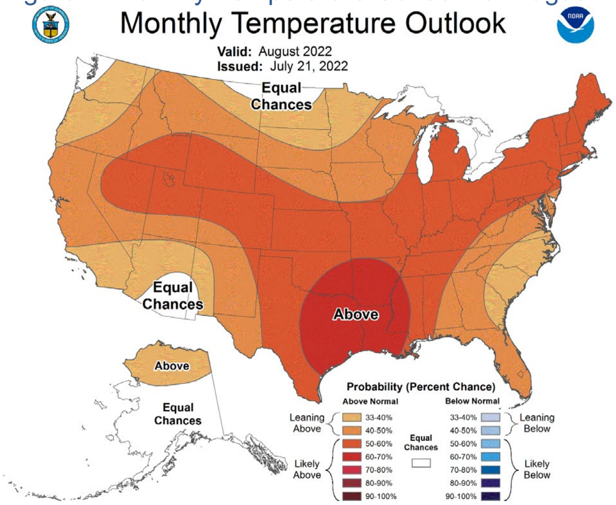
Source: EIA

Natural Gas – NOAA expects another hotter than normal month in August

One item we forgot to tuck in last week's (July 24, 2022) Energy Tidbits memo was NOAA's Official 30-Day Forecast (issued on July 21) for its monthly temperature outlook for August. No surprise, NOAA forecasts a warmer than normal August throughout almost all of the US. And like seen the summer, very hot in Texas/Louisiana. Below is the NOAA 30-Day Forecast temperature map. [LINK]

Hotter than normal in Aug

Figure 2: Monthly Temperature Outlook for August



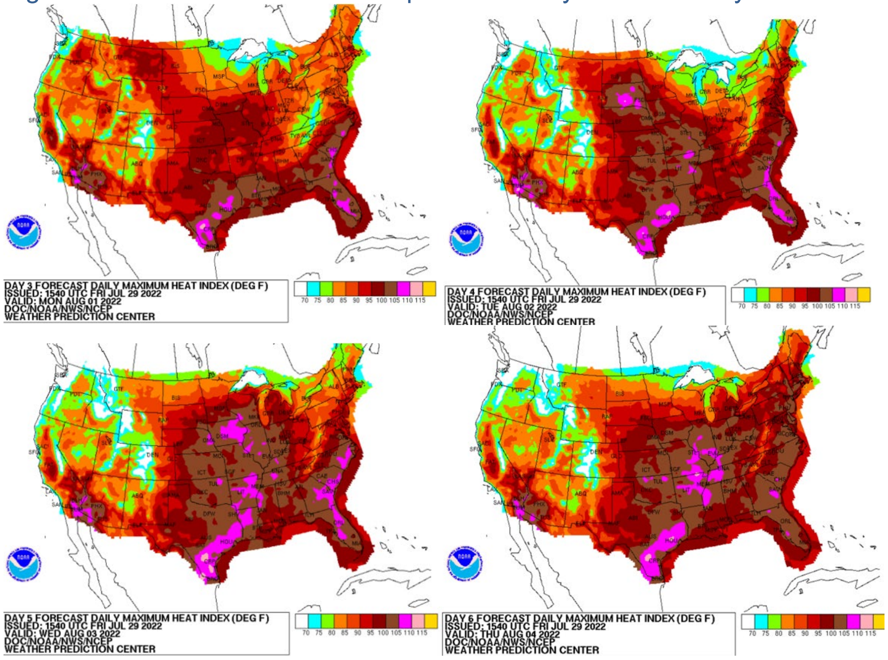
Source: NOAA

Natural Gas – Continues to be mostly hot temperatures in US

The story in the US continues to its been hot in most of the US. July was hot in the US and it looks like August will start off with continued hot weather. On Friday, we tweeted [LINK] NOAA's National Weather Service posts daily updated Maximum Heat Index Forecasts, which call for a warm start this week Monday thru Thursday. Below are NOAA's maximum heat index maps for Mon Aug 1 thru Thurs Aug 4. [LINK]

Continued hot weather to start Aug

Figure 3: Maximum heat index maps for Monday thru Thursday



Source: NOAA National Weather Service

Natural Gas – US May gas production +1.0 bcf/d MoM to 96.9 bcf/d

We continue to see support for the view that US shale/tight natural gas looks to have moved to stronger growth. US natural gas supply from both dry shale gas and association gas from shale/tight oil continues to be up strongly YoY. The EIA released its Natural Gas Monthly on Friday, [LINK], which includes its estimates for "actuals" for May gas production. The key takeaway from the May actuals is that May was +1.0 bcf/d MoM to 96.9 bcf/d and is just below the recent Nov/Dec 2021 peak of 97.0 bcf/d. May 2022 is +3.9 bcf/d YoY. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

US May gas production +3.9 bcf/d YoY

Figure 4: US Dry Natural Gas Production

bcf/d	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	56.0	60.0	66.0	65.3	66.8	73.4	73.6	70.6	78.7	89.4	95.1	92.8	94.8
Feb	57.2	58.8	67.0	65.4	68.4	73.8	77.3	71.5	80.4	90.0	98.1	86.2	94.1
March	57.3	61.5	65.0	65.3	68.9	74.1	73.8	73.2	81.3	90.6	94.6	92.3	94.9
Apr	57.6	62.3	64.8	66.1	70.5	75.2	73.7	73.3	81.2	91.0	92.9	93.2	95.9
May	58.0	62.4	65.0	65.9	70.2	74.1	72.9	73.3	82.1	91.7	87.8	93.0	96.9
June	57.2	62.1	64.6	65.8	70.5	74.0	72.2	74.0	82.5	92.0	88.4	93.2	
July	58.2	62.5	66.3	67.1	72.0	74.2	72.8	74.7	84.2	92.5	89.8	93.7	
Aug	58.9	63.2	66.0	66.9	72.4	74.3	72.2	74.7	85.9	94.8	90.2	94.3	
Sept	59.1	63.1	66.4	66.8	72.4	74.7	71.7	76.0	87.3	94.7	89.5	93.6	
Oct	60.1	65.1	66.5	67.0	73.1	74.2	71.4	77.3	88.4	96.0	88.9	95.6	
Nov	60.1	65.9	66.6	67.7	72.6	73.9	72.0	79.8	89.9	96.7	92.0	97.0	
Dec	61.0	65.6	66.0	66.5	73.2	73.9	71.2	80.4	89.5	97.0	92.5	97.0	
Average	58.4	62.7	65.9	66.3	70.9	74.2	72.9	74.9	84.3	93.0	91.6	93.5	95.3

Source: EIA

Natural Gas – US LNG exports +1.2 bcf/d YoY in May to 11.3 bcf/d

US May LNG +1.2 bcf/d YoY

As a reminder, US LNG exports will be lower starting in June because of the Freeport LNG 2.2 bcf/d shut down on June 8. US LNG exports were up to a new monthly record of 11.7 bcf/d in March, but has fallen -0.4 bcf/d to 11.3 bcf/d in May. The big driver to stronger (and higher downside support) US natural gas prices has been the ramp up in US LNG exports, which are up ~8 bcf/d over the past 3 years. This is over 2.5 tcf a year of added gas demand for US natural gas supply. On Friday, the EIA Natural Gas Monthly reported "actuals" for US LNG exports were 11.3 bcf/d in May, which is up +1.2 bcf/d YoY and up +0.3 bcf/d from April of 11.0 bcf/d. Note our table rounds to one decimal and the actual is 11.337 bcf/d for May. Below is our table of EIA's monthly LNG exports.

Figure 5: US LNG Exports (bcf/d)

(bcf/d)	2016	2017	2018	2019	2020	2021	2022
Jan	0.0	1.7	2.3	4.1	8.1	9.8	11.4
Feb	0.1	1.9	2.6	3.7	8.1	7.4	11.3
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7
Apr	0.3	1.7	2.9	4.2	7.0	10.2	11.0
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3
June	0.5	1.7	2.5	4.7	3.6	9.0	
July	0.5	1.7	3.2	5.1	3.1	9.7	
Aug	0.9	1.5	3.0	4.5	3.6	9.6	
Sept	0.6	1.8	2.7	5.3	5.0	9.5	
Oct	0.1	2.6	2.9	5.7	7.2	9.6	
Nov	1.1	2.7	3.6	6.4	9.4	10.2	
Dec	1.3	2.7	4.0	7.1	9.8	11.1	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	11.4

Source: EIA

Natural Gas – US pipeline exports to Mexico up 0.1 bcf/d MoM to 6.0 bcf/d in May

US pipeline exports to Mexico

The EIA Natural Gas Monthly also provides its "actuals" for gas pipeline exports to Mexico, which were 6.0 bcf/d in May, down 0.2 bcf/d YoY but up 0.1 bcf/d MoM from April. US natural gas exports have been mostly stuck since Covid, but the completion of new pipeline infrastructure such as the Wahalajara system [LINK] should help increase US penetration further into Mexico. Below is our table of the EIA's monthly gas exports to Mexico.

Figure 6: US Pipeline Gas Exports To Mexico (bcf/d)

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.6
Feb	1.8	2.3	3.5	4.0	4.5	4.8	5.4	4.9	5.5
March	1.9	2.4	3.3	4.2	4.3	4.8	5.4	5.9	5.5
Apr	1.9	2.6	3.5	3.7	4.4	4.7	4.6	6.1	5.9
May	2.0	2.8	3.7	4.0	4.4	5.0	4.7	6.2	6.0
June	2.2	3.0	3.9	4.5	4.6	5.2	5.4	6.6	
July	2.2	3.3	4.0	4.4	4.9	5.4	5.8	6.4	
Aug	2.1	3.3	4.3	4.4	5.0	5.4	6.0	6.2	
Sept	2.2	3.3	4.1	4.2	5.0	5.4	6.1	6.0	
Oct	1.9	3.2	4.2	4.2	4.9	5.5	6.0	6.0	
Nov	1.9	3.0	4.0	4.5	4.7	5.3	5.5	5.5	
Dec	2.1	3.2	3.6	4.4	4.5	4.9	5.3	5.4	
Full Year	2.0	2.9	3.8	4.2	4.6	5.1	5.5	5.9	5.7

Source: EIA

Natural Gas – No BC/Blueberry River First Nations deal = low NE BC Montney drilling

Low NE BC Montney drilling

The BC rig levels indicate the lack of a BC deal with the Blueberry River First Nations is holding back NE BC Montney drilling. The caveat is in the following Trican item that seems to suggest something may be coming soon. But putting Trican's comment aside, it has now been over nine months since what looked to e good news when, on Oct 7, British Columbia and Blueberry River First Nations announced they had reach an interim agreement [LINK] that is the first step agreement. We had assumed the interim agreement was a clear first step given the impression that they could reach final agreements. However, there is still no deal and we haven't heard of any specific updates. The lack of a deal has, at least to date, continued to hold drilling in most of NE BC Montney lands. Later in the memo, we note the comments from the Trican Q2 call that highlight this point. The holdup in drilling is clear in the Baker Hughes rig count as of July 29. Even with the great natural gas prices in 2022, there are now 12 rigs in BC, up 4 from the spring break up trough of 8 rigs. A year ago, there were 21 BC rigs, up 10 from the spring break up trough of 11 rigs. And even in the slow 2020 summer following the onset of Covid, BC rigs were at 10 rigs, up 5 from the spring break up trough of 5 rigs.

Natural Gas – Trican, LNG Canada "*can always buy the gas*" from other NE BC players

Trican on LNG Canada

We couldn't help note Trican's comments on LNG Canada especially their comment that "*LNG Canada is point seven of a BCF a day, short on their commitments. And, of course, they can always buy the gas from other, other companies operating in the basin. So be careful not to imply too much from that information*." Trican didn't blame it on the lack of a BC/Blueberry River First Nations deal, but, in their Q2 call on Wednesday, highlighted how the lack of drilling in the NE BC Montney area. However, Trican also hinted that something may be happening to allow more drilling. (i) Trican didn't blame the lack of BC deal for the lack of drilling so far, but kind of hinted something may be happening as they expect LNG drilling to nothing but increase. It's vague but we are hopeful. Mgmt said *"It's important to note, LNG activity has started in the field from a drilling perspective, I think we're I think we're all expecting LNG facility and get them out to be on stream, I think in 2025 and the drilling activity now has sort of officially started and from what we understand LNG Canada is behind on their gas production and so we expect that as the months go by the LNG related drilling activity will do nothing but increase."* (ii) Surprising Trican said LNG Canada was 0.7 bcf/d behind short of their commitments. We were surprised Trican saying the 0.7 bcf/d number. Mgmt said ""*Yes, we have seen RFPs on the completion side for one of the participants of LNG Canada. When we're going to see more, I don't know but from what we understand just* *from the information that's publicly available, LNG Canada is point seven of a BCF a day, short on their commitments."* Note the Bloomberg transcript didn't have the point seven detail, but we listened to replay and mgmt. did say point seven of a bcf a day. (iii) We were even more surprised by mgmt's follow on comment. Mgmt telling a reader be careful not to imply to much from that information only brings more attention to the comment. Mgmt said ""*And, of course, they can always buy the gas from other, other companies operating in the basin. So be careful not to imply too much from that information so be careful not to imply too much from that information.But, generally what that tells you is, there's going to be activity in the basin that's LNG based. LNG obviously, is a very, very long term project and so there's just that there's just a layer of consistent, Montney drilling that, is going to be in place that we've never had before. So, we're not only excited for Canada to participate in the global LNG market, and as we all know the world needs more Canadian oil and gas. But it's very, it's just nice to have some reliable consistent projects that are occurring.*"

Natural Gas – Coastal GasLInk on track for mechanical in-service by end of 2023

One of the big surprises from the TC Energy Q2 release was their status update on the Coastal GasLink pipeline that will supply the natural gas for LNG Canada – it's on track for mechanical in-service by year end 2023. This is way sooner than expectations. TC Energy highlighted the developments at Coastal GasLink in its Q2 report, call and presentation. TC Energy announced "*Coastal GasLink LP has achieved a significant milestone with the execution of revised agreements with LNG Canada that settles all outstanding disputes and allows us to continue the safe and timely completion of the project. Now given Coastal GasLink will be on everyone's mind. I'll start by discussing the importance of the revised Agreements."* TC Energy highlighted the project is now approximately 70% complete and "*we anticipate mechanical in service by the end of 2023 followed by commissioning and commercial in service."* This timing is sooner than expectations and sets up Coastal GasLink to be done well before needed to meet Shell's general timing of first cargos at LNG Canada Phase 1 before the middle of the decade.

Coastal GasLink mechanical in-service by end of 2023

Figure 7: TC Energy Coast GasLink Now 70% Complete

Source: TC Energy

Natural Gas – TC Energy bullish on LNG Canada Phase 2, says FID is being discussed

TC Energy bullish on LNG Canada Phase 2

For anyone who saw TC Energy's Q2 results & call, it would be almost impossible to have any other takeaway other than TC Energy is expecting LNG Canada Phase 2 to be FID and proceed. (i) Early Thursday morning, TC released its Q2 results and, before the Q2 call and their Q2 call slide deck was posted, we tweeted [LINK] "*Buckle up! Feels like 👇 @TCEnergy showcasing #LNGCanada & related #CoastalGasLink expansion potential and why else other than a #LNGCanada Phase 2 1.8 bcf/d FID is coming?? Maybe Sept timing like Phase 1 FID? Very bullish for CA #NatGas thru 2030. #OOTT.*" TC Energy's Q2 report was showcased the progress of Coastal GasLink and the potential for Coastal GasLink expansion based on the market opportunity for LNG Canada Phase 2. (ii) It turns out that there was even greater showcasing in the Q2 call and slide deck. We recommend flipping thru the first slides & verbal comments from mgmt. on Coastal GasLink, LNG outlook and the potential for Coastal GasLink/LNG Canada expansion. When we see this type of showcasing, it infers that they expect something to happen before the next quarterly report. (iii) On the call, we were surprised by the direct TC Energy mgmt. comments that LNG Canada is going thru the FID decision making now. This is a great example of why we get the best insights from the Q&A of earnings calls. Note we listened to the replay so we could edit this part of the Bloomberg transcript to make sure it was accurate. In the Q&A, mgmt. said ""*Yes. So we're in active discussions with LNG Canada around Phase two in the feasibility. Doing the appropriate front-end work to establish what the scope and scale of that project will be. The project looks very different than Phase 1. It's not a linear development, it is compression facilities and so that changes the risk profile to our benefit. In terms of the FID timing, that is one where our customers LNG Canada are in control of determining when they are prepared to bring a final investment decision and we're supporting them in that in that evaluation right now. There is a tremendous amount of work that needs to be accomplished. But it's important to do that work today so we have a high confidence decision in going into that FID*." They are careful to not say it is going to happen, but it certainly seems TC Energy believes LNG Canada is going to FID Phase 2.

Natural Gas – Shell says no LNG Canada Phase 2 FID is "imminent", how long is that?

How long is imminent?

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 – Mexico's natural gas production still stuck below 5 bcf/d, +0.4% YoY

Mexico natural gas still stuck below 5 bcf/d

On Thursday, Pemex reported [LINK] its oil and gas data for June. Pemex reported natural gas production of 4.744 bcf/d, which was up only 0.4% YoY and up 0.9% MoM, from May. For the past 3 years, an ongoing theme of the Mexican energy sector, has been their inability to grow domestic natural gas production. As a result, Mexico has relied on imports from the US which are reaching record levels; US pipeline exports to Mexico have increased ~2 bcf/d since Jan 1, 2018. Pemex does not provide any commentary along with its production data. Below is our ongoing table of Pemex reported monthly natural gas production.

