Energy Tidbits

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Bullish For LNG: Russia Confirms Arctic LNG-2 is Nowhere Near Timing to Add 0.87 bcf/d in Each of 2023, 2024 & 2025

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. TASS's reported timing at the under construction Arctic LNG-2 is nowhere near the plan to add 0.87 bcf/d in each of 2023, 2024 and 2025 [LINK]

2. Freeport LNG expects to return to ~2 bcf/d in early Oct ie. almost 100% capacity [LINK]

3. JCPOA discussions resume with reports of progress on a couple of key issues [LINK]

4. OPEC+ warns of "*the severely limited availability of excess capacity*" [LINK]

5. OPEC+ warns on insufficient investment "will impact the availability of adequate supply in a timely manner to meet growing demand beyond 2023" from OPEC+ and other countries [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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Natural Gas – Natural gas injection of +41 bcf, storage now -268 bcf YoY deficit

YoY storage at -268 bcf YoY deficit

The YoY storage deficit started the winter at -282 bcf YoY at Oct 31 and is now -268 bcf YoY. The EIA reported a +41 bcf build (+30 bcf expectations) for the July 29 week, which was above the 5-yr average build of +33 bcf, and above last year's injection of +13 bcf. Storage is 2.457 tcf as of July 29, decreasing the YoY deficit to -268 bcf vs -293 bcf last week and is -337 bcf below the 5-year average vs -345 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (07/29/21)		5-year average (2017-21)	
Region	07/29/22	07/22/22	net change	implied flow	Bcf	% change	Bcf	% change
East	549	532	17	17	601	-8.7	626	-12.3
Midwest	643	625	18	18	717	-10.3	709	-9.3
Mountain	147	144	3	3	184	-20.1	178	-17.4
Pacific	253	253	0	0	244	3.7	273	-7.3
South Central	865	862	3	3	979	-11.6	1,007	-14.1
Salt	195	195	0	0	253	-22.9	263	-25.9
Nonsalt	671	667	4	4	726	-7.6	744	-9.8
Total	2,457	2,416	41	41	2,725	-9.8	2,794	-12.1

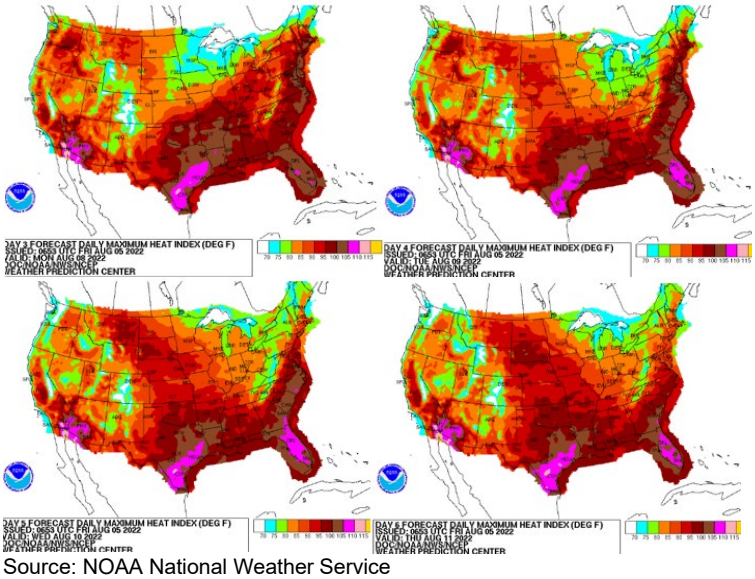
Source: EIA

Natural Gas – Continues to be mostly warm in US

Cooler, but still warm this week

The story in the US continues was a very hot July. It was also a hot start to Aug, but, this week looks to be cooler but still a little warmer than normal. 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 8 thru Thurs Aug 11. [LINK]

Figure 2: Maximum heat index maps for Monday thru Thursday



Source: NOAA National Weather Service

Natural Gas – AccuWeather also forecasts a warm start to winter natural gas season

Warm start to winter

We are using the term winter as we are talking about the start of winter natural gas season on Nov 1, whereas the weather forecasters will include November in their term "fall". On Wednesday, AccuWeather posted its "The fall forecast is in, and it's going to be a warm one". [LINK]. AccuWeather's fall forecast is for Sept/Oct/Nov as it says "*Meteorological autumn officially kicks off on Thursday, Sept. 1, and continues through Wednesday, Nov. 30. This is consistent year after year, making it easier for scientists to compare one season to another.*" AccuWeather writes "*After combining the forecasting ingredients, the team has boiled down the seasonal outlook into one word: warm.*" AccuWeather forecast is much in line with the recent NOAA seasonal outlook (see our July 24, 2022 Energy Tidbits). AccuWeather forecasts a warmer than normal September. AccuWeather didn't provide any specific commentary on November temperatures, but included the below map to go along with their it will be warm commentary.

Figure 3: 2022 Fall Highlights

Source: AccuWeather

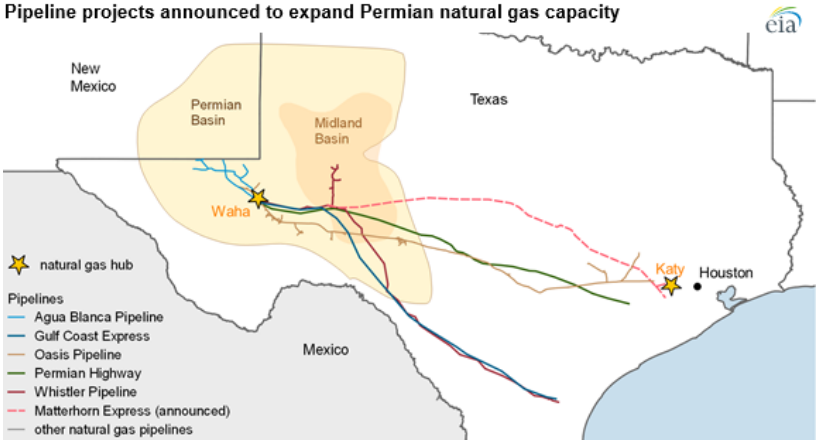
Natural Gas – EIA recaps 5 projects to add 4.18 bcf/d of Permian natural gas takeaway

More Permian natural gas pipeline capacity

We recommend adding the EIA's Thursday blog *"Pipeline projects announced to expand Permian natural gas capacity*" [LINK] to reference libraries. It's a good jumping off point for the expected increase of natural gas takeaway capacity from the Permian of 4.18 bcf/d over the next two years. The EIA writes "*Our latest Natural Gas Pipeline Project Tracker includes five new projects—four newly announced projects and one project under construction—since the last update in April 2022. Of the four new projects, three will expand capacity for existing pipelines, and one will be a new pipeline. If completed as planned, these five projects together would increase takeaway capacity out of the Permian Basin by a combined 4.18 billion cubic feet per day (Bcf/d) over the next two years."* The four newly announced projects include (a) three capacity expansion projects. Gulf Coast Express Pipeline expansion increasing capacity by 0.57 to 2.55 bcf/d with targeted in service Dec 2023. Permian Highway Pipeline Expansion increasing capacity by 0.55 bcf/d to 2.65 bcf/d with targeted in service Nov 2023. Whistler Pipeline Capacity Expansion increasing capacity by 0.5 bcf/d to 2.5 bcf/d

with targeted in service Sept 2023. (b) One new pipeline, the Matterhorn Express Pipeline to have capacity up to 2.5 bcf/d with targeted in service in Q3/2024. In addition, the EIA noted the one project under construction – the Oasis Pipeline Modernization Project to provide an additional 0.06 bcf/d of Permian Basin takeaway. Our Supplemental Documents package the EIA blog.

Figure 4: Permian Natural Gas Pipeline Projects



Source: EIA

Freeport LNG update

Natural Gas – Freeport believes it can get to 2 bcf/d in early Oct

Freeport surprised the market on Wednesday with their expectation they will get back to almost 100% capacity in early October. Freeport LNG has entered into a consent agreement with the Pipeline Hazardous Materials Safety Administration (PHMSA) with the intentions of resuming LNG production in early October. On Wednesday, we tweeted [LINK] *"Positive for HH #NatGas price and for EU urgency for #LNG to replace RUS gas supply. #FreeportLNG consent agreement with @PHMSA_DOT. Freeport believes can resume initial operations in early Oct, importantly with delivery ~2 bcf/d, basically at normal volumes! #OOTT"*. Freeport stated "*Freeport LNG continues to believe that it can complete the necessary corrective measures, along with the applicable repair and restoration activities, in order to resume initial operations in early October. Those initial operations are expected to consist of three liquefaction trains, two LNG storage tanks and one LNG loading dock, which the company believes will enable delivery of approximately 2 BCF per day of LNG, enough to support its existing long-term customer agreements."* Our Supplemental Documents package includes from the Freeport LNG release.

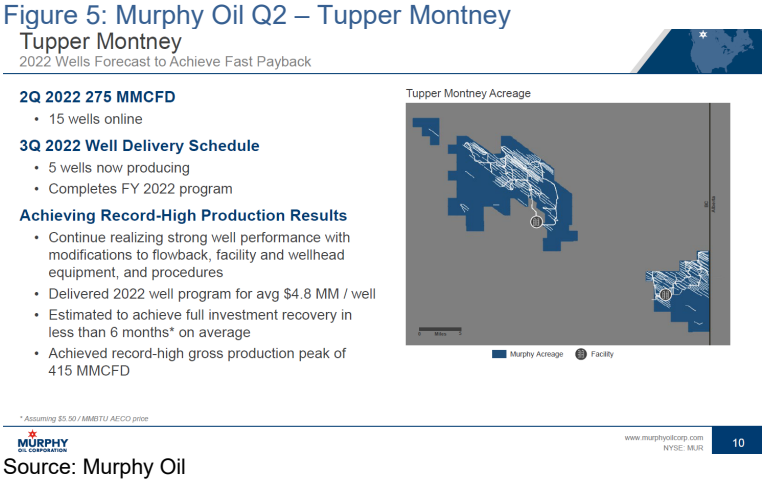
Dry Montney payout <6 mths

Natural Gas –Murphy's dry Montney has excellent economics

There was a great reminder on the excellent economics of the dry Montney play in NE BC. The focus over the past few years have been on the liquids rich Montney because natural gas prices were low. So the dry Montney natural gas plays have been overlooked. But Murphy Oil released Q2 on Thursday and we tweeted [LINK] "*#Montney keeps looking better. New #MurphyOil Q2 slide deck. It's Tupper Montney wells have full investment recovery in <6 mths at $5.50 AECO. Plus Tupper is fairly dry so no big added economic boost from liquids.*

#OOTT.": Murphy's slide notes "*estimated to achieve full investment recovery in less than 6 months on average"* and that these economics are "*assuming $5.50/MMBTU AECO price."* No wonder, Canada Onshore gets the biggest allocation of Murphy's 2022 CAPEX. Canada Onshore is mostly Montney with some Kaybob and is allocated 46% of Murphy's 2020 CAPEX of $900 to $950 mm.

Figure 5: Murphy Oil Q2 – Tupper Montney



Source: Murphy Oil

Natural Gas – Union raises risk of lengthy shutdown at Shell's Prelude 0.47 bcf/d FLNG

Shell Prelude FLNG 0.47 bcf/d

On Friday, we tweeted [LINK] "*Hmmm! How long will #Shell's 0.47 bcfd #PreludeFLNG be shut down by labor dispute? 1st time Offshore Alliance messaging mentions risk for a potential shutdown for months? Last #LNG cargo July 6. No analyst questions on 07/28 Q2 call. #OOTT #NatGas*." We have been noting each week the lack of progress between Shell and the Offshore Alliance on their labor dispute at Prelude 0.47 bcf/d FLNG. But, what caught our attention this week was the first mention by the union of the risk for an extended shutdown. The union's Facebook postings have been aggressively criticizing mgmt. for their operations at Prelude and their labor negotiations. And they have been noting how Shell isn't speaking to the union to try to reach a deal, which is why we have been writing there is no visibility to when we might see a resumption of LNG cargos from Prelude. The last LNG cargo was lifted on July 6. However, one thing jumped out in the Offshore Alliance Tuesday Facebook post. It seemed like the Union added a different twist to their messaging - the potential for this to be a long-term labor dispute. They haven't included this type of warning in prior posts. On Tuesday, the Union wrote "*Shell management have now advised our Prelude members that they are digging in for the long haul and will be preparing for the Prelude to be shut down for months. Shell have now missed 6 offtakes and $960 million of revenue. A shutdown until Xmas will cost Shell an additional $5.5 Billion of gas revenue - not to mention the deferral of the Turnaround by 10 months".* We haven't seen the union raise this risk in prior Facebook posts. Our tweet noted that there were no analyst questions on Prelude FLNG on the Shell Q2 earnings call on July 28. Our Supplemental Documents package includes the Union Aug 2 Facebook posts.

Figure 6: Shell Crux Project Overview

Source: Shell

ENI FLNG offshore Mozambique

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

On Tuesday, Bloomberg interviewed Eni COO Guido Brusco, who advised that Eni is looking to move ahead with its second FLNG vessel offshore Mozambique as a way to develop more of the massive offshore Mozambique natural gas. This is in the Exxon operated block that has had its massive Rozuma LNG 2.0 bcf/d Phase 1 delayed due to the onshore violence that delayed TotalEnergies Mozambique LNG. Eni and Exxon are in the process of having 1st LNG cargos in Q4/22 from the Eni operated Coral FLN G in the Rozuma block. Bloomberg reported "*If Eni decides to proceed by early 2023, output could begin even before TotalEnergies SE's $20-billion onshore project that abruptly halted construction last year due to security issues."* Eni made it clear that, before any FID, they would need to have to have agreement with their partners – Exxon, CNPC and Mozambique state owned Empresa Nacional de Hidrocarbonetos. Eni looks at FLNG as an addition to develop the natural gas. Bloomberg wrote ""*I believe that to fully develop Mozambique's considerable gas resources, the right decision is to move toward both an onshore concept and an offshore concept," Brusco said."* Our Supplemental Documents package includes the Bloomberg report.

Eni highlighted a 2nd Mozambique FLNG in the Q2 call

Here is what we wrote in our July 31, 2022 Energy Tidbits on this FLNG potential offshore Mozambique. "*There was an interesting Eni comment in the Q&A of the Q2 call on Friday with respect to their proposal to Exxon to move to or include small scale floating LNG (FLNG) in the offshore Mozambique lands. Eni is a partner in the big offshore Exxon Rozuma LNG 2.0 bcf/d Phase 1 that has been held up by the violence onshore Mozambique. Rozuma is to follow TotalEnergies Mozambique LNG, which put its project on hold in April 2021 due to the security situation. Eni's operated Coral FLNG, offshore Mozambique, has not been impacted by the onshore violence and is on track for its first cargo in late 2022. In the Q2 Q&A, Eni suggested moving to small scale FLNG with each FLNG capacity of 2.5 to 3.0 mtpa or 0.33 to 0.39 bcf/d ie. each about 1/5 the size of the Rozuma LNG Phase 1. In the Q&A, mgmt. said "So we are discussing, you know that we are working on the onshore, and in our joint venture, in our Company's with Exxon and the other company in charge of the upstream, and the offshore. Clearly, we are discussing, we are proposing a possible additional offshore development through LNG. The same fast*

LNG that we are developing in Congo's, so something that is very fast, as more size that we can replicate size that can range between 2.5 million ton and 3 million ton per year. So that is something that is on the table we are discussing. I can say that among our partners, there is a positive view, but we have to wait for final approval but that clearly an easy way to go faster and develop LNG in Mozambique. We have a huge amount of reserves there, its in our block we have about 80 test, so you can imagine that is the moment. So we are really focused and determined to go through these developments. For onshore, onshore is not in our hand, clearly is in the hand of Exxon, the big train, all the engineering and everything has been done. I think that is just a question to understand if we find a reasonable security condition to develop this activity. But if we think about small size, I seen that the offshore, we demonstrate 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 – Mozambique expects safety conditions by yr end for TotalEnergies LNG

TotalEnergies Mozambique LNG

Our view on Mozambique is that we haven't expected TotalEnergies to announce a restart on its Mozambique LNG until early 2023 at the soonest ie, not in 2022. The comments from Mozambique and the involved companies seem to keep pointing to that timetable. (i) Mozambique says will be ready to guarantee the conditions by year end 2022. On Thursday, Club of Mozambique news reported [LINK] "*Mozambique's Minister of Mineral Resources and Energy Carlos Zacarias promised today that, by the end of this year, all conditions for the resumption of Total's natural gas project, suspended due to the war in Cabo Delgado will be in place. "From our point of view, we expect that this year all the conditions will be created to guarantee and convince the concessionaires to resume activities," Carlos Zacarias told journalists on the sidelines of the seventh Ministry of Mineral Resources and Energy coordinating council. The minister asserted that the security situation in Cabo Delgado province, northern Mozambique, which hosts the natural gas exploitation projects, "has changed radically" against the armed groups active in the region since October, 2017."* (ii) Mozambique knows the restart decision is up to TotalEnergies. Club of Mozambique also reported "*"Of course, any resumption of activities will depend on the specific perception of each concessionaire regarding safety conditions," Minister Zacarias conceded."* (iii) Last week's (July 31, 2022) Energy Tidbits highlighted comments from Saipem (engineering and construction) Q2 call on July 27. On July 27, 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."* (iv) TotalEnergies Q2 call. Last week's (July 31, 2022) Energy Tidbits also highlighted the lack of comments on Mozambique on its July 26 Q2 call. 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. Our Supplemental Documents package includes the Club of Mozambique reports.

