

Energy Tidbits

August 20, 2023

Produced by: Dan Tsubouchi

Do Two Shorter-Term LNG Deals Mean the Post-July 2021 Buyer Rush to Lock Up Long-Term (>10 yrs) LNG Supply is Ending?

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. There were two shorter-term (4-5 yrs) LNG deals and we want to watch to see if this indicates LNG buyers big post-July 2021 rush to lock up long-term LNG supply is ending. ([Click here](#))
2. Unions vote to strike at Woodside's LNG platforms if no deal by Wed Aug 23. ([Click here](#))
3. US shale/tight oil production, including in the Permian, have been stalled out for the past five months. ([Click here](#))
4. North Dakota warns that multiple Biden Administration regulatory changes and that "*all of these have significant downside for oil and gas production*" ([Click here](#))
5. NOAA forecasts a warm start to winter and a warmer than normal winter for US, ECMWF forecasts the same for Europe. ([Click here](#))
6. Please follow us on Twitter at [\[LINK\]](#) for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [\[LINK\]](#).

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Natural Gas: +35 bcf build in US gas storage; now 549 bcf YoY surplus

For the week of August 11, the EIA reported a +35 bcf build (just above the expectations of a +34 bcf build), and an increase compared to the +18 bcf build reported for the week of August 12 last year. This is up from last week’s build of +29 bcf, and down vs the 5-year average build of +43 bcf. Total storage is now 3.065 tcf, representing a surplus of +549 bcf YoY compared to a surplus of +535 bcf last week. Total storage is +299 bcf above the 5-year average, down from the +305 bcf surplus last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage report [\[LINK\]](#).

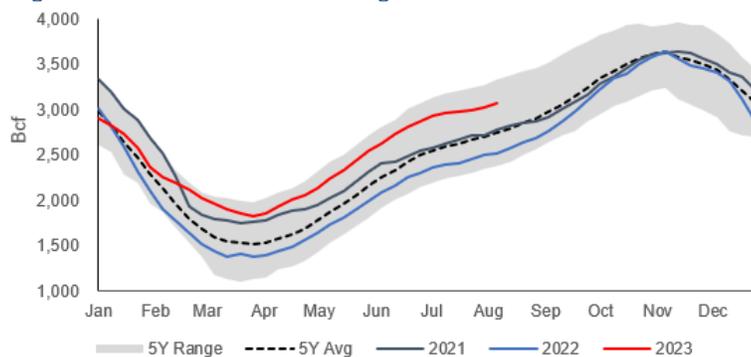
US gas storage 549 bcf YoY surplus

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Year ago (08/11/22)		5-year average (2018-22)	
	08/11/23	08/04/23	net change	implied flow	Bcf	% change	Bcf	% change
East	717	700	17	17	570	25.8	638	12.4
Midwest	812	793	19	19	681	19.2	731	11.1
Mountain	202	196	6	6	151	33.8	172	17.4
Pacific	240	233	7	7	249	-3.6	263	-8.7
South Central	1,093	1,108	-15	-15	867	26.1	962	13.6
Salt	272	284	-12	-12	186	46.2	235	15.7
Nonsalt	821	824	-3	-3	681	20.6	728	12.8
Total	3,065	3,030	35	35	2,516	21.8	2,766	10.8

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



Source: EIA, SAF

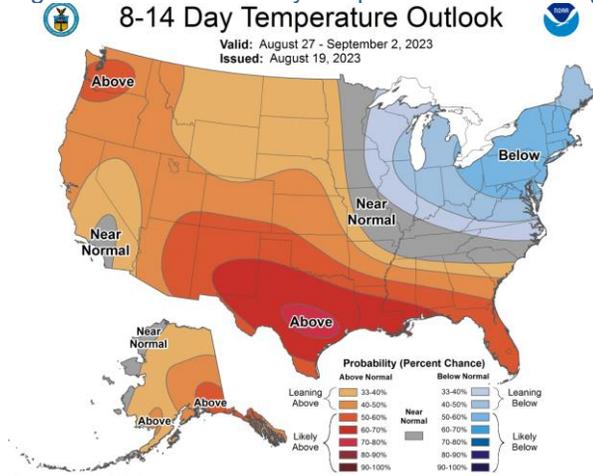
Natural Gas: NOAA 8-14 day temperature outlook turning colder in NE & Great Lakes

NOAA posts daily, around 1pm MT, an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [\[LINK\]](#) “Today’s @NOAA updated 6-10 & 8-14 day temperature outlook covering Aug 25-Sept 2. Really hot ending this week. Should lose big A/C push in NE & Great Lakes moving to below normal temps ie. highs in NYC ~25C. #NatGas #OOTT.” It is still expected to be hot for the next few days in the NE but that should start to turn before the end of the week. Our tweet included the AccuWeather drily forecast for NYC that noted how daily highs are moving to 24/25C, which isn’t normally strong A/C demand temps. Yesterday’s NOAA 6-10 day [\[LINK\]](#) and 8-14 day outlook [\[LINK\]](#) are valid for Aug 25-Sept 2.

NOAA 8-14 day outlook

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Figure 3: NOAA 8-14 day temperature outlook Aug 27-Sept 2



Source: NOAA

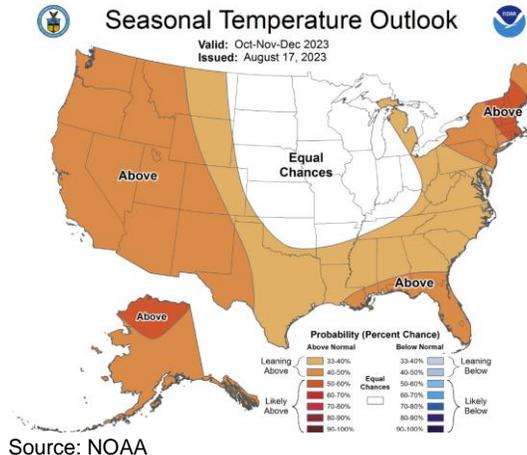
Natural Gas: NOAA calls for warmer than normal start to winter and for Dec/Jan/Feb

The warm 2022/23 winter in all the key natural gas consumption regions shaped, in a negative way, the outlook for natural gas and LNG prices for 2023. It is extremely difficult for natural gas and LNG prices to recover from a warm winter. It's why winter, including the start of winter, temperatures are the most important factor to natural gas and LNG prices. On Thursday we tweeted [\[LINK\]](#) "Holdback to near term #NatGas prices? It's still early, but @NOAA Dec/Jan/Feb temperature outlook is for a warmer than normal winter. Other winter temp forecasts will be issued over next month and suspect to see similar views to NOAA given the strong El Nino conditions. #OOTT." And [\[LINK\]](#) "forgot to add. @NOAA also expects a warm start to winter with warmer than normal temps for Oct/Nov/Dec. holdback to near term #NatGas prices. #OOTT." On Thursday, NOAA issued its monthly seasonal forecast that calls for a warmer than normal start to winter and a warmer than normal winter. We know that weather forecasts are not 100% especially the longer out the period for the forecast. That is why we also highlighted NOAA's temperature outlook for Oct/Nov/Dec, which is the start for winter. And NOAA forecasts a warm start to winter as well as a war winter. Late Aug and early Sept is when we normally start to see the winter forecasts from groups like AccuWeather, Farmers Almanac and Old Farmers Almanac. Our tweet noted that we suspect to see similar views for winter given the continued forecasts for strong El Nino conditions in the winter. Below are the NOAA temperature probability maps for Oct/Nov/Dec and Dec/Jan/Feb.

NOAA forecasts warm winter

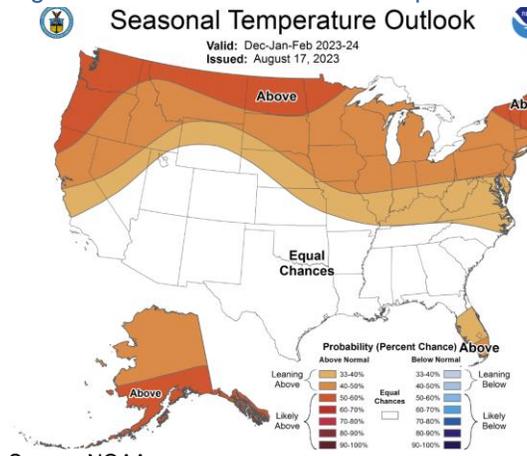
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Figure 4: NOAA OND 2023 Temperature Probability Forecast



Source: NOAA

Figure 5: NOAA DJF 2023/24 Temperature Probability Forecast



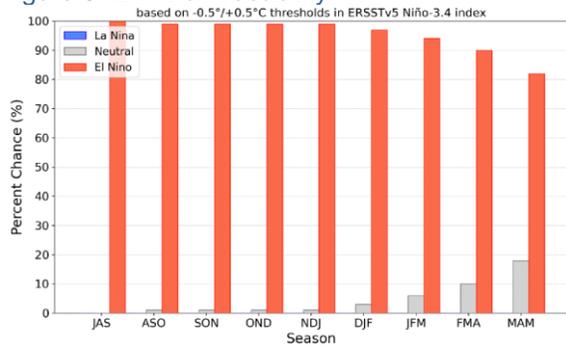
Source: NOAA

NOAA sees El Nino conditions thru winter

Last week’s (Aug 13, 2023) Energy Tidbits highlighted NOAA’s updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [\[LINK\]](#). NOAA continues to forecast strong El Nino conditions through winter 2023-24. Last week, we wrote “It’s only August, but we normally in early Sept, we start to get the start of forecasts for winter temperatures. But, based on NOAA’s continuing expectation for strong El Nino conditions, the early betting will be that winter 2023/24 forecasts are likely to be for a warmer than normal winter. Weather is never 100% certain, but El Nino conditions in the winter tend to be correlated with warmer winters. As noted in the earlier graph, NOAA’s updated El Nion//La Nina outlook expects a 97% chance for El Niino conditions in Dec/Jan/Feb.”

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Figure 6: El Nino Probability

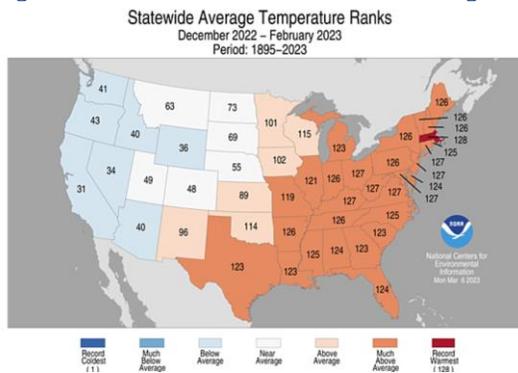


Source: NOAA

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 not likely be 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
 US natural gas production is still up strong YoY with the US shale/tight natural gas plays up over 3 bcf/d YoY. However, we have been highlighting how the major US shale/tight natural gas plays have been stuck at around 98 bcf/d, now for the last five months. (i) On Monday, the EIA released its monthly Drilling Productivity Report for August 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 August) and the next month (in this case September). (ii) The EIA forecasts US shale/tight natural gas for September at 98.26 bcf/d, which is down slightly from 98.41 bcf/d in August. The shale/tight natural gas plays have been fairly flat for five months with May 98.19 bcf/d, June 98.45 bcf/d, July 98.51 bcf/d, August at 98.41 bcf/d,

Shale/tight gas production

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and now September at 98.26 bcf/d. (iii) Permian has been stalled just over 23 bcf/d for seven months. Mar 23.17 bcf/d, Apr 23.37 bcf/d, May 23.48 bcf/d, June 23.54 bcf/d, July 23.59 bcf/d, August at 23.63 bcf/d, and now September at 23.67 bcf/d. (iv) Haynesville is the same for the last five months. May 16.38 bcf/d, June 16.46 bcf/d, July 16.47 bcf/d, August at 16.43 bcf/d, and now September at 16.33 bcf/d. (vi) The YoY growth is still strong at +3.11 bcf/d YoY, but its the stalling growth that is the item to highlight from the DPR. (vii) 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	2023													Sep YoY
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	
Anadarko	6,917	6,967	6,825	6,567	6,872	6,864	6,846	6,844	6,778	6,762	6,722	6,661	6,600	-317
Appalachia	34,922	34,397	34,821	34,687	35,534	34,966	35,753	35,436	35,729	35,787	35,799	35,770	35,748	826
Bakken	3,222	3,198	3,088	2,686	2,886	3,081	3,099	3,156	3,191	3,227	3,256	3,281	3,304	82
Eagle Ford	6,983	7,041	7,073	7,082	7,175	7,264	7,529	7,457	7,575	7,595	7,578	7,537	7,496	513
Haynesville	15,802	16,179	16,384	16,222	16,262	17,123	16,524	16,034	16,376	16,458	16,477	16,432	16,339	538
Niobrara	5,172	5,210	5,215	4,925	5,071	4,986	5,030	5,052	5,057	5,073	5,085	5,096	5,108	-64
Permian	22,133	22,103	21,980	21,775	22,240	22,163	23,171	23,367	23,479	23,544	23,595	23,632	23,667	1,535
Total	95,151	95,094	95,385	93,943	96,040	96,448	97,951	97,345	98,185	98,446	98,512	98,409	98,263	3,112

Source: EIA, SAF

Natural Gas: US LNG exports 10.9 bcf/d in June, down MoM but up YoY

On Tuesday, the Department of Energy (DOE) posted its US LNG exports estimates for June 2023 [\[LINK\]](#). 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 June/23 of 10.93 bfd, +9.1% YoY, -10.6% MoM. See 07/18 tweet, June expected lower due to higher maintenance. June/23 top 5 export markets: Dutch, France, Japan, China, Argentina June/22 top 5 export markets: France, Dutch, Spain, Argentina, Korea This DOE LNG data is posted 2 wks before same data in @EIAgov Natural Gas Monthly. #OOTT #NatGas". As mentioned last month, maintenance started in late May which impacted US LNG exports in May but maintenance was increasing in June and that was expected to lead to lower MoM US LNG exports. US LNG exports are now averaging 11.6 bcf/d per month YTD for 2023, which is +0.5 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.

June 2023 US LNG Exports

Figure 9: US Monthly 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	10.9
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	11.6

Source: EIA, DOE

Figure 10: US LNG Exports June 2023 vs June 2022



Source: DOE

Natural Gas: Two shorter-term LNG deals, is the rush to long-term LNG deals ending?

We don't want to look at a couple of shorter-term LNG deals and say that represents a sea change in perhaps the most important LNG global market trend in the last 2+ years – the abrupt shift from Asian LNG buyers in July 2021 to move from spot/short-term to long-term contracts following TotalEnergies force majeure at its Mozambique LNG that indefinitely backed up 5 bcf/d of LNG in Mozambique that was supposed to start come on stream over a five year period starting in 2024. (i) But there were two shorter-term LNG deals this week, which don't fit our longstanding thesis so it jumped out at us. Do they represent the start of a move by buyers and sellers away from long-term LNG contracts? Do they point to less concern on LNG supply shortage towards the end of the 2020s. There have been 17.08 bcf/d of long-term LNG deals since July 2021. And, TotalEnergies is expected to lift the force majeure at its Mozambique LNG, which will set in motion 5 bcf/d of LNG in Mozambique to probably start up in 2027. So maybe the start of a pivot. of a pivot. If it's a pivot, it points to an outlook of strong but not necessarily crazy LNG prices. Definitely something we will want to watch. (ii) On Monday we tweeted [\[LINK\]](#) "One off? or is rush to tie up late 2020s #LNG ending? ie. buyers expect restart #TotalEnergies Mozambique LNG leads to 5 bcf/d of MZ LNG post 2026? #OmanLNG to supply 0.4 mtpa to Germany's SEFE starting 2026. BUT on a 4-yr term. NOT the 10+ yr term common post Total Apr 2021 MZ force majeure. 17.08 bcf/d long-term LNG deals since 07/01/21, see SAF Group 08/13/23 Energy Tidbits [\[LINK\]](#) #OOTT." Oman LNG announced a LNG supply deal of 0.4 mtpa starting from 2026 but it was only for a 4-year term. The 4-year term surprised us. We know German buyers have been looking for short-term LNG deals, but the major LNG suppliers have been holding out for traditional long-term LNG deals. So this deal jumped out at us. (iii) Yesterday, we tweeted [\[LINK\]](#) "Item to watch! Another shorter term #LNG deal: ADNOC 5-yr deal with JAPEX."

Two shorter-term LNG deals

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Follows 📌 *OmanLNG 4-yr deal with DEU's SEFE. is the rush to tie up late 2020s LNG ending? ie. buyers expect restart #TotalEnergies Mozambique LNG leads to 5 bcf/d of MZ LNG post 2026? #OOTT #NatGas.* On Thursday, ADNOC Gas (UAE) signed a 5-yr LNG supply deal with Japan Petroleum Exploration starting in 2026. There was no disclosure anywhere of the volumes but they did say the agreement was valued at \$450-\$550mm. Our Supplemental Documents package includes ADNOC release and the Times of Oman reporting. The reason we did not include the Oman LNG release is that it didn't include the deal was only for a 4-year term.