Figure 8: Mexico Natural Gas Production (bcf/d)

Natural Gas Production bcf/d	2016	2017	2018	2019	2020	2021	21/20	2022	22/21
Jan	6.162	5.326	4.910	4.648	5.005	4.848	-3.1%	4.713	-2.8%
Feb	6.122	5.299	4.853	4.869	4.942	4.854	-1.8%	4.646	-4.3%
Mar	6.030	5.383	4.646	4.857	4.946	4.839	-2.2%	4.766	-1.5%
Apr	5.921	5.334	4.869	4.816	4.827	4.671	-3.2%	4.740	1.5%
May	5.841	5.299	4.827	4.841	4.460	4.730	6.1%	4.702	-0.6%
June	5.881	5.253	4.840	4.843	4.754	4.727	-0.6%	4.744	0.4%
July	5.785	5.216	4.856	4.892	4.902	4.725	-3.6%		
Aug	5.686	5.035	4.898	4.939	4.920	4.656	-5.4%		
Sept	5.619	4.302	4.913	5.017	4.926	4.746	-3.7%		
Oct	5.583	4.759	4.895	4.971	4.928	4.718	-4.3%		
Nov	5.515	4.803	4.776	5.015	4.769	4.751	-0.4%		
Dec	5.380	4.811	4.881	5.024	4.846	4.697	-3.1%		

Source: Pemex

Natural Gas – Two more buyers lock up long term LNG supply

Two more long term LNG deal

The rush continues for LNG buyers locking up long term LNG supply as there has been 11.02 bcf/d of long-term LNG supply locked up since July 1, 2021. We say continues because it started a year ago and was well underway before Russia invaded Ukraine. But no question it has 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. (i) On Tuesday, Cheniere Energy announced [LINK] that its wholly-owned subsidiary, Corpus

Christi Liquefaction has entered into a long-term LNG sale and purchase agreement (SPA) with PTT Global LNG, Thailand's largest state-owned, multinational energy company. Under the SPA, PTT Global has agreed to purchase 0.13 bcf/d of LNG from Corpus Christi for 20 years beginning in 2026. The SPA calls for a combination of free-on-board and delivered ex-ship deliveries. This customization reminds of why buyers like US long term LNG deals, because they have flexibility to redirect cargos. Our Supplemental Documents package includes the Cheniere release. (ii) On Wednesday, NextDecade announced today the execution of a 20-year sale and purchase agreement (SPA) with ExxonMobil LNG Asia Pacific for the supply of LNG from NextDecade's Rio Grande LNG export project in Brownsville, Texas. Under the SPA, ExxonMobil will purchase 0.13 bcf/d of LNG. The LNG will be supplied from the first two trains of Rio Grande LNG, with the first train expected to start commercial operations as early as 2026. Our Supplemental Documents package includes the Cheniere and NextDecade releases.

Major LNG suppliers are also buying other's LNG for their supply portfolios
The NextDecade deal with Exxon is a reminder that the major global LNG suppliers (Chevron, Exxon and Shell) have all committed to buy long term LNG from other LNG providers to add to their LNG portfolios. This gives them the flexibility to have other LNG supply in the event of outages in their own LNG supply projects. One of the major LNG stories of the past year has been LNG supply outages including at Chevron's Gorgon LNG and Shell's Prelude LNG.

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 11.02 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 11.02 bcf/d of long term LNG deals since July 1, 2021. 66% 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 Equinor deal, major LNG supply companies like Exxon, Shell and now Equinor 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 9: 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
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**7.30**			
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.
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**3.73**			
Total New Long Term LNG Contracts since Jul/21				**11.02**			
*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: Company reports, SAF Group

Natural Gas – No visibility to Shell's next LNG cargo at Prelude 0.47 bcf/d FLNG

Shell Prelude FLNG 0.47 bcf/d

The last LNG loading at Shell's 0.47 bcf/d Prelude FLNG was July 6 and we think it's hard to see when the next loading might happen. Yesterday we tweeted [LINK] "*Unplanned #LNG supply interruption continues and latest Offshore Alliance 👎 posting after Shell's big Q2 profits makes it hard to see any near term prospects for end to industrial action that has shut down #Shell 0.47 bcf/d #PreludeFLNG loadings since July 6. #NatGas #OOTT.*" Post Shell's big Q2 earnings release, the Offshore Alliance posted its latest update on the Prelude LNG stalemate. We attached the posting to our tweet. It's hard to see how there is any potential resolve at least from the union's side. We were a little surprised that analysts didn't ask on the status of the Prelude LNG labor dispute on the Q2 call. Earlier in the week Shell decided to cancel its threatened lockout on July 25, and the union extended its industrial action for another week until Aug 11. From a distance, it's hard to see when there will be a labor deal and then there will be time needed to get people back on board and go thru any restart procedures. It's why we think it has to be at least a month before there is the likelihood for the next LNG cargos at Shell Prelude FLNG, which has a 0.47 bcf/d capacity. Our Supplemental Documents package includes the Union July 29 Facebook posting.

Figure 10: Shell Crux Project Overview

Source: Shell

Natural Gas – Will Eni convince Exxon to move to/include FLNG at Mozambique LNG?

Eni wants FLNG in 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 the offshore the faster one. So I* *think that, I never thought of small train onshore by saying that a good way, because there is no constraint, a small size offshore LNG."*

Natural Gas – Saipem doesn't expect TotalEnergies Mozambique LNG restart in 2022

TotalEnergies Mozambique LNG

Saipem (engineering and construction) held its Q2 call on Wednesday and updated their investors on their view On Wednesday, we tweeted [LINK] *"#TotalEnergies reports Q2 tomorrow, but #Saipem Q2 "we do not expect any restore operation [@TotalEnergies 1.7 bcfd Mozambique #LNG Phase 1] within 2022". Plus any restart must be on different terms as original terms are "clearly no longer sustainable". #OOTT #NatGas."* There has been some chatter or maybe hope that TotalEnergies could restart its 1.7 bcf/d Mozambique LNG Phase 1 in 2022, but that isn't going to happen based on the comments from Saipem (engineering and construction) in its Q2 call. Saipem is not expecting to restore operations in 2022. In the Q&A of the Q2 call, mgmt. said "*Regarding Mozambique, we still in the project is suspended our current cost our coverage in a fully reimbursable scheme from the client and we do not expect any restore operation within 2022*." Also note Saipem is renegotiating its Mozambique LNG contract with TotalEnergies. In the Q&A of the Q2 call, mgmt. was asked "*Thank you very much. As a follow-up to that one of the characteristics of Saipem is very high backlog, a lot of which was one before COVID and what, are there any possibilities of even rebidding some of these larger legacy projects even Mozambique. Thank you*." Mgmt replied "*Sure, clearly many things as you were mentioning as happened between the period 2018 and 2019 when many of those projects that were acquired. And basically we are in a completely different quarter today. First of all, this goes of the COVID. And second, because of the inflation of the, the raw materials that we have been experiencing, starting at the end of 2021 even before the beginning of the of the Ukrainian crisis and what we see is that most of the client after an initial period now clearly willing to to accommodate those cost that are documented and one of the, one of the clear example was the one that it was mentioning before the relief package in Saudi Arabia clearly restart when there would be a restart operation in Mozambique, those have to be necessary on different terms and condition because what was agreed back and the beginning of the project is clearly no longer no longer sustainable."*

No updates on TotalEnergies Q2 call for timing to restart Mozambique LNG

TotalEnergies held its Q2 call on Thursday. Mgmt did not make any statements on the timing for the restart of the 1.7 bcf/d Mozambique LNG Phase 1 and there were no analyst questions on a restart timing. We have been noting our view that we didn't expect any restart until sometime in 2023 at the earliest.

Natural Gas – India June natural gas production +1.3% YoY to 3.31 bcf/d

India natural gas production +1.3% YoY

One of the key themes for India in the last year is that it looks like they have turned the corner on a decade of declining domestic natural gas production, which is even more important given the stronger than expected LNG prices in 2021-2022. The key India natural gas theme for the past decade was that India's natural gas production declined, which meant that increases in natural gas consumption had to be met by increased LNG imports. India's domestic natural gas production peaked in 2010 at 4.6 bcf/d but it now looks like we are seeing modest return to growth. Last week, India's Petroleum Planning and Analysis Cell released their monthly report for June natural gas and oil statistics [LINK]. India's domestic natural gas production was up 1.3% YoY from 3.27 bcf/d in June 2021 to 3.31 bcf/d, down slightly from 3.32 bcf/d in May. India has consistently struggled to grow domestic natural gas production with 2018-2019 production averaging 3.18 bcf/d, declining to 3.02 in 2019-2020 and averaged 2.78 bcf/d 2020-2021. Our Supplemental Documents package includes excerpts from the PPAC monthly package.

Natural Gas – India June LNG imports down -9.5% YoY to 2.89 bcf/d, flat MoM

India LNG imports -9.5% YoY

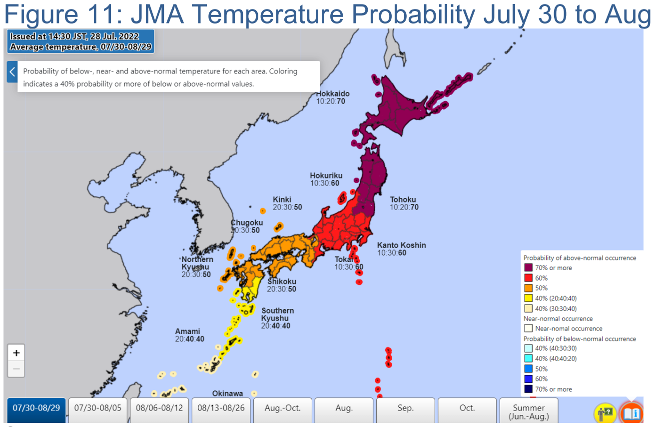
There is no surprise that the above noted increasing India domestic natural gas production means reduced need for LNG imports. Plus India is always viewed as an extremely price sensitive buyer in terms of its LNG imports, which was exemplified in their 2020-2021 import data. India had ramped up imports from June to October 2020, taking advantage of low LNG prices to fill their stocks. Imports began to decline in November 2020 as LNG prices rose, with the price trajectory ramping up in late Dec and reaching record levels in January. This resulted in India LNG imports declining from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021. June imports decreased were flat MoM at 2.89 bcf/d and down -9.5% YoY due to abnormally high spot prices. India has been trying to avoid high spot LNG prices.

Natural Gas – Continued hot weather forecast for Aug in Japan

Still hot in Japan

The warm weather continues in Japan with JMA forecasting much warmer than normal temperatures through August. Hot weather in the summer is always a positive for natural gas demand. However, Japan's ENEOS Holdings CEO recently highlighted [LINK] there have been increased orders for fuel oil from regional utilities with the jump in LNG prices. Demand for fuel oil to be used in power plants is expected to be 90% higher YoY during April-Sept in Japan. ENEOS will only be able to supply fuel oil equivalent to a 60% YoY gain due to issues with infrastructure, meaning LNG must fill this gap. The Japan Meteorological Agency posted its July 30 to August 29 weather forecast [LINK] calling for warmer than normal temperatures. This type of weather will drive some significant weather-related natural gas demand for air conditioning.

Figure 11: JMA Temperature Probability July 30 to August 29



Source: Japan Meteorology Agency

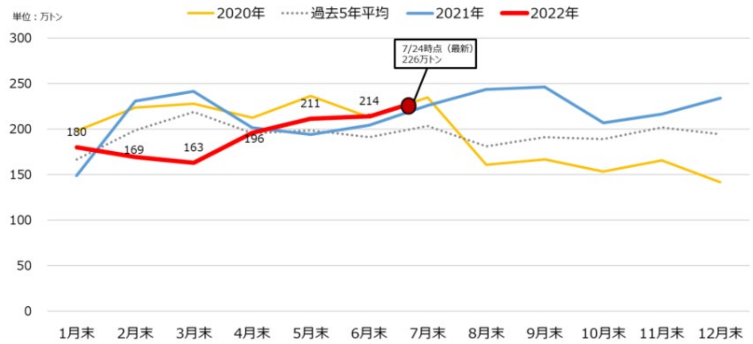
Natural Gas – Japan's LNG stocks up +17.2% from last week

Japan LNG stocks +17.2% 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. 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 July 24 were ~109 bcf, +17.2% WoW from 93 bcf and up from the 5-yr average of 97 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 12: Japan's LNG Stocks



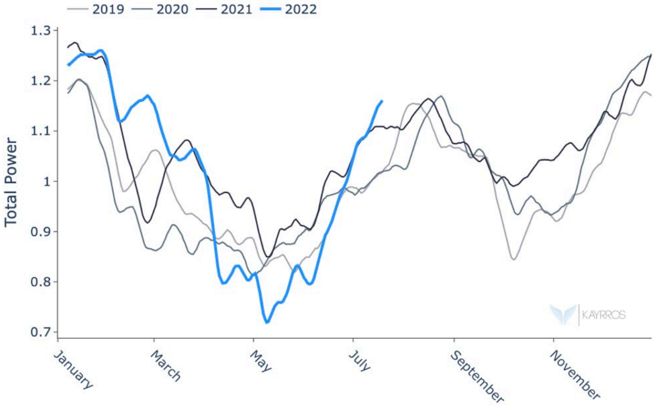
Source: METI

Natural Gas – High LNG prices lead to China fuel switching to coal

China switching to coal from LNG

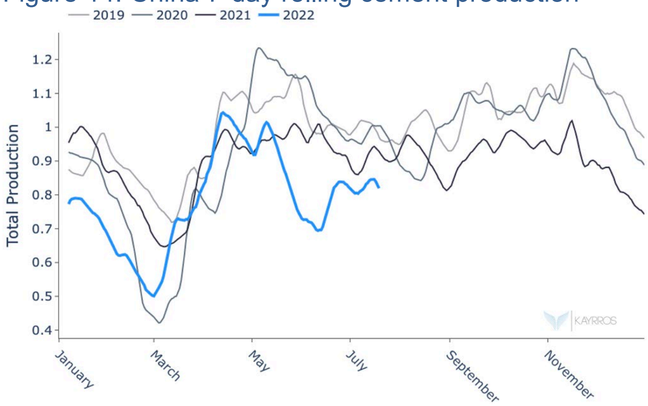
We have been highlighting the lower China LNG imports because of increasing domestic natural gas production, increasing natural gas pipeline imports via's Russia's Power of Siberia pipeline and high LNG prices. On Monday, we tweeted [LINK] "*Recent surge in China #Coal-fired generation is more linked to heatwaves air-conditioning demand & fuel switching from #NatGas to #Coal not from post Covid -recovery. Great graphs/insights from @Kayrros weekend email. Thx @antoine_halff. #OOTT".* Last weekend's Kayrros email highlighted the ramp up in China's coal-fired generation, and noted it was due to the heat and fuel switching from high LNG to better priced coal. It was interesting to see how Kayrros didn't think the coal was linked to any economic recovery by their highlighting that China's cement production wasn't rallying. Kayrros wrote "*A series of heatwaves that engulfed half of China this month has helped lifted the country's coal-fired power generation from recent Covid lows to meet unprecedented air conditioning demand. Coal-fired electricity production has also risen on the back of fuel-switching from natural gas, following ripple effects from exceptionally high gas prices and supply concerns in Europe. China's cement production, a proxy for construction-sector activity and a reliable economic indicator, remains lower than typical for the season, underscoring that the recent surge in coal-fired power generation has more to do with air-conditioning demand and fuel switching from gas to coal than with a post-Covid economic recovery."*

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



Source: Kayrros

Figure 14: China 7-day rolling cement production



Source: Kayrros

Natural Gas – Centrica thinks Rough UK natural gas storage can reopen for winter

Rough gas storage shut in 2017

Centrica is trying to get a deal done with the UK govt so it can reopen its Rough natural gas storage for winter. On Thursday, Bloomberg reported "*Centrica Plc, the owner of the Rough facility, is still hammering out a deal with the government on details including subsidies for getting the retired storage site back in regular operation. Capacity would be brought back gradually, providing further relief for surging gas prices next winter, too. "Physically it's possible, but there's a whole bunch of things that we need to go through and we are working on it right now," Centrica Chief Executive Officer Chris O'Shea told reporters on Thursday. "We are right now doing the engineering to make sure that it can physically happen and we're doing that at our own cost."* And "C*entrica will pay to make Rough operational but is seeking longer-term guarantees from the government on price, such as a contract for difference, O'Shea said."* We recognize this is being portrayed as linked to Russia's invasion of Ukraine, but the reality is that last October, Centrica was already at reopening Rough because of the massive natural gas price spike (energy crisis) in Europe last year, well before Russia invaded Ukraine. And it's also a reminder example of why natural gas will cost more under the energy transition. The UK got more involved in talks in June (see our June 5, 2022 Energy Tidbits), and now O'Shea is saying Centrica can get this done soon if they can finalize the terms of a deal with the government. Our Supplemental Documents package includes the Bloomberg report.

In Oct, Centrica was talking about reopening its Rough UK natural gas storage

On Tuesday, we tweeted [LINK] "*Reminder #Centrica was already looking to reopen Rough #NatGas storage in Oct. The #EnergyTransition was already going to take longer, be bumpy & cost a lot more. RUS has just made it worse. Positive for #Oil #NatGas for the 2020s. #OOTT.*" Here is what we wrote in the Oct 31, 2021 Energy Tidbits "*There was another good example of why energy, in this case natural gas, will cost a lot more under the Energy Transition. Reportedly, there are discussions to look to restart Centrica's Rough gas storage site that shut down four years ago. So 4 years ago, it wasn't worth spending the capex to fix the problems, but now it may now be worth spending the capex. It's a good example that illustrates why natural gas prices and energy should be higher in the 2020s. On Wednesday, Bloomberg reported "Rough Gas Storage Site May Be Reopened to Bolster Strategic Reserves. Britain's biggest energy supplier is in talks with the Government about reopening a mothballed gas storage facility in a bid to protect the industry from surging power costs. Centrica, the owner of British Gas, is seeking to restore the defunct Rough site off the Yorkshire Coast to boost the country's energy reserves. It comes after gas prices spiked to as much as 11 times normal levels in the wake of surging demand." Centrica reportedly talking about going back in to fix Rough storage so it can be restarted first as the major UK gas storage facility and then over time to hydrogen. And Centrica reportedly says don't need govt subsidies to do so, just can charge out to customers. This was abandoned because the cost to fix it wasn't worth it in 2017. The reality check is that the costs to fix it today have to be way higher than before. Yet Centrica can now make the math work by charging customers. ie. the costs of using storage are going much higher.*"

Centrica shut down UK largest gas storage, Rough, in 2017

Our October 10, 2021 Energy Tidbits also included a recap of Centrica shutting down its Rough UK gas storage in 2017. At that time, we wrote "*One of the big criticism on the UK natural gas system is that there is a lack of gas storage. In September, Energy UK estimated there was 141 bcf in UK natural gas storage and wrote [LINK] "Britain has over 4bcm of storage capacity that can be called upon to deliver over one quarter of national gas demand on a cold winter's day. Gas is sent to storage facilities throughout the summer and at other times of the year to make sure we have gas supplies available when we need them." UK natural gas storage was much higher in 2017. In 2017, Centrica ceased operations at the largest UK gas storage facility, Rough. Our July 2, 2017 Energy Tidbits noted that, at the time of its cessation, Centrica estimated there was 183 bcf of recoverable cushion gas. They had massive problems with the storage that led to pre tax charge of £176 in 2016 results. Made the decision to shut it down in early 2017. We went back and couldn't see what the "working gas" level was prior to the problems. But Rough was the largest UK storage and believed to have represented something like 70% of the storage send out capacity. Rough was a depleted reservoir being used for* *storage. As a rule of thumb, we would use 50/50 split between cushion gas and working gas. So its probably reasonable to roughly assume working gas was about the same at 183 bcf. The closing of Rough is why UK has relatively low natural gas storage."*

Natural Gas – Gazprom stops natural gas to Latvia

Gazprom stops gas to Latvia

There are now six European countries that have been cut off from Russian natural gas. Yesterday, we tweeted [LINK] "*Latvia joins the list of Bulgaria, Denmark, Finland, Netherlands and Poland of having #NatGas being cut off by Gazprom for violations. #LNG #OOTT."* Gazprom had tweeted [LINK] "*Today, Gazprom stopped its gas supplies to Latvia specified in the July request due to a violation of the conditions established for gas withdrawal."* Gazprom did not provide any specifics to the violation. Interestingly, on Friday, Bloomberg had reported "*Latvijas Gaze, Latvia's main gas distribution company, started buying Russian gas in the last month, paying in euros through an unnamed supplier, Chief Executive Officer Aigars Kalvitis said in an interview with the nation's public broadcaster.*
** Kalvitis said the identity of the supplier was a commercial secret, but that it was not Gazprom."*

Natural Gas – Nord Stream at 20% of capacity, how long will it stay there?

