Energy Tidbits

July 23, 2023

Produced by: Dan Tsubouchi

G20 Elevates Energy Security, Access, Affordability & Market Stability to Same Priority as Advancing Energy Transitions

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. G20 Energy Ministers communique last night will be disappointing to G7 and signals what is to come at COP28 UAE ie. energy security, affordability and availability is as important as energy transitions. (Click Here)

2. US shale/tight oil and natural gas production growth has been stalled out for past five months. (Click Here)

3. Baker Hughes expects 1.6 bcf/d of new LNG supply FIDs in H2/23 plus a further 8.6 bcfd of new LNG supply FIDs in 2024. (Click Here)

4. Schlumberger bullish offshore comments point to stronger than expected offshore oil & natural gas growth for long term. (Click Here)

5. Is UK cabinet minister Gove's Telegraph interview yesterday a signal the UK is going to back away from expensive Net Zero and Green policies? (Click Here)

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

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

Dan Tsubouchi
Chief Market Strategist
dtsubouchi@safgroup.ca

Ryan Dunfield
CEO
rdunfield@safgroup.ca

Aaron Bunting
COO, CFO
abunting@safgroup.ca

Ryan Haughn
Managing Director
rhaughn@safgroup.ca

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US gas storage 575 bcf YoY surplus

Natural Gas: +41 bcf build in US gas storage; now 575 bcf YoY surplus

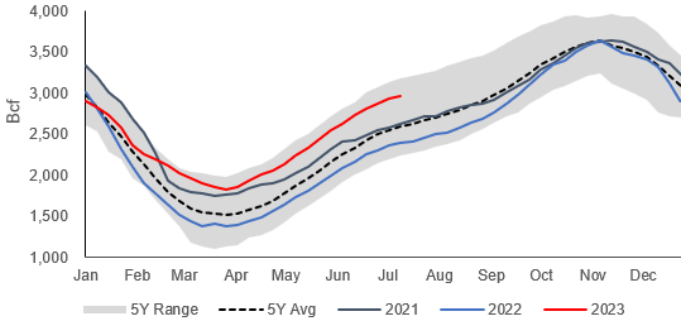
For the week of July 14, the EIA reported a +41 bcf build (just under the expectations of an +45 bcf build), and an increase compared to the +32 bcf build reported for the week of July 15 last year. This is down from last week's build of +49 bcf, and a slight decrease vs the 5-year average build of +43 bcf. Total storage is now 2.971 tcf, representing a surplus of +575 bcf YoY compared to a surplus of +569 bcf last week. Total storage is +360 bcf above the 5-year average, down from the +364 bcf surplus 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)				Year ago (07/14/22)		5-year average (2018-22)	
Region	07/14/23	07/07/23	net change	implied flow	Bcf	% change	Bcf	% change
East	661	653	8	8	518	27.6	567	16.6
Midwest	741	724	17	17	605	22.5	642	15.4
Mountain	186	180	6	6	144	29.2	161	15.5
Pacific	232	225	7	7	252	-7.9	268	-13.4
South Central	1,150	1,147	3	3	876	31.3	972	18.3
Salt	321	323	-2	-2	208	54.3	262	22.5
Nonsalt	829	824	5	5	669	23.9	710	16.8
Total	2,971	2,930	41	41	2,396	24.0	2,611	13.8

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



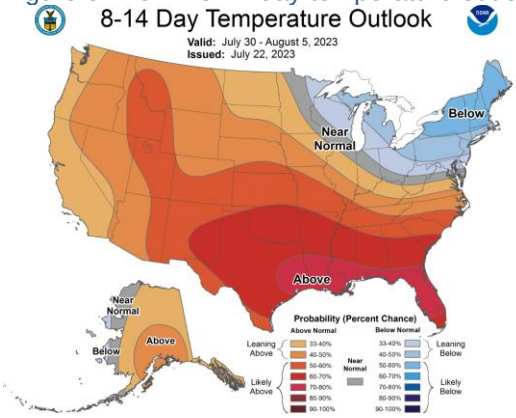
Source: EIA, SAF

NOAA 8-14 day outlook

Natural Gas: NOAA 8-14 day temperature outlook stays positive to gas price tone

Mid-July is when we start to see the period for the normal hottest day of the year in some states. So the key is that we don't want to see below normal temperatures when it is normally the peak heat time. And for the most part, the temperatures have continued to be hot across most of the US. NOAA posts daily, around 1pm MT, an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [LINK] "*Continued temperature support for US #NatGas. Today's @NOAA 6-10 & 8-14 day temperature outlook covering July 28-Aug 5: continued above normal temps expected for most of the US. #OOTT.*" Yesterday's NOAA 6-10 day [LINK] and 8-14 day outlook [LINK] is valid for July 28-Aug 5 warmer than normal temperatures are expected to continue across most of the US.

Figure 3: NOAA 8-14 day temperature outlook July 30-Aug 5



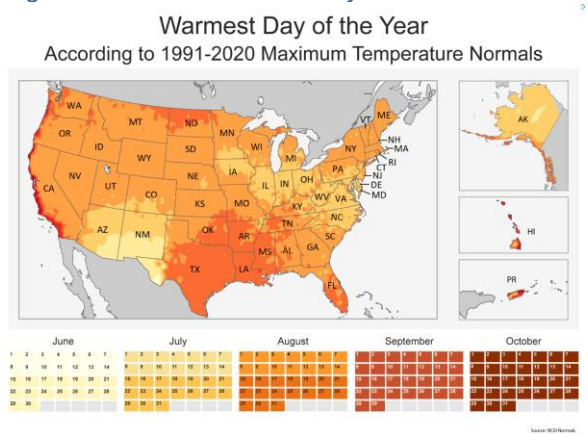
Source: NOAA

Natural Gas: NOAA's normal warmest day of the year across the US

Normal warmest day of the year across the US

It was another week where the big US news one of the big US news stories was it was really hot in the southern part of the US. And the warning is that the normal hottest day in the south is normally the end of July/early Aug. Here is where we wrote in our July 2, 2023 Energy Tidbits memo. "*Yesterday, we tweeted [LINK] "Here's why temperature watch gets important in July ie. don't want below normal temps when it is supposed to be the hottest. @NOAA map when to expect Warmest Day of the Year. Mid July starts to see hottest day of the year in states like IL, IN, OH, WV, VA, NC. And current @NOAA 8-14 day expects below normal temps in some of these states. #OOTT #NatGas." On Thursday, NOAA posted "When to expect the Warmest Day of the Year" [LINK]. Our tweet included the NOAA map, which reminds that mid-July is when we start to see the hottest day of the year in many states. It's why the temperatures are important in July as we don't' want to see below normal temps when it is supposed to be peak heat and peak summer electricity/natural gas residential/commercial demand*."

Figure 4: NOAA Warmest Day of the Year



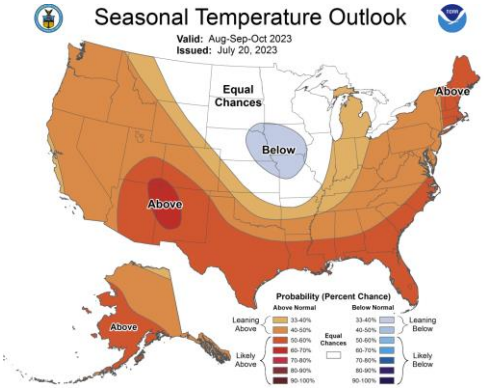
Source: NOAA

Natural Gas: NOAA calls for warmer than normal Aug/Sep/Oct but also Dec/Jan/Feb

NOAA forecasts warm winter

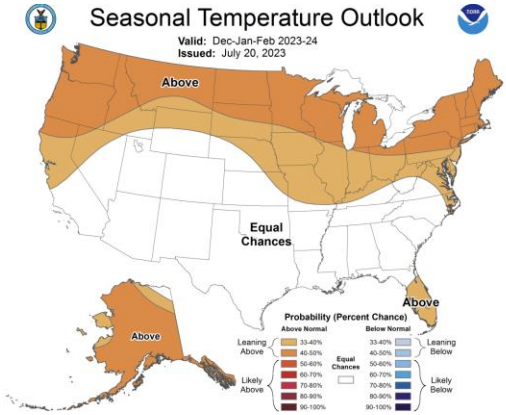
On Thursday, we tweeted [LINK] "*Updated @NOAA seasonal outlook. Warmer than normal ASO should help summer #NatGas demand, BUT warmer than normal DJS would be a bigger hurt to winter #NatGas demand. No surprise with El Nino forecast to continue. #OOTT."* On Thursday, NOAA issued its monthly seasonal temperature probability forecast. [LINK] No one should be surprised that, with the continued El Nino conditions also forecast in the winter that the outlook is for warmer than normal temperatures for the next several months. Our tweet notes that the warmer ASO should help weather driven natural gas demand but a warmer than normal DJF should have a more significant negative impact on weather driven natural gas demand. Our tweet included the below NOAA ASO and DJF temperature probability maps.

Figure 5: NOAA ASO 2023 Temperature Probability Forecast



Source: NOAA

Figure 6: NOAA DJF 2023/24 Temperature Probability Forecast

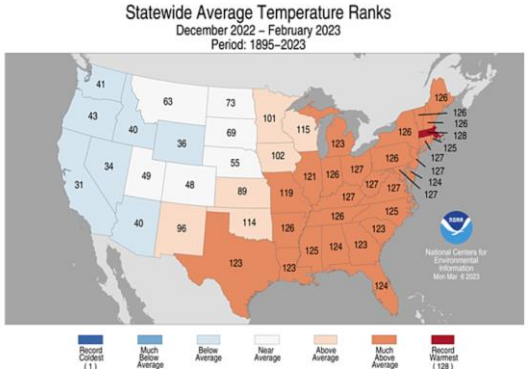


Source: NOAA

Winter 2022/23 was very hot

At least as of now, NOAA is expecting a warmer than normal Dec/Jan/Feb, but the current forecast will now be anywhere close to winter 2022/23 (Dec/Jan/Feb) that was the 17th hottest in the last 128 years. Below is NOAA's statewide average temperature map for Dec/Jan/Feb 2022/23.

Figure 7: US 2022 JAS Statewide Average Temperature Map



Source: NOAA

Natural Gas: EIA, US shale/tight natural gas been fairly flat for 5 months at ~98 bcf/d

Shale/tight gas production

The two major negatives that held down US natural gas prices in H1/23 were the mild winter and strong YoY increases to US natural gas production. The shale/tight US natural gas plays are still showing strong YoY increases in natural gas production but the last five months have been stuck ~98 bcf/d. (i) On Tuesday, we tweeted [LINK] "*US shale/tight #Oil & #NatGas production, including the Permian has been stalled for past 5 mths. See 👇SAF Group table per @EIAgov Drilling Productivity Report data. #OOTT."* (ii) On Monday, the EIA released its monthly Drilling Productivity Report for July 2023 [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case July) and the next month (in this case August). (iii) The EIA forecasts US shale/tight natural gas for Aug at 97.97 bcf/d, which is down slightly from 98.07 bcf/d in July. The shale/tight natural gas plays have been fairly flat since April 97.42 bcf/d, May 97.74 bcf/d, June 98.01 bcf/d, July 98.07 bcf/d and now August at 97.97 bcf/d. (iv) Permian has bene stalled just over 23 bcf/d. April 23.18 bcf/d, May 23.24 bcf/d, June 23.30 bcf/d, July 23.35 bcf/d and now August 23.39 bcf/. (v) Haynesville is the same. April 16.46 bcf/d, May 16.56 bcf/d, June 16.64 bcf/d, July 16.65 bcf/d, and now August 16.60 bcf/d. (iv) The YoY growth is still strong at +4.22 bcf/d YoY, but its the stalling growth that is the item to highlight from the DPR. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So, whatever the trends are for shale/tight gas are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

Figure 8: EIA Major Shale/Tight Natural Gas Production

mmcf/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Aug YoY	Aug YoY%	Aug MoM
Anadarko	6,713	6,917	6,967	6,948	6,509	6,871	6,863	6,855	6,870	6,873	6,854	6,810	6,746	33	0.5%	-64
Appalachia	34,757	34,922	34,397	34,988	34,509	34,131	34,943	35,123	35,190	35,246	35,319	35,345	35,329	571	1.6%	-16
Bakken	3,130	3,222	3,198	3,088	2,685	2,885	3,081	3,099	3,143	3,181	3,218	3,247	3,272	142	4.5%	25
Eagle Ford	7,021	6,983	7,041	7,104	7,088	7,189	7,249	7,491	7,547	7,590	7,608	7,590	7,548	527	7.5%	-42
Haynesville	15,430	15,802	16,179	16,323	16,135	16,510	16,713	16,066	16,458	16,563	16,638	16,649	16,599	1,169	7.6%	-50
Niobrara	5,120	5,172	5,210	5,215	5,003	5,080	5,020	5,029	5,037	5,050	5,065	5,078	5,089	-31	-0.6%	11
Permian	21,585	22,133	22,103	21,940	21,706	22,115	22,370	23,103	23,180	23,239	23,303	23,353	23,389	1,804	8.4%	36
Total	93,756	95,151	95,094	95,605	93,636	94,781	96,241	96,764	97,424	97,741	98,005	98,072	97,971	4,215	4.5%	-100

Source: EIA, SAF

Haynesville well productivity

Natural Gas: Raymond James sees Haynesville well productivity finally hitting the wall

On Monday, there was another good Raymond (John Freeman) Deep Dive report, this time on the Haynesville shale gas titled "*Haynesville Deep Dive: Well Productivity & Remaining Core Inventory*". (i) On Monday, we tweeted [LINK] *"Positive for #NatGas in 20s/30s. #Haynesville up >5 bcfd since Feb/21 to 16.6 bcfd, key supply for long-term US #LNG exports, BUT @RaymondJames John Freeman's Deep Dive "Haynesville well productivity finally hitting the wall" "Given the trend, we expect gross per-well productivity to be down in 2023". Increasing supply costs to a key global #NatGas/#LNG supply basin points to higher prices ahead. #OOTT."* (ii) We thought this was bullish for natural gas as markets look ahead to the rest of the decade and start of the 2030s. (iii) Haynesville has been a major US gas production growth region in the past few years driven by its proximity to the growing US LNG capacity. It's up over 5 bcf/d since Feb 2021 to 16.6 bcf/d. (iv) Raymond James doesn't say there isn't growth potential, but says well productivity has reached an inflection point so it will cost more to stay flat ie. supply costs are going higher. (v) Raymond James notes well productivity has reached a potential inflection point. "*Well Productivity Conclusion. Similar to what we saw with our deep-dive report on the Permian Basin, well productivity finally appears to have hit the wall. Last year, the Haynesville had flat 6-month per well volumes and 7% decline on a per-foot basis. The lack of productivity gains occurred despite longer laterals (up 4%) and higher proppant loadings (up 5%) last year. In comparison, the prior 5 years the Haynesville increased well productivity at a ~10% CAGR so this represents a potential inflection point in the basin*." (vi) Core inventory is ~6 years. This doesn't include the non-core, but this is the core that has the best economics. "*Publics have ~7 ½ yrs of core inventory remaining vs. ~4 yrs for privates. In aggregate, the Haynesville has 6 years of core inventory remaining. As a disclaimer, many public E&Ps will see Haynesville volumes decline y/y, meaning true core inventory life (i.e. higher cadence levels required for sustaining production) is likely lower than the adjacent charts."* (vii) So Raymond James doesn't say it has reached peak production but it has reached peak best economic production. And the bullishness is that Cheniere et al are signing long term supply contracts for LNG that depends in large part from the Haynesville. More expensive production additions means higher supply costs. That may not be an issue except for US LNG depends upon the Haynesville. So higher supply costs should translate into higher natural gas prices in the 2020s/2030s. (vii) We think it also sets up an interesting opportunity for the Permian and an issue for Mexico, There is increasing pipeline capacity from the Permian to Mexico, but the Permian also has the takeaway for the most part to the Gulf Coast for LNG. If Haynesville does peak out and starts to modestly decline, it could set up an increasing arbitrage for Permian natural gas. Our Supplemental Documents package includes a couple of the key concluding pages.

Natural Gas: Liberty Energy, US natural gas production flat, maybe even some decline

Maybe even some decline in US gas production

Liberty Energy is a big US frac company released its Q2 on Wednesday night and held its Q2 call on Thursday. The sentence that caught our eye on Wednesday night was on how they see lower US frac activity in H2/23 vs H1/23, which led to our tweet [LINK] "*More support for a near term pause in US #Oil production growth. #LibertyEnergy also sees North American frack activity down in H2/23 vs H1/23. "We anticipate North American completions activity will moderate in the second half of the year versus the first half."* That was based on the Wednesday night Q2 release. Liberty held its Q2 call on Thursday morning and spoke on how the lower frack activity on US natural gas plays would impact US natural gas production. Liberty sees US natural gas production being flat or maybe some decline. IOn Thursday, we tweeted [LINK] "*Expecting flat, maybe some decline in US #NatGas production says #LibertyEnergy CEO. #NatGas frac pickup "could be late this yr, that could be early next yr" "now activity is going to dial back to, gas production flat. We may even see some decline in gas production" Thx @business #OOT."*

Natural Gas: RBN's Cheniere blog is a good one to add to reference libraries

Good RBN blob on Cheniere LNG

On Monday, we tweeted [LINK] "*Good blog on #CheniereLNG to add to reference libraries. Don't forget Cheniere is the vast majority of US #LNG exports and, by itself, would be #3 LNG exporter only behind Qatar & Australia. Thx @RBNEnergy @lss_energy #OOTT #NatGas."* On Sunday night, RBN Energy publicly posted its July 14 blog "*King Creole - Can Anyone Challenge Cheniere As The King Of U.S. LNG?"* RBN provides a good overview of Cheniere's LNG operations with sufficient detail to be a good blog to add to reference libraries. RBN didn't say it in the blog but one other key reason to include it in reference libraries is that an overlooked reminder is that Cheniere, by itself would be the 3rd largest LNG exporter in the world only behind Qatar and Australia. RBN notes "*Cheniere currently operates 45 MMtpa (6 Bcf/d) of LNG export capacity at its two terminals — Sabine Pass (yellow boxes in Figure 1) and Corpus Christi (green boxes) — and is by far the largest U.S. producer. Globally, Cheniere ranks as the second-largest LNG producer, behind only QatarEnergy. Cheniere has an additional 10 MMtpa (1.3 Bcf/d) of capacity under construction at Corpus Christi with its Stage III expansion (purple-dotted boxes)."* RBN provided detail on some of the new LNG sales deals, which they summarized "*As that project was closing in on FID, Cheniere began to sell offtake capacity from an as-yet-unnamed Corpus Christi expansion. It quickly announced three deals totaling 2.8 MMtpa (0.37 Bcf/d) of LNG, then later announced that this would be an expansion of Stage III, adding an additional two mid-scale trains (8 and 9, blue-striped boxes) for a total of 2.9 MMtpa (0.38 Bcf/d) of capacity."* There is much more in the blog. Our Supplemental Documents package includes the RBN blob, which was publicly posted in full.