TotalEnergies Mozambique LNG delay was the game changer to LNG markets

We have been highlighting TotalEnergies force majeure on its Mozambique LNG Phase 1 for the past 16 months as the game changing event for LNG markets. Phase 1 at 1.7 bcf/d is significant, but our view has been because TotalEnergies delaying Phase 1 of 1.7 bcf/d is actually leading to a delay of 5.0 bcf/d. This was the reason why, on April 28 2021, we posted a 7-pg blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [LINK] We thought, and still think, there has been a major change to the outlook for LNG supply in the 2020s and one that is still being overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. We saw Total's April 27, 2021 announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d was much more significant that viewed. We just didn't see market focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow, and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022 at the earliest. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We had been warning that Mozambique has a major LNG market impact and its why we posted the April 28 blog. Its also why earlier we said that this is starting the clock running for other LNG projects wanting to go FID to make their mind up ie. like LNG Canada Phase 2. Our Supplemental Documents package includes our 7-pg April 28, 2021 blog.

Natural Gas – India still targets natural gas from >6% to 15% of energy mix by 2030

India targets natural gas to 15% of energy mix

We have been highlighting how India is far behind their stated target to have natural gas to be 15% of its energy mix by 2030. We still believe this is impossible considering current natural gas share is still just over 6%. But, on Monday, India reaffirmed that they still have this target despite no significant progress in the last two years. There are positives and the government press release recapped many of the expanding natural gas infrastructure that sets up big natural gas consumption growth thru the 2020s. However, like other countries,

extremely high LNG and natural gas prices have led to India cutting back natural gas consumption ie. in favor of coal. We have been highlighting how modestly increasing India domestic natural gas production supplants LNG imports especially with the high LNG prices. However, the reality is that India is just not growing its natural gas consumption due high natural gas and LNG prices. Bloomberg wrote "*In the short term, though, India's natural gas consumption is reported to havefallen as refiners, power generators and petrochemical companies cut back on usage owing to high current prices. India's consumption fell 2.5% year or year in the first quarter of the 2023 fiscal year, according to Ministry of Petroleum data."*

India is adding +2.9 bcf/d of LNG regasification capacity by 2025

India has been increasing its natural gas infrastructure to provide for big growth in natural gas consumption and LNG imports in the 2020s. But we just don't see anyway they get to their 15% target of energy mix by 2030. Here is what we wrote in our May 15, 2022 Energy Tidbits. "*On Wednesday, we tweeted [LINK] "Positive, India 👇adding 2.9 bcfd of #LNG regas capacity by 2025. But need a big step up in 2025-30 pace to hit #Petronet est +12 bcf/d LNG import growth to reach India's target for #NatGas to be 15% of its energy mix by 2030. #OOTT". The good news is that India is moving quickly to expand its regasification capacity, but the bad news is that we don't see it moving at the pace needed to hit its ambitious goal for natural gas to 15% of its energy mix by 2030 or the pace forecast by Petronet in October that would see India increase LNG imports (not capacity) by +12.4 bcf/d to 2030. We retweeted the India Ministry of Petroleum and Natural Gas's tweet [LINK] "India's capacity to regasify LNG to increase by 55% by 2025. LNG holds around 49% share in total natural gas consumption in FY 2021-22. LNG is bound to be the key driver for India's #PragatiKiGati #PMGatiShakti @Logistics_MoCI." It's positive that India is ramping up its LNG regasification import capacity. It will increase regasification by +55% or +2.9 bcf/d to 8.2 bcf/d by 2025. But our concern is that these regasification plans were committed to 2 to 3 yeas ago, before the changing LNG market and current very high LNG prices. So we have to believe that they will not reach their ambitious goal of natural gas being 15% of the energy mix by 2030, especially with the huge stress and high prices of LNG with Europe moving off Russia oil supply. We still expect India's growth in LNG imports will be very big, but I think it will be more like +10 bcf/d to 2030 instead of +12.4 bcf/d.*"

It would be big to LNG if India gets natural gas to >10% of energy mix by 2030

It is important to remember that India getting natural gas to 15% of the energy mix is a game changer for LNG markets. The question will be can they do half of what Petronet forecast last Oct? If so, that would add ~6 bcf/d to India LNG imports. Here is another item we wrote in our May 15, 2022 Energy Tidbits. "*We also noted how As noted above, it's positive for India's to add regasification capacity, but we believe they are behind the pace needed to reach Petronet's Oct 22, 2021 forecast for India's LNG imports to be +12.4 bcf/d by 2030. In our Oct 24, 2021 Energy Tidbits memo, we wrote "We continue to believe India's moves to increase natural gas to 15% of its energy mix by 2030 is a game changer for LNG markets in the 2020s. Especially as we have seen clear signs of action toward that target. On Friday, there was very bullish for India's LNG import growth from Petronet CEO Singh at the India Energy*

*Forum on Friday. As soon as we saw the reports, we tweeted [LINK] "Bullish for #LNG #NatGas in 2020s. #Petronet CEO fcasts India LNG imports +12.4 bcfd to reach 15.8 bcfd (120 MTPA) in 2030. In line with his June est, see below SAF Group June 20 Energy Tidbits #Petronet sees LNG imports +13 bcfd to 2030. Thx @JournoDebjit @rajeshsing13 #OOTT". Bloomberg's India energy team reported "India's import of natural gas is expected to hit 120 million tons/year by 2030 as the nation targets an energy mix goal, Akshay Kumar Singh, CEO of Petronet LNG, said at the India Energy Forum by CERAWeek. NOTE: India aims to boost use to natural gas to 15% of primary energy mix from about 6% now. * India's current annual LNG import is about 26 million tons". Singh is forecasting India's LNG imports to grow from current 26 MTPA (3.4 bcf/d) to 120 MTPA (15.8 bcf/d) in 2030. That is an increase of 12.4 bcf/d to 2030. This is very bullish for LNG and natural gas in the 2020s."*

Remember Modi's highlighted India "should be a gas-based economy"

It was one year ago that Modi made his major speech and highlighted natural gas for India's future. Our August 15, 2021 Energy Tidbits highlighted Modi's 75th anniversary of India independence speech. Modi has been stressing the importance to increase natural gas share of India's energy mix from 6% to 15% by 2030. India posted the Modi speech transcript at [LINK]. This is a big picture speech about the future for India and Modi's tries to set a vision for the next 25 years to the 100th anniversary. It's a general speech but it is also good reminder to people in the west that India still has a long way to go to catch up. Modi notes how they *"have made authentic efforts to construct toilets in 100% households*". One of his major themes was that India should be a gas based economy but targets to be energy independent in 25 years. Modi didn't get into his policy to increase natural gas share of the energy mix from 6% to 15% by 2030 and only gave gas a glancing mention, but the mention is significant – India "should be a gas based economy". Our August 15, 2021 Energy Tidbits had more detailed on the other Modi speech themes.

Natural Gas – Petronet reminds Qatar wants higher "slope" for its long term contracts

Higher slope in LNG contract negotiations

This is likely a key factor also why Europe isn't signing up long term deals with Qatar. India's Petronet LNG held its Q2 call on Friday. Mgmt was asked a couple of times on the upcoming renewal discussions with Qatar on future expiring long term LNG deals. There is still 16 months on that renegotiation timeline. But mgmt. was asked about long term contracts. And reminded of a key factor in long term deals that are linked to oil like Qatar – the LNG supplies want higher slope because of what is happening in the near term LNG markets. Mgmt replied "*Actually this particular time is not good for long-term sourcing because right now being too higher in the spot market. It will go for any long-term contract. It comes at a very high flow.* [Note we did not listen to the call, but suspect this flow is actually slope] *So, we are waiting for some time because if prices come down then you can think of having a good long-term contract. Right now, everybody will ask a slope, which is very high. Because everybody's seen that price there, LNG spot prices at $43, $44. So, at this price, if you go with the the market is a towards a long-term contract. We find that space will be very high, so we are looking forward to some opportunities, but of course, that is preventing us from talking too much to the renewal because it is a ninja man, , European countries are energy. Now they are ready to buy at any price. So that is in fact, initiating the market here findin*

difficulty, even search for the good supplier. We are hoping that once is to increase the share of oil over and is market stabilizes and it becomes really reasonable price in the range of $50 $80. Then we can think of, in fact, we're going for this much.
But right now we are focusing on our guests. so this is how we this is how we are proceeding but if you ask me whether you are looking for is not today to go at this is a get very high school but in future prices will definitely come down. At this point of time if you go for a long term contract you will insert enter into contract, which is very high price. And in future isn't difficult to is that same that LNG So we are waiting for right environment when the prices of LNG export LNG come down and that will be the right atmosphere. And we are hopeful that next year it will be there and hopefully we will then negotiate a good contract."

The push for higher slope deals was before Russia/Ukraine

We remind that this push for higher slope was happening before Russia invaded Ukraine. Our Jan 16, 2022 Energy Tidbits noted the rumored Beijing 10 yr LNG supply deal with Shell that was rumored to be negotiating at 12.7% slope. Our Feb 20, 2022 Energy Tidbits provided updates on those rumors but that the ended up deal was done at a slope just below 12% and not the January rumors of 12.7%. We haven't seen confirmation of this deal so it isn't in our running list. But it was a 10-yr deal of 0.20 bcf/d. Slopes are not disclosed but, in our Jan 16, 2022 Energy Tidbits memo, we noted Qatar had been doing slope deals in the low 10's in early 2021, which was relatively unchanged from the 10.19 slope deals in Sept 2020.

Explaining "slope" in LNG contracts

Our Sept 27, 2020 Energy Tidbits item noted above reference the slope of 10.19. Look at the slope very simply as a % of a reference oil price. Take whatever the reference price is and divide by the slope. The original Qatar and most other long term LNG supply deal were done at a slope of 16.7, or 1/6 the price of oil. Basically the energy equivalent of oil and natural gas. In our March 28, 2021 Energy Tidbits, we noted Qatar negotiated a lower slope with Sinopec, which was reported at 10.19. This week's rumored Beijing Gas deal is reported at 12.7% to 12.9%, which, at Brent $80 is ~$10.25, compared to a 10.19 slope of $8.15.

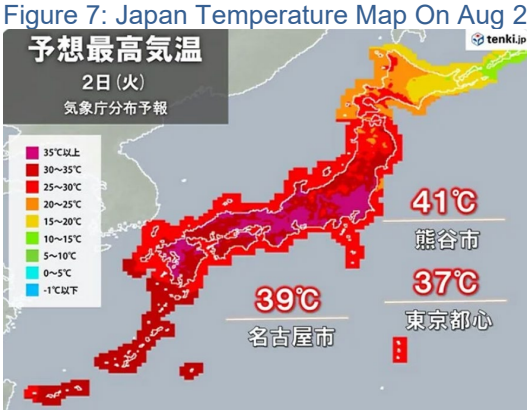
Natural Gas – So hot in Japan, trains had to stop as the rails hit 64C

Japan train tracks hit 64C

We have been highlighting that it has been hot in Japan this summer. It was so hot this week that there had to a temporary halt to rail service on the Ryutetsu Nagareyama Line in the Chiba Prefecture, just to the NE of Tokyo. This is basically just part of the urban sprawl adjoining Tokyo. Bloomberg's Stephen Stapczynski tweeted [LINK] the below Japan temperature map on Tuesday. On Tuesday TV Asahi reported [LINK] "*The Ryutetsu Nagareyama Line, which connects Nagareyama City and Matsudo City in Chiba Prefecture, was temporarily suspended because the temperature of the rail exceeded the standard value. According to Ryutetsu, around 1:00 pm on the 2nd, the temperature of the rails on the Nagareyama Line exceeded the standard value of 63 degrees Celsius and reached 64 degrees Celsius. Therefore, from 1:18 pm, we stopped driving on the entire Nagareyama Line. Afterwards, officials walked over to check the safety of the rails, and operations resumed at 2:18 p.m. As a result, a total of 6 outbound and outbound trains were suspended.*

It is the first time since the start of operation in 1916, 1916, that the operation was suspended due to the rail temperature.

Figure 7: Japan Temperature Map On Aug 2



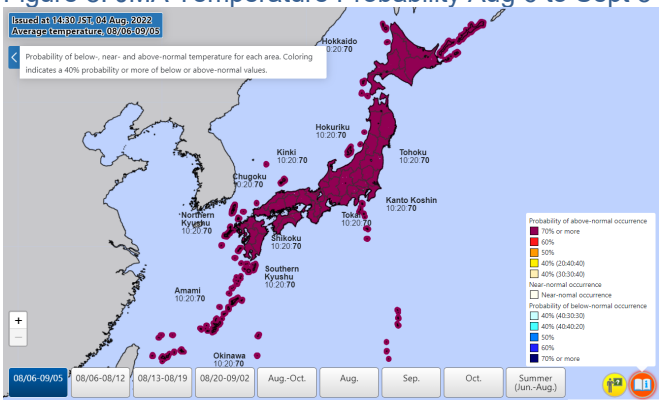
Source: Bloomberg, Tenki

Natural Gas – Continued hot weather forecast for month ahead in Japan

Still hot in Japan

The hot weather continues in Japan with JMA forecasting much warmer than normal temperatures through August and into September. Hot weather in the summer is always a positive for natural gas demand. However, we have seen that with the very high LNG prices, Japan's utilities have been trying to maximize fuel oil and coal. But still hot weather is positive to Japan natural gas consumption. The Japan Meteorological Agency posted its August 6 to September 5 weather forecast [LINK] calling for much warmer than normal temperatures. Note the below map is for the next month, but the maps for each of the next two weeks is the same all purple depicting hot weather.