Asia abruptly moved to lock up long-term LNG supply in July 2021

We were several months ahead of the markets seeing the sea change in LNG contracting in 2021. Prior to 2021, LNG buyers were increasing spot and short-term LNG contracts but that changed in April 2021. That is when we came out with our major LNG markets call because it came quickly 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*

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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 17.08 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 17.08 bcf/d of long-term LNG deals since July 1, 2021. 64% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. 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		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	Unipet	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	Bangladesh/Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China/Qatar	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
Aug 8, 2023	LNG Japan	Woodside	Japan / Australia	0.12	10.0	2026	2036
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				11.02			
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	Defin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Defin 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	Defin 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
Jul 28, 2023	OMV	BP	Austria/UK	0.13	10.0	2026	2036
Aug 4, 2023	ConocoPhillips	Mexico Pacific Ltd	US/Mexico	0.29	20.0	2025	2045
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				6.07			
Total New Long Term LNG Contracts since Jul/21				17.08			

Source: SAF

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Natural Gas: Strike could start Aug 30 at Woodside's LNG if no union deal by Aug 23

Earlier this morning, we tweeted [\[LINK\]](#) *"Getting ready to rumble". Woodside platform #OffshoreAlliance vote unanimously in servicing Woodside with 7-day industrial action if no deal by Aug 23. ie. #LNG supply interruption would be Aug 30. See 📌 OA posts on Woodside this week. #OOTT #NatGas."* This morning (Perth local time), Offshore Alliance (union) posted [\[LINK\]](#) *"Offshore Alliance members have unanimously endorsed giving Woodside 7 'Working Days' notice of Protected Industrial Action if our EBA bargaining claims for the Woodside Platforms are not resolved by COB Wednesday 23rd August."* So if no deal by Wednesday, the union plans to issue a 7 working-days notice of action. We Aug 30 since everyday is a working day on a platform. And if that is the case, Woodside will have to decide in advance of Aug 30 if they plan to try to keep the platforms going with replacement workers and other Woodside employees or being an orderly shutdown in advance of Aug 30. Our tweet included the Offshore Alliance posts this week on Woodside including their post, contrary to press reports, that there was a wide gap in their negotiations. Yesterday, we tweeted [\[LINK\]](#) *"Key dates to Aug 31 on potential #LNG supply interruption in Sept at Chevron & Woodside in AUS Aug 23, new Woodside/union discussions. See 📌 08/15 tweet, union view of last discussion. No date for Chevron/union discussions. Thx @David_Stringer. #OOTT #NatGas."* Woodside is negotiating whereas Chevron's workers are still voting. Note that Bloomberg noted Woodside's comments on the Aug 15 negotiations but our Aug 15 tweet noted the union's comments post the Aug 15 meeting and how there is no way anyone would interpret the union's remarks as pointing to any agreement on any major items. On the key dates, Bloomberg wrote *"* Aug. 18: A ballot of workers at Chevron's Gorgon and Wheatstone downstream facilities will begin, according to the alliance * Aug. 21: Voting among workers at Chevron's Wheatstone offshore platform is scheduled to open * Aug. 23: New discussions are expected to take place between Woodside and labor union officials * Aug. 24: Ballot of workers at Gorgon and Wheatstone downstream expected to be finalized by 3 p.m. local time in Perth ** Vote must be completed by Aug. 28 at the latest * Aug. 28: Voting of workers at the Wheatstone platform expected to be finalized ** Ballot must be completed by Aug. 31 at the latest"*. Our Supplemental Documents package includes the Bloomberg key dates report and the Offshore Alliance Facebook posts this week.

Potential strike at Australian LNG

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

July weather was much the same as June around the world. So no one will be surprised to see the recap of July weather around the world to see it was the warmest July in history for the world. Just like June, very hot temperatures around the world were the news story on all news channels everywhere, although western Europe got a bit a break towards the end of August. On Monday, NOAA posted its Global Climate Report for July 2023 [\[LINK\]](#). It was hot around the world. NOAA summarized *"The July global surface temperature was 1.12°C (2.02°F) above the 20th-century average of 15.8°C (60.4°F), making it the warmest July on record. This marked the first time a July temperature exceeded 1.0°C (1.8°F) above the long-term average. July 2023 was 0.20°C (0.36°F) warmer than the previous July record from 2021, but the anomaly was 0.23°C (0.41°F) lower than the all-time highest monthly temperature anomaly on record (March 2016). July 2023 marked the 47th-consecutive July and the 533rd-consecutive month with temperatures at least nominally above the 20th-century average. Climatologically, July is the warmest month of the year. As the warmest July*

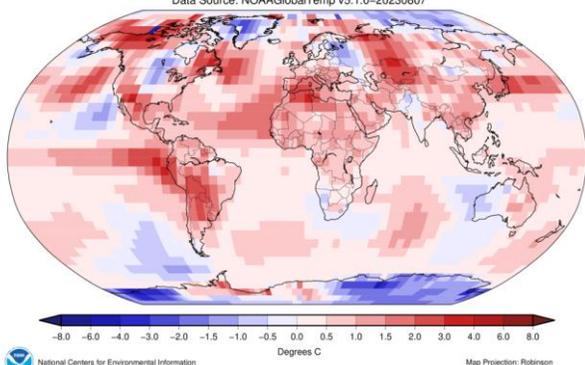
Warmest July ever

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on record, July 2023 was more likely than not the warmest month on record for the globe since 1850. The past nine Julys have been the warmest Julys on record.”

Figure 12: July 2023 temperature departure from average

Land & Ocean Temperature Departure from Average Jul 2023
(with respect to a 1991–2020 base period)
Data Source: NOAAGlobalTemp v5.1.0–20230807



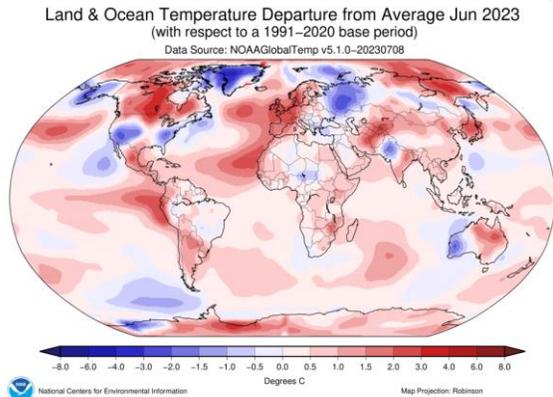
Source: NOAA

Follows June 202, which was the globe’s warmest ever June

Here is what we wrote in our July 23, 2023 Energy Tidbits. “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.”

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Figure 13: June 2023 temperature departure from average

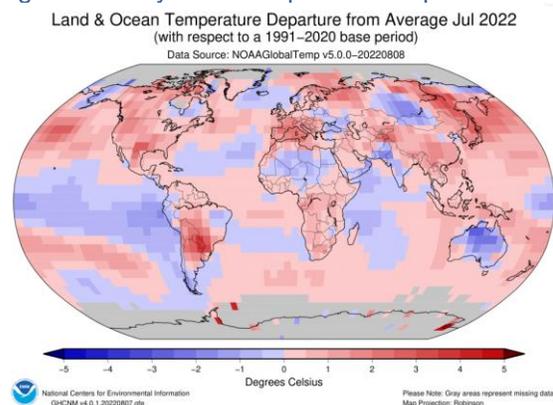


Source: NOAA

July 2022 was the 6th highest July in the then last 143 years

Last July 2022 was also a good month for weather related demand for electricity. NOAA’s recap of July 2022 [\[LINK\]](#) was “*The July 2022 global surface temperature departure was the sixth highest for July in the 143-year record at 0.87°C (1.57°F) above the 20th century average of 15.8°C (60.4°F). The five warmest Julys on record have all occurred since 2016. July 2022 also marked the 46th consecutive July and the 451st consecutive month with temperatures, at least nominally, above the 20th century average. The month of July was characterized by warmer-than-average conditions across much of North America, Asia, Europe, and South America. Record-high July temperatures were observed in parts of North and South America, southern and eastern Asia, and Europe, as well as parts of the western and southern Pacific Ocean. During the month, an unprecedented heat wave affected much of Europe and many European countries, including Italy, Portugal, Spain, and the United Kingdom, set new record-high July maximum temperatures.*”

Figure 14: July 2022 temperature departure from average



Source: NOAA

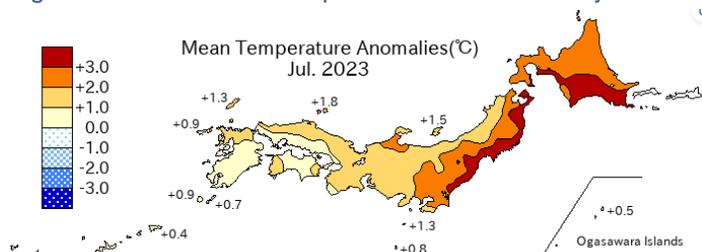
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A very hot July in Japan

Natural Gas: Hottest July in Japan since 1998

No one should have been surprised by the Japan Meteorological Agency's recap of July temperatures that it was very hot, but we didn't know that July was the hottest July since 1898. Early this week, the JMA posted its climate report over Japan for July. [LINK](#) It included the below map and the JMA said "Monthly mean temperatures were significantly above normal in northern/eastern Japan and were above normal in western Japan and in Okinawa/Amami, because warm-air inflow was stronger than normal and the regions were covered by warm-air in July. Monthly mean temperatures were the highest in northern Japan on record for July since 1946. The monthly anomaly of the average temperature over Japan was +1.91°C, the highest on record for July since 1898."

Figure 15: JMA Mean Temperature Anomalies July 2022

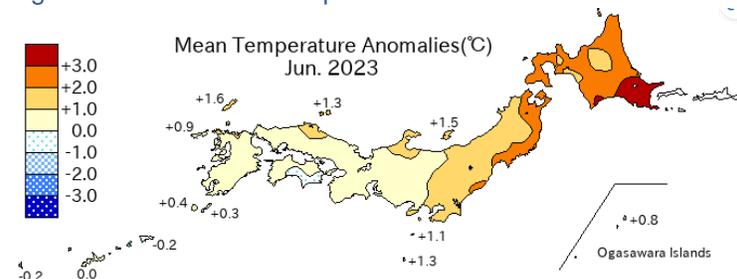


Source: Japan Meteorological Agency

June was also hot in Japan

Here is what we wrote in our July 23, 2023 Energy Tidbits memo. "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 northern 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 16: JMA Mean Temperature Anomalies June 2022



Source: Japan Meteorological Agency

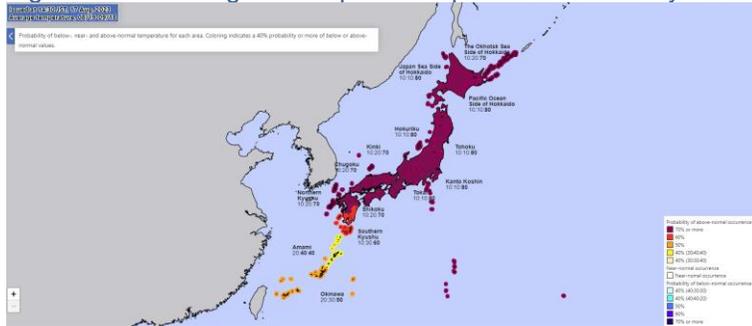
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Natural Gas: Forecast well above normal temperatures thru mid Sept in Japan

It has been really hot in Japan this summer and it looks like the hot weather will continue to end August and thru mid-September. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK](#). The August 17 update calls for much warmer than typical temperatures for the Aug 19 – Sep 18 period. The well above average temperatures are forecasted through the whole country, with the northern and central regions being most affected. The hot weather should keep demand on electricity for air conditioning and hopefully some pull on LNG stocks. Below is the JMA’s 30-day temperature probability forecast for Aug 12 to Sep 11.

Japan’s 30-day temperature forecast

Figure 17: JMA Aug 19 – Sep 18 Temperature Probability Forecast



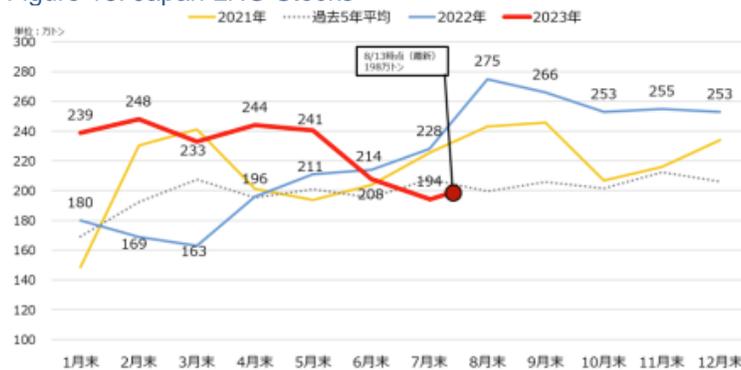
Source: Japan Meteorological Agency

Natural Gas: Japan’s LNG stocks remain below 2022 and 5-year average levels

It’s been hot in Japan, and Japan has been drawing on its LNG stocks for power generation for the past few weeks. Which means that Japan LNG stocks are now below 2022, 2021 and 5-year average levels. Although this week, we saw the first increase in Japan’s LNG stocks in a month. On Wednesdays, Japan’s METI releases its weekly LNG stocks data [LINK](#). LNG stocks on August 13 were 95.1 bcf and are up +6.5% WoW from August 6 of 89.3 bcf, and are now under the 5-year average of 99.9 bcf. METI did not comment on the MoM increase. Below is the Japanese LNG stocks graph from the METI weekly report.

Japan LNG stocks up +6.5% WoW

Figure 18: Japan LNG Stocks



Source: METI

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Natural Gas: Japan LNG imports to 7.88 bcf/d in July

The warm winter was the key factor for Japan's low natural gas demand and ending winter with high LNG stocks. And Japan didn't really draw on the high LNG stocks in the spring. As a result, Japan's LNG imports in 2023 have been below normal levels. But, with LNG stocks moving below the five-year average, we would expect to see some pickup in LNG imports in Aug and Sept. But on Thursday, Japan's Ministry of Finance posted its import data for July [\[LINK\]](#) and pointed to a material YoY decline in LNG imports. The MOF reported Japan's July LNG imports were 7.88 bcf/d, which is up +8.7% MoM from 7.25 bcf/d in June, and -17.4% YoY from 9.29 bcf/d in July 2022. Notably, July's imports of 7.88 bcf/d show some recovery from the recent low in May of 7.14 bcf/d. Japan's thermal coal imports in July were -7.0% YoY, compared to -17.0% YoY in June. Petroleum products imports were up +9.3% YoY. Below is our table that tracks Japan LNG import data.

Japan LNG imports up MoM

Figure 19: 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%	7.88	-17.4%
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

Natural Gas: China natural gas production +7.6% YoY in July

Our big concern on China's LNG imports for the past 18 months was that China would continue to grow its domestic natural gas production and increase cheaper natural gas pipeline imports from Russia. Those factors have squeezed out LNG imports in 2022 and 2023. On Thursday, Xinhua (state media) reported [\[LINK\]](#) that China natural gas production was +7.6% YoY in July to 20.96 bcf/d ie. +1.5 bcf/d YoY.

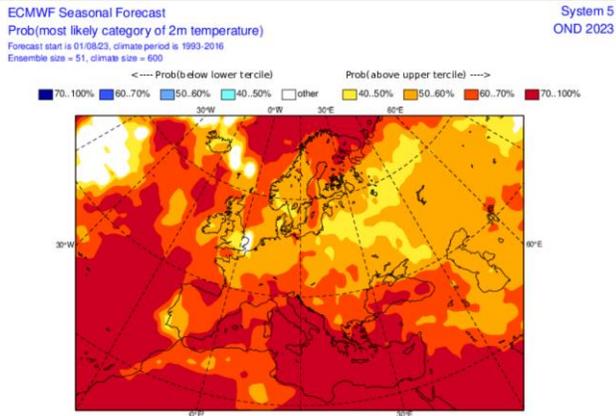
China natural gas production

Natural Gas: Europe expected to have warm start to and a warmer than normal winter

The other holdback to natural gas is that, at least for now, Europe is forecast to have a warm start to winter. Earlier, we noted the NOAA forecast for a warm start to and a warmer than normal winter in the US. Earlier in August, the ECMWF updated their monthly seasonal forecast and they also forecast a warm start to winter and a warmer than normal winter. Below are the ECMWF seasonal forecast temperature probability maps for Oct/NovDec [\[LINK\]](#) and Dec/JanFeb [\[LINK\]](#).

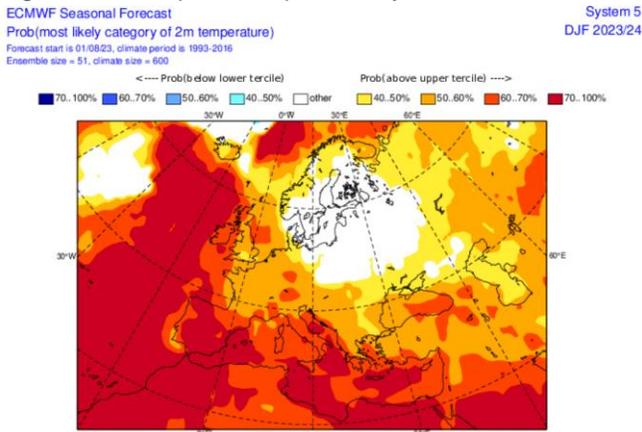
A warmer than normal winter in Europe

Figure 20: Temperature probability for Oct/Nov/Dec



Source: ECMWF

Figure 21: Temperature probability for Dec/Jan/Feb



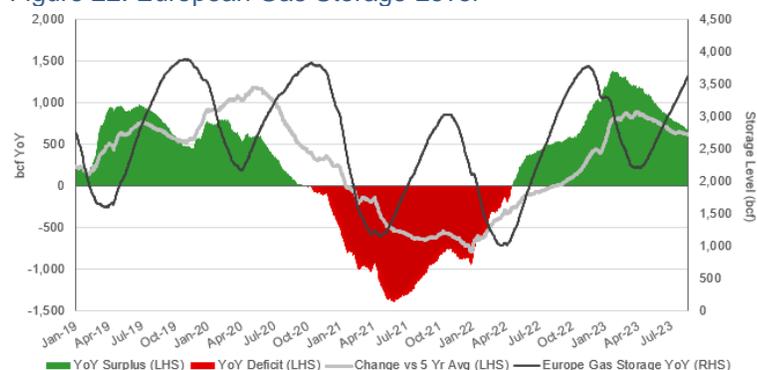
Source: ECMWF

Natural Gas: Europe storage hits 90% full so should go into winter full or close to full
 Europe storage hit the 90% full level this week so should be able to go into winter at full or close to full levels. Over the past several weeks, the hot weather and relatively low natural gas prices have led to a modest narrowing of the gas storage surplus relative to last year and the 5-year average. Although not putting risk to Europe storage being full or near full for the start of winter. This week, Europe storage increased by +1.85% WoW to 90.12% on August 16. Storage is now +14.55% greater than last year levels of 75.57% and is +13.57% above the 5-year average of 76.55%. 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.

