

Energy Tidbits

August 13, 2023

Produced by: Dan Tsubouchi

Can or Will Anyone Stop Iran Adding ~600,000 b/d to Oil Markets in Next Few Months?

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. Iran to hit 3.5 mmb/d in Sept vs 2.83 mmb/d in July, it's hard to see if anyone can or will stop Iran adding a lot of oil to world oil markets in the next few months. ([Click here](#))
2. Potential strike action at Chevron/Woodside LNG in NW Australia could impact ~10% of global LNG trade. ([Click here](#))
3. IEA's Oil Market Report did not change its 2024 oil demand at 103.2 mmb/d, +1.0 mmb/d YoY and no sign for peak oil demand. ([Click here](#))
4. Saudi Aramco CEO reminds global oil depletion is 5% to 7%. ([Click here](#))
5. Tourmaline's huge returns at its Aitken 6-well pad remind why the Montney is likely the best natural gas play in North America, if not the world. ([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: +29 bcf build in US gas storage; now 535 bcf YoY surplus

US gas storage 535 bcf YoY surplus

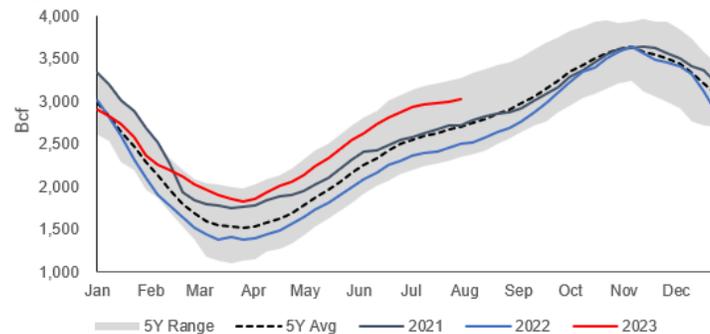
For the week of August 4, the EIA reported a +29 bcf build (just above the expectations of a +24 bcf build), and a decrease compared to the +44 bcf build reported for the week of August 5 last year. This is up from last week’s build of +14 bcf, and down vs the 5-year average build of +43 bcf. Total storage is now 3.030 tcf, representing a surplus of +535 bcf YoY compared to a surplus of +550 bcf last week. Total storage is +305 bcf above the 5-year average, up from the +225 bcf surplus last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage report [\[LINK\]](#).

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Year ago (08/04/22)		5-year average (2018-22)	
	08/04/23	07/28/23	net change	implied flow	Bcf	% change	Bcf	% change
East	700	680	20	20	562	24.6	622	12.5
Midwest	793	775	18	18	660	20.2	706	12.3
Mountain	196	191	5	5	148	32.4	169	16.0
Pacific	233	230	3	3	252	-7.5	264	-11.7
South Central	1,108	1,124	-16	-16	873	26.9	963	15.1
Salt	284	297	-13	-13	193	47.2	240	18.3
Nonsalt	824	828	-4	-4	680	21.2	723	14.0
Total	3,030	3,001	29	29	2,495	21.4	2,725	11.2

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



Source: EIA, SAF

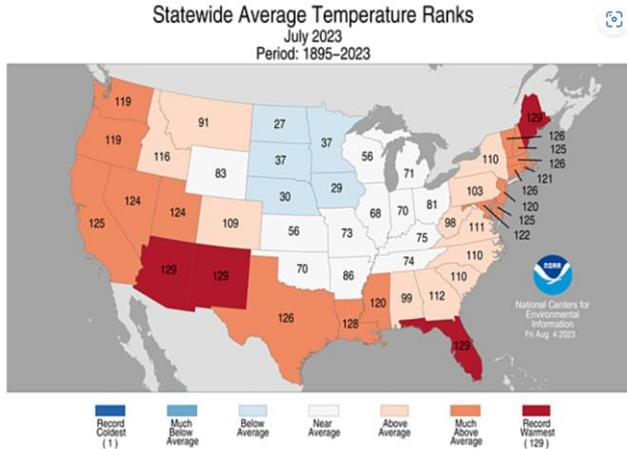
Natural Gas: NOAA, July was 11th hottest in last 129 years

NOAA July US climate recap

There was a goof reinforcement in July that hot summer temperatures don't have anywhere near the impact on natural gas prices as cold winter temperature. On Thursday, NOAA posted its National Climate Recap for July [\[LINK\]](#) and if not for the Plains, it would have been the hottest July on record. But even still, July 2023 was the 11th hottest in the last 129 years. It was extremely hot along the entire east coast, gulf coast, SW and west coast with the hottest July temperatures on record in Maine, Florida, New Mexico and Arizona. And many states in the top 5 hottest July temperatures on record including California, Texas, Louisiana, and five other states. It was well below normal temperatures in North and South Dakota, Nebraska, Iowa and Minnesota. And averaged temperatures in a number of Great Lake states. Overall, it was hot at the 11th hottest July on record. Below is NOAA’s by state ranking for May temperatures.

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Figure 3: NOAA Statewide Average Temperature Ranks – July 2023

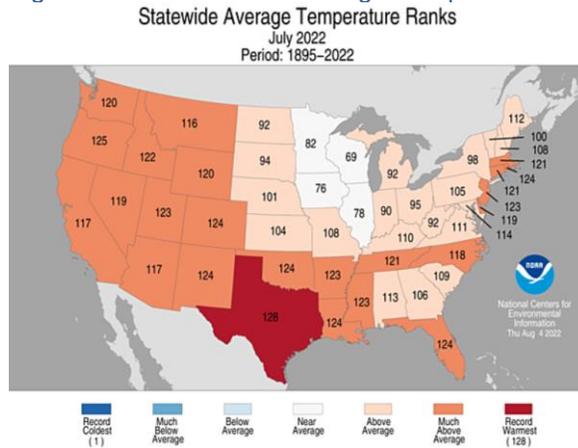


Source: NOAA

July was 3rd hottest in the last 128 years in US

As hot as it was in July 2023, it was still, on average, not as hot as July 2022, which was the then 3rd hottest in the last 128 years. Our Aug 14, 2022 Energy Tidbits wrote “On Tuesday, NOAA posted its recap of US weather for July [LINK](#) that showed July 2022 ranked 3rd hottest in the last 18 years. Temperatures were above average in almost every state in the Lower 48. Below is the NOAA’s statewide average temperature map for July 2022.”

Figure 4: US Statewide Average Temperature Ranks July 2022



Source: NOAA

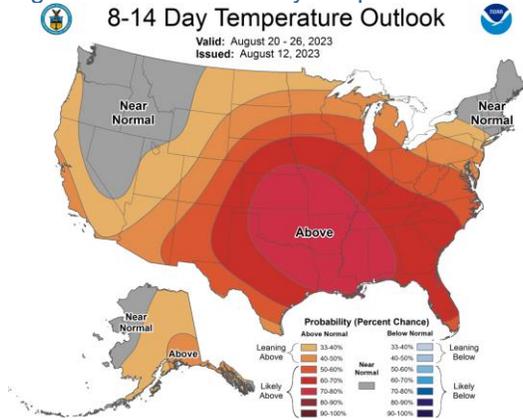
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Natural Gas: NOAA 8-14 day temperature outlook stays supportive to gas price tone

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 18-26. Warmer than normal temperatures expected thru most of the US. Should be supportive for US #NatGas. #OOTT." Yesterday's NOAA 6-10 day [\[LINK\]](#) and 8-14 day outlook [\[LINK\]](#) is valid for Aug 18-26.

NOAA 8-14 day outlook

Figure 5: NOAA 8-14 day temperature outlook Aug 20-26



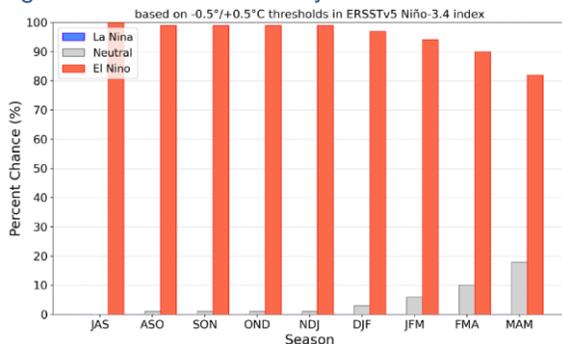
Source: NOAA

Natural Gas: NOAA sees El Nino conditions continuing thru hurricane season

One of the big general news stories has been the waters have been extremely hot in the Atlantic and the Gulf of Mexico and that is bringing fear of an active hurricane season. Plus, last week's (Aug 6, 2023) Energy Tidbits memo reminded that 90% of Atlantic hurricanes come after Aug 1, and that the most active time for hurricanes is mid-Aug (now) thru mid-Oct with the normal peak in mid-Sept. We are just now starting the peak season. On Thursday, NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [\[LINK\]](#). NOAA continues to forecast El Nino conditions in the peak Atlantic hurricane season in Aug/Sept/Oct. NOAA provided a probabilistic forecast for meeting El Nino thresholds for ASO at 99%.

El Nino conditions thru hurricane season

Figure 6: El Nino Probability



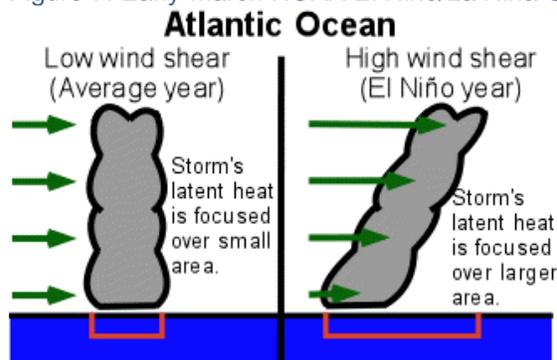
Source: NOAA

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El Nino years tend to be low Atlantic hurricane years

It looks like this year will not be one of the normal years for hurricane activity with El Nino conditions. But given the record warm waters in the Atlantic and Gulf of Mexico, it may well be that the El Nino conditions are still stopping some tropical storm and hurricane development but just can't do as much given the record warm waters. Our prior Energy Tidbits over the years/decades noted how El Nino conditions typically work to suppress tropical storm development. For years, we have written "*The hurricane forecasters note that warm El Nino years tend to have less hurricane activity in the Atlantic and Gulf of Mexico, but typically more hurricane activity in the Pacific. The primary explanation for the decline in hurricane frequency during El Niño years is due to the increased wind shear in the environment. It is commonly explained that "In El Niño years, the wind patterns are aligned in such a way that the vertical wind shear is increased over the Caribbean and Atlantic. The increased wind shear helps to prevent tropical disturbances from developing into hurricanes. In the eastern Pacific, the wind patterns are altered in such a way to reduce the wind shear in the atmosphere, contributing to more storms"*. This is the common explanation, and we referenced the University of Illinois's description because they also had a good simple graphic (see below). We double checked the link this week, and it is still active after more than a decade, the University of Illinois explanation is found at: [\[LINK\]](#)

Figure 7: Early-March NOAA El Nino/La Nina Outlook



Natural Gas: It's early but NOAA sees El Nino conditions thru the winter

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.

El Nino conditions in winter 2023/24

Natural Gas: EIA increases US gas production for 2023, even moreso in 2024

As expected, we are seeing the EIA increase its forecast for US natural gas production in 2023 and in 2024 in large part driven by the EIA's increasing, as expected, its forecast for oil

EIA US natural gas production forecast

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production. The EIA’s actuals for oil production have been running head of the forecast and we have been expecting to see an increase to H1/23 ie. a bit of a catch up adjustment. And, given the big increases in US oil production are oil plays that produce associated natural gas and NGLs, any increase in US oil production lead to increases in associated natural gas production from these oil plays. (i) On Tuesday, the EIA released its monthly Short Term Energy Outlook for August 2023 [LINK](#). The EIA increased its 2023 US natural gas production to 103.0 bcf/d (was 102.35), which, on a full year average basis, gives solid YoY growth of +4.90 bcf/d from 2022. The EIA’s increased 2023 forecast increases estimates for every quarter of 2023. The revisions by quarter were Q1/23 +0.14 mmb/d, Q2/23 +0.59 mmb/d, Q3/23 +0.39 mmb/d, and Q4/23 exit +1.39 mmb/d. (ii) The EIA increased its 2024 forecast to 104.10 bcf/d (was 102.40), which, on a full year average basis, is only up marginally vs 2023 forecast of 103.00 bcf/d. The EIA commented *“The Permian Basin has driven the growth in U.S. natural gas production in 2023. Most of the natural gas produced from the Permian Basin is associated natural gas produced from oil wells, meaning producers’ oil-drilling activities in the region determine natural gas production levels. We expect increased oil-drilling activity to continue to drive increased natural gas production in the Permian Basin, although these increases will be offset by some small production declines in other large producing regions.”* (iii) The EIA lowered its HH natural gas price expectations to \$2.58 in 2023 (was \$2.62) and decreased the 2024 expectation to \$3.22 (was \$3.29). The EIA did not comment on the change in HH natural gas prices. (iv) Our Supplemental Documents package includes excerpts from the STEO.