Figure 8: JMA Temperature Probability Aug 6 to Sept 5



Source: Japan Meteorology Agency

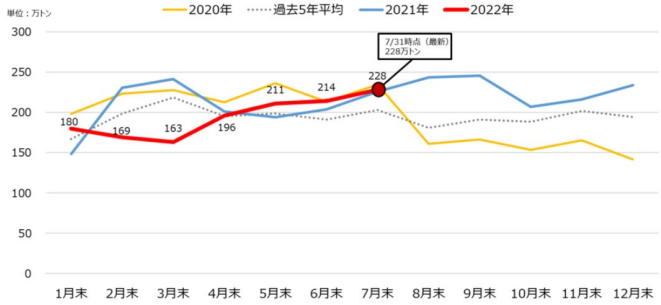
Natural Gas – Japan's LNG stocks up +1.0% from last week

Japan LNG stocks +1.0% 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 31 were ~110 bcf, +1.0% WoW from 109 bcf and up from the 5-yr average of 97 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 9: Japan's LNG Stocks



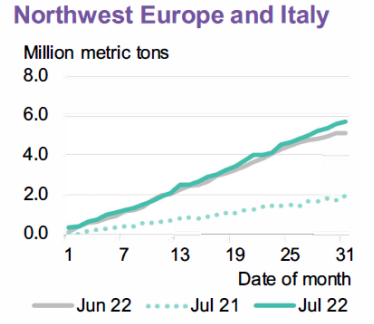
Source: METI

Natural Gas – Continued high LNG imports into Northwest Europe and Italy

Continued high LNG imports into Europe

There is no question that the reason for Europe gas storage filling up at a fast pace is continued high LNG imports into Europe. On Tuesday, BloombergNEF posted its "*LNG Trade Weekly: Spot LNG Volumes to Asia Continue to Dip".* We tweeted [LINK] *"No surprise, crazy high ~$60/mmbtu Dutch TTF #NatGas prices continue to attract any available #LNG cargo to Europe. LNG imports to NW EU & Italy: 7.89 bcfd for week of July 25-31, 8.75 bcfd for July, 9.62 bcfd for YTD July 31. Thx @BloombergNEF team. #OOTT".* BNEF wrote "*Imports into Northwest Europe and Italy reached a total of 1.1 million tons over July 25-31, similar to the same period a month earlier (June 25-July 1). Supply from the US decreased, while Russia increased exports to Europe. Qatari deliveries to Europe stayed flat. Imports from the US were down 24% from the same week in the previous month, mostly attributable to no imports into Italy, the UK and Belgium. Russian LNG supply increased, with all three LNG cargoes delivered to France."* Our Supplemental Documents package includes excerpts from the BNEF report.

Figure 10: Cumulative LNG Imports (as of July 31)



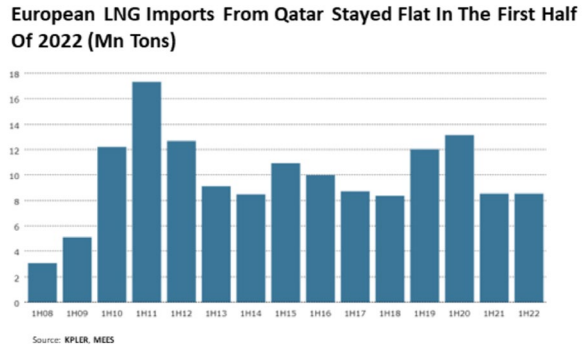
Source: EIA

Natural Gas – No surprise, not much EU LNG from Qatar who need long term contracts

Qatar needs long tem LNG commitments

No one should be surprised to see Europe's LNG imports from Qatar haven't surged in their urgency/panic to get all possible LNG cargos. Qatar wants long term contracts with destination clauses and European LNG buyers haven't given in to those basic contract conditions. And Qatar only has limited LNG cargos that aren't tied up on long term contracts. Plus, as noted above in the Petronet comments, Qatar is looking for higher slopes in its long term contracts. On Monday, we tweeted [LINK] "*Good reminder if Germany/EU wants reliable #LNG supply from @qatarenergy, it will need to do long term contracts with destination clauses (ie. cargos can't be redirected) especially with LNG supply crunch for 2020s. Thx @Jamie__Ingram @MeesEnergy. #OOTT #NatGas."* Bloomberg tweeted the below graph saying "*Amid Europe's gas crunch governments have to realise that there's no outside help coming. US LNG can't replace Russian gas, flows from Qatar to Europe have remained flat, and Algeria gas exports have dropped*."

Figure 11: European LNG imports from Qatar



Source: Bloomberg

Germany and Qatar haven't been able to agree to long term LNG deal

Here is what we wrote in our May 15, 2022 Energy Tidbits. "*We suspect most weren't surprised to see the Bloomberg report that Germany and Qatar haven't been able to come to an agreement on a long term LNG supply deal. The Europeans have avoided committing to long term LNG supply deals, and Qatar does long term LNG deals. Bloomberg wrote "Germany and Qatar are at odds about duration of any contract as they continue talks about liquefied natural gas supply deals, Reuters reports, citing three people familiar with the discussions. * Germany has expressed reluctance to accept Qatar's proposed deals of at least 20 years, due to its goal of cutting its carbon emissions 88% by 2040 * Qatar seeks a destination clause that would prevent any LNG from being rerouted to other countries in Europe, a condition the EU opposes * A deal isn't expected soon, one of the people said".*

Qatar has always been focused on long term supply deals

Here is another item we wrote in our May 15, 2022 Enerrgy Tidbits. "*The Qatar Energy comments on the Germany meetings in late March were in line with the prior public statements from Qatar that always remind Qatar does long term supply deals and not spot deals. Our Feb 27, 2022 Energy Tidbits wrote "Qatar's energy minister*

Al Kaabi reminded this week that Qatar really can't help much if Russia natural gas supplied to Europe get interrupted. In fact, he noted that no one can replace Russia's dominant supply to Europe. There were three other key reminders in his comments at the GECF press conference. (i) He didn't hesitate to remind that Qatar is in the long term contract business. (ii) Only 10-15% of Qatar LNG that could be diverted to Europe. The Qatar Peninsula reported ""Russia provides I think 30-40 percent of the supply to Europe. There is no single country that can replace that kind of volume, there isn't the capacity to do that from LNG," he said. "Most of the LNG is tied to long-term contracts and destinations that are very clear. So, to replace that sum of volume that quickly is almost impossible," he said. Minister Al Kaabi said that for Qatar the amount of divertable contracts that can be shipped to Europe is only 10-15 percent. "It's not that something is not contracted, the question is, is it divertible or not? And the majority is tied up to long term contracts. The divertible volume is probably 10-15 percent," he said." (iii) He reminds the issue is the lack of investment, not Russia-Ukraine. The Qatar Peninsula wrote "The steep rise in the natural gas prices in the global markets are caused by the lack of investment and not due to Russian-Ukrainian crisis, said Minister of State for Energy Affairs H E Eng. Saad bin Sherida Al Kaabi. He said Qatar wants to meet European Union (EU) demands for additional LNG supplies, but most of its exports are already tied to long-term contracts. "Everything that is going on today on pricing is fundamentally because of lack investments and that will take time to catch up. Supply demand has a tendency to correct itself over time so hopefully this will be corrected, it will take time."

Natural Gas – Nord Stream still at 20% of 5.3 bcf/d capacity, how long will it stay there?

Nord Stream still at 20%

It was a week of relative calm on the Nord Stream front from the perspective there was no reported change in natural gas volumes and also no indication of any change in position from Russia on increasing volumes. As a results Nord Stream is still reportedly shipping at 20% of its 5.3 bcf/d capacity ie. ~1.06 bcf/d.

Scholz's photo-op with the Siemens gas turbine

We can't believe German Chancellor Scholz thought this would apply any more pressure on Russia to increase Nord Stream volumes so we have to believe he just wanted a photo-op with the controversial Siemens gas turbine. On Wednesday, Scholz tweeted [LINK] "*At @Siemens_Energy, I could see with my own eyes: The serviced turbine is there and ready for use at any time. It only has to be requested from Russia. So there are no technical reasons to reduce gas supplies*."

Figure 12: Scholz with the controversial Siemens gas turbine

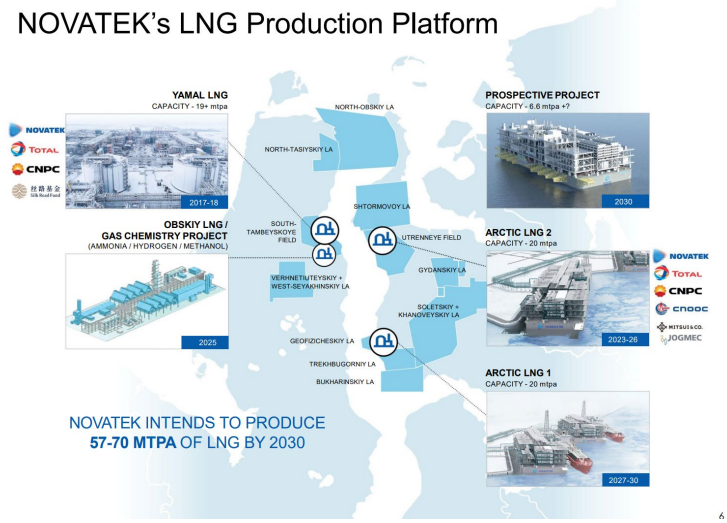
Source: German Chancellor Scholz

Natural Gas – Russia big delays in LNG coming from Arctic LNG-2 in 2023-2025

Big delays in Arctic LNG-2

Russia may not have said it directly, but they confirmed there are big delays to the under construction Arctic LNG-2 project that was supposed to add 2.6 bcf/d by 2026. Rather it sounds like Arctic LNG-2 may only add 0.47 in this period instead of 2.6 bcf/d. Russia effectively confirmed thesis in our June 19, 2022 Energy Tidbits memo, which was titled *"Game Changer for LNG: ~6.2 bcf/d Russian LNG is at Risk with Reports Baker Hughes to Stop Providing Services/Equipment".* The thesis that Baker Hughes stopping providing equipment and services would cause a delay in the under construction Arctic LNG-2 of 2.6 bcf/d capacity that was to add 0.87 bcf/d in each of Phase 1 in 2023, Phase 2 in 2024 and Phase 3 in 2025. Looks like it's coming true. (i) On Thursday, we tweeted [LINK] "*Game changer for #LNG. Big delays in under construction RUS Arctic LNG-2, was 0.87 bcfd in 23, 0.87 in 24 & 0.87 in 25 for 2.6 bcfd by 26. TASS says now 0.47 bcfd in 23 & "may soar" to 2.76 by 30. See 👇 06/16 thread, 07/31 Energy Tidbits at [LINK]. #NatGas #OOTT* ." (ii) On Thursday, TASS reported on the timelines for under construction Arctic LNG-2 and future Arctic LNG-1 projects. TASS did not say there were changes in timing. There was no mention of Baker Hughes but what else can it be? (iii) Arctic LNG-2 Phase 1. TASS says phase 1 cargos in 2023 at 3.6 mm tonnes in 2023. 2023 is the original planned start up for Phase 1. Note they don't say if this is annual capacity rate or a prorated volume depending on how much of the year Phase 1 is onstream. We suspect it's a capacity. If 3.6 mm tonnes is a revised capacity for Phase 1, that is only 0.47 bcf/d. If so, it is less than expected 0.87 bcf/d for Phase 1. That would make sense because we would expect it's because they don't have the Baker Hughes big gas turbines so less capacity. (ii) Arctic LNG-2 Phase 2 & 3. TASS says "*the flow of cargo from Arctic LNG 2 is projected at 3.6 mln tonnes in 2023, whereas by 2030 it may soar almost six-fold to 21 mln tonnes*." What it doesn't say is when Phase 2 & 3 are on stream? Sometime by 2030. Whereas the prior expectation was 6.6 MTPA (0.87 bcf/d) in each of 2023, 2024 and 2025, for a total of 2.6 bcf/d by 2026. TASS's vague comment that the remaining phases "may" soar by 2030 is pointing to big delays to Phase 2 and 3. (iii) Arctic LNG-1 looks like it will be at lesser volumes when it starts up and a lot longer to hit the peak capacity. This was a down the road Novatek project that Novatek said would add 20 mtpa (2.63 bcf/d) in the 2027-2030 period. We assumed this would be a look alike to Arctic LNG-2. Ie. 0.87 mtpa in 3 phases over 3 years. But TASS wrote "The flow of cargo from Arctic LNG 1 is expected at 2.3 mln tonnes in 2027, potentially able to rise to 21.5 mln tonnes by 2035." 2.3 mtpa is 0.23 bf/d and 21.5 mtpa is 2.83 bcf/d. This also looks like a much lower and longer LNG increase. (iv) TASS did not comment on the 3.6 bcf/d of Russian LNG that is in operation and, up until the last two months, was being serviced by Baker Hughes. Our Supplemental Documents package includes the TASS report.

Figure 13: Novatek's LNG production platform, May 2021



Source: Novatek

Russia needs Baker Hughes turbines for LNG, like Siemens for Nord Stream

TASS didn't mention Baker Hughes in its report, but it stands to reason that Baker Hughes stopping providing equipment and services for Russian LNG projects has to be the reason. We are surprised that people haven't expected these LNG reductions. Here is what we wrote in last week's (July 31, 2022) Energy Tidbits "*Yet no market worries about Baker Hughes turbines for Russian 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*

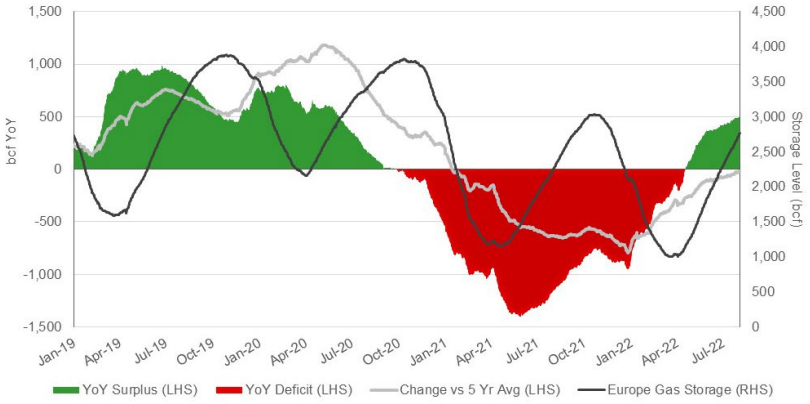
*LNG adds, hopes no more than 1-2 yrs. Arctic LNG-2 2.6 bcfd from 3 phases, phase 1 0.87 bcfd starting in 2023, all on in 2026. Urgent need for FIDs ie. #LNGCanada Phase 2. #OOTT #NatGas." TASS reported on comments from Russia First Deputy Minister Sorokin, who admitted that the under construction 2.6 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.*

Natural Gas – Europe storage is now +12.82% YoY ie. 70.89% full vs 58.07%

Europe storage now 70.89% full

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 12.82%. 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 Aug 3 is at 70.89%, which is +12.82% greater than last year levels of 58.07% and are +0.18% above the 5-year average of 70.71%. Below is our graph of Europe Gas Storage Level.

Figure 14: Europe Gas Storage Level



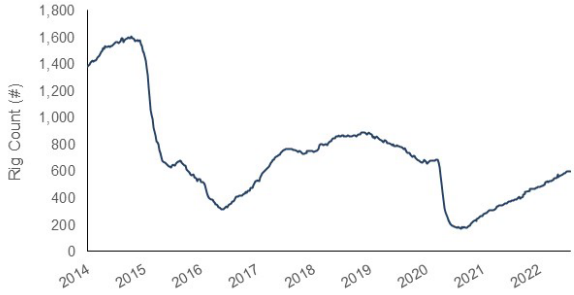
Source: Bloomberg

Oil – US oil rigs -7 at 598 oil rigs at Aug 5

US oil rigs -7 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. This week US oil rigs were -7 at 598 oil rigs. This will be the watch for the next couple weeks – were the -6 oil rigs due to factors like the extremely hot weather in Texas/New Mexico or is the decline because WTI is now ~$90 and not $100. Oil rigs are +430 off the bottom of 172 in Aug14/2020 week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by -81 to 598 oil rigs (-13%). US gas rigs were +4 WoW at 161 rigs as HH still continues to be above $8.