Europe gas storage

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Figure 22: European Gas Storage Level



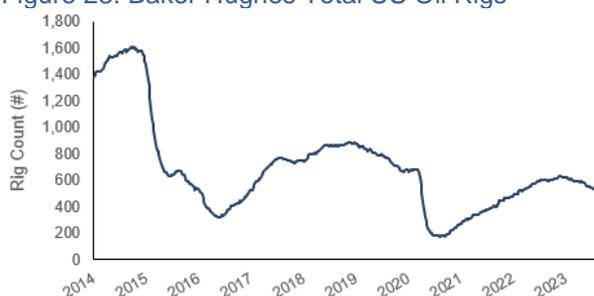
Source: Bloomberg, SAF

Oil: US oil rigs -5 WoW to 520 rigs on August 18, US gas rigs -6 WoW to 117 rigs

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Total US oil rigs were down -5 rigs WoW to 520 total rigs, and are -81 rigs YoY for the week of August 18. This is up +39 rigs from the 2022 low of 481 rigs in January, and +348 rigs since the 2020 low of 172 rigs on Aug 14. The Permian and Granite Wash both increased by +1 rig WoW to a total of 323 rigs and 2 rigs, respectively. In contrast, Cana Woodford was down -3 rigs WoW to 17 rigs, the Williston was -2 rigs WoW to 32 rigs and “Others” decreased -2 rigs WoW to a total of and 79 rigs. The Permian is now down -34 rigs from it’s recent high of 357 rigs on April 28, 2023. (ii) Gas rigs were down -6 rigs WoW at total of 117 rigs and have now decreased -42 rigs YoY. On a per basin basis, there were no WoW increases. In contrast, “Others” and Utica, both decreased by -2 rigs WoW to a total of 28 rigs and 10 rigs. The Permian was also down -1 rigs WoW to 4 rigs. Below is our graph of total US oil rigs.

US oil rigs down WoW

Figure 23: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

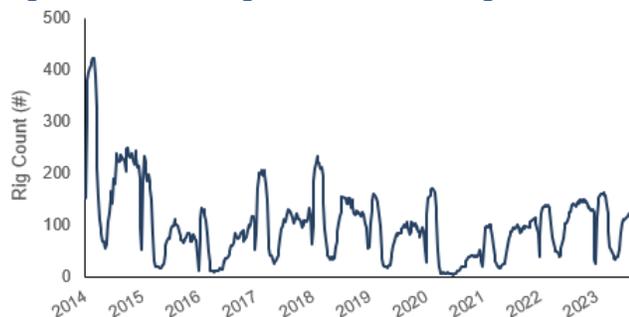
Oil: Total Cdn rigs down -1 rigs WoW to 189 total rigs

For the week of August 18, total Cdn rigs were down -1 rigs WoW to 189 rigs. Saskatchewan increased +4 rigs WoW, to a total of 36 rigs, a positive response to recent strength in oil prices. In contrast, Alberta decreased -3 rigs WoW for a total of 131 rigs. BC down -2 rigs WoW to 17 total rigs, the decrease in BC rigs was likely linked to the wildfires. Cdn oil rigs were up +3 WoW to 119 rigs, and Cdn gas rigs decreased -4 rigs to 70 rigs. Cdn oil rigs are down -18 rigs YoY, while gas rigs are up +6 rigs YoY. Below is our graph of total Cdn oil rigs.

Cdn total rigs down WoW

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Figure 24: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates up +0.1 mmb/d WoW to 12.7 mmb/d

Last week's (Aug 13, 2023) Energy Tidbits memo highlighted the EIA increasing their weekly US oil production estimates by +0.4 mmb/d and how we have been expecting such a big increase to the weekly estimates. For months, we have highlighted how the US weekly estimates were well below the EIA's actuals as per its monthly Form 914. This week, the EIA increased its weekly US oil production estimates, up +0.1 mmb/d to 12.7 mmb/d for the week ended August 11 [\[LINK\]](#). The Lower 48 was also up +0.1 mmb/d WoW at 12.3 mmb/d, and Alaska was up +0.007 mmb/d to 0.384 mmb/d. Below is a table of the EIA's weekly oil production estimates.

US oil production up WoW

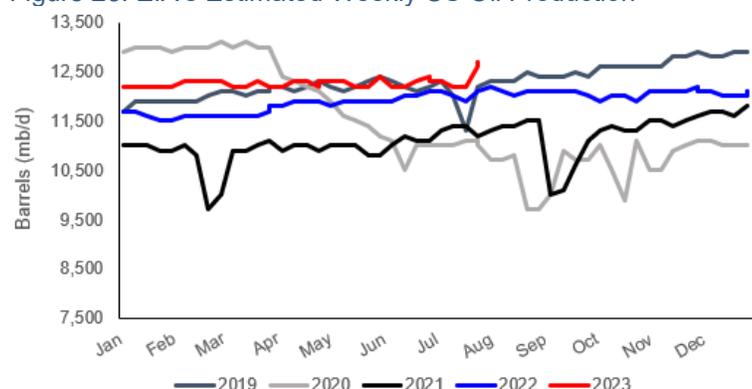
Figure 25: EIA's Estimated Weekly US Field Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	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	07/21	12,200	07/28	12,200		
2023-Aug	08/04	12,600	08/11	12,700						

Source: EIA

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Figure 26: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

EIA Form 914: US May oil actuals +387,000 b/d vs weekly estimates

Given the EIA adjusted up its weekly US oil production estimates last week and maintained the big step up, we don't plan to include this comment on Form 914 each week unless we see a big disconnect between actuals and estimates. That big disconnect was why we expected to see the EIA make a big upward adjustment in the weekly estimates. Here is what we wrote in the Aug 6, 2023 Energy Tidbits memo on the EIA's actuals being well above the weekly supply estimates. "As a reminder, the EIA's actuals for US oil production continue to be well above their weekly estimates. On Monday, the EIA released its Form 914 data [\[LINK\]](#), which is the EIA's "actuals" for May US oil and natural gas production. The Form 914 actuals for May have production at 12.662 mmb/d, which is +387,000 b/d vs the EIA weekly estimates of 12.275 mmb/d. And because of this significant difference, the Form 914 May production is +0.928 mmb/d YoY. The actuals paint a picture of much stronger than expected YoY growth in US oil production."

Figure 27: 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	12,770	12,677	12,662							
2022	11,480	11,258	11,806	11,770	11,734	11,800	11,834	11,985	12,325	12,378	12,376	12,138
2021	11,137	9,916	11,351	11,318	11,390	11,366	11,392	11,276	10,921	11,564	11,782	11,678
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

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Figure 28: EIA Form 914 US Oil Production vs Weekly Estimates



Source: EIA, SAF

Oil: North Dakota June oil production increases +0.032 mmb/d MoM to 1.167 mmb/d

On Tuesday, the North Dakota Industrial Commission posted its Director’s Cut, which includes June’s oil and natural gas production data [\[LINK\]](#). As expected, North Dakota oil production in June was up +0.032 mmb/d MoM to 1.167 mmb/d, which was up +6.4% YoY from 1.096 mmb/d in June 2022. In our July 16, 2023 Energy Tidbits memo, we noted how a wet end to May impacted production. We’ve also highlighted how North Dakota has estimated 138 completions in May, 85 completions in June, and now 83 completions in July, and that this timing and level of completions should lead to North Dakota production increase in June, July and August. Our Supplemental Documents package includes excerpts from the Director’s Cut.

North Dakota oil production

Figure 29: North Dakota Oil Production by Month

(b/d)	2017	2018	2019	2020	2021	2022	2022/21	2023	2023/22
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	1,088,613	-5.1%	1,060,708	-2.6%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	1,089,091	0.5%	1,158,837	6.4%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	1,122,640	1.2%	1,122,693	0.0%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	900,597	-19.8%	1,133,435	25.9%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	1,059,060	-6.1%	1,135,009	7.2%
June	1,032,873	1,227,320	1,425,230	893,591	1,133,498	1,096,783	-3.2%	1,167,301	6.4%
July	1,048,099	1,269,290	1,445,934	1,042,081	1,076,594	1,072,632	-0.4%		
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	1,075,307	-2.9%		
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	1,121,063	0.6%		
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	1,121,754	0.9%		
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	1,098,389	-5.2%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	957,864	-16.3%		

Source: NDIC, NDPA

North Dakota Rule of Thumb: 60-70 completions/mth to hold production flat

It is important to remember that North Dakota holds a monthly press conference on the monthly oil and gas data. It seems like analysts and investors don’t listen to the press conference but we always get additional insights. One example is their rule of thumb that they need 60-70 completions per month to hold North Dakota oil production flat, and since completions were high in June and July, they expect oil production up in July and Aug. On Wednesday, we tweeted [\[LINK\]](#) “Rule of Thumb for North Dakota #Oil production. May 1.14 mmbd. June 1.17 mmbd. “It takes 60 to 70 completions a mth to hold production [North Dakota] flat. We saw 83 in July & 85 in June so next month we ought to be reporting another production increase” NDIC

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Lynn Helms #OOTT. Here is the transcript we created of Helms' comments. [\[LINK\]](#)
At 4:05 min mark, Helms "... we saw as we thought we would a rig count increase of four. It takes 60 to 70 completions a month to hold production [North Dakota] flat. We saw 83 in July and 85 in June so next month we ought to be reporting another production increase, Looking forward to that. We saw wells waiting on completion go down. So the DUC well count is coming down. And that also is reflected with 22 frack crews operating today. They're able to more than keep up with 41 drilling rigs."

Is Harold Hamm the only one drilling Tier 2 wells as good as Tier 1 wells?

It is worth noting some new commentary from North Dakota on Bakken Tier 2 wells. North Dakota has been highlighting how Bakken drilling has been moving away from the core to Tier 2 and Tier 3 lands and that is leading to lower productivity wells as wells as higher gas/oil ratio in the wells. BUT in the Thursday press conference, North Dakota's Lynn Helms said something very different. Helms came out and said that drilling and completion technology development is leading to Tier 2 wells performing better and now performing like Tier 1 acreage. He referenced Harold Hamm having this success but surely, the way technology gets quickly adopted, Hamm isn't the only one having this success. If so, it speaks to better Bakken oil potential in North Dakota. This will be one to watch what we see from the public Bakken players. Here is the transcript we created of Helms comments on this point. At 1:05 min mark, Helms "... what we're seeing is the migration of the drilling and completion activity out of the core and into the Tier 2 area and somewhat out into the Tier 3 areas. I think if you were at Mr. Hamm's event earlier in the week or late last week, you also heard comments from him that a lot of that Tier 2 acreage with the newer drilling and completion technologies is now performing like Tier 1 acreage." [Note Helms was referring to Harold Hamm's Aug 10 event promoting his new book "Game Changer: Our Fifty-Year Mission to Secure America's Energy Independence"]

Helms comments on the denial for Summit carbon dioxide pipeline

In the monthly press conference, North Dakota's Lynn Helms commented on regulators denying the permit request for the Summit carbon dioxide pipeline. Helms said "Our CO2 production only manages to meet three to 10% of the needs for an recovery in North Dakota. So, Carbon dioxide has got to come to North Dakota from somewhere, if we're going to stabilize and sustain Bach and oil production. So we've got to find a way for carbon capture and utilization to become a part of North Dakota's economy. Or we will leave billions of barrels of oil in the ground. So, not a great decision, in terms of the potential for problems with transportation of carbon dioxide to the Bakken oil field and that is going to be a really a driving force for us at mineral resources, as well as for state government, because there are billions of barrels of oil at stake." The Associate Press summarized the details of the denial proposal on August 4 [\[LINK\]](#). The article highlighted that Summit will reapply and restart the process to be approved for a permit. Summit commented "it respects the decision by the North Dakota Public Service Commission, and we will revisit our proposal and reapply for our permit. We're committed to understanding and incorporating the considerations outlined in the decision. We are confident that our project supports state policies designed to boost key economic sectors: agriculture, ethanol, and energy."

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Oil: North Dakota crude by rail down MoM to 67,554 b/d in June

On Tuesday, the North Dakota Pipeline Authority posted its monthly update “August 2023 Production & Transportation” [\[LINK\]](#). Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority that provide low and high estimates for Williston crude by rail exports. The NDPA Monthly Update (graph below) report has a thick line that represents the low and high range. In the backup excel, the NDPA estimates crude by rail in May from a low of 52,554 b/d and a high of 82,554 b/d for an average of 67,554 b/d. A moderate decrease from the May average of 67,544 b/d. The NDPA did not comment on the MoM changes. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

North Dakota
CBR down MoM
in June

Figure 30: Estimated North Dakota Rail Export Volumes



Source: NDPA

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

US shale/tight oil production continues to be stuck just above 9.4 mmb/d, now for the last five months. On Monday, the EIA released its monthly Drilling Productivity Report for August 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 August) and the next month (in this case September). (ii) The EIA is forecasting a MoM production decrease in August of -15,000 b/d MoM to 9.434 mmb/d and a MoM decline of -19,000 b/d to 9.415 mmb/d in September. (iii) The EIA's forecast for US shale/tight oil for the past five months are May 9.40 mmb/d, June 9.44 mmb/d, July 9.45 mmb/d, August at 9.43 mmb/d, and now September at 9.41 mmb/d. (iv) Permian shale/tight oil production has also been stalled. March 5.833 mmb/d, April 5.801 mmb/d, May 5.815 mmb/d, June 5.823 mmb/d, July 5.822 mmb/d, August 5.812 mmb/d, and now September at 5.799 mmb/d. (v) US shale/tight oil production is +415,000 b/d YoY to 9.415 mmb/d in September 2023. The major change areas are Permian +247,000 b/d YoY, Anadarko +61,000 b/d YoY, and Appalachia +61,000 b/d YoY. (vi) 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.

Shale/tight oil
production

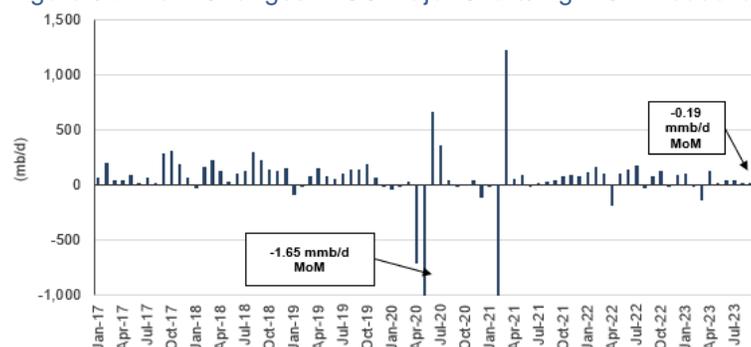
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Figure 31: US Major Shale/Tight Oil Production

Thousand b/d	2023													
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Sep YoY
Anadarko	373	388	403	384	414	404	416	423	431	436	438	436	434	61
Appalachia	120	126	127	122	144	152	152	148	158	159	159	159	158	38
Bakken	1,149	1,143	1,126	988	1,093	1,190	1,171	1,171	1,180	1,193	1,201	1,206	1,210	61
Eagle Ford	1,119	1,120	1,102	1,061	1,111	1,128	1,145	1,130	1,134	1,137	1,131	1,120	1,109	-10
Haynesville	37	36	35	33	35	35	35	35	35	36	36	36	36	-1
Niobrara	641	651	662	605	624	610	633	643	654	659	663	666	669	28
Permian	5,525	5,564	5,628	5,603	5,728	5,643	5,833	5,801	5,815	5,823	5,822	5,812	5,799	274
Total	8,964	9,027	9,082	8,796	9,299	9,163	9,385	9,350	9,407	9,442	9,449	9,434	9,415	451

Source: EIA

Figure 32: MoM Changes in US Major Shale/Tight Oil Production



Source: EIA, SAF

Oil: EIA DUC's down marginally MoM in July

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) The EIA estimates DUCs were down -5 MoM (-495 YoY) in July to 4,787 DUCs. Note that June's data (including the Permian) had a net downward revision of -21 to 4,792. (ii) To put in perspective, there were 8,791 DUCs in the height of the Covid slowdown in July 2020, 6,010 DUCs in July 2021, 5,290 DUCs in July 2022 and now 4,787 DUCs in July 2023. (iii) However, it looks like DUCs have stabilized over the past four months with 4,812 DUCs in April, 4,789 DUCs in May, 4,792 DUCs in June and now 4,787 DUCs in July. (iv) But we still believe there is still 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. (v) The largest YoY DUCs declines are the Permian (-369 YoY), Eagle Ford (-183 YoY), and Appalachia (-101 YoY). (vi) 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.

DUCs down marginally in July

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Figure 33: Estimated Drilled Uncomplete Wells in 2023

Drilled Uncompleted	Feb	Mar	April	May	June	July	YoY	YoY %	MoM	MoM %
Anadarko	744	740	741	741	739	739	-42	-5%	0	0%
Appalachia	755	743	731	725	716	710	-101	-12%	-6	-1%
Bakken	553	542	530	520	510	500	-92	-16%	-10	-2%
Eagle Ford	523	497	489	482	480	480	-183	-28%	0	0%
Haynesville	727	738	748	764	774	786	143	22%	12	2%
Niobrara	716	719	705	711	717	716	141	25%	-1	0%
Permian	956	899	868	846	856	856	-369	-30%	0	0%
Total	4,974	4,878	4,812	4,789	4,792	4787	-495	-9%	-5	0%

Source: EIA, SAF

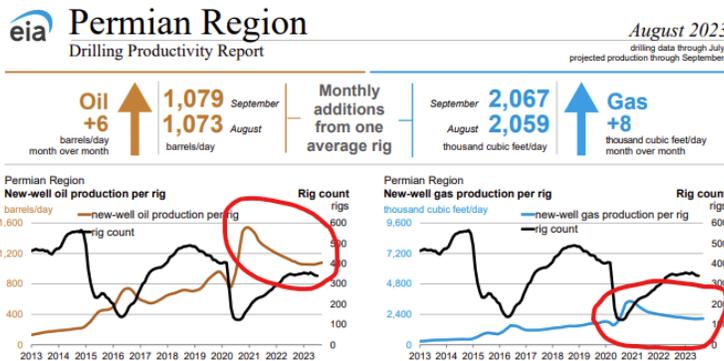
Oil: Hard to see the math for sustained Permian growth based on the DUCs

Permian 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 August or September, 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 beyond 2023 based on the level of DUCs and oil rigs. Permian DUCs are at the roughly the same levels as Aug/Sept 2014. Permian DUCs are 856 in July 2023. The peak for Permian DUCs was in the height of Covid at 3,519 DUCs in July 2020. The last time Permian DUCs were at 856 was back in fall 2014 with 818 in Aug 2014 and 903 in Sept 2014. Yet Permian oil rigs are 323 at August 18, 2023, which is currently 58% of the Aug/Sept 2014 average of approx. 560 oil rigs. Yet Permian oil production of 5.812 mmb/d in Aug 2023 is 3.5 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 August 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 August DPR.