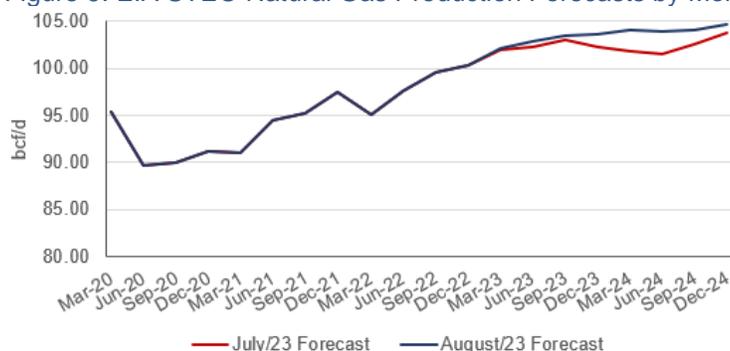
Figure 8: EIA STEO Natural Gas Production Forecasts

bcfd	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Aug-2023	94.60	95.10	97.60	99.50	100.30	98.10	102.10	102.80	103.40	103.60	103.00	104.00	103.90	104.00	104.60	104.10
July-2023	94.60	95.10	97.60	99.50	100.30	98.10	101.96	102.21	103.01	102.21	102.35	101.79	101.53	102.53	103.74	102.40
June-2023	94.60	95.10	97.60	99.50	100.30	98.10	102.00	103.70	103.40	101.90	102.70	102.80	102.80	103.00	103.60	103.00
May-2023	94.51	95.10	97.60	99.50	100.30	98.10	102.10	101.90	99.90	100.40	101.10	100.70	101.10	101.40	101.80	101.20
Apr-2023	94.51	95.10	97.60	99.50	100.20	98.10	101.60	100.50	100.90	100.88	101.20	101.50	101.80	101.80	101.58	
Mar-2023	94.51	95.10	97.60	99.50	100.20	98.08	100.96	100.21	100.56	100.96	100.67	101.37	101.40	101.96	102.04	101.69
Feb-2023	94.57	95.10	97.60	99.50	100.10	98.10	99.90	100.00	100.30	100.90	100.30	101.20	101.60	102.00	101.90	101.70
Jan-2023	94.57	95.10	97.59	99.44	99.87	98.02	100.82	99.87	100.08	100.62	100.34	101.12	101.75	102.72	103.57	102.29
Dec-2022	93.55	95.08	97.58	99.22	100.54	98.11	99.87	99.52	100.50	101.60	100.37					
Nov-2022	93.55	95.08	97.58	99.43	100.11	98.05	99.00	99.42	99.99	100.33	99.68					
Oct-2022	93.55	95.08	97.55	98.48	99.06	97.54	99.19	99.57	99.73	100.00	99.62					
Sep-2022	93.55	94.60	96.87	97.85	98.99	97.08	99.65	100.51	100.59	100.67	100.36					
Aug-2022	93.55	94.60	96.61	97.02	98.09	96.59	98.90	100.13	100.52	100.51	100.02					
Jul-2022	93.55	94.61	95.51	96.88	97.89	96.23	98.40	99.62	100.60	101.25	99.98					
Jun-2022	93.55	94.61	95.48	96.90	98.94	96.50	99.94	101.30	102.33	102.66	101.57					
May-2022	93.55	94.66	95.82	97.17	99.14	96.71	100.25	101.55	102.42	102.42	101.71					
Apr-2022	93.57	95.41	97.01	97.94	99.23	97.41	99.72	100.56	101.41	101.72	100.86					
Mar-2022	93.54	95.69	96.09	96.97	98.00	96.69	96.11	98.75	99.60	100.10	98.64					
Feb-2022	93.57	95.43	95.54	96.26	97.12	96.09	97.11	97.57	98.34	98.84	97.97					

Source: EIA, STEO

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Figure 9: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

Natural Gas: EIA Aug STEO fcasts Apr 1/24 storage 1.904 tcf, +0.245 tcf vs July STEO

Given the strong increase in forecast US gas production, the EIA Aug STEO increased its forecast for storage to end winter 2023/24. (i) The EIA STEO also forecasts US gas storage. Gas storage started the summer 2023 refill season at 1.849 tcf on April 1, 2023, which is +0.448 tcf YoY. For the summer 2023 refill season, the EIA forecasts storage on Nov 1, 2023 at 3.882 tcf, which is +0.313 tcf YoY but basically unchanged vs July STEO of 3.884 tcf. The EIA's increased US natural gas production forecast but also increased its demand forecast. (ii) The increasing US natural gas production has a bigger impact on storage to end winter 2023/24. The EIA forecasts gas storage to end the winter at 1.904 bcf, which would be +0.054 tcf YoY and up big vs July STEO of 1.658 tcf. (iii) The EIA wrote "Net injections of natural gas into storage have exceeded the five-year average by 3% so far this refill season (April 1–October 31), in part due to high natural gas production. The increased surplus of natural gas storage inventories reduced natural gas prices throughout 1H23 compared with 2022. We forecast working natural gas inventories to end the refill season at nearly 3.9 trillion cubic feet (Tcf) which is 7%, or 250 Bcf, higher than the five-year average. We expect storage inventories to remain above the five-year average throughout 2024 as natural gas production remains high and natural gas consumption declines by 2% in 2024 compared with 2023". Our Supplemental Documents package includes excerpts from the STEO.

EIA STEO storage forecast

Natural Gas: Tourmaline's 6-well Aitken Montney pad has huge returns

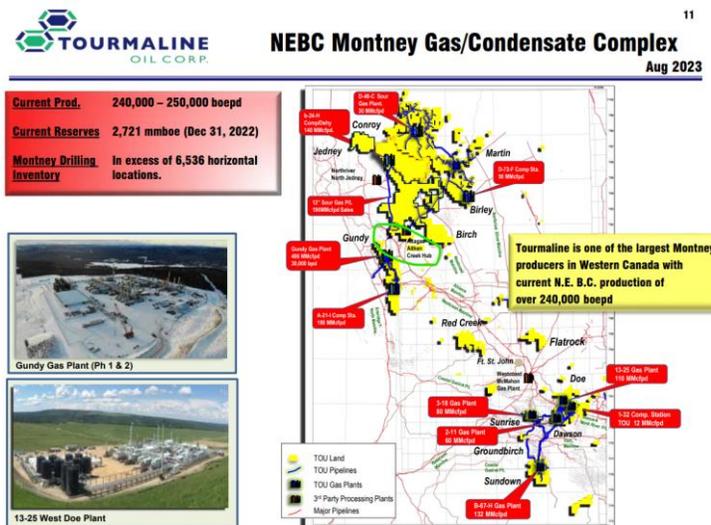
We rarely note specific well results and only do so if there are potential big picture implications beyond the company drilling the wells. And that was the case when we saw Tourmaline's Q2 call last Thursday as their 6-well Aitken Montney pad's huge returns would seem to point to the Montney have much more potential than expected for other Montney players even if the other players Montney are not quite as good as Tourmaline. (i) On Monday, we tweeted [\[LINK\]](#) "Here's why #Montney is likely #1 #NatGas play in CAN/US, maybe in the world! \$TOU Q2 call: 6-well 10b Aitken Creek Montney pad. Drill/complete/onstream in Q4/21, cost \$30.6mm, payout of 3 months, income to date >\$130 mm, forecast IRR is >1,000%. #OOTT." These returns are huge and even if other Montney isn't quite as good, we have to believe other Montney will still be excellent. (ii) Here is what Tourmaline said on the Q2 call. "The b-10-B pad at Aitken underscores the very strong

Tourmaline's huge Montney returns

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economic returns that we realize in the North Montney complex. This was a six-well pad that we drilled, completed and brought on stream very late in the fourth quarter of 2021. Average per well IP 365 from the six wells was 5.3 million cubic feet per day of natural gas and 224 barrels per day of condensate. Estimated average 2P reserves per well bore or 12.6 BCF of gas and 260,000 barrels of condensate. Just looking at the economic investment, total capital for construction, drilling, completions, equipping and pipeline tie-in for the whole pad and all six-well was \$30.6 million. The income we've earned to date on the six-well pad is in excess of \$130 million. And that results in a payout period of only three months and the forecast internal rate of return of the pad is well in excess of 1,000%. And actually in all of our complexes, our development will continue to seek that balance between initial deliverability, ultimate reserve recovery, and most importantly, economic return."

Figure 10: Tourmaline NEBC Montney Gas/Condensate Complex



Source:Tourmaline

Natural Gas: Tourmaline, LNG Canada 1.8 bcf/d Phase 1 “on schedule” start mid 2025

We still think an overlooked factor for Cdn natural gas values is the startup of LNG Canada 1.8 bcf/d Phase 1. Maybe it’s because Shell has never come out and said here is the starting date instead of a general around the middle the decade. But in approx. 2 years, LNG Canada adding 1.8 bcf/d of natural gas demand for LNG exports should be a material event to Cdn natural gas. In the Q&A of its Q2 call last Thursday, Tourmaline CEO Rose spoke on the status of LNG Canada 1.8 bcf/d Phase 1 that is moving towards completion. Rose said Phase 1 “*appears to be on schedule for mid-2025*”, and “*hopefully Phase 2 FIDs*”. Interesting that he uses “*on schedule*” as if someone has indicated to him that is the schedule. Shell and LNG Canada have never publicly stated a specific date and all we have noted are their saying timing like “*around*” the middle of the decade. On Phase 2 FID, Tourmaline only said “*hopefully Phase 2 FIDs*”. Here is what Tourmaline said in the Q&A. “*The ranch. Yes. Though the fires, there haven’t been many fires down south. Unfortunately, they’re right in the middle of our two gas complexes, but we’re past that now. As far as LNG Canada and the Coastal Gas Link, I mean those are projects run by other companies, so we just rely on the*

LNG Canada Phase 1

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same public data that you do, but what we're hearing is, is that the pipeline is 90% complete and the liquefaction facility is 85% complete, so appears to be on schedule for mid-2025, and we think that'll be a very positive event for natural gas prices in the Western Canadian Sedimentary Basin, both AECO and Station 2, as you'll pull two Bs a day and then hopefully Phase 2 FIDs and it's four Bs a day, you'll pull them West out of a basin that's more or less in supply-demand balance. So yeah, it's an exciting time for Canada and it's probably been going on for more than 10 years, but at least it's happening."

Natural Gas: Woodside and LNG Japan sign long-term LNG deal for 0.12 bcf/d

Long-term LNG deal

June was the biggest month for new long-term LNG supply deals in a long time with six deals over the course of the month. But we continued to see more long-term deals in July and to start August. This week, there was a long-term agreement signed between Woodside and LNG Japan. Even still, there was a big slowdown in long-term LNG deals in the last year compared to the activity seen from July 1, 2021 through June 30, 2022. That's because most, if not all the available long term LNG supply available before 2026 was locked up in the July 1, 2021 through June 30, 2022 rush. Rather, the long-term deals in the last year have been for long-term supply starting in 2026 or later. And the other significant item to note is that we are seeing some very long-term out past 2050. (i) On Tuesday, Woodside (Australia) announced the sale of a 10% non-operating stake in the Scarborough Joint Venture to LNG Japan [\[LINK\]](#). The purchase price has been set at \$500mm (USD), and expected to close in Q1/24. As part of the strategic relationship, Woodside and LNG Japan have also entered into a long term LNG supply deal with LNG Japan purchasing 0.12 bcf/d per annum. The deal is set to commence in 2026 and end in 2036. The CEO of Woodside, Meg O'Neill, commented *"The support of LNG Japan is testament to the quality of the Scarborough project. It also underscores the ongoing demand from Japanese buyers for new supplies of gas and the role of gas in supporting Japan's energy security; "Our new energy agreements with Sumitomo and Sojitz provide further opportunities for us to work closely together on our shared decarbonisation and energy security ambitions; Scarborough will be an important source of gas for both the Western Australian and international markets, supporting domestic jobs and providing taxation revenue for the State and Federal Governments".* The Scarborough Joint Venture consists of the Scarborough field and its associated offshore/subsea infrastructure. The project will include the installation of a floating production unit with 8 wells, which will eventually grow to 13 total wells. Our Supplemental Documents package includes excerpts from the STEO. Our supplement document package contains the Woodside press release.

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

Asian buyers were early to secure long term LNG supply and started to lock up long term LNG supply starting in July 2021. The LNG supply crunch for the 2020s was clear before Russia invaded Ukraine. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July

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

There have been 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.