Figure 15: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – Was the US frac spreads -6 to 289 spreads for the week ending Aug 5

Frac spreads -6 to 289

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending Aug 5 on the Primary Vision network. YouTube video is at [LINK]. For the week ending Aug 5, US frac spreads at the high point in the week were -6 to 289 spreads. Here are some of this comments on the week. Normally, will have a weaker 1st and 2nd week of August and them spreads will normally pick up in the last part of August and accelerates in September. Had a little bit of a dip in the Permian, some dips in other areas. Williston is ramping up, as are some other unnamed key areas. But if you look at the numbers, it reinforces the point he made last July, running tight on equipment, not a lot of spare

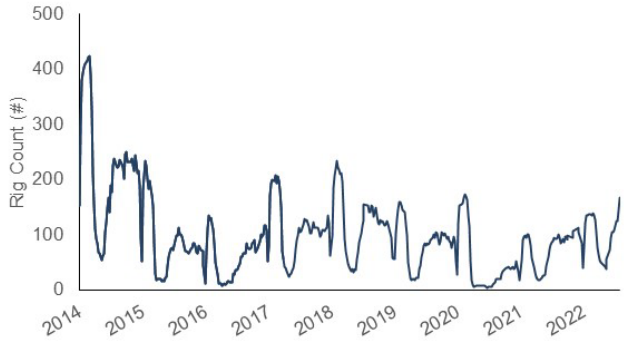
equipment lying around. Sees the market as being fairly capped. Maybe 310 or 315 can work, but it's a question of where is the equipment vs the activity. Permian is fairly maxed out at this point in time.

Oil – Total Cdn rigs -1 WoW at 203 total rigs, +47 rigs YoY

Cdn rigs -1 WoW

Total Cdn rigs were -1 at 203 total rigs. Cdn oil rigs were +3 at 140 rigs. Cdn gas rigs were -4 at 63 gas rigs. We will watch to see if this is just a small pause in growth for the week or if this is linked to lower oil prices. Total rigs are now +190 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 95 and Cdn gas rigs were 60 for a total Cdn rigs of 156, meaning total Cdn oil rigs are +45 YoY and total rigs are +47 vs 2021.

Figure 16: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

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

US oil production flat WoW

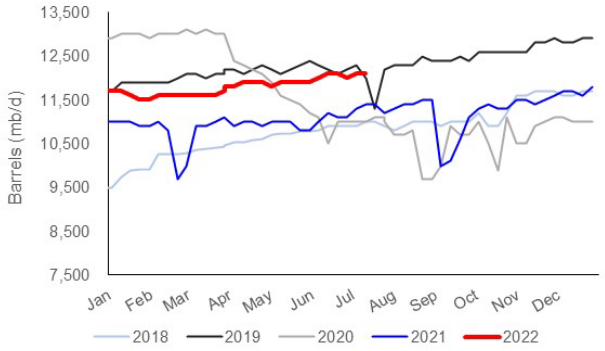
US oil production was flat at 12.1 mmb/d for the week ended July 29 after an increase last week. Lower 48 production drove total production and was flat at 11.7 mmb/d this week, with Alaska having immaterial change. US oil production is up YoY at +0.9 mmb/d, but is still down significantly at -1.0 mmb/d 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 for the oilfield services companies are all saying that US producers continue to be disciplined on capex and focus on returns to shareholders.

Figure 17: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	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	07/29	12,100

Source: EIA

Figure 18: US Weekly Oil Production



Source: EIA, SAF

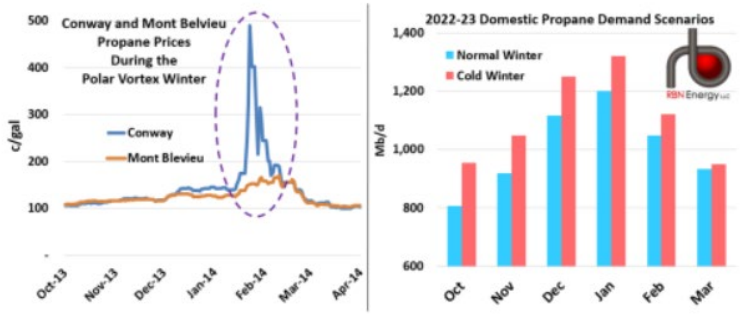
Oil – RBN blog: will the propane market be prepared for winter? Part 2

RBN blog on propane

Last week's (July 31, 2022) Energy Tidbits memo highlighted the RBN blog titled "*People Get Ready - Will The Propane Market Be Prepared For Winter?"* [LINK]. RBN released a part 2 of this blog last Sunday with a look ahead. With the winter propane heating season approaching, last week's blog highlighted that propane exports are running high and production is not increasing fast enough to get inventories back up. Last year, propane prices spiked way up prior winter due to a confluence of bullish market developments, then virtually collapsed in November and December with mild winter weather. Part 2 of the blog mostly focused on the outlook U.S. propane markets during the upcoming 2022-23 heating season. The average price of July propane was higher in 2022 than any year for the past decade. However, it is considerably cheaper than this time last year relative to other energy commodities. This year propane is much cheaper relative to WTI, averaging only 52% through June and 48% during

July. Looking forward, the most significant propane market fundamentals are production, exports, domestic demand, and the combined impact of those factors on U.S. inventories. Total U.S. monthly gas plant production has been increasing at a quite modest pace since January 2020, and it is not enough to make much of a difference in the market. Exports on the other hand have been increasing at a robust rate, growing about 10% per year in the most recent four-year period. This year most of the growth in exports has been for Europe, and the volumes headed there could increase further, assuming the Russia-induced natural gas supply crunch intensifies in Europe this winter as expected. The last factor, weather, is the most unpredictable. If a polar vortex hits like it did in 2013-2014, inventories will be sucked down to uncomfortably low levels, threatening supply chain disruptions. The conclusion of the blog stated "*Here's the sobering takeaway. These projections show what would happen in a polar vortex scenario at the U.S. level. But the real impact will be regional — that's where the rubber meets the road in propane supply-chain disruptions because when there's a sudden surge in demand, propane supplies have to be close at hand. And most likely, that regional impact would be the most severe in the Midwest, just where it hit in 2013-14. In the next episode, we'll examine the potential regional effect of a polar vortex winter and discuss actions the propane market should consider to mitigate the risks of such an event.*"

Figure 19: Propane Prices



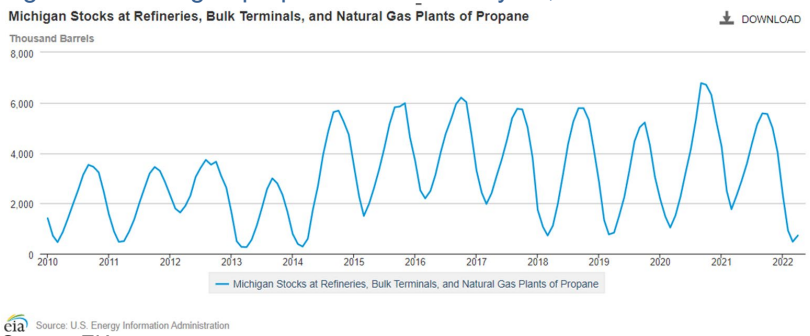
Source: RBN

Will Michigan Gov Whitmer keep pushing to shut down Line 5?

The RBN blog didn't provide by state views but noted "*And most likely, that regional impact would be the most severe in the Midwest, just where it hit in 2013-14.".* Last week's (July 31, 2022) Energy Tidbits memo highlighted Part 1 of the RBN propane blogs. And 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 July 27, 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 then current propane stock graph for Michigan for April 30. This week, the EIA updated the data

to May 31 and it is still a very low inventory propane levels, the lowest since May 2013. The EIA estimates propane stocks of 1.393 million barrels at May 31, 2022, which compares to 2.907 million barrels at May 31, 2021. Last year, Michigan propane stocks were 5.551 million barrels at Oct 31, 2021 going into the winter. Our July 27 tweet also reminded that Enbridge's Line 5 supplies 55% of Michigan's propane consumption. Below is the updated EIA propane stocks to May 31, 2022 graph.

Figure 20: Michigan propane stocks to May 31, 2022



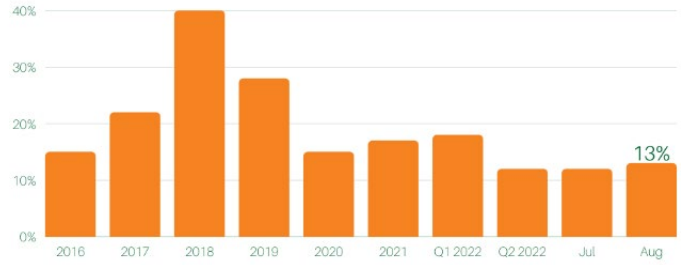
Source: EIA

Oil – Trans Mountain apportioned by 13% for Aug

Trans Mountain apportionment

On Wednesday, Trans Mountain released an update [LINK] on its capacity for the month of August. Total system nominations are apportioned by 13% for Aug (July was 12%), meaning 13% of demand for the pipeline exceeds its capacity. Trans Mountain reminds that it has been running at full capacity and has seen regular monthly apportionment for over a decade ie, the clear sign for a need for expansion. The Trans Mountain apportionment update also includes a bit of an apportionment 101. Trans Mountain wrote "*When a pipeline experiences significant and prolonged apportionment like in the case of the existing Trans Mountain Pipeline, it's one signal that more capacity is needed. Apportionment can bring with it a discounting of prices as producers compete to sell what they can through the pipeline before having to use another pipeline or other modes of transport to another, less profitable market. It can also mean the buyers at the end of the pipeline are forced to source their shortfall of supply from alternate, less desirable sources*." Below is a chart which shows the average apportionment since 2016. Our Supplemental Documents package includes the Trans Mountain release.

Figure 21: Trans Mountain Pipeline Apportionment



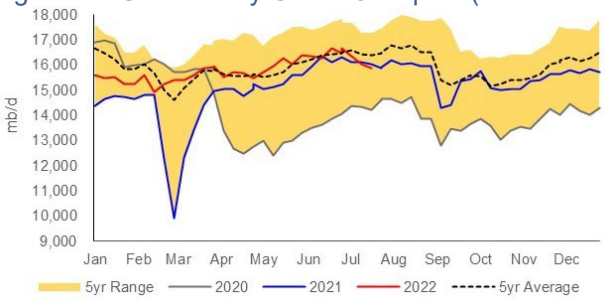
Source: Trans Mountain Pipeline

Oil – Refinery inputs -0.174 mmb/d WoW at 15.853 mmb/d

Refinery inputs down WoW

The EIA crude oil input to refinery data is for the week ended July 29. This is the season that normally sees increasing processing volumes in Q2 every year, though the EIA reported crude oil inputs to refineries down -0.174 mmb/d to 15.853 mmb/d for the week ended July 29 and are -0.067 mmb/d YoY. Refinery utilization was down to 91.0%, which is -0.3% YoY. 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 -0.027 mmb/d to 19.948 mmb/d, and Motor gasoline was down -0.704 mmb/d at 8.541 mmb/d from 9.245 mmb/d last week. The 4-week average for Motor Gasoline was down -0.828 mmb/d YoY to 8.592 mmb/d. The 4-week average of Total demand was down -0.627 mmb/d YoY to 19.917 mmb/d.

Figure 22: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – 2.9 mmb/d of refining additions in Asia and Middle East for 2022 and 2023

Asia and Middle East refining additions

We recommend adding to reference libraries the new EIA blog on Tuesday that listed all the new refinery capacity additions in the Middle East and Asia scheduled to come onstream in 2022 and 2023. The EIA identified nine refinery projects beginning operations or scheduled to come online before the end of 2023. On Wednesday, we tweeted [LINK] *"Who doesn't love a great map! @EIA shows ~2.9 mmb/d of 2022/23 refinery additions by refinery. China 1.120 mmb/d, Kuwait 0.615 mmb/d, Saudi 0.400 mmb/d, Malyasia 0.300 mmb/d, Oman 0.230 mmb/d, Iraq 0.140 mmb/d & India 0.135 mmb/d. #OOTT"*. The EIA highlighted that China's refinery capacity is scheduled to increase significantly this year. The 320,000 b/d Shenghong Petrochemical facility in Lianyungang reports that trial crude oil-processing operations began in May 2022. In addition, PetroChina's 400,000 b/d Jieyang refinery is

expected to come online in Q3/22. A planned 400,000 b/d Phase II capacity expansion also began operations earlier this year at Zhejiang Petrochemical Corporation's Rongsheng facility. Outside of China, the 300,000 b/d Malaysian Pengerang refinery restarted in May 2022 after a fire forced the refinery to shut down in March 2020. In India, the Visakha Refinery is undergoing a major expansion, scheduled to add 135,000 b/d by 2023. Our Supplemental Documents package includes the EIA article.

Figure 23: Selected Major Global Refinery Projects Scheduled for 2022 and 2023

Source: EIA

Oil – US "net" oil imports up 2.214 mmb/d WoW at 3.830 mmb/d

US "net" oil imports up WoW

US "NET" imports were up 2.214 mmb/d to 3.830 mmb/d for the July 29 week. US imports were up 1.178 mmb/d to 7.342 mmb/d. US exports were down +1.036 mmb/d to 3.512 mmb/d. The WoW increase in US oil imports was driven by US's Top 10 imports by country which were up by 0.914 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was up this week by 0.365 mmb/d to 3.673 mmb/d. (ii) Saudi Arabia was down -0.0.16 mmb/d to 0.500 mmb/d this week. (iii) Colombia was down 0.178 at 0.328 mmb/d. (iv) Ecuador was up 0.093 mmb/d at 0.243 mmb/d. (v) Iraq was up 0.204 mmb/d to 0.369 mmb/d. (vi) Mexico was up 0.176 mmb/d to 0.815 mmb/d.

Figure 24: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	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	July 29/22	WoW
Canada	3498	3444	3603	3394	3344	2887	3803	3827	3481	3308	3,673	365
Saudi Arabia	588	345	349	681	760	701	398	634	242	516	500	-16
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	872	747	711	608	374	743	702	610	877	639	815	176
Colombia	218	215	143	292	228	215	213	213	405	150	328	178
Iraq	282	326	196	555	100	76	362	302	454	165	369	204
Ecuador	250	48	259	227	124	59	142	149	57	150	243	93
Nigeria	39	193	194	181	43	201	171	79	136	143	57	-86
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	5,747	5,318	5,455	5,938	4,973	4,882	5,791	5,814	5,652	5,071	5,985	914
Others	739	900	699	1,047	1,253	1,116	1,048	861	867	1,093	1,357	264
Total US	6,486	6,218	6,154	6,985	6,226	5,998	6,839	6,675	6,519	6,164	7,342	1,178

Source: EIA, SAF

Oil – On Tues, US signaled a modest OPEC+ supply increase on Wed

US Patriot missile deal for Saudi

On Tuesday afternoon, we tweeted [LINK] "*Hmmm! Would seem to point to some sort of modest #Oil supply increase by #OPEC+ tomorrow? Likely why Saudi has been holding back*

a little bit from producing at quota. UAE & Saudi are the only members with any real spare capacity. #OOTT." We saw what looked like a clear signal that OPEC+ was going to go thru with a modest supply increase on Wednesday. We saw an Al Arabiya tweet [LINK] on the breaking news "*The #US State Department approves the sale of 300 Patriot missiles to #SaudiArabia in a deal worth $3.05 billion and another deal worth $2.25 billion to the #UAE for 96 THAAD missile rounds*." The US announcing it approved the long awaited Patriot missiles sale to Saudi and THAAD missile rounds to UAE was a clear signal of one of the items MBS got from Biden. The question remains – what else did MBS get?