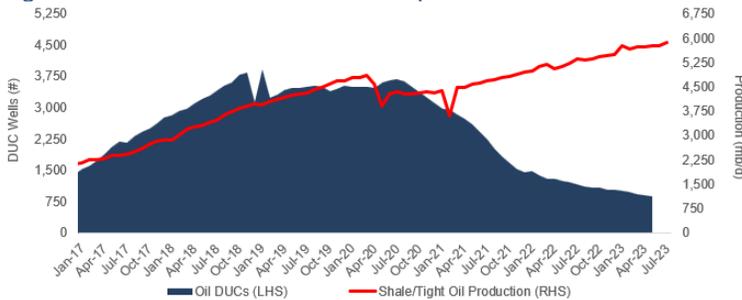
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Figure 34: Permian – EIA’s Permian new-well-oil Production Per Rig



Source: EIA, SAF

Figure 35: Estimated Drilled Uncomplete Wells vs Permian Oil Production



Source: EIA, SAF

Oil: North Dakota warns Biden regulations a “significant downside” to oil & gas

There was a big warning to the US oil and gas industry from North Dakota in their monthly press conference. North Dakota’s Lynn Helms call it a risk to North Dakota oil and natural gas but their warnings are applicable to all oil and gas – there are multiple Biden administration regulatory changes in different agencies that will hit oil and gas. And that was reaffirmed by the below item noting the API’s warning on one of the regulatory changes. On Wednesday, we tweeted [\[LINK\]](#) “North Dakota warns on multiple #Biden regulatory rule revisions. “All of these have significant downside for #Oil and #NatGas production. so a major concern there” says NDIC’s Lynn Helms. #OOTT.” Biden is doing the normal playbook to use regulations where he can so that they can hit the oil and gas sector. We say normal because regulatory changes are generally not picked up by media compared to if Biden worked with congress to get a law passed. So regulatory changes normally fly below the radar. And the other advantage of Biden doing regulatory changes is that they aren’t necessarily restricted in what they can do. That is evident in what the PHMSA is doing – they are basically stepping outside of their mandate. Moving to do things by regulatory changes lets Biden step out further and faster against oil and gas. But Helms highlighted there were multiple regulatory changes in multiple agencies and each of these regulatory changes pose significant downside to oil and gas. Here is the transcript we created of Helms comments. At 7 min mark, Helms “... so we are facing Bureau of Land Management leasing rule

North Dakota warns on Biden’s regulations

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modification. The CEQ is out with a new NEPA rule. The EPA is out with their greenhouse gas rule. PHMSA is getting into the act. They're the Pipeline and Hazardous Materials Agency so they are supposed to look at pipeline safety, but they've written a rule that involves LDAR and methane emissions. So even the pipeline safety organization is in the act. And now, US Fish & Wildlife is modifying the endangered species act. So in terms of oil and gas, we're working on the list of five active rule revisions and trying to get comments put in and looking at what we can do. All of these have significant downside for oil and gas production. So a major concern there."

"API Highlights Significant Concerns with PHMSA Leak Detection Rule"

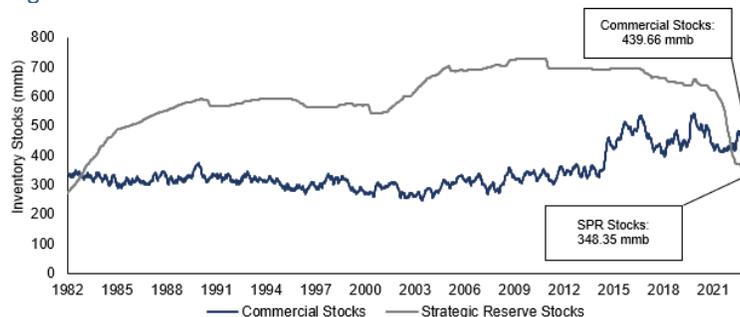
On Wednesday, the API released its "*significant concerns with PHMSA Leak Detection Rule*" that was one of the multiple Biden regulatory changes in Helms list that each provide significant downside for oil and gas. And note how the API's subtitle was "*Urges PHMSA to consider safety mandate*" as the API highlights how the new PHMSA lead detection rule is out of the PHMSA's mandate. The API wrote "*The American Petroleum Institute (API) today filed comments outlining significant concerns with the Pipeline and Hazardous Materials Safety Administration (PHMSA) proposed gas pipeline leak detection and repair rulemaking. API supports the intent of PHMSA's goal of addressing methane emissions and our industry remains committed to reducing emissions associated with operations. However, PHMSA's proposed rule goes well beyond its mandate from Congress to ensure pipeline safety under the Pipelines and Enhancing Safety (PIPES) Act of 2020, failing to propose risk-based safety measures.*" Our Supplemental Documents package includes the API release.

Oil: US SPR reserves now -91.308 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 -5.960 mmb, which puts commercial stocks at their lowest level since January. The EIA's weekly oil data for August 11 [LINK](#) saw the SPR reserves up +0.600 mmb WoW with the US DOE repurchases that increased SPR reserves to 348.354 mmb, while commercial crude oil reserves decreased +5.960 mmb to 439.662 mmb. There is now a -91.308 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

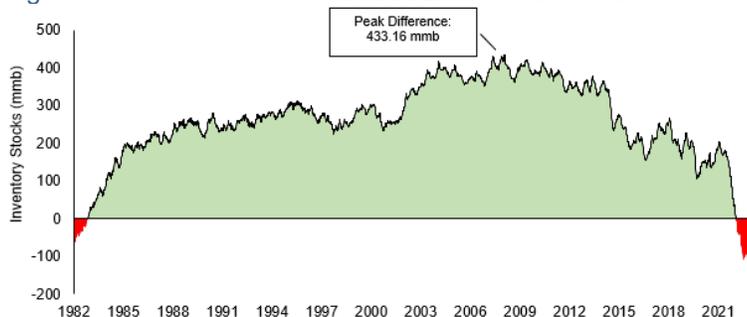
US SPR reserves

Figure 36: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 37: US Oil Inventories: SPR Less Commercial



Source: EIA, SAF

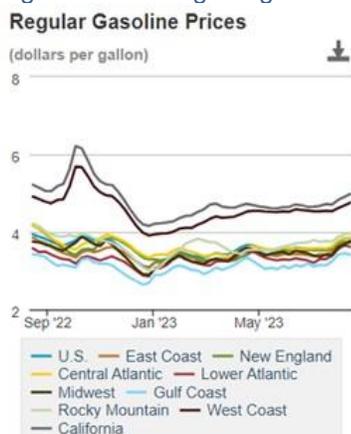
Oil: US gasoline prices keep inching up, not what Biden wants for 2024 election

Remember the panic in March 2022 when, eight months before the mid-term elections, US gasoline prices first went over \$4, and then over \$5 by the end of June before easing back before \$4 in Aug. Biden told Americans in Feb he was working to get gas prices down, and on March 30, announced they were going to release 180 million barrels from the SPR. It worked as a key factor for US gasoline prices going lower. It's now less than 15 months until the 2024 US elections. And US gasoline prices haven't been on a big ramp but are continuing to move higher. On Monday, we tweeted [\[LINK\]](#) "US #Gasoline prices keep inching up. @EIAgov 08/14/23 national average \$3.85, only down \$0.09 YoY. Not what #Biden expected with <15 mths to 2024 elections. Likely why he hasn't held back Iran's increasing #Oil exports. #OOTT." On Monday, the EIA posted its Gasoline and Diesel Fuel Update August 14, 2023 [\[LINK\]](#), which included the below graph that shows how US gas prices were \$3.85 on August, and only \$0.09 down YoY. US gas prices have been a steady, but slow increase. Don't forget most were calling for US gas prices to be weakening over the summer peak driving season. The EIA blog was for Aug 14, and the AAA national average gas prices as of Aug 19 were \$3.87, which was only down \$0.05 YoY from \$3.92 a year ago. Our Supplemental Documents package includes excerpts from the EIA gasoline and diesel fuel update.

US gas prices

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Figure 38: US regular gasoline prices



eia Data source: U.S. Energy Information Administration

Source: EIA, SAF

Oil: CNQ reminds 5 million barrel line fill (line pack) to soon start for TMX

We continue to get comments on the startup of Trans Mountain's TMX expansion and it seems like most are debating exactly when it will start up. Our comments is that we just don't know the exact month or quarter, except it is close and that is the key reminder. It's a matter of months not years to when TMX will be starting to need line pack/fill. Here is what we wrote in our Aug 6, 2023 Energy Tidbits memo on this soon to be needed line pack/fill. "On Thursday, Canadian Natural Resources held its Q2 call and there was a huge surprise when mgmt. stated they thought Trans Mountain could call for line fill any time now. And CNQ reminded that there would be 5 million barrels of oil needed for the line fill (line pack). This surprised everyone. Whether the line fill starts in Oct, Nov or Dec, or in early 2024, CNQ's comments are a reminder that line fill is soon to come. And when it does, that means there will be a need for 5 million barrels of oil for line pack before the pipeline can be operational. Trans Mountain should be releasing Q2 in late August and there will be a formal construction update. Their last formal update was in their Q1 report on May 30 [\[LINK\]](#) said "Trans Mountain anticipates mechanical completion of the Project to occur at the end of 2023 with commercial service expected to occur in the first quarter of 2024." The Bloomberg transcript of CNQ mgmt. comments in the Q&A was "Sure. As far as the apportionment, we don't see it being an issue. From all indications TMX is -- will be making a call for line fill here in the fall here, August, September, October. So from that aspect. I look at it as a very positive and very constructive for Canada's oil WCS. Because you can appreciate one you'll have the line fill and I believe it's up around 5 million barrels of line fill for that line. And then on top of it heavy oil capacity, I believe is a little over 500,000 barrels a day. So it's going to take 500,000 barrels a day of heavy to a different market. So to me, I find that the WCS piece will be very constructive here. Obviously typically, historically the winter months it does widen a bit. B mean, let's face it's 20% that is still very strong on a relative basis."

TMX line fill

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Oil: Cdn oil differentials widened \$1.75 to close at \$17.25 on Aug 18

It's been a great last 3 ½ months for WCS less WTI differentials that saw much narrower than normal WCS less WTI differentials for the summer. Normally WCS less WTI differentials start to widen in mid-May. But that didn't happen this year. 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 13.50 on May 31, narrowed in June to \$11.25 on June 30, widened in July to \$13.75 on July 31. But have widened in August to \$15.50 on Aug 11 and further this week by \$1.75 to \$17.25 to close on Aug 18. What isn't clear is if this is the start to a normal seasonal widening or if Saudi keeping its cuts thru September can keep WCS less WTI differentials less than normal. I. 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 \$19.95 on Aug 18, 2022. Below is Bloomberg's current WCS-WTI differential as of Aug 18, 2023 close.

WCS less WTI differentials

Figure 39: WCS less WTI oil differentials including Aug 18 close



Source: Bloomberg

Oil: Crack spreads at \$41.78 so no reason for US refiners to stop buying crude

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 decreased by \$1.25 to close at \$41.78 on Aug 18. Over \$40 is a very high crack spread and more than a double vs the more normal range pre-Covid that was more like \$15-\$20. A \$41.78 crack spread is a big incentive for US refiners to run hard and process as much crude as possible.

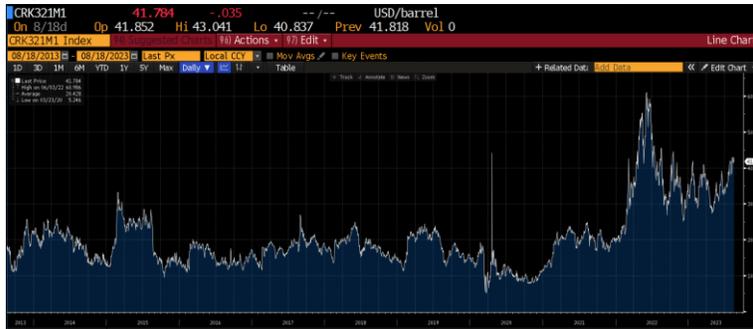
Crack spreads down this week

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 \$41.78 as of the Friday Aug 18, 2023 close.

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Figure 40: Cushing Crude Oil 321 Crack Spread Aug 18, 2013 to Aug 18, 2023



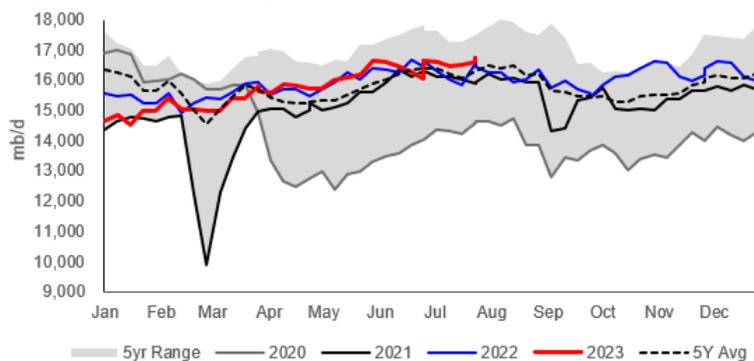
Source: Bloomberg

Oil: Refinery inputs up +0.167 mmb/d WoW to 16.746 mmb/d

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 strong crack spreads noted above, refineries are 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 August 11 [LINK](#). The EIA reported crude inputs to refineries were up +0.167 mmb/d this week to 16.746 mmb/d and are up +0.166 mmb/d YoY. Refinery utilization was up +1.1% WoW to 94.7%, which is +1.2% YoY. We are likely hitting the seasonal peak in refining in the next few weeks.

Refinery inputs up +0.167 mmb/d WoW

Figure 41: US Refinery Crude Oil Inputs



Source: EIA, SAF

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

US net oil imports

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import volumes to the wrong country. Perhaps this is part of the reason for the big weekly plug in its oil supply and demand 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 starting in Jan. 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 -1.763 mmb/d to 2.559 mmb/d for the August 11 week. US imports were up +0.476 mmb/d to 7.158 mmb/d. US exports were up 2.239 mmb/d to 4.599 mmb/d. The WoW increase in US oil imports was driven mostly by "Top 10". The Top 10 was up +0.297 mmb/d. Some items to note on the country data: (i) Canada was up +0.039 mmb/d to 3.505 mmb/d. (ii) Saudi Arabia was down -0.045 mmb/d to 0.285 mmb/d. (iii) Mexico was up +0.234 mmb/d to 0.901 mmb/d. (iv) Colombia was down -0.221 mmb/d to 0.075 mmb/d. (v) Iraq was down -0.001 mmb/d to 0.304 mmb/d. (vi) Ecuador was up +0.221 mmb/d to 0.363 mmb/d. (vii) Nigeria was up +0.070 mmb/d to 0.307 mmb/d.

Figure 42: US Weekly Preliminary Imports by Major Country

(thousand b/d)	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	Jun 23/23	Jun 30/23	Jul 7/23	Jul 14/23	Jul 21/23	Jul 28/23	Aug 4/23	Aug 11/23	WoW
Canada	3,589	3,504	3,339	3,570	3,776	3,611	3,385	3,698	3,203	3,691	3,466	3,505	39
Saudi Arabia	534	66	677	146	460	313	444	426	242	427	330	285	-45
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	913	647	845	808	758	882	526	1,004	830	760	667	901	234
Colombia	286	127	184	148	222	287	153	215	287	290	296	75	-221
Iraq	114	430	252	102	216	122	134	259	273	235	305	304	-1
Ecuador	214	218	54	203	67	157	144	207	216	175	142	363	221
Nigeria	98	144	132	204	96	192	189	91	229	94	237	307	70
Kuwait	0	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	0
Top 10	5,748	5,136	5,483	5,181	5,595	5,564	4,975	5,900	5,280	5,672	5,443	5,740	297
Others	1,469	1,264	898	980	985	1,474	905	1,274	1,087	996	1,239	1,418	179
Total US	7,217	6,400	6,381	6,161	6,580	7,038	5,880	7,174	6,367	6,668	6,682	7,158	476

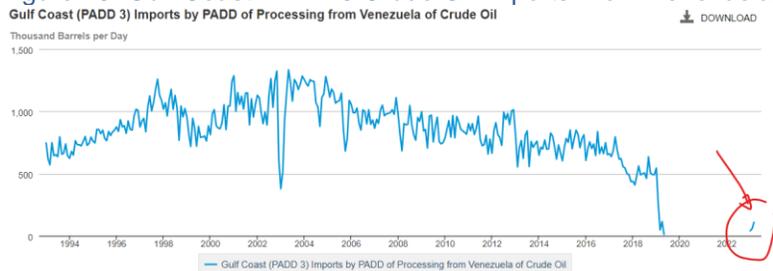
Source: EIA, SAF

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 from the graph but we pointed to the first Venezuela oil imports into the Gulf Coast in about 3 1/2 years were 40,000 b/d in Jan and 58,000 b/d in Feb, and this will be higher in March."