Nord Stream down to 20%

Europe remains on edge as to what will happen to natural gas volumes on the Gazprom 5.3 bcf/d Nord Stream pipeline. As Putin warned a couple weeks ago, the big news this week was that Nord Stream was cut back to 20% of its 5.3 bcf/d capacity after resuming for a few days at 40% of capacity post the July 21 end of the annual maintenance. On Monday, we tweeted [LINK] "*Buckle up! #Gazprom cutting #NordStream volumes to 1.17 bcf/d or 20% of 5.3 bcf/d capacity. Flowing thru to increase Henry Hub +$0.39 to $8.69. #NatGas #OOTT*." Gazprom had tweeted that "*due to the expiration of prescribed time before overhaul (in line with the Rostekhnadzor notification and taking into account the technical condition of the relevant machine), Gazprom is shutting down one more gas turbine engine produced by Siemens at the Portovaya CS. The dailyj throughput of the Portavaya CS from 7:00 am (Moscow Time) July 27 will be up to 33 million cubic meters*." 33 million cubic meters is 1.1 bcf/d. Since then, there have been a number of indications from Russia that the risk is that Nord Stream gets cut down to zero until the Siemens turbine issues are resolved in a lasting manner. On Friday, Bloomberg reported on example of the redtape issues. "*The permission issued by Canadian authorities does not take into account conditions of the current contract" with Gazprom on servicing the turbines, Markelov said. The waiver is issued to Siemens Energy Canada Ltd., which has no contract with Gazprom, he added. Currently, three turbines that require repairs in Canada are still in Russia, with little clarity on how they can be brought to the manufacturing site and back amid due to sanctions, and three more require maintenance from Siemens, according to Markelov."*

Natural Gas – Why Russia needs Siemens turbines for Nord Stream

Nord Stream needs Siemens turbines

One of the reasons why we still believe Baker Hughes suspending all LNG equipment and services work in Russia is a game changer is exactly the same reason why the Siemens turbines for Nord Stream are a huge issue – Russia can't produce powerful enough turbines to replace Siemens or Baker Hughes turbines. On Tuesday, Reuters posted "*EXPLAINER-Nord Stream's turbine tussle puts spotlight on equipment*" [LINK]. Reuters explains it simply – Gazprom is using the Siemens SGT-A65 turbine, which Siemens specs say "*60 to 71 MW€58* *to 62 MW gas turbine*". Russia can't make turbines anywhere near as powerful. That is the issue. Reuters wrote "*Russia produces turbines with a maximum capacity of 25 megawatts. Engineering company Power Machines is developing two types of turbine with capacities of 65 MW and 170 MW each, it said. The 65 MW turbine is expected to start working in testing mode only in 2024, and the other later in 2022 or in 2023. Russian Industry and Trade Minister Denis Manturov said in a speech earlier this month in parliament that Russia is speeding up trials of the large turbines "in the interests of the Russian power sector."* Our Supplemental Documents package includes the Reuters report and the Siemens SGT-A65 spec sheet.

Natural Gas – Yet no market worries about Baker Hughes turbines for Russian LNG?

What about turbines for LNG?

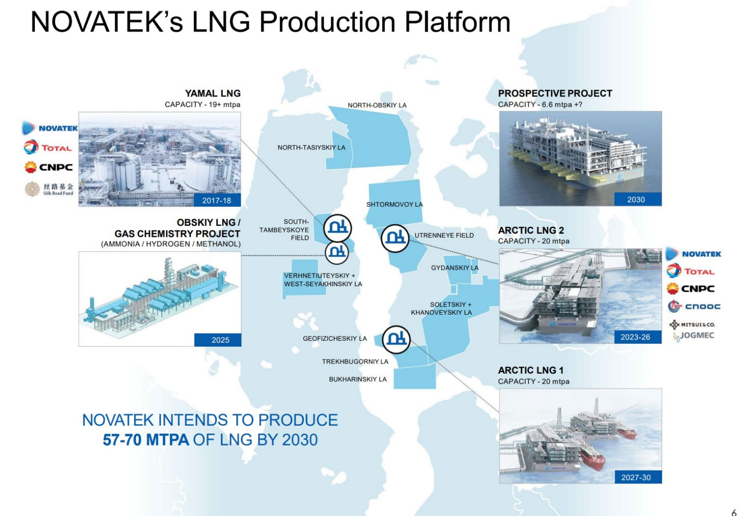
There is so much focus on the Siemens turbines for Nord Stream, yet there is almost zero worry about Baker Hughes suspending all LNG equipment and services work in Russia ie. including on LNG. (i) There must be some sort of non-public reason for this lack of interest. The above item notes the Manturov speech to the Duma. On July 15, TASS reported [LINK] "*"It is important here, on the one hand, to upgrade capacities by replacing foreign, exploration, drilling, offshore equipment and speeding up work on our own medium and large-tonnage LNG equipment. On the other hand, in the interests of domestic consumption, we will be able to supply all the technological piping ourselves for the entire gasification of our country," the minister said. According to him, the timing of testing and launching mass production of large gas turbines will be accelerated. "In the interests of the Russian electric power industry, in addition to the already supplied small and medium-sized turbines, we are compressing the time for testing and entering a series of large 65 and 170 MW turbines," Manturov said."* Manturov is specifically including high power turbines for LNG projects. (ii) Last week's (July 24, 2022) Energy Tidbits was titled "*LNG Game Changer: Baker Hughes Suspended All Equipment & Services Contracts on Russian LNG Projects*". We wrote "*Baker Hughes reported Q2 on Wednesday. All the analysts focused on the impact of Russia on the financial results, but there didn't seem to be any real market concerns on what Baker Hughes suspension of all equipment and services contracts for LNG in Russia would mean to LNG markets. It is important to note Baker Hughes is clearly stating they have suspended work on all of their "equipment" and "services" contracts in Russia. Think about what is happening with Nord Stream and this is very similar. It's not just supplying new equipment for new LNG projects, but also servicing existing equipment in existing LNG projects. We remain surprised that this isn't a major LNG market focus. Baker Hughes LNG business is within its TPS group. In the Q2 call mgmt. said "In TPS we have suspended work on equipment and service contracts in Russia. As a result, these projects have been removed from RPO and second-quarter revenue was impacted by roughly $160 million but with minimal impact to TPS operating margins." And "So at the beginning of the year, we were expecting, around $300 million of EBITDA for Russia this year and our Russian operations are generally quite accretive to our overall mix really due to the risk premium of operating there as well as some business mix primarily in TPS services as well as in some OFS product lines".* (iii) Baker Hughes website on LNG solutions says [LINK] says "*our expertise: supporting 450+ million tons of capacity*", which is over 59 bcf/d. The two turbines noted are the LM9000 aeroderivative gas turbine (73.5 MW, 50/60 Hz) and LM6000PF+ aeroderivative gas turbine (53.8 MW, 50/60 Hz). Both would be in the same general specs as the Siemens SGT-A65. It's why we don't understand why there isn't any focus on Baker Hughes turbines for Russian

LNG project. Or maybe Russia is saving that for a winter issue? Our Supplemental Documents package includes the TASS report.

LNG game changer, Baker Hughes stops work on 6.2 bcfd RUS LNG
We have been highlighting the Baker Hughes Russia stoppage as an LNG game changer. Our June 19, 2022 Energy Tidbits memo was titled "*Game Changer for LNG: ~6.2 bcf/d Russian LNG is at Risk with Reports Baker Hughes to Stop Providing Services/Equipment*". Here is what we wrote in our June 19 memo. "*We are still surprised that others haven't jumped on what we called the game changer to LNG – the reports Baker Hughes is stopping servicing, replacing parts, etc for in operating Russian LNG projects and will not provide gas turbines for the under construction LNG projects. This is putting at risk 3.6 bcf/d of existing LNG supply and 2.6 bcf/d of under construction LNG. It is huge or, at least we think so. Don't forget Baker Hughes is the leading global services company for LNG and is involved in almost every recent LNG project. (i) On Thursday, we tweeted [LINK] "1/2. Game Changer for #LNG. 6.2 bcfd RUS LNG is now at risk incl operating 1.3 bcfd Sakhalin-2 LNG & 2.3 bcfd Yamal LNG, and under construction 2.6 bcfd Arctic LNG-2 w/ phase 1 0.87 planned 2023 in service. #OOTT #NatGas" and [LINK] "2/2. Must read, @Kommersant reports #BakerHughes stopping service/replacement parts for existing #LNG & shipping gas turbines for Arctic LNG-2. Projects are designed for specific turbines. Urgent need for LNG FIDs ie. how about @Shell #LNGCanada Phase 2 is 1.8 bcfd. #NatGas #OOTT". Baker Hughes is reportedly stopping servicing two in-service Russian LNG projects (Sakhalin-2 and Yamal LNG) and stopping deliveries on gas turbines for the under construction Arctic LNG-2 project. Sakhalin-2 LNG in operation. Think about what is happening with Nord Stream being shut down waiting on equipment repairs. The operating 3.6 bcf/d LNG will be at risk for now having Baker Hughes servicing and providing any equipment repairs/replacement. And the 2.6 bcf/d of under construction LNG can't be finished without Baker Hughes equipment. (ii) On Friday, we tweeted [LINK] "Game changer for #LNG. See 👇 Thurs thread, $BKR pullout is huge. RUS admits delays in new LNG adds, hopes no more than 1-2 yrs. Arctic LNG-2 2.6 bcfd from 3 phases, phase 1 0.87 bcfd starting in 2023, all on in 2026. Urgent need for FIDs ie. #LNGCanada Phase 2. #OOTT #NatGas." TASS reported on comments from Russia First Deputy Minister Sorokin, who admitted that the under construction 2.6 bcf/d Arctic LNG-2 would be delayed and they hoped the delay wouldn't be more than 1 to 2 years. In the Kommersant Thursday report, they noted that the Baker Hughes equipment could not be replaced. Kommersant wrote ""There is, in fact, nothing to replace this equipment now: analogues are not produced in the Russian Federation, and LNG production lines have already been designed for the LM9000". (iii) There was a good example on how nothing is every clear in Russia. And that Novatek still sees Phase 1 of Arctic LNG-2 starting on time in 2023. On Friday night, Bloomberg reported "Novatek plans to launch Arctic LNG 2 on time despite all the problems amid sanctions, Interfax reports, citing CEO Leonid Mikhelson at St. Petersburg International Economic Forum. * NOTE: Novatek holds 60% stake in the Arctic LNG 2 project with three LNG production trains with a capacity of 6.6m tons/year each. The first train was expected to start production in 2023 * Novatek has revised Arctic*

LNG 2 financing scheme, there are no problems with that." Our Supplemental Documents package includes the Kommersant report, and the TASS Friday report.

Figure 15: Novatek's LNG production platform, May 2021



Source: Novatek

Natural Gas – Exxon thinks Germany could go back to fracking?

Will Germany ever allow fracking?

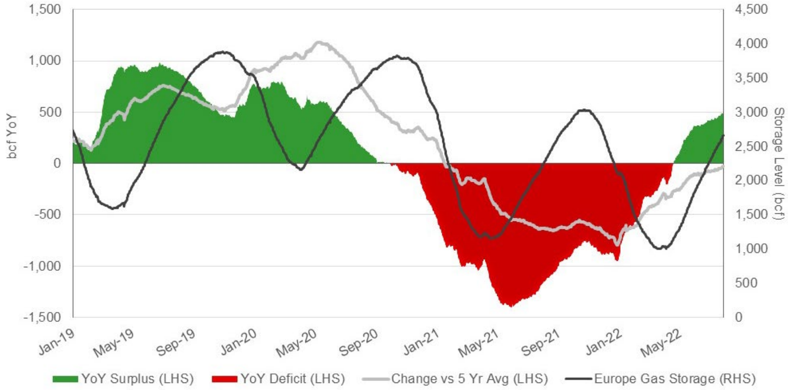
We listened to the Exxon Q2 call and were surprised by part of Exxon CEO Woods answer to the first question on how Europe can deal with their energy challenge. We tweeted [LINK] "*Relevant to #VermilionEnergy. Exxon Q2 Q&A right now, #Exxon CEO asked re Europe energy security, think Europe will be driven to leverage resources available to them ie. fracking & unconventional #NatGas potential in Germany, thinks industry has proven it can be done safely #OOTT*". It doesn't sound crazy when you think of what Europe is doing to deal with the accelerated energy crisis. Germany has increased coal-fired generation, getting LNG import terminals, and maybe forced to keep nuclear going. So why not, let fracking for unconventional gas on German's oil and gas leases. We noted Vermilion as we remember Vermilion got into Germany years ago in part for the unconventional potential. The first question on the Q2 call included "*And so would love your perspective on the European energy challenges that are being faced right now. How does the continent ultimately work its way through it?*" CEO Woods replied "*I think you touched on what is a very challenging situation today. And that reflects, I think, the complexity associated with making a massive change to a system that's so critically important to people's lives. And so I think going forward and what we are seeing happening today is a what I'd say is a broader net being cast with respect to how we think about the transition and how that evolves. Making sure that we have got a diversified portfolio of energy and one -- and sources of energy that are not dependent on any one nation state -- stay which is I think an important step that we are seeing being taken. I think they'll be a drive over time to make sure that they're leveraging the resources available to them. And I'll just make one example would be the potential that we* *see for fracking an unconventional gas in Germany. I think the industry has proven over the years that unconventional gas can be produced safely, and you then have a secure source of supply and economically and reliable sources supply. And so I think there's an opportunity where certainly ExxonMobil could play a key role."*

Natural Gas – Europe storage is now +12.37% YoY ie. 67.82% full vs 55.45%

It looks like the continued strong LNG imports and efforts to reduce consumption are having an impact. Even with the reduced volumes on Nord Stream prior to its July 11-21 maintenance, 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 12.37%. Inventories are rising all across Europe, as is normal during spring and early summer. Europe gas storage started last winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1/21. Europe storage levels bottomed in late Apr 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 July 27 is at 67.82%, which is +12.37% greater than last year levels of 55.45% and are -0.58% below the 5-year average of 68.40%. Below is our graph of Europe Gas Storage Level.

Europe storage now 67.82% full

Figure 16: Europe Gas Storage Level



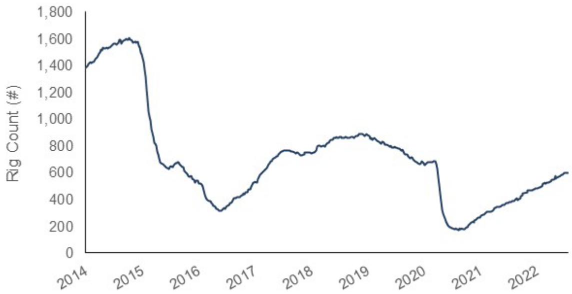
Source: Bloomberg

Oil – US oil rigs +6 at 605 oil rigs at July 29

Baker Hughes released its weekly North American drilling activity data on Friday. There are still strong oil, NGLs and natural gas prices and industry has higher YoY 2022 capex budgets, but the reality is that industry needs to crank up drilling to increase the depleted inventory of DUCs. This week US oil rigs were +6 at 599 oil rigs. Oil rigs are +433 off the bottom of 172 in Aug14/2020 week. Note the Permian was +2 to 346 rigs this week. The Bakken was flat at 37 rigs after no change last week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by -78 to 605 oil rigs (-13%). US gas rigs were +2 WoW at 157 rigs.

US oil rigs +6 WoW

Figure 17: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – Was the US frac spreads +5 to 295 for the week ending July 29

Frac spreads +5 to 295

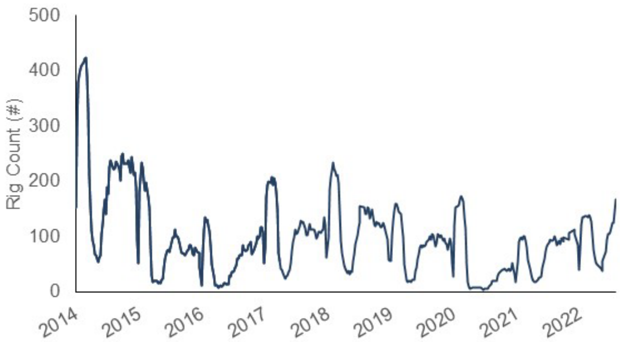
Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending July 29 on the Primary Vision network. YouTube video is at [LINK]. For the week ending July 29, US frac spreads at the high point in the week were +5 to 295 spreads. He noted the Q2 earnings calls commentary on how activity is getting the moves that he has been expecting in the western Gulf, Anadarko and Permian. And also playing out in the other basins, especially the smaller basins that have been getting some activity. The 295 is just a little bit shy of the 300 he had expected for the end of July. Rossano had initially thought spares could get to 315, but that doesn't' seem very likely at this point. Rather he now thinks closer to 300 to 3015 spreads. Rossano also highlighted his spread count picks up the smaller guys who may have 1 or 2 spreads and that these smaller players tend to get overlooked in other spread counts.

Oil – Total Cdn rigs +9 WoW at 204 total rigs, +51 rigs YoY

Cdn rigs +9 WoW

Total Cdn rigs were +9 at 204 total rigs. Cdn oil rigs were +13 at 137 rigs. Cdn gas rigs were -4 at 67 gas rigs. Total rigs are now +191 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 93 and Cdn gas rigs were 59 for a total Cdn rigs of 153, meaning total Cdn oil rigs are +44 YoY and total rigs are +51 vs 2021. These increases have been the recent theme for Canada. This growth is all driven by oil rigs, as natural gas is down. As noted earlier, BC rigs are only up 4 from the spring break up trough of 8 rigs to be at 12 rigs.