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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	Delim Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delim 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	Delim 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

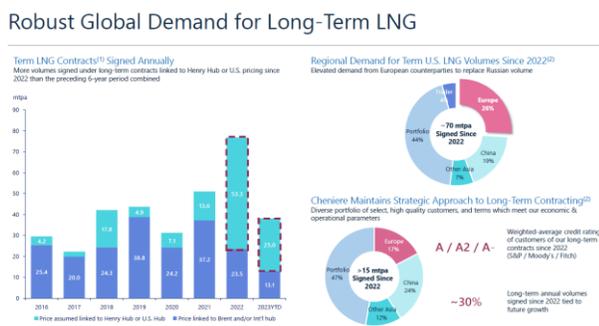
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Natural Gas: New Cheniere slide highlights long-term LNG deals in 2022/23

Last Thurs, Cheniere reported held its Q2 call and their Q2 slide deck included a new LNG macro slide titled “Robust Global Demand for Long-Term LNG”. We haven’t seen this slide in prior Cheniere slide decks. This slide is what we have been highlighting and tracking for the past two years in our above table and was the basis for our July 14, 2021 8-pg blog “Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs”. The difference is that Cheniere’s Q2 call discussion of the slide didn’t link this increasing long-term contracts to any specific event, whereas we believe it was clearly linked to TotalEnergies halting its Mozambique LNG project in April 2021. And why we wrote 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. The TotalEnergies force majeure was a clear reason why long-term LNG buyers, especially in Asia, started to race to lock up long-term LNG deals. But Cheniere didn’t mention that event. Here is what Cheniere said on this slide “Over the last 12 to 18 months, we have witnessed record levels of long-term contracting, particularly for U.S. volumes, as the long-term trade outlook continues to call for further growth in LNG supply. In aggregate, the level of long-term Henry Hub Link contracts signed in '22 alone far exceeded the total signed over the six preceding years combined, and the market looks to be on track to potentially repeat this level of contracting activity this year. As we previously discussed, we expect demand from China and other fast growing Asian economies to underpin the next LNG supply wave, representing over 70% of the LNG demand growth through 2040. Asian demand, coupled with Europe’s desire to replace Russian supply, has driven recent commercial activity. Although Asian customers and portfolio players have been the largest and most active buyers of long-term volumes globally over the past 18 months. European counterparties have certainly stepped up signing contracts, representing over 20 mtpa of which 18 mtpa is tied to U.S. projects for about a quarter of the total U.S. volumes signed since 2022.”

New Cheniere slide

Figure 12: Robust Global Demand for Long-Term LNG



Source: Cheniere

Natural Gas: Can Chevron/Woodside avoid strikes shutting down their Australia LNG?

It’s a big week for LNG markets because workers at Woodside’s North Rankin, Goodwyn and Angel LNG platforms (off Karratha) and Chevron’s Wheatstone and Gorgon LNG facilities could soon start strike action. As of our 7am MT news cut off, we haven’t seen any

Potential strike at Australian LNG

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updates. Yesterday, we tweeted [\[LINK\]](#) “#LNG Supply risk. Would Chevron take on the risk to safely operate its Wheatstone & Gorgon #LNG downstream facilities with replacement workers & other non-union? Offshore Alliance postings don't suggest any quick resolve. Thx @David_Stringer. #OOTT #NatGas.” (i) We did not do the math but the estimates sound reasonable that a shut down of the Woodside and Chevron’s LNG facilities could impact 10% of the world’s LNG trade. (ii) We are skeptical on the reports that Chevron could keep operations going in the event of a strike with, we assume, replacement workers and other Chevron employees or management from elsewhere. But that was the inference from Bloomberg’s Friday report “Chevron Says Taking Steps to Avoid Disruption at Australia Sites. Producer will continue to engage with “employees and their representatives” after Australia’s Fair Work Commission authorized some workers at the Wheatstone and Gorgon downstream facilities to vote on taking industrial action, Chevron Corp. said in a statement on Friday. * Chevron is aware that the Australian Workers’ Union has also made a similar application in relation to a potential vote on action by workers at the Wheatstone offshore platform: statement * Co. “is taking steps to ensure safe and reliable operations are maintained in the event of disruption,” Chevron said.” (iii) Similar to last year’s strike at Shell’s Prelude FLNG offshore NW Australia, we have been following the union, Offshore Alliance, Facebook postings. They turned out to be the best indicator of what happened at the Shell Prelude 76-day strike. Their latest posts were from Thursday and Friday. On Thursday, Offshore Alliance said “Chevron and Woodside have the benefit of hindsight in looking at how the bargaining dispute about EBA outcomes played out for Shell, and are making the same dumb IR mistakes which Shell made on Prelude.” On Friday, Offshore Alliance responded to the reports of Chevron trying to hire replacement workers and wrote “Judging by the panicked phone calls OA members have received over the few days, Chevron and Woodside must think they can pluck oil & gas workers off the back of the KFC employment queue – and still maintain full production. Good story Chevron and Woodside, but it fools no-one.” And “They are dumber than we first thought if they actually believe their own spin and rhetoric about the successful use of scab labour. There is fat chance of untrained, inexperienced or incompetent workers being able to keep all trains operating for long. When shit hits the fan, shit will hit the fan. There will be no get out of jail for Chevron or Woodside in these circumstances. Woodside are in exact same position as Chevron in this regard and they will find out the hard way that highly skilled and experienced workers are not ‘expendable units of production’ as seen through the prism of their HR bosses and bean counters. They can contact Shell to see how well that strategy worked. The only way Woodside and Chevron can avoid the inevitable train wreck (no pun intended) of PIA, is to reach agreement on job security provisions, salaries and employment conditions. The Offshore Alliance and our members will never blink. Shell, Jadestone, Santos and scores of oil and gas contractors can attest to that.” Our Supplemental Documents package includes the Thursday and Friday Offshore Alliance Facebook posts.

Natural Gas: WMO forecasts a hot end to summer, hot ASO temperatures everywhere

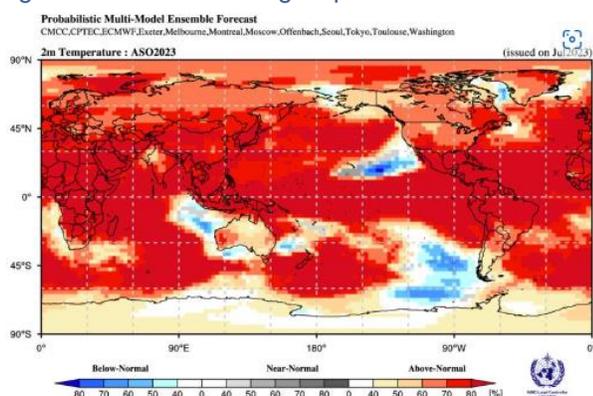
The story for July and August has been above normal temperatures around the world. It’s been a hot summer everywhere. On July 25, the World Meteorological Organization posted its “Global Seasonal Climate Update for August-September-October 2023”. [\[LINK\]](#) The WMO is calling for a hot ASO around the world. The WMO wrote “Without exception, the likelihood of above-normal temperature anomalies is expected over all land areas in the Northern and Southern Hemisphere. The largest increase in probabilities for above-normal temperatures

A hot end to summer

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extend around the globe within the 50° S and 60° N band that includes the Maritime continent, New Zealand, Central America, the Caribbean, southern regions of North America, northern regions of South America, Africa, southern Europe, the Arabian Peninsula, east and southeast Asia. Over these regions the model consistency is high.” We recognize that the WMO forecast is only for ASO, but our concern is that the hot weather in ASO carries over into the start of the winter. A hot end to summer is positive for natural gas and LNG prices but has nowhere near the impact that a warm or cold winter has on natural gas and LNG prices. We recognize the WMO forecast is only for ASO, but we worry that the hot weather everywhere carries over into the start of winter in Nov and Dec. Our Supplemental Documents package includes the WMO forecast.

Figure 13: GSCU for Aug-Sept-Oct 2023



Source: WMO

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 10 update calls for much warmer than typical temperatures for the Aug 12 – Sep 11 period. The above average temperatures are forecasted through the whole country, with the northern and central regions being most affected. Over the last few weeks we have seen the weather pulling on Japan's LNG stocks, even with this summer's push to conserve natural gas, there should be continued strong demand strong demand for AC through the end of summer, which should benefit natural gas consumption. Below is the JMA's 30-day temperature probability forecast for Aug 12 to Sep 11.

Japan's 30-day temperature forecast

Figure 14: JMA Aug 12 – Sep 11 Temperature Probability Forecast



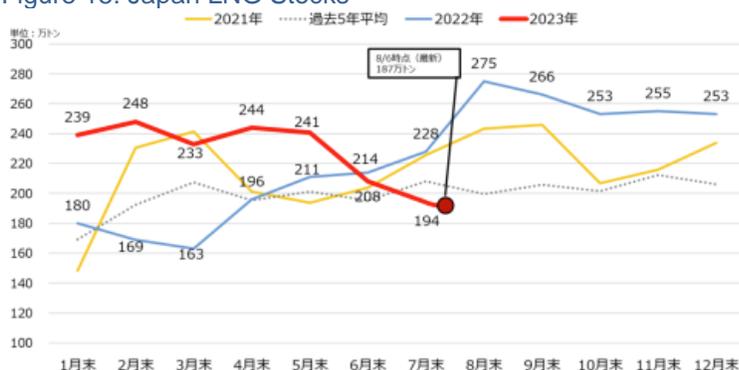
Source: Japan Meteorological Agency

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

It’s been hot in Japan and it looks like 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. On Wednesdays, Japan’s METI releases its weekly LNG stocks data [\[LINK\]](#). LNG stocks on August 6 were 89.8 bcf and are down -2.6% WoW from July 30 of 92.2 bcf, and are now under the 5-year average of 99.9 bcf. Below is the Japanese LNG stocks graph from the METI weekly report.

Japan LNG stocks down -2.6% WoW

Figure 15: Japan LNG Stocks



Source: METI

Natural Gas: China natural gas imports +18.5% YoY in July

On Tuesday, Bloomberg reported on the summary data of China’s oil and natural gas imports for July based on China’s General Administration of Customs website. It is only summary data so, as of our 7am MT news cut off, we have seen any detailed splits for natural gas imports between LNG and pipeline imports. And we haven’t yet seen the China natural as production data. But on the summary data, China’s natural gas imports (LNG and pipeline gas) was +18.5% YoY to 10.308 tons in July 2023, and was +7.6% YoY to 66.876 tones for YTD July 31, 2023. Based on what we have seen so far in 2023, we expect that the splits, when available, will continue to show lower YoY LNG imports and continued higher YoY pipeline imports from natural gas.

China natural gas imports

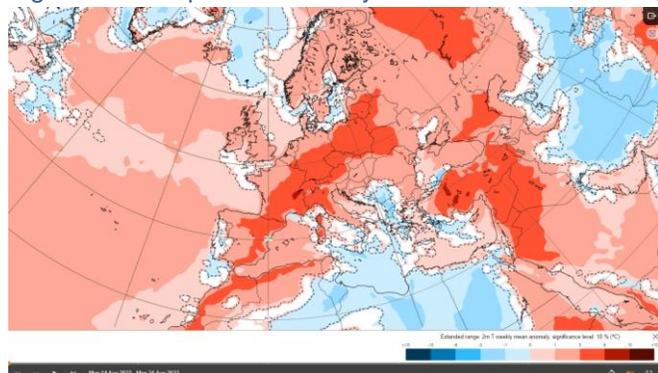
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Natural Gas: Western Europe back to hot weather to end August

It wasn't a cold snap but the short break from the very hot temperatures in western Europe looks to be over. Unfortunately, the near-term weather forecast are showing a return to above normal temperatures to end August for western Europe. Below are the ECMWF temperature probability maps, posted yesterday for Aug 14-21 and Aug 21-28. [\[LINK\]](#)