Natural Gas: US LNG exports 11.8 bcf/d in May, down MoM but up YoY

May 2023 US LNG Exports

On Monday, the Department of Energy (DOE) posted its US LNG exports estimates for May [LINK]. This is a reminder that the US LNG export data is available about two weeks prior to the more popularly referenced US LNG exports from the Natural Gas Monthly. The EIA is a group under the Department of Energy, and the Department of Energy posts its LNG Monthly about two weeks before the EIA's Natural Gas Monthly. The data for LNG exports is either identical or just a rounding issue. On Tuesday, we tweeted [LINK] "*US #LNG exports May/23 of 11.83 bcfd, +4.4% YoY, -1.4% MoM due to maintenance that should have a larger impact on Jun/23. May/23 top 5 export markets: Dutch, France, Japan, Argentina, UK May/22 top 5*

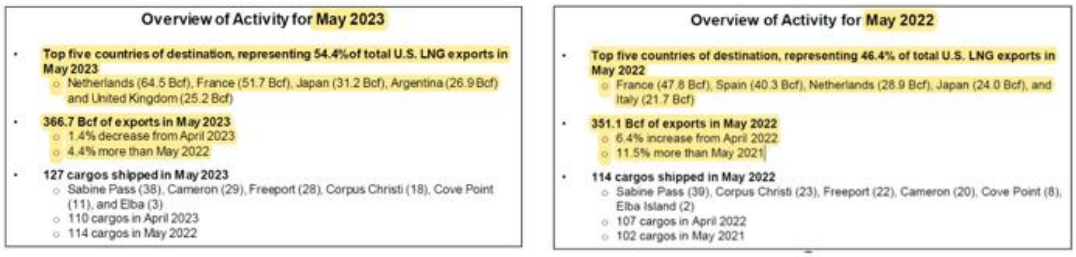
export markets: France, Spain, Dutch, Japan, Italy This DOE LNG data is posted 2 wks before same data in @EIAgov #NatGas Monthly. #OOTT". Maintenance started in late May and impacted US LNG exports in May and there will be a bigger maintenance impact on US LNG exports in June. US LNG exports are now averaging 11.7 bcf/d per month YTD for 2023, which is +0.4 bcf/d compared to the same period in 2022.The DOE did not comment on the MoM or YoY increases. Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

Figure 9: DOE Monthly US LNG Exports

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023
January	0.0	1.7	2.3	4.1	8.1	9.8	11.4	10.9
February	0.1	0.9	2.6	3.7	8.1	7.4	11.3	11.7
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7	11.8
April	0.3	1.7	2.9	4.2	7.0	10.2	11.0	12.5
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3	11.8
June	0.5	1.7	2.5	4.7	3.6	9.0	10.0	
July	0.5	1.7	3.2	5.1	3.1	9.7	9.7	
August	0.9	1.5	3.0	4.5	3.6	9.6	9.7	
September	0.6	1.8	2.7	5.3	5.0	9.5	9.8	
October	0.1	2.6	2.9	5.7	7.2	9.7	10.0	
November	1.1	2.7	3.6	6.4	9.4	10.2	10.1	
December	1.3	2.7	4.0	7.1	9.8	11.1	11.0	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	10.6	11.7

Source: DOE, SAF

Figure 10: US LNG Exports May 2023 vs May 2022



Source: DOE

Natural Gas: Baker Hughes expects 1.6 bcf/d FIDs in H2/23 & a further 8.6 bcf/d in 2024

Another 10 bcf/d of LNG FIDs in next 18 months

Baker Hughes is probably the most plugged in of any company of what is coming down the pipe for LNG projects. They are involved in most existing LNG export projects and are called by most, if not all, LNG developers as they look to move to FID on a brownfield or greenfield project. So we believe it is always worth listening to what Baker Hughes CEO Simonelli says on what he expects for near term FIDs for new LNG export projects. He sees another 10 bcf/d of FIDs for LNG export projects in the next 18 months including 1.6 bcf/d in H2/23 and a further 8.6 bcf/d in 2024. Yesterday, we tweeted [LINK] *">10 bcfd LNG FIDs in next 18 mths. $BKR CEO @simonelli_l : 7.0 bcfd #LNG FIDs so far in 2023. Expects another 1.6 bcfd FIDs in 2023 and a further 8.6 bcfd FIDs in 2024. Surely #LNGCanada brownfield 1.8 bcfd Phase 2 will be part of this >10 bcfd in next 18 mths. #OOTT #NatGas."* On the Q2 call, Simonelli said "*The continued strength in long-term LNG contracts has been a key driver of the momentum in industry FIDs, which have now totaled 53 MTPA so far this year. This includes*

the recent FIDs for Phase 1 of Next Decade's 17.6 MTPA Rio Grande project and QatarEnergy's 16 MTPA North Field South project. Based on the continued development of the LNG project pipeline, we still expect the market to exceed 65 MTPA of FIDs this year and should see a similar level of activity in 2024. We continue to see the potential for this LNG cycle to extend for several years with a pipeline of new international opportunities expanding project visibility out to 2026 and beyond."

Still waiting on LNG Canada brownfield 1.8 bcf/d Phase 2 FID

Our Baker Hughes tweet yesterday said "*Surely #LNGCanada brownfield 1.8 bcfd Phase 2 will be part of this >10 bcfd in next 18 mths*." It's been quiet on the LNG Canada Phase 2 FID front and it was surprisingly quiet in the recent Shell June investor day. We still expect an FID sooner than later especially as Phase 1 approaches its completion. We have to give LNG Canada credit as they seem to have put a pretty clear no official comment on Phase 2 from their contractors on Phase 1. But it does seem like some of them plan to be in Canada for more than the next year or two. We shall see. Here is what we wrote in our June 18, 2023 Energy Tidbits memo on the LNG Canada Phase 2 from the Shell Capital Markets Day 2023. *"Natural Gas – No question to Shell on potential FID for LNG Canada 1.8 bcfd Phase 2. There were no comments from Shell nor questions from analysts on a potential FID for LNG Canada 1.8 bcf/d Phase 2. However, bulls for LNG Canada Phase 2 will be looking at Shell's growth expectations for LNG supply in the back half of the 2020s and believe LNG Canada Phase 2 has to be included in the growth assumptions. In their prepared comments, mgmt. said "We are the world leader in LNG. Supplying our customers with secure, reliable energy today and in the future. LNG is deeply integrated with our trading and optimization activities, which enable us to capture additional value from the scale and breadth of our global LNG portfolio. And we're growing that portfolio even more, with around 11 million tonnes per year of new LNG capacity under construction, which will come on stream in the second half of the decade. This is almost a third of our current LNG portfolio." 11 million tonnes per year is 1.45 bcf/d per year."*

Natural Gas: ADNOC and IOCL sign long-term LNG deal for 0.16 bcf/d per annum

Long-term LNG deal

Last month was the biggest month for new long-term LNG supply deals in a long time with six deals totalling 1.74 bcf/d. This week, there was another deal with UAE's ADNOC and India's IOCL entering a long-term sale and purchase agreement. Even still, there was a big slowdown in long-term LNG deals in the last year compared to the activity seen from July 1, 2021 through June 30, 2022. That's because most, if not all the available long term LNG supply available before 2026 was locked up in the July 1, 2021 through June 30, 2022 rush. Rather, the long-term deals are now for long-term supply starting in 2026 or later. And the other significant item to note is that we are seeing some very long-term out past 2050. (i) On Tuesday, ADNOC (UAE) and IOCL (India) announced that they have agreed to enter into a long-term LNG sale and purchase agreement [LINK]. The deal is set to begin in 2026, and end in 2040, with IOCL purchasing ~0.16 bcf/d per annum. This is the first time that ADNOC has signed a LT deal with an Indian company. The CEO of ADNOC, Ahmed Alebri, commented "*We are pleased to announce this long-term LNG sale, further strengthening the long-standing partnership with IOCL. We look forward to expanding our collaboration and take pride in the knowledge that ADNOC Gas' LNG exports will further support the*

development of IOCL and contribute to India's growth story". Our Supplemental Documents package includes the ADNOC press release.

Asia was early to secure and hasn't stopped securing long term LNG supply

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

There have been 16.54 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 16.54 bcf/d of long-term LNG deals since July 1, 2021. 66% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 65% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long-term supply deals since July 1, 2021.

Figure 11: Long-Term LNG Buyer Deals Since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan/Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea/US	0.05	19.0	2027	2046
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh/Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	Bangledesh/Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China/Quatar	0.53	27.0	2027	2054
Jun 26, 2023	ENN LNG	Cheniere	Singapore / US	0.24	20.0	2026	2046
Jul 5, 2023	Zhejiang Energy	Mexico Pacific Ltd	China / Mexico	0.13	20.0	2027	2047
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**10.90**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	PKN ORLEN	Sempra Infrastructure	EU/US	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	2026	2046
Apr 24, 2023	Hartree Partners LP	Delfin Midstream	US / US	0.08	20.0	n.a.	n.a.
Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	15.0	2027	2042
Jun 22, 2023	SEFE	Venture Global LNG	EU//US	0.30	20.0	2026	2046
Jul 14, 2023	ONEE (Morocco)	Shell	Africa/US	0.05	12.0	2024	2036
Jul 18, 2023	IOCL	Adnoc	India/UAE	0.16	14.0	2026	2040
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**5.65**			
Total New Long Term LNG Contracts since Jul/21				**16.54**			

Source: SAF

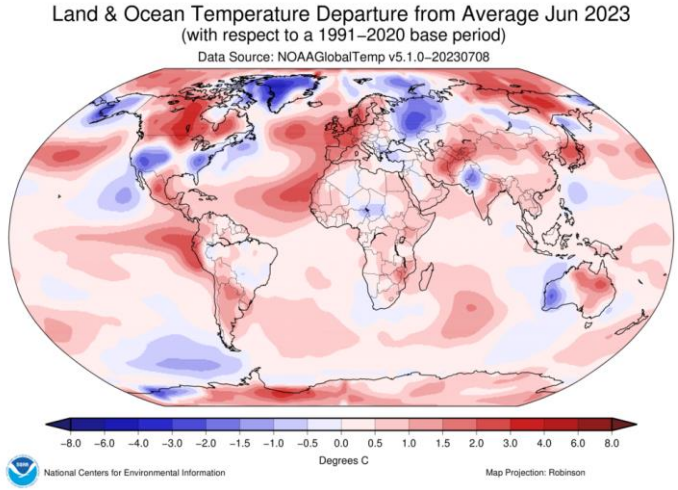
Natural Gas: June 2023 was the globe's warmest ever June

Warmest June ever

No one will be surprised to see the recap of June to see it was the warmest June in history for the world. Very hot temperature was the news story on all news channels everywhere Last week, NOAA posted its Global Climate Report for June 2023 [LINK]. It was hot around

the world. NOAA summarized "*June 2023 set a record as the warmest June for the globe in NOAA's 174-year record. The June global surface temperature was 1.05°C (1.89°F) above the 20th-century average of 15.5°C (59.9°F). This marked the first time a June temperature exceeded 1°C above the long-term average. The Junes of 2015–2023 rank among the ten warmest Junes on record. June 2023 marked the 47th consecutive June and the 532nd consecutive month with global temperatures, at least nominally, above the 20th-century average."* NOAA reinforced it was hot everywhere writing "*Temperatures were above average throughout most of South America, Europe, Africa and Asia. Parts of northern and southern North America, Oceania, Antarctica and the Arctic also experienced warmer-than-average temperatures this month*."

Figure 12: June 2023 temperature departure from average



Source: NOAA

Natural Gas: India June natural gas production basically flat MoM to 3.35 bcf/d

India natural gas production flat MoM

It looks like India's domestic natural gas production is staying relatively flat after moving up from the recent 2020/21 trough. India's natural gas production peaked in 2010 at 4.6 bcf/d. Its 2018-2019 production averaged 3.18 bcf/d, declining to 3.02 bcf/d in 2019-2020 and then further declined to average 2.78 bcf/d 2020-2021. But then natural gas production returned to growth in 2021-2022, but that growth has mostly stalled or is modest at best. On Thursday, India's Petroleum Planning and Analysis Cell released their monthly report for June's natural gas and oil statistics [LINK]. India's domestic natural gas production for June was 3.35 bcf/d, which was up small from 3.23 bcf/d in May. On a YoY basis, natural gas production was up +3.6% from 3.23 bcf/d in June 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas: India LNG imports down +2.8% MoM to 2.61 bcf/d in June

India LNG imports down -1.6% YoY

For the past several years, India has increased LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 has been the sky-high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had

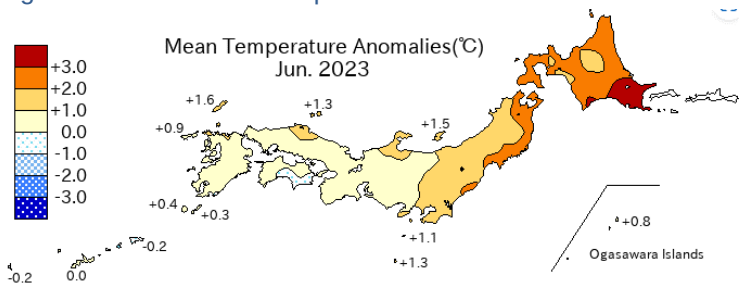
a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we have been seeing some modest MoM increases in India's LNG imports over the past year. On Thursday, India's Petroleum Planning and Analysis Cell released their monthly report for June's natural gas and oil statistics [LINK]. Over the past 3 years, India's LNG imports declined from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. Additionally, June's LNG imports were 2.61 bcf/d, which is up small from May's 2.54 bcf/d, but relatively flat. LNG imports are now down -1.6% YoY from 2.66 bcf/d in June 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas: It was a hot June in Japan

A hot June in Japan

No one should have been surprised by the Japan Meteorological Agency's recap of June temperatures in June that it was hot with above normal temperatures in all of Japan and significantly above normal in norther and eastern Japan. This week, the JMA posted its climate report over Japan for June [LINK]. It included the below map and the JMA said "*Monthly mean temperatures were significantly above normal in northern/eastern Japan and above normal in western Japan, because warm-air inflow was stronger than normal in early June and the regions were covered by warm-air in late June. Monthly mean temperatures were the highest in northern Japan on record for June since 1946*."

Figure 13: JMA Mean Temperature Anomalies June 2022



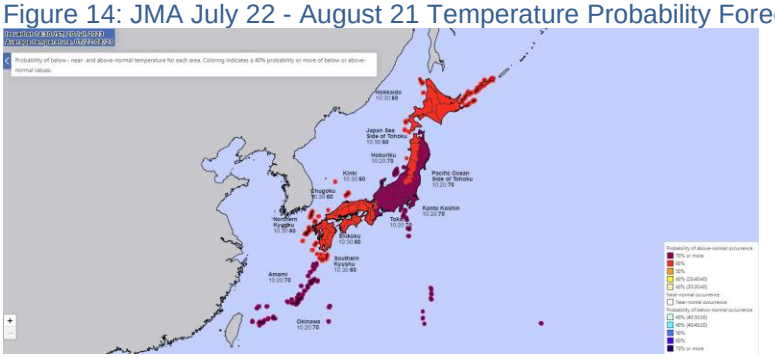
Source: Japan Meteorological Agency

Natural Gas: Forecast for well above normal temperatures to end July/start Aug

Japan's 30-day temperature forecast

It has been really hot in Japan this summer and it looks like the hot weather will continue to end July and start August. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The July 20 update calls for much warmer than typical temperatures for the July 22-Aug 21 period. The above average temperatures are forecasted through the whole country, with the central region being most affected. Even with this summer's push to conserve natural gas, there should still be strong demand for AC, which will benefit natural gas consumption. Below is the JMA's 30-day temperature probability forecast for July 22 to August 21.

Figure 14: JMA July 22 - August 21 Temperature Probability Forecast



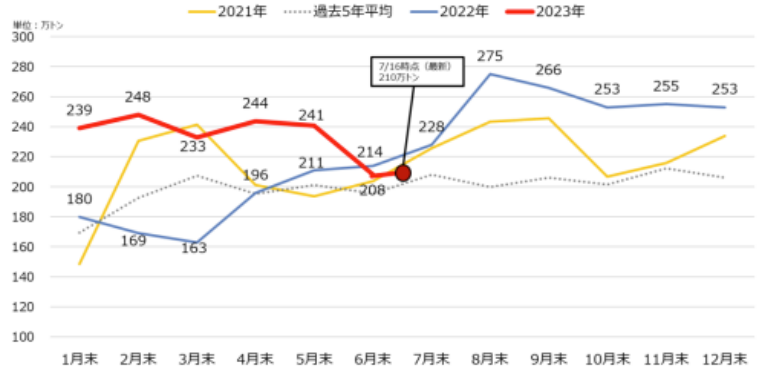
Source: Japan Meteorological Agency

Natural Gas: Japan's LNG stocks up +1.0% WoW to 100.9 bcf

Japan LNG stocks up +1.0% WoW

We will have to see if any more color comes out on how Japan is fueling the power generation in the heat wave or if their natural gas conservation push this summer is working but, at least based on its LNG stocks, it doesn't look like they are relying as heavily on natural gas as might have been expected in the heat wave. The last few weeks have seen draws on LNG stocks, but that was reversed this week. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on July 16 were 100.9 bcf and are up +1.0% WoW from July 9 of 99.9 bcf, and climb just above the 5-year average of 99.9 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 15: Japan LNG Stocks



Source: METI

Natural Gas: Japan LNG Imports up small MoM to 7.25 bcf/d in June

Japan LNG imports up small in June

On Thursday, Japan's Ministry of Finance posted its import data for June [LINK] and pointed to a material YoY decline in LNG imports. The MOF reported Japan's June's LNG imports were 7.25 bcf/d, which is up +1.5% MoM from 7.14 bcf/d in May, and -22.0% YoY from 9.29 bcf/d in June 2022. Notably, June's imports of 7.25 bcf/d are the lowest LNG imports recorded for the month of June in over a decade. It is important to note that this is the first increase in Japan's LNG imports since February. June's imports are 1.17 bcf/d below the June 2020 imports levels, which was heavily impacted by Covid. This makes June, May, and

April the lowest consecutive months for LNG imports in over a decade. Japan's thermal coal imports in June were -17.0% YoY, compared to -27.4% YoY in May. Petroleum products imports were up +1.8% YoY. Below is our table that tracks Japan LNG import data.