Figure 18: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production +0.2 mmb/d to 12.1 mmb/d

US oil production +0.2 mmb/d WoW

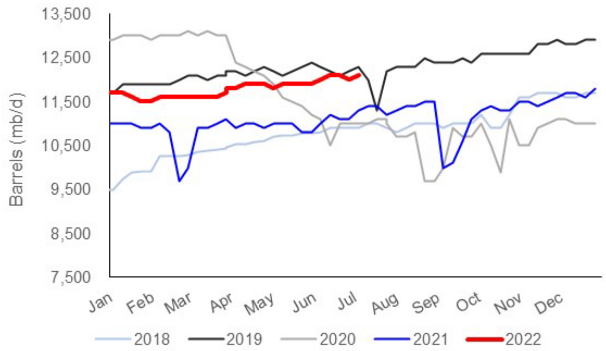
US oil production was +0.2 mmb/d to 12.1 mmb/d for the week ended July 22 after a decrease last week. Lower 48 production drove total production and was up 0.2 mmb/d from last weeks level at 11.7 mmb/d this week, with Alaska having immaterial change. US oil production is up YoY at +0.9 mmb/d, but is still down significantly at -1.0 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. Increasing US oil production would be consistent with the growth in the EIA's latest Drilling Productivity Report (see our July 24, 2022 Energy Tidbits) that forecast US shale/tight oil would be +176,000 b/d MoM in July. Q2 reporting has started for the oilfield services companies and they are all saying that US producers continue to be disciplined on capex and focus on returns to shareholders.

Figure 19: EIA's Estimated Weekly US Oil Production

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
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		

Source: EIA

Figure 20: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA Form 914, May oil production disappointing and down MoM

EIA Form 914 May

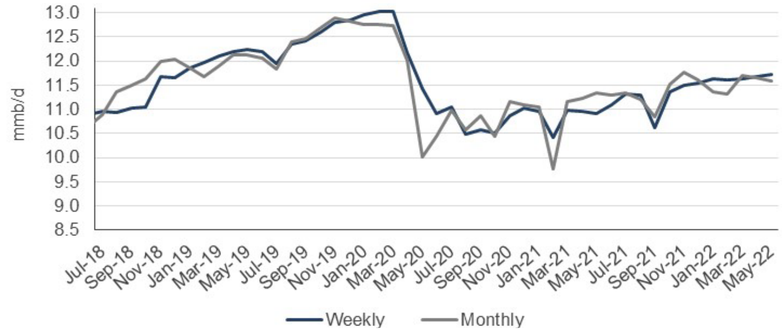
The EIA released its Form 914 data [LINK] on Friday, which is the EIA's "actuals" for May US oil and natural gas production. (i) We thought the oil production was disappointing as May was down 0.057 MoM to 11.585 mmb/d in May. And this was despite May having a recovery from the North Dakota blizzard hit April oil production. North Dakota in may ws +154,000 b/d MoM to 1.049 mmb/d. (ii) Form 914 estimates total US oil production is down 0.057 mmb/d MoM to 11.585 mmb/d in May. May is only slightly below Dec 2021 levels of 11.604 mmb/d and still below Nov 2021 of 11.769 mmb/d. May 2022 is still down -1.202 mmb/d from March 2020 (pre-covid) and +0.239 mmb/d YoY. (iii) The actuals for May were slightly above the EIA weekly estimates, as well as the EIA STEO April had for March. (iv) Federal Offshore Gulf of Mexico had the largest MoM change with a decrease of -157,000 b/d. North Dakota was up +154,000 mmb/d to 1.049 mmb/d as it made a recovery from the blizzards in April.

Figure 21: EIA Form 914 US Oil Production

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	11,369	11,306	11,701	11,652	11,595							
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,848	11,653	11,899	12,125	12,141	12,179	11,896	12,475	12,572	12,771	12,966	12,910
2018	9,996	10,276	10,461	10,493	10,424	10,628	10,888	11,373	11,422	11,488	11,868	11,924
2017	8,873	9,109	9,168	9,103	9,184	9,110	9,246	9,245	9,516	9,659	10,077	9,979
2016	9,201	9,063	9,088	8,871	8,832	8,672	8,660	8,688	8,542	8,802	8,901	8,814

Source: EIA

Figure 22: EIA Form 914 US Oil Production vs Weekly Estimate



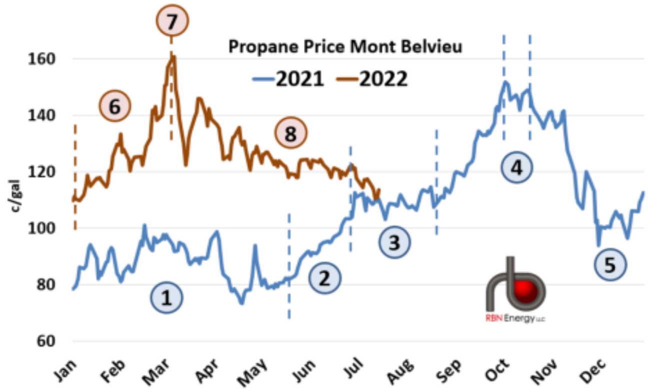
Source: EIA

Oil – RBN blog: will the propane market be prepared for winter?

RBN blog on propane

There was a good food for thought blog from RBN on Sunday titled *"People Get Ready - Will The Propane Market Be Prepared For Winter?"* [LINK] which gives a good overview of the propane market as the US is two months away from the official start of propane heating season. Inventories are 3.5 mmb lower than last year, or 2.6 mmb below the five-year week-on-week low. Just like last summer, propane exports are running high and production is not increasing fast enough to get inventories back up. But propane prices are not behaving at all like last year. At this point in 2021, the price of propane was moving higher, both in absolute terms and relative to the price of crude oil. This year, prices have been falling for the past four months and are much weaker relative to crude than a year ago. The primary challenge for the US propane market has always been seasonality, which makes inventory levels very important. Furthermore, the competition between domestic and international buyers now dominates the behavior of U.S. propane prices, both in the inventory fill season and the withdrawal season. Today, inventories are below where they were this time last year. Exports year-to-date are up about 8%. And although crude prices are not ramping up, there is certainly nothing stable about the prices of oil given the ongoing Ukraine war and the impact of European and U.S. sanctions. This many portend a repeat of last year's fall propane price spike. But if propane prices stay at their current levels, will there be enough inventories and production to meet a period of sustained cold weather, if it happens? Our Supplemental Documents package include the RBN blog.

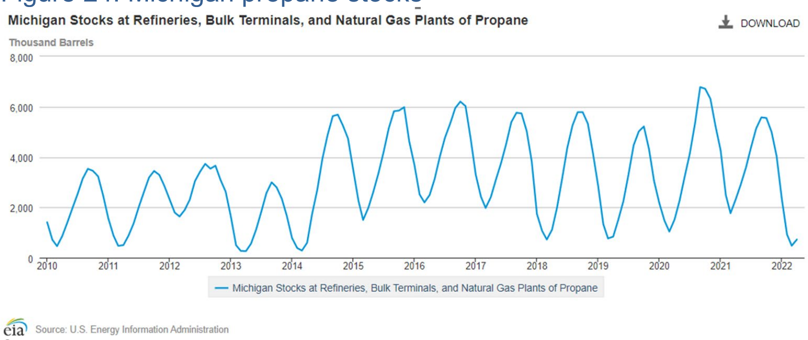
Figure 23: Propane Prices



Source: RBN

Will Michigan Gov Whitmer keep pushing to shut down Line 5?
The RBN blog reminded us to take a look at Michigan's propane inventory position given the big push over the past few years has been Michigan Governor Whitmer's push to shut down Enbridge's Line 5. And we wonder how hard Whitmer will be pushing on shutting down Line 5 in her re-election campaign for the November election in light of the low Michigan propane stocks. On Wednesday, we tweeted [LINK] "*Good @RBNEnergy blog on low #Propane inventories. Not a pretty picture for propane stocks in Michigan, Good thing MI has $ENB #Line5 that supplies 55% of MI propane. Will @GovWhitmer push its shutdown as hard in Nov election with the winter risk from low inventories? #OOTT*". Our tweet included the EIA's current propane stock graph for Michigan that shows the low Michigan stocks. And also the reminder Enbridge report that Line 5 supplies 55% of Michigan's propane consumption.

Figure 24: Michigan propane stocks



Source: EIA

Oil – TC Energy increases Keystone capacity from 590,000 to 610,000 b/d

There was a bit of an overlooked tidbit from the TC Energy Q2 call on Thursday – the capacity of Keystone oil pipeline has increased from the previously stated 590,000 b/d to 610,000 b/d. In the Q2 release, TC Energy wrote "*Additionally, during the quarter the Keystone Pipeline System safely delivered nearly 610,000 Bbl/d as we placed approximately 30 per cent of the 2019 Open Season contracts into service effective April 1, 2022 with additional volumes anticipated through year end*." And in the Q2 call, mgmt. said ""*we safely reached nearly 610,000 b/d a day as we placed about 30% of the 2019 open season contracts into service,"* and "*as I mentioned just a minute ago, we're increasing long haul volumes on Keystone*". The Keystone Pipeline starts in Hardesty (Alberta), moves thru southern Saskatchewan and Manitoba, turns south thru Nort Dakota, South Dakota, Nebraska, Kansas, Oklahoma and then thru Texas to Houston on the Gulf Coast. Below is a shrunken down version of the detailed TC Energy Keystone Pipeline map. Our Supplemental Documents package includes a full page blow up of the detailed Keystone Pipeline map.

Keystone capacity now 610,000 b/d

Figure 25: Keystone Pipeline System

Source: TC Energy

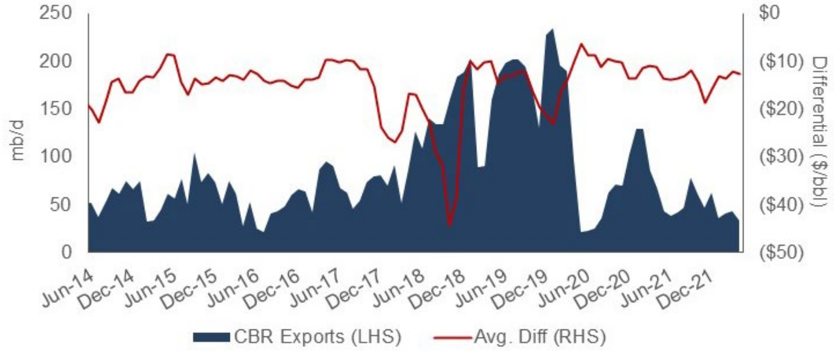
Oil – Cdn crude by rail imports to Gulf Coast down 89% YoY in May to 82,000 b/d

The EIA posted its monthly "U.S. Movements of Crude Oil by Rail" [LINK] on Friday, which also had good insights on Cdn crude by rail. Canadian CBR volumes to PADD 3 (Gulf Coast) were 82,000 b/d in May, which is up 18,000 b/d MoM from April, and up 39,000 b/d YoY vs

Cdn CBR imports to Gulf Coast up 39,000 b/d YoY

May 2021. Last months data was revised up materially from 33,000 b/d. Below is our graph of Cdn CBR exports to the Gulf Coast.

Figure 26: Canada CBR Exports to US Gulf Coast vs WCS Differential



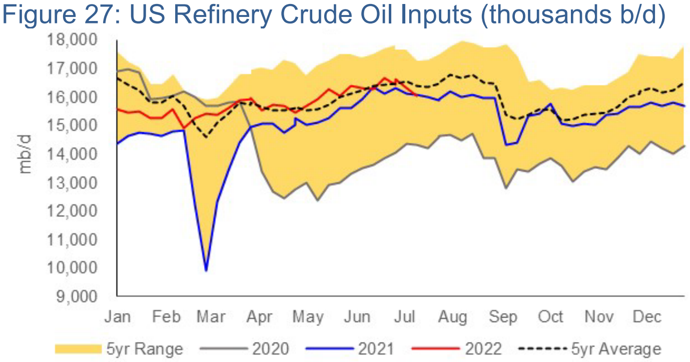
Source: EIA, Bloomberg

Oil – Refinery inputs -0.292 mmb/d WoW at 16.027 mmb/d

Refinery inputs down WoW

US refineries have been running at high capacity utilization levels in the face of very high crack spreads to pump out more gasoline and diesel. The EIA crude oil input to refinery data is for the week ended July 22. This is the season that normally sees increasing processing volumes in Q2 every year, though the EIA reported crude oil inputs to refineries down -0.292 mmb/d to 16.027 mmb/d for the week ended July 22 and are +0.153 mmb/d YoY. Refinery utilization was down to 92.2%, which is +1.1% YoY. Refineries have exited the maintenance season with ramped up summer demand. Note that hurricane season in the US is here, with the official start of the season on June 1. Total products supplied (i.e., demand) decreased WoW, down -1.049 mmb/d to 19.976 mmb/d, and Motor gasoline was up 0.724 mmb/d at 9.245 mmb/d from 8.521 mmb/d last week. The 4-week average for Motor Gasoline was down -0.677 mmb/d YoY to 8.810 mmb/d. The 4-week average of Total demand was down -0.592 mmb/d YoY to 20.046 mmb/d.

Figure 27: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – US "net" oil imports down -1.144 mmb/d WoW at 1.616 mmb/d

US "net" oil imports down WoW

US "NET" imports were down -1.144 mmb/d to 1.616 mmb/d for the July 22 week. US imports were down -0.355 mmb/d to 6.164 mmb/d. US exports were up +0.789 mmb/d to 4.548 mmb/d. The WoW increase in US oil imports was driven by US's Top 10 imports by country which were down by -0.581 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by -0.173 mmb/d to 3.308 mmb/d. (ii) Saudi Arabia was up 0.274 mmb/d to 0.516 mmb/d this week. (iii) Colombia was down -0.255 at 0.150 mmb/d. (iv) Ecuador was up 0.093 mmb/d at 0.150 mmb/d. (v) Iraq was down -0.289 mmb/d to 0.165 mmb/d. (vi) Mexico was down -0.238 mmb/d to 0.639 mmb/d.

Figure 28: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	May 13/22	May 20/22	May 27/22	June 3/22	June 10/22	June 17/22	June 24/22	July 1/22	July 8/22	July 15/22	July 22/22	WoW
Canada	3588	3498	3444	3603	3394	3344	2887	3803	3827	3481	3308	-173
Saudi Arabia	420	588	345	349	681	760	701	398	634	242	516	274
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	832	872	747	711	608	374	743	702	610	877	639	-238
Colombia	365	218	215	143	292	228	215	213	213	405	150	-255
Iraq	242	282	326	196	555	100	76	362	302	454	165	-289
Ecuador	43	250	48	259	227	124	59	142	149	57	150	93
Nigeria	127	39	193	194	181	43	201	171	79	136	143	7
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	5,617	5,747	5,318	5,455	5,938	4,973	4,882	5,791	5,814	5,652	5,071	-581
Others	951	739	900	699	1,047	1,253	1,116	1,048	861	867	1,093	226
Total US	6,568	6,486	6,218	6,154	6,985	6,226	5,998	6,839	6,675	6,519	6,164	-355

Source: EIA, SAF

Oil – Pemex oil production still stuck around 1.7 mmb/d, but partners now 65,000 b/d

Pemex May oil 1.720 mmb/d

On Friday, Pemex released its June production for its interests, it was 1.702 mmb/d of oil, which is basically unchanged for the last several months. Pemex has been unable to grow its own oil production. However, the non-Pemex oil production in Mexico is now up to 65,000 b/d and has averaged 59,000 b/d for YTD April 30. As a result, total Mexico oil production (Pemex and non-Pemex) was 1.690 mmb/d for May and 1.720 mmb/d for YTD June 31. Below is our chart tracking Pemex oil production.

Figure 29: Pemex Mexico Oil Production

Oil Production (thousand b/d)	2015	2016	2017	2018	2019	2020	2021	2022
Jan	2,251	2,259	2,020	1,909	1,623	1,724	1,651	1,705
Feb	2,332	2,214	2,016	1,876	1,701	1,729	1,669	1,684
Mar	2,319	2,217	2,018	1,846	1,691	1,745	1,697	1,696
Apr	2,201	2,177	2,012	1,868	1,675	1,703	1,693	1,686
May	2,227	2,174	2,020	1,850	1,663	1,633	1,688	1,690
June	2,247	2,178	2,008	1,828	1,671	1,605	1,698	1,702
July	2,272	2,157	1,986	1,823	1,671	1,595	1,701	
Aug	2,255	2,144	1,930	1,798	1,683	1,632	1,657	
Sept	2,271	2,113	1,730	1,808	1,705	1,643	1,709	
Oct	2,279	2,103	1,902	1,747	1,655	1,627	1,692	
Nov	2,277	2,072	1,867	1,697	1,696	1,633	1,691	
Dec	2,275	2,035	1,873	1,710	1,706	1,650	1,694	

Source: Pemex

Oil – Pemex evaluating if any Madero refinery impact from lightning strike

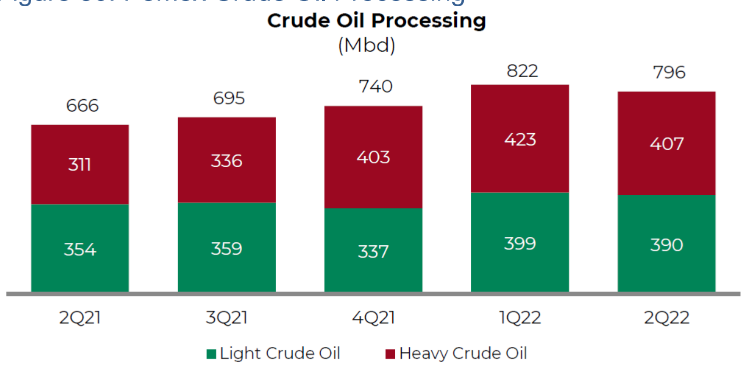
Pemex Madero 190,000 b/d refinery

On Friday, we tweeted [LINK] *"#Pemex evaluating damage from lightning strike at 190,000 b/d capacity Madero refinery. See 👇 Pemex Q2, Madero processed 101,000 b/d & produced 62,000 b/d of #Gasoline #JetFuel #Diesel. Any refinery impact would send more MEX #Oil to* *export markets like US Gulf Coast. #OOTT.*" On Friday, Pemex reported [LINK] "*PEMEX controls incident at Madero Refinery caused by electrical storm. Unfortunately, the finding of a deceased worker was reported, in addition to a missing person, both from contractor companies. Start-up activities continue and material damage assessment continues*." And "*Petróleos Mexicanos (PEMEX) informs that today, at approximately 04:45 hours, at the Madero Refinery, Tamaulipas, there was a meteorological phenomenon due to an electrical storm. As a result of this, an emergency warning was reported from the operating personnel of the effluent treatment plant, upon observing an empty pressure truck (UPV) on fire, near the SA-1 and SA-2 oil separators, towards where the fire was directed and caused the pit to burn. Specialized personnel immediately activated the corresponding protocols and, with the support of two fire-fighting trucks and the water network, contained the fire. Subsequently, actions were taken to cool the separator with foam injection. Start-up activities continue and the evaluation of material damage to the facilities continues."* As of our news cut off at 7am MT, we have not seen any update from Pemex of the impact on the refinery.