US/Saudi arms deal seemed to confirm MBS was the big winner vs Biden

We still wonder what else MBS got from Biden in Biden's going to Saudi Arabia to kiss the ring. We have been of the view that MBS got the validation needed and that we see a set up to an early ascension to the throne. But above he also got his needed Patriot missiles. And, at least so far, the only thing he has given is the stated 100,000 b/d increase in OPEC+ oil supply in September. It reminded us of one of our post MBS/Biden meeting tweets two days after the MBS/Biden meeting. On July 17, we tweeted [LINK] "*Ouch! Best indicator #Biden didn't get any wins on #Oil supply or #Iran from MBS & Gulf Arab leaders meetings. Go to @WhiteHouse home page, nothing to even indicate he was in Jeddah. Didn't expect the MBS fist bump, but there would be something he thought he won something. #OOTT."* If you went to the White House home page, there wasn't anything to indicate Biden had been in Saudi Arabia. They were clearly trying to not bring any attention to the Saudi Arabia trip, which was a clear confirmation the White House knew they didn't win anything from MBS.

Saudi hasn't needed Patriots lately with Houthi truce being extended again

The good news for Saudi Arabia is that they haven't need Patriot missiles for most of 2022 with the Houthi truce. And that is expected to continue with the Friday reports, such as Bloomberg's, that " *The UN has announced that the warring sides in Yemen have agreed to extend the current ceasefire for a further two months. Late on Tuesday the government and the Houthi rebels committed to intensify efforts on negotiations, said Hans Grundberg, special envoy for the country. The news will bring some relief for citizens who had been bracing for war to return after what has already been an uneasy four-month truce."*

Oil – One big OPEC+ warning "severely limited availability of excess capacity"

OPEC+ has severely limited surplus capacity

There were two big warnings from OPEC+ in their post meeting press release. These stark warnings are very bullish for the oil outlook for the 2020s. We were expecting a modest supply increase but we weren't expecting stark warnings in the press release on the oil supply outlook. We tweeted [LINK] "*Buckle Up! Must read #OPEC+ warns on #Oil supply. "severely limited availability of excess capacity", insufficient investment will impact adequate supply post 2023 from "some OPEC Member Countries & participating non-OPEC oil-producing countries" & other non-OPEC+ countries #OOTT*." We, and everyone, have been warning that the only real significant spare oil capacity in OPEC+ is Saudi Arabia and UAE. That continues to be proven up by the underperformance the vast majority of OPEC+ countries relative to their quota. In the post OPEC+ meeting press release, OPEC+ gave a very stark warning on the lack of surplus oil capacity. OPEC+ wrote *"The Meeting noted that*

the severely limited availability of excess capacity necessitates utilizing it with great caution in response to severe supply disruptions." The attention grabbers was OPEC saying there is "*severely limited availability of excess capacity*". But the other key part of the sentence is the warning to the US and markets that it means no one should expect any big increases from Saudi Arabia and UAE because the surplus should only be used "*with great caution*".

Oil – Second big OPEC+ warning inadequate supply post 2023 from OPEC+ & others

OPEC warns on future oil supply

The other big OPEC+ warning was linked to the lack of surplus capacity comment noted above – it was the other reminder that insufficient investment is adding huge supply risk post 2023. We noted this second big warning in or tweet. [LINK] OPEC+ wrote "*The Meeting noted that chronic underinvestment in the oil sector has reduced excess capacities along the value chain (upstream/midstream/downstream). The Meeting highlighted with particular concern that insufficient investment into the upstream sector will impact the availability of adequate supply in a timely manner to meet growing demand beyond 2023 from non-participating non-OPEC oil-producing countries, some OPEC Member Countries and participating non-OPEC oil-producing countries."* The OPEC+ warning is making it clear that the lack of investment is affecting all major oil supply groups – OPEC, the non-OPEC countries in OPEC+, and other countries. The other part of the warning is that the insufficient investment means there can't be a "timely" supply response.

Oil – OPEC+ increases September production +100,000 b/d

OPEC+ raises September production

There was a strong consensus that OPEC+ announced increase of +100,000 b/d to its quota for September was essentially adding zero or very little oil to the market. Rather it was viewed as a token increase for the US requests. OPEC+ had it's 31th ministerial meeting on Wednesday [LINK] which adjusted production levels upward by 100,000 b/d for September. (i) OPEC stated, "*Reaffirm the decision of the 10th OPEC and non-OPEC Ministerial Meeting on 12 April 2020 and further endorsed in subsequent meetings including the 19th OPEC and non-OPEC Ministerial Meeting on the 18 July 2021.*" (ii) In addition, OPEC+ stated, "*Adjust upward the production level for OPEC and non-OPEC Participating Countries by 0.1 mb/d for the month of September 2022 as per the attached table. This adjustment does not affect the baselines decided on the above-mentioned Meeting on 18 July 2021*". (iii) They also stated "*Reiterate the critical importance of adhering to full conformity and to the compensation mechanism. Compensation plans should be submitted in accordance with the statement of the 15th OPEC and non-OPEC Ministerial Meeting*". Our Supplemental Documents package includes the OPEC+ release.

Figure 25: OPEC+ September 2022 Required Production

September 2022 Required Production	
Algeria	1057
Angola	1529
Congo	325
Eq.Guinea	127
Gabon	187
Iraq	4663
Kuwait	2818
Nigeria	1830
Saudi Arabia	11030
UAE	3186
Azerbaijan	718
Bahrain	205
Brunei	102
Kazakhstan	1710
Malaysia	595
Mexico	1753
Oman	883
Russia	11030
Sudan	75
South Sudan	130
OPEC 10	26753
Non-OPEC	17202
OPEC+	43955

Source: OPEC

OPEC+ meeting September 5

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

The short press release on the 31th OPEC and non-OPEC Ministerial Meeting (ONOMM) noted that the next ONOMM meeting will be held on September 5, 2022. We assume it will be via videoconference again. It wasn't in the press release, but there were press reports after the meeting indicating OPEC+ was planning for their Dec meeting to be an in-person meeting in Vienna.

OPEC under delivered in June

Oil – Bloomberg survey reminds not much spare OPEC surplus capacity

On Tuesday, we tweeted [LINK] on the Bloomberg survey of OPEC production for July. We tweeted *"#OPEC. Nigeria, Angola & Iraq make up 1.131 mmb/d of shortfall vs quota of total OPEC 1.156 mmb/d shortfall. Who else besides Saudi, Kuwait & UAE likely has much in reserve to increase #Oil production in near term? See 👇 @business survey for OPEC July production vs quota. #OOTT."* The Bloomberg survey estimates the OPEC countries subject to quota production in July was +270,000 b/d MoM, but were still 1.156 mmb/d below their quota. Our tweet included our below table. No surprise Nigeria, Angola and Iraq are the big underperformers making up 1.131 mmb/d of the shortfall. But the other reality is that there really isn't any surplus spare capacity outside of Saudi Arabia, UAE and possibly a little bit in Kuwait.

Figure 26: OPEC Bloomberg July Survey vs Quota

OPEC July Production Vs Quota					
		Bloomberg Survey For July Producion, As of Aug 1, 2022			
OPEC (mmb/d)	July 2022 Quota	July	June	July - Quota	July - June
Algeria	1,039	1,020	1,020	-19	0
Angola	1,502	1,130	1,200	-372	-70
Congo	320	260	270	-60	-10
Equatorial G.	125	100	90	-25	10
Gabon	183	200	190	17	10
Iran	n.a.	2,520	2,550	n.a	-30
Iraq	4,580	4,420	4,420	-160	0
Kuwait	2,768	2,770	2,640	2	130
Libya	n.a.	700	670	n.a	30
Nigeria	1,799	1,200	1,230	-599	-30
Saudi Arabia*	10,833	10,780	10,600	-53	180
UAE	3,127	3,240	3,190	113	50
Venezuela	n.a.	710	710	n.a	0
Total OPEC	26,276	29,050	28,780	-1,156	270
Source: Bloomberg, OPEC					

Source: OPEC, Bloomberg

Oil – Tanker tracking shows Saudi oil exports 7.5 mmb/d in July vs 6.6 mmb/d in June

Saudi oil exports higher in July

On Monday, we tweeted [LINK] "*Negative to #Oil. Tanker-tracking data compiled by @business saw observed seaborne shipments from Saudi Arabia were ~7.5 mmb/d in July vs a revised ~6.6 mmb/d in June. Thx @bwingfield. #OOTT".* Our tweet included the below graph that shows estimated Saudi oil exports in July of 7.5 mmb/d based on tanker tracking, Bloomberg wrote "*Saudi Arabia's crude exports soared in July to the highest level since April 2020 amid international pressure to tame elevated oil prices. Observed seaborne shipments from the kingdom came to about 7.5 million barrels a day last month, tanker-tracking data compiled by Bloomberg show. That compares with a revised 6.6 million barrels a day in June."*

Figure 27: Saudi Oil Exports based on tanker tracking

Source: Bloomberg

Oil – Saudi nest egg, its net foreign assets up MoM, but down $3.6b since Nov 2020

Saudi net foreign assets down $3.63b since Nov 2020

We continue to see key financial reasons why Saudi Arabia is going to do all it can to maintain high oil prices (ie. say >$80) for the foreseeable future. And we continue to believe the #1 financial theme for Saudi Arabia in the 2020s will be their continued, and likely increasing, use of Other People's Money as they try to transition their country to MBS's Vision 2030. We are surprised that markets and oil watchers don't seem to pay much attention to the Saudi net foreign assets data ie. what we call their nest egg to help them thru the Energy Transition. However, it looks like ~$120 Brent in June gave a big boost to Saudi revenues as Saudi Arabia's net foreign assets at June 30 were up $13.0b MoM to $448.5b vs $435.5b in May, but down $3.6b from $452.1b in Nov 2020. Oil prices have been around $100 since Russia/Ukraine, but they were still basically still over $70 in Dec and over $80 in Dec. With the decline in net foreign assets, it reinforces that there is a lot more on the cost side to Saudi Arabia. Saudi Arabia is far from going broke but there has been a huge decline in the last 7 years, but it is still a very big nest egg. This net foreign asset depletion is why we have been highlighting that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money (OPM) to fund as much of their Vision 2030 as possible. And no question, accessing OPM has helped to slow down and temporarily pause the decline in net foreign assets, at least up until the past few months. Saudi Arabia's central bank (SAMA) doesn't provide explanations for the monthly swings. But it looks like it is trending back towards November levels as oil prices remain elevated. Saudi net foreign assets on June 31 of $448.5b are up $6.6b YoY from $441.8b at June 30, 2021. The peak in Saudi net foreign assets was $737.0b on Aug 31, 2014, which means there has been a decline of >$280.0b, or approx. $3.0b per month for that period. We believe this is why there has been such a big push in the last few use to get OPM so Saudi doesn't keep depleting its nest egg. And why we call this the #1 financial theme for Saudi Arabia in the 2020s – the increasing use of Other People's Money. And not just in Saudi Aramco, although we do expect to see more equity and bond sales from Aramco. Below is our graph of Saudi Arabia net foreign assets updated for the June 30 data.

Figure 28: Saudi Arabia Net Foreign Assets

Source: Bloomberg

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

Surprising admissions on Saudi production capacity

We are repeating an item from last week's (July 31, 2022) Energy Tidbits because of the high level of interest. Here is what we wrote *"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 29: 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

Oil – JCPOA indirect negotiations resume, Times of Israel suggests some progress

JCPOA negotiations resume

The indirect negotiations for the JCPOA have now resumed in Vienna. What has struck us through the last months has been that the US hasn't walked away and it continues to reinforce our view that Biden really wants to get a JCPOA done. He hasn't been able to do so yet, but we suspect this round will likely determine if there is any chance to get the JCPOA done before the mid term elections. It was interesting to see The Times of Israel report on Friday that suggested there was some progress being made on two key issues – the US would somehow give language to satisfy Iran they wouldn't just pull out of the deal again, and

Iran being prepared to leave the designation of the IRGC out of the way for now. The Times of Israel referred to some unnamed senior EU official. The Times of Israel wrote "*A senior EU official said progress was made after world powers reconvened in Vienna for a fresh round of talks to salvage the Iran nuclear deal." "The senior EU official said the progress included guarantees that the United States would not scupper the deal by going back on its word in the future. It was unclear how this would be possible, and a number of Republican presidential hopefuls have already pledged to once again withdraw the US from the agreement if elected in 2024. "We have now quite substantial guarantees," the EU official insisted. "It's my understanding that Iran is happy and feels satisfied with what is in the text." A demand by Tehran that the United States remove the country's powerful Islamic Revolutionary Guard Corps from the State Department's official blacklist of "foreign terrorist organizations" has been dropped from the discussions, the official added. It will instead be handled "in the future" — after the deal."* Our Supplemental Documents package includes the Times of Israel report.

Oil – Iraq's YTD July 31 revenue $71.9b almost equal to full year 2021 $75.5b

Iraq oil revenues

Earlier this morning, we tweeted [LINK] "*ICYMI. Here's why #OPEC+ members want to work together post Dec 31. They are printing huge $$$ at $100 oil. Iraq oil revenues: July $106b, June $11.5b, May $11.4b. YTD July 31 $71.9b vs Full year 2021 $75.5b. #OOTT*." Note our original tweet had a typo of July at $11.1b, we tweeted a correction to $10.6b. Iraq is a great example of how OPEC+ countries are having huge financial years with $100 oil. The OPEC+ declaration of commitment that saved oil prices ends on Dec 31 and we expect to see clear messaging that the countries will continue to work together in the future. On Tuesday, Kurdistan news, Rudaw, reported on Iraq's oil revenues for July. [LINK] Rudaw wrote "*Iraq in July pocketed $10.6 billion in oil revenues, the oil ministry said on Monday raising the country's total oil revenue since the start of the year to over $70 billion. Over 102 million barrels of oil were exported last month with a rate of 3.3 million barrels per day, as revealed by the ministry in its monthly report. Iraq's total gross amount from oil sales was placed at $11.608 billion, at an average price of $103 per barrel. July's numbers are Iraq's lowest reported revenue from oil sales in three months. The oil ministry reported over $11.5 billion in oil revenue in June, Iraq's highest ever recorded gross, and over $11.4 billion in May. The revenue of July raises Iraq's total gross to more than $71.9 billion dollars this year, only a few billion dollars shy of already surpassing the entire gross of 2021 which was reported to be over $75.6 billion dollars."*

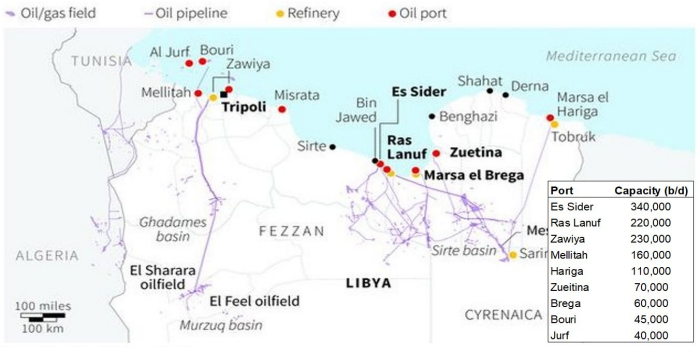
Oil – Libya exports to hit 1.01 mmb/d in Aug, first time since Apr over 1 mmb/d

Libya exports 1.01 mmb/d in Aug

It's been a second week of recovery in Libya oil production and exports. Last week's (July 31, 2022) Energy Tidbits wrote "*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."* On Wednesday, Bloomberg reported "*Libya plans to export 31.4m bbl or 1.01m b/d of crude in August, exceeding 1m b/d mark for the first time since April. * Compares with 621k b/d in July. * Es Sider exports will be 9.2m bbl, or 297k b/d in August, compared with 84k b/d in July, according to loading program seen by Bloomberg."* The question remains how long will this last given there is still no visibility to the delayed elections. There were widely reported heavy fighting south of Tripoli early Saturday morning. As of our 7am MT news cut off, we have not seen any reports of the same early this morning.