Figure 16: Japan Monthly LNG Imports

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	12.66	13.06	11.22	12.85	12.79	11.69	11.63	12.48	10.51	-15.8%	10.56	0.5%
Feb	12.88	13.26	12.30	13.36	14.23	12.61	10.99	13.84	12.19	-11.9%	10.98	-9.9%
Mar	12.46	12.60	12.62	12.61	12.28	11.30	11.16	11.04	10.07	-8.7%	8.86	-12.0%
Apr	11.54	10.56	10.21	10.52	8.97	9.00	8.31	7.96	8.92	12.0%	7.25	-18.7%
May	10.06	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.92	16.3%	7.14	-19.9%
June	10.91	10.61	10.02	9.90	8.88	8.32	8.42	9.13	9.29	1.7%	7.25	-22.0%
July	12.14	10.77	10.19	10.19	10.55	10.56	9.35	9.58	9.54	-0.4%		
Aug	10.92	10.93	11.96	11.24	11.73	9.45	9.04	9.75	9.71	-0.4%		
Sept	11.64	11.06	10.67	9.31	10.04	10.30	10.41	8.66	8.52	-1.6%		
Oct	10.75	9.38	9.73	9.50	10.12	9.75	9.20	7.17	7.88	9.9%		
Nov	11.00	10.71	12.07	10.26	10.15	10.03	9.63	9.38	8.88	-5.4%		
Dec	12.79	12.51	11.69	12.31	11.23	10.54	11.96	10.89	9.39	-13.8%		

Source: Japan Ministry of Finance, SAF

China LNG imports

Natural Gas: China LNG imports +23.7% YoY to 9.54 bcf/d in June

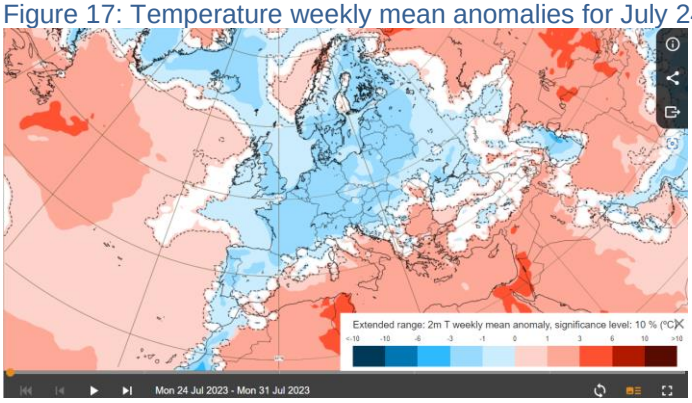
We have been highlighting a big change in China's natural gas and LNG dynamics over the past two years. China has been increasing its domestic natural gas production, which means less need for LNG imports. That has been compounded by China's increasing natural gas pipeline imports of cheaper Russian natural gas. This reduces the need for LNG imports. (i) China continued to increase its domestic natural gas production in June 2023. On Sundary, China's National Bureau of Statistics reported domestic natural gas production was +5.5% YoY to 21.5 bcf/d in June. June was basically flat MoM to May of 21.6 bcf/d. (ii) On Tuesday, China's General Administration of Customs released the finalized natural gas import data for June, which provided the split of natural gas imports between pipeline imports and LNG imports. (iii) Natural gas pipeline imports for June were up +8.2% MoM to 6.06 bcf/d and are -2.9% YoY from 6.24 bcf/d in June 2022. (iv) Despite the higher YoY domestic natural gas production and natural gas pipeline imports, the increasd natural gas demand with the hot June led to LNG imports being up +23.7% YoY to 9.54 bcf/d vs 7.72 bcf/d in June 2022.

Southern Europe break from heat wave

Natural Gas: Finally, southern Europe getting a break from the heat wave

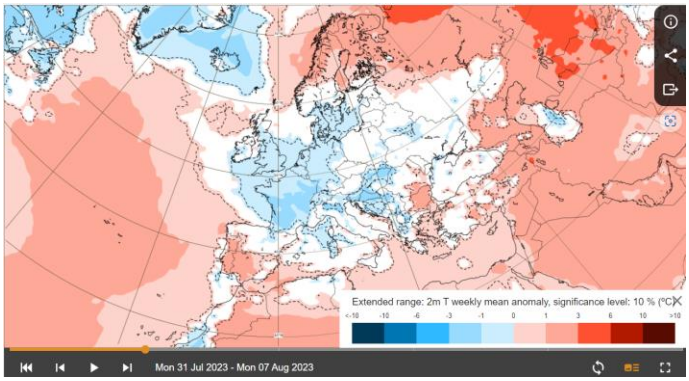
It looks like southern Europe is finally getting a break from the brutal heat wave that saw mid 40's temperatures this week. The ECMWF forecasts moving to below normal temperatures for most of western Europe for the next two weeks. Below are the ECMWF temperature probability maps, posted yesterday, for July 24-31 and July 31-Aug 7. [LINK]

Figure 17: Temperature weekly mean anomalies for July 24-31



Source: ECMWF

Figure 18: Temperature weekly mean anomalies for July 31- Aug 7



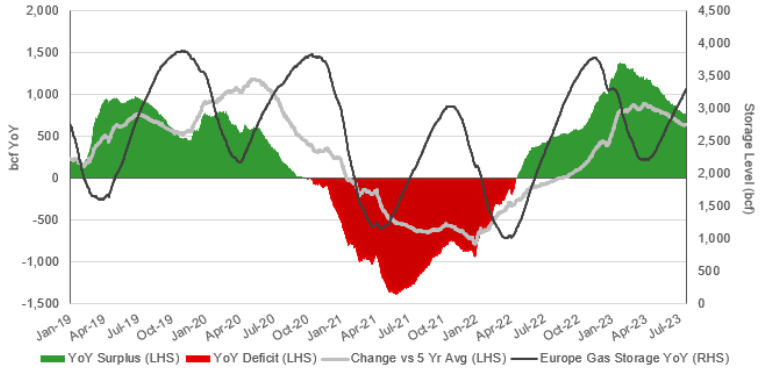
Source: ECMWF

Natural Gas: Europe storage is now +15.02% vs 5-yr average, but within 5-yr range

Europe gas storage

The Europe natural gas storage picture this week is much the same as the last several weeks – storage is significantly higher YoY, but hot weather and relatively low natural gas prices continues to see a steady narrowing of the gas storage surplus relative to last year and the 5-year average. This week, Europe storage increased by +2.01% WoW to 82.53% on July 19. Storage is now +17.42% greater than last year levels of 65.11% and is +15.02% above the 5-year average of 67.51%. Prior to this week's +17.42% vs last year, the prior four weeks starting with the most recent has seen the YoY surplus at +17.51%, +18.34%, +19.12%, and +19.67%. Prior to this week's +15.02 % above the 5-year average, the prior four weeks starting with the most recent has seen the surplus to the 5-year average were +14.69%, +15.24%, +15.86%, and +16.40%. This is the first time we've seen a WoW increase in the difference between the current storage level vs the 5-year average in over 10 weeks. The current storage is within the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Figure 19: European Gas Storage Level



Source: Bloomberg, SAF

Oil: US oil rigs -7 WoW at 530 rigs on July 21, US gas rigs -2 WoW at 131 rigs

US oil rigs down WoW

Baker Hughes released its weekly North American drilling rig data on Friday. Total US oil rigs were down -7 rigs WoW to 530 total rigs, and -69 rigs YoY for the week of July 21. This is up +49 rigs from the 2022 low of 481 rigs in January, and +358 rigs since the 2020 low of 172 rigs on Aug 14. The decline in oil rigs has been driven by WTI oil prices drifting down below and staying not much above $70. And that price not providing the incentive for companies to keep from dropping oil rigs. However, WTI has been around or over $75 for the past 10 days and the comments from service companies Q2 call, like Halliburton, is that these higher oil prices should bring back more activity. Notable, there were no WoW increases in oil rigs at any basin. The Permian, Eagle Ford, and Granite Wash decreased this week by -3, -2 and -1 rigs WoW to a total of 323 rigs, 57 rigs, and 2 rigs, respectively. This Permian is now down -34 rigs from it's recent high of 357 rigs on April 28, 2023. Last week was the first time since April 1, 2022 the Permian had dipped under 330 rigs. Gas rigs were down -2 rigs WoW to total of 131 rigs and have now decreased -24 rigs YoY. On a per basin basis, there were no increases in gas rigs WoW. In contrast, Haynesville and the Permian both decreased by -1 rig WoW to a total of 44 rigs and 10 rigs, respectively. Below is our graph of total US oil rigs.

Figure 20: Baker Hughes Total US Oil Rigs

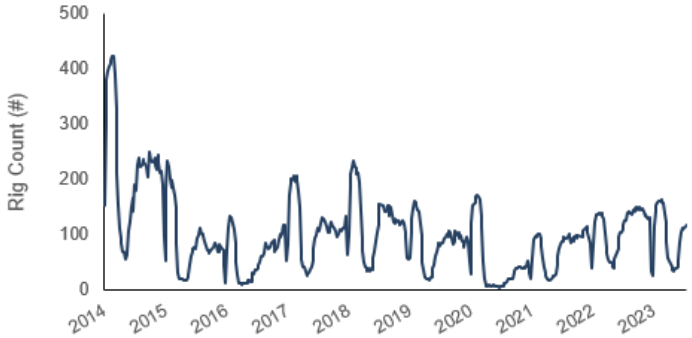
Source: Baker Hughes, SAF

Oil: Total Cdn rigs flat WoW at 187 total rigs

Cdn total rigs flat WoW

For the week of July 21, total Cdn rigs were flat WoW at 187 rigs. This continues to be in-line with the typical post breakup trend, even in the face of wildfires that are likely holding back rigs. Alberta was up +4 WoW, to a total of 129 rigs. Notably, BC and Saskatchewan were down -1 rigs and -3 rigs WoW to a total of 18 rigs and 35 rigs. The major wildfires in BC do not seem to be directly impacting drilling rigs, although it will be something to continue to monitor for moving into next week. Cdn oil rigs were up +2 WoW to 116 rigs, and Cdn gas rigs decreased -2 to 71 rigs. Cdn oil rigs are down -8 rigs YoY, while gas rigs are flat YoY. Below is our graph of total Cdn oil rigs.

Figure 21: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates flat WoW at 12.3 mmb/d

US oil production flat WoW

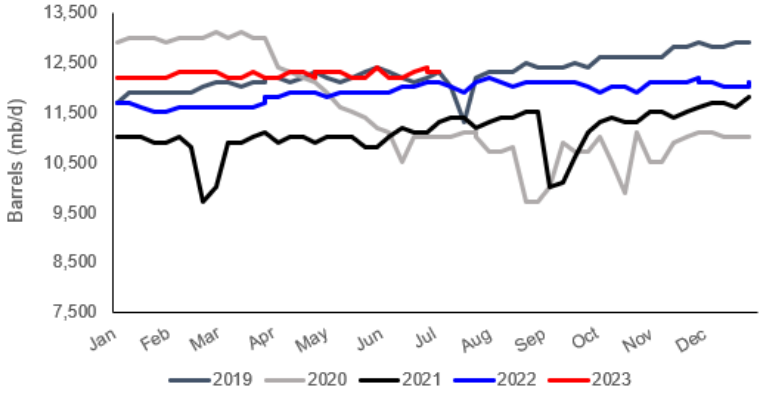
We don't make too much of minor or flat changes to the weekly EIA oil production estimates, which was the case this week. The EIA estimates US oil production was flat WoW at 12.3 mmb/d for the week ended July 14 [LINK]. This is just under the post Covid high level of 12.4 mmb/d, which was hit twice in June and once in July. We have been highlighting how the EIA monthly "actuals" have been above 12.4 mmb/d in Jan, Feb, March, and April so we have been expecting to see the weekly estimates hit 12.4 mmb/d and higher. The Lower 48 was also flat WoW at 11.9 mmb/d, and Alaska was down -0.011 mmb/d to 0.406 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 22: EIA's Estimated Weekly US Field Oil Production

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200	08/12	12,100	08/19	12,000	08/26	12,100		
2022-Sep	09/02	12,100	09/09	12,100	09/16	12,100	09/23	12,000	09/30	12,000
2022-Oct	10/07	11,900	10/14	12,000	10/21	12,000	10/28	11,900		
2022-Nov	11/04	12,100	11/11	12,100	11/18	12,100	11/25	12,100		
2022-Dec	12/02	12,200	12/09	12,100	12/16	12,100	12/23	12,000	12/30	12,100
2023-Jan	01/06	12,200	01/13	12,200	01/20	12,200	01/27	12,200		
2023-Feb	02/03	12,300	02/10	12,300	02/17	12,300	02/24	12,300		
2023-Mar	03/03	12,200	03/10	12,200	03/17	12,300	03/24	12,200	03/31	12,200
2023-Apr	04/07	12,300	04/14	12,300	04/21	12,200	04/28	12,300		
2023-May	05/05	12,300	05/12	12,200	05/19	12,300	05/26	12,200		
2023-Jun	06/02	12,400	06/09	12,400	06/16	12,200	06/23	12,200	06/30	12,400
2023-Jul	07/07	12,300	07/14	12,300						

Source: EIA

Figure 23: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

EIA Form 914: US Apr actuals 12.615 mmb/d, +398,000 b/d vs weekly estimates

In our July 2, 2023 Energy Tidbits memo we wrote *"As a reminder, the EIA's actuals for US oil production continue to be well above their weekly estimates. This the large difference between what the EIA looks at as "actuals" for US oil production vs the EIA's weekly estimates noted above. The actuals continue to be significantly higher than the weekly estimates. On Friday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for April US oil and natural gas production. The Form 914 actuals for April have production at 12.615 mmb/d, which is +398,000 b/d vs the EIA weekly estimates of 12.217 mmb/d. And because of this significant difference, the Form 914 April production is +947,000 b/d YoY, just shy of 1 mmb/d YoY. The actuals paint a picture of much stronger than expected US oil production."*

Figure 24: EIA Form 914 US Oil Production (thousands b/d)

(thousands b/d)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	12,568	12,532	12,717	12,615								
2022	11,369	11,316	11,701	11,668	11,629	11,797	11,844	12,002	12,337	12,417	12,379	12,149
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,869	11,673	11,913	12,149	12,154	12,218	11,902	12,486	12,590	12,809	13,000	12,978
2018	10,001	10,281	10,467	10,500	10,435	10,641	10,897	11,392	11,443	11,509	11,886	11,945
2017	8,875	9,110	9,166	9,101	9,185	9,111	9,247	9,250	9,517	9,669	10,085	9,983

Source: EIA

Figure 25: EIA Form 914 US Oil Production vs Weekly Estimates

Source: EIA

Oil: US shale/tight oil production has been stalled for five months

Shale/tight oil production

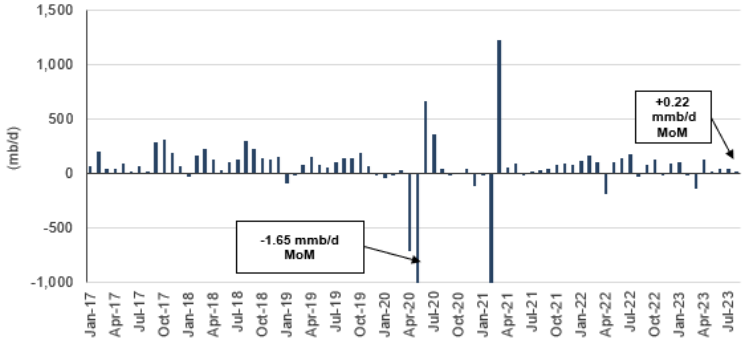
The headline on the EIA's Drilling Productivity Report July 2023 was how US shale/tight oil was decreasing. And that is true from the EIA's latest forecast, but the forecast MoM decline is only down 18,000 b/d MoM in August to 9,399,000 b/d. We thought the more significant takeaway is the US shale/tight oil production has been stalled for five months. (i) On Tuesday, we tweeted [LINK] "*US shale/tight #Oil & #NatGas production, including the Permian has been stalled for past 5 mths. See 👇SAF Group table per @EIAgov Drilling Productivity Report data. #OOTT."* (ii) On Monday, the EIA released its monthly Drilling Productivity Report for July 2023 [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case July) and the next month (in this case August). (iii) The EIA is forecasting a MoM production increase in July of only +6,000 b/d MoM to 9.417 mmb/d, but then an immaterial MoM decline of 18,000 b/d to 9.399 mmb/d. (iv) The EIA's forecast for US shale/tight oil for the past five months are April 9.329 mmb/d, May 9.374 mmb/d, June 9.411 mmb/d, July 9.417 mmb/d, and August 9.399 mmb/d. (v) Permian shale/tight oil production has also been stalled. Marrh 5.740 mmb/d, April 5.757 mmb/d, May 5.765 mmb/d, June 5.775 mmb/d, July 5.775 mmb/d, and August 5.764 mmb/d. (vi) US shale/tight oil production is +613,000 b/d YoY to 9.399 mmb/d in August 2023. The major change areas are Permian +367,000 b/d YoY and the Bakken +120,000 b/d YoY. (vii) Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 26: MoM Change – Major Shale/Tight Oil Production

Thousand b/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Aug YoY	Aug YoY%	Aug MoM
Anadarko	387	373	388	403	384	415	406	414	426	435	440	441	439	52	13%	-2
Appalachia	118	120	126	133	127	144	152	147	145	146	147	147	147	29	24%	0
Bakken	1,103	1,149	1,143	1,126	988	1,093	1,190	1,170	1,184	1,198	1,211	1,218	1,222	120	11%	4
Eagle Ford	1,106	1,119	1,120	1,095	1,067	1,114	1,123	1,141	1,133	1,141	1,143	1,136	1,124	19	2%	-12
Haynesville	36	37	36	35	33	35	35	35	36	36	36	36	36	1	2%	0
Niobrara	639	641	651	662	605	624	621	632	649	653	658	662	665	26	4%	3
Permian	5,398	5,525	5,564	5,600	5,555	5,668	5,680	5,740	5,757	5,765	5,775	5,775	5,764	367	7%	-11
Total	8,786	8,964	9,027	9,054	8,759	9,299	9,208	9,278	9,329	9,374	9,411	9,417	9,399	613	7.0%	-18

Source: EIA, SAF

Figure 27: MoM Change – Major Shale/Tight Oil Production



Source: EIA, SAF

Oil: EIA DUC's down marginally MoM in June

DUCs down marginally in June

We have been warning that we see a key risk to how much US oil production can sustainably grow in 2023 and beyond is the need to increase rig counts (not have less frac spreads) to replenish the inventory of Drilled Uncompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. The biggest problem in the past with the EIA's Drilling Productivity Report [LINK] estimate of Drilled Uncompleted wells was that the data had been constantly revised and sometimes significantly. (i) However, the DUC estimates provide a clear picture of the trend that DUCs have steadily decreased since Feb 2022. It's why there is the need for drilling rigs to pick up to replenish the DUC inventory if the US is to have sustained strong oil growth in 2024 and beyond. (ii) Drilled Uncompleted Wells were down -24 MoM (-483 YoY) in June to 4,804 DUCs. Note that May's data (including the Permian) had a net downward revision of -6 to 4,828. (iii) But at 4,804 DUCs, it means that a total 4,070 DUCs were worked down since the Jun/20 peak of 8,874. The largest work downs are coming from the Permian (-395 YoY) and Eagle Ford (-119 YoY). With DUCs being worked down so significantly we will need to see rig counts go up to replenish DUCs in the near future. (iv) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 28: EIA – Estimated Drilled UnCompleted Wells in 2023

				2023								
Drilled Uncompleted	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	YoY	YoY %	MoM
Anadarko	737	749	747	737	741	743	744	744	744	20	-5%	0
Appalachia	795	776	781	754	743	732	723	716	710	226	-6%	-7
Bakken	558	566	584	573	560	547	535	525	515	106	-13%	-10
Eagle Ford	593	566	560	535	518	501	493	485	481	-119	-27%	-8
Haynesville	696	705	710	719	729	740	750	766	776	331	29%	16
Niobrara	646	676	702	718	720	723	709	715	721	389	37%	6
Permian	1,090	1,066	1,044	997	987	930	899	877	857	-395	-33%	-22
Total	5,115	5,104	5,128	5,033	4,998	4,916	4,853	4,828	4,804	-483	-8%	-24