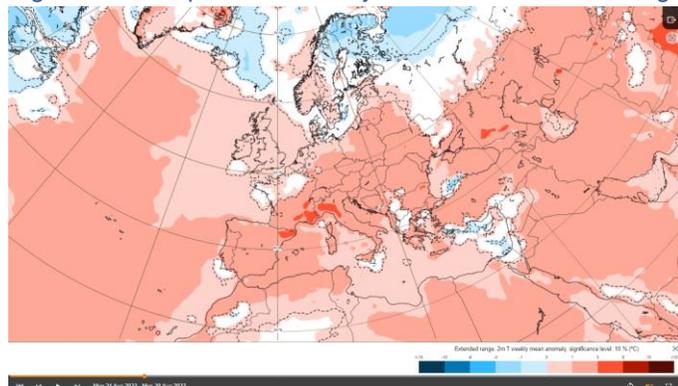
Back to above normal temperatures

Figure 16: Temperature weekly mean anomalies for Aug 14-21



Source: ECMWF

Figure 17: Temperature weekly mean anomalies for Aug 21-28



Source: ECMWF

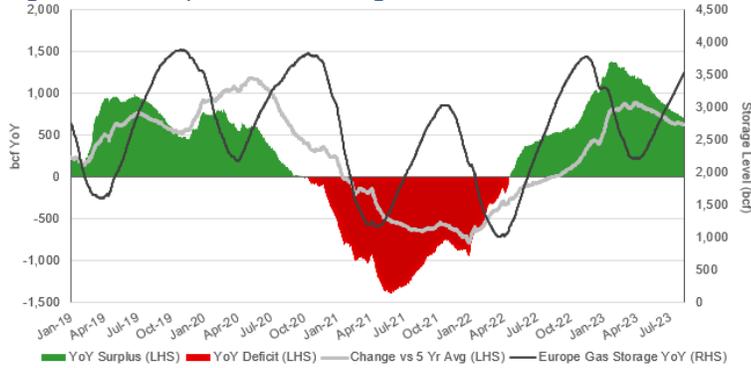
Natural Gas: Europe storage is now +14.16% vs 5-yr average, but within 5-yr range

The Europe natural gas storage picture this week is much the same as the last several weeks – storage is significantly higher YoY and on track to be full or close to full for the start of the winter natural gas withdraw season. But hot weather (at least up until now) 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 +1.97% WoW to 88.28% on August 9. Storage is now +15.49% greater than last year levels of 72.79% and is +14.16% above the 5-year average of 72.79%. 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 18: European Gas Storage Level



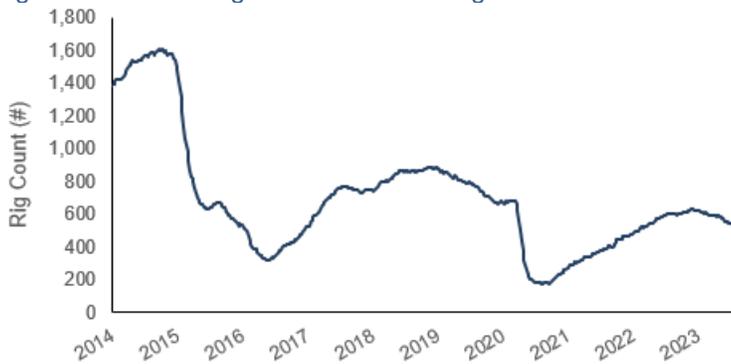
Source: Bloomberg, SAF

Oil: US oil rigs flat WoW at 525 rigs on August 11, US gas rigs -5 WoW to 123 rigs

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) US oil rigs. Total US oil rigs were flat WoW at 525 total rigs, and -76 rigs YoY for the week of August 11. This is up +44 rigs from the 2022 low of 481 rigs in January, and +353 rigs since the 2020 low of 172 rigs on Aug 14. The Permian and Ardmore Woodford increased +2 rigs and +1 rig WoW to a total of 322 rigs and 1 rig, respectively. In contrast, Eagle Ford and “Others” decreased this week by -2 and -1 rigs WoW to a total of 51 rigs, and 81 rigs, respectively. Aside from the WoW decrease this week, “Others” has been up the most in the last month, responding quicker to the oil price strength. The Permian is now down -35 rigs from its recent high of 357 rigs on April 28, 2023. (ii) US gas rigs. Gas rigs were down -5 rigs WoW at total of 123 rigs and have now decreased -37 rigs YoY. On a per basin basis, Eagle Ford increased by +1 rig WoW to a total of 2 rigs. In contrast, the Permian and Marcellus decreased by -4 rigs and -2 rigs WoW to a total of 5 rigs and 30 rigs, respectively. Below is our graph of total US oil rigs.

**US oil rigs flat
WoW**

Figure 18: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

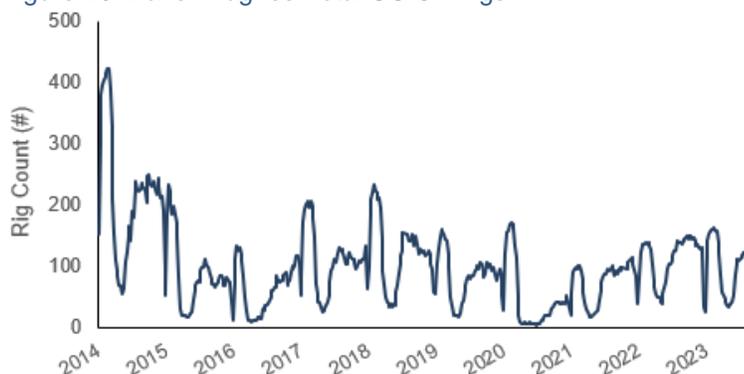
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Oil: Total Cdn rigs up +2 rigs WoW to 190 total rigs

For the week of August 11, total Cdn rigs were up +2 rigs WoW to 190 rigs. Alberta increased +4 rig WoW, to a total of 134 rigs, which is likely linked to the decline in wildfires. In contrast, Saskatchewan decreased by -2 rigs WoW to a total of 32 rigs. Cdn oil rigs were down - 2 WoW to 116 rigs, and Cdn gas rigs increased +4 to 74 rigs. Cdn oil rigs are down -21 rigs YoY, while gas rigs are up +10 rigs YoY. Below is our graph of total Cdn oil rigs.

**Cdn total rigs up
WoW**

Figure 20: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates up +0.4 mmb/d WoW to 12.6 mmb/d

As expected, the EIA made an upward adjustment to its weekly US oil production estimates, up +0.4 mmb/d to 12.6 mmb/d for the week ended August 4 [\[LINK\]](#). This surpasses the post Covid high level of 12.4 mmb/d, which was reached twice in June. The EIA doesn't provide any explanation for the increase, but we have been highlighting for months how the EIA's actuals were way higher than the weekly supply estimates and that an increase to the weekly supply estimates was to be expected. The Lower 48 was also up +0.4 mmb/d WoW at 12.2 mmb/d, and Alaska was down -0.016 mmb/d to 0.377 mmb/d. Below is a table of the EIA's weekly oil production estimates.

**US oil production
up big WoW**

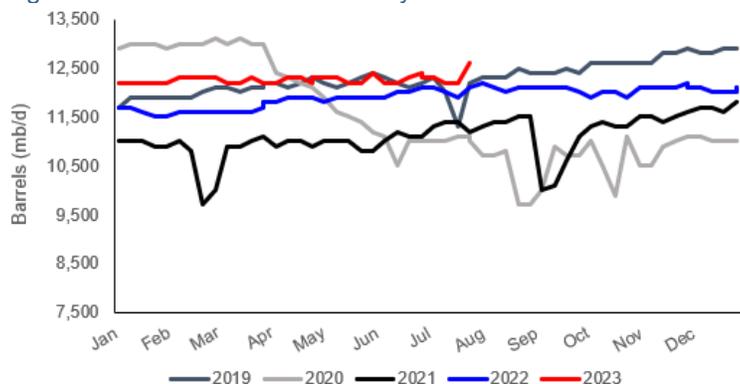
Figure 21: EIA's Estimated Weekly US Field Oil Production

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								

Source: EIA

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Figure 22: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

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

Here is what we wrote in last week's (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 23: 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

Figure 24: EIA Form 914 US Oil Production vs Weekly Estimates



Source: EIA, SAF

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Oil: EIA Aug STEO increases 2023 and 2024 US oil production

EIA STEO US oil production

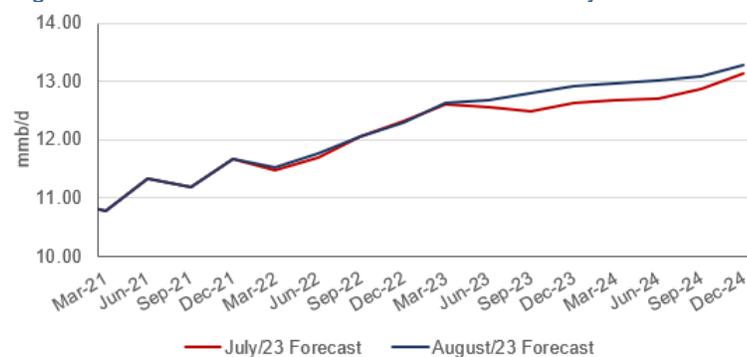
As noted earlier, we have been expecting, based on the US actuals being higher than the weekly supply estimates, the EIA to increase its forecasts for US oil supply and its 2023 supply forecast. On Tuesday, the EIA released its Short-Term Energy Outlook for August 2023 [\[LINK\]](#) and increased its oil production forecasts for 2023 and 2024. (i) The Aug STEO forecasts for 2023 US oil production estimated have increased vs the last STEO in July. The August STEO forecast for 2023 is up +200,000 b/d to 12.76 mmb/d from the July STEO of 12.56 mmb/d. The revisions by quarter were Q1/23 +0.02 mmb/d, Q2/23 +0.12 mmb/d, Q3/23 +0.33 mmb/d, and Q4/23 exit +0.30 mmb/d. (ii) The EIA increased its 2024 oil production forecast by +240,000 b/d to 13.09 mmb/d compared to 12.85 mmb/d in the July STEO, which is a YoY increase of +0.33 mmb/d. And the EIA increased its Q4/23 forecast to 13.27 mmb/d (was 13.13 mmb/d).

Figure 25: EIA STEO Natural Gas Production Forecasts by Month

(million b/d)	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Aug-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.67	12.81	12.93	12.76	12.98	13.01	13.08	13.27	13.09
Jul-23	11.25	11.47	11.70	12.06	12.31	11.89	12.61	12.55	12.48	12.63	12.56	12.67	12.71	12.88	13.13	12.85
Jun-23	11.25	11.47	11.70	12.06	12.31	11.89	12.60	12.56	12.57	12.70	12.61	12.69	12.63	12.76	13.00	12.77
May-23	11.25	11.47	11.70	12.06	12.31	11.89	12.54	12.51	12.46	12.61	12.53	12.63	12.58	12.68	12.85	12.69
Apr-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.54	12.50	12.50	12.61	12.54	12.69	12.71	12.77	12.83	12.75
Mar-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.71	12.63
Feb-2023	11.25	11.47	11.70	12.06	12.36	11.90	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65
Jan-2023	11.25	11.47	11.70	12.05	12.23	11.86	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81
Dec-2022	11.25	11.46	11.70	12.03	12.29	11.87	12.24	12.24	12.34	12.51	12.33					
Nov-2022	11.25	11.46	11.70	11.99	12.15	11.82	12.22	12.24	12.32	12.48	12.31					
Oct-2022	11.25	11.46	11.70	11.83	11.99	11.74	12.27	12.29	12.36	12.50	12.35					
Sep-2022	11.25	11.47	11.70	11.81	12.16	11.79	12.42	12.55	12.70	12.87	12.63					
Aug-2022	11.25	11.46	11.69	12.01	12.28	11.86	12.39	12.50	12.82	13.10	12.70					
Jul-2022	11.19	11.46	11.75	12.08	12.34	11.91	12.45	12.58	12.87	13.17	12.77					
Jun-2022	11.19	11.45	11.71	12.08	12.43	11.92	12.64	12.82	13.07	13.33	12.97					
May-2022	11.19	11.42	11.78	12.07	12.35	11.91	12.56	12.71	12.94	13.18	12.85					
Apr-2022	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95					
Mar-2022	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99					
Feb-2022	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60					

Source: EIA STEO

Figure 26: Estimated US Crude Oil Productions by Forecast Month



Source: EIA, STEO

Oil: US SPR reserves now -97.868 mmb lower than commercial crude oil reserves

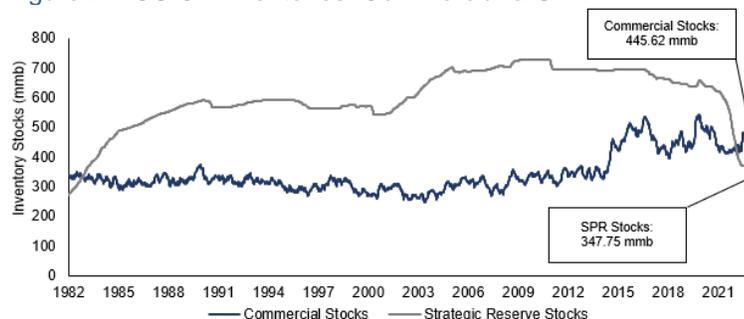
US SPR reserves

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

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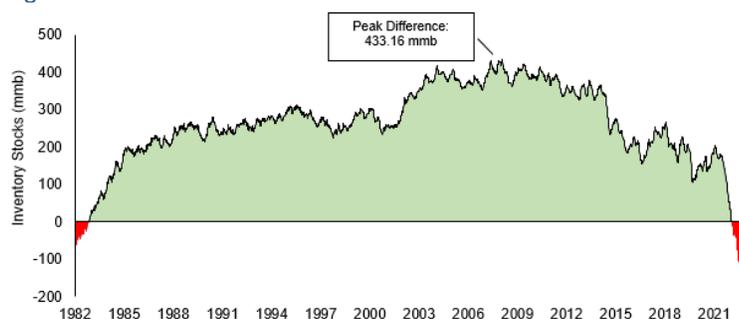
in the Sept 16, 2022 week. This deficit widened this week after a build in commercial oil stocks of +5.851 mmb. The EIA's weekly oil data for August 4 [LINK](#) saw the SPR reserves up +0.995 mmb WoW with the first of the US DOE repurchases that increased SPR reserves to 347.754 mmb, while commercial crude oil reserves increased +5.851 mmb 445.662 mmb. There is now a -97.868 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 27: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 28: US Oil Inventories: SPR Less Commercial