Figure 30: 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

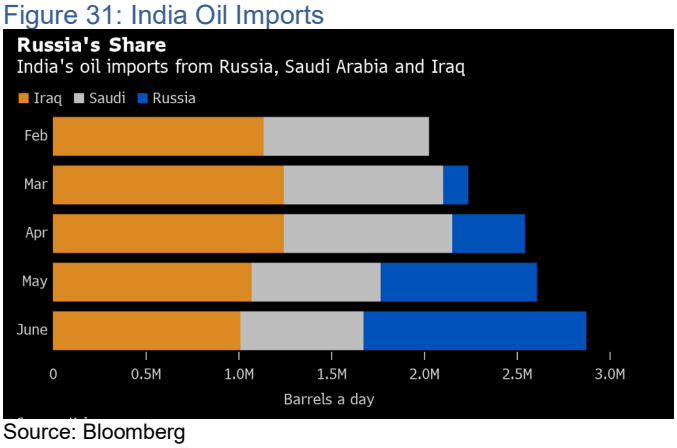
Source: SAF Group

Oil – India buying discounted Russia oil = big increase in Russia oil imports

India increasing Russia oil imports

There was a good reminder this week that China and India are the big winners from sanctions on Russia. On Thursday, we tweeted [LINK] "*India & China are the big winners and taking advantage of big price discount on RUS #Oil as US/EU try to shut down RUS #Oil exports. RUS discount to Saudi oil was $19/b in May, still $13/b in June. Thx @business @JournoDebjit for great graphs. #OOTT*". Bloomberg reported [LINK] Russia surpassed the Saudi Arabia as the second biggest supplier to India in June, ranked just behind Iraq. The founder of Vanda Insights stated, "*Indian refiners are going to try and get their hands on the cheapest crude possible that works with their refinery and product configurations. Russian crude fits that bill for now. The Saudis and Iraqis are not entirely losing out because they are directing more supply to Europe.*" Our Supplemental Documents package includes the Bloomberg report.

Figure 31: India Oil Imports



Source: Bloomberg

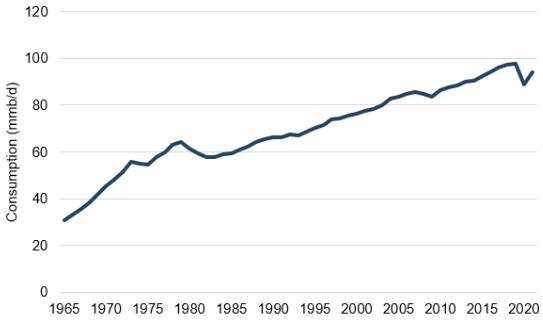
Oil – Oil % of energy mix keeps declining but oil consumption keeps going up

Oil % of energy mix vs oil demand

On Tuesday, we tweeted a reminder on the math that oil % of the energy mix can keep declining as it has, but that oil consumption on a b/d basis can keep increasing as it has. We

saw a tweet from respected oil analyst Art Berman [LINK] "*The end of the oil age began with the price shocks of the 1970s. Oil consumption has fallen from 48% to 36% of total energy use since 1977. #OOTT #oilandgas #WTI #CrudeOil #fintwit #OPEC #Commodities #ClimateActionNow #NetZero #renewables."* No one disagrees with oil's declining share of the energy mix. But we thought it was important to note that in that same period, oil consumption, based on BP data, went from 59.97 mmb/d in 1977 to 94.08 mmb/d in the partially Covid recovered 2021 and higher in 2022. We tweeted [LINK] "*No question, #Oil share of #EnergyMix will keep going lower. The question will be how much higher will demand go before peak demand hits? #BP oil consumption 1977 was 59.97 mmbd, Covid 2020 88.75, partial recovery 2021 94.08 mmbd. IEA WEO stated policies 103 mmbd in 2030. #OOTT".* This is the key – oil consumption still keep going higher despite a declining share of oil in the energy mix. It's why peak oil demand isn't forecast until after 2030. Our tweet referenced the latest WEO forecast for the stated policies case that doesn't forecast peak oil demand until sometime after 2030. Below are the BP oil consumption data and IEA's WEO forecast for oil consumption referenced in our tweet.

Figure 32: World oil consumption



Source: BP

Figure 33: IEA World Oil Demand

Table A.8: Oil demand (mb/d)

	Historical			Stated Policies		Announced Pledges		Sustainable Development	
	2010	2019	2020	2030	2050	2030	2050	2030	2050
World	86.7	96.6	87.9	103.0	103.0	96.1	76.7	87.6	47.0
North America	22.2	22.7	20.1	21.3	16.7	18.0	7.7	17.7	6.8
United States	17.8	18.4	16.4	17.4	13.4	14.7	5.4	14.6	5.4
Central and South America	5.5	5.5	5.0	5.4	6.0	4.8	4.0	4.5	2.4
Brazil	2.3	2.4	2.3	2.4	2.5	1.9	1.1	1.9	1.0
Europe	13.9	13.0	11.9	10.4	6.4	9.0	3.6	8.7	2.2
European Union	10.6	9.7	8.9	7.4	4.1	6.2	1.4	6.2	1.3
Africa	3.3	4.0	3.6	5.1	8.4	5.0	7.9	4.6	4.3
Middle East	6.6	7.4	6.7	8.2	10.2	8.2	10.2	7.2	6.1
Eurasia	3.2	3.8	3.7	4.4	4.5	4.4	4.5	4.0	2.6
Russia	2.6	3.1	3.0	3.5	3.1	3.5	3.1	3.2	2.0
Asia Pacific	25.0	32.0	30.8	38.5	38.8	37.8	30.1	33.0	17.2
China	8.8	13.1	13.3	15.7	13.4	15.7	6.4	13.6	5.9
India	3.3	4.8	4.4	7.2	9.2	7.2	9.2	6.0	4.1
Japan	4.2	3.4	3.1	2.8	1.8	2.4	0.8	2.4	0.8
Southeast Asia	4.0	5.1	4.7	6.6	7.7	6.6	7.6	5.6	3.2
International bunkers	7.0	8.3	6.1	9.6	11.9	8.9	8.8	7.9	5.4

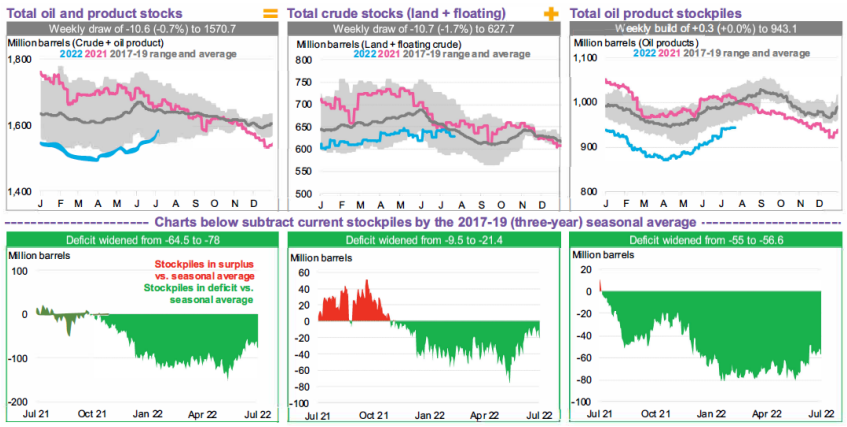
Source: IEA World Energy Outlook October 2021

Oil – BNEF: global oil and product stocks deficit widened

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 global oil and products stockpile deficit widened for crude and products from 64.5 mmb to 78.0 mmb. The stockpile deficit against the five-year average (2015-19) narrowed from 48.0 mmb to 56.1 mmb. Total crude inventories decreased by 1.7% to 627.7 mmb, including global floating inventories. Product stocks were up 0.03% WoW with the stockpile deficit against the 3-year average widening from 55.0 to 56.6 mmb. Gas oil and middle distillate stocks have widened against their three-year average deficit (2017-2019) from 35.3 mmb to 38.7 mmb. Jet fuel consumption by international departures increased by 54,500 b/d WoW while consumption by domestic passenger departures decreased by 3,200 b/d. The global mobility index increased over the past week, up 0.4% in the week to July 28. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 34: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Oil – Vortexa crude oil floating storage 97.72 mmb as of Aug 5, +1.90 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 30 at noon MT. (i) As of Noon MT yesterday, Bloomberg has posted Vortexa crude oil floating storage estimate as of 97.72 mmb, which is +1.90 mmb WoW vs revised up July 29 of 95.82 mmb. Note July 29 of 95.82 mmb was revised +16.96 mmb vs the 78.86 mmb posted on Bloomberg as of noon MT on July 30. (ii) Note that, like seen in two prior week's data, week's data, other than the July 15 data, the several six weeks were all revised up vs the data posted last week. But the revisions were not like the huge revision to July 29. The revisions were +16.96 mmb to July 29, +1.89 mmb to July 22, -0.91 mmb to July 15, +3.28 mmb to July 8, +1.44 mmb to July 1, +1.86 mmb to June 24, +2.11 mmb to June 17, +-0.66 mmb to June 10, and +1.86 mmb to June 3. (iii) With the revisions, crude oil

floating storage is more like +/- 95 mmb vs the +/- 90 mmb that was seen the last couple weeks. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) Aug 5 estimate of 97.72 mmb is -125.06 mmb vs June 26, 2020 peak of 222.78 mmb. (vi) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in late March/ thru late June 2020 as Covid started to have a huge impact. Aug 5 estimate of 97.72 mmb is +45.41 mmb vs pre-Covid of 52.31 mmb on Aug 5, 2019. Aug 5 estimate of 97.72 mmb is -5.55 mmb YoY vs 103.27 mmb on Aug 6, 2021. (vii) Below are the last several weeks of estimates made as of yesterday noon MT, July 30 at noon MT, and July 23 at noon MT.

Figure 35: Vortexa Floating Storage as of Aug 5 posted on Bloomberg Noon MT yesterday

Source: Bloomberg, Vortexa

Figure 36: Vortexa Estimates Posted Aug 6 noon MT, July 30 noon MT, July 23 noon MT

Posted Aug 6, noon MT

FZWWFST VTXA Inde 94) Su
08/04/2019 - 08/05/2022
1D 3D 1M 6M YTD 1Y

	Date	FZWWFST VT... Last Px
Fr	08/05/2022	97720
Fr	07/29/2022	95816
Fr	07/22/2022	87022
Fr	07/15/2022	86619
Fr	07/08/2022	96039
Fr	07/01/2022	96794
Fr	06/24/2022	96394
Fr	06/17/2022	106.642k
Fr	06/10/2022	103.827k
Fr	06/03/2022	86967
Fr	05/27/2022	97566

Posted July 30, noon MT

FZWWFST VTXA Inde 94) Su
07/28/2019 - 07/29/2022
1D 3D 1M 6M YTD 1Y

	Date	FZWWFST VT... 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 Inde 94) Su
07/21/2019 - 07/22/2022
1D 3D 1M 6M YTD 1Y

	Date	FZWWFST VT... 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

Source: Bloomberg, Vortexa

Oil – Caixin PMI for July is down slightly at 50.4, after last month at 51.7

One of the overlooked items for oil markets is China recovering out of Covid. It isn't getting much oil market attention given the negative economy/market views around the world. The

Caixin PMI down in July

Caixin China Manufacturing PMI data for July [LINK] was released on Sunday night (North America time) and the index showed the rate of improvement easing slightly from June's 13-month high. On Sunday, we tweeted [LINK] *"China Caixin PMI for July 50.4 vs Est 51.5 & June 51.7. "However, overall growth momentum softened since June amid slower upturns in output and total new work." Thx @IHSMarkitPMI. #OOTT".* June 2022 was the highest PMI since May 2021. IHS wrote "*July survey data pointed to a further improvement in the health of China's manufacturing sector following the easing of COVID-19 containment measures. However, overall growth momentum softened since June amid slower upturns in output and total new work. Relatively subdued demand conditions and efforts to contain costs led to another decline in employment, while firms were able to further reduce backlogs of work. Cost pressures meanwhile eased notably on the month, with average input costs rising at the weakest rate since last December, while prices charged were cut for the third month running."* Our Supplemental Documents package includes the Caixin China PMI for July.

Oil – Difference between gasoline retail sales vs gasoline supplied to gas stations

Gas sales at the pump vs gas supplied to gas stations

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

there just a lot more demand to come back if gasoline prices stay below $4/gallon?? And it's also why we the EIA motor gasoline product supplied data over the next couple reporting weeks will be closely scrutinized.

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

US gas stations hold a lot of gasoline in tanks

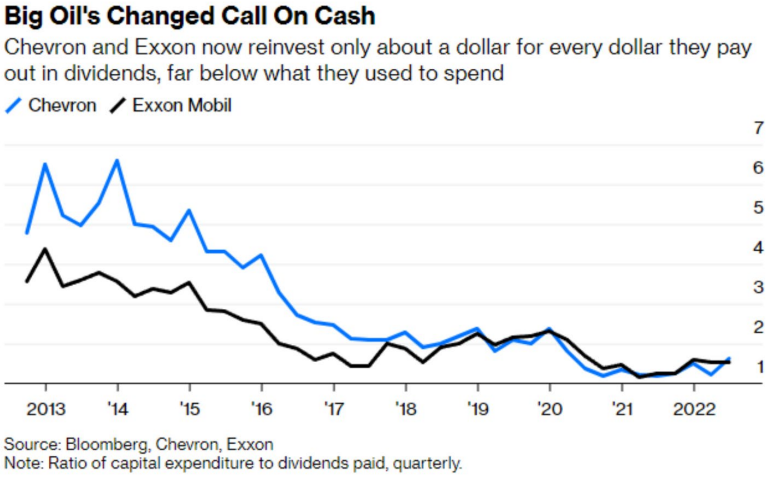
The controversy on how strong is US gasoline consumption brought up the issue of how US gas stations will order more or less gasoline for delivery depending on their view of immediate term gasoline prices. It brings up the question of how gasoline is in inventory at US gas stations. We could not find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

Oil & Natural Gas – Chevron/Exxon return to shareholders ~= to investment capital

Chevron/Exxon return to shareholders

On Tuesday, we tweeted [LINK] "*Buckle up! Reminds why #Oil #NatGas look good thru 2020s. Blame Russia, blame whatever. Big ramp in #Wind #Solar, but not eliminating #FossilFuels as quickly (at all yet?) as #EnergyTransition plans. Yrs of underinvestment can't be fixed quickly. Thx @liamdenning @NatBullard #OOTT.*" Markets can spend time figuring out what to blame, but that isn't the key point. The key point is that big oil has a new investment model. They aren't doing any major acceleration of oil and gas investing when oil, natural gas and LNG prices are all very high. And that means several years of underinvestment aren't corrected quickly. And it's why oil and natural gas looks good for the 2020s. The original Bloomberg tweet [LINK] was "*This is a pretty extraordinary chart from @liamdenning: Chevron and Exxon Mobil now reinvest about the same amount of money as they return shareholders - last time oil was $100+ a barrel, it was $4-5 reinvested per $1 dividends [LINK].*"

Figure 37: Chevron and Exxon ratio of investment to return to shareholders



Source: Bloomberg

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

Sector insights from Q2 calls

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

Allianz – EUR -29b net flows out of PIMCO, mainly from fixed income

Allianz, the parent of PIMCO, reported Q2 on Friday. One of the key stories were redemptions out of PIMCO, in particular from fixed income. The Allianz Q2 call slide deck wrote "*3rd party net flows PIMCO: EUR -29b. 3rd party net outflows mainly from fixed income, in line with overarching market trends. 3rd party net inflows in alternatives*."