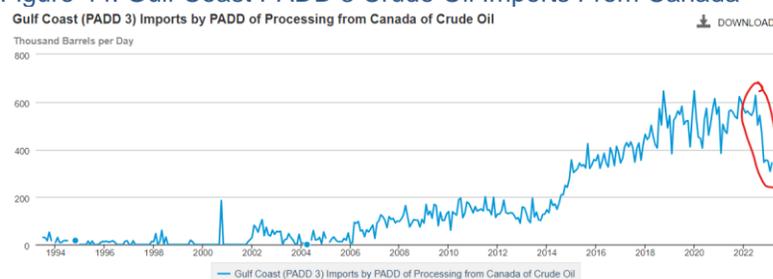
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Figure 43: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



eia Data source: U.S. Energy Information Administration
Source: EIA, SAF

Figure 44: Gulf Coast PADD 3 Crude Oil Imports From Canada



eia Data source: U.S. Energy Information Administration
Source: EIA, SAF

Oil: Fire/explosion at Russia's major Black Sea oil export terminal Novorossiysk

As of our 7am MT news cut off, we haven't seen the cause of the fire/explosion at Russia's major Black Sea oil export terminal, Novorossiysk on Thursday. We tweeted [\[LINK\]](#) "Reminder Novorossiysk is Russia's major Black Sea #Oil export terminal at ~0.4 mmb/d. See 🙌 Aug 5 tweet. Not clear yet what damage has been done to the port. But thick black smoke seen in all videos often signifies fuel or oil was hit. [\[LINK\]](#) #OOTT." We don't know the extent of the damage, but our initial thoughts were that the thick black smoke normally signifies there is oil or fuel oil on fire. This is normally what you see when an oil or products tank gets on fire. And there would be a lot of tankage at Novorossiysk given this is the major oil and products export terminal on the Black Sea. On Friday, The Guardian reported [\[LINK\]](#) "fire broke out in the port of Novorossiysk on Friday, Russian officials said. Footage shared by local media and emergency services showed a huge blaze engulfing the cargo area of the Black Sea port. The Caspian Pipeline Consortium said a nearby oil terminal, Russia's main oil export hub in the region, was working as normal." It isn't clear how much tankage was hit or much of the loading infrastructure was hit, but fires have to impact the near term export capacity. And more importantly raises the risk to Russian oil and products exports from the Black Sea.

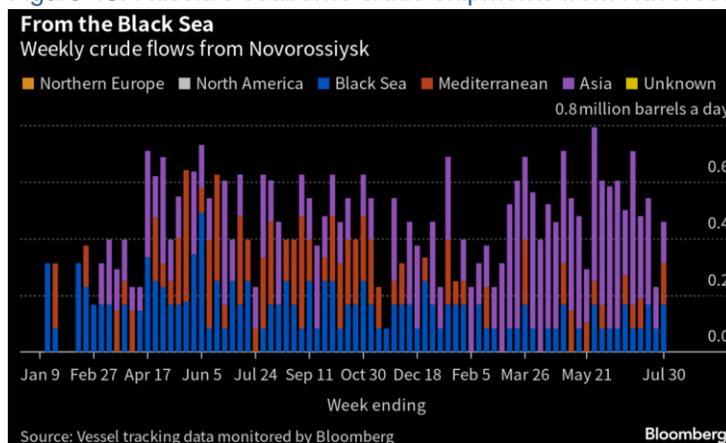
**Russia
seaborne crude
flows down**

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08/05/23: Ukraine warned Russia Black Sea oil port now “war risk area”

We haven’t seen the cause of the fire/explosion at Novorossiysk. But we remind that Ukraine warned, on Aug 5, that Novorossiysk and other major Russian Black Sea ports were now “war risk areas”. Here is what we wrote in our Aug 6, 2023 Energy Tidbits memo. “Big development in the Russia/Ukraine war yesterday morning that should impact commodities, including oil, when markets open on Monday. Early yesterday morning, we tweeted [\[LINK\]](#) “Buckle up! Ukraine hits Russian #Oil tanker & warns 6 Russian ports are now in “war risk area”. @business. Including major RUS Black Sea #Oil export port Novorossiysk. See great 📈 @JLeeEnergy graph, still loading ~0.4 million b/d. #OOTT.” There were two big developments yesterday morning. First, a Ukraine drone attack on a Russia oil tanker, which is the first case of any ship/tanker carrying commodities being attacked in the war. Second, and even more significantly, Ukraine declare the water area around six Russian Black Sea ports are now in a “war risk zone”. And these six ports include Russia’s Black Sea oil port at Novorossiysk. The six ports are Anapa, Novorossiysk, Gelendzhik, Tuapse, Sochi, Taman. Our tweet included Bloomberg’s Aug 1 update of Russian seaborne oil shipments, which included the below graph that shows crude oil shipments from Novorossiysk have been about 400,000 b/d. It’s not just crude oil that is at risk. Ukraine isn’t necessarily saying exactly what will be attacked but we have to believe that the Ukraine declaration has to impact the volume of ships and also the cost of insurance, if available, for any ships.”

Figure 45: Russia’s seaborne crude shipments from Novorossiysk (Black Sea)



Source: Bloomberg

Oil: Saudi use of oil for electricity up in June i.e., less oil available for export

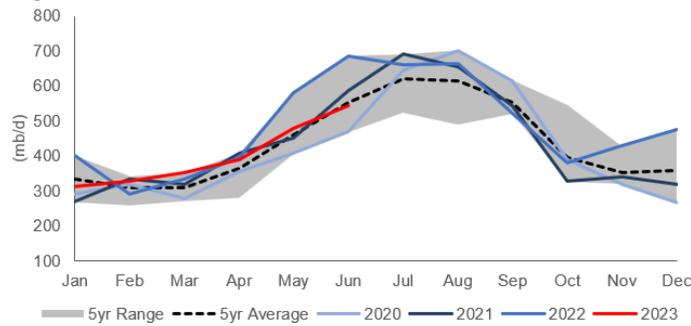
The key seasonal theme for Saudi oil exports is that, all things being equal, Saudi can export more oil in winter months as it uses less oil for electricity and, conversely, it would have less oil exports in summer months as it uses more oil for electricity i.e. air conditioning. With June being the first month 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 oil use for electricity up in June

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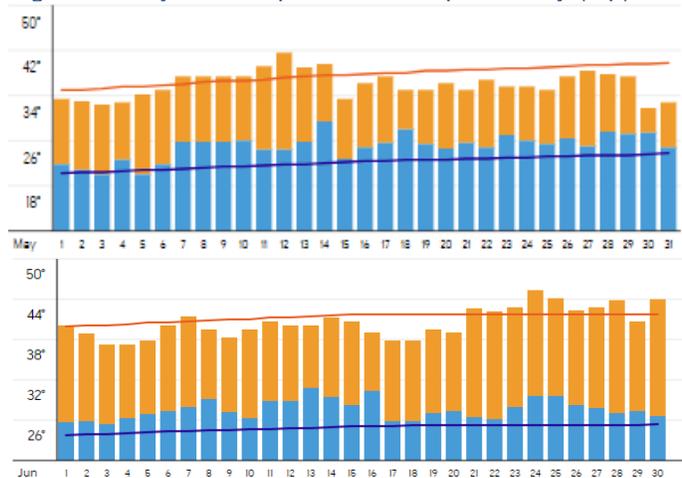
Saudi Arabia oil supply and demand for June [\[LINK\]](#) was updated on Tuesday. Saudi used more oil for electricity in June vs May. The increased electricity usage was primarily driven by daily temperatures being at or above the average high throughout most of the month. It is important to note that June experienced warmer temperatures than May and warmer weather means more air conditioning/electricity demand. Oil used for electricity generation in June was 543,000 b/d (vs June 2022 of 687,000 b/d) and May was 478,000 b/d (vs May 2022 of 582,000 b/d). Below are the AccuWeather Temp maps for Riyadh for June and May.

Figure 46: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI, SAF

Figure 47: Riyadh Temperature Recaps for May (top) and June (bottom)



Source: Accuweather

Oil: Saudi oil exports down -124,000 b/d to 6.804 mmb/d in June

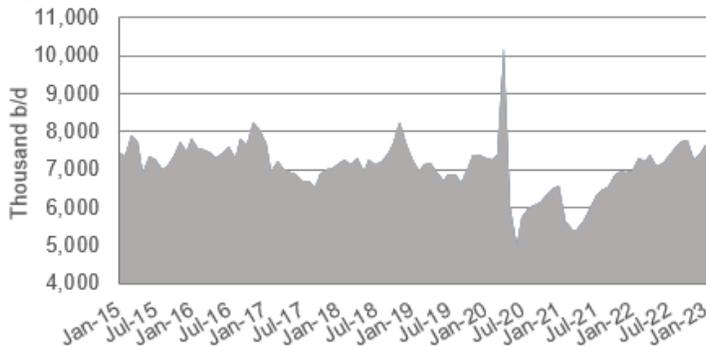
The JODI data notes Saudi oil exports in June were down -124,000 b/d MoM to 6.808 mmb/d. But, the math would have expected oil exports to be down -90,000 b/d MoM given production was down 3,000 b/d MoM, there was an increase in direct use of oil for electricity of +65,000 b/d MoM, there was an inventory build of +48,000 b/d MoM offset by refinery intake being down -28,000 b/d MoM. The math is off a bit and we suspect it is due to the

Saudi oil exports down -124,000 b/d MoM

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combination of transactions involving imports of Russian oil and fuel oil. Below is our graph of Saudi Arabia monthly oil exports.

Figure 48: Saudi Arabia Oil Exports (mb/d)



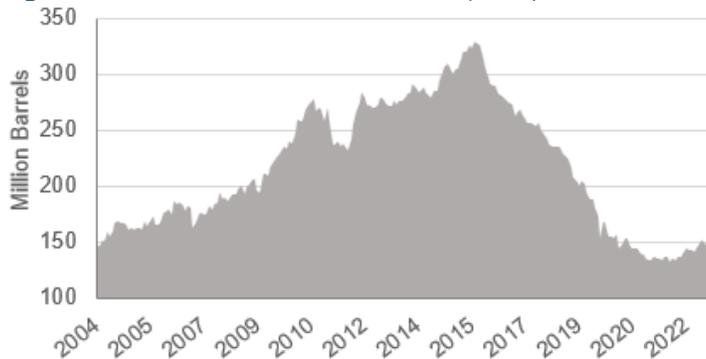
Source: JODI, SAF

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 +1.452 mmb MoM, or +48,000 b/d MoM. Looking at the basic components, we would have expected a build on inventory closer to +2.520 mmb MoM or +84,000 b/d MoM. There should have been a MoM inventory build impact from production being -3,000 b/d MoM and crude oil used for electricity +65,000 b/d MoM. But the offsetting impact for a MoM inventory build would be for exports being -124,000 b/d MoM and oil intake into refineries being -28,000 b/d MoM. The net impact should have been a 84,000 b/d MoM build in inventories. But inventories only were up by 48,000 b/d MoM leaving a 36,000 b/d unexplained MoM items. We believe this is due to increasing oil and fuel oil imports from Russia.

Saudi oil inventory data

Figure 49: Saudi Arabia Oil Inventories (mb/d)



Source: JODI, SAF

Oil: Will or can anyone stop Iran from adding ~0.6 mmb/d to oil markets in H2/23?

We still believe one of the major oil risks over the coming months is Iran increasing supply and exports. Here is what we wrote in last week's (Aug 13, 2023) Energy Tidbits memo.

Iran adding 600,000 b/d to oil markets

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“Iran looks to be an overlooked risk to oil prices in H2/23 and not because of sanctions removal. Rather because they are adding oil production capacity and we don’t know who will or can stop them from adding the new oil capacity to oil markets. (i) Earlier this morning, we tweeted [\[LINK\]](#) “Near term Oil hold back. Another Iran reminder today that at 3.2 mmb/d & to exceed 3.3 mmb/d by late Aug. Vs #OPEC MOMR Secondary Sources had Iran at 2.828 mmb/d in July. Who can or will stop Iran from adding up 0.6 mmb/d to #Oil markets in next few mths? #OOTT.” It follows our tweet yesterday [\[LINK\]](#) “Who can or will stop Iran from adding up to 0.6 mmbd to #Oil markets over coming mths? Iran not subject to #OPEC quota. US negotiating with Iran on prisoners & releases of Iranian funds. See 📌 08/09/23 thread - Iran is #oil supply risk in H2. #OOTT @DanialRahmat12.” Our Aug 8, 2023 tweet was [\[LINK\]](#) “Iran near term #Oil supply adds! Given #Biden doesn’t have any stroke over #MBS & tapped SPR, wonder if he effectively turns a blind eye as he sees this as a replacement for an SPR release to try to help keep a lid on oil/#Gasoline prices for 2024. Thx @DanialRahmat12! #OOTT. “ (ii) On Wednesday, Tehran-based analyst, Danial Rahmat, tweeted [\[LINK\]](#) “CEO of #NIOC: Iran’s crude prod. to increase by 150 k b/d in a week. By the end of Sep. 100k b/d will be added and output will reach 3.5 mil. b/d. In H2, about \$8 b deals will be signed to develop 2 joint fields. #OOTT @Energy_Tidbits @sean_evers @FrankKaneDubai @imannasseri.” Rahmat was reporting on comments by National Iranian Oil Company managing director, Khojasteh mehr, at a press conference in Tehran on Aug 9. (iii) Later PressTV (Iran state media) reported on Khojasteh mehr’s comments on the press conference. [\[LINK\]](#) “Iran will reach a milestone oil production figure of 3.5 million barrels per day (bpd) in late September, according to the CEO of state oil company NIOC, despite sanctions imposed on the country by the US. Mohsen Khojasteh Mehr said on Wednesday that Iran’s oil output will increase by 150,000 bpd within the next week and by another 100,000 bpd by the end of the month to September 22 to reach a total of 3.5 million bpd. The figure would be a major increase from 2.2 million bpd of oil production reported in August 2021 when the current administrative government led by President Raeisi took office, said Khojasteh Mehr. He said the growth in oil output will entirely serve Iran’s plans to increase its oil exports.” Earlier this morning, our tweet attached the Irna (state media) reporting [\[LINK\]](#) on Iran oil minister saying today that oil production was 3.2 mmb/d and to surpass 3.3 mmb/d by the end of August. (iv) Iran is saying they can hit 3.5 mmb/d in late Sept. Based on this week’s OPEC Aug MOMR Secondary Sources production for Iran of 2.828 mmb/d in July, this is an add of >600,000 b/d. We think this is a significant item as we don’t see who will or can block Iran from adding these barrels to global markets. Iran is one of three countries not subject to OPEC+ quotas so isn’t held back by OPEC+ in increasing production and exports. (v) In theory, Iran is under sanctions but US has turned a blind eye to stopping Iran oil exports. And given the late week breaking news of a potential US/Iran prisoner swap and release of Iran’s blocked funds in South Korea, it’s hard to see the US stepping up to enforce sanctions. Plus there is the political reality that it’s only 15 months to the US 2024 Presidential election. Our Aug 9 tweet said “Given #Biden doesn’t have any stroke over #MBS & tapped SPR, wonder if he effectively turns a blind eye as he sees this as a replacement for an SPR release to try to help keep a lid on oil/#Gasoline prices for 2024.” US gasoline prices keep inching up. Biden used the SPR to keep a lid on prices in the run up to the 2022 mid-term elections. He doesn’t have that cushion now so he can look at Iran’s new capacity as a bit of SPR replacement to keep a lid on oil prices. Our Supplemental Documents package include the PressTV report.

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

We have to believe there isn't any near term expectations for a restart of Kurdistan oil exports via Turkey as it's silence and we don't hear any of Kurdistan, Iraq or Turkey talking about a potential restart. Rather, the only updates we saw this week was the Iraqi Oil Report on Friday [\[LINK\]](#) *"Upcoming Iraq-Turkey diplomacy aims for pipeline progress. Imminent ministerial-level visits to Baghdad and Ankara are likely to address major challenges to restarting Iraq's northern exports."* And *"Iraq and Turkey are planning to trade ministerial-level diplomatic visits next week, as negotiations continue over reopening the Iraq-Turkey Pipeline (ITP) that has been shut since March following an international tribunal ruling. Turkish Foreign Minister Hakan Fidan will visit Baghdad and Erbil on Aug. 23 and 24, according to four Iraqi officials, while Iraqi Oil Minister Hayyan Abdulghani is scheduled to travel to Ankara "early next week," according to an Oil Ministry official."* Ministerial meetings are a step up from lower level meetings but, until Haftar is involved, it's hard to see the potential for a deal. We still believe the restart of oil via Turkey is one of the Iraq/Turkey items to be resolved.

Kurdistan oil still shut in

Oil: Libya oil production stable at ~1.2 mmb/d

It will be interesting to see if the Libya National Oil Corporation continues to give regular production updates given the return of fighting in Tripoli this week that seemed to have killed >50 and injured a couple hundred. Recall that during the recent protest period that shut in Sharara and El Feel oilfields, there weren't any NOC production updates for a couple weeks. But, at least for now, we have the NOC updates. On Wednesday, the NOC tweeted [\[LINK\]](#) *"Crude oil production amounted to one million and 203 thousand barrels per day, and condensate production reached 50 thousand barrels per day during the past 24 hours."* The update is right in line with the ~1.2 million barrels per day stable level of production Libya has had for the past several months.

Libya oil stable at 1.205 mmb/d

Blame Tripoli killing on 444 Brigade and Special Deterrence Force, not Haftar

This has been an unusual bout of fighting because it can't be blamed on east (Haftar) vs west groups or sponsored groups. Rather it seems to be fighting within groups within the west. On Thursday, Al Jazeera posed a good report *"Why did clashes break out in Libya's Tripoli? Fighting between the influential 444 Brigade and the Special Deterrence Force has raged this week after months of relative peace."* [\[LINK\]](#). Al Jazeera gives color on the 444 Brigade and Special Deterrence Force. Al Jazeera wrote *"Fighting raged from Monday night into Tuesday between the influential 444 Brigade and the Special Deterrence Force, or al-Radaa Force. The 444 Brigade is affiliated with Libya's defence ministry and is reputed to be the North African country's most disciplined armed group. The Special Deterrence Force is a powerful ultraconservative militia that acts as the capital's police force. They are two of myriad militias vying for power since the 2011 overthrow of longtime dictator Muammar Gaddafi, growing in wealth and power, particularly in Tripoli and the west of the country. The 444 Brigade and the Special Deterrence Force are among the largest militias in Tripoli and have been backed by the Tripoli-based government in the west of the country, led by Prime Minister Abdul Hamid Dbeibah."* Our Supplemental Documents includes the Al Jazeera report.