Madero processed 101,000 b/d & produced 62,000 b/d petroleum products

Our tweet also noted the Q2/22 performance of the Madero refinery. It has a stated capacity of 190,000 b/d. In the Q2/22 report released on Thursday, Pemex reported Madero processed 101,000 b/d in Q2/22 (up vs 95,000 b/d in Q1/22), which included 46,000 b/d of heavy crude oil. In terms of petroleum products output, Pemex wrote "*In the second quarter of 2022, petroleum products production increased by 22.6% as compared to 2Q21, averaging 803 Mbd: 257 Mbd were gasoline, 156 Mbd diesel, 28 Mbd jet fuel, and 364 Mbd other petroleum products and LPG. As compared to 1Q21, distillate production (gasoline, diesel, and jet fuel) increased by 34.0%, mainly due to its higher production at the following refineries: Salamanca 78 Mbd, Madero 62 Mbd and Minatitlán 60 Mbd."* Our Supplemental Documents package includes the Pemex Q2/22 report page on refining data.

Figure 30: Pemex Crude Oil Processing



Source: Pemex

Oil – Mexico June oil exports up to 1.029 mmb/d

Pemex May oil exports

Our April 3, 2022 Energy Tidbits highlighted the major (and a surprising one) change in Mexico oil export strategy for 2022. On March 31, AMLO announced "plan emergente" that would see Mexico oil exports relatively flat YoY in 2022, and not down huge as has been one of the primary election promises to the Mexican people. The plan didn't make sense as to why export oil at a high price but then keep importing more petroleum products at higher prices ie. a net loss. That is, unless increasing refining capacity wasn't happening as planned. Part of this came to light last month with the inauguration of the new 340,000 b/d Dos Bocas refinery, which won't be ready to refine oil for several months. As a result, Mexico isn't making any real decreases in oil exports. On Friday, Pemex reported June oil exports were 1.029 mmb/d, which was up MoM vs May of 0.965 mmb/d, and down -7.0% YoY vs June 2021 of 1.106 mmb/d. Pemex oil exports to US were 0.664 mmb/d in June, which was down 10% from last month. Below is our table of the Pemex oil export data.

Figure 31: Pemex Mexico Oil Export

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	21/20	2022	22/21
Jan	1,119	1,085	1,107	1,071	1,260	979	-22.3%	832	-15.0%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	-8.0%	925	-8.1%
Mar	1,062	1,001	1,176	1,150	1,144	925	-19.1%	905	-2.2%
Apr	1,081	1,017	1,266	1,023	1,179	923	-21.7%	1024	10.9%
May	1,204	958	1,222	1,205	1,062	1,031	-2.9%	965	-6.4%
June	1,098	1,157	1,110	995	1,114	1,106	-0.7%	1,029	-7.0%
July	1,146	1,255	1,156	1,079	1,051	1,173	11.6%		
Aug	1,261	1,114	1,181	1,082	1,190	1,099	-7.6%		
Sept	1,425	1,159	1,206	995	1,023	983	-3.9%		
Oct	1,312	1,342	1,027	963	908	935	3.0%		
Nov	1,273	1,388	1,135	1,114	1,171	1,025	-12.5%		
Dec	1,115	1,401	1,198	1,115	1,243	1,037	-16.6%		

Source: Pemex

Oil – OPEC and non-OPEC ministerial meeting (ONOMM) is Wed August 3

OPEC+ meeting August 3

The 30th OPEC and non-OPEC Ministerial Meeting (ONOMM) is on Wednesday August 3, 2022 and is to be via video conference once again. The next planned in-person meeting isn't expected until the December meeting at the OPEC offices in Vienna.

Oil – Feels like Abdulaziz/Novak meeting was a set up for a modest OPEC+ increase

Modest supply adds at OPEC+?

Saudi Arabia energy minister Abdulaziz bin Salman and Russian Deputy Prime Minister Novak met in Riyadh on Friday. When we saw the meeting and reports of only general discussion, it makes us wonder why did Novak feel the need to fly to Riyadh less than a week before the OPEC+ Aug 3 meeting? In light of all the US Administration comments on the positive Biden/MBS meeting, it doesn't seem likely that Novak went to convince Saudi to not do something. Rather, we think it's to make it look like Novak was in on a joint decision and to make sure the messaging reflects the Saudi/Russia working together. When we read the TASS report [LINK] of the Russian statement saying "*Separately, at the meeting, the current situation in the global oil market was touched upon. It was emphasized that Russia and Saudi Arabia are firmly committed to the goal of the OPEC+ agreement to maintain market stability and restore the balance of supply and demand," the statement says"*, we feel that more likely reflects some sort of modest added supply to be agreed by OPEC+ including Russia. It was the phrase "*and restore the balance of supply and demand*" that makes us think this given the logic for why OPEC+ increased their July and Aug quotas. When they made that decision in June, OPEC+ said "*It further noted that global refinery intake is expected to increase after seasonal maintenance. The Meeting highlighted the importance of stable and balanced markets for both crude oil and refined products."* The Saudi/Russia statement didn't say increase, but it feels like the move to restore the balance of supply and demand is likely to see some sort of modest added supply to the market.

Oil – Very bullish report, surprising admissions on Saudi Arabia's production capacity

On Monday, we were surprised to see the Arab News report "*Secret or reality: can Aramco produce 15 million barrels a day?*" [LINK] (i) We tweeted [LINK] "*Must read. Hard not to be very bullish #Oil on reality for #Aramco to MAINTAIN & increase production. Yes can produce 11-12 mmb/d but need massive investments & above all more reservoir management, Ghawar 3.8 mmbd of MSC is in decline, economics not there for new fields #OOTT*." Our tweet did not do justice to the fact that there was so much more in the report including a number of frank statements that question the economics and potential for added oil production barrels. (ii) This is very bullish for oil. We think it reinforces that the view that markets shouldn't expect Saudi Arabia to produce on a sustainable basis much more than 11 mmb/d. This will be their quota in August. Their current maximum sustainable capacity is `12 mmb/d. (iii) It reminds Saudi Arabia always wants to keep 1 to 2 mmb/d of spare capacity. So if the current MSP is ~12 mmb/d, it is telling the market the most they will produce is ~11 mm/d, or basically the August quota. Mahdi writes "*The Kingdom took on its shoulders the responsibility of keeping between 1 and 2 million barrels a day of oil as spare capacity*". (iv) We were surprised by this comment on just maintaining the spare capacity as I don't' recall seeing it before. But it is normal oil operations. It costs money to maintain capacity. Mahdi writes "*This idle capacity isn't free. It comes at a cost. There is an economic cost of not selling that oil, and there is a financial cost in the form of capex and opex to keep these wells and the surface facilities ready to pump this crude at any time*." (v) It was very surprising to see the admission that the massive Ghawar oil field is in decline. This is what many oil watchers believe but it isn't something we have heard from Saudi Arabia. And this alone brings into question Saudi's ~12 mmb/d MSC. Mahdi wrote ""*I think the world now can say goodbye to the 15-million-barrels-a-day scenario. Many of these increments have already been developed to maintain Aramco's 12 million MSC. Khurais 300,000 and 250,000 are history now. As for Berri's increment, it is coming online over the next two years. Now we will rely on Zuluf and Safaniyah to hit the 13 million barrels a day target and to compensate for the declines in older fields such as Abqaiq and Ghawar."* (vi) And to get to produce 11 or 12 mmb/d requires massive investments. We are concerned that many assume that Saudi Aramco's stated MSC of ~12 mmb/d is there ready to be called up. But that isn't reality and Mahdi reminds that this requires massive investments. Mahdi writes "*I don't doubt the ability of Aramco to produce at 11 or 12 million barrels a day because I didn't get my information from the officials who smile at the media but from those who were against seeing the company producing at that level. Aramco can do it but it will require more work for petroleum engineers who don't want to walk the extra mile and it will need massive investments and above all more reservoir management*." As an aside, we have to believe there will be changes at some levels in Aramco with the multiple digs at Aramco. (vii) For the increase from ~12 mmb/d to 13 mmb/d MSC, this was surprising as he basically says that the key oil fields that have been assumed to add production aren't economic to bring on. This is another surprising statement. "*First, there are tens of fields that are still not developed. There are more than 100 discovered fields but the majority if not all of production is coming from less than 25 of them. Yes all these undeveloped fields are giant but when combined can add something between 500,000 and 1 million barrels a day extra. However, the economics for bringing them online is still not there, not until the big fields are on decline."* (viii) Note the part of the new fields that does look solid is the 250,000 b/d from the Neutral Zone fields. These are 500,000 b/d split 50/50 Saudi/Kuwait. Mahdi wrote "*Second, observers tend to forget that*

Saudi Arabia shares massive resources in the partitioned zone with Kuwait. Khafji network of offshore fields can produce up to 300,000 barrels a day, while onshore fields in Wafra are able to add 200,000 barrels a day. Saudi Arabia was trying for years through Chevron to implement a steam flooding program that can unlock at least 5 billion barrels extra of heavy oil from Wafra. The steam injection project was undergoing until the two countries halted production from the entire zone between 2014 and 2015. With operations resuming normally in the zone, the prospect for seeing more oil from Wafra and Khafji is high." (ix) This is supposed to be a reassuring comment, but we have trouble buying into the thesis that Saudi can free up 1 mmb/d of oil for export markets by 2030 by substituting natural gas for oil in its power plants and by adding renewables. Maybe so, but it won't be cheap given it will be driven by renewable that has been so far behind and unconventional natural gas. (x) This is an excellent report to read and one that we believe is very bullish for oil for the 2020s. Our Supplemental Documents package includes the Arab News report.

Can Saudi have ~12 mmb/d MSC if Ghawar is in decline?
Long time oil followers remember the peak oil supply focus of the early 2000's that was made famous by Matt Simmons and his book Twilight in the Desert referring to his analysis that Saudi Arabia's big oil fields, in particular Ghawar, was in decline. The Arab News admission that Ghawar is declining is not a surprise to many oil watchers, but nothing we have seen admitted by Saudi Aramco. This is huge because if Ghawar is declining, we have to wonder how can Saudi Aramco have ~12 mmb/d MSC? Our tweet included the below table from the Saudi Aramco IPO registration document that showed 2018 data splitting out Saudi Aramco's 12 mmb/d of MSC. Ghawar is the largest component at 3.8 mmb/d or 32% of Saudi Aramco's 12 mmb/d MSC. We checked their 2021 financial disclosure and could not see an updated split of the 12 mmb/d MSC by oil field.

Figure 32: Saudi Aramco MSC by oil field

Table 14: Key characteristics of certain of the Company's principal oil fields by reserves listed as at 31 December 2018G

	Liquids Reserves(1) (mmbbl)	Combined Reserves (mmboe)	MSC (mmbpd)
Ghawar	48,254	58,319	3.800
Khurais	20,100	21,402	1.450
Safaniyah	33,664	34,029	1.300
Shaybah	13,617	14,864	1.000
Zuluf	30,417	31,313	0.825
Other	80,718	96,963	3.625
Total	**226,770**	**256,890**	**12.000**

Source: Company.

Source: Saudi Aramco

Arab News is owned by MBS brother
One of the reasons why we believe people should pay attention to the Arab News report is its ownership – it is reportedly owned by a brother of MBS and we do not believe this report, given its controversy, would not be published if MBS wasn't onside. We tweeted [LINK] "*what makes the #Aramco story even more interesting.*

Note ownership of Arab News. @Wikipedia "At least as of May 2019, Arab News was owned by Prince Turki bin Salman Al Saud, the brother of the ruling Crown Prince of Saudi Arabia Muhammad bin Salman (aka MBS)." #OOTT." Wikipedia writes [LINK] "*Arab News is an English-language daily newspaper published in Saudi Arabia. It is published from Riyadh. The target audiences of the paper which is published in broadsheet are businessmen, executives and diplomats.[4][5] At least as of May 2019, Arab News was owned by Prince Turki bin Salman Al Saud, the brother of the ruling Crown Prince of Saudi Arabia Muhammad bin Salman (aka MBS)."*

Oil – Prelude to near term ascension to King? MBS EU trip incl Macron in France

Is stage being set for MBS to become King

We continue to believe MBS will be ascending to the throne soon, likely before year-end and his re-emergence on the international stage is a prelude to that event. Our July 17, 2022 Energy Tidbits wrote "*We think the most significant item to come out of the Biden's lack of success is that it will likely lead to MBS becoming Saudi King in the coming months. And as seen in the Biden meetings, he is a positive for Oil. Earlier this morning, we tweeted [LINK] "#MBS certainly looks like the big winner post #Biden meetings. if so, see 👇 as @gulf_intel @sean_evers June 20 prediction is likely right, time for MBS to become king. And as seen in not giving anything to Biden on #Oil, MBS is a positive for Oil. #OOTT."* This week was another big week for MBS in his return to global acceptance with his first trip to EU since the Khashoggi killing. MBS met with Greek Prime Minister Kyriakos Mitsotakis in Athens and France President Emmanuel Macron in Paris. No one should be surprised to see his re-emergence on the international stage post Biden going to meet MBS in Saudi Arabia. We tweeted [LINK] "*Feeling like the prelude to a near term ascension to King? #Biden goes to KSA to meet with #MBS, now MBS EU trip incl France with #Macron & Greece with Mitsotakis. But MBS is positive for #Oil prices in 2020s especially with the upcoming financing requirements for Neom. #OOTT*." And then after seeing the video of Macron warmly greeting MBS on Thursday, we tweeted [LINK] "*See 👇video. Very warm #Macron greeting of #MBS - long handshake, pose, stop & do the turn back and wave. Feels more & more like the prelude to MBS ascending to be King. MBS is a positive for #Oil prices as he needs a financially strong KSA for his Vision 2030. #OOTT*." Below is what we wrote in our June 26, 2022 Energy Tidbits on this idea of the Biden meeting being a catalyst for MBS to become King.

Figure 33: Macron greeting MBS on July 28

Source: SCMP, BFMTV

June 26, 2022 Energy Tidbits excerpt
Should we be prepared for MBS to become Saudi King in the coming months?
We can help wonder if the stage is being set for MBS to become Saudi King in the coming months, perhaps ahead of the G20 leaders summit in October? There were two unrelated items on Monday morning that make us wonder. (i) On Monday, we tweeted [LINK] "Hmmm! #Biden/#MBS meet. "i think what MBS ultimately gets, in my opinion is the final blessing of Washington to ascend to become King. I think that is the real big prize here for him. Because up to know, they haven't given that" said @sean_evers. MBS is a positive for #Oil. #OOTT" There was a direct comment from Sean Evers (Gulf Intelligence founder) on their daily podcast. We have been listening to his daily podcast for the past year or two and he is an experienced oil follower, who generally doesn't make any outrageous type statements. He is in UAE. Here is what he said this morning "I struggle, I can see what the Saudis obviously get and the region. I think what MBS ultimately gets is, in my opinion, is the final blessing of Washington to ascend to become King. I think that is the real big prize here for him. Because up to now, they haven't given that." (ii) A Bloomberg report on Monday morning "Saudi Arabia's de facto ruler will go on a rare regional tour to build bridges ahead of US President Joe Biden's visit." The "rare" description caught my eye. Leaders don't normally do "rare" things without some reason. If we hadn't listened to Evers comments, we might not have linked it. (iii) So two unrelated events but we have to wonder. Then the question is what does this mean? There are so many potential implications but a few to come to mind. It will be the end of a redemption tour post Khashoggi killing. At least from MBS perspective. So we think there could be two items: First, If we accept the premise that MBS has been the de facto leaders, then it means continuation of what has been happening ie. aggressively using OPM to fund Vision 2030, no change to their oil policy (it's working), building relations with Israel (we think this is more the enemy of my enemy is my friend), continued negative vs Iran, cracking down on the Saudi wealthy who don't agree with him, etc.). Second, the real question is has MBS has been holding back on some items post the Khashoggi killing to get to this redemption, if he backs off of some of these to go back to his original approach pre-Khashoggi, or if he is agreeing with Biden's team to keep on some of these relaxed items as part of this deal. Ie. will he keep trying for some sort of peace with the Houthis or go back to blowing them away. Will he maintain the truce with Qatar for the past year or go back to trying to squeeze Qatar. We think this will be one of the key quesitons, will he go back to causing regional conflicts in Yemen, Qatar."

"

Excerpt June 26, 2022 Energy Tidbits
Remember MBS's Atlantic March 3 interview
We still wonder what MBS is getting from Biden because there has to be a lot more than the chance to be smiling/gloating in a photo op with Biden. We can't help remember what we wrote in our March 6, 2022 Energy Tidbits. "Oil – Saudi MBS "simply, I do not care" if Biden misunderstands something about him. The Atlantic's March 3 report "Absolute Power" [LINK] based on its interviews Saudi crown prince Mohammed bin Salman got some good headlines. MBS says their "aim is to keep it and strengthen it" talking about their long historical relationship with the US. The headlines were on his Biden comments and warning to not interfere in Saudi

domestic issues. The Atlantic wrote "We asked whether Biden misunderstands something about him. "Simply, I do not care," he replied. Alienating the Saudi monarchy, he suggested, would harm Biden's position. "It's up to him to think about the interests of America." He gave a shrug. "Go for it." For now, MBS's main request to the outside world, and especially the United States, is the usual request of misbehaving autocrats—namely, to stay out of his internal affairs. "We don't have the right to lecture you in America," he said. "The same goes the other way." Saudi affairs are for Saudis. "You don't have the right to interfere in our interior issues." It reminds that no one should expect the Saudi's to bend over in anyway to the US on oil. The problem for Biden and the Democrats is that it's difficult to reverse their view on MBS. We look at it as another of the situations where Biden and the Democrats like to have a villain to make sure they can get people onside their views. But by doing so, it makes it difficult for Biden to back track in a public way. It's like now with the oil companies, they really can't say anything positive about them or ask them to help without looking very weak. They made the oil companies the villains to sell energy transition for so long. How can they go back and say something good. They made MBS out to be a huge villain, Biden's team making it clear that Biden wouldn't meet or talk with MBS, only the King, they pulled out a Patriot missile defense system from Saudi Arabia, and have supposedly not given in to Saudi's request for more Patriot missiles to replace the shot missiles. So no surprise by the MBS comments on US. And unfortunately for the US, it means that Saudi isn't likely to help the US unless it helps them. We will be watching to see if there are reports on restocking Patriot missiles and any potential MBS/Biden meeting. Our Supplemental Documents package includes The Atlantic report."