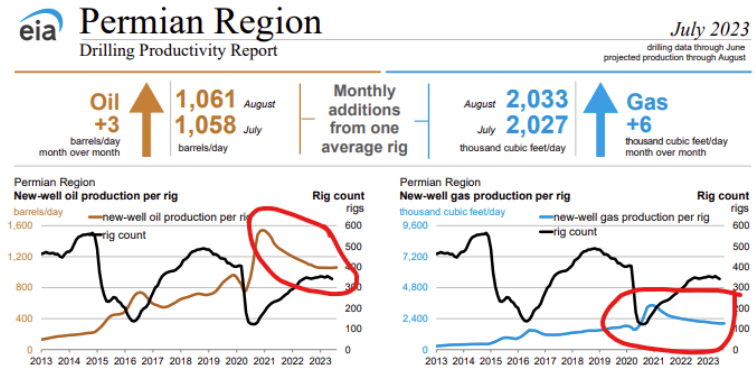
Source: EIA, SAF

Permian DUCs

Oil: Hard to see the math for sustained Permian growth based on the DUCs

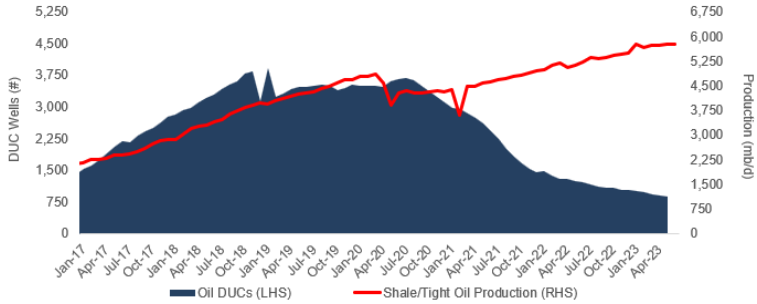
We have been focused on the level of Drilled UnCompleted Wells (DUCs) in the Permian from the EIA's monthly Drilling Productivity Report because the level of sustained Permian oil growth in the 2020s is perhaps the biggest wildcard and variable to oil prices in the 2020s. It's not that we don't care what US shale/tight oil production is forecast in July or August, absent a big fall off the cliff, it isn't the key data point from the EIA's DPR. Our position is unchanged – we have trouble seeing how the math works for sustained Permian oil growth in the 2020s based on the level of DUCs and oil rigs. Note that the EIA made significant upward revisions to the recent month's Permian DUCs that basically reversed the surprise significant downward revisions in the June DPR. However, that still doesn't make any real difference to the overall math problem. Permian DUCs are at the roughly the same levels as Aug/Sept 2014. Permian DUCs are 857 in June 2023 vs 818 in Aug 2014 and 903 in Sept 2024. Yet Permian oil rigs are 323 at July 21, 2023, which is currently are 58%% of Aug/Sept 2014 average of approx. 555 oil rigs. Yet Permian oil production of 5.764 mmb/d in Aug 2023 is 3.45 times higher than 1.673 mmb/d in Aug/Sept 2014. There is no question fracking/completions are multiples better than 2014. But if we use the EIA July DPR new production added per rig as a guide (see below EIA excerpt), it's about three times higher than 2014 so a big jump as would be expected. But note that that has dropped by about a third in the past two years. That makes sense if you recall some recent producer comments that, in the move to survive in 2020 and 2021, they drilled their best wells. On the flip side, when you look ahead, more companies have drilled up most off, or a good chunk, of their Tier 1 lands and we have been seeing this specifically said by more producers. The math is straightforward. Oil and gas production levels are the result of decline rates and how much can they be offset or more than offset by new well completions. And the ability to complete a well for shale/tight plays needs wells that are being drilled or have been drilled for an inventory of DUCs to be completed to add to production. Shale/tight oil plays like the Permian are all fracked. So a drilling rig drills the well, it then leaves the well as uncompleted and waiting for the frack spread to come and frack/complete the well. If drilling isn't high enough to keep adding to the DUCs and the existing DUCs inventory is low, there is less growth potential. It's math! This is why we still think it's tough to see how there is sustained production growth from the Permian for the coming years. It doesn't mean to say it declines and falls off a cliff, but it's hard to see sustained growth. Below is the table showing Permian DUCs vs rigs and production comparing June with Aug/Sept 2014 when DUCs were a similar level, and the excerpt from the DPR showing the new well production per Permian rigs that was in the June DPR.

Figure 29: Permian: EIA's Permian new-well-oil Production Per Rig



Source: EIA

Figure 30: EIA Estimated Drilled UnCompleted Wells vs Permian Oil Production



Source: EIA, SAF

Oil: Halliburton takes a lot more activity even to stand still in production

Takes more activity to stand still

On Wednesday, Halliburton held its Q2 call and we tweeted [LINK] "*Set up for near term pause in US #Oil production growth? #Halliburton doesn't say maturing US shale/tight oil. BUT says "think that this is my point around service intensity, meaning it takes more work to produce the same over time unless there are step changes in terms of either efficiency". And expects less H2/23 activity vs H1/23. #OOTT."* Halliburton CEO Jeff Miller didn't call the US shale basins maturing or mature but was asked about well productivity being down and if the customer conversations were that they have to drill more wells in the US given that productivity decline. We listened to the call to make sure the transcript was correct and Miller did say it was their view that there will be more activity over time, even to stand still. Sounds like a maturing basin. In the Q&A, Miller said "*I think that this is my point around service intensity, meaning it takes more work to produce the same over time unless there are step changes in terms of either efficiency or insight. And so, we talk about our smart fleet offering quite often, but the reality is that's part of our technology portfolio to help customers better understand productivity of rock and where the frac is going and how to design fracs that can be more productive over time. So I think that's an important step. But there is no question when we think about North America, and we even saw that during the COVID, the pace at which North America declined following sort of the near slowdown or near stoppage in North America. And so I think those are well understood by the market and our clients. And so*

when I think about the way forward in North America, that features in it and is clearly part of our view as to why, A, there'll be more activity over time, even to stand still, and further, why eFleets in our case are so valuable because they really do help clients achieve better productivity and lower costs. So, I think that that's one of the reasons we're so focused on that, and I think that's how it plays out."

Oil: Liberty Energy sees less US frack activity in H2/23 vs H1/23

Less US fracking in H2/23

Earlier in the memo, we noted Liberty Energy's Q2 call comments that US natural gas production will be flat or maybe decline a bit. In the Q2 call on Thursday, Liberty did not provide any specific comments on a near term outlook for US oil production. But did not that they expect lower US frac activity in H2/23 vs H1/23 and US shale/tight oil production growth depends on fracking wells. Liberty released Q2 on Wednesday night and we tweeted [LINK] "*More support for a near term pause in US #Oil production growth. #LibertyEnergy also sees North American frack activity down in H2/23 vs H1/23. "We anticipate North American completions activity will moderate in the second half of the year versus the first half" #OOTT."*

Oil: US Energy Secretary Granholm wants to see more oil supply

US wants more oil supply

We wouldn't have mentioned the Jennifer Granholm comments on calling for more oil supplies if the US hadn't proposed a big increase to its Gulf of Mexico royalties the day before. But yesterday, CNBC posted its story *"Oil markets are still volatile, U.S. energy chief says, calling for further supplies.* [LINK]. CNBC interviewed US Energy Secretary at the G20. CNBC didn't post the entire video, but reported "*Volatility is still weighing on oil markets, U.S. Energy Secretary Jennifer Granholm said Saturday, reiterating calls for additional supplies. Asked to comment on the state of oil markets, she told CNBC's Sri Jegarajah that "there's no doubt that there is a volatile environment" — a situation that the White House is monitoring. "There is a lot of emotion in these markets and so we have deep concern about trajectories of where things are headed," the energy secretary added. Granholm called for additional output to help curtail prices. "We want to see more supply … It gets dangerous when the prices are so high," she said. "I think the prudent course is to ensure that transportation is affordable for people, and that of course means making sure that supply is stable."*

US proposes higher royalties (16.67% from 12.5%) on offshore oil and gas

On Friday, the US Department of Interior announced *"Interior Department Takes Steps to Modernize Oil and Gas Leasing on Public Lands, Ensure Fair Return to Taxpayers*" [LINK]. The DOI maintains the Biden Administration approach that the oil and gas companies need to pay more. The DOI wrote "*The proposed rule would revise outdated fiscal terms of the onshore federal oil and gas leasing program – including for bonding requirements, royalty rates, and minimum bids – which would increase returns to the public and disincentive speculators or less responsible actors. The Interior Department has taken several steps over the last two years to ensure the federal oil and gas program provides a fair return to taxpayers, adequately accounts for environmental harms, and discourages speculation by oil and gas companies. This new proposed rule will help fully codify those goals and lead to more responsible leasing and development processes," said Principal Deputy Assistant Secretary for Land and Minerals Management Laura Daniel-Dav "* The obvious added cost is increased royalties for offshore lands including the Gulf of Mexico. The DOI wrote "*Royalty rates: Proposed changes to royalty rates reflect provisions of the*

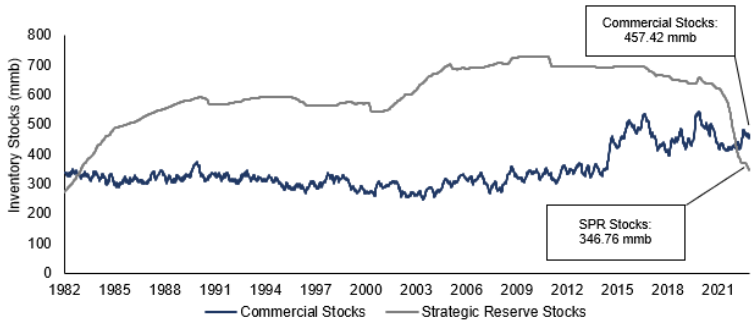
Inflation Reduction Act. Royalty rates for leases issued for 10 years after the effective date of the Inflation Reduction Act are 16.67 percent. After August 16, 2032, the rate of 16.67 percent will become the minimum royalty rate." This is an increase from the current 12.5%. Our Supplemental Documents package includes the DOI announcement.

US SPR reserves

Oil: US SPR reserves now -110.661 mmb lower than commercial crude oil reserves

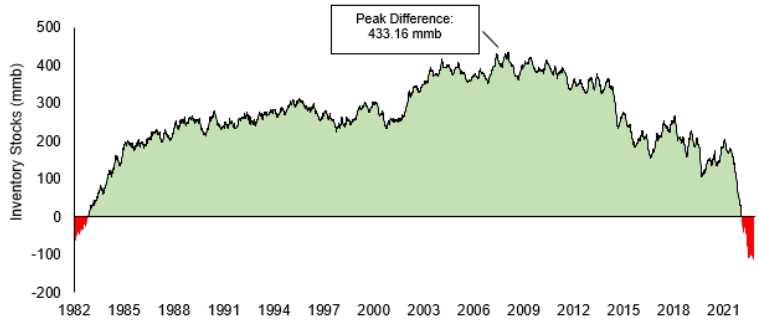
Oil in US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit narrowed this week after a draw in commercial oil stocks of -0.71 mmb. The EIA's weekly oil data for July 14 [LINK] saw the SPR reserves increase +0.001 mmb to 346.759 mmb, while commercial crude oil reserves decreased -0.708 mmb 457.420 mmb. There is now a -110.661 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 31: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 32: US Oil Inventories: SPR Less Commercial



Source: EIA, SAF

WCS less WTI differentials

Oil: Cdn oil differentials widened +$2.00 to close at $14.00 on July 21

It's been a great last two months for WCS less WTI differentials that still continue to see the impact of OPEC+ cuts including Saudi Arabia's extra voluntary 1 mmb/d cut for July and

August. This has led to continued much narrower than normal WCS less WTI differentials for this time of year. WCS less WTI differentials widened by $2.00 to close at $14.00 on July 21. Even still this has been a great May/June/July for WCS less WTI differentials, which are hugely narrower than normal as differentials normally start to widen in mid-May. WCS less WTI differentials were $14.15 on March 31, which was the Friday before the Sun Apr 2 reports that OPEC+ was going to cut production effective May 1. The WCS less WTI differential was up and down but closed at $14.65 on Apr 28, then narrowed in May to 13.75 on May 26, narrowed in June to $11.25 on June 30, were $12.00 on July 14 and widened this week to close at $14.00 on July 21. This looks like it is the start of the normal widening of the differentials as US refineries start to look to upcoming maintenance to change to winter fuel blends. The normal seasonal trend for WCS less WTI differentials that normally widen starting in mid-May. For perspective, a year ago, the WCS-WTI differentials last year were $20.50 on July 21, 2022. Below is Bloomberg's current WCS–WTI differential as of July 21, 2023 close.

Figure 33: WCS less WTI oil differentials including July 21 close

Source: Bloomberg

Oil: Crack spreads at $38.35 so no reason for refiners to stop buying crude

Crack spreads up this week

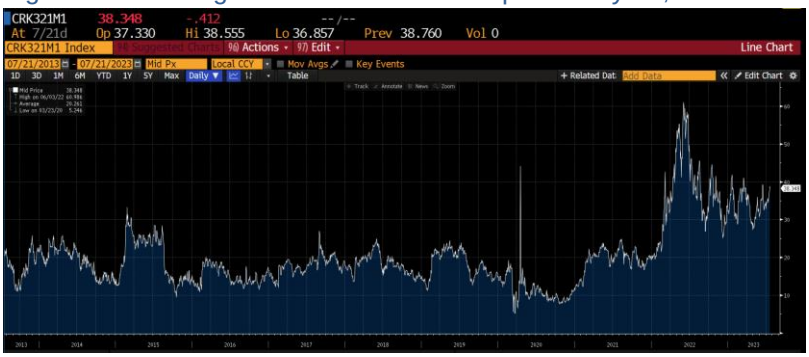
We remind that oil demand is driven by refiners and their ability to make money by processing oil and selling petroleum products. So crack spreads are a good indicator if refiners will be looking to buy more or less oil. This week, the US 321 crack spreads increased by $3.36 to close at $38.35 on July 21. It's not like the crazy high spreads of a year ago, when 321 crack spreads high that were $58.50 on June 17, 2022 and were over $40 until falling to the high $30s in mid-July 2022. But spreads are still about double the more normal range pre-Covid that was more like $15-$20. A $38.35 crack spread is a good incentive for US refiners to run hard and process as much crude as possible.

Explaining 321 crack spread

People often just say "cracks", which refers to the 321 crack spread. This is the spread or margin that refiners make from buying crude at a certain price and then selling the finished petroleum products at their respective prices. The 321 crack spread is meant to represent what a typical US refinery produces. It assumes that for every three barrels of crude oil, the refinery will produce two barrels of gasoline and one barrel of distillates. So the crack spread is based on that formula and worked

back to a crack spread per barrel. Below is the current 321 crack spread, which was $38.35 as of the Friday July 21, 2023 close.

Figure 34: Cushing Crude Oil 321 Crack Spread July 21, 2013-to July 21, 2023



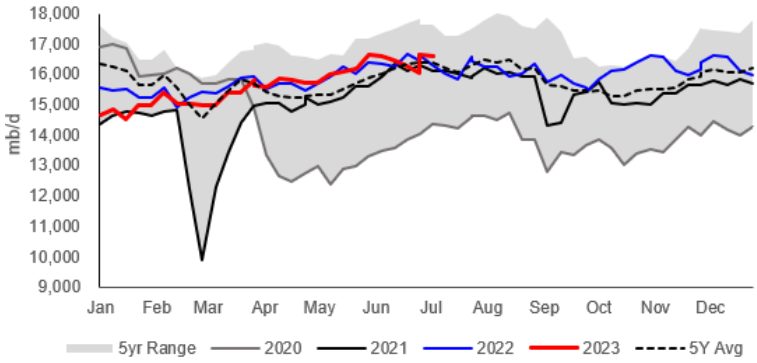
Source: Bloomberg

Oil: Refinery inputs down -0.074 mmb/d WoW to 16.585 mmb/d

Refinery inputs down -0.074 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. We'll normally see refineries come out of turnarounds in late March/early April to start their ramp up in refining of summer blend fuels, which typically peaks in Aug/early Sept. And given the solid crack spreads noted above, refineries are still incentivized to process as much crude as possible. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended July 14 [LINK]. The EIA reported crude inputs to refineries were down -0.074 mmb/d this week to 16.585 mmb/d and are up +0.266 mmb/d YoY. Refinery utilization was up +0.6% WoW to 94.3%, which is +0.6% YoY. Total products supplied (i.e., demand) increased WoW, up +2.066 mmb/d to 20.767 mmb/d, and Motor gasoline was up +0.099 mmb/d to 8.855 mmb/d from 8.756 mmb/d last week. The 4-week average for Motor Gasoline was down -0.130 mmb/d WoW to 9.129 mmb/d. The 4-week average of Total demand was up +0.201 mmb/d WoW to 20.252 mmb/d.

Figure 35: US Refinery Crude Oil Inputs



Source: EIA, SAF

US net oil imports

Oil: Something still isn't right in the EIA weekly oil imports by country data

The reason why we continue to highlight this error is that no one can tell if its only the EIA allocating imports incorrectly by country or if the EIA is understating oil imports. But it's the same commentary as the last several weeks that something doesn't look quite right in the EIA weekly oil imports by country data. It looks like something is off in the EIA's estimates of weekly oil imports by country data but, the reason we highlight this is that we just don't know if the total US crude oil imports are wrong or if it's just that the EIA has incorrectly allocated import volumes to the wrong country. Perhaps this is part of the reason for the big weekly plug in its estimates. (i) For some reason, the EIA weekly data does not include any oil imports from Venezuela in their weekly reporting of US oil imports by country. Yet we have seen Chevron importing oil from Venezuela into its and other PADD 3 Gulf Coast refineries. What we don't know if the EIA has just allocated to some other country. We have been highlighting how Chevron has steadily increasing US Gulf Coast (PADD 3) imports from Venezuela every month in 2023. And the EIA reports oil imports from Venezuela in its monthly data but for reason not in these weekly estimates. (ii) US "NET" imports were down -0.376 mmb/d to 3.360 mmb/d for the July 14 week. US imports were up +1.294 mmb/d to 7.174 mmb/d. US exports were up +1.670 mmb/d to 3.814 mmb/d. The WoW increase in US oil imports was driven mostly by "Top 10". The Top 10 was up +0.925 mmb/d. Some items to note on the country data: (i) Canada was up +0.313 mmb/d to 3.698 mmb/d. (ii) Saudi Arabia was down -0.018 mmb/d to 0.426 mmb/d. (iii) Mexico was up +0.478 mmb/d to 1.004 mmb/d. (iv) Colombia was up +0.062 mmb/d to 0.215 mmb/d. (v) Iraq was up +0.125 mmb/d to 0.259 mmb/d. (vi) Ecuador was up +0.063 mmb/d to 0.207 mmb/d. (vii) Nigeria was down -0.098 mmb/d to 0.091 mmb/d.

Figure 36: US Weekly Preliminary Imports by Major Country

(thousand b/d)	May 5/23	May 12/23	May 19/23	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	Jun 23/23	Jun 30/23	Jul 7/23	Jul 14/23	WoW
Canada	3,269	3,592	3,707	3,589	3,504	3,339	3,570	3,776	3,611	3,385	3,698	313
Saudi Arabia	381	415	212	534	66	677	146	460	313	444	426	-18
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	393	676	657	913	647	845	808	758	882	526	1,004	478
Colombia	47	339	214	286	127	184	148	222	287	153	215	62
Iraq	247	174	136	114	430	252	102	216	122	134	259	125
Ecuador	145	101	71	214	218	54	203	67	157	144	207	63
Nigeria	143	329	77	98	144	132	204	96	192	189	91	-98
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	4,625	5,626	5,074	5,748	5,136	5,483	5,181	5,595	5,564	4,975	5,900	925
Others	928	1,234	776	1,469	1,264	898	980	985	1,474	905	1,274	369
Total US	5,553	6,860	5,850	7,217	6,400	6,381	6,161	6,580	7,038	5,880	7,174	1,294

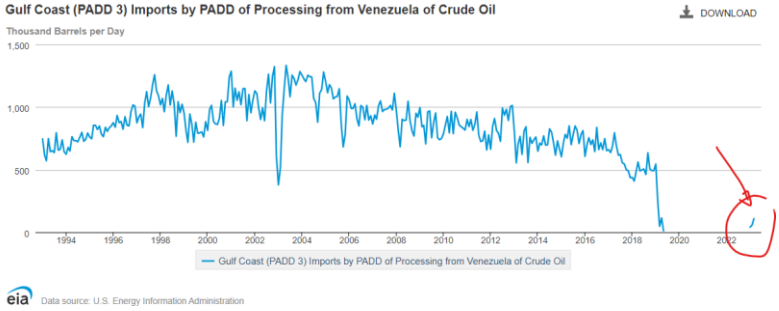
Source: EIA, SAF

EIA shows imports from Venezuela in its monthly import data.