Beyond Meat – people can't afford their protein so switch to animal protein

Beyond Meat held its Q2 call on Thursday. We were reminded of what was happening in the energy markets by their call. The headlines were all about weak sales, reducing guidance and cutting people, which management blamed on people moving away from their protein to cheaper animal protein. No wonder, mgmt. noted that in June their protein was $8.35/lb vs USDA ground beef of $4.90/lb and that reflected the increasing cost of animal protein. Mgmt said "*We need to continue to temper expectations given the clear precedent for consumers to trade down among proteins in grocery stores when buying power shrinks inflationary periods as I noted earlier, we've indeed begun to see this trading down materialize and expect to continue for the time being".* Mgmt's comments on why they had a bad quarter

remind of some of the issues being seen in a return to coal and with EV penetrations. Good reminder that people will do things that are believed to be environmentally friendly assuming the cost to do so assuming they can afford to pay the premium to be environmentally friendly. It's kind of like EVs that, even with the incentives, haven't really had huge penetration success among lower income people. Or countries don't want to pay high LNG prices so are switching to coal. Our Supplemental Documents package includes excerpts from the Beyond Meat Q2 call transcript.

BP – Increasing Lower 48 production but not material to the overall US

BP held its Q2 call on Tuesday. And in the call, they noted they are increasing their US oil and gas capex from $1 to $1.7 billion in 2022. That is a significant capex increase and their focus is on short cycle drilling. But BP is not a huge player in the US so it's impact won't be material to the overall US production base. On Tuesday, we tweeted [LINK] "*Shouldn't look to @bp_plc to drive any big increase in overall US #Oil #NatGas production. #BP Q2 Lower 48. Liquids +21,000 b/d YoY to 127,000 b/d. #NatGas +0.174 bcf/d YoY to 1.145 bcf/d. Rigs +1 YoY to 9 rigs (3 Haynesville, 4, Eagle Ford, 2 Permian). #OOTT."* BP's Lower 48 liquids is only 127,000 b/d. The other key reason is that BP doesn't run many rigs. In Q2/22, BP had only 9 active drilling rigs – four in the Eagle Ford, three in the Haynesville and two in the Permian.

Maersk – Global supply chain issues set to continue

Maersk held its Q2 call on Wednesday. The big general reminder from the call is the "*quick resolution of global supply chains issues is increasingly unlikely*". Mgmt said "*As we all know, congestion really ramped up last year in the U.S. West Coast as import volumes jumped up at the same time as labor supply, longshoremen, truck drivers, warehouse workers dropped because of COVID-19. We had expected the congestion to ease by the middle of this year as demand put moderate. But, as we can see on the left-hand chart, import volumes into the U.S. remained at very, very high levels. The situation on the ground have eased, that – while congestion has eased a bit on the West Coast, congestion has spread to the East Coast and to Europe, even though European volumes are essentially lined with pre-pandemic levels. But containers are just not moving off the terminals as fast as we would like to see. One simple example, on the West Coast, we have massive problems getting rails cars. Yesterday, we had 8,500 containers in our Los Angeles Terminal, waiting for rail cars, which is 3x or 4x the average rail flow from a few years ago. Across the East Coast, the West Coast and Europe, we see issues in getting enough labor to drive trucks and with customers not picking up containers because of the full inventories. The picture means that a quick resolution of global supply chains issues is increasingly unlikely, but we do expect that we will see a gradual normalization from the fourth quarter towards the end of the year as macro headwinds keep demand down and labor market become less tight.*"

Petronet – Spot LNG price is rising too high

Petronet held its Q2 call on Friday. Earlier, we noted Petronet's comment about waiting on long term Qatar contract negotiations in the hopes that the slope will be lower. Petronet also noted how the high spot LNG price is rising too high for the LNG

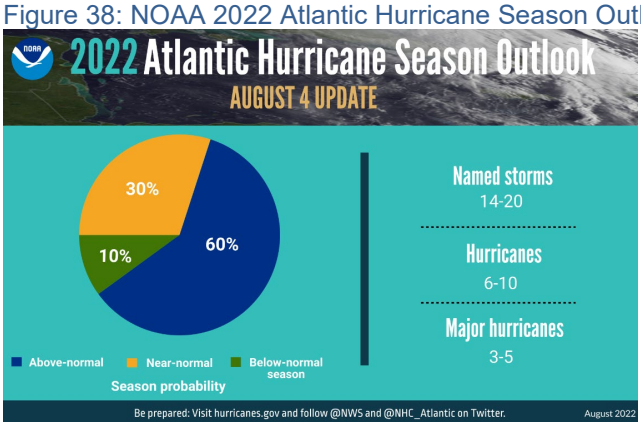
trading arm to jump in. In the Q&A, mgmt. said "*But right now, the LNG price is rising too high is not LNG that trading through that arm is also is a challenge. So, we had objective of having some spot reading cargo to that entity, that right away for fear is not too good to have some PLNG in our portfolios and supply demand is this price is of course, I but demand is not there in India. So we hope that as soon as we prices also supplies come down and these are affordable then, perhaps you can think of trading some data for right now. We cannot think of any opportunity and not even any opportunities coming up to us that entity that we can do, in future we will do this podcast was trading will be students".*

Above average hurricane forecast

Oil & Natural Gas – Still expecting an above average Atlantic hurricane season

Two of the major hurricane forecasters came out with their updated outlook for Atlantic hurricane season and both continue to forecast above average hurricane season. (i) NOAA issued its annual midseason update on Thursday [LINK], and atmospheric and oceanic conditions are conducive for an above-average hurricane season. We tweeted [LINK] "*Reminder, just now moving into the Aug 15 thru Oct 15 normal peak season for Atlantic hurricane activity. Updated @NOAA hurricane forecast still calls for above normal hurricane activity, essentially unchanged vs May 24 forecast. #OOTT #NatGas #Oil #LNG*". NOAA is expecting a 60% chance of an above-normal hurricane season, 30% chance on near normal, and 10% chance of below normal. Forecasts for an above average hurricane season is a reminder to be prepared for supply interruptions in the Gulf Coast. The NOAA wrote *"NOAA's update to the 2022 outlook — which covers the entire six-month hurricane season that ends on Nov. 30 — calls for 14-20 named storms (winds of 39 mph or greater), of which 6-10 could become hurricanes (winds of 74 mph or greater). Of those, 3-5 could become major hurricanes (winds of 111 mph or greater). NOAA provides these ranges with a 70% confidence".* NOAA also reminded of correlation between active hurricane seasons and La Nina/Neutral conditions, the NOAA wrote *"There are several atmospheric and oceanic conditions that still favor an active hurricane season. This includes La Niña conditions, which are favored to remain in place for the rest of 2022 and could allow the ongoing high-activity era conditions to dominate, or slightly enhance hurricane activity. In addition to a continued La Niña, weaker tropical Atlantic trade winds, an active west African Monsoon and likely above-normal Atlantic sea-surface temperatures set the stage for an active hurricane season and are reflective of the ongoing high-activity era for Atlantic hurricanes".* (ii) The well regarded Philip Klotzbach and team at Colorado State University also issued their updated Atlantic Hurricane season forecast on Thursday [LINK]. They reduced their forecast for 2022 but are still calling for another above-normal year. Their July forecast had called for an above-average season, and this month they decreased their forecast slightly. The CSU forecasters wrote *"We have decreased our forecast but continue to call for an above-average 2022 Atlantic hurricane season. Sea surface temperatures averaged across the tropical Atlantic are slightly warmer than normal, while subtropical Atlantic sea surface temperatures are cooler than normal. Vertical wind shear anomalies averaged over the past 30 days over the Caribbean and tropical Atlantic are slightly weaker than normal. Current La Niña conditions are likely to persist for the rest of the Atlantic hurricane season. We continue to anticipate an above-normal probability for major hurricanes making landfall along the continental United States coastline and in the Caribbean".* Our Supplemental Documents package includes the NOAA and Klotzbach forecasts.

Figure 38: NOAA 2022 Atlantic Hurricane Season Outlook



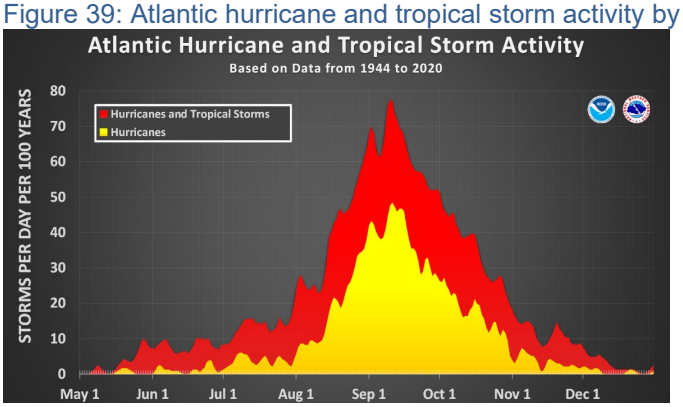
Source: NOAA

Oil & Natural Gas – Atlantic hurricane activity normally ramps up 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 39: Atlantic hurricane and tropical storm activity by month



Source: NOAA

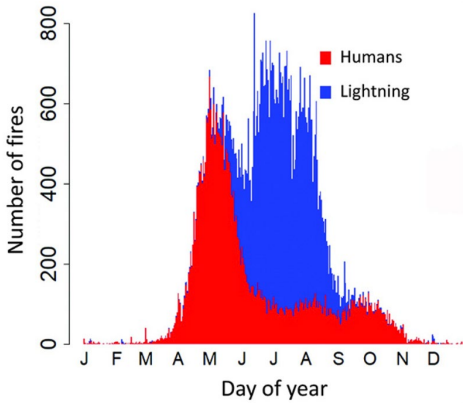
Oil & Natural Gas – Keep our fingers crossed, wildfires so far not as bad as feared

In the middle of peak wildfire season

We were scanning Grande Prairie news and saw Thursday's report '*The County of Grande Prairie has lifted the fire advisory for the entire region, including the towns of Beaverlodge, Sexsmith and Wembley.Regional fire officials say they were able to lift the advisory, which has been in place since July 27th, due to cooler temperatures and recent rainfall*." [LINK]. That was a relief to Grande Prairie as there was very low precipitation in July, which has

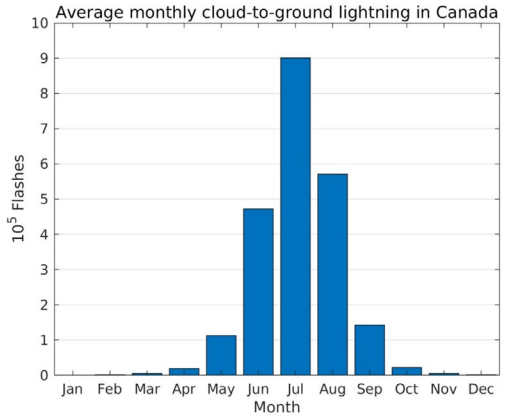
raised fears of an active wildfire period in NW Alberta. Unfortunately, wildfire season is unpredictable. Below are two graphs that remind the big factor for wildfires is lightning. For a good way to track the wildfires, check out the AB [LINK] and BC [LINK] wildfire maps, which show any active fires as well as the stage of control they are in as well as their suspected cause. Below is the Wildfire Today graph of wildfires in Canada by month [LINK] Canada Environment and Natural Resources graph showing average monthly cloud-to-ground lightning in Canada [LINK]..

Figure 40: Canada Wildfires Distribution Over Year



Source: Wildfire Today

Figure 41: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Energy Transition – DOE call for bids to prove grid can be reliable under clean energy

Help DOE prove a reliable grid

Biden Administration calls for projects to help demonstrate the US electricity grid can be reliable in a US move to clean energy. It's a bad look for the Biden Administration. It seems to infer they either didn't look at this before committing the US to the move to clean energy, or their models aren't working. Because if their models work, why are they doing unneeded

analysis? On Tuesday, the Dept of Energy announced [LINK] "*The Biden-Harris Administration, through the U.S. Department of Energy (DOE), today announced $26 million to fund projects that will demonstrate that America's electricity grid can reliably run with a mix of solar, wind, energy storage, and other clean distributed energy resources. Funded by President Biden's Bipartisan Infrastructure Law, the Solar and Wind Grid Services and Reliability Demonstration Program will show how clean energy resources can address key reliability challenges facing the grid by developing and testing tools and plant functions that allow the grid to stay online amid disturbances and restart if it goes down. The demonstration projects will provide data to underscore how President Biden's goal of 100% clean electricity by 2030 can be achieved while supporting grid reliability."* Our Supplemental Documents package includes the DOE announcement.

Energy Transition – Glencore, renewables can't fill a growing gap from less fossil fuels

Increasing energy gap

We probably should have put this under natural gas or oil & natural gas, but left it in the energy transitions section as Glencore's bullish view on natural gas and coal is linked to a growing gap that renewables just can't fill. On Thursday, Glencore posted its H1/22 report. We recommend reading the excerpts attached to our memo. We tweeted [LINK] "*Buckle Up! #Glencore H1. Bullish for #Coal #LNG for H2/22, Also, pre RUS #NatGas #LNG #Oil fundamentals were already strong for 2020s "Energy prices were already at elevated levels before the conflict, reflecting resurgent demand, tight supply and reducing inventories" .. #OOTT* ." And [LINK] "Very bullish post RUS with "growing gap between an overly accelerated decline of fossil fuel base load generating capacity & the current & nearer-term capabilities of variable #RenewableEnergy sources and associated infrastructure around the world" #OOTT #NatGas #LNG #Coal". There are many great insights into oil, natural gas, LNG, coal and metals. One key reminder is that these markets were already tight before any Russian/Ukraine conflict ie. back in 2021. Glencore highlighted the bullish near term for coal and LNG prices writing "*With few short term solutions to rebalance global energy markets, coal and LNG prices look set to remain elevated over the second half of the year, particularly given the current challenge of securing sufficient and reliable energy supply for the Northern hemisphere winter ahead."* And we highlighted the big picture concern on the growing gap. Glencore wrote "*growing gap between an overly accelerated decline of fossil fuel base load generating capacity and the current and nearer-term capabilities of variable renewable energy sources and associated infrastructure around the world*." Our Supplemental Documents package includes excerpts from the Glencore H1 report.

Energy Transition – Germany restarts coal fired power plant

Germany restarts coal power plant

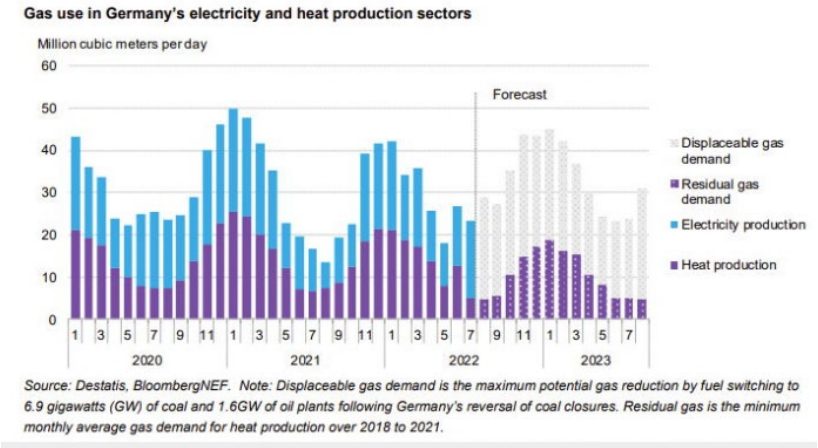
Germany's scramble to be able to replace Russian natural gas is now being forced to allow the return of coal-fired power generation. Coal-fired power generation has been the #1 fossil fuel target of Green parties everywhere, including the Germany Green party that is part of the government. But the reality is that coal has to come back and not just because it's cheaper than LNG. So coal-fired power generation is coming back to Germany. The first hard coal fired reserve power plant is to be put into operation in Germany to help partially replace natural gas power generation. It is the Mehrum power plant in Lower Saxony, which belongs to the Czech energy group EPH. It has been in reserve since the beginning of December 2021, and it generated enough electricity to theoretically supply more than half a million homes in 2018. Zeit reported [LINK] that controversy arose in the federal government over using gas to generate electricity. Germany's finance minister called for this form of electricity

generation to be stopped and for nuclear power plants to be allowed to continue to run. A spokesman for Habeck replied that a complete abandonment of gas in the electricity sector would lead to the electricity crisis and blackouts. *"There are system-relevant gas-fired power plants that have to be supplied with gas. If they don't get gas, serious disruptions occur. Unfortunately, that's the reality of the electricity system, which you have to know in order to ensure security of supply."* The federal government is allowing electricity to be sold from reserve coal or oil fired power plants until April 2023. Power plant operators are incentivised to restart operations for several months due to surging electricity prices and sufficient hard coal supply. The Essen-based company Steag announced that they want to bring power plants totaling 2,300 megawatts back into operation. The Düsseldorf group Uniper is currently examining additional production of more than 2,000 megawatts. Our Supplemental Documents package includes the Zeit report.