Oil – Saudi wants $160b in 2020s of Other People's Money for NEOM Phase 1

Saudi's NEOM Phase 1

We couldn't help think about the massive $160 billion of OPM that Saudi Arabia will want for NEOM. Putting aside whether the project is realistic or not, if Saudi is going to have to get $160 billion from others, they would want to give some comfort to these investors (even if some are captive investors) and having a strong oil price would mean a strong Saudi Arabia can fund their portion of NEOM. It's why we thin the disclosure on NEOM is positive for oil prices. We have been highlighting our view that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money to fund as much as possible in the country from helping Saudi Aramco cover its dividends to funding the hoped for transformation of the country in its Vision 2030. This is the theme for the 2020s. That was reinforced big time on Tuesday, when MBS did the big reveal of flagship megaproject, NEOM. Bloomberg wrote "*Saudi Arabia will set aside 300 billion riyals ($80 billion) for an investment fund tied to the crown prince's flagship megaproject, NEOM, and plans an initial public offering of the project on the kingdom's stock market as soon as 2024. The NEOM Investment Fund could potentially expand to 400 billion riyals, Crown Prince Mohammed bin Salman told reporters in Jeddah. It will invest in companies that agree to operate at NEOM, a new region planned in Saudi Arabia's northwestern corner…. For the first time, Prince Mohammed also outlined details on how he plans to finance NEOM -- one of the largest and most complex construction programs in the world. The first phase of the project, which runs until 2030, will cost 1.2 trillion riyals, with about half of that covered by the Public Investment Fund (PIF), he said. Officials will seek to raise another 600 billion riyals from other sovereign wealth funds in the region, private investors in Saudi Arabia and abroad, and an initial public offering of NEOM* *itself on the Saudi stock market -- an idea the prince first floated in 2017*." This was the key disclosure and the MBS reveal - Saudi Arabia will be looking for half of Phase 1 cost of $320b (using the exchange rate used by Bloomberg) from Other People's Money. We tweeted [LINK] "*Positive for #Oil for 2020s. Be tough for #NEOM success and to raise 1/2 of $320b 1st phase from sovereign wealth funds in region, private investors in KSA & abroad and IPO if KSA isn't strong. And for KSA to be strong, need high oil prices. Thx @viviannereim. #OOTT.*" Our Supplemental Documents package includes the Bloomberg report.

The Line in NEOM is a pretty cool concept

Arab News reported [LINK] "*Saudi Arabia's Crown Prince Mohammed bin Salman announced the plans for The Line development at NEOM on Monday. The prince said the design would clarify the internal structure of the multi-layered city and address the problems of traditional flat horizontal cities, achieving harmony between urban development and preservation of nature, according to Saudi Press Agency. Prince Mohammed launched the initial idea and vision of the city that redefines the concept of urban development and what cities of the future should look like in January 2021. "At NEOM, we strive to be at the forefront of providing new and innovative solutions, and today we are determined to implement the idea of 'Building to the Top' through a team led by NEOM and a group of the brightest minds," the crown prince said. During Monday's announcement, Prince Mohammed said The Line would achieve "ideal living" and address the urgent challenges facing humanity. "NEOM is one of the most important projects of the Saudi Vision 2030 and The Line is an affirmation of our firm commitment to presenting a project to the whole world, NEOM is a place for those who dream of a better tomorrow," he said. The designs of The Line embody how urban communities will be in the future in an environment free from roads, cars and emissions, he added. The crown prince said the project, which offers a new approach to urban design, would run on 100 percent renewable energy and prioritize people's health. "The idea of layering city functions vertically, giving people possibility of moving seamlessly in three dimensions to access them is a concept referred to as Zero Gravity Urbanism," he said. According to the design plan revealed on Monday, The Line will have an outer mirror facade that will provide the structure its unique character and allow even its small footprint to blend with nature, while its interior will be built to create "extraordinary experiences and magical moments," the crown prince added. The Line will eventually accommodate 9 million residents and will be built on a footprint of 34 square kilometers, which is unheard of when compared to other cities of similar capacity, according to Monday's statement."* What is interesting is the 34 square kilometres is not a square or rectangle, but a line. The NEOM writes [LINK] "*Only 200 meters wide, but 170 kilometers long and 500 meters above sea level. THE LINE will eventually accommodate 9 million people and will be built on a footprint of just 34 square kilometers. This will mean a reduced infrastructure footprint, creating never-before-seen efficiencies in city functions. The ideal climate all-year-round will ensure that residents can enjoy the surrounding nature. Residents will also have access to all facilities within a five-minute walk, in addition to high-speed rail – with an end-to-end transit of 20 minutes."*

Figure 34: The Line: Revolutionary Urbanism

Source: NEOM

Oil – US still won't walk away from JCPOA even with Iran getting closer to nuclear

US still won't walk away from JCPOA chance

Another week and no change to what will happen to the JCPOA. The US position remains unchanged – they are prepared to go back to the JCPOA with the basic deal that was supposedly agreed to by all a few months ago. And the other key point is that the US is still not prepared to walk away despite it being probably at least five months ago since the US warned time was running out for the JCPOA or else Iran's nuclear program would be too far advanced. Two weeks ago, we noted Iran's stating its advanced on its nuclear capability. And that, even in the face of the Iran update, the Biden Administration maintained its same position on the JCPOA – they aren't walking away, it's in Iran's court, the conditions have been on the table for months for a mutual return to the JCPOA. It seemed like the US ignored the Iran nuclear update. On Thursday (July 28) US State Department spokesperson Price reiterated the US position "*We have made very clear that we are prepared to return to compliance with the JCPOA, assuming that Iran does the same. We have made that clear publicly. We have conveyed that message privately, if indirectly, to the Iranians.*"

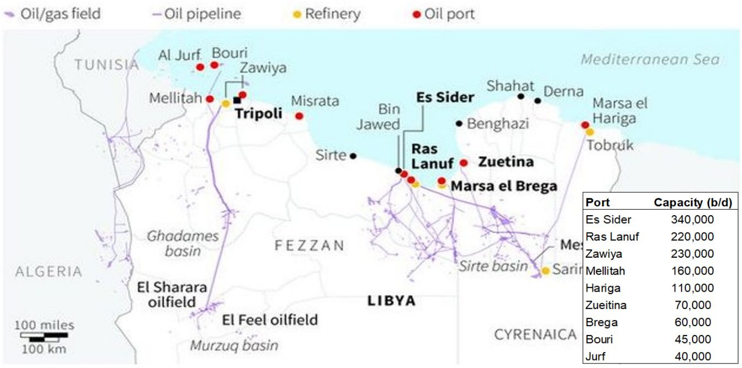
Oil – Libya back to 1.1 mmb/d, stop in fighting for now in Tripoli

Libya at 1.1 mmb/d

There was some good news in Libya on Thursday with what looks to be some sort of temporary end to fighting in and around Tripoli. Asharq Al-Awsat reported [LINK] "*Militias in the Libyan capital Tripoli agreed to end the latest round of fighting to avert another war in the country. Clashes had erupted in recent weeks between militias loyal to the Tripoli-based Government of National Unity, headed by Abdulhamid al-Dbeibah, and others loyal to an east-based administration, headed by former Interior Minister Fathi Bashagha. Osama al-Gweili, former head of military intelligence who is loyal to Bashagha, met on Tuesday with heads of military groups that are loyal to the GNU to ease the tensions. They agreed to withdraw all hardline groups and postpone talk about Bashagha's entry to Tripoli and about whether Dbeibah should remain in his post.*" So good news that there is a truce, the question remains on how long will it last? On Wednesday, Bloomberg reported "*Libya's oil production rose further and is set to return to its normal level of 1.2m b/d 'in days', after fields and exports resumed, according to oil minister Mohamed Oun.*"

Figure 35: Libya Ports, Major oilfields and Terminals map

SAF Group Compiled Libya Ports & Terminals Status



Port	Capacity (b/d)
Es Sider	340,000
Ras Lanuf	220,000
Zawiya	230,000
Mellitah	160,000
Hariga	110,000
Zueitina	70,000
Brega	60,000
Bouri	45,000
Jurf	40,000

Source: Bloomberg, HFI Research, SAF

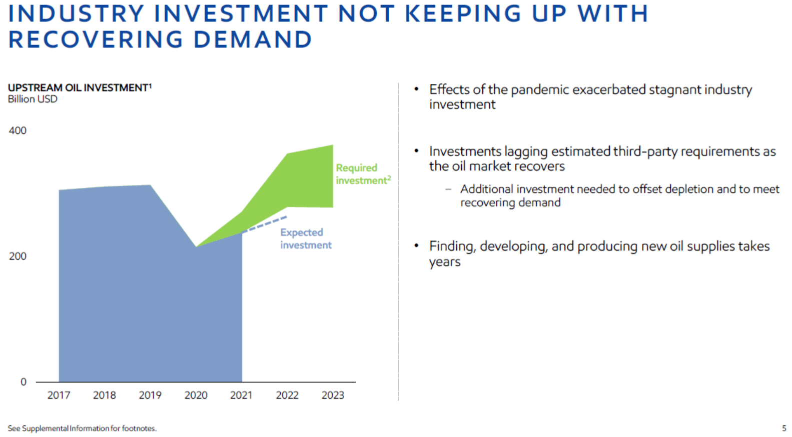
Source: SAF Group

Oil – Exxon reminds existing global oil production supply base declines ~7% per year

Exxon reminds of oil declines

There was a great reminder from Exxon's Q2 call presentation of one of the reasons why oil looks good for the 2020s. Everyone has been made well aware of the underinvestment in the oil and gas sector, whether it be from industry, OPEC countries or pro-climate change agencies like the IEA. But most have overlooked the biggest challenge for the oil sector – the existing production supply base declines every day. This is very bullish for oil in the 2020s. We were reminded of this in the Exxon Q2 call prepared remarks. Exxon posted the remarks shortly before their Q2 call and we tweeted [LINK] "*Bullish for #Oil. #Exxon reminds #Oil #NatGas supply declines at ~7% per year ie. need to replace 7% to stay flat. not a new argument, see 👇SAF 06/20/19 blog ""Exxon's Math Calls For Overall Global Oil Decline Rate of ~7%, A Very Bullish Argument For Post 2020 Oil Prices" #OOTT*." On an existing oil supply base of 100 mmb/d, that is approximately 7 mmb/d of annual declines. Note that Exxon said for oil and natural gas and they have previously suggested the oil decline rate was lower ie. below 6%. So that is 6 mmb/d of declines. Exxon said "*As a depletion business, large annual investments in oil and gas production are needed to offset the decline in supply – roughly a 7% per year reduction. Even more investment is required to grow net production. As the world began to recover from the pandemic, demand for all but jet fuels recovered far faster than the time required to bring on new investments. As a result, the industry hasn't been able to meet the recovery in demand.*" Our Supplemental Documents package includes the Exxon remarks on this oil call.

Figure 36: Industry Investment Not Keeping Up With Recovering Demand

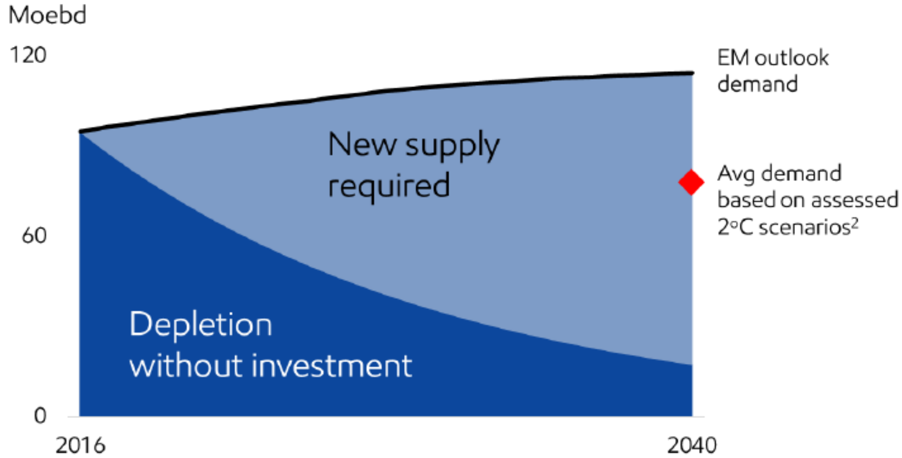


Source: ExxonMobil

Exxon was warning on oil declines before Covid

Our tweet this week reminded that Exxon's warning on global oil decline rates was not new. Rather, they highlighted this pre-Covid in June 2019. And that warning was the reason for our SAF Group June 19, 2019 blog "*Exxon's Math Calls For Overall Global Oil Decline Rate Of ~7%, A Very Bullish Argument For Post 2020 Oil Prices"* [LINK]. Exxon presented at a sellside conference that week and then thought Exxon presented a very bullish argument for oil prices beyond 2020 which was overlooked because most readers only flip thru a slide deck and don't listen to or read transcripts of management's spoken words. Exxon's spoken words highlighted one of the forgotten (and perhaps most important) oil supply/demand concerns for post 2020 – the mid term challenge to replace increasing rate of overall global oil declines. And what was eye opening was Exxon's estimated overall global oil decline rate, which is way higher than any we could then ever remember seeing. Our blog said *"Its impossible to tell from the small oil supply/demand graph in the slide deck, but Exxon's spoken words says long term oil demand is 0.7% per year and then "When you factor in depletion rates, the need for new oil grows at close to 8% per year and new gas at close to 6% per year." Exxon may not specifically say what the global decline rate is, but their math is that the world needs new oil supply to grow annually at close to 8% to meet the 0.7% annual increase in oil demand and offset declines ie. an overall global decline rate of approx. 7%. This is an overall global oil decline rate for OPEC and non-OPEC".* At that time in 2019, BP's estimate of overall global oil decline rate is 4.5% and we expect most are probably assuming something around 5%, certainly not above 6%. No one should be surprised by the increased decline rate given that high decline US shale and tight oil have increased by ~2.5 mmb/d in the last ~2 years. But an implied ~7% overall global oil decline rate is way higher than expectations. There is a big difference between needing to offset oil declines of ~7 mmb/d vs declines of ~4.5 mmb/d ie. an additional 2.5 mmb/d of new oil supply every year. Even if the implied difference was to 6%, it would still be an additional 1.5 mmb/d of new oil supply and that would also be very bullish for post 2020 oil. At that time, we said we recognized that the 2019/2020 oil supply demand story is the need for OPEC+ to keep cuts thru 2020, but Exxon's math implying ~7% overall global oil decline rate sets up a very bullish view for oil post 2020. We believe the reality to replace oil declines post 2020 is overlooked. Our Supplemental Documents package includes June 19, 2019 blog.

Figure 37: Exxon Estimated Oil Supply/Demand, June 2019 slide deck



Source: ExxonMobil June 2019

Oil – Shell sees demand response to high oil prices but not demand "destruction"

Shell bullish view on oil

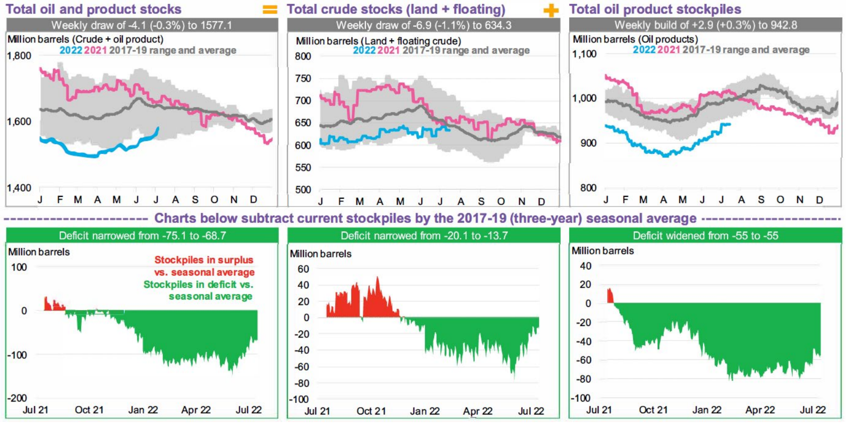
We have been highlighting one of the key overlooked concepts on high oil and gasoline prices and oil demand is that there is a difference between demand "response" and demand "destruction". Before the Shell Q2 earnings call, Shell CEO was on Bloomberg TV and made what we thought were very bullish comments on the outlook for oil. We tweeted [LINK] "*Buckle up! Bullish #Oil. @TomMackenzieTV asks signs of demand destruction? @VanBeurdenShell "see demand RESPONSE.. but demand DESTRUCTION of liquids side, No. because there is very very little elasticity when it comes to that". Much more incl limited OPEC+ spare capacity. #OOTT.'* Van Beurden does not see demand destruction of liquids, but we should note does see demand destruction of natural gas to some degree in Europe. We made a transcript of the key sections [LINK]. At 0:30 min mark, Van Beurden "*Energy markets are tight, and will remain tight and volatile, I think, not only for the remainder of this year but also well into next year*." At 1:55 min mark, re oil prices, Van Beurden "*Let's look at the facts. Demand hasn't fully recovered yet. And supply is definitely tight. There is lot of talk about limited spare capacity in OPEC+ and we subscribe to that theory as well. There is not a lot that can come out of say shales in North America. Of course, the release from the Strategic Petroleum Reserve has helped a bit but listen that's not a price management tool, so there is a limit that can be done there as well. And even thought of course we focus a lot on Russia, as a matter of fact the amount of crude oil coming out of Russia has not really diminished an awful lot. That may still come of course when the sanctions start to bite next year. So I think that where we are today, there is more upside than downside when it comes to the oil price*". At 2:45 min mark, Mackenzie "*are you seeing any signs Ben of demand destruction*?" Van Beurden "*I think you see demand response. What we see for instance, US gasoline demand is down a few percentage points compared to 2019. And of course, we see still a little bit of lagging effect in China because of Covid and the rolling lockdowns. And there are some areas where the recovery has not been complete, like still for instance in aviation. But demand destruction of liquids side, No. Because there is very very little elasticity when it comes to that. On the Gas [Natural Gas] side, that's a different story thought. What I do see in Europe of course with the very very high gas prices we are* *experiencing at the moment, we see a lot of LNG being bid away from Asia into Europe. But of course, there is limited supply coming on extra. There I would see an accelerated transition away from gas into renewables. But that is not something that will happen in a matter of a few quarters, that will take a little bit longer. In the meantime, I think LNG will remain very very buoyant for years to come.*"

Oil – BNEF: global oil stocks deficit narrowed as product stocks remained flat

BNEF's global oil inventories

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 trends were mostly negative for oil this week. The global oil and products stockpile deficit narrowed for crude and products from 75.1 mmb to 68.7 mmb. The stockpile deficit against the five-year average (2015-19) narrowed from 54.8 mmb to 48.0 mmb. Total crude inventories decreased by 1.1% to 634.3 mmb, including global floating inventories. Product stocks were up 0.3% WoW with the stockpile deficit against the 3-year average flat at 55.0 mmb. Gas oil and middle distillate stocks have widened against their three-year average deficit (2017-2019) from 34.1 mmb to 35.3 mmb. Jet fuel consumption by international departures increased by 11,800 b/d WoW while consumption by domestic passenger departures decreased by 14,200 b/d. The global mobility index dropped over the past week, decreasing by 0.8% in the week to July 24. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 38: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Oil – Vortexa crude oil floating storage 78.86 mmb as of July 29, -6.27 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 are compared to the prior weeks Vortexa estimates posted on Bloomberg on July 23 at noon MT. (i) As of Noon MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate as of July 29 was 78.86 mmb, which is -6.27 mmb WoW vs revised up July 22 of 85.13 mmb. Note July 22 of 85.13 mmb was revised +6.19

mmb vs the 78.94 mmb posted on Bloomberg as of noon MT on July 23. (ii) Note that, like seen in last week's data, the last several weeks were all revised up vs the data posted last week. The upward revisions were +6.19 mmb to July 22, +2.28 mmb to July 15, +0.84 mmb to July 8, +3.14 to July 1, +3.26 mmb to June 24, +2.62 mmb to June 17, and +3.11 mmb to June 10. Still the key is that crude oil floating storage has been more +/- 90 mmb instead of the +/- 100 mmb level that was seen two months ago. (iii) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (iv) July 29 estimate of 78.86 mmb is -144.28 mmb vs June 26, 2020 peak of 223.14 mmb. (v) 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 late March/ thru late June 2020 as Covid started to have a huge impact. July 29 estimate of 78.86 mmb is +22.81 mmb vs pre-Covid of 56.05 mmb on July 29, 2019. July 29 estimate of 78.86 mmb is -13.40 mmb YoY vs 92.26 mmb on July 30, 2021. (vi) Below are the last several weeks of estimates made as of today noon MT, July 23 at noon MT, and July 16 at 2pm MT.