Here is what we wrote in our May 7, 2023 Energy Tidbits memo. *"Last week's (Apr 30, 2023) Energy Tidbits memo highlighted our Apr 29 tweet [LINK] that Chevron's start of Venezuela oil imports into the Gulf Coast is likely impacting Cdn WCS less WTI differentials and how Venezuela oil into the Gulf Coast will be increasing in March and April. On Monday, Bloomberg's Tanker Tracker for Venezuela confirmed the increases in March and April. We tweeted [LINK] 'Blame it on #Chevron. Seasonal narrowing for WCS-WTI differentials, but not as much as might be expected. Increasing PADD 3 Gulf Coast imports of VEN #Oil. Feb: 89 kbd. Mar: 115 kbd. Apr: 143 kbd. Thx @business Tanker Tracker, @lkassai. #OOTT".* (ii) Here is what we wrote in our Apr 30, 2023 Energy Tidbits memo on the EIA monthly data.

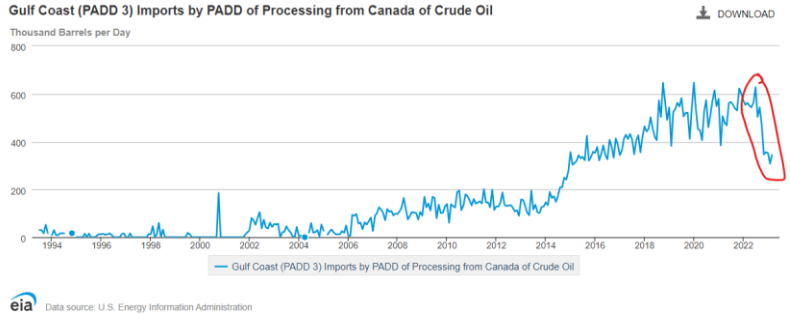
"*Our tweet included the below EIA graphs of crude oil imports into the Gulf Coast PADD 3. They remind how Cdn heavy/medium crude was able to penetrate PADD 3 (Gulf Coast) because there was a need with declining Mexico and Venezuela crude oil. Conversely, if Venezuela increases, it will mean more Venezuela crude to the Gulf Coast and less need/increased pressure on Cdn differentials. It's hard to see form the graph but we pointed to the first Venezuela oil imports into the Gulf Coast in about 3 ½ years were 40,000 b/d in Jan and 58,000 b/d in Feb, and this will be higher in March.*"

Figure 37: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 38: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil: Pemex, offshore pipeline release was minimal, what about the other pipelines?

Pemex offshore pipeline leak

Maybe there is a little bit of a case of lost in translation, but we couldn't help note the Pemex July 18 release "*PEMEX clarifies leak control in Ek Balam fields".* This was in response to the media reports of a large offshore oil spill not related to the recent platform explosion. The main message from Pemex was "*Given the small size of the cracks, the volume of hydrocarbons that escaped was minimal."* And "*The leak is fully repaired This event has nothing to do with the events that occurred in Nohoch-A on July 5."* But what caught our attention was Pemex saying there was good news in that the pipeline network had reached its 30 yr life so they have now fixed this pipeline so it's good as new. Pemex said "*The pipeline network of the Ek Balam fields concluded its useful life of 30 years, so that, in a preventive way, the change for a new network is carried out. With these actions, the*

possibility of oil leaks will be definitively eliminated." What surprised is is that we haven't seen any comments post this release what about the other Pemex offshore pipelines age and status? For those who have been around the oil industry, they know that the super giant Cantarell oil field and other offshore oil development was in the late 70s/early 80s so all of those pipeline networks are over 30 years. Have they been replaced already? Our Supplemental Documents package includes the Pemex release.

Norway oil production

Oil: Norway June oil production of 1.810 mmb/d, up +1.5% MoM

On Friday, the Norwegian Petroleum Directorate released its June production figures [LINK]. It reported oil production of 1.810 mmb/d, up +1.5% MoM from 1.783 mmb/d in May and +36.2% YoY from 1.329 mmb/d in June 2022. June's production actuals came in +0.6% (0.010 mmb/d) over the forecast volumes of 1.800 mmb/d. The NPD does not provide any explanations for the MoM changes. The theme for Norway through 2022 was that Norway oil production returned to growth because of the Johan Sverdrup oil field, and tax breaks from the government allowing increased capex in the energy sector. Norway oil production is expected to be up modestly in 2023. Our Supplemental Documents package incudes the NPD release.

Figure 39: Norway June 2023 Production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm³/day	Total MSm³ o.e/day
Production	**June 2023**	**1.810**	**1.990**	**259.1**	**0.575**
Forecast for	June 2023	1.800	2.002	299	0.617
Deviation from forecast		0.010	-0.012	-40	-0.042
Deviation from forecaset in %		0.6 %	-0.6 %	-13.4 %	-6.8 %
Production	May 2023	1.783	2.002	274.2	0.592
Deviation from	May 2023	0.027	-0.012	-15.1	-0.017
Deviation in % from	May 2023	1.5 %	-0.6 %	-5.5 %	-2.9 %
Production	June 2022	1.329	1.540	332	0.577
Deviation from	June 2022	0.481	0.450	-73	-0.002
Deviation in % from	June 2022	36.2 %	29.2 %	-22 %	-0.3 %

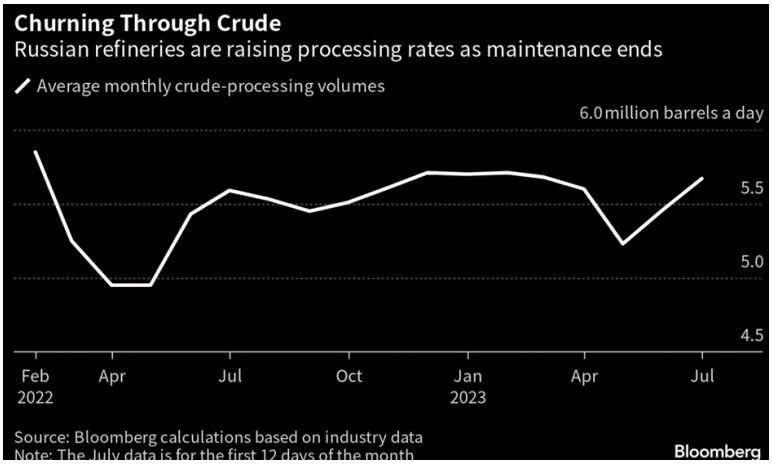
Source: Norwegian Petroleum Directorate

Russian refineries crude processing

Oil: Russian refinery runs on seasonal increase ie. less crude for export

On Monday, we tweeted [LINK] "*Increasing Russian refinery runs = less Russian #Oil for exports. Seasonal refinery maintenance ends & refineries ramp up refinery runs in July/Aug. @ja_herron latest update shows RUS refineries processing ~0.4 mmb/d more than Apr/May. Fits 👇05/27 tweet re @JODI trends. #OOTT."* Our tweet included the below Blooomberg graph showing that Russian refineries are now processing about 0.4 mmb/d more than April/May. Bloomberg wrote "*Russia's refineries are ramping up after spring maintenance, taking advantage of the last remaining weeks of generous downstream subsidies before the government cuts the payments by half. The nation's primary processing rates averaged 5.68 million barrels a day from July 6 to July 12, a 13-week high, according to a person with knowledge of the matter. That's up about 22,000 barrels a day from the week before, Bloomberg calculations show."*

Figure 40: Russian refineries crude processing rates

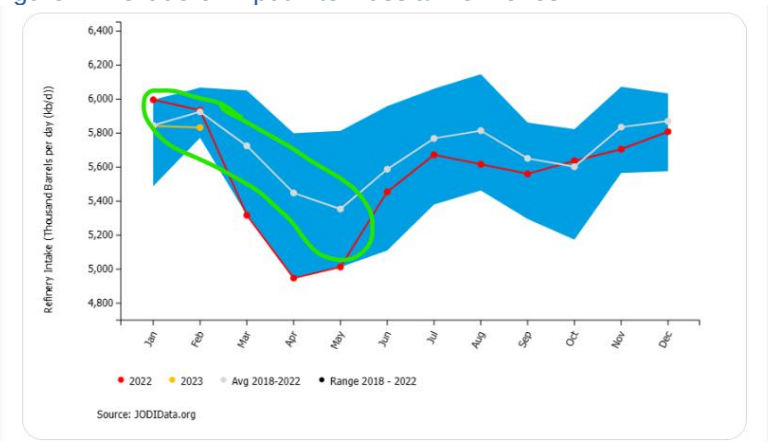


Source: Bloomberg

Russian refineries normally increase oil volumes in June ie. less oil for export

No one should be surprised to see the big increase in crude processing at Russian refineries – it happens every year in Q2. Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*One of the big negatives for oil markets has been the view that more Russian oil crude has been hitting export markets and the generally accepted cause is that Russia hasn't delivered on stated plan to cut 500,000 b/d beginning in March. However, there is another reason why more Russia oil would have hit export markets in March/April/May – it's the season when Russian refineries process less crude due to refinery maintenance. So less crude processed by refineries frees up more oil for export. Yesterday, we tweeted [LINK] "Should see RUS #oil production cuts hit Jun/Jul/Aug physical markets & why cuts hasn't hit exports yet. Normal seasonal pattern of RUS refinery turnarounds reduce oil intake by ~500,000 b/d from Feb thru May. Thx @JODI_Data. #OOTT." Nothing is normal in Russia post its invasion of Ukraine, but the normal seasonal pattern of Russian refineries is that they reduce crude oil inputs in March, April and May, and this is down over 500,000 b/d in this period in the normal seasonal trend. Below is the JODI graph attached to our tweet*."

Figure 41: Crude oil input into Russian refineries



Source: JODI

Oil: US warns RUS/UKR is a real war and is going to be long, hard and bloody

US on Russia Ukraine war

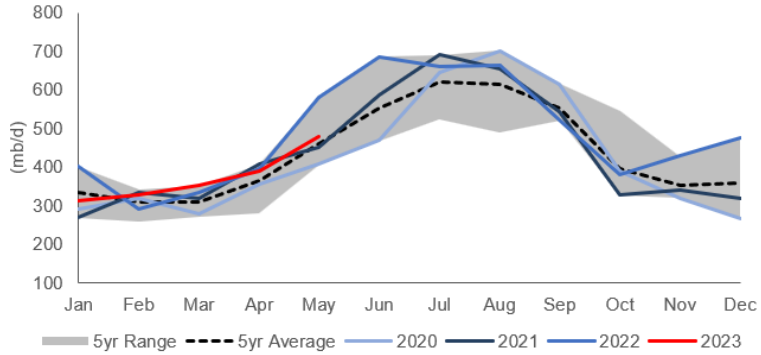
There was a good reminder this week from chairman Joint Chiefs of Staff General Mark Milley on the reality of the Russia/Ukraine war and that, absent some big change, the war is going to go on for a lot longer. And no one knows what the end results will be for the Ukraine. Milley and Defense Secretary Lloyd Austin held a press conference on Tuesdayu.. On Wednesday, we tweeted [LINK] "*ICYMI. US General Milley on reality of UKR counteroffensive. "Because that's the difference between war on paper and real war. These are real people in real machines that are out there really clearing real minefields and they're really dying." "It is far from a failure, in my view. I think that it's way too early to make that kind of call. I think there's a lot of fighting left to go. And I'll stay with the what we've said before, this is going to be long, it's going to be hard, it's going to be bloody. And at the end of the day, we'll see where the Ukrainians end up, vis-a-vis the Russians." #OOTT [LINK]*."

Oil: Saudi use of oil for electricity up in May ie., less oil available for export

Saudi oil use for electricity up in May

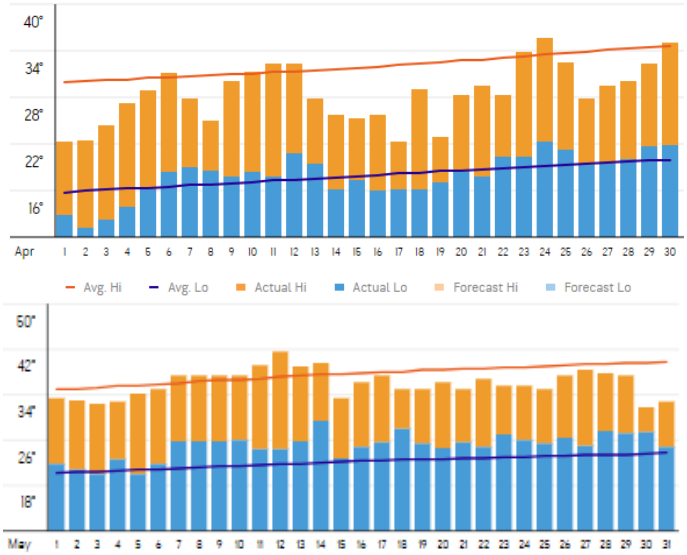
The key seasonal theme for Saudi oil exports is that, all things being equal, Saudi can export more oil in winter months as it uses less oil for electricity and, conversely, it would have less oil exports in summer months as it uses more oil for electricity i.e. air conditioning. With May marking the end of spring and the beginning of summer, it was no surprise that Saudi oil use for electricity continues to seasonally ramp up. Note that a normal peak to trough decline is ~400,000 b/d. If there is less oil used for electricity, then there is more oil for export and vice versa. The JODI data for Saudi Arabia oil supply and demand for May [LINK] was updated on Monday. Saudi used more oil for electricity in May vs April. The increased electricity usage was primarily driven by daily temperatures being at or above the average high throughout most of the month. It is important to note that May experienced warmer temperatures than April and warmer weather means more air conditioning/electricity demand. Oil used for electricity generation in May was 478,000 b/d (vs May 2022 of 582,000 b/d) and April was 389,000 b/d (vs April 2022 of 397,000 b/d). Below are the AccuWeather Temp maps for Riyadh for May and April.

Figure 42: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI, SAF

Figure 43: Riyadh Temperature Recaps for April (top) and May (bottom)



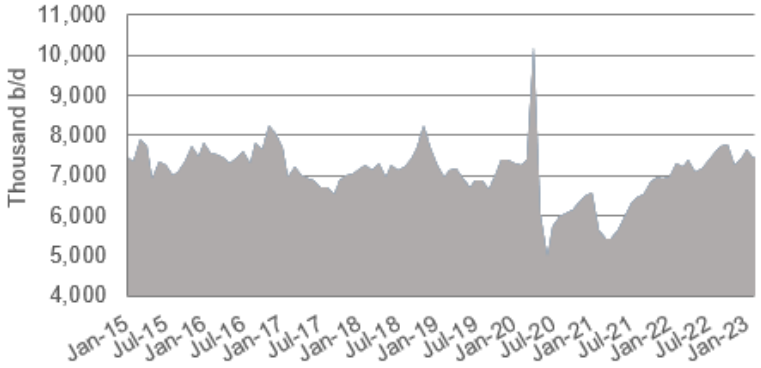
Source: AccuWeather

Oil: Saudi oil exports down -388,000 b/d to 6.928 mmb/d in May

The JODI data notes Saudi oil exports in May were down -388,000 b/d MoM to 6.928 mmb/d. Production was down -502,000 b/d MoM, refinery intake was down -100,000 b/d MoM and only a +89,000 b/d increase in direct use for electricity. In the pre Russian ban days, Saudi oil exports should have seen a larger MoM decrease. However, Saudi continues to increase its imports of Russian fuel oil, which is likely the explanation for why expots didn't go down as much as might have been expected. Below is our graph of Saudi Arabia monthly oil exports.

Saudi oil exports down -388,000 b/d MoM

Figure 44: Saudi Arabia Oil Exports (mb/d)



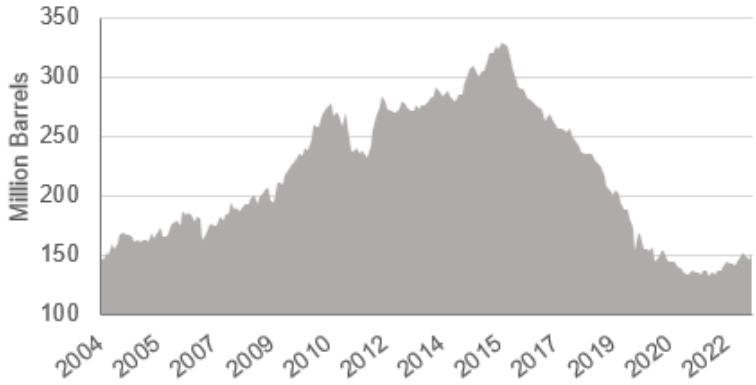
Source: JODI, SAF

Saudi oil inventory data

Oil: Expected Saudi oil inventories down -1.156 mmb MoM in May

It looks like the increasing Saudi imports of Russian fuel oil is the missing piece of the puzzle for the MoM reconciliation of Saudi oil inventories. JODI data shows inventories were -1.156 mmb MoM, or -37,000 b/d MoM. Looking at the basic components, we would have expected a draw on inventory closer to -3.193 mmb MoM or -103,000 b/d MoM. There should have been a MoM inventory draw impact from production being -502,000 b/d MoM and crude oil used for electricity +89,000 b/d MoM. But the offsetting impact for a MoM inventory build would be for exports being -388,000 b/d MoM and oil intake into refineries being -100,000 b/d MoM. The net impact should have been a 103,000 b/d MoM draw in inventories. But inventories only were down by 37,000 b/d MoM leaving a 66,000 b/d unexplained MoM items. We believe this is due to increasing oil and fuel oil imports from Russia. .

Figure 45: Saudi Arabia Oil Inventories (mb/d)



Source: JODI, SAF

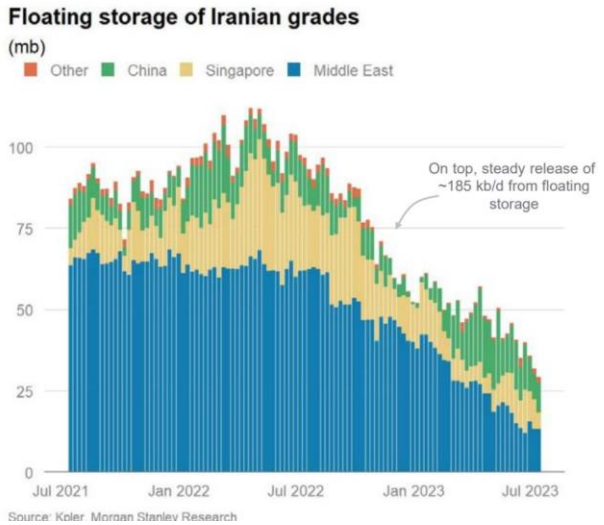
Iran sold most of its floating storage

Oil – Iran's floating oil and condensate storage has been mostly sold

One of the overlooked positives for potential torque to oil prices has been the big reduction in 2023 in Iran's floating oil and condensate storage t that was over 100 million barrels in mid 2022. On Wednesday, we tweeted [LINK] "*Must read! #Oil Positive. See* 👇

@DanialRahmat12 tweet: Iran's floating oil reserves shrinking as did their condensates. Another great insight, he told us this was happening on May 5 tweet [LINK] Torque to #Oil prices as demand keeps recovering. #OOTT." We retweeted Danial Rahmat's tweet [LINK] *"#Iran's floating oil reserve shrinks as #NIOC exports more crude to China and consumes more #gas_condensates domestically. #OOTT @Energy_Tidbits @gulf_intel @PetroleumEcon".* Rahmat's tweet included the below graph with Kpler and Morgan Stanley that shows how Iran's floating storage was well over 100 million barrels and is now down to less than 30 million barrels. And how it's been a steady release of 185,000 b/d from floating storage since around year end. We have been highlighting this since early May. This is a big reduction to the overhang of Iran's floating oil storage.