Source: EIA, SAF

Oil: Cdn oil differentials widened \$0.15 to close at \$15.50 on Aug 11

It's been a great last three months for WCS less WTI differentials that still continue to see the impact of OPEC+ cuts including Saudi Arabia's extra voluntary 1 mmb/d cut for July, August and now Sept. This has led to continued much narrower than normal WCS less WTI differentials for this time of year. WCS less WTI differentials widened by \$0.15 to close at \$15.50 on Aug 11. This has been a great May/June/July for WCS less WTI differentials, which are hugely narrower than normal as differentials normally start to widen in mid-May. WCS less WTI differentials were \$14.15 on March 31, which was the Friday before the Sun Apr 2 reports that OPEC+ was going to cut production effective May 1. The WCS less WTI differential was up and down but closed at \$14.65 on Apr 28, then narrowed in May to 13.50 on May 31, narrowed in June to \$11.25 on June 30, widened in July to \$13.75 on July 31, and widened in Aug to close at \$15.50 on Aug 11. We should expect this to be the start of a delayed normal seasonal widening, but with Saudi keeping its oil cuts thru September and

WCS less WTI differentials

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with its continued new big premium to its OSPs to US, that should help keep differentials narrower than normal. 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 \$19.70 on Aug 11, 2022. Below is Bloomberg's current WCS–WTI differential as of Aug 11, 2023 close.

Figure 29: WCS less WTI oil differentials including Aug 11 close



Source: Bloomberg

Oil: MEG thinks WCS less WTI differentials already reflect winter widening

MEG Energy held its Q2 call on July 28. MEG CEO Derek Evans as asked on WCS less WTI differentials and he doesn't think there will be any more widening in the WCS less WTI differential, rather he thinks the differential "already has what we would call winter effects ...". Here is what Evans said in the Q&A: *"So yeah, a bunch of questions in that question. So let me start with where we see the differential today. Now that WCS differential appears to be in that CAD15.50 [ph] in Edmonton, quite a move from the CAD10 that we saw earlier. We think part of the rationale or the reason for that is that there was a lot of production off -- offline in that July-August period and BP Whiting probably -- they moved their turnaround up from September into August. And we think that really impacted the amount of crude that there was at -- I'll call it semi distressed situation in terms of having a lot more heavy oil on the market, which really push that differential down and I think is a very good indication of what's going to happen, impact to, to those differentials once we bring TMX on. So that's -- a good color there as we think about what TMX may do in terms of bringing differential down. I think as we look to that differential going forward for the remainder of the year, I think we're pretty comfortable that it's widened out as much as it's going to and already has what we would call winter effects in it as where we've got more condensate in a product going forward. Typically, you see it widened out through the fourth quarter."*

MEG on WCS differentials

Oil: Crack spreads at \$43.03 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 increased by \$4.90 to close at \$43.03 on Aug 11. 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 \$43.03 crack spread is a big incentive for US refiners to run hard and process as much crude as possible.

Crack spreads down this week

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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 \$43.03 as of the Friday Aug 11, 2023 close.

Figure 30: Cushing Crude Oil 321 Crack Spread Aug 11, 2013-to Aug 11, 2023



Source: Bloomberg

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

We had a number of comments on our item in last week's (Aug 6, 2023) Energy Tidbits memo of how many haven't yet focused on the coming startup of the Trans Mountains TMX expansion. Our view is that it's hard to tell when they will start to input crude for line fill/pack, but the point is that it's happening in a matter of months not years. Here is what we wrote in last week's (Aug 6, 2023) Energy Tidbits memo. *"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, 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*

TMX line fill

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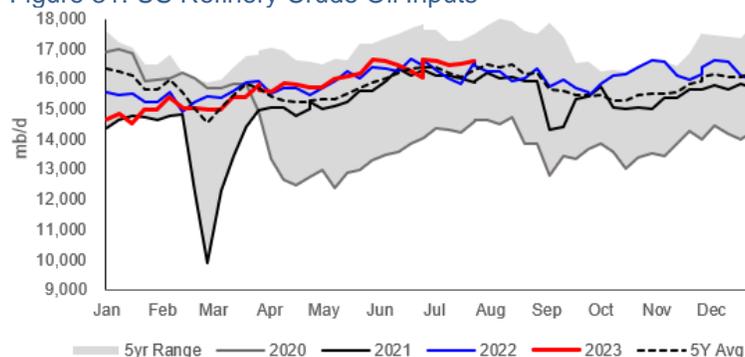
little over 500,000 barrels a day. So it's going to take 500,000 barrels a day of heavy to a different market. So to me, I find that the WCS piece will be very constructive here. Obviously typically, historically the winter months it does widen a bit. B mean, let's face it's 20% that is still very strong on a relative basis."

Oil: Refinery inputs up +0.062 mmb/d WoW to 16.579 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 4 [LINK](#). The EIA reported crude inputs to refineries were up +0.062 mmb/d this week to 16.579 mmb/d and are down -0.002 mmb/d YoY. Refinery utilization was up +1.1% WoW to 93.8%, which is -0.5% YoY. Total products supplied (i.e., demand) increased WoW, up +0.704 mmb/d to 20.727 mmb/d, and Motor gasoline was up +0.464 mmb/d to 9.302 mmb/d from 8.838 mmb/d last week. The 4-week average for Motor Gasoline was up +0.136 mmb/d WoW to 8.983 mmb/d. The 4-week average of Total demand was up +0.506 mmb/d WoW to 20.698 mmb/d.

**Refinery inputs
up +0.062 mmb/d
WoW**

Figure 31: 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 it's only the EIA allocating imports incorrectly by country or if the EIA is understating oil imports. But it's the same commentary as the last several weeks that something doesn't look quite right in the EIA weekly oil imports by country data. It looks like something is off in the EIA's estimates of weekly oil imports by country data but, the reason we highlight this is that we just don't know if the total US crude oil imports are wrong or if it's just that the EIA has incorrectly allocated import volumes to the wrong country. Perhaps this is part of the reason for the big weekly plug in its 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

**US net oil
imports**

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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 up +2.937 mmb/d to 4.322 mmb/d for the August 4 week. US imports were up +0.014 mmb/d to 6.682 mmb/d. US exports were down -2.923 mmb/d to 2.360 mmb/d. The WoW increase in US oil imports was driven mostly by “Top 10”. The Top 10 was down -0.229 mmb/d. Some items to note on the country data: (i) Canada was down -0.225 mmb/d to 3.466 mmb/d. (ii) Saudi Arabia was down -0.097 mmb/d to 0.330 mmb/d. (iii) Mexico was down -0.093 mmb/d to 0.667 mmb/d. (iv) Colombia was up +0.006 mmb/d to 0.296 mmb/d. (v) Iraq was up +0.070 mmb/d to 0.305 mmb/d. (vi) Ecuador was down -0.033 mmb/d to 0.142 mmb/d. (vii) Nigeria was up +0.143 mmb/d to 0.237 mmb/d.

Figure 32: US Weekly Preliminary Imports by Major Country

(thousand b/d)	May 19/23	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	Jun 23/23	Jun 30/23	Jul 7/23	Jul 14/23	Jul 21/23	Jul 28/23	Aug 4/23	WoW
Canada	3,707	3,589	3,504	3,339	3,570	3,776	3,611	3,385	3,698	3,203	3,691	3,466	-225
Saudi Arabia	212	534	66	677	146	460	313	444	426	242	427	330	-97
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	657	913	647	845	808	758	882	526	1,004	830	760	667	-93
Colombia	214	286	127	184	148	222	287	153	215	287	290	296	6
Iraq	136	114	430	252	102	216	122	134	259	273	235	305	70
Ecuador	71	214	218	54	203	67	157	144	207	216	175	142	-33
Nigeria	77	98	144	132	204	96	192	189	91	229	94	237	143
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	5,074	5,748	5,136	5,483	5,181	5,595	5,564	4,975	5,900	5,280	5,672	5,443	-229
Others	776	1,469	1,264	898	980	985	1,474	905	1,274	1,087	996	1,239	243
Total US	5,850	7,217	6,400	6,381	6,161	6,580	7,038	5,880	7,174	6,367	6,668	6,682	14

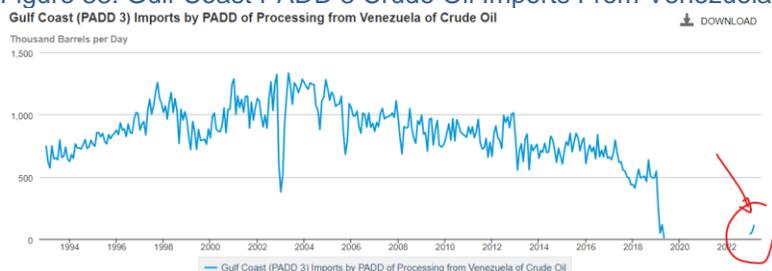
Source: EIA, SAF

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 ½ years were 40,000 b/d in Jan and 58,000 b/d in Feb, and this will be higher in March.”

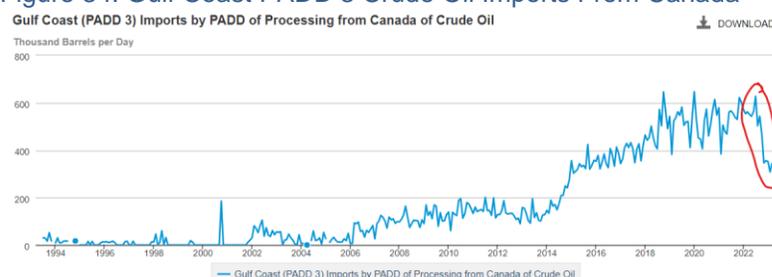
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Figure 33: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



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

Figure 34: Gulf Coast PADD 3 Crude Oil Imports From Canada



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

Oil: Russia's seaborne crude flows still right around lowest early Jan

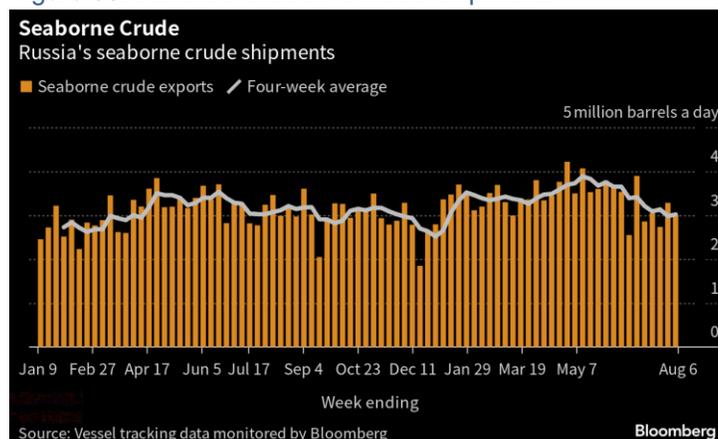
It was another solid week for Russia delivering on its commitments to cut oil exports. (i) Last week's (Aug 6, 2023) Energy Tidbits memo highlighted the Bloomberg tracking of Russian oil shipments and how it looks like Russia was finally delivering on its promises. On Aug 2, we tweeted [LINK](#) "Russia finally complying! RUS seaborne crude flows in the 4-weeks to July 30 fell to the lowest since early Jan. 4-week ave shipments dropped to 2.98 mmb/d, smallest since the 28-day period ending Jan. 8 & down >900,000 b/d from peak seen in mid-May. Thx @JLeeEnergy #OOTT." (ii) Bloomberg's updated shipment tracking for Russia crude was much the same as last week, Russia is continuing to deliver on its promises. On Tuesday, we tweeted [LINK](#) "Russia complying! RUS average seaborne crude flows for 4-weeks to Aug 6 were 3.02 mmb/d, ~870,000 b/d below recent mid-May peak. Small 40,000 b/d WoW increase vs 4-weeks to July 30 of 2.98 mmb/d. Thx @JLeeEnergy #OOTT." Bloomberg's shipment tracking shows a small increase of +40,000 b/d WoW to the 4-week average to 3,02 mmb/d for the week ended Aug 6. But Russia shipments are still back at early Jan levels. Bloomberg wrote "Russia's seaborne crude flows stabilized in the four weeks to Aug. 6, before Ukrainian naval drones attacked two Russian ships in the Black Sea — a move that could prompt Moscow to divert cargoes. Average shipments during the period steadied at 3.02 million barrels a day, about 870,000 barrels a day below the peak in mid-May, tanker-tracking data compiled by Bloomberg show. More volatile weekly numbers slipped, with no cargoes leaving from the Arctic port of Murmansk after the previous week's record-equaling flow. The figures support the notion that Moscow is now honoring a pledge to keep supply off

Russia
seaborne crude
flows

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the global market alongside its allies in the OPEC+ producer coalition.” Our Supplemental Documents package includes the Bloomberg report.