Figure 39: Vortexa Floating Storage as of July 29 posted on Bloomberg Noon MT yesterday

Source: Bloomberg, Vortexa

Figure 40: Vortexa Estimates Posted July 30 noon MT, July 23 noon MT, July 16 2pm MT

Posted July 30, noon MT

FZWWFST VTXA Index — 07/28/2019 - 07/29/2022

	Date	Last Px
Fr	07/29/2022	78861
Fr	07/22/2022	85128
Fr	07/15/2022	87534
Fr	07/08/2022	92763
Fr	07/01/2022	95352
Fr	06/24/2022	94533
Fr	06/17/2022	104.531k
Fr	06/10/2022	103.166k
Fr	06/03/2022	85334
Fr	05/27/2022	96018
Fr	05/20/2022	97847

Posted July 23, noon MT

FZWWFST VTXA Index — 07/21/2019 - 07/22/2022

	Date	Last Px
Fr	07/22/2022	78939
Fr	07/15/2022	85254
Fr	07/08/2022	91919
Fr	07/01/2022	92209
Fr	06/24/2022	91266
Fr	06/17/2022	101.914k
Fr	06/10/2022	100.055k
Fr	06/03/2022	85570
Fr	05/27/2022	94962
Fr	05/20/2022	95161
Fr	05/13/2022	108.167k

Posted July 16, 2pm MT

FZWWFST VTXA Index — 07/14/2019 - 07/15/2022

	Date	Last Px
Fr	07/15/2022	78398
Fr	07/08/2022	88687
Fr	07/01/2022	90512
Fr	06/24/2022	87995
Fr	06/17/2022	98441
Fr	06/10/2022	99311
Fr	06/03/2022	88065
Fr	05/27/2022	97476
Fr	05/20/2022	97121
Fr	05/13/2022	111.462k
Fr	05/06/2022	96728

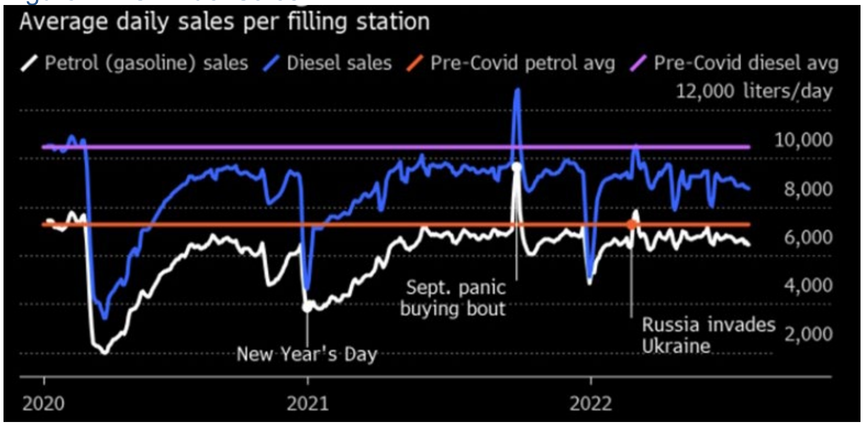
Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: UK continues slow gasoline recovery

Bloomberg's Oil Demand Monitor

We recommend reading the Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The headline this week was that road fuel sales in the UK continue to underwhelm into the summer, while US gasoline demand rebounded as high food and energy retail prices around the world temper consumption. Sales of both diesel and gasoline are drifting further below pre-Covid levels in the UK. The rolling seven-day average of diesel purchases has fallen to 8,761 liters per day per station, 16% below the average for early 2020. However, Bloomberg noted that in the U.S., demand bounced back above 9 mmb/d in the week ended July 22, after sinking as low as 8.06 mmb/d two weeks earlier. American drivers are seeing gasoline prices retreat, with the national average dipping to $4.302/ on July 26, after briefly topping $5 in mid June. In several European countries, where consumption data is so far only available through the month of June, demand was above pre-pandemic levels including Portugal, Italy and France. Indian gasoline demand was also much stronger, up 28% in the first half of July versus 2019 levels. Around the world, city traffic levels show a lack of regular commuters, perhaps due to summer vacations in the Northern Hemisphere. For a third consecutive week, none of the 13 cities regularly tracked in this monitor had congestion above typical 2019 levels. Congestion also eased off in most Chinese cities for a third consecutive week, including Beijing. A seven-day moving average of 15 Chinese cities with the highest number of cars shows congestion was about 1% higher than an early-2021 baseline as of July 25. Air travel data hasn't changed remarkably in the past week, with the main deficit being capacity reductions in China. Globally, the number of commercial flights is about 14% less than the equivalent pre-pandemic date in 2019. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 41: UK Fuel Sales



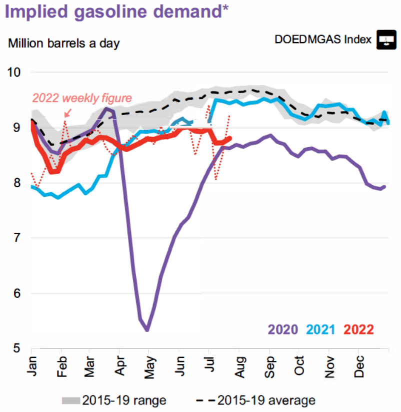
Source: Bloomberg

Oil – BNEF: US gasoline and jet fuel demand show signs of rebound

US oil indicators weekly

There was a good reminder of demand response vs demand destruction in the face of high gasoline prices. In the US case, it looks like it has been demand response. For the prior weeks (as US gas prices went above $5), the headlines were clear that the combined impact of very high food and gasoline prices were forcing many Americans to change what they expect to do post the summer boom. However, this week saw the rebound of gasoline demand amid falling pump prices. On Thursday, we tweeted [LINK] *"Reminder #Oil demand "response" is different than demand "destruction" from high oil prices. Response comes back quickly. See 👇 @BloombergNEF Danny Adkins highlights US #Gasoline demand rebounded sharply following easing pump prices in recent weeks. #OOTT"*. BloombergNEF's U.S. Oil Indicators Weekly report showed stark reversal from the previous two weeks on multiple fronts. BNEF had a couple of key messages. "*Gasoline demand rebounded sharply from its sharp plunge earlier this month to hit a new high on the year, coinciding with the biggest weekly decline in pump prices since 2008."* And "*Jet fuel demand also showed a promising rebound after a recent lull, surging back to 90% of 2019 levels – a mark it has failed to break through this year*". Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 42: Implied US gasoline demand



Source: BloombergNEF

Oil – Demand response, 64% of U.S. adults have changed driving habits since March

AAA driving survey data

Earlier we noted the Shell CEO highlighting the difference between demand "response" and demand "destruction" in reaction to high oil/gasoline prices. We put this in the category of demand response and not demand destruction. High gasoline prices have started to impact the driving habits of Americans. On Tuesday, AAA released their new gas survey data examining the changes Americans are making in response to record pump prices [LINK]. The survey found that drivers are making significant changes to cope with record pump prices. Almost two-thirds (64%) of U.S. adults have changed their driving habits or lifestyle since March, with 23% making "major changes." Drivers' top three changes to offset high gas prices are driving less, combining errands, and reducing shopping or dining out. The survey was conducted June 23-27, when US gas prices were right around $5/gallon. More changes are highlighted in the table below, including postponing vacations and putting aside less money to savings. Our Supplemental Documents package includes the AAA release.

Figure 43: Lifestyle Changes in Response to High Pump Prices

In Response to Gas Price Increases, Consumers Are Most Likely to Drive Less, Combine Errands, and Reduce Shopping or Dining Out	
The 64% of Americans Who Reported Making Changes Adapted Their Driving or Lifestyle in the Following Ways *(Multiple responses possible)*	Have Made Changes Already
Drive less	88%
Combine errands	74%
Reduce shopping or dining out	56%
Delay major purchases	30%
Postpone vacations this year	29%
Put aside less money for savings	24%
Carpool	16%
Drive a more fuel-efficient vehicle	13%
Use public transportation more regularly	5%
Switch to an electric vehicle	2%
Something else	5%

Source: AAA

Oil – Looks like Heathrow passenger cap is having an impact on jet fuel consumption

Heathrow dropped to #2 busiest airport

On Tuesday, Heathrow Airport CEO John Holland-Kaye was in the news following the release of Heathrow's H1/22 results. And it looks like the recent July 1 passenger cap at Heathrow is having an impact on jet fuel consumption. We tweeted [LINK] "*Looks like @HeathrowAirport passenger cap is having an impact on expected #JetFuel consumption. July Dubai +13.9% seats vs Heathrow. June Heathrow +1.1% seats vs Dubai. CEO expects 12-18 mths until back to full capacity. #OOTT.*" Heathrow capped passengers starting July 1, which basically cut ~4% from the expected July/Aug passenger volumes. Heathrow recently extended a passenger cap into October. On Tuesday, reported its H1/22 results that highlighted the ground handlers as the key shortage driving the passenger cap and ground handlers are at only 70% of pre-Covid numbers. We created a transcript of Holand-Kaye's comments on LBC [LINK]. Holland-Kaye "… *sadly we have seen the ground handlers have not hired anyone in the last six months*" "*this is the airlines choice on who they have as ground handlers. We have eight main ground handlers across the airport. They aren't hiring enough people ….. as the airlines recruit more ground handlers, we'll be able to increase the cap back to full capacity. But I think that's going to take 12 to 18 months before we get to full capacity*." Our tweet noted seat data and why it would point to Heathrow using some lesser amount of jet fuel than it expected. Unfortunately, we couldn't find up to date flight miles data for July vs June. But the seat data is interesting. The Heathrow cap announcement noted the impact would be 4% less passengers. Using the OAG data, Heathrow was #2 in terms of # of seats in July but was #1 in June. It's impossible to tell exactly what the impact on jet fuel, but it would seem to imply that jet fuel demand out of Heathrow would be probably be a least 4% less than might have been expected this summer and thru year end. Heathrow was +1.0% more seats than Dubai in June. But in Dubai is 13.9% more seats than Heathrow in July.

Figure 44: Ten Busiest International Airports by Seats

Top 10 Busiest International Airports by Seats

Calculated using international frequency only

2022 Ranking	Airport Code	Airport Name	Seats (Total)	201
1	DXB	Dubai International	4,092,656	1
2	LHR	London Heathrow Apt	3,591,861	2
3	AMS	Amsterdam	3,152,556	5
4	CDG	Paris Charles de Gaulle Apt	3,106,586	4
5	FRA	Frankfurt International Apt	3,003,783	6
6	IST	Istanbul Airport	2,853,937	9
7	DOH	Doha	2,188,218	15
8	SIN	Singapore Changi Apt	2,031,535	8
9	MAD	Madrid Adolfo Suarez-Barajas Apt	2,023,395	13
10	LGW	London Gatwick Apt	2,020,828	12

Source: OAG

OAG

Source: OAG

Oil & Natural Gas – sector/play/market insights from Q2 calls

Sector insights from Q2 calls

It was the first busy week of Q2 reporting and the upcoming week should be the peak week. As usual, the oil and gas services companies and integrated oil companies are first to report and we typically get some of the best macro insights from the services, pipelines, refineries and utilities. This is our favorite time each time of each quarter as it is quarterly reporting and this is when we get the best insights into a range of oil and gas themes/trends, sectors and plays. 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, 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

Liberty Energy – Very tight US market for services

Liberty Energy, a frac company, held its Q2 call today. (i) Liberty, like the other service companies, is warning on the tight services market and how the high-end equipment is in short supply and expected to be in short supply for some time to come. The message reiterates that service sector capacity is the biggest risk to the growth forecasts in the US. (ii) On Liberty's observations from customers bidding, they are modeling flattish demand for frac spreads at the end of 2022 and slow creep upwards. (iii) Another key message from mgmt. was that the frac market is near full utilization. Mgmt said "*the frac market is near full utilization at few service providers have the fleet capacity and supply chain reach to satisfy E&P operators goals.*" (iv) Mgmt. went on to highlight the unavailability of new equipment, stating "*next generation equipment is in short supply and will remain so for the foreseeable future to maintain development program produce are seeking a frac crew are willing to take equipment available to support their operations in the near term.*" They went on to say that there is also very little new equipment being built as companies learn from the burden of overbuilding and redeploying idle equipment from the past. (iv) On the tightness of the labor markets, mgmt. said "*Yeah. Labor markets remain tight, I would say you're seeing them a few more people coming back into the labor force so incrementally better than it was six months ago, but still a very tight labor market nothing like we've seen in the last 10 or 12 years.*" (v) Liberty sees similar US oil growth in 2023 of about 1 mmb/d, but are more cautious on natural gas growth. In the Q&A, mgmt. replied "*drive intraday modest growth in both US oil and natural gas production. I think we've said in the beginning of this year we expected 700,000 or 800,000 exit over exit oil production growth this year. I think that's a reasonable estimate we might be a bit above that, but we might be a bit below that. I think that's a reasonable pace at which we're running right now and if you keep going at the current rate we would see a similar growth rate next year. So I think you'll see, again, probably a little million barrels a day of US EksoWorks rate oil production growth this year probably on track to see a similar level next year. Now, while they have gone that but 500 to a million barrels a day of exit over exit growth rate next year probably. And continued you know -- even more cautious here natural gas is growing and group production rate will grow. But again also at a modest rate and its current activities next year's plans, I think it continues to grow next year at a modest rate.*" (vi) Liberty CEO Chris Wright has before warned about the lack of oil and gas and does so again in this call. Note his closing sentence in the section. Wright said "*The world is gripped today by serious energy and food crisis that is of our own making it is not in fact due to any shortage of available resources. It is due entirely to investment decisions and a growing very added barriers to investment in hydrocarbons. The very hydrocarbons without which the modern world. It's simply not possible. It is admirable that the public regulators in our industry our team to improve the quality and cleanliness of our activities. It is not admirable that so many are mostly driven fact free impediments to investment have come from government regulations and geo will engagement and Wall Street to often equating lower Greenhouse gas with better in all cases the blame for the current energy crisis also falls on our industry for too often compliant going along with the endless anti-hydrocarbon fashion of today. If it is not for us to speak candidly honestly and loudly about the critical role hydrocarbons play in the modern world and most critically for those desiring simply to join the modern world then who else will play this role, certainly it is not been political leaders, activities, academics or celebrities it is us that must carry that torch. Otherwise the immense human damage we see today from the lack of investment in hydrocarbon production and hydrocarbon infrastructure will be only the beginning.*" Our Supplemental Documents package includes excerpts from the Liberty Q2 call transcript.

Precision Drilling – Continued strong demand for drilling

Precision held its Q2 call on Thursday. (i) The call highlighted that drilling is picking up in many areas in Canada. We shouldn't be surprised with high oil and natural gas prices. Mgmt said "*Currently, we are operating 61 rigs in visibility to over 70 rigs for this quarter. I previously mentioned the Clearwater play, which emerged late last year but we are seeing a strong rebound in conventional heavy oil, safety and strengthening activity and most other oil and gas regions in Canada. The Precision Super Single rig is a regulatory sequential heavy oil safety in the Clearwater region, and we expect our utilization to exceed 80% with leading-edge rates progressing into* *a low 20s for this highly cost-effective (Inaudible). In the Montney deep basin, gas liquids activity remains strong. permitting delays in British Columbia have led to several operators diverting activity to Alberta and the min term.*" (ii) Mgmt highlighted that customer demand remains strong. Mgmt said "*Customer demand remains strong and leading-edge day rates are approaching the mid-US$30,000s.*" Super triples are also fully booked in Canada. Furthermore, on demand in Canada, mgmt stated "*This is the highest activity level since 2014 and highest average second quarter day rates in a decade. We currently have 61 rigs active and expect activity in both the third and fourth quarters to exceed the first quarter as our customers remain committed to their drilling plans, particularly in the Montney, conventional heavy oil, and Clearwater plays.*" (iii) Customers are seeking longer term commitments with rising concerns about high-specification rig availability. Mgmt said "*since the beginning of the second quarter we have signed 18 new term contracts at leading-edge day rates, including five contracts for two years or longer.*" (iv) On labor shortages, mgmt stated "*the shortage of skilled labor is stressing all parts of our economy and oil service sector is not immune*". (v) Rather than doing new builds, Precision is seeing its competitors focus on upgrades. In the Q&A mgmt. said "*So I just -- I don't see new builds on the horizon. I do see potential for these moderately costed upgrades. And in a world where you can get this $36,000 or $38,000 a day for a rig, which if it's drilling wells in 10 days, that's really not a big incremental cost on the well, I think we have another 12 to 15 rigs we can bring into play next year.*" (vi) Precision is expecting publics to pick up rig activity in the US. In the Q&A, mgmt. said "*We do see public E&Ps looking to start to focus on recovering and rebuilding or balancing their completions with their drilling. So I think we'll see a few rigs are to creep back in through public drillers that are public E&Ps that need to start to rebuild their inventory of declining decks[ph]. So I'd say it's really or weighted looking forward and more public weighted looking forward.*" Our Supplemental Documents package includes excerpts from the Precision Q2 call transcript.