Figure 46: Floating storage of Iranian crudes (million barrels)



Source: Danial Rahmat, Kpler, Morgan Stanley Research

Iran's floating oil and condensate storage reportedly sold in past few months

We know one person who wasn't' surprised to see the big drop in Iran's floating oil storage – Tehran-based analyst Danial Rahmat. Our May 7, 2023 Energy Tidbits memo was titled "*Tehran-based Danial Rahmat: Last 3 Mths, Iran Decided to Sell Most of its Floating Oil & Condensate with Remarkable Discounts*". We then wrote "*No question oil has been week over the past couple months and one overlooked, at least by us, is that Iran has reportedly sold off all their 100 million barrels of floating oil and undisclosed million barrels of condensate over the past few months. No question, it's been a negative to oil prices, but it also means that floating storage isn't there when demand increases over the coming months. Please note that some of this oil will be in floating oil storage estimates and some will be in transit oil, albeit very slow moving in transit. But the point is that it takes this either floating storage or in very slow transit off the market and into customers. On Friday morning, we tweeted [LINK] " "Iran, during the last 3 mths, decided to sell most of its [floating] #Oil with remarkable discounts" "And there is almost no gas condensate floating right now" Tehran-based @DanialRahmat12 to @FrankKaneDubai on @gulf_intel. Torque*

to oil price when demand returns. #OOTT". We hadn't realized Iran had recently sold its floating oil and condensate storage. We try to listen to the 30-min Gulf Intelligence podcast every morning as they have an excellent group of experienced guests from all over the world. One of the regular commentators is Tehran-based Senior Energy Security Consultant, Danial Rahmat. We have referenced his comments in prior memos as Rahmat has typically been a pretty plugged in energy consultant in Iran. Our tweet included the SAF Group created transcript of comments by Danial Rahmat (Tehran-based Senior Energy Security Consultant) with moderator Frank Kane (Editor-at-Large, Arabian Gulf Business Insights) on Gulf Intelligence PODCAST Daily Energy Markets – May 5th. [LINK]. Items in "italics" are SAF Group created transcript. Kane asked Ramat on Iran saying they are increasing more oil of late and one of the reasons "we have seen the price weakness of late?" Rahmat "…. Please consider, remember last year at this time, we were speaking about Iran's floating reserves in Asia, which was about 100 million barrels. Right now there is almost nothing left of that. So you see that Iran has delivered a very huge amount of oil to the markets this last year. Basically, within the last six months." Kane: "Dan, let me clarify one point, you said that the 100 million barrels of floating oil has now gone?" Rahmat "Mostly. Iran, because of the high level of uncertainty in the market. And actually, backwardation in the market where future contracts are cheaper than the spot prices. Iran, during the last 3 months, decided to sell most of its oil with remarkable discounts. Because it was not making sense to keep that oil floating because the prices were getting better and better so you were there to sell your oil with a discount instead of keeping that floating accepting the risk, and also spending the money for keeping that floating. So sold most of its oil. And there is almost no gas condensate floating right now. "

Oil: Still no indication for a restart of Kurdistan/Iraq oil via Turkey

Kurdistan oil still shut in

As of our 7am MT news cut off, we haven't seen any reports from Kurdistan specifically noting their major issue – getting its oil exports back on thru Turkey. There seems to be no indication or expectation for any near term restart of Kurdistan/Iraq exports. It's hard to tell from the exact situation but we have to believe the key focus is what does Turkey want or is waiting for as they hold the cards as to when Kurdistan/Iraq oil can resume exports via Turkey. (i) Turkey says the holdup is Iraq and Kurdistan internal issues. Here is what we wrote in last week's (July 16, 2023) Energy Tidbits memo. "Turkey says its Iraq and Kurdistan internal issues holding it up. On Wednesday, we tweeted [LINK] "*Erdogan says holdup of Iraq/Kurdistan #Oil via Turkey is not Turkey's fault. Turkey is waiting for them to resolve their internal matters. Erdogan "we endorse the opening of pipelines because it is a win-win deal. Let them win and let us win too". Thx @KarwanFaidhiDri #OOTT*." Our tweet included a Rudaw (Kurdistan news) report [LINK], who wrote "*Turkish President Recep Tayyip Erdogan on Wednesday said that the suspension of Kurdistan Region's oil exports is because of problems between Baghdad and Erbil, and Turkey takes no issue with the exports. "We do not have an issue in receiving oil from Iraq. This issue is sourced from tensions between the federal government of Iraq and northern Iraq. My relevant friends are holding meetings in this regard," Erdogan told Rudaw's Zinar Shino during a press conference in Vilnius. He said that Ankara is waiting for Baghdad and Erbil to resolve their internal matters, and then Turkey will act. "We endorse the opening of pipelines because it is a win-win deal. Let them win and let us win too," he added."* (ii) Kurdistan regional parliamentary elections holdup. We check

Rudaw (Kurdistan news) regularly each week for their reporting. We have not seen any reports that Kurdistan links the holdup from Iraq on restart is because of the still uncertain dates to hold the required Kurdistan regional parliamentary elections that were originally sete to be held in Oct 2022. On Wednesday, Rudaw reported [LINK] "*Iraq's electoral body on Wednesday said it will prioritize holding the Kurdish parliamentary vote and that "a date may be set that might be so near it will be a surprise," in response to a request by the Kurdistan Region's Presidency calling for the vote to be held this year. The Kurdistan Region Presidency announced last week that it had submitted a formal request to Iraq's Independent High Electoral Commission (IHEC) in regards to the Kurdish parliamentary elections, suggesting the polls be held on their originally scheduled date of November 18 or simultaneously with Iraqi provincial elections on December 18. "We have answered the letter of the Kurdistan Region's Presidency, we cannot run the Iraqi provincial elections and the Kurdistan Region parliamentary elections on the same day," Emad Jamil, head of the journalistic team of the commission, told Rudaw. "It has been decided that we will hold the Kurdistan Region's parliamentary elections, we are now busy selecting a day for the vote and a date may be set that might be so near it will be a surprise," Jamil said, adding that the commission will prioritize the Kurdish parliamentary elections over the Iraqi provincial vote.*

Oil: No Libya production update post Libya's El Feel and Sharara oil fields restart

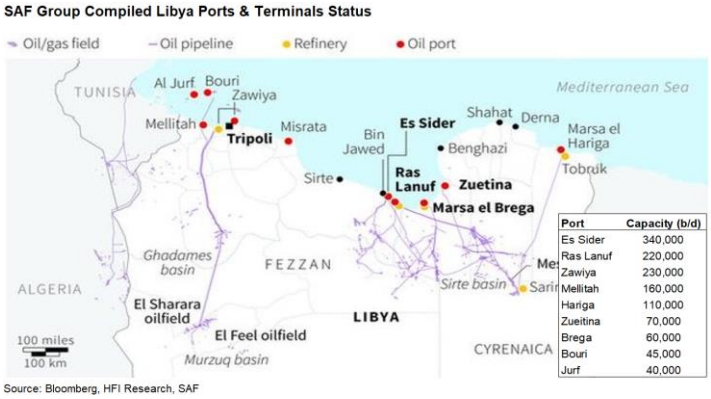
El Feel Sharara oil fields restarted a week ago

We are a little surprised that, as of our 7am MT news cut off, we haven't seen any Libya National Oil Corporation production update to give some confidence to markets that Libya is back at full production. Last week's (July 16, 2023) Energy Tidbits memo noted how protests shut down last Thursday shut down Libya's 70,000 b/d El Feel oil field and then, on Friday, that protests had also shut down the 300,000 b/d Sharara oil field. But by Saturday afternoon, we weeted [LINK] "*Breaking! "Libya's Sharara oil field is gradually resuming production after protesters that shut the facility earlier this week left, a person familiar with the matter said. Output is likely to be fully restored over the next 24 hours" reports @business Hatem Mohareb. #OOTT".* And then we saw reports the El Feel oil field was also being restarted. So in a matter of a few days, the oil fields were shut down and then restored. Given the reports that production had been restored a week ago, we would have expected to see the NOC provide a production update, but there were no production updates.

Libya NOC last production report was oil production at ~1.2 mmb/d on July 7

As noted above, as of our 7am MT news cut off, we have not seen any production update from the Libya National Oil Corporation posts this week. Our last three Energy Tidbits memo noted how the NOC had resumed giving production updates as it seemed like they wanted to reassure outsiders who would be concerned by the threats by Haftar and eastern Libya to disrupt oil exports as impacting Libya's current oil production. The latest update was on July 7 on the NOC Facebook [LINK]. The Google Translate version was "*Crude oil production reached one million and 207 thousand barrels per day, and condensate production reached 50 thousand barrels per day during the past 24 hours."* Libya oil production has been steady at ~1.2 mmb/d for the past several months.

Figure 47: SAF Group compiled Libya Ports & Terminals



Source: SAF, Bloomberg, HFI Research

The last Libya east vs west fight took oil production to almost zero

Risk of a Libya east vs west conflict

Last week's shut in and return of the El Feel and Sharara oil fields was a reminder that there is ongoing risk to Libya's oil production. Especially as there is still no visibility to when the national election will be held. The eastern Libya threats to cut off oil exports without a fair sharing of oil revenues is not a new issue. It was one of the key reasons for the east vs west fighting and conflict that took Libya oil production to almost zero a few years ago. The conflict ended with the promise of a national election on Dec 24, 2021, which would also lead to a resolve over the fair sharing of oil revenues between east and west Libya. The promise of the election led to a restoration of production. The national election never happened and there is still no date for the election, which is why the eastern Libya threat to halt oil exports without a fair sharing of oil revenues is being watched.

Figure 48: Libya oil production Starting July 1, 2010

Source: Bloomberg, OPEC

Oil: No Covid updates this week on Chinese state media

No Covid reporting

We are still somewhat surprised to see another week of no reporting on Covid given it was forecast to peak at the end of June, even if it is to say Covid is over. But, as of our 7am MT news cut off, is was another week where we didn't see we haven't seen any updates from

state media (Global Times, Xinhua, People's Daily) and the South China Morning Post on an update on Covid cases for the third week. The last reports were pointing to less Covid cases and there have been no reports on hospitalizations. And we have not seen any reporting suggesting Covid was having any restrictions on the economy. Absent some new reporting, we don't plan to include this item in the Energy Tidbits memo. By way of background to the expected peak in Covid at the end of June, here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*On Monday, China admitted there is a new wave of Covid that their predictive model calls for a peak of 65 million cases per week at the end of June, but also thinks the impact wont' be as bad. On Tuesday, we tweeted [LINK] "China on market watch for next several weeks as to how severe is this new wave of Covid. State media: China's top respiratory disease expert says new COVID-19 wave will likely peak in late June at ~65 million cases per week. Thinks 2nd peak won't be as bad as 1st, now will hospitals be overloaded as usually mild symptoms. Also new variant XBB has no significant change in pathogenicity. Even if only mild, will slow down pace of recovery. #OOTT". Our tweet included the Global Times (China state media) reporting that included "A small wave of COVID-19 infections at the end of April and early May was "anticipated." Projections showed that a small peak of infections is likely at the end of May, with the number of infections peaking at about 40 million per week. By the end of June, the epidemic is expected to peak at about 65 million infections a week. The second peak won't be as bad as the first, nor will hospitals be overloaded as reinfection usually comes with milder symptoms, Wang Guangfa, a respiratory expert at Peking University First Hospital, told the Global Times on Monday."*.

Oil: 4th consecutive WoW increase in China scheduled domestic flights

China scheduled domestic flights

On Monday, we tweeted [LINK] "*#Oil Positive. China Scheduled domestic flights +2.8% WoW to 102,709 flights. 4th consecutive WoW increase. Chinese consumer didn't get Covid bonus money from govt like in West so spending their own savings/money in summer travel. Thx @BloombergNEF Claudio Lubis. #OOTT #JetFuel."* (i) BloombergNEF posted its Aviation Indicators Weekly on July 18 but it was released on July 17 in the evening MT when we saw it. (ii) Positive indicator for the Chinese consumer from China's scheduled domestic flights for the July 11-17 week, which were +2.8% WoW to 102,709 flights. Besides topping >100,000 flights for the first time post Covid, it was the 4th consecutive WoW increase. Flights increased +3.4% WoW for June 20-26 week as expected for the 3-day national holiday Dragon Boat Festival on June 22/23/24. But, different than what happened after the 5-day May Day holiday, flights didn't drop right back down after Dragon Boat Festival. Rather, scheduled domestic flights were +1.9% WoW to 97,572 flights for June 27-July 3 week, then +2.4% WoW to 99,804 flights, and this week +2.8% WoW to 102,709 flights. This is the first time scheduled domestic flights are over 100,000 since the Covid crash.This is a positive. Domestic scheduled flights are still a long way to go to what was expected at the end of March but, four consecutive WoW increases seem to point to a steady trend happening, which would be an indication that that Chinese consumer is at least prepared to spend for domestic air travel this summer. (iii) We don't have the data before Jan 5, 2022 but we assume 102,709 flights is the highest since the Covid crash. Two weeks ago, we checked back on Bloomberg and it looks like the first Aviation Indicators Weekly report was Jan 5, 2022, but they didn't have separate China graph until months later. (iv) So positive as there have been three consecutive up weeks following the Dragon Boat Festival up week. But still less than what was expected 3 ½ months ago. Scheduled flights for July 11-17 of 102,709 flights is still -13.85 vs what was scheduled on March 28 for the then next 4-weeks (ie. April)

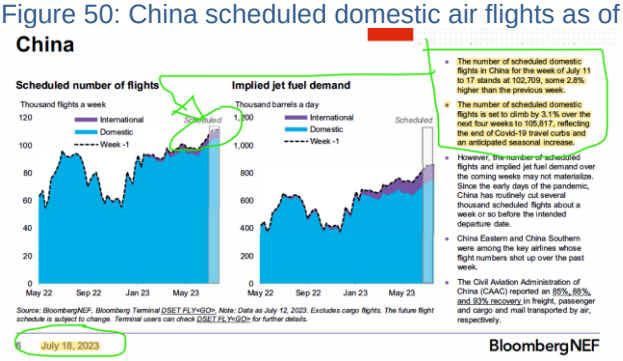
of 119,180 flights. But flights are at post Covid highs and well above the prior high of 97,087 flights for the May Day Holiday travel. (v) This week's number of scheduled domestic flights for the next four weeks is set to increase by +3.1% "*over*" the next four weeks to reach 105,817 flights. Despite the scheduled domestic flights being up 10,141 flights over the past four weeks, the lookahead is only slightly more than the last four weekly reports that had their respective 4-week lookahead flights 105,802 flights, 104,972 flights, 104,691 flights and 104,501 flights. This weeks 4-week lookahead of 105,817 flights is also still -11.2% below the 4-week scheduled on March 28 for the end of April that was 119,180 domestic scheduled flights. The big jump up in April never happened. (vi) But we think the takeaway is positive for the Chinese consumer. Flights were up for the recent Dragon Boat Festival national holiday but didn't dip down post holiday as they did after the May Day Holiday. Rather, there were three more consecutive weeks of WoW increases. It looks like a steady increase is happening and hopefully signals that Chinese consumers have more faith the worst of Covid is behind them and that the modestly increasing govt support points to a slow but relatively consistent recovery for the consumer. Recall the Chinese consumer didn't get the free handout as happened in the west for Covid so for them its more spending their own money and not the bonus Covid money received elsewhere. Our tweet included the BloombergNEF charts from July 18 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

Figure 49: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

July 11-17: +2.8% WoW to 102,709 flights
Jul 4-10: +2.4% WoW to 99,904
Jun 27-Jul 3: +1.9% WoW to 97,572
Jun 20-26: +3.4% WoW to 95,724
Jun 13-19: -0.9% WoW to 92,568
June 6-12: -1.2% WoW to 93,328
May 30-Jun 5: +0.2% WoW to 94,486
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW to 94,138
Apr 11-17: +0.7% WoW to 92,231
Apr 3-10: -4.2% WoW to 91,567
Mar 28-apr 3: +6.8% WoW to 95,624
Mar 21-27: +1.5% WoW to 89,513
Mar 14-20: -0.6% WoW to 88,166
Mar 7-13 week: -0.8% WoW to 88,675
Feb 27-Mar 3 week: -2.6% WoW to 89,430
Feb 21-27 week: +0.0% WoW to 91,828
Feb 14-20 week -0.5% WoW to 91,561
Feb 7-13 week -0.7% WoW to 92,007
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW to 83,500
Jan 17-23 week +7% WoW to 91,959
Jan 10-16 week +20% WoW to 85,910
Jan 3-9 week: -5.3% WoW to 71,642
Dec 27-Jan 2 week: -5.6% WoW to 75,652

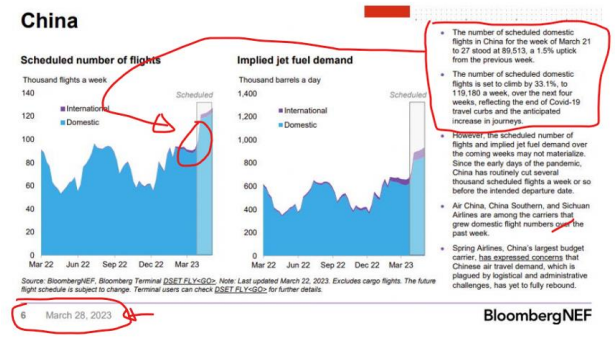
Source: BloombergNEF

Figure 50: China scheduled domestic air flights as of July 18



Source: BloombergNEF

Figure 51: China scheduled domestic air flights as of March 28



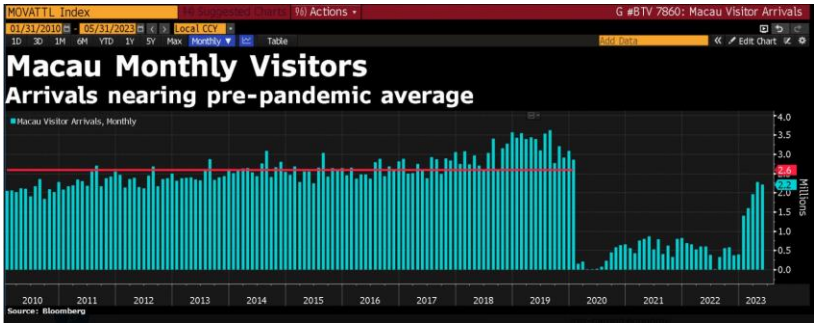
Source: BloombergNEF

Oil: Macau, more support Chinese are traveling and spending domestically

Macau, an indicator for Chinese travel

This week, we saw a couple of good indicators from Macau to support the above item on schedule domestic Chinese flights that the Chinese are traveling and spending within China. (I) We try to watch BloombergTV in the evenings as the shows comes from Asia on the market open. And inevitably, there are some good regional graphs/charts that are applicable to the oil call. If you are looking for any BloombergTV graphics, just type GTV <GO>. On Tuesday night, BloombergTV reported that Macau arrivals were nearing pre-pandemic average. On Tuesday, we tweeted [LINK] "*Another indicator Chinese consumers are traveling domestically - visitors to Macau nearing pre-pandemic levels. Fits 👇07/17 tweet Chinese scheduled domestic flights keep steady increase. Thx @business. #OOTT.*" (ii) On Thursday, we tweeted [LINK] "*More support Chinese consumers are traveling domestically & spending more - Sands China (Macau casinos) reported first quarterly profit since Covid. Fits 👇07/18 tweet visitors increasing to Macau & 👇07/17 tweet Chinese scheduled domestic flights keep steady increase. #OOTT.*" Sands China reported its quarter and it was the first quarterly profit since Covid. As an example, its The Venetian Macao had Q1/23 Net Revenues of $653 mm and Adjusted Property EBITCA of $252 mm compared to Q1/22 of $150 mm and -$21 mm, respectively. Our Supplemental Documents package includes the Sands China release.