Figure 35: Russia’s seaborne crude shipments



Source: Bloomberg

Oil: OPEC MOMR: no real changes incl 2024 demand forecast +2.25 mmb/d YoY

On Thursday, OPEC released its Monthly Oil Market Report. (i) We thought the overall takeaway from the data and forecasts was neutral. There were very few changes, and normally there will be a lot of immaterial updates to their numbers. Global oil stocks deficit as of June 30 modestly narrowed the deficit compared to its historical averages. But remember OPEC introduced its 2024 forecast last month, which remained unchanged at +2.25 mmb/d YoY to 104.25 mmb/d. (ii) 2023 average demand slightly increased to 102.1 mmb/d (was 102.0), but growth remained unchanged at +2.44 mmb/d YoY. The increase is driven by OPEC increasing its Q1/23 and Q3/23 demand to 101.65 mmb/d (was 101.61 mmb/d) and 101.96 mmb/d (was 101.95), respectively. OPEC also made a small decrease to Q2/23, which decreased to 101.18 mmb/d (was 101.22), and Q4/23 remained unchanged at 103.21 mmb/d. (iii) There was no change to OPEC’s 2024 demand forecast of +2.25 mmb/d YoY to 104.25 mmb/d which was introduced last month. OPEC sees modest +0.26 mmb/d YoY demand growth to 46.27 mmb/d for OECD. Non-OECD is forecast +1.98 mmb/d YoY to 57.97 mmb/d (was +1.99 mmb/d YoY to 57.98 mmb/d) with the largest growth being China +0.58 mmb/d YoY to 16.35 mmb/d and the Middle East +0.38 mmb/d YoY to 9.05 mmb/d. Other Asia non-OECD +0.31 mmb/d YoY to 9.66 mmb/d. India +0.22 mmb/d YoY to 5.60 mmb/d. (iv) Non-OPEC supply was slightly increased for 2023 to +1.51 mmb/d YoY (was +1.41 mmb/d) and full year average of 67.27 mmb/d (was 67.14 mmb/d). For 2024, OPEC forecasts non-OPEC supply at +1.45 mmb/d YoY to 68.66 mmb/d (was +1.39 mmb/d YoY to 68.53 mmb/d). Key YoY non-OPEC growth areas for 2024 are US +0.66 mmb/d (was +0.68 mmb/d), Canada +0.24 mmb/d (was +0.22 mmb/d), Guyana unchanged at +0.15 mmb/d (unchanged), Brazil +0.12 mmb/d (unchanged), Norway +0.09 mmb/d (unchanged), and Kazakhstan +0.08 mmb/d (unchanged). (v) OPEC Secondary Sources for August were -836,000 b/d MoM to 27.310 mmb/d. The major changes were Saudi Arabia down -968,000 b/d MoM to 9.021 mmb/d, Iran +68,000 b/d MoM to 2.828 mmb/d, Angola +56,000 b/d MoM

OPEC Monthly
Oil Market Report

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to 1.170 mmb/d, and Libya -52,000 b/d MoM to 1.110 mmb/d. (vi) Direct Communications (what the OPEC countries report). There were a few items to note vs what countries directly reported vs Secondary Sources estimates: Libya says it produced 1.173 mmb/d in July vs Secondary Sources of 1.110 mmb/d. We normally reference the Libya NOC tweets/Facebook posts that have consistently said production has been marginally over 1.2 mmb/d. Venezuela says it produced 810,000 b/d in July vs secondary sources of 796,000. Nigeria says it produced 1.081 mmb/d compared to the 1.255 mmb/d reported by Secondary Sources. Note that Iraq didn't report July production. (vii) Our Supplemental Documents package includes excerpts from the August OPEC MOMR.

Oil: IEA OMR: No change to 2024 demand 103.2 mmb/d, +1.0 mmb/d YoY

There is no sign, at least in their forecasts, that the IEA is forecasting peak oil demand. On Friday, the IEA released its monthly Oil Market Report for August at 2am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) The headlines were framed slightly negative as the IEA forecasted lower demand growth in 2024 despite no change to their 2024 oil demand forecast of 103.2 mmb/d. The IEA also notes that global oil stocks declined in June, with further draws to be expected through July and August. There is still concern that the Q1/24 demand forecast looks low, which means that the 2024 demand forecast will also be low. (ii) We have the same concern as last month and wonder if the IEA oil demand forecast for 2024 is too low. On Friday, we tweeted [\[LINK\]](#) "*Is #IEA's Q1/24 #Oil demand still low? if so, then likely subsequent quarters likely low. Aug OMR Q1/24 -1.6 mmbd QoQ July OMR Q1/24 -1.9 mmbd QoQ June OMR Q1/24 -2.0 mmbd QoW Still >~1.5x normal seasonal QoQ drop from Q4 to Q1. Thx @business K Siedenburger for table. #OOTT*". The August OMR only had a slight change and the IEA forecasts demand to drop QoQ by 1.6 mmb/d from Q4/23 to Q1/24. The normal seasonal pattern for oil demand is that Q1 is a little lower than the preceding Q4, but we don't recall ever seeing this big of a QoQ drop. We reviewed older pre-Covid OMR reports and the normal QoQ drop was generally below 1 mmb/d. Now, the IEA forecasts oil to bounce right back up in Q2, Q3 and Q4. IEA forecasts Q1/24 demand 101.5 mmb/d, Q2/24 demand is 102.6 mmb/d, Q3/24 demand is 104.2 mmb/d, and Q4/24 demand is 104.3 mmb/d. We don't see precedent for this large of a QoQ decline. For perspective, the EIA issued its Short Term Energy Outlook for August on Tuesday, and they show Q1/24 oil demand to be +0.05 mmb/d QoQ vs Q4/23. In Wednesday's OPEC MOMR, OPEC forecasts Q1/24 demand to be +0.47 mmb/d QoQ vs Q4/23. (iii) There were immaterial changes to the IEA's 2023 non-OPEC YoY supply growth, it was reduced to +1.9 mmb/d YoY to 67.2 mmb/d (was +2.0 mmb/d YoY to 67.3 mmb/d). (iv) Immaterial increases to 2024 non-OPEC supply, up to +1.3 mmb/d YoY to 68.7 mmb/d (was +1.2 mmb/d YoY to 68.5 mmb/d). The IEA wrote "*Next year, non-OPEC+ supply is also set to dominate world supply growth, up 1.3 mb/d while OPEC+ could add just 160 kb/d.*" (v) Our Supplemental documents package includes the IEA release and the Bloomberg reports.

IEA Oil Market Report

Figure 36: IEA Global Demand Forecast by OMR Report

mmb/d	2021	21-20	Q1/22	Q2/22	Q3/22	Q4/22	2022	22-21	Q1/23	Q2/23	Q3/23	Q4/23	2023	23-22	Q1/24	Q2/24	Q3/24	Q4/24	2024	24-23
Aug 23	97.7	97.7	99.6	98.7	100.7	100.7	99.9	2.2	100.6	102.0	102.9	103.1	102.2	2.3	101.5	102.6	104.2	104.3	103.2	1.0
July 23	97.7	97.7	99.6	98.7	100.7	100.7	99.9	2.2	100.5	101.4	103.1	103.3	102.1	2.2	101.4	102.6	104.3	104.5	103.2	1.1
June 23	97.7	6.7	99.6	98.7	100.7	100.7	99.9	2.2	100.5	101.6	103.4	103.5	102.3	2.4	101.5	102.5	104.1	104.4	103.1	0.8
May 23	97.7	6.7	99.6	98.7	100.7	100.7	99.9	2.2	100.5	101.3	103.0	103.1	102.0	2.1						
Apr 23	97.7	6.7	99.6	98.7	100.7	100.7	99.9	2.2	100.4	101.2	103.1	103.0	101.9	2.0						
Mar 23	97.7	6.7	99.6	98.8	100.8	101.0	99.9	2.2	100.7	101.3	101.9	101.9	101.5	1.6						
Feb 23	97.7	6.7	99.5	98.7	100.7	100.8	100.0	2.3	100.1	101.1	102.9	103.5	101.9	1.9						
Jan 23	97.7	6.7	99.5	98.7	100.7	100.5	99.9	2.2	99.6	100.8	102.9	103.5	101.7	1.8						
Dec 22	97.7	6.7	99.5	98.7	100.7	100.8	99.9	2.2	99.7	100.6	102.7	103.4	101.6	1.7						
Nov 22	97.7	6.7	99.4	98.7	100.3	100.7	99.8	2.1	99.6	100.5	102.3	103.0	101.4	1.6						
Oct 22	97.7	6.7	99.4	98.5	100.0	100.6	99.6	1.9	99.5	100.4	102.1	102.9	101.3	1.7						
Sep 22	97.7	6.7	99.5	98.4	99.9	100.9	99.7	2.0	100.2	101.0	102.6	103.3	101.8	2.1						
Aug 22	97.6	6.6	99.4	98.5	100.0	100.8	99.7	2.1	100.3	101.1	102.5	103.3	101.8	2.1						
July 22	97.5	6.5	99.3	97.8	99.4	100.2	99.2	1.7	99.8	100.8	102.0	102.7	101.3	2.1						

Source: IEA, Bloomberg, SAF

Oil: Saudi Aramco CEO reminds global oil “depletion of 5% to 7%” per year

Saudi Aramco had its Q2 call on Monday and the headlines were on their boosted dividend. The beauty of time zones is that, given the time zones, Bloomberg posted the transcript early Monday morning and, in the Q&A, Saudi Aramco CEO Nasser reminded of the key fundamental reason why we have been positive on oil for the 2020s especially in the face of the underinvestment – the overall decline rate of the global oil production base is 5% to 7%. That is an overall average decline rate for the global oil production that takes into account the high decline rate on the US’s 12 mmb/d, but also no or very little decline rate for oil sands mining. (i) On Monday morning, we tweeted [\[LINK\]](#) “#Oil 101. Decline rates. Every barrel produced has to be replaced just to keep production flat. #Aramco CEO “considering the depletion of 5% to 7% and you need to have huge investment just to maintain the current decline that we see in existing mature fields” Oil looks good for 2020s! #OOTT.” Saudi Aramco is saying there is a global decline rate of 5% to 7%, which means that every year, if there is no reinvestment, the 100 mmb/d global production base would decline by 5 to 7 mmb/d. Or that means the world needs to add 5 to 7 mmb/d of new production additions just to keep production flat. (ii) In the Q&A, CEO Nasser said the low end of demand growth requires an additional 1.5 mmb/d of new oil supply. And then he reminds about the base decline in the global oil production base. Nasser said “By the way that we view the market, we think demand will grow in the mid to long term. Don't forget, we are a company that always focused on the long term, the signals that we're getting are just in the slides as I mentioned earlier. If you are talking about the 103 to 104 million barrel in the second half of this year based on different forecasts, And this is not with a full economic recovery from different countries because they are at different levels and China is still picking up growth potential. And as I said, also, there is a lot of potential growth in the aviation industry, and as economy improve going forward, there will be additional demand and even if we consider the low end at 1.5% increase in the 100 million barrel system, we are talking about 1.5 million to 1.7 million barrels of additional demand and considering the depletion of 5% to 7% and you need to have huge investment just to maintain the current decline that we see in existing mature fields at that level, you need a huge investment and to meet that growth, 1.5 even at the low end to 1.5% you need really significant investment and you need to be prepared.” (iii) Saud Aramco’s 5% to 7% is in line with what most others use as the base global decline rate and what we have been highlighting for years.