Trican – Very tight US market for services

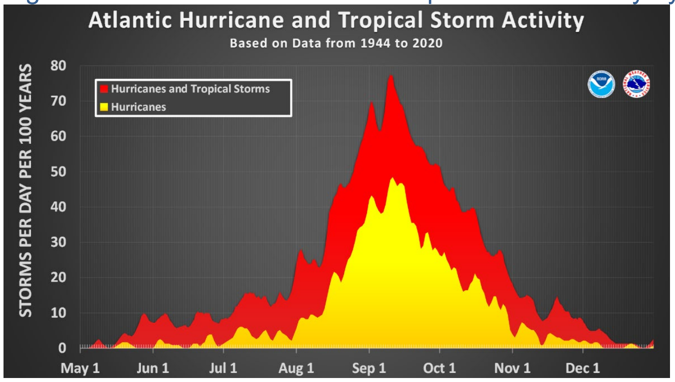
Trican held its Q2 call on Thursday. (i) Trican noted that spring break up activity is higher not just from weather but better planning. Something to keep in mind for future years is that the industry is able to do more during spring break up apart from the weather. Trican noted they had "*relatively favorable weather conditions throughout which allowed our customers to work effectively through their programs, resulting in a somewhat more muted spring break up than many prior years*". But mgmt. also said "*but fortunately it appears that the trend now is for a busier breakups than historically we've experienced and I think it's just a combination of better planning and logistics with respect to multi-well paths which allows more work to continue on through the quarter.*" (ii) July will be busy as they make up for delayed work due to heavy rains in June. Mgmt stated "*So the Q2 the quarter overall was very good we did have some relatively significant project delays though heavy rains in June pushed a fair bit of our work out of unit into Q3.*" (iii) Cost escalations was another important point of discussion from the Trican call. Mgmt said "*we continued to see costs escalations and Q2 preliminary -- primarily driven by increased diesel costs and as everybody knows diesel, prices affect almost everything in all aspects of our business, including, products third-party trucking just day-to-day life requires a lot* *of hard to carbons to make it go around. We continue to see fuel surcharges on rails, which are significant in this obviously impacts our costs on sand and Chemicals.*" (iv) Mgmt also noted that they are fully booked in Q3, and Q4 is quickly booking up. On Wednesday, we tweeted [LINK] *"#Oil #NatGas services are tapped out. "frack cement crews perspective, we think the basin will very soon be approaching capacity" "sand mines & the rail is operating basically at capacity" says #Trican on Q2 call. #OOTT"*. Mgmt said "*when we look at Q3 and Q4 we expect a second half of the year to be quite busy as commodity prices remain high. Our third quarter is fully booked and our Q4 is quickly booking up and typically at this time of year we have fairly good visibility leading up to Christmas and from everything that's on the Board today, the second half of this year's going to be as should be really busy and which should be a great year. We did, we're very happy with our start to the quarter, we're very busy, July should be a great month. We've got a really good activity in the field, the weather's cleared up, and I think we're up and running quite efficient.*" On fracking cement crews, mgmt stated "*we think the basin will very soon be approaching capacity and it should stay a capacity for the remainder of the year in the coil market we're, I think we're already there.*" (v) The sand supply chain is also stressed. Mgmt said "*And, even though the inflation is, I think the rate of change of inflation slowing, we're still our supply chain is still stressed particularly in sand[ph], we think the sand mines and the rail is operating basically at capacity and we do expect some temporary and shortages to occur in the second half of 2022.*" Our Supplemental Documents package includes excerpts from the Trican Q2 call transcript.

Oil & Natural Gas – Atlantic hurricane activity ramps normally in mid-Aug

Atlantic hurricane seasonality

It's been really quiet on the Atlantic hurricane season front despite all forecast calling for above normal hurricane activity this year. But the lack of activity to date isn't unusual, There can always be hurricane activity at any time of the season. But, as a norm, it's still only July 10 and, normally, hurricane and tropical storm activity starts to ramp up in mid August to a peak in mid September and continuing active thru mid October. Below is NOAA's graph showing the distribution of Atlantic hurricanes and tropical storms based on data from 1944 to 2020. [LINK]

Figure 45: Atlantic hurricane and tropical storm activity by month



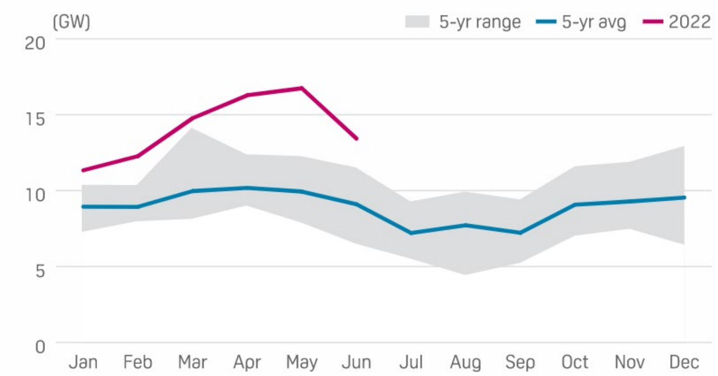
Source: NOAA

Energy Transition – Texas wind generation typically wanes in JAS

Texas wind power risk

There was a good reminder this week on two key elements of Texas wind power generation – it's up big YoY and the summer is the seasonally low period for wind generation. On Tuesday, we tweeted [LINK] "*Texas #Wind generation up big in 2022, however, average wind output tends to wane from June thru Sept. and risk increases for sufficient wind power to be unavailable during certain peak hours in Aug & Sept. Great reminder from @SPGlobalPlatts Mark Watson. #NatGas #OOTT".* There has to be some sort of power that can come to the rescue with the unpredictability of wind power. In Texas' case, it would be natural gas. Platts posted the report "*As Texas heat persists, ERCOT forwards indicate risk of triple-digit power prices*" [LINK]. Platts included the key graph below of average hourly wind output in 2022 compared to 5-year historical output. Our Supplemental Documents package includes the Platts report.

Figure 46: ERCOT Average Hourly Wind Output



Source: ERCOT

Energy Transition – Hawaii ending coal power, electricity prices going up

Hawaii ending coal power

On Thursday, Hawaii Governor Ige tweeted [LINK] "T*his week Hawai'i is receiving its final shipment of coal. This is a huge step forward in Hawai'i's transition to clean energy. In its time, coal was an important resource for Hawaii and I'd like to thank the workers who have run our last remaining coal plant*." Gov Ige highlighted that this is the beginning of the end of coal power generation on Oahu. What Gov Ige didn't remind is that electricity prices are going up after this last shipment of coal. KHON2 report [LINK] "*Hawaii gets last shipment of coal: Expect to pay more*" wrote "*As KHON2's Always Investigating reports, replacement power projects are behind schedule due to unexpected global events with supply chain issues, so Oahu residents should prepare to pay even more for electricity this fall. In the meantime, consumers can either cut back on power, try solar and batteries, or pay more for oil-generated power — which costs as much as five times more than coal. Hawaii is the most expensive state for energy costs The Kapolei plant has been Oahu's largest single generator for three decades, meeting about 16% of the island's peak electricity demand. Its closure on Sept. 1 means eliminating 180 megawatts of power, or about one-tenth of what Oahu needs."* Our Supplemental Documents package includes the KHON2 report.

Capital Markets – IFIC: Mutual funds and ETF assets -7.1% in June

Mutual Fund & ETF assets decrease MoM

On Tuesday, the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for June. IFIC does not provide any commentary on the numbers but there should be no surprise that the assets are down. Market price decreases accounted for majority of the overall decrease in net assets.-* For June, the IFIC reported "*Mutual fund assets totalled $1.788 trillion at the end of June 2022. Assets decreased by $107.0 billion or 5.6% compared to May 2022. Mutual funds recorded net redemptions of $10.4 billion in June 2022. ETF assets totalled $288.9 billion at the end of June 2022. Assets decreased by $22.0 billion or 7.1% compared to May 2022. ETFs recorded net redemptions of $0.7 billion in June 2022."* Our Supplemental Documents package includes the IFIC release.

Capital Markets – USDA consumer price index for food +10.4% YoY

USDA consumer price index for food

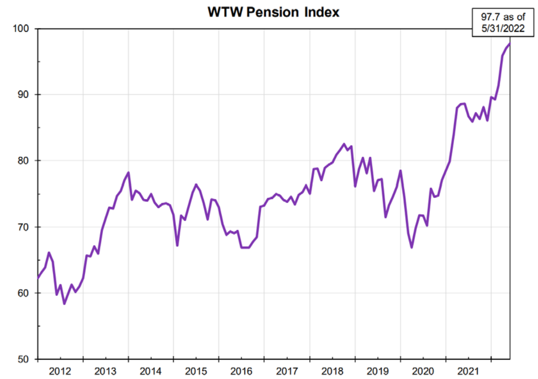
The USDA's official food price data keeps going up, but we continue to believe it is nowhere as much as what Americans feel when they go to the grocery stores in the US. This feels like what we heard last summer about inflation being transitory, the real food price increases are way higher than per government data. The USDA posted its consumer price index for food data for June on Monday [LINK], which is +1.0% MoM and +10.4 % YoY, compared to May at +10.1% ; while it is up over 10%, it still seems low given the rapidly increasing grocery bills being reported. This is for the overall food price index, which weights various changes like beef/veal +4.1% YoY, pork +9.0%, eggs +33.1% with changes like fresh vegetables +6.5% YoY, dairy products +13.5% YoY and cereals & bakery products +13.8% YoY. We also just don't see how the USDA won't be low in their 2022 forecast which predicts price escalation between 5.0-6.0% throughout the year.

Capital Markets – WTW, pensions are stronger with higher discount rate on liabilities

WTW Pension Finance Watch

On Tuesday, WTW (formerly known as Willis Towers Watson) posted its Pension Finance Watch Second Quarter 2022 [LINK], which highlighted a lot of the same key messages as last month's report, except it was a recap of the quarter. It reminded that the math involved in assessing the strength/security of a pension is what input variables are used. Our May 8, 2022 energy tidbits memo, said "*Some might think with markets and returns down in 2022, the strength of a pension is probably less than it was at year end 2021. But that is not the case. The reason is that higher long term interest rates increase the discount rate to value the pension liabilities over time. And this higher discount rate more than offsets the negative returns in 2022. The math makes sense, it just feels like kicking the can down the road. But it reminds that it is important to look at what discount rates are used.*" It was essentially the same story for Q2/22. WTW stated *"Q2 2022 was another volatile quarter, marked by rapidly rising global discount rates, poor asset performance across the globe, and continued inflationary pressures. The sharp increase in discount rates drove positive second quarter pension index results for most regions. Asset returns were negative for all regions for the quarter which notably offset the liability gains. While inflationary pressures generally continued, the market with the strongest link of pensions to inflation, the United Kingdom, has lower inflation than last quarter. The overall impact of these changes resulted in positive pension index returns for all markets during Q2 apart from Brazil and the U.S. where the negative asset returns were greater than the liability gains. In addition, multinational* *companies are facing shifts in exchange rates, with a notable strengthening of the U.S. Dollar."*

Figure 47: WTW Pension Index



Source: Willis Towers Watson

Capital Markets – Minnesota Vikings GM approach are good lessons to analysts

Vikings GM insights

It always amazes how many of the sports minds approaches are relevant to business and in particular being an energy analyst or investor. The first impression from reading a great US Today interview this week with new Minnesota Vikings GM Kwesi Adofo-Mensah [LINK] was that a lot of his views are good for analysts and investors. Here are a few of the NFL football approaches that apply to being an energy analyst. Adofo-Mensah said *"There is a threshold of championship talent," and "I study these things. I know them. And if you don't have them, you don't win. That's very binary. "The way you can screw up in this job is deceiving yourself that you're there."* That's a great reminder to never fool yourself into thinking you know it all. We have all seen many people who thought they made it to the top but then to flame out. Adofo-Mensah said. "*I don't believe that I can pick the next Pat Mahomes that much better than anybody. If you give me five chances, I think we'd be better and we'd get four out of five rather than (others') three out of five. But one shot, your odds are at best 65%, so they study this*." It reminds of seeing people happy to do what pack does and then those who are always trying to do more than the pack to outperform. Adofo-Mensah said ""*Sometimes information comes as numbers and it's really great, and sometimes they come as scouts reading reports and that's great too," "So I think my best skill set is my ability to be multilingual and speak all of those languages*." This reminded what we like earnings call, in particular Q&A. Yes there is data in the disclosed Q2 report or slide deck, but the verbal comments, especially the Q&A, always provide that extra insight to help form a better picture. US Today wrote "*Adofo-Mensah considers systems thinking about the "interconnectedness" of football in hopes of determining ways the offense can cut one negative run per game and one third-and-10; ways the defense can forfeit one fewer explosive play and get off the field with one more contained drive before halftime."* This is a great reminder to try to bring more than just a narrow focus to looking at energy or stocks. Our Supplemental Documents package includes the US Today report.

Demographics – High prices/mortgage rates force record homebuyer relocation

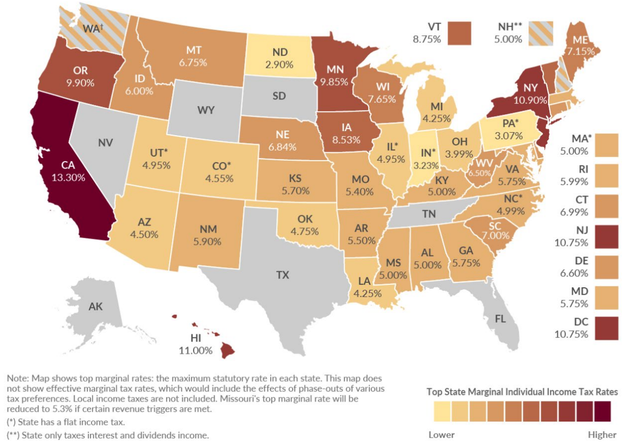
Homebuyers seek less expensive locales

The rate of homebuyer relocation in the US is increasing as the surging cost of housing and other goods is limiting American's ability to buy homes in many cities. Redfin released an article last week [LINK] which reported "*A record 32.6% of Redfin.com users nationwide looked to move from one metro to another in the second quarter, up slightly from 32.3% in the first quarter and roughly 26% before the pandemic.*" While the housing market has slowed due to rising mortgage rates, high home prices, inflation and a faltering economy, those who can still afford to buy continue to relocate at unprecedented levels. Surging housing costs are putting more expensive cities out of financial reach, making more affordable locales such as Tampa and San Antonio more attractive. Redfin Deputy Chief Economist stated "*Those factors, along with more companies giving employees the permanent flexibility to work remotely, are driving a larger portion of buyers to consider homes in other parts of the country. Someone who would have to stretch beyond their budget in Los Angeles may be able to comfortably afford a home in Phoenix or San Antonio.*" They went on to highlight the continued popularity of Sun Belt metros for relocators. Migration into Florida continues to pick up, as people from New York and Chicago relocate to the warmer state where they can get more for their money. Redfin highlighted that increasing home prices in Phoenix, Sacramento, Las Vegas and Dallas has caused net inflow to slow down from last year.

Surprised they didn't mention lower state income taxes

There is no doubt weather and housing prices are huge factors, but lower taxes are another key factor driving Americans moves within the US. We are surprised that this was not mentioned in the Redfin article. There is a clear correlation between low tax rates and high inbound migration in these states, especially for income tax rates. Below is the Tax Foundation graphic comparing state income tax rates in the US.

Figure 48: State Individual Income Tax Rates and Brackets 2022



Source: Tax Foundation

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

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.

@Energy_Tidbits on Twitter

LinkedIn – Look for quick energy items from me 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].

Look for energy items on LinkedIn

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.

In the hunt today, Leblanc for 1st LPGA win and Pendrith for 1st PGA win

It was a good day yesterday to be grinding on the Energy Tidbits memo as I had golf on all day so could watch Maude-Aimee Leblanc shoot a 6 under 66 to enter today's Scottish Open T3, one shot behind the leaders. As of our news cut off at 7am MT, Leblanc has played steady but is even par thru 8 at -14 so has lost ground and is T6, but 4 shots behind Celine Boutiers. On the PGA tour, Taylor Pendrith shot a 6 under 66 to enter today's final round of the Rocket Mortgage T1 with Ton Finau. The Rocket Mortgage coverage was excellent as they showed every Pendrith shot. Leblanc had pretty good coverage with most of her shots shown on TV. Both are still looking for their first tour victories.

Easier to bring your dog to a restaurant patio in Alberta

Good news for those who don't want to leave their dogs alone at home while they go out for a bite to eat or a couple of drinks. Was surprised to see a couple of tables on a lunch patio in Canmore where the people were accompanied by their dogs quietly lying on the floor by their table. We asked the waitress about it and she said Alberta recently passed a new law that didn't make a restaurant get a special license to allow dogs on their patio. It turns out that, on May 26, 2022, Alberta announced [LINK] "*Making it easier to offer dog-friendly patios. Restaurants, bars and coffee shops can now welcome customers' dogs on their patios without approval from Alberta Health Services.*" The only caveat is that you have to be able access the patio without going thru any indoor areas. Alberta wrote "*Non-service dogs are allowed on patios only and must not pass through any indoor food handling areas, such as dining and food preparation areas. Customers must keep their dogs on a leash or in a carrier and have physical control of the dog at all times.*"

Sprite moving green to clear bottles for more recycling opportunities
On Wednesday, The Coca-Cola Company announced [LINK] that, beginning Aug 1, it will no longer be packaging Sprite in its signature green color bottle and will move to a clear color bottle. Coca-Coal said "*Sprite, meanwhile, is shifting all of plastic PET packaging from its signature green color to clear, beginning Aug. 1. Although green PET is recyclable, the recycled material is more often converted into single-use items like clothing and carpeting that cannot be recycled into new PET bottles. During the sorting process, green and other colored PET is separated from clear material to avoid discoloring recycled food-grade packaging required to make new PET bottles. "Taking colors out of bottles improves the quality of the recycled material," said Julian Ochoa, CEO, R3CYCLE, which is working with Coca-Cola Consolidated to enable bottle-to-bottle recycling across the largest U.S. bottler's 14 state-territory*. "

Figure 49: Sprite replacing iconic green bottle with clear

Source: Coca-Cola

MBS didn't stay in hotel in France, check out his chateau
Normally when we someone like Saudi crown prince MBS travel, we inevitably hear reports on how he will take the penthouse floor and the floor before in some luxury hotel. But that wasn't the case for his trip to France to meet with Macron. Rather, he stayed in his reported Chateau Louis XIV, which MBS reportedly bought in 2015 for $301 milllion. In a touch of irony, the Chateau was built by property development company, COGEMAD, owned by Emad Khashoggi, a cousin of Jamal Khashoggi. The Chateau reportedly as 53,800 square feet of living space surrounded by moats on a 57-acre walled site. And the land was once part of the Versailles estate. Below are a couple of pictures from the COGEMAD website. [LINK]

Figure 50: MBS's Chateau Louis XIV

Source: COGEMAD