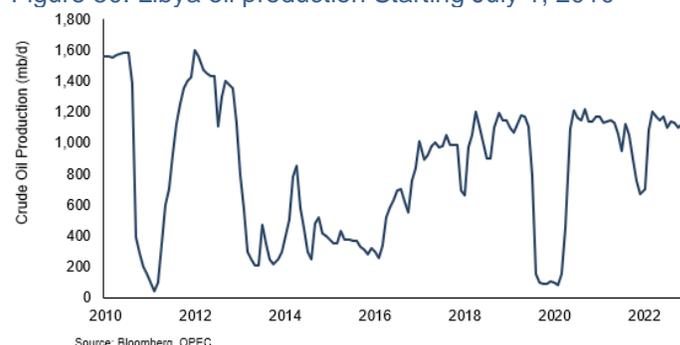
Tripoli violence reminded that Qaddafi was run out of Tripoli in Aug 2011

It isn't a special anniversary but it was right around now in August 2011 that Qaddafi lost control of Tripoli and effectively out of power as he went into hiding. Most history recordings put Aug 22, 2011 as the day that Qaddafi lost control of Tripoli and Aug 23, 2011 as the day when he lost control of his Tripoli headquarters and went into hiding. Ultimately Qaddafi was killed by rebels on Oct 20, 2011 after several weeks of fighting for control of Sirte.

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

The fighting this week looks to have been limited to some parts of Tripoli. But the fighting, along with the recent shut in and return of the El Feel and Sharara oil fields in July, are reminders 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 50: Libya oil production Starting July 1, 2010



Source: Bloomberg, OPEC

Oil: As expected, it was a bad week for China July economic and capital flows data

Last week's (Aug 13, 2023) Energy Tidbits memo highlighted the China state media, Global Times, last Sunday morning report that we suspected was trying to lower expectations for the Monday economic data. That was an understatement and on Monday night, we tweeted [\[LINK\]](#) "Breaking. Shouldn't be surprised, China July data for Industrial Production, Retail Sales and Fixed Asset Investments all below expectations Thx @YvonneManTV @DavidInglesTV #OOTT." And the rest of the week seemed to be bad news after bad news. We could write pages if we went thru the all the bad news. But a couple of the capital flows items were: (i) Last Sunday night, we tweeted [\[LINK\]](#) "More China stalling recovery data. July normally sees a MoM decline in lending in China, but this year is really big MoM decline. Note, changed the time frame so the July MoM changes could be clearly seen each year. Thx

A bad week of economic data for China

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@business #OOTT. Our tweet included BloombergTV graphs “China Credit Data by Loan Type: Household lending virtually disappeared in July” and “China Bank Lending Plummet 90%. July’s yuan bank loans drop to 17-year “low”. (ii) On Friday, we tweeted [LINK](#) “Economic strength is about access to, and flows of, capital. Xi may be able to “convince” Chinese investors to not sell, but foreign investors are reducing capital allocated to China. And #Oil gets dragged down with any China weakness. Thx @SheryAhnNews @PaulAllenLive #OOTT.” Our tweet included BloombergTV graphs “China ETFs listed in US. Outflows seen in some of the large ETFs last week.” And “Northbound Stock Connect Flows into China. Record streak of net selling by foreign investors”. There were many more negative economic and market stories on China. Our Supplemental Documents package includes the BloombergTV graphs attached to our tweets.

Oil: China scheduled domestic flights +0.8% WoW

On Tuesday night, we tweeted [LINK](#) “China scheduled domestic flights +0.8% WoW to 104,823. Chinese consumer stepped up to fly this summer. BUT summer holiday travel is to peak in next week or so. What happens to air travel in Sept/Oct with weak China economy? Thx @BloombergNEF Claudio Lubis #OOTT #JetFuel.” (i) On Tuesday, BloombergNEF posted its Aviation Indicators Weekly Aug 15, 2023. (ii) The key concern for Chinese domestic flights is what happens once summer holiday flying peaks in the next week or so ie. what happens to air travel in Sept and Oct. Scheduled domestic flights were +0.8% WoW to 104,823 flights for Aug 8-14. And the summer holiday season took domestic flights from 92,568 flights in June 13-19 week to 104,823 flights this week. Yet the 104,823 flights is still well below what was expected at the end of March for April of 119,180 flights. The big jump in flights in April never happened. But the Chinese consumer did step up to fly this summer. And the reminder, Chinese didn’t get the big Covid payouts like people in US, Canada, etc so they are spending their own money/savings to fly. but what isn’t clear is how much higher they would have stepped up to fly in a stronger Chinese economy and how did the weaker than expected Chinese economy impact summer scheduled domestic flights. So a positive that Chinese flying increased with summer travel, but clearly not as much as was expected at the end of March. (ii) China scheduled domestic flights +0.8% WoW to 104,823 flights for Aug 8-14 week. A WoW increase would be expected in early Aug. Not like what happened last week, when there was the first WoW decline since early June, when scheduled domestic flights were -0.4% WoW to 104,000 flights for Aug 1-7 week. Prior to that, there were six consecutive weeks of WoW increases as was expected with the start of the summer holiday season when scheduled domestic flights went from 92,568 flights in June 13-19 week to 104,436 in July 25-31 week, before the WoW drop to 104,000 flights in Aug 1-7 week. And now this WoW takes it up to 104,823 flights. (iii) Note that, even with the summer holiday flight increases, scheduled domestic flights at 104,823 for the Aug 8-14 week are still well below, 12% below, what was expected at the end of March for April of 119,180 flights. (iv) BloombergNEF’s updated scheduled domestic flights over the next four weeks is expected +0.5% to 105,862 flights. “reflecting a slowdown in growth rates as the summer peak travel season comes to an end”. The peak travel season is ending. The 105,862 flights is unchanged vs last week’s report’s look ahead over the next four weeks. And the 105,862 flights is still 11.2% below what was expected at the end of March for April. Below is our running WoW changes from the prior BloombergNEF reports and the BloombergNEF charts from August 15 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

China scheduled domestic flights

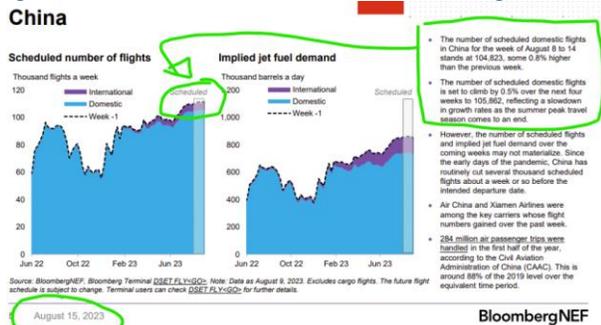
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Figure 51: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

Aug 8-14: +0.8% WoW to 104,823 flights
 Aug 1-7: -0.4% WoW to 104,000 flights
 July 25-31: +0.4% WoW to 104,436
 July 18-24: +1.3% WoW to 104,011
 July 11-17: +2.8% WoW to 102,709
 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

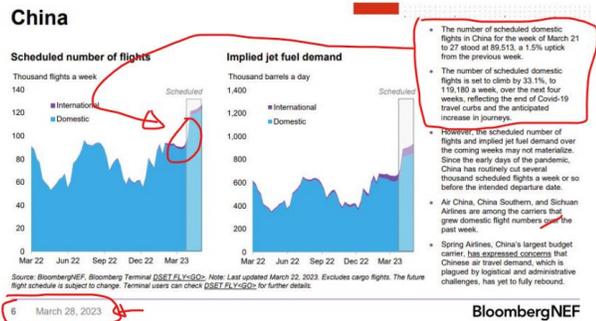
Figure 52: China scheduled domestic air flights as of Aug 15



Source: BloombergNEF

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Figure 53: China scheduled domestic air flights as of March 28



Source: BloombergNEF

Oil: Still a long way to go in recovery of visitors to Hong Kong

We haven't seen the July data yet but, based on the June data, visitor arrivals to Hong Kong have stalled out and at levels 46% below pre-Covid levels. On Friday, we tweeted [LINK](#) "Still a long way to go for recovery in Hong Kong visitor arrivals. Total. June/23 of 2.749 mm is -46.6% vs June/19 of 5.144 mm. From China. June/23 of 2.155 mm is -46.1% vs June/19 of 4.001 mm. Plus June/23 was -6.7% vs Apr/23 of 2.309 mm. Thx @business #OTT." Visitor arrivals in Hong Kong have stalled out at ~46% below pre-Covid levels. And visitor arrivals to Hong Kong from China have dropped 6.7% from April. There is still a long way to go for travel to Hong Kong.

Visitor arrivals to Hong Kong

Figure 54: Visitor arrivals to Hong Kong to June 30 (thousands)

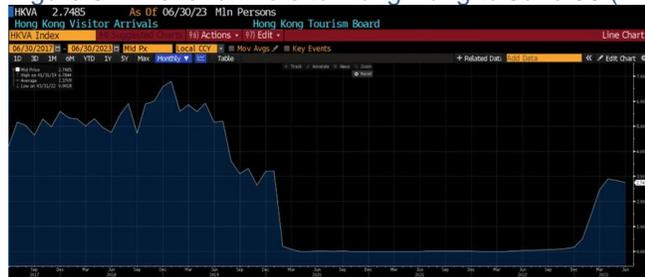


Figure 55: Visitor Arrivals to Hong Kong from China to June 30 (thousands)

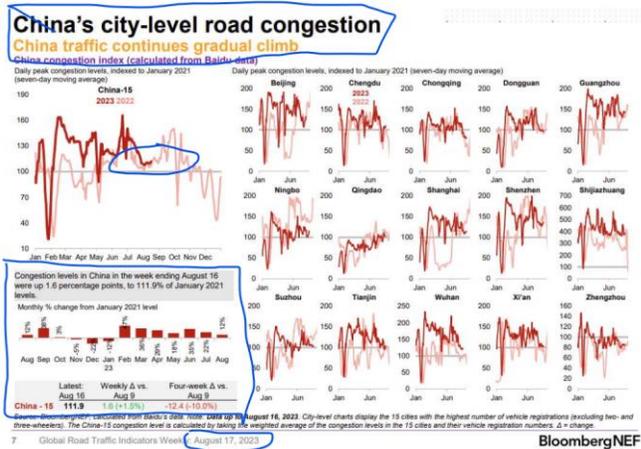


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China city-level traffic congestion

Oil: Baidu China city-level road congestion increasing with end of summer holidays
 BloombergNEF describes it as “China traffic continues gradual climb” as summer holidays come to an end. (i) On Thursday, we tweeted [\[LINK\]](#) “China summer holidays winding down = more return to cities & increasing city-level traffic congestion. China Baidu city-level road congestion +1.6% WoW to 111.9% of Jan/21 levels. Only “gradual climb” so far, ahead of normal Sept/Oct seasonal ramp. Thx @BloombergNEF #OOTT.” (ii) BloombergNEF posted its Global Road Traffic Indicators Aug 17 report, which includes the China Baidu city-level road congestion data for week ended Aug 16. (iii) BNEF’s headline was “China traffic continues gradual climb.” (iv) For the week ended Aug 16, 2023, Baidu data for China city-level road congestion was +1.6% WoW to 111.9% of Jan 2021 levels. It looks to be a second week indicating that the summer holiday season is starting to end and more people are returning to cities and back to work. But, as BloombergNEF writes, it’s a gradual climb so far. The key question is what happens in Sept/Oct and will there be the expected seasonal bigger increase in city-level road congestion. The top 15 cities in Aug to date are 108% of Aug 2021 levels, which is better YoY than Aug 2022 that was 106% of Aug 2021 levels. (v) BloombergNEF provided its specific by city numbers for Aug, but this is for only the first 16 days of Aug. For the top 15 cities in aggregate, Aug 2023 so far are 108% of Aug 2021 levels, whereas Aug 2022 was 106% of Aug 2021 levels. Of the top 15 cities, 6 are up YoY and 9 are down YoY. Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators Aug 17 weekly report.

Figure 56: China city-level road congestion for the week ended Aug 16



Source: BloombergNEF

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Figure 57: China city-level road congestion for the week ended Aug 16.



Global Road Traffic Indicators Weekly August 17, 2022 BloombergNEF

Source: BloombergNEF

Oil: China says “No need to panic” over 3rd Covid infections

We have been surprised for the past two months how Covid in China hasn't been a big story as, in Q2, Chinese state media warned a big peak for new Covid cases at the end of June. But there was very little said if that peak happened or the impact. There was some reassurance that if there was big Covid outbreak, it wasn't as deadly as we didn't see reports of hospitals filling up or high number of deaths. So the assumption was that Covid, if it was ramping up, was more like a normal flu or cold. We check Chinese state media almost every day so we couldn't help note the Monday story by Global Times (China state media) [LINK](#) titled 'No need to panic' over third COVID-19 infections, overall situation stable." And "Along with EG.5, a sublineage of the Omicron variant, being classified as a "variant of interest" by the World Health Organization (WHO), the topic of a third COVID-19 wave has triggered discussions among Chinese netizens in recent days with many sharing their infection experiences. Experts noted that the COVID-19 situation in China is still stable and that there is no need to panic. Some netizens on Monday who said on social media that they had been reinfected a third time noted that their symptoms were lighter than previous infections. However, some shared different experiences. The current COVID-19 infections are more hidden, but generally still at a relatively stable level. There isn't an obvious seasonal pattern for COVID-19 transmission, but usually it will show a small infection peak every five to six months. Generally, "the infection peak is decreasing, with no impact on the country's overall prevention work," Lu Hongzhou, head of the Third People's Hospital of Shenzhen, told the Global Times on Monday." Let's all hope it's no big deal but, with any government on Covid, we have to wonder the level of truth to the report. To be fair to China, we doubted the US and Canadian governments when they first came out and said no need to wear masks. As was found out later, it was so they could at least get control of the then existing masks. Our Supplemental Documents package includes the Global Times report.

China Covid update

Oil: Vortexa crude oil floating storage at Aug 18 was 95.32 mmb, -14.91 mmb WoW

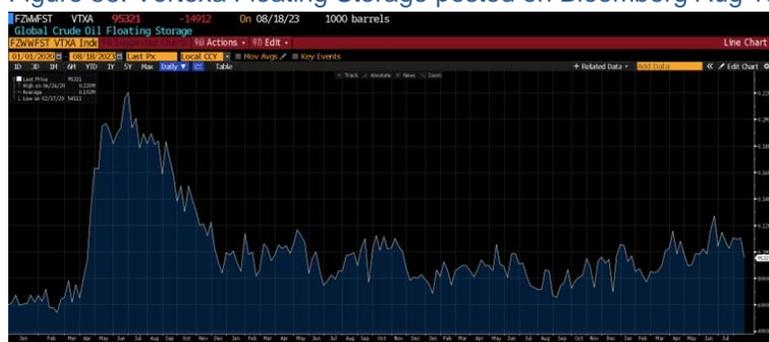
We are referencing the Vortexa crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so

Vortexa floating storage

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our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Aug 12 at 9am MT. (i) Upward revisions to last three weeks, rest were mostly unchanged. (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Aug 18 at 95.32 mmb, which is -14.91 mmb WoW vs upwardly revised Aug 11 of 110.23 mmb. Note Aug 11 of 110.23 mmb was revised +7.30 mmb vs 102.93 mmb originally posted at 9am MT on Aug 12. (iii) Revisions. Upward revisions for prior three weeks, then basically neutral revisions. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on Aug 12 are as follows: Aug 11 revised +7.30 mmb. Aug 4 revised +4.19 mmb. July 28 revised +3.06 mmb. July 21 revised +0.85 mmb. July 14 revised +0.79 mmb. July 7 revised +1.13 mmb. June 30 revised -0.35 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 107.28 mmb vs last week's then seven-week average of 106.13 mmb. (v) 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. Normally we download the Vortexa data as of Saturday mornings around 9am MT. (vi) 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. (vii) Aug 18 estimate of 95.32 mmb is -124.99 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (viii) Aug 18 estimate of 95.32 mmb is +29.71 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) Aug 18 estimate of 95.32 mmb is +9.93 mmb YoY vs Aug 19, 2022 of 85.39 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Aug 19, 9am MT Aug 12, and 9am MT Aug 5.

Figure 58: Vortexa Floating Storage posted on Bloomberg Aug 19 at 9am MT



Source: Bloomberg, Vortexa

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Figure 59: Vortexa Estimates Posted Aug 19 9am MT, Aug 12 9am MT, Aug 5 9am MT

Posted Aug 19, 9am MT						Aug 12, 9am MT						Aug 5, 9am MT					
FZWWFST VTXA Inde 94) Su						FZWWFST VTXA Inde 94) Su						FZWWFST VTXA Inde 94) Su					
01/01/2020 - 08/18/2023						01/01/2020 - 08/11/2023						01/01/2020 - 08/04/2023					
ID	3D	1M	6M	YTD	1Y	ID	3D	1M	6M	YTD	1Y	ID	3D	1M	6M	YTD	1Y
Date						Date						Date					
Last Px						Last Px						Last Px					
Fr 08/18/2023 95321						Fr 08/11/2023 102.926k						Fr 08/04/2023 101.748k					
Fr 08/11/2023 110.233k						Fr 08/04/2023 105.335k						Fr 07/28/2023 107.366k					
Fr 08/04/2023 109.534k						Fr 07/28/2023 107.492k						Fr 07/21/2023 106.429k					
Fr 07/28/2023 110.553k						Fr 07/21/2023 101.807k						Fr 07/14/2023 109.407k					
Fr 07/21/2023 102.657k						Fr 07/14/2023 107.016k						Fr 07/07/2023 119.648k					
Fr 07/14/2023 107.813k						Fr 07/07/2023 113.739k						Fr 06/30/2023 105.631k					
Fr 07/07/2023 114.87k						Fr 06/30/2023 104.561k						Fr 06/23/2023 125.781k					
Fr 06/30/2023 104.206k						Fr 06/23/2023 125.059k						Fr 06/16/2023 114.804k					
Fr 06/23/2023 127.016k						Fr 06/16/2023 114.605k						Fr 06/09/2023 98560					
Fr 06/16/2023 115.986k						Fr 06/09/2023 98183						Fr 06/02/2023 102.284k					
Fr 06/09/2023 98412						Fr 06/02/2023 101.73k						Fr 05/26/2023 95875					

Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

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, Aug 11 in total was revised +7.30 mmb. The main revisions in a region vs the originally posted (as of 9am Aug 12) floating oil storage for Aug 11 were Asia revised +6.15 mmb and Europe revised +2.29 mmb. (ii) Total floating storage was -14.91 mmb WoW. The major WoW changes by region were Asia -13.86 mmb WoW, Other -5.25 mmb WoW, and Middle East +3.19 mmb WoW. (iii) The other reminder is that Other continues to be the second largest region, after Asia, and we don’t know the Other is outside of the major regions Asia, Europe, Middle East, US Gulf Coast and West Africa. 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 Aug 11 that was posted on Bloomberg at 9am MT on Aug 12.