Global oil decline rate of 5% to 7%

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06/01/23: Exxon CEO “people continue to forget about the depletion curve”

Here is what we wrote in our June 4, 2023 Energy Tidbits memo. “The focus of investor attention on the Exxon sell-side presentation on Thursday was on their shale oil potential. So overlooked was their regular and, at least annual, reminder that there is a 7% annual depletion/decline rate in global oil production. This is on a global basis so would work in the very high decline rates in US shale oil and essentially zero decline rate in oil sands mining. It means that, on average, the world has to add another 7 mmb/d of oil production to stay offset decline and stay flat. This is the challenge for growing global oil supply especially in the face of the well understood underinvestment in the oil and gas upstream. And Exxon says that if you’re not investing, the market will be short at some point in time. Exxon CEO Darren Woods said “So you can call it being stubborn. Our focus on it is a disciplined approach to understanding what the business required and sticking to it, because the facts didn’t change. And with time, the facts were proven right. And it’s not, wasn’t that we were somehow magical in understanding it. It’s basic math and understanding depletion curves and where the rest of the industry is. I’ll tell you something else that’s happening right now. If you look at, people continue to forget about the depletion curve and that every barrel of crude that you produce, or every ton of LNG that you produce is that much less supply available to the world. And you have to replace that, even if demand is flat So think about a 7% depletion curve. Maintaining volumes flat means you have to grow production by 7% to offset the decline. That’s huge growth. People don’t appreciate that. And the bigger the demand, that 7% becomes bigger, the bigger the hole that you’re digging every year. If you look at where the demand for oil and gas is today, you look at a depletion and then you look at the investment going into the industry, the industry as a whole is under-investing in those resources. So whatever your view of demand is, and I said before, if we go back in time, what we typically miss is supply. No matter what your view of demand and where that’s going to be at, that depletion curve eventually catches up to that demand equation. And if you’re not investing, you will find the market gets short at some point in time. And my view is we’re in that point in time today. The industry is under-investing. You hear that coming out of OPEC in Saudi Arabia, they’re making that point. I think many people can see that maybe thinking it’s self-serving, but the reality is that’s an Issue.”

10/31/22: UAE’s Dr. Al-Jaber says global oil declines at 5 mmb/d per year

Dr. Sultan bin Ahmed Al-Jaber is CEO of the Abu Dhabi DNOC and is the president designate for the upcoming COP28 in UAE. He is the top oil executive in the UAE. His view on global oil decline rates is much the same as Saudi Arabia. Last year, Oct 31, 2022, we tweeted [\[LINK\]](#) “Global #Oil declines at ~5% per year so the world’s oil companies must add new production capacity or use up existing spare capacity of 5 mmb/d just to keep global oil production capacity flat. This builds in high US shale declines where the treadmill runs way faster. #OOTT.” Here is what we wrote in our Nov 6, 2022 Energy Tidbits memo. “We believe an overlooked basic of the global oil supply picture is the decline rate of the current oil production base of 100 mmb/d. It is a theme that we have highlighted for years and certainly before Covid. ADIPEC 2022 was this week in Abu Dhabi. One of the highlighted Monday speeches was by Abu Dhabi DNOC CEO HE Dr Sultan bin Ahmed Al Jaber. He reminded “now is not

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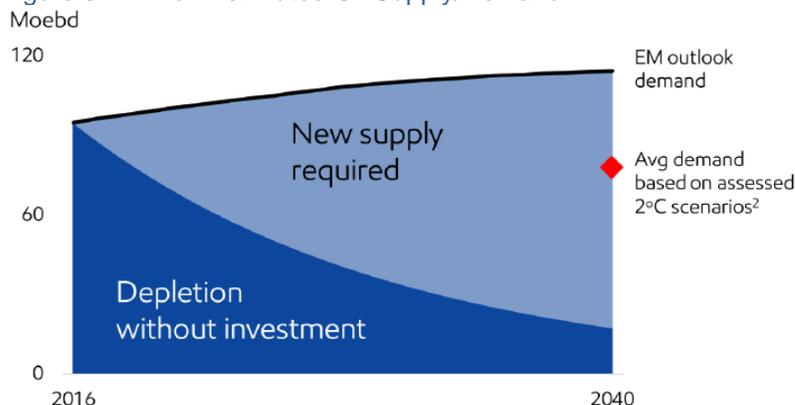
the time to point out that long-term under-investment in oil and gas has made a difficult situation even worse, as the data is clear.” But al Jaber also reminded of the basics of oil supply – the existing oil production base declines so if the world produces 100 mmb/d today, those same producing assets will be producing a lesser amount in one year. Al Jaber said “if we zero out hydrocarbon investment due to natural decline, we would lose 5 million barrels per day of oil each year from current supplies.” Al Jaber is using an approx. 5% decline rate, on average, across the existing global oil production base ranging from oil sands, to OPEC to deepwater to shale. The 5% global oil decline rate tends to be on the lower end of what we normally see of 5% to 7%.”

06/18/19: Exxon used a global oil production supply base decline of ~7% per yr

Before Covid and Russia/Ukraine, we have been highlighting that the base oil decline rate was a key reason why oil should be strong for the 2020s. And we were reminded of this them by Exxon on June 18, 2019. Here is what we wrote in our June 23, 2019 Energy Tidbits memo. *“Exxon’s bullish argument for post 2020 oil prices, global oil decline rate of ~7%. Exxon presented at a sellside conference this week, and we believe Exxon presented a very bullish argument for oil prices beyond 2020 which was overlooked because most readers only flip thru a slide deck and don’t listen to or read transcripts of management’s spoken words. Exxon’s spoken words highlighted one of the forgotten (and perhaps most important) oil supply/demand concerns for post 2020 – the mid term challenge to replace increasing rate of overall global oil declines. And what is eye opening is Exxon’s estimated overall global oil decline rate, which is way higher than any we can ever remember seeing. We posted a blog on Thurs evening titled “Exxon’s Math Calls For Overall Global Oil Decline Rate Of ~7%, A Very Bullish Argument For Post 2020 Oil Prices”. Our blog said “Its impossible to tell from the small oil supply/demand graph in the slide deck, but Exxon’s spoken words says long term oil demand is 0.7% per year and then “When you factor in depletion rates, the need for new oil grows at close to 8% per year and new gas at close to 6% per year.” Exxon may not specifically say what the global decline rate is, but their math is that the world needs new oil supply to grow annually at close to 8% to meet the 0.7% annual increase in oil demand and offset declines ie. an overall global decline rate of approx. 7%. This is an overall global oil decline rate for OPEC and non-OPEC”. BP’s estimate of overall global oil decline rate is 4.5% and we expect most are probably assuming something around 5%, certainly not above 6%. No one should be surprised by the increased decline rate given that high decline US shale and tight oil have increased by ~2.5 mmb/d in the last ~2 years. But an implied ~7% overall global oil decline rate is way higher than expectations. There is a big difference between needing to offset oil declines of ~7 mmb/d vs declines of ~4.5 mmb/d ie. an additional 2.5 mmb/d of new oil supply every year. Even if the implied difference was to 6%, it would still be an additional 1.5 mmb/d of new oil supply and that would also be very bullish for post 2020 oil. We recognize that the 2019/2020 oil supply demand story is the need for OPEC+ to keep cuts thru 2020, but Exxon’s math implying ~7% overall global oil decline rate sets up a very bullish view for oil post 2020. We believe the reality to replace oil declines post 2020 is overlooked.”* Our Supplemental Documents package includes our June 20, 2019 blog.

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Figure 37: Exxon Estimated Oil Supply/Demand



Source: Exxon June 2019

Oil: Saudi OSPs and exports influence market perceptions

We were asked on our view on Saudi Aramco OSPs that came out on Monday for September. (i) Saudi Aramco posted its OSPs for September. They made big increases to Europe customers, small increases to Asian customers and not change to US customers. However, their price premiums to US customers are already extremely high. For September, Saudi OSPs differentials to the US for extra light were \$9.40 in Aug and unchanged in Sept, and for medium were \$7.95 for Aug and unchanged in Sept. Whereas the differentials to the US for extra light were \$4.40 in Aug and now \$7.40 in Sept, and for medium were \$3.0 in Aug and now \$4.60 in Sept. (ii) We look at Saudi OSPs as not just about gaining/losing market share in a particular region. No question that is part of it, but we believe the primary objective is to influence markets. It's about where they are trying to get their crude but also where they don't want anyone to buy their crude. (iii) We think the key differential for Saudi is to the US. We have noted before that, at least for the US, Saudi likes to crank up the premium so US refiners don't want to take Saudi crude. And that is the way Saudi cuts get appreciated by "the market" the quickest because the US has weekly oil inventory data. So, if US refiners aren't taking Saudi crude as they normally do, then it tends to have an impact on overall imports and it shows up right away in weekly oil inventory. This is why we have seen the big premium to the US in July and Aug. they wanted their exports to be reflected as soon as possible. But with US oil inventories correcting, they probably think they don't have to keep that huge of a premium vs Europe. (iv) Some will say the widening premium to Brent and not to Asia is the Saudi's trying to recapture market share. That may well be the case, but we think the bigger play is that they want to try to do what they can to keep oil prices as low as possible to Asia so they don't hurt the recovery. Don't forget China is more than a China story, China drives Asia.

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

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

Iran adding 600,000 b/d to oil markets

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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 mmb/d 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 Raisi 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.

Iran says the \$6b frozen in South Korea has been released

Yesterday, Iran confirmed that that its \$6 billion frozen in South Korea institutions has been released. It was apparently \$7 billion but Iran reported said it lost nearly \$1

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billion over the past years due to the devaluation of the won vs US dollar. Iran statement media PressTV [LINK](#) reported “*Central Bank of Iran Governor Mohammad Reza Farzin says that Iranian funds recently released in South Korea as part of a prisoner swap deal with the United States will be deposited to accounts held by Iranian banks in Qatar despite reports suggesting that Qatar’s central bank will have control over the funds. Mohammad Reza Farzin said on Saturday that Iran can use the funds to purchase goods and products that are not subject to US sanctions. “Soon all these euro resources will be deposited to accounts of six Iranian banks in Qatar and will be used for purchase of non-sanctioned commodities via bank payments,” said Farzin in a post on his social media account.*

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

Two weeks ago, we saw the first production update post the brief shut-in of the Sharara and El Feel oil fields and the production update was right at its normal ~1.2 mmb/d. We have a 7am MT news cut off so the latest production update from Libya National Oil Corporation is as of Monday [LINK](#) “*Crude oil production reached 1.211 million barrels per day, and condensate production reached 43 thousand barrels per day during the past 24 hours.*” The 1.2 million barrels per day is the stable level of production Libya has had for the past several months.

**Libya oil stable
at 1.211 mmb/d**

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

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

Figure 38: Libya oil production Starting July 1, 2010



Source: Bloomberg, OPEC

Source: Bloomberg, OPEC

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Oil: Feels like China setting the stage for so so July economic data release

China is scheduled to release a range of July economic data tomorrow night local time such as retail sales, industrial production and fixed asset investment. In doing our early morning check of China state media news today, one of the upfront highlighted Global Times home page reports was “China’s July economic data to highlight improvement, challenges”. [\[LINK\]](#) Stories are for reasons on state media and, after reading this report, we suspect the report is to set expectations low for the release. The question will be is will the expectations disappoint. Global Times led off “After a series of Chinese policymakers’ back-to-back policy measures to boost the economy in the second half of 2023, many around the world are keeping a close eye on China’s forthcoming economic data for July to gauge the recovery trajectory of the world’s second-largest economy amid downward risks in other major economies. While data for industrial output, fixed-asset investment and consumption in July will likely point to slight improvements, challenges faced by the Chinese economy are also expected to be highlighted, analysts said on Sunday. However, after the traditionally down season for economic activity in July and August, a more pronounced economic rebound is expected at the end of the third quarter and the fourth quarter, which will ensure annual growth targets are met, thanks to the increasing policy support, they noted.” Maybe we will be surprised, but we don’t believe they would choose to highlight quotes on the challenges if it was to be a rosy economic data release. But all the quotes tend to have some optimism aspect.