BNEF "*Coal Can Help Germany Cut 66% of Gas Used for Power*"

On Monday, BloombergNEF provided the below graph and wrote "*The European Union's plan to cut 15% of gas use between now and the end of winter identifies fuel switching as key for the power sector. Based on 8.6 gigawatts of coal and oil capacity being revived, fuel switching could displace a maximum of 25 million cubic meters per day of Germany's average power sector gas demand between August 2022 and March 2023, according to BloombergNEF. This is equivalent to a 66% reduction. Any further curbs in gas use would require halting heat-related processes.*

Figure 42: Gas use in Germany's electricity and heat production sectors



Source: BloombergNEF

Energy Transition – Environmental tire slasher group also targets EVs, not just SUVs

Tire slashers also go after EVs

We will regularly have CTV National News on in the background early in the morning or later at night so often get Cdn news reports. One from last Sunday [LINK] was "*A new environmental activist group claims to have deflated the tires on 34 SUVs in Victoria and Oak Bay this week.The group, called "Tyre Extinguishers," describes itself as "a worldwide direct action environmentalist group with the goal of eliminating SUVs from urban areas." It says the vehicles it "disarmed" Thursday night represent the first Tyre Extinguishers action in Western*

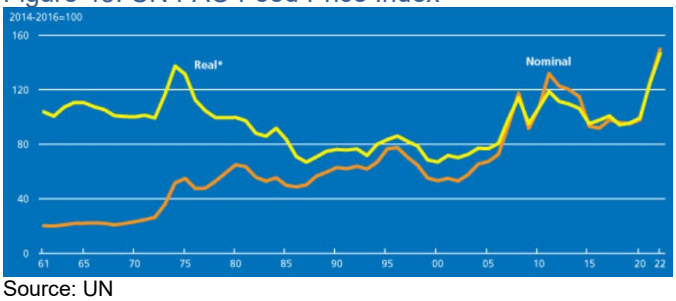
Canada." We went to their website to look at their mandate and it was interesting to see that their cause is also against electric vehicles. The priority is SUVs in urban areas, but they also say electric vehicles are fair game. The Tyre Extinguishers "*How to Deflate a SUV Tyre*" [LINK] writes " • *Hybrids and electric cars are fair game. We cannot electrify our way out of the climate crisis - there are not enough rare earth metals to replace everyone's car and the mining of these metals causes suffering. Plus, the danger to other road users still stands, as does the air pollution (PM 2.5 pollution is still produced from tyres and brake pads)."* Our Supplemental Documents package includes the CTV report and the Tyre Extinguishers How To Deflate a SUV Tyre.

Capital Markets – UN FAO Food Price Index registered a steep decline in July

UN food price index +13.1% YoY

There isn't an explanation for the factors driving the numbers, but there was a steep decline in the UN global food price index for July 2022. It was +13.1% YoY, but that is down huge from the all-time record highs of +33.6% YoY seen in March 2022. On Friday, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*FAO Food Price Index registered a steep drop in July".* Note this is on a Real price basis. The FFPI averaged 140.9 points for July 2022, which was -13.3% MoM and +13.1% YoY. The drop in the FFPI in July was led by a significant decrease in the vegetable oil price index, along with a declines in every other index. The Vegetable oil index was down -19.2% MoM, marking another retreat from April's all time high. The Sugar Price Index was down -3.8% MoM and the Dairy Price Index was down -3.8% MoM though still +25.4% YoY. The Meat Price Index was down 0.5% MoM, driven by poultry meat prices amidst tight global supplies. Below is the all time FFPI graph. Our Supplemental Documents package includes the UN FAO Food Price Index update.

Figure 43: UN FAO Food Price Index



Source: UN

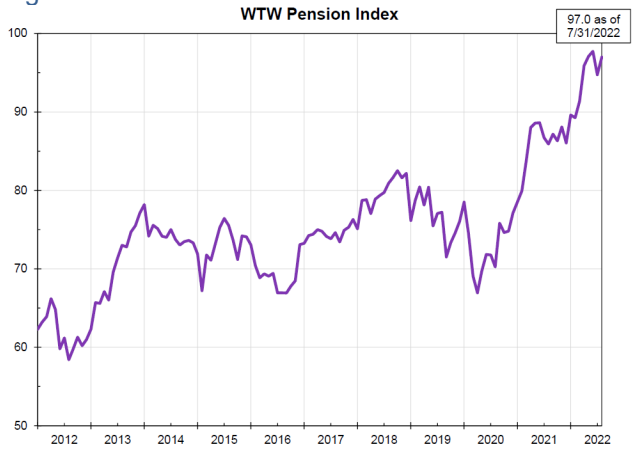
Capital Markets – WTW, pensions are stronger with stronger investment returns

WTW Pension Finance Watch

On Thursday, WTW posted its Pension Finance Watch July 2022 [LINK], which showed a recovery from most of June's declines. For once, the recovery wasn't' from higher interest rates, but from better investment returns. We have been highlighting the math involved in assessing the strength/security of a pension is what input variables are used. And how increasing interest rates have been the key driver in 2022 of the increasing pension index. 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."* However, for

once the new Pension Fund Watch update for July highlighted stronger investment returns. WTW stated *"The WTW Pension Index started the third quarter on a positive note, recovering most of June's declines. The increase was primarily due to strong investment returns, partially offset by the impact of decreased discount rates. The end-of-July index level of 97.0 reflects an increase of 2.4% for the month."* Our Supplemental Documents package includes the WTW Pension Finance Watch for July.

Figure 44: WTW Pension Index



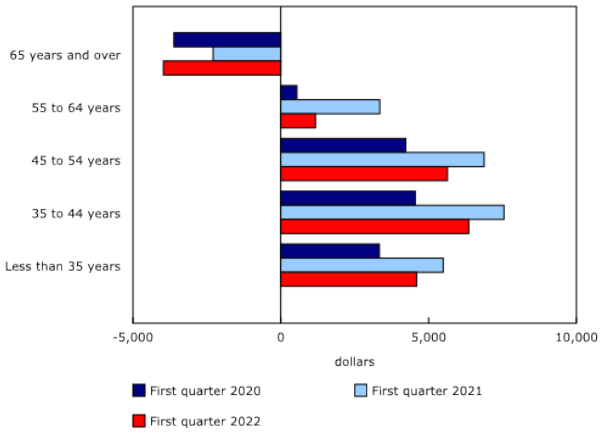
Source: Willis Towers Watson

Older Cdns hit in their savings

Demographics – Older Canadians been hit the hardest in their savings since Covid

We believe that one of the biggest challenges for governments over the coming years will be what level of financial support is provided to the rapidly aging population. That challenge is being made worse by seniors being hit the hardest in their savings since Covid. There is no question that there are seniors who have accumulated wealth and aren't impacted by any savings loss. But most really don't have substantial pensions apart from Canada Pension Plan or savings to draw upon. And it looks like senior have been the hardest hit on their savings since Covid. On Wednesday, Statistics Canada posted its report "*Distributions of household economic accounts for income, consumption and saving of Canadian households, first quarter of 2022*" [LINK]. Statistics Canada wrote "*Households in every age group decreased their average net saving in the first quarter of 2022 compared with the same quarter a year earlier, especially seniors (-73.5%) and those aged 55 to 64 years (-65.0%). While net saving for households with an older major income earner dropped more relative to younger age groups, this does not necessarily mean that their economic well-being is worsening, as households in older age groups tend to have accumulated significant pension and other financial assets from which they may draw to fund their consumption.*"

Figure 45: Average household net saving by age group of major income earner



Source: Statistics Canada

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

US nuclear bombs were on Aug 6 Hiroshima and Aug 9 Nagasaki

Everyone has their view on Iran but it doesn't seem like many people, outside Isreael, truly fear the potential of Iran or other countries having the capability for a nuclear weapon. We suspect its because it has been 77 years since the last, and only, nuclear bombs were used as a weapon. The only two nuclear bombs used as weapons were the nuclear bombs the US dropped on Hiroshima on August 6, 1945 and on Nagasaki on August 9, 1945. The death toll wasn't all immediate, but general estimates were over 125,000 killed in Hiroshima and over 225,000 in Nagasaki. As a result, there was a real fear of nuclear bombs certainly thru the 60s. Baby boomers can recall having nuclear bomb drills in grade schools in the early 60s. And in

hindsight, it was kind of silly for the teacher to tell first graders to hide under their desk. No question, Israel feels differently, but it feels like not as many countries and people fear the potential of nuclear bombs.

Hiroshima's Genbaku Dome is a must see

I had the opportunity decades ago to be in a very small group to be with a Japanese businessman who grew up 50 km from Hiroshima and go see the Hiroshima Prefectural Industrial Promotion Hall. The hall is now referred to as the Genbaku Dome. Google Translate is the Atomic Bomb Dome. It brought a moving personal perspective to what happened in the aftermath of the bomb and Japan's surrender. The dome was the only surviving structure around the bomb. It was quite a moving experience to take the dome and museum in and realize it was right on the site of the first nuclear bomb. Now, the Hiroshima Peace Memorial Park has been built around the Genbaku Dome. Google Translate is the Atomic Bomb Dome. The dome was the only surviving structure around the bomb.

Figure 46: Genbaku Dome in Hiroshima

Source: New York Times, RTF

Star Trek Nichelle Nichols was key to recruiting minorities & women for NASA

A very impressive person died this week, when Nichelle Nichols passed away this week at the age of 89. She is best known for her role at Lt. Uhura on the original Star Trek. But, what was impressive was how she used her fame to drive a major push to diversify NASA's astronauts. Instead of just complaining about the lack of diversity in NASA's astronauts, she became the driving force behind an astronaut diversity at NASA that saw the first African Americans, Asian Americans and women become astronauts that went to space. if you haven't seen, we highly recommend watching the documentary *"Woman n Motion: Nichelle Nicols, Start Trek and the Remaking of NASA*". Many people don't realize how she was a key to NASA recruiting minorities and women to their Astronaut program. Upon her passing, NASA wrote [LINK] "*Nichelle's advocacy transcended television and transformed NASA. After Apollo 11, Nichelle made it her mission to inspire women and people of color to join this agency, change the face of STEM and explore the cosmos. Nichelle's mission is NASA's mission. Today, as we work to send the first woman and first person of color to the Moon under Artemis, NASA is guided by the legacy of Nichelle Nichols."* The documentary is about Nichols role in recruiting for NASA. USA Today

wrote "*Among the astronauts who applied and were accepted into the 1978 astronaut program following Nichols' 1977 recruitment campaign were Dr. Sally Ride, the first American woman in space, Col. Frederick D. Gregory, who would go on to become a NASA deputy administrator, Guion Stewart Bluford Jr., who became the first African American in space, Judy Resnik, who was the second American woman in space and Ronald McNair, who was the second African American to fly in space. Nichols received a public service award from NASA.*"

It was a slice of chorizo not Proxima Centauri, the nearest star to the Sun

We wish we had seen this on Twitter before hearing about it on the news. Etienne Klein is Research director of CEA. The CEA website says "*The French Alternative Energies and Atomic Energy Commission (CEA) is a public scientific, technical and industrial research body (EPIC). A major player in research, development and innovation, the CEA operates in four areas: defense and security, low-carbon energies (nuclear and renewable), technological research for industry and basic research (science matter and life sciences).*" Last Sunday, Klein tweeted [LINK] the below picture with the Google Translate saying "*Photo of Proxima Centauri, the closest star to the Sun, located 4.2 light years from us. She was taken by the JWST. This level of detail… A new world is revealed day after day.*" JWST is the James Webb Space Telescope. It turns out the picture wasn't Proxima Centauri but a slide of chorizo taken against a black background. He got busted and, it took a few days, but on Wednesday, he tweeted [LINK] "*I come to present my apologies to those whom my hoax, which had nothing original about it, may have shocked. He simply wanted to urge caution with images that seem eloquent on their own. A Scientist's Joke https://lepoint.fr/tiny/1-2485344 #Astronomie via @LePoint.*" We have to believe some of his fellow scientists thought it would be funny to see how many regular people were tricked by the chorizo. But surely he had to realize that he would be busted quickly and that it would impact his credibility, at least on Twitter. Maybe it elevates his standing within the scientific community?

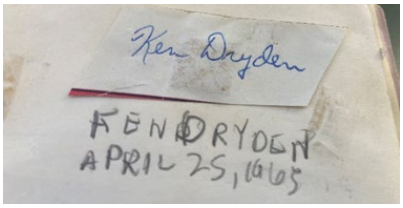
Figure 47 Slide of chorizo not Proxima Centauri

Source: Etienne KLEIN @EtienneKlein

Update on Happy Birthday Ken Dryden

A year ago (our Aug 8, 2021 Energy Tidbits), i had an item in the Misc "Happy Birthday Ken Dryden", who was born Aug 8, 1947. hat told the story how I got his autograph when he was playing Junior B hocking for the Etobicoke Indians on April 25, 1965. And how I had gone to the game with two of my friends as their dad, Larry Regan, was the coach. And like all kids who looked up to hockey players, got autographs from all the players including Ken Dryden. I sent on the autograph to Cornell University, where Ken played NCAA hockey who forwarded it to Ken, who sent me back a nice email, which ended with "*I can't believe you, or anyone, asked me for my autograph, and I'm sure I would've been thrilled when you did. It's interesting to see that at 17 I still wrote like I was in Grade 3*."

Figure 48: Ken Dryden, Etobicoke Indians 1964-65 Season



Source: SAF Group

Effective writers know how to "*make words count*"

There is nothing better to motivate you to be a better writer than to read a well written article, report, tweet, etc. This is especially so when see great writing for market related items because I know from experience that any editing is mostly focused on compliance review and making sure no offside statements. But it also a huge help for a writer to have a great editor as a partner. One of my must weekly reads is NFL football writer Peter King's NBC Football Morning in America. His column used to be called Monday Morning Quarterback when he wrote for SI. On Monday, King wrote about his long term editor, Dom Bonvissuto, leaving for another opportunity. King wrote "*Editing a behemoth like this column isn't often about saying, Don't do this. It's dumb. It's being fast and clever and knowing what picture fits and what headline is smart. It's really teamwork. I trusted Dom's advice on what was the best news of the week, what belonged on top of the column. And other things. Don't go napping on me now—almost finished, for instance. Now that's important. Editors are vital to the process of columns like this. I remember seeing Tom Brady in Montana, on deadline, one week after the 28-3 Super Bowl comeback, and racing through my writing that night/early morning, Brady dissecting every big play in the game. I was just trying to be cogent, trying to be understood, so we could have the column posted by the time people in all time zones woke up. At 3:37 a.m., with the last of 10,943 words filed, Dom sent this email: "We are good. Good night and damn proud to have worked on this." That was cool to get just before conking out. Once I closed a column on what I felt was Philadelphia's precipitous firing of Chip Kelly. I filed this last draft: "Sad. Just very sad." He changed it to: "Sad." Period. He wrote me, "It's better as Sad. Not a big fan of the repeat." Dom was correct. Make words count."* Our Supplemental Documents package includes the excerpt from King's FMIA column on Bonvissuto.