Vortexa floating storage by region

Figure 60: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted		Recent Peak	
Region	Aug 18/23	Aug 11/23	WoW	Aug 11/23	June 23/23	Aug 18 vs June 23	Aug 18 vs June 23
Asia	42.39	56.25	-13.86	50.10	69.43	-27.04	
Europe	8.11	8.92	-0.81	6.63	6.52	1.59	
Middle East	8.75	5.56	3.19	6.86	9.03	-0.28	
West Africa	7.64	5.82	1.82	6.99	3.72	3.92	
US Gulf Coast	0.79	0.79	0.00	0.79	1.23	-0.44	
Other	27.64	32.89	-5.25	31.56	37.09	-9.45	
Global Total	95.32	110.23	-14.91	102.93	127.02	-31.70	

Vortexa crude oil floating storage posted on Bloomberg 9am MT on Aug 19

Source: Vortexa, Bloomberg

Source: Bloomberg, Vortexa

Oil: BNEF – global oil and product stocks surplus widened WoW to 56.8 mmb

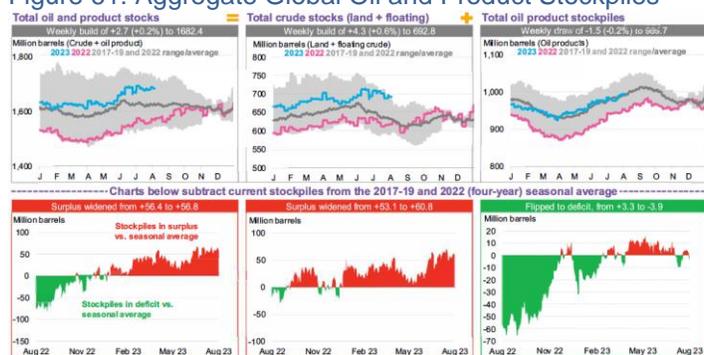
Please note that the BloombergNEF global oil and products stocks estimate are for the week ending August 4, which is a week earlier than the EIA US oil inventory data that is for the

Global oil and product stocks

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week ending August 11. So, the BloombergNEF global oil stocks data won't include the US crude oil inventory draw of -5.9 mmb for the week ending August 11. On Monday, BloombergNEF posted its "Oil Price Indicators" weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022, and other times using a five-year average 2016-2019 + 2022. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products surplus widened from 56.4 mmb to 56.8 mmb for the week ending August, widening the surplus by 2.4 mmb to 56.8 mmb against the four-year average (2017-2019 + 2022). (iii) Total crude inventories (incl. floating) increased by +4.3 mmb WoW to 692.8 mmb, widening the surplus from +53.1 mmb to +60.8 mmb against the four-year average (2017-2019 + 2022). (iv) Land crude oil inventories increased by +5.3 mmb WoW to 586.5 mmb, narrowing the deficit to -3.8 mmb against the five-year average (2016-2019 + 2022). (v) Floating oil inventories decreased by 2.9 mmb, narrowing the surplus from 48 to 39.6 mmb against the five-year average (2016-2019 + 2022). (vi) Total product stocks were down by -1.5 mmb WoW to 989.7 mmb, flipping the surplus to a deficit of -3.9 mmb against the 4-year average (2017-2019 + 2022) for the August 4 week. The gas, oil, and middle distillate stocks decreased by -2.3 mmb WoW to 148.1 mmb/d, with the deficit against the four-year average widening to -22.2 mmb. Jet fuel consumption by international departures for the week of August 21 is set to decrease by +4,200 b/d WoW, while consumption by domestic passenger departures is forecast to increase by +6,700 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 61: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

Oil: Bloomberg Oil Demand Monitor “Flying Set for Seasonal Dip; China Stresses”

We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. With the summer holidays coming to an end in North America and Europe, the seasonal decline in demand for air travel and jet fuel begins. China’s economy continues to show signs of weakness, causing uncertainty about the country’s fuel usage for the remainder of 2023. Although the China’s refiners increased throughput to a three-month peak in July, crude oil imports dropped to the lowest in six months due to a subdued economic rebound after Covid, which has also been impacting energy demand. This has currently restrained the oil futures price surge observed since late June. Analysts from Citibank commented “Chinese demand growth has been exaggerated

Bloomberg oil demand monitor

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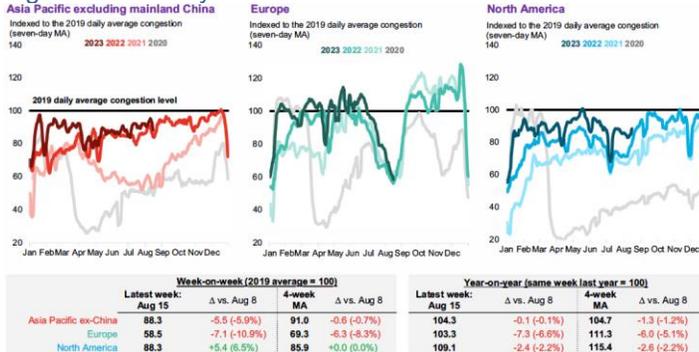
substantially, and shorting crude oil this coming winter and into 2024 “makes sense” given the likelihood of soft demand and robust supply”. Jet fuel usage has played a key role in driving oil demand growth this year, with a surge of post-pandemic air-travel demand. AEG Aviation commented “Global capacity has fallen this week by half a million seats to just over 116 million; Capacity will continue to decline in line with seasonal trends in the coming weeks, averaging almost 114 million a week over the next three months. Globally, seat capacity was 1.5% behind the same week in 2019” The latest figures imply that US jet fuel demand dipped to a one month low, but continues to remain at a seasonal post-pandemic high. Commercial airline flights at the start of this week were ~23% higher YoY, and ~7.1% above 2019 levels (pre-Covid), according to a 7-day average tracked by Flightradar24. As of Monday morning, road congestion was above pre-pandemic levels in only 1 of the 13 major global cities tracked by TomTom mobility data, although China’s traffic continuing to remain strong in major cities following the huge initial recovery seen after the country’s zero-Covid policy was lifted. Refinery utilization as of August 11 was up +0.4% MoM to 94.7% and also up +1.2% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Oil: TomTom city road congestion – NA increases, while EU and Asia Pacific decrease

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 the week ending August 15, North American city road congestion levels increase by +6.5% WoW, while European and Asia Pacific (ex-China) city level congestion level decreased -10.9% and -5.9% WoW, respectively. Note these are indicators of road congestion at the city level and tracks the major cities in each region. So, in theory, we would expect to see seasonal declines in July and Aug, but the start of a return back sometime in Aug. City traffic levels in Europe, North America, and Asia Pacific (ex-China) traffic are -41.5%, -11.7% and -11.7% below the 2019 average and are +3.3%, +9.1% and +4.3% YoY, respectively. City traffic in Europe continues to drop significantly but is inline with its historical trend. NA and Asia Pacific (ex-China) have fluctuated over the last few weeks, but overall remain relatively unchanged throughout July and to midway through August. It is worth noting that TomTom data on city road congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Global city road congestion

Figure 62 Mobility Indicators



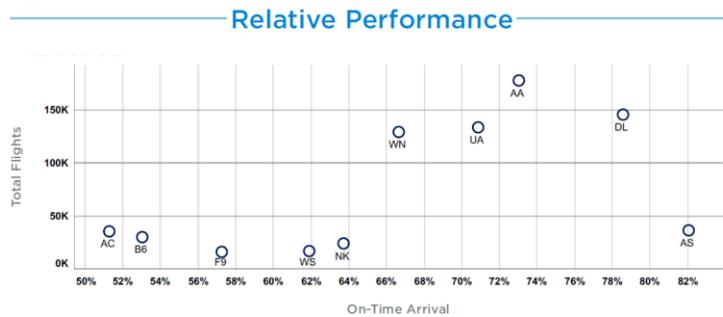
Source: BloombergNEF's calculation based on TomTom data. Note: Data up to August 15, 2023. Δ = change, MA = moving average.
Source: BloombergNEF

Oil: Cirium Global and North American airlines on-time performance

Last week, Cirium released its “*The Monthly On-Time Performance Report – July 2023*” [\[LINK\]](#), which is about airline on-time performance around the world and by region. (i) Global. Cirium wrote “*LATAM Airlines (LA) switched positions with Avianca (AV) this month with an OTP of 85.30% and 84.67% respectively. Saudia (SV) took the third position among the top performing global airlines with an OTP of 83.76%.*” The rest of the top 10 were JAL #4, Qatar Airways #5, ANA #6, Iberia #7, Aeromexico #8, Delta #9, and Emirates #10. (ii) North America. Cirium wrote “*Alaska Airlines (AS) for the second month in a row led North American carriers with an OTP of 82.03% over Delta Air Lines (DL) with an OTP of 78.55%. American Airlines (AA) took the third position with an OTP of 73.01%.*” The rest of the top 10 were United #4, Southwest #5, Spirit #6, WestJet #7, Frontier #8, JetBlue and Air Canada tied at #9. Note the huge difference in arrival on-time by Alaska at 82% of flights vs WestJet at 62% and Air Canada at 51%. Our Supplemental Documents package includes excerpts from the Cirium report.

Airline on-time performance

Figure 63: North America Airlines Relative On-Time Arrivals



Source: Cirium

Oil & Natural Gas: California refineries in path of Tropical Storm Hilary today

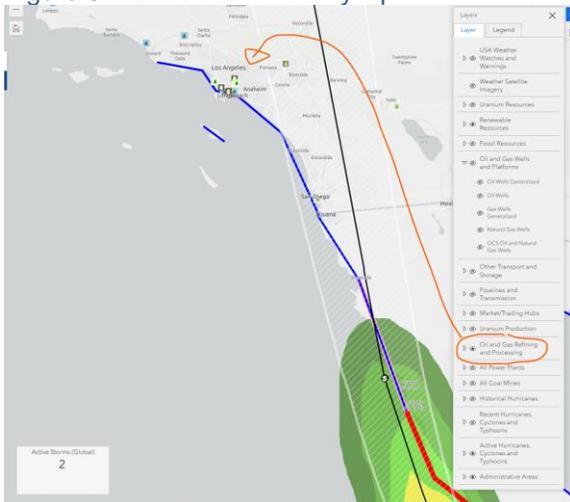
The NHC’s 3am MT update this morning shows Hurricane Hilary expected to be down to Tropical Storm strength when it hits Southern California this afternoon. Note that it is an very fast moving hurricane at 21 mph. if it keeps this speed, the good news will be that the storm

Hilary to hit California today

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won't be lingering too long and dumping too much rain. Most damage tends to come from flooding rather than wind strength. Earlier this morning, we tweeted [LINK](#) "726,500 of California refinery capacity still expected to be in impact area when Hilary hits with Tropical Storm strength later today. See 📍 @EIA has great mapping system showing energy infrastructure in hurricane paths. here is 4am MT look. #OOTT." Our tweet included the EIA's refinery capacity as of Jan 1, 2023 for California that highlighted there is 726,500 b/d of refinery capacity in the Long Beach/LA region that is in the Tropical Storm impact area. California has 1,827,400 b/d of total refinery capacity. Our tweet also included the EIA's live storm mapping that shows the oil and gas refineries/processing in the path of Hilary. Yesterday morning, we tweeted [LINK](#) "Hurricane Hilary is forecast by @NHC_Atlantic to hit Southern California at Tropical Storm strength. Would be the first Tropical Storm to hit California since 1939. But Hilary expected to be a big hit to the Baja in Mexico. Hope everyone can be safe!" Hilary will be the first Tropical Storm to hit California since 1939. What isn't clear is how these refineries are set up to prepare for potential flooding vs their Gulf Coast counterparts that must have flooding risk as a key set up design. Below is the refineries in Hilary's path as of 4am MT today and EIA's California refinery capacity as of Jan 1, 2023.

Figure 64: Refineries in Hilary's path



Source: NOAA

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Figure 65: EIA refinery capacity per calendar day (left) and per operating day at Jan 1, 2023

California	1,734,371	6,000	1,827,400	8,000	1,033,256	407,600
Chevron USA Inc						
El Segundo	269,000	0	290,500	0	169,100	76,700
Richmond	245,271	0	257,200	0	123,456	0
Kern Oil & Refining Co						
Bakersfield	26,000	0	27,000	0	0	0
Lunday Thagard Co						
South Gate	8,500	0	10,000	0	5,000	0
Martinez Refining Co LLC						
Martinez	156,400	0	157,000	0	101,000	26,800
Phillips 66 Company						
Rodeo	114,200	6,000	120,000	8,000	93,200	51,000
Wilmington	139,000	0	147,000	0	83,400	53,200
San Joaquin Refining Co Inc						
Bakersfield	15,000	0	25,000	0	14,300	0
Talley Asphalt Products Inc						
Kern	1,700	0	2,000	0	0	0
Tesoro Refining & Marketing Co						
Carson	363,000	0	382,000	0	205,000	109,100

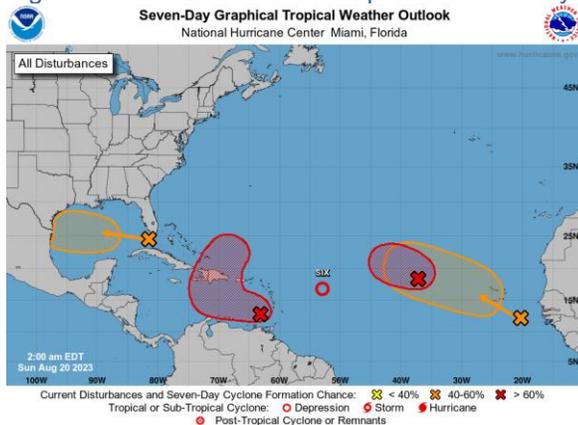
Source: EIA

Oil & Natural Gas: Storm potential to move into GoM this week

Earlier this morning, we tweeted [\[LINK\]](#) "50% chance for cyclone formation to move into GoM and Gulf Coast major #Oil #NatGas #LNG production and infrastructure. @NHC_Atlantic 7-day outlook as of 2am ET update. #OOTT." At 2am ET, NOAA sees a 50% chance cyclone formation into the GoM and wrote "An area of disturbed weather located over the Straits of Florida and the southern Florida peninsula will move into the Gulf of Mexico later today, where a broad area of low pressure is expected to form early this week. Some slow development of this system could occur thereafter as it moves westward at about 15 to 20 mph, and a tropical depression could form as it approaches the western Gulf of Mexico coastline by Tuesday. * Formation chance through 48 hours...low...30 percent. * Formation chance through 7 days...medium...50 percent." Below are the two NOAA NHC maps with our tweet this morning.

Storm potential into GoM

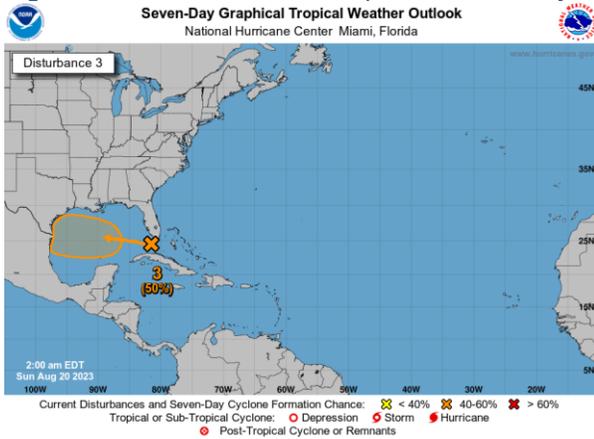
Figure 66: NOAA storm development next 7-days



Source: NOAA

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Figure 67: NOAA storm development next 7-days

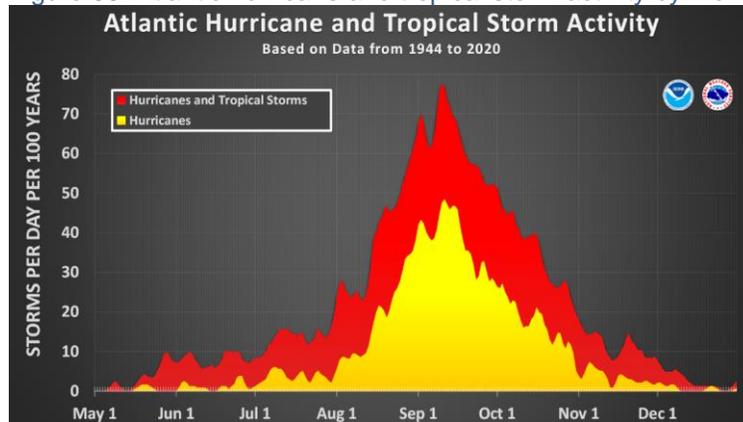


Source: NOAA

90% of Atlantic hurricanes are after Aug 1, peak is mid-Sept

No two hurricane seasons are identical and there will always be items that make a hurricane season not the norm. But, last week's (Aug 6, 2023) Energy Tidbits memo reminded that 90% of Atlantic hurricanes come after Aug 1, and the peak is normally mid-Sept. We reminded that July and early Aug may well be the hottest time of the year, but 90% of Atlantic hurricanes typically come after Aug 1. So August normally marks the start of the ramp up of hurricane season with high hurricane activity typically from mid-Aug thru mid-Oct with a normal peak in mid-Sept. Below is NOAA's graph showing the distribution of Atlantic hurricanes and tropical storms based on data from 1944 to 2020. [\[LINK\]](#)

Figure 68: Atlantic hurricane and tropical storm activity by month



Source: NOAA

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Oil & Natural Gas: Alberta not much changed, BC declares state of emergency

Alberta wildfires continue to decline but BC wildfires were up again this week. As of 7pm MT last night, there were 84 Alberta wildfires including only 1 Out of Control, which compares to a week ago at 87 Alberta wildfires included 1 Out of Control. As of 7pm MT last night, there were 384 BC wildfires including 162 Out of Control, which compares to a week ago at 378 BC wildfires included 172 Out of Control.