Figure 52: Macau Monthly Visitors



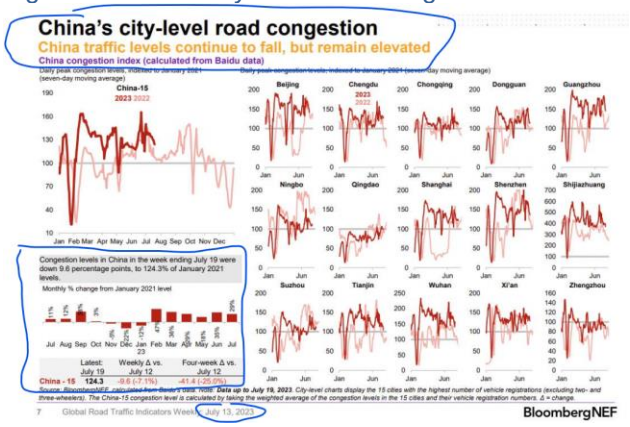
Source: Bloomberg

China city-level traffic congestion

Oil: Baidu China city-level road congestion likely impacted by summer holidays

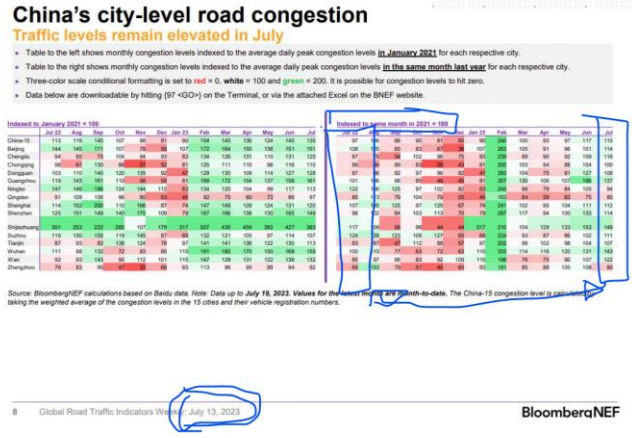
The Baidu China city-level road congestion was down WoW, but we think it is likely due to the start of the main summer holidays. (i) On Thursday, we tweeted [LINK] "*China Baidu city-level road congestion -9.6% WoW to 124.3% of Jan/2021 levels. But less city congestion likely linked to July start of summer holiday season given 👇07/17 tweet 4th consecutive WoW increase in domestic flights. And Top 15 cities congestion July/ 2023 are up YoY to 115% of July/2021 levels. 13 of top 15 cities congestion up YoY. Thx @BloombergNEF #OOTT."* (ii) BloombergNEF posted its Global Road Traffic Indicators July 20 report, which includes the China Baidu city-level road congestion data for week ended July 19. BNEF's headline was "*China traffic levels continue to fall, but remain elevated*". (iii) For the week ended July 19, 2023, Baidu data for China city-level road congestion was -9.6% WoW to 124.3% of Jan 2021 levels. I don't think it's a negative, but it also isn't a big positive. A decline in city-level road congestion isn't unexpected given July is the start of the summer holiday rush and so it makes sense that city-level congestion is down WoW. And that move to holiday is supported by the continued WoW increases in scheduled domestic air flights that saw the 4th consecutive week of WoW increases. It looks to be a continued modest positive reflecting a continued recovery in China given the city-level traffic congestion is up YoY and also up vs 2021. The top 15 cities July 2023 congestion are 115% of July 2021, whereas July 2022 was only 96% of July 2021. (iv) BloombergNEF provided its specific by city numbers for July. For the top 15 cities in aggregate, July 2023 so far are 115% of July 2021 levels, whereas July 2022 was 96% of July 2021 levels. Of the top 15 cities, 13 are up YoY and only 2 are down YoY. Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators July 20 weekly report.

Figure 53: China city-level road congestion for the week ended July 19



Source: BloombergNEF

Figure 54: China city-level road congestion for the week ended July 19.



Source: BloombergNEF

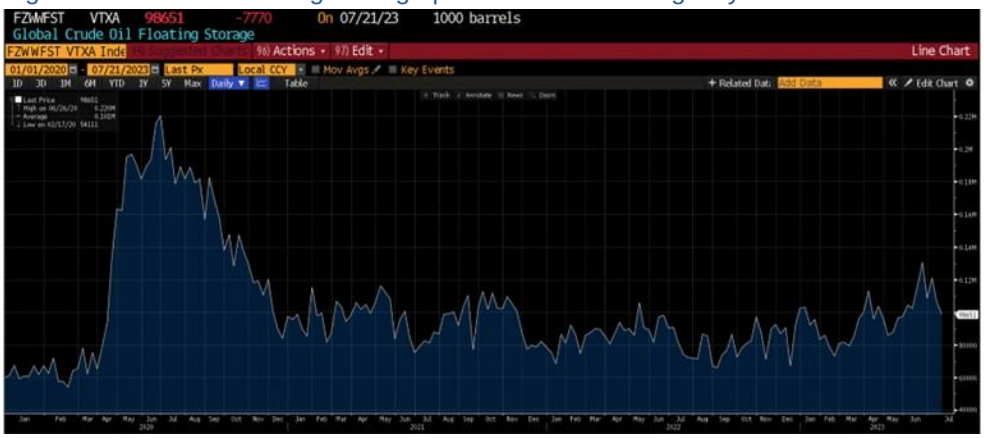
Oil: Vortexa crude oil floating storage at July 21 was 98.65 mmb, -7.77 mmb WoW

Vortexa floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 9am 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 on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on July 15 at 9am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for July 21 at 98.65 mmb, which is -7.77 mmb WoW vs upwardly revised July 14 of 106.42 mmb. Note July 14 of 106.42 mmb was revised +14.61 mmb vs 91.81 mmb originally posted on Bloomberg as of 9am MT on July 15. (ii) Other than the big +14.61 upward revision to June 14, all the other revisions over the past several weeks were very small. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on July 15

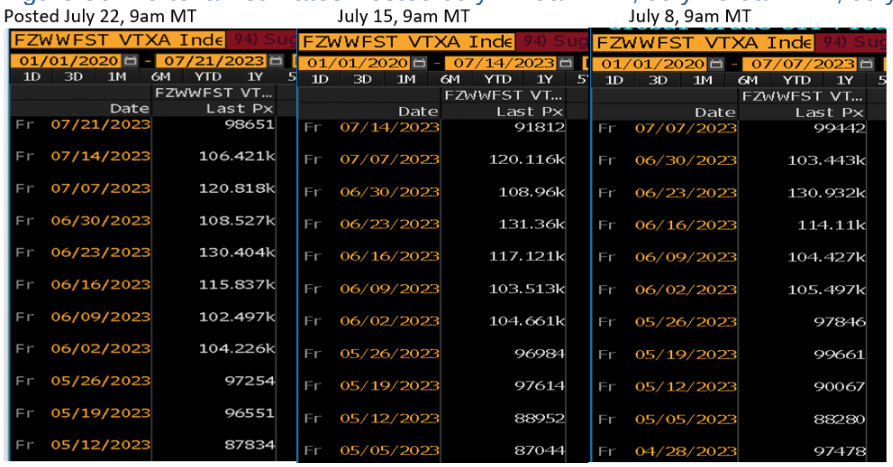
are as follows: July 14 revised +14.61 mmb. July 7 revised -0.70 mmb. June 30 revised -0.43 mmb. June 23 revised -0.96 mmb. June 16 revised -1.28 mmb. June 9 revised -1.01 mmb. June 2 revised -0.43 mmb. (iii) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 111.88 mmb vs last week's then seven-week average of 111.08 mmb. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis. For example, when most report on the Vortexa data on Monday morning, they will be reporting on different estimates. We do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison (ie. Saturday mornings around 9am MT) to provide a fair comparison. (v) Note the below graph now goes back to Jan 1, 2020 and not just three years as floating storage in Apr 2020 had started to reflect the Covid impact. (vi) July 21 estimate of 98.65 mmb is -121.66 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (vii) July 21 estimate of 98.65 mmb is +33.04 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (viii) July 21 estimate of 98.65 mmb is +26.61 mmb YoY vs July 22, 2022 of 72.04 mmb. (ix) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT July 22, 9am MT July 15, and 9am MT July 8.

Figure 55: Vortexa Floating Storage posted on Bloomberg July 22 at 9am MT



Source: Bloomberg, Vortexa

Figure 56: Vortexa Estimates Posted July 22 9am MT, July 15 9am MT, July 8 9am MT



Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Bloomberg also posts the Vortexa crude oil floating storage in the key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. (i) As noted above, there was a big upward revision to July 14 of +14.61 mmb. The major revision was Asia, revised +9.68 mmb from 48.13 mmb to 57.81 mmb. (ii) With the upward revision to July 7, the major WoW changes were Asia -6.41 mmb WoW, Europe +3.26 mmb WoW, Other -3.14 mmb WoW, and West Africa -2.97 mmb WoW. Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for July 14 that was posted on Bloomberg at 9am MT on July 15.

Figure 57: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	July 21/23	July 14/23	WoW	July 14/23	June 23/23	July 21 vs June 23
Asia	51.40	57.81	-6.41	48.13	72.44	-21.04
Europe	7.96	4.70	3.26	4.56	6.34	1.62
Middle East	13.96	12.00	1.96	11.18	14.98	-1.02
West Africa	13.89	16.86	-2.97	15.27	12.39	1.50
US Gulf Coast	0.79	1.26	-0.47	1.55	1.21	-0.42
Other	10.65	13.79	-3.14	11.12	23.04	-12.39
Global Total	98.65	106.42	-7.77	91.81	130.4	-31.75
Vortexa crude oil floating storage posted on Bloomberg 9am MT on July 22						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

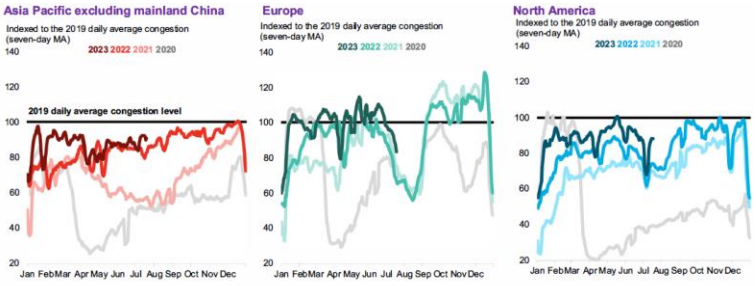
Oil: TomTom mobility indicators: NA increases, while EU and Asia Pacific decrease

Global road traffic indicators

On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly report, which recaps traffic indicators in all the major economic regions of the world i.e. mobility indicators like TomTom. For week ending July 18, North American traffic levels increase by +7.5% WoW, while Europe and Asia Pacific (ex-China) traffic level decreased -10.7% and -1.8% WoW, respectively. Traffic levels in Europe, North America, and Asia Pacific (ex-China) traffic are -16.4%, -11.7% and -9.4% below the 2019 average and are +24.9%, +18.8% and

+9.7%YoY, respectively. Traffic in Europe had been steadily increasing in June, but has since dropped off in July and continues to drop significantly. NA and Asia Pacific (ex-China) have been steadily increasing over the last few weeks, although Asia Pacific (ex-China) has begun to lose the positive momentum. It its worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 58: Mobility Indicators



	Week-on-week (2019 average = 100)				Year-on-year (same week last year = 100)			
	Latest week: Jul 18	Δ vs. Jul 11	4-week MA	Δ vs. Jul 11	Latest week: Jul 18	Δ vs. Jul 11	4-week MA	Δ vs. Jul 11
Asia Pacific ex-China	90.6	-1.6 (-1.8%)	88.7	-0.0 (0.0%)	109.7	-3.5 (-3.1%)	106.2	+0.8 (+0.7%)
Europe	83.6	-10.0 (-10.7%)	93.9	-6.3 (-6.3%)	124.9	+7.6 (6.5%)	115.5	+2.3 (+2.0%)
North America	88.3	+6.1 (7.5%)	82.9	-0.5 (-0.6%)	118.8	+0.9 (0.7%)	115.2	+1.8 (+1.6%)

*Source: BloombergNEF's calculation based on TomTom data. Note: **Data up to July 18, 2023**. Δ = change. MA = moving average.*

Source: BloombergNEF

Oil: Truck tonnage index in June is down 0.8% YoY

Truck tonnage index -0.8% YoY MoM in June

We look to items like truck tonnage for indicators on the US economy, and the June truck tonnage is in line with the expectations for a slowing US economy. Truck tonnage increased +2.1% MoM, but is down -0.8% YoY in June, resulting in a total YTD decline of -2.3% since the start of 2023. This is under 2022's cumulative growth of 3.4% which was the largest single year increase observed since 2018. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for June on Tuesday [LINK]. Chief Economist Bob Costello noted, *"The index continues to fall from a year earlier and is off 1.9% from its recent peak in September 2022. A multitude of factors have caused a recession in freight, including stagnant consumer spending on goods, lower home construction, falling factory output, and shippers consolidating freight into fewer shipments compared with the frenzy during the goods buying spree at the height of the pandemic. However, the magnitude of the year-over-year declines is improving, perhaps pointing to a bottom in the freight market."* Trucking serves as a barometer of the U.S. economy, representing 72.6% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 11.46 billion tons of freight in 2022. Motor carriers collected $940.8 billion, or 80.7% of total revenue earned by all transport modes. Our Supplemental Documents package includes the ATA release.

Figure 59: Truck Tonnage Index

Source: ATA

Oil & Natural Gas: Schlumberger points to stronger growth from offshore for long term

Stronger offshore growth ahead

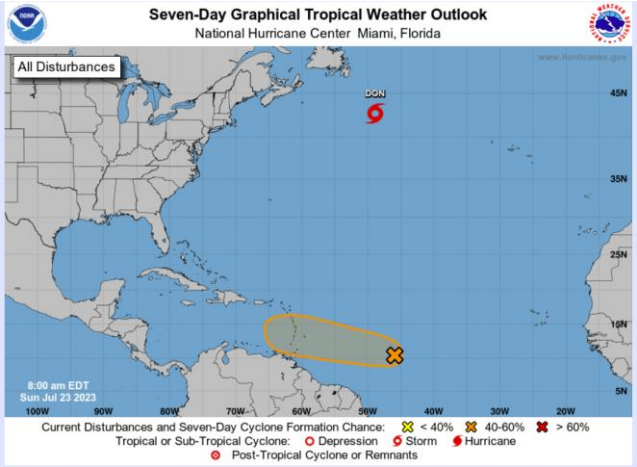
We recommend reading the Schlumberger Q2 call transcript from the Friday call as it seemed like a significant change to its long term outlook for oi land natural gas. (i) On Friday morning before the Q2 call we compared the SLB outlook comments from the Q2 results vs the outlook from the Q1 results. We tweeted [LINK] "*Positive but less bullish long term #Oil#NatGas outlook from #Schlumberger. 1st sentence of outlook. Q2: "We continue to see positive upstream investment momentum in the international and offshore markets" Q1: "Looking at the macro, we maintain our very constructive multiyear outlook as the upcycle attributes and key activity drivers continue to evolve very positively." #OOTT."* There wasn't any statement as such, but we thought it was a big change in view towards the long term. (ii) Then when saw the Q2 call transcript, SLB didn't come out and specifically say that they see a big increase in offshore oil and natural gas supply but their comments certainly pointed to that. SLB had many bullish comments on offshore activity – how it was pickup broadly around the world, FIDs were working below $50 oil, new players are in, etc. Yesterday, we tweeted [LINK] " *Stronger td #Oilhan expecte #NatGas supply from offshore in long term? #Schlumberger may not specifically say it, but their Q2 call comments point to it. international "investment momentum of past few years is accelerating" "witness a broad resurgence in offshore" "operators all over the world are making large scale commitments to ascend discovery, accelerate development times and increase the productivity of their assets" "new projects in offshore basins across the world" "vast majority of the FID [Offshore] are below $50" And more. #OOTT."* Our Supplemental Documents package includes excerpts from the SLB Q2 call transcript.

Oil & Natural Gas: Potential storm development for Yucatan or Gulf of Mexico

Potential storm development

We remind that peak Atlantic hurricane season is from mid-Aug to mid-Oct. One other reminder for Atlantic tropical storms & hurricanes is that hurricanes moving west from the Atlantic that go south of the Dominican Republic have a higher chance of moving into the Gulf of Mexico assuming they don't move due west to hit the Yucatan Peninsula or if wind shear breaks up any potential development Earlier this morning, the National Hurricane Center's 4am MT update identified a system that has a 40-60% chance of developing into a tropical storm or hurricane over the next seven days. And its projected path would be south of the Dominican Republic.

Figure 60: Potential storm development in Atlantic



Source: NHC

Oil & Natural Gas: BC wildfires up 26% WoW, Alberta up 5% WoW

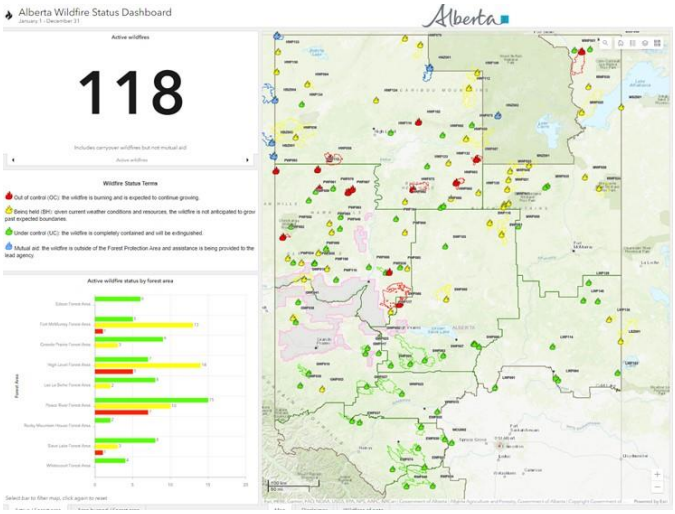
BC and Alberta Wildfires

It's been another bad week for BC with massive increases in wildfires and Out of Control wildfires this week and both keep increasing every day. Alberta wildfires have been roughly flat this week. It is inevitable that this massive increase will have a huge impact on people including evacuations. And there will inevitably be some impacts on business as the priority in BC will be in allocating all possible resources to getting people to safety, protecting homes and businesses. The day-to-day business workings will inevitably have some impact, the question is how much. Last night, we tweeted [LINK] "*Wildfire update last 48 hrs. Big increase in BC wildfires. BC: 7pm 07/22: 468 fires incl 280 Out of Control. 8pm 07/20: 384 fires incl 239 OOC. AB: 7pm 07/22: 118 fires incl 14 OOC. 8pm 07/20: 118 fires incl 18 OOC. Stay safe! #OOTT #NatGas."* For perspective BC's total wildfires are up 26% WoW and Out of Control fires are up 12% WoW. Alberta's total wildfires are up 5% Wow and Out of Control fires are unchanged WoW.