BC and Alberta Wildfires

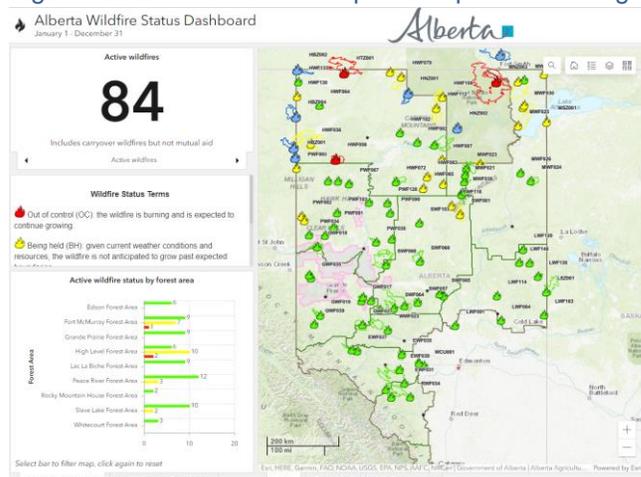
On Friday, BC declared State of Emergency & Travel Restrictions

It was a brutal week in BC wildfires that led to major evacuations in many cities and towns. We have multiple friends who have been evacuated and the challenges is that there are many highway closures preventing people from getting to where they might want to be to try to wait out the wildfires. On Friday, BC announced [LINK](#) "On August 18, 2023, the Province of BC declared a Provincial State of Emergency to support ongoing response and recovery efforts caused by wildfire. This declaration allows the Province to enact Emergency Orders, including travel restrictions to specific areas as needed. Travel Restrictions. On August 19, 2023, the Province of BC issued an Emergency Order restricting non-essential use of temporary accommodations, including hotels, motels, inns, bed and breakfasts, hostels, RV parks, and campgrounds, in these Okanagan cities: Kelowna & West Kelowna. Kamloops. Oliver. Osoyoos. Penticton. Vernon"

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.

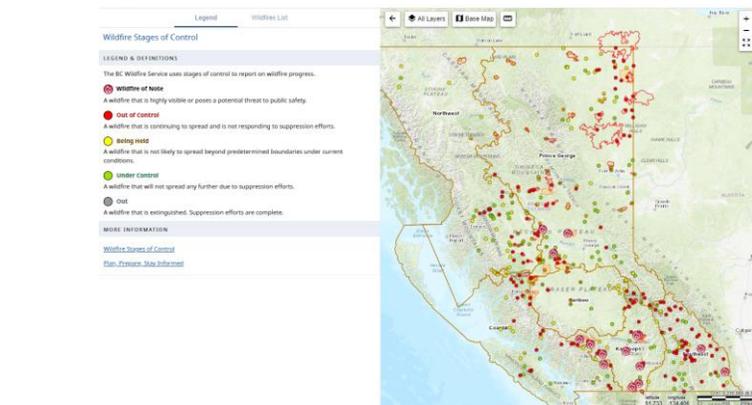
Figure 69: Alberta wildfire map as of 7pm MT on Aug 19



Source: Alberta Wildfire Status Dashboard

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Figure 70: BC wildfire map as of 7pm MT on Aug 19



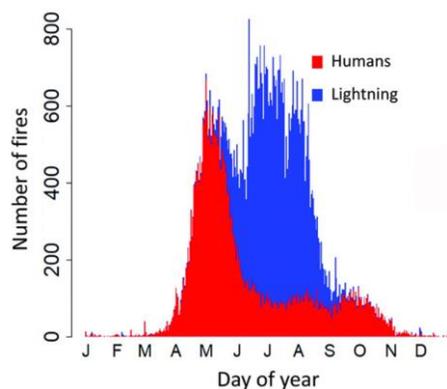
Source: BC Wildfire Service

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

Unfortunately, we remind that this is still 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.

Wildfire peak is normally July Aug

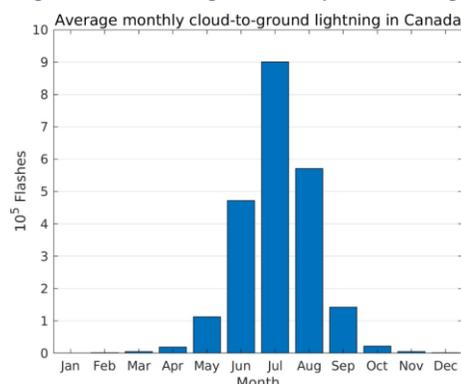
Figure 71: Canada Wildfires Distribution Over Year



Source: Wildfire Today

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Figure 72: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Energy Transition: Suncor's “disproportionate emphasis” on the energy transition

We were a little surprised that Suncor CEO Rich Kruger's comments on the Q2 call on Tuesday didn't seem to get a lot of rage from the climate change side. It will be interesting to see how much criticism he gets from investors as he was very clear in his message that Suncor has wrongly had a disproportionate emphasis on the energy transition. Prior to that he was clear that the Suncor strategic framework was insufficient for them if they want to wind, and then he linked in his energy transition views. It was a clear message. On Thursday, we tweeted [\[LINK\]](#) “Refreshing! “.. our current strategic framework is not or is insufficient in terms of what it takes to win. The lack of emphasis on today's business drivers & while important, we have a bit of a disproportionate emphasis on the longer-term #EnergyTransition” \$SU CEO Kruger #OOTT.” We listened to Kruger's comments and we made a transcript of his comments “Another area we spent time in during the quarter was a strategy re-examination. In particular, we've taken a, we've started a comprehensive re-look at our strategies and our articulated objectives. Where we stand is we judge that our current strategic framework is not or is insufficient in terms of what it takes to win. The lack of emphasis on today's business drivers and while important, we have a bit of a disproportionate emphasis on the longer-term energy transition. Today, we win by creating value through our large integrated asset base underpinned by oil sands. Discussions have occurred with our Board of Directors who are supportive of our revised direction and tone. And I would just leave this with more to come, but you can expect a sharper, clearer, more tangible articulation of how Suncor plans to win.”

Suncor CEO on energy transition

Energy Transition – IEA sees renewable taking care of growth in electricity demand

On Tuesday, the IEA tweeted [\[LINK\]](#) “Renewables are on track to meet all the growth in global electricity demand over the next two years. And by 2024, renewables are set to account for over a third of the world's power generation. More in our latest Electricity Market Report 🙌 [\[LINK\]](#).” We reviewed their Electricity Market report, which covers 2023 and 2024. The IEA wrote “Despite reduced hydropower generation due to droughts in many regions, global renewable generation grew in 2022 by 7.8%, its highest growth rate over the last

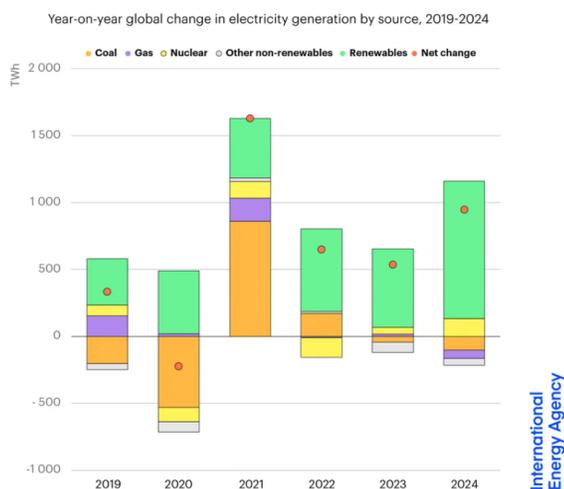
IEA on renewable energy

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30 years. We expect growth of slightly less than 7% in 2023, as hydropower is reduced in some regions by recurring droughts. Renewable electricity generation should then grow by 11% in 2024, driven by continued wind and solar capacity expansions and assumed hydropower recovery in various regions. By 2024, the third for the first time in history. With demand growth easing in 2023, the incremental growth in renewable generation alone is expected to cover all the additional demand increase, and will do the same in 2024 even as demand growth is expected to accelerate again.” Based on their report forecast, their tweet is accurate – renewables are set to meet the GROWTH in global electricity demand over the next two years. And their forecast assumes renewables accelerate at a faster pace their share of total electricity. Renewables take care of the growth but aren’t eating very quickly on the fossil fuels base share. The EIA forecasts renewables share of total global electricity: 2021: 30.07%. 2022: 31.67%. 2023: 33.22%. 2024: 35.78%. Our Supplemental Documents package includes excerpts from the IEA Electricity Market report.

Figure 73: Renewables set to meet all the growth in global electricity demand

Renewables are set to meet all the growth in global electricity demand over the next 2 years



Source: IEA

Capital Markets: Jackson Hole “Structural Shifts in the Global Economy”

It will be a big week for global economic themes as all the major global central bankers, finance ministers, etc meet in Jackson Hole on Aug 24-26 at the 2023 Economic Policy Symposium. The symposium title is “Structural Shifts in the Global Economy”. Everyone will be looking towards Fed Chair Powell’s speech on Aug 25 but there will be much more. And clearly China will be a big theme.

Jackson Hole
Aug 24-26

09/07/22: A must read Deutsche Bank CEO keynote speech

When we saw the title of Jackson Hole “Structural Shifts in the Global Economy”, we couldn’t help think of one of the best short speeches we have seen in the past couple years – the Sept 7, 2022 Deutsche Bank CEO speech. CEO Sewing warned on this

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global structural shift. Here is what we wrote in our Sept 11, 2022 Energy Tidbits memo. *“A must read Deutsche Bank CEO keynote speech. We weren’t certain where to put this item, but we believe the Deutsche Bank CEO Christian Sewing views of the world, if correct, will be positive for oil and natural gas thru the 2020s. The headlines on his Wednesday comments were all about his warning a recession is coming for Germany. (i) We tweeted [\[LINK\]](#) “1/2. Must Read @DeutscheBank CEO. RUS/UKR “destroyed a number of certainties on which we build our economic system over the past decades”. NEXT UP, “awkward question on how to deal with China” in light of increasing CN/US isolation/tension, reducing China dependency will .. #OOTT”, and [\[LINK\]](#) “2/2..”require a change no less fundamental than decoupling from RUS energy”. Globalization gone, labor a global bottleneck. Extremely expensive #Electricity #NatGas s a threat to economy. the longer inflation remains high the higher the potential for social unrest, etc. #OOTT.” (ii) As you can see from our tweets, there are many thoughts. We tend to agree with a lot of what he is saying unless there is a social revolt to say enough is enough. (iii) The real theme of his theme of his speech is excellent – the world has changed for the foreseeable future. The norms of the past decades are gone. Globalization gone. China dependency must be reduced. Global value and supply chains disrupted. Workforce a worldwide bottleneck. Electricity/natural gas will be expensive in EU for a long time.. The truth is that 30 years of presumed calm will now be followed by a period of heightened volatility with economic uncertainty, regular crises and geopolitical conflicts that are also likely to drag on for decades. Trouble spots are not cut off from the rest of the world; they impact other regions in a number of ways. (iv) And he doesn’t say much about it, but says “But the longer inflation remains high, the greater the strain and the higher the potential for social conflict.” We still wonder about social conflict and if there will be Arab Spring type revolt within Germany and other European countries to how people feel they are getting hit by the Russian sanctions. (v) His views are relevant to longer term capital allocation. It’s not just Germany has a terrible economic outlook. He raises issues like we have noted about China is the next Russia type target even if they don’t invade Taiwan. Germany affects more than itself. And think about it, if Germany can hold the line on Russian sanctions on energy, then it probably says most of Europe can hold the line other than a handful like Hungary, etc. (vi) There is much more in this short viewpoint. Our Supplemental Documents package includes the CEO viewpoint.”*

Demographics: China’s fertility rate crashed in 2022 to 1.09

Unless China starts to hold back information on births and deaths, China’s population is going to move to faster declines. (I) Our Jan 22, 2023 Energy Tidbits memo highlighted the first decline in China’s population in 60 years. We then wrote *“Demographic impacts don’t surprise overnight, but demographics are predictive. And one of the key demographic trends for the next 30 years is China’s aging population. And it looks lie Covid caused an abrupt pivot to a declining population in 2022. And it may be down the road, but China, like any aging population will eventually face a Japan problem. On Monday, we tweeted [\[LINK\]](#) “China population shrinks by 850,000 to 1.4118 b, 1st decline in 60 yrs. Seems Covid impact with deaths and also lower birth rates. But reminds of long-term challenge for China - an aging population ie. a Japan demographic problem in 10 or 20 years. Thx @sunyue_luna. #OOTT.”* (ii) But the picture looks even worse for 2023 and 2024. On Tuesday, Reuters reported

China’s crashing fertility rate

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“China's fertility rate drops to record low 1.09 in 2022- state media” [\[LINK\]](#). “China's fertility rate is estimated to have dropped to a record low of 1.09 in 2022, the National Business Daily said on Tuesday, a figure likely to rattle authorities as they try to boost the country's declining number of new births. The state-backed Daily said the figure from China's Population and Development Research Center put it as having the lowest fertility level among countries with a population of more than 100 million. China's fertility rate is already one of the world's lowest alongside South Korea, Taiwan, Hong Kong and Singapore.” We don't know what fertility rate China needs but most on use a general fertility rate of 2.1 as the number needed to keep populations flat. China's population declined in 2022 for the first time in 60 years and that decline should accelerate unless there is a huge increase in fertility. And with Xi having a range of China economic challenges, we expect this long term economic issue is at the back of line for Xi's focus in 2023 and 2024. Our Supplemental Documents package includes the Reuters report.

Russia's shrinking population was Putin's greatest concern pre-Ukraine

When we see the crashing fertility rate in China and recognize that China has big near-term economic challenges, we can't help believe that China will, over the next few years, worry that they waited too long before trying to prioritize turning around a shrinking population. And it reminds us of how Putin finally woke up to this problem for Russia a couple years ago. Here is an item from our Dec 26, 2021 Energy Tidbits memo. *“Putin's big press conference comments on Russia's population reminded us of an item we forgot to include in our Dec 5, 2021 Energy Tidbits – Putin's greatest concern is the shrinking Russia population. This week, Putin noted “There are issues that cannot but cause concern, including life expectancy, which has slightly decreased from 71.5 to 70.1 years.” The item we forgot to include was Putin's comments at the “Russia Calling! Investment Forum” on Nov 30. [\[LINK\]](#). Putin was asked “What keeps you awake at night?” In the sense, “What is your greatest concern?”. Putin responds “We have domestic issues typical of Russia, primarily demographic problems. We had two natural declines in our demographic development: during World War II or the Great Patriotic War, as we call it, in 1943–1944, and in the early and middle 1990s after the collapse of the Soviet Union. There was an equal drop in the birth rate. It was the lowest in 1999 – I believe a little over 1,200,000. In 2006, we already had almost two million births – more than 1,900,000. This problem has acquired a systemic and economic character due to the shortage of workforce in the labour market. We have a little over 80 million there and our losses amount to 1.1–1.2 percent a year. In this context, demographics is one of our main problems both for humanitarian and economic considerations, and because we need to strengthen our statehood as well. I will not enumerate all the measures and instruments we are using and intend to continue using in the future in order to tackle this problem. In general, we managed to get things moving in the recent past. Overall, we understand what we can do and know how to do it.”*

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

For new followers to our Twitter, we are trying to tweet on breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. Our Twitter handle is @Energy_Tidbits and can be followed at [\[LINK\]](#). We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos

**@Energy_Tidbits
on Twitter**

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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

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

Look for energy items on LinkedIn

Misc Facts and Figures

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

Huge day for our Cdn PGA stars today to get into top 30 FedEx

It's a huge day today for our Cdn PGA stars with the 4th round of the BMW Championship. The key is can they make the top 30 who make it into the Tour Championship this week. While it is impossible for them to be the season winner of the Tour Championship and FedEx cup with its \$18 million first prize. But being one of the top 30 to play next week guarantees them a minimum of \$500,000. As well as other perks like entry into the Masters, US Open and the British Open, and also into a number of the exclusive invitational only golf tournaments like the Arnold Palmer Invitational, RBC Heritage, The Players Championship, Charles Schwab Challenge, The Genesis Invitational, and the Memorial Tournament. Going into the final round, the projected standings are Corey Connors at 18, Nick Taylor at 24, Adam Svensson at 35, and Adam Hadwin at 43.

Former Toronto Maple Leafs Bob Baun passed away at age of 86

Former Toronto Maple Leafs right defenseman Bob Baun passed away this week at the age of 86. He was one of the three defensemen that played on the Leafs Stanley Cup wins (the last Cup wins for the Leafs) along with right defenseman Tim Horton and left defenseman Allan Stanley. Left defenseman Carl Brewer didn't play on the 67 winners. Baun is most famous for coming back from a fracture in his foot, having it frozen and taped (that is what hockey players did in the 60s and 70s) and then coming back to score an OT winner in game 6 against the Detroit Red Wings to tie the series at 3-3. The other thing Baun is noted for is that he always spoke the kids after practice or games and signed autographs for every kid there.

Great line from Jack Ryan season 2

We were reminded of being in the international oil and gas business in the late 80s and dealing in some sketchier countries. Don't forget in that era, US and Cdn oil and gas companies were aggressively looking at international oil and gas as North American oil and gas was considered to have been more of less mature. We can remember going to some of these countries and dealing with some sketchy people and some sketchy agents. It wasn't like North American oil and gas deals that were relationship driven and done with handshakes. In Jack Ryan Season 2, Jack Ryan is

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worried about getting things done as they didn't have any established relationships. One of the other characters tells him not to worry and that *"trust takes years to build or moments to purchase"*. It reminded of trying to get international oil and gas deals done in the late 80s – money talks.

Today is National "Bacon Lover's" Day

Today is National "Bacon Lover's" Day but, for those who have forgotten to get their bacon fix today, International Bacon Day is on Sept 2. Here are a few tidbits from Foodimentary. [\[LINK\]](#). *"Bacon is one of the oldest processed meats in history. The Chinese began salting pork bellies as early as 1500 B.C. More than half of all homes (53%) keep bacon on hand at all times. Pregnant women should eat bacon. Choline, which is found in bacon, helps fetal brain development. Each year in the US more than 1.7 billion lbs. of bacon are consumed. Bacon is said to cure hangovers."* One fact that Foodimentary didn't include is turkey bacon is not bacon!

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