Links to Alberta and BC wildfire status maps

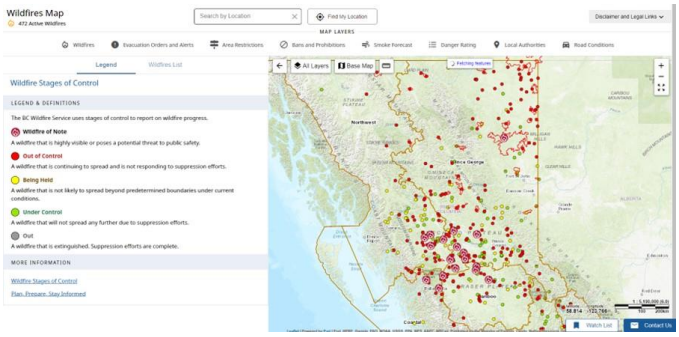
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [LINK] and the BC Active Wildfires interactive map [LINK]. Please note these links have changed over the past few years. Both maps are interactive and open up for the information on any particular fire. Here are the wildfire maps as of 7pm MT last night.

Figure 61: Alberta wildfire map as of 7pm MT on July 22



Source: Alberta Wildfire Status Dashboard

Figure 62: BC wildfire map as of 7pm MT on July 22



Source: BC Wildfire Service

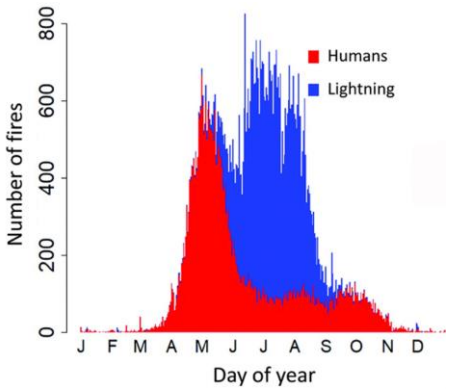
Oil & Natural Gas: Peak Cdn wildfire season is normally Jul/Aug & lightning is #1

Wildfire peak is normally July Aug

Unfortunately, we remind that this is the peak wildfire season right now in Canada. In peak wildfires season (right now) lightning strikes are the major cause of wildfires. We don't track wildfires data outside Alberta/BC as our focus is on the oil and gas sector but, the big Canada story this year has been wildfires in eastern Canada because of the smoke drifting into the US. It's a reminder that wildfires are not just a western Canada. It's always better to see less wildfires. And we remind that wildfire season peak isn't normally until July/Aug. (i) On May 9, we tweeted [LINK] *"#Wildfire season is, unfortunately, only just starting with normal peak Jul/Aug. See 👇excerpts. SAF 06/13/21 Energy Tidbits re distribution of wildfires by month in Canada. SAF 05/07/23 Energy Tidbits re heightened 2023 risk with very low precipitation in Nov 1-Mar 31 & Apr. Hope everyone can be safe! #OOTT."* (ii) Our tweet included two graphs from our June 13, 2021 Energy Tidbits memo that shows the normal peak for Canada wildfires is July/Aug with a key reason being that is when lightning strikes

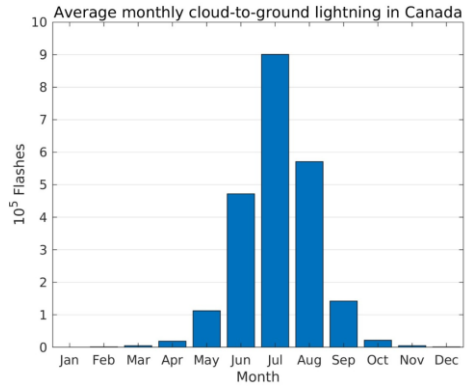
normally peak. (ii) The problem that we have been warning is that it was extremely dry in the west this winter and in the spring. Our tweet also included the Alberta Environment maps of precipitation % of normal for Nov 1 thru Mar 31, and for the month of April that clearly show how dry it was this winter and especially so in April. Note we have updated the precipitation maps for the end of May. We checked yesterday and the Alberta environment had a notice that it was down for the precipitation maps until Monday ie. the June precipitation isn't yet available. Below are Nov 1 thru Apr 30 and for the month of May maps showing precipitation % of normal. It's been dry.

Figure 63: Canada Wildfires Distribution Over Year



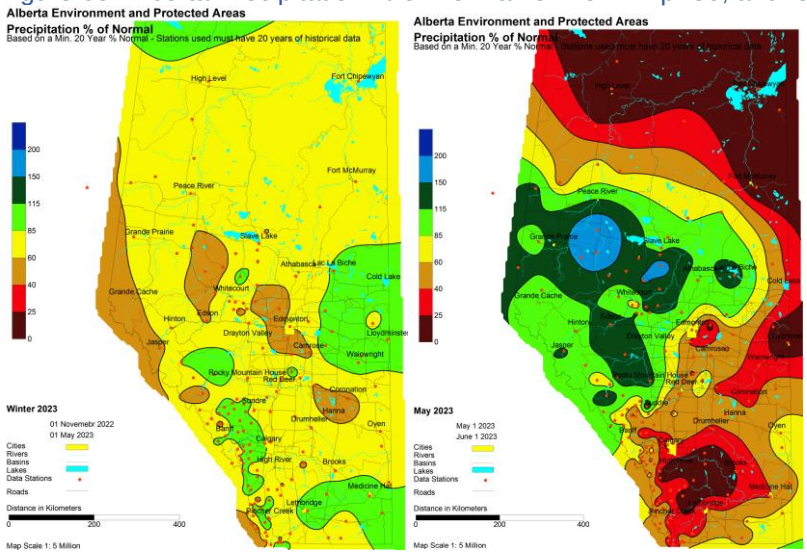
Source: Wildfire Today

Figure 64: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 65: Alberta Precipitation % of Normal for Nov 1-Apr 30, and for May



Source: Alberta Environment

Energy Transition: G20 energy ministers elevate energy security, affordability etc.

G20 energy ministers.

It's going to be interesting how the G7 leaders spin yesterday's G20 energy communique as anything other than a big disappointment as the G20 level of commitment on reducing emissions is nowhere near the G7 commitments. From the start of the communique, it's clear that the G20 elevated the priority of energy security, affordability, access as a priority to be advanced simultaneously with advancing energy transitions. The G20 could not agree on anything significant, even on eliminating unabated coal. It's a reality check on what can be accomplished at COP28 as (i) Last night, we tweeted [LINK] "*Ouch! #G20 communique today far from what G7 leaders wanted. Energy security, access & affordability just as important as advancing energy transitions. Get to #NetZero GHG emissions/carbon neutrality by or around mid-century. #Oil #NatGas will be needed for longer #OOTT."* And [LINK] "*look at the #G20 as a preview of #COP28 UAE. "We stress the importance of ensuring that the growing global energy demand is matched by sustainable and affordable energy supplies". pg 13, couldn't get a commitment on unabated coal. & much more. #NatGas will be needed for longer #OOTT. [LINK]."* (ii) Our tweet include the G20 countries list including such as Brazil, China, India, and Saudi Arabia that would not be pressured by the G7 countries. And it seems clear from the statement that they didn't give in to any G7 pressure. Maybe it's because we see Saudi Energy Minister Abdulaziz speak more than other energy ministers, but it seemed like the G20 statement is aligned with his views on energy security, availability and affordability. (iii) We thought the G20 energy communique is a good preview for what can be accomplished at COP28 UAE later this year. If the G7 in a forum of 20 can't pressure more from the G20, it's hard to see how they can accomplish something more at COP28. (iv) One big reminder that is always overlooked is that there will be statements but then always an out for any country when they add language like "*in light of different national circumstances*" ie. do what you can on this point. (v) It was clear from the opening "*we*

believe" statement that the G20 was placing as important priority for energy security as in reducing emissions. The G20 "2. *We firmly believe that energy security, energy access, market stability, and energy affordability need to be advanced simultaneously while advancing energy transitions, in pursuit of economic growth and prosperity, and ensuring access to modern energy for all, leaving no one behind."* (vi) And that same opening we believe also didn't commit to Net Zero by 2050. Rather it said "*We also recognize the urgent need for advancing energy transitions, through various pathways, for contributing towards achieving our sustainable development goals as well as global net zero green-house gas emissions/carbon neutrality by or around midcentury."* (vii) Affordable was highlighted point 3 "*3. We stress the importance of ensuring that the growing global energy demand is matched by sustainable and affordable energy supplies."* (viii) They couldn't get agreement on unabated coal. The communique starts with the 10 pages of items the G20 agreed to have under their signature. These are the items that start with "We". Then there are 4 pages of "*Chair's Summary*" or other points that the G20 didn't sign off. Including in this was the lack of agreement on phasing out unabated fossil fuels such as coal. The Chair's Summary wrote "*25. The energy sector's contribution to global GHG emissions is significant. Given that fossil fuels currently continue to play a significant role in the global energy mix, eradication of energy poverty, and in meeting the growing energy demand, the importance of making efforts towards phase down of unabated fossil fuels, in line with different national circumstances was emphasized by some members while others had different views on the matter that abatement and removal technologies will address such concerns."* (ix) There are many other items in the 16-page communique. Our Supplemental Documents package includes the communique.

Energy Transition: Qatar, natural gas will be needed as a baseload fuel beyond 2030

Natural gas, a baseload fuel beyond 2030

We suspect that most on the climate side will just ignore Qatar Energy CEO al-Kaabi's keynote speech on Wednesday because Qatar has a strong vested interest in having natural gas be needed for longer. That's too bad because they would be ignoring his reminders that rich countries can't just continue to focus on rich country needs but need to start to prioritize poor country needs. That was a good reminder. The natural gas comments is that Qatar sees the need for natural gas to baseload fuel for decades. On Wednesday, we tweeted [LINK] "*#QatarEnergy CEO's advice to those calling for "speedy #EnergyTransition" is "world needs a fair and effective transition with a realistic and stable path, which wisely balances humans flourishing with environmental protection. it should not continue to only focus on the needs of the rich and well-developed countries but must prioritize the needs of developing countries." It's why "#NatGas will be needed as a safer reliable base load in the energy mix for most nations for decades well beyond 2050." #OOTT."* Qatar Energy wrote "*I would like everyone around the world calling for a speedy energy transition to consider that the world needs a fair and effective transition with a realistic and stable path, which wisely balances humans flourishing with environmental protection, it should not continue to only focus on the needs of the rich and well-developed countries but must prioritize the needs of developing countries." His Excellency added. His Excellency Minister Al-Kaabi told the participants in this annual conference: "This highlights the need for a realistic and resolute energy transition, starting with a solid integration of natural gas in the energy mix of today and tomorrow. We strongly believe that Gas will be needed as a safer reliable base load in the energy mix for most nations for decades well beyond 2050."* Our Supplemental Documents package include the Qatar Energy reporting of al-Kaabi's keynote speech.

Energy Transition: Baker Hughes see natural gas a baseload fuel in energy transition

Natural gas, a baseload fuel for the future

Baker Hughes held its Q2 call on Wednesday and CEO Simonelli gave his reality check view on the energy transition. Its not a new view but rather what has become a growing acceptance over the past couple years – natural gas isn't a transition fuel, it's a baseload fuel in the future of energy under an energy transition. This has been one of our major views for the past few years – natural gas will be needed for way more for way longer. We tweeted [LINK] "*Reality check from $BKR @simonelli_l. fully expect #NatGas & #LNG "to play a key role in the energy transition as a baseload fuel to help balance against intermittent renewable energy sources" "believe the expanding pipeline of LNG opportunities is tied to the growing recognition of this reality and that the transition will take more time and must be financially" #NatGas will be needed for way longer. #OOTT."* In the Q2 call, Baker Hughes CEO Simonelli said "*As we have stated consistently, we fully expect natural gas and LNG to play a key role in the energy transition as a baseload fuel to help balance against intermittent renewable energy sources. We believe the expanding pipeline of LNG opportunities is tied to the growing recognition of this reality and that the transition will take more time and must be financially viable."*

Energy Transition: Is UK signaling a shift away from expensive Net Zero policies?

UK warns on the environment

We have to wonder if we are going to see a major shift in the UK's green policies and if that is the takeaway from the big Michael Gove interview yesterday. Did Gove call out the climate change side with a view to getting them to take a more realistic position on moving towards Net Zero, or did he signal the UK is no longer just going to give to climate change? (i) Earlier this morning, we tweeted [LINK] "*Hmmm! was @michaelgove's interview a preview the UK is going to back away from expensive #NetZero policies? worth reading Telegraph interview. [LINK] Momentum seems to be building for shift to energy security, availability & affordability. #NatGas will be needed for longer. #OOTT."* (ii) Yesterday, UK Housing Secretary Michael Gove had an interview with the Telegraph. [LINK] Here is what the Telegraph wrote "*On Natural England's foray into attempting to limit air pollution, though, Gove is less sympathetic. "I think – how can I put this – that is unwise," he says. "I'm all in favour of encouraging people to walk and cycle more. But there are some car journeys which are absolutely vital, and low-traffic neighbourhoods are a crude and sometimes counterproductive tool. We've seen in the Netherlands how the inflexible application of tight EU-derived rules leads to a backlash. "One of the dangers – I don't think Labour are alive to this at all – is that if people think that you are treating the cause of the environment as a religious crusade, in which you're dividing the world into goodies and baddies, then you alienate the support that you need for thoughtful environmentalism." Should Natural England pause its work in this area? "Yes," he says. "Some of the recommendations that the Climate Change Committee make about what it is that we have to do run so far ahead of where people are, particularly during a cost-of-living crisis, that you risk ending up creating a backlash rather than a consensus." Asked about the Government's own targets, such as the planned 2030 ban on the sale of petrol cars, Gove is curiously equivocal. "I haven't looked back at the particular target since I was at Defra," he says. "I'm confident, and Kemi has secured the investment from Tata and Jaguar Land Rover this week, so I think we're on course for that, but I don't know enough to be able to say whether or not that's a perfectly calibrated target. But on the basis of everything I've heard, I'm sure it is achievable." In his own policy area, Gove wants to relax the current rules that will ban landlords from renting out their homes unless they pay to increase the Energy*

Performance Certificate rating of their properties by 2028, which could include spending thousands on fitting a heat pump, insulation or solar panels. "My own strong view is that we're asking too much too quickly. We do want to move towards greater energy efficiency, but just at this point, when landlords face so much, I think that we should relax the pace that's been set for people in the private rented sector, particularly because many of them are currently facing a big capital outlay in order to improve that efficiency." (iii) We don't see many western politicians prepared to step out and say to the climate change side that there needs to be a change to the plan because the plan isn't working as per aspirations. But that is what Gove did yesterday. The question is if this an approach to get to some sort of revised climate change plan or if it's just a preview of a major position shift away from expensive Net Zero policies by the ruling conservative in light of Thursday's by-elections (they lost 2 and won 1). And if so, they are prepared to take the flak UK Housing Secretary Michael Gove gets from the climate change side. (iv) but there is always the chance that it is to get the climate change side to work to a revised plan. Yesterday, we tweeted [LINK] "*Too late to avoid energy volatility for 2020s? "One of the dangers .... is that if people think that you are treating the cause of the environment as a religious crusade, in which you're dividing the world into goodies and baddies, then you alienate the support that you need for thoughtful environmentalism" @michaelgove. Thx @malnick. #EnergyTransition #OOTT #NatGas."* Our big concern on the ability for the world to make its maximum progress, whatever that might be, for reducing emissions is that there is no way but the highway for the climate change side. This may be fine IF the climate change side also looked at how their ambitions need to be adjusted in light of the reality. Instead of insisting on doubling down or accelerating when behind, there should at least be analysis of why they are behind and not just assume all items are working as per aspirations. We just worry it leads to energy volatility and crisis for the 2020s and 2030s.

Maybe UK PM Sunak is worried UK people will pull a "Howard Beale"

UK PM Richie Sunak was born in 1980 so is far too young to remember the 1976 US movie hit "Network" and its key character, Howard Beale. But the by election losses on Thursday are likely a reminder that people in UK aren't very happy about the cost of living, including their energy bills. When we sit with people from the UK visiting Calgary, we always ask about cost of living and cost of energy. There is no question the high costs are a major negative to their everyday lives. Whenever we hear people upset about everyday issues, we always think of Howard Beale. A TV anchor who talks about how bad things are, people are out of work, a dollar buys a nickel's worth and there is now end to it, and crime is up, etc. and then has his classic I want you to get mad. First you have to get mad. I'm a human being, my life has value, etc. He tells the views to go stick your head out your window and yell "*I'm as mad as hell and I'm not going to take this anymore"*.

Figure 66: Howard Beale in Network 1976

Source: Sudbury News

Capital Markets – Food inflation to be hit, India halts exports of non-basmati rice

India halts non basmati white rice exports

There was big global food news on Thursday, when India's Ministry of Consumer Affairs, Food & Public Distribution announced "*Centre prohibits export of Non Basmati White Rice. Move to ensure lower prices and availability in the upcoming festival season*." [LINK] And this was done "*with immediate effect*". The good news is that this was for non basmati white rice and did not impact non basmati rice (par boiled rice) and basmati rice, "*which forms the bulk of rice exports*". Regardless, this will still impact global rice prices. India is the #2 rice producer, only behind China and well ahead of #3 Indonesia.

Rice trails wheat but more than meat in global per capita consumption

The Food and Agriculture Organization of the United Nations recently posted its "*Food Outlook: Biannual Report on Global Food Markets*" in June 2023. [LINK] The FAO includes global consumption stats of commodities. For 2022/23, the FAO estimates world consumption for milk was 117.4 kg/yr, wheat was 67.1 kg/yr, rice was 53.0 kg/yr, meat was 45.2 kg/yr, coarse grains 28.5 kg/yr, sugar 22.1 kg/yr, and fish 20.6 kg/yr.

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 and Calgary items.

Missing Ivor Robson at The Open

As of our 7am MT news cut off, there is still a long way to go in the final round at The Open (British Open) with the leader, Brian Harmon still three groups away from teeing off and sitting at -12 and a five-shot lead. It's raining today but, at least so far, the winds aren't too strong and the winds are the factor that ends to impact scores more than some rain. There was an interesting stat we heard on Friday when one of the announcers said the average ranking of golfers who have won The Open (we think they said over the last 20 years) was 25.8 and Harmon was ranked 26 coming into The Open. One of the advantages for golf fans is that there was huge live TV coverage of the golf including at the first tee. Hadn't thought about until hearing the players called at the first tee and remembered how Ivor Robson was no longer the voice for announcing the players on the first tee. He did it for over 40 years and last did it at The Open in 2015 at St. Andrews. There was a good story on Ivor Robson earlier this week "*Ivor Robson: I miss The Open enormously*". [LINK] Our Supplemental Documents package includes the Ivor Robson story.

Bloomberg Tom Keene's shout-out to Calgary band Loverboy

We always love when Bloomberg Surveillance's Tom Keene gives one of regular shout-outs to hockey as hockey doesn't get a lot of US coverage especially on business TV. And we will often him reference people we know in that vein. But Friday, we couldn't help tweet out a different Tom Keene shout-out to Canadians – to the Calgary band (now Vancouver based) Loverboy who rose to fame in the 70s. We tweeted [LINK] "*ICYMI, another* 🇨🇦 *shoutout from @tomkeene. But not his normal hockey to @FerroTV, rather on @Nickelback and #Calgary's @loverboyband's classic "Working for the Weekend".* Working for the Weekend was part of the second album in 1982 and a video clip is at [LINK].