**China’s
upcoming July
data**

Oil: 1st WoW drop in China scheduled domestic flights since June 13-19 week

Early Wednesday morning, we tweeted [\[LINK\]](#) “China scheduled domestic flights -0.4% WoW to 104,000 flights, following 6 consecutive WoW increases. Chinese consumer stepped up to fly this summer. But focus now shifts to watch flights post Aug summer holiday peak. Thx @BloombergNEF Claudio Lubis. #OOTT #JetFuel.” (i) Our tweet was based on BloombergNEF’s Aviation Indicators Weekly Aug 8, 2023. (ii) There is a reminder that summer holiday travel season in China is coming to an end in Aug. After six consecutive WoW increases in China scheduled domestic flights, there was a small -0.4% WoW decrease in flights to 104,000 flights for Aug 1-7 week. It’s still a solid week, But Aug should mark the end of peak summer holiday air travel. BloombergNEF notes scheduled domestic flights “over” the next four weeks is set to increase +1.8% to 105,862 flights. So a modest increase. But last week’s report had a then 4-week look ahead of 106,170 flights for period that only included Aug. Whereas this week’s includes the start of Sept ie. infers the start of Sept starts to decrease, which would be expected with summer holiday season over. The key to watch will be what happens in Sept /Oct. Flying remains well below what was expected at the end of March before there was a new Covid phase and the Chinese economy outlook dimmed. The return to normal summer season flying increase signaled the Chinese consumers aren’t worried about Covid so are back to spending to flying. But given that it still less than was expected four months ago, the working assumption should be they are spending their savings/income but not as much as might have expected four months ago. Recall the Chinese consumer didn’t get the free handout as happened in the west for Covid so for them its more spending their own money and not the bonus Covid money received elsewhere like in the US/Canada. And also that the stalling China recovery has held back non-holiday flying. (iii) China scheduled domestic flights -0.4% WoW to 104,000 flights for Aug 1-7 week. This is the first WoW decline since early June, after there were six consecutive weeks of WoW increases as was expected with the start of the summer holiday season. Prior to this

**China scheduled
domestic flights**

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week, there was a steady WoW increase from 92,568 flights in June 13-19 to 104,436 to July 25-31 before this week's -0.4% WoW to 104,000 flights for Aug 1-7 week. (iv) Today's number of scheduled domestic flights for the next four weeks is set to increase by 1.8% "over" the next four weeks to 105,862 flights. Note that this is less than last week's four-week look ahead of 106,170 flights. (v) The 4-week look ahead flights of 105,862 is essentially the peak of summer holiday air travel, yet it is -11.2% vs what was expected for a 4-week look ahead at the end of March. On March 28, BloombergNEF had the scheduled domestic flights for the next 4-weeks at 119,180 flights. The big jump up never happened in April and the summer holiday peak never got close to that April expectations. (vi) Also note how it was clear that the outlook tipped for a couple months at the end of March with lesser China recovery and the then worries about a new Covid peak to hit China at the end of June. The BloombergNEF March 28 report reported that the March 21-27 weeks flights were 89,513 flights and they forecast massive jump to 119,180 flights over the then next 4-weeks. Then the next week, March 28-Apr 3 week had made a huge WoW jump from 89,513 flights to 95,624 flights, but then the following week was down to 91,567 flights. And scheduled domestic flights didn't get back to March 21-27 until the end of June. Below is our running WoW changes from the prior BloombergNEF reports and the BloombergNEF charts from August 8 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

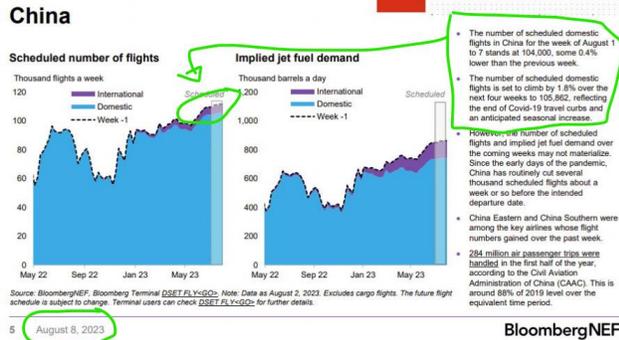
Figure 39: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

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

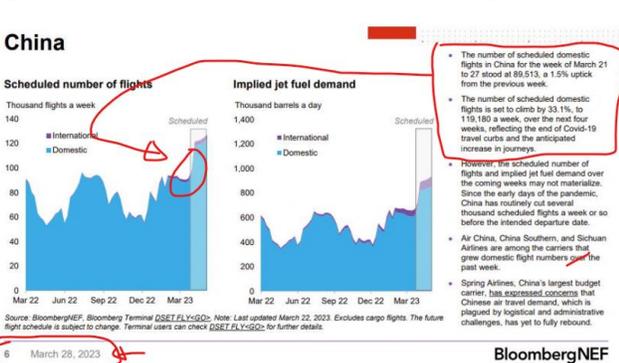
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Figure 40: China scheduled domestic air flights as of Aug 8



Source: BloombergNEF

Figure 41: China scheduled domestic air flights as of March 28



Source: BloombergNEF

Oil: China approves group travel to US, EU, Japan and other countries

Every week, we include China scheduled domestic air flights as a good indicator of the Chinese consumer. We only occasionally highlight Chinese international flights as, up until now, China hasn't allowed groups to visit the major foreign destinations for travel and family such as the US. But that changed on Thursday. This is the 3rd round of countries that China no longer restricts group travel post Covid. But it is important to note that the restricted removal wasn't necessarily related to Covid issues/improvements. On Thursday, we tweeted [\[LINK\]](#) "Wonder how much Chinese consumer has been saving for first international air travel since Covid? China announced resumption of "group tours to some 78 countries including the US, Japan, South Korea, Australia, India and the majority of European countries". #OOTT #JetFuel." Our tweet included the Global Times, Chinese state media report [\[LINK\]](#) "China on Thursday announced the resumption of a third round of group tours to some 78 countries including the US, Japan, South Korea, Australia, India and the majority of European countries. The Ministry of Culture and Tourism made the announcement with immediate effect, specifying that the outbound group tour services to these countries will be resumed at all national travel agencies and online travel companies." Our Supplemental Documents

China approves group travel to EU, US, etc

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package includes the Global Times report.

China says Japan was held back to 3rd round due to non-Covid reasons

The China restrictions on group travel were put during Covid but they acknowledge that their order of removing the group travel restrictions haven't been Covid related. Rather on Friday, Global Times (state media) posted an opinion piece "*Japan's gestures to China – real desire to reconcile or just for show?: Global Times editorial.*" [\[LINK\]](#). Global Times notes that, pre-Covid, Chinese tourists made up 30% of international tourists to Japan. And the opinion piece is all about Japan needs to step up in its relationship with China. And was clear that Japan was held back to the 3rd round due to political reasons. Global Times wrote "*Chinese tourists once accounted for 30 percent of overseas tourists visiting Japan. Due to the direct impact of the COVID-19 pandemic, the number has sharply declined. As the pandemic's influence has subsided, many countries, including Japan, are stepping up efforts to attract foreign tourists. China didn't resume outbound group tour services to Japan in the first two rounds, which can be attributed to complex factors beyond the epidemic. And it is also a reflection of the reality of the dilemma of China-Japan relations. Japan's tourism industry certainly hopes for an increase in Chinese tourists and Japanese society is also looking forward to the easing of China-Japanese relations - or, in other words, it has a stronger worry that China and Japan will move toward confrontation. We can clearly feel this from the Japanese public opinion. The Japanese government should have sensed it and taken action as well. It's reported by Japanese media on Wednesday that during the ASEAN series of meetings held in September, it is possible for a high-level leadership meeting between China and Japan, and China has a "positive attitude" toward this. This news has not been confirmed by China so far, but Japanese media claims that China-Japanese relations have been further damaged recently due to Japan's planned dumping of nuclear-contaminated water into the sea, and Tokyo has been seeking to improve bilateral relations with Beijing.*"

Oil: Baidu China city-level road congestion seeing a start to end of summer holidays

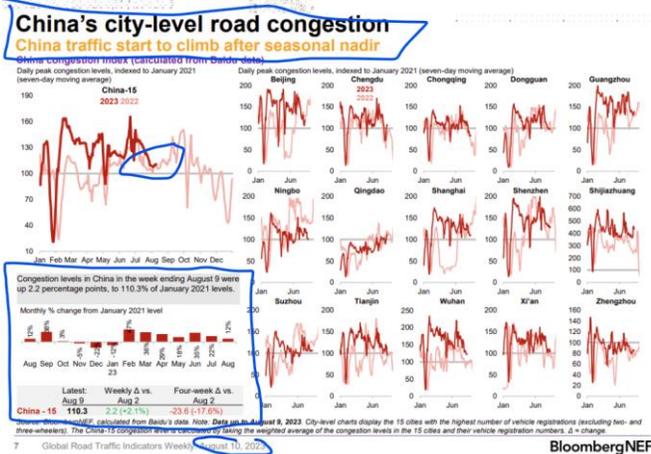
It looks like we may have seen the first indication, from a city-level traffic perspective, that China summer holiday season is starting to wind down. (i) On Thursday, we tweeted [\[LINK\]](#) "*China summer holidays ending = city traffic increasing and domestic air travel down. China Baidu city-level road congestion +0.4% WoW to 110.3% of Jan/21 levels. But 📈 08/09 tweet, 1st WoW decline since early June in domestic flights. Thx @BloombergNEF #OOTT.*" (ii) BloombergNEF posted its Global Road Traffic Indicators Aug 10 report, which includes the China Baidu city-level road congestion data for week ended Aug 9. (iii) BNEF's headline was "*China traffic start to climb after seasonal nadir*". (iv) For the week ended Aug 9, 2023, Baidu data for China city-level road congestion was +2.2% WoW to 110.3% of Jan 2021 levels. It looks to be an indicator that summer holiday season is starting to end and more people are returning to cities and back to work. This should lead to a seasonal increase to 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. The modest WoW increase in city-level road congestion fits to yesterday's China scheduled domestic air flights that had their first, albeit small -0.4% WoW, decrease in domestic flights that also likely signaled the peak of the summer holiday season was ending. (v) BloombergNEF provided its specific by

China city-level
traffic congestion

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city numbers for Aug, but this is for only the first 9 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, 7 are up YoY and 8 are down YoY. Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators Aug 10 weekly report.

Figure 42: China city-level road congestion for the week ended Aug 9



Source: BloombergNEF

Figure 43: China city-level road congestion for the week ended Aug 9.



Source: BloombergNEF

Oil: China oil imports +17% YoY to 10.33 mmb/d

China oil imports

On Tuesday, Bloomberg reported on the summary data of China's oil and natural gas imports for July based on China's General Administration of Customs website. It is only summary data and it did not include China's oil production for July. But on the summary data, Bloomberg reported China's July oil imports were +17% YoY to 10.33 mmb/d, but that was down 18.8% MoM.

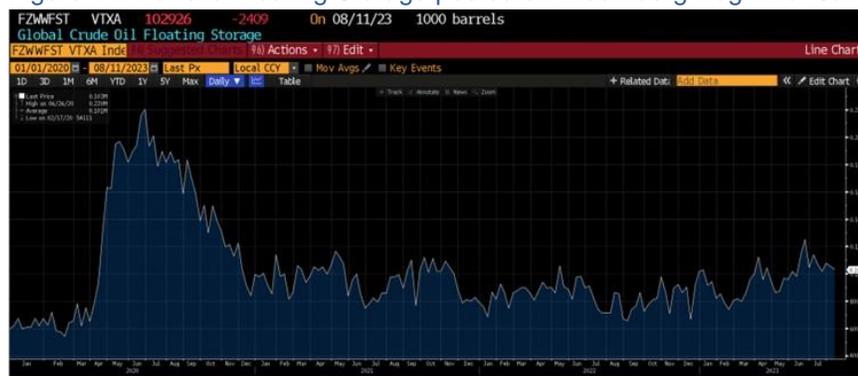
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Vortexa floating storage

Oil: Vortexa crude oil floating storage at Aug 11 was 102.93 mmb, -2.41 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 our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Aug 5 at 9am MT (i) Aug 4 was revised +3.59 mmb but, other than that, most of the other revisions were downward revisions to the prior several weeks. Also there weren't big revisions to Aug 4 on the by regions splits. (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Aug 11 at 102.93 mmb, which is -2.41 mmb WoW vs upwardly revised Aug 4 of 105.34 mmb. Note Aug 4 of 105.34 mmb was revised +3.59 mmb vs 101.75 mmb originally posted at 9am MT on Aug 5. (iii) Revisions. Aug 4 was revised +3.59 mmb, July 28 was basically flat and all other revisions were downward revisions. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on Aug 5 are as follows: Aug 4 revised +3.59 mmb. July 28 revised +0.12 mmb. July 21 revised -4.62 mmb. July 14 revised -2.39 mmb. July 7 revised -5.91 mmb. June 30 revised -1.07 mmb. June 23 revised -0.72 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 106.13 mmb vs last week's then seven-week average of 110.86 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 11 estimate of 102.93 mmb is -117.38 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (viii) Aug 11 estimate of 102.93 mmb is +37.32 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) Aug 11 estimate of 102.93 mmb is +16.69 mmb YoY vs Aug 12, 2022 of 86.24 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Aug 12, 9am MT Aug 5, and 5am MT July 23.

Figure 44: Vortexa Floating Storage posted on Bloomberg Aug 12 at 9am MT



Source: Bloomberg, Vortexa

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Figure 45: Vortexa Estimates Posted Aug 12 9am MT, Aug 5 9am MT, July 30 5am MT

Posted Aug 12, 9am MT						Aug 5, 9am MT						July 30, 5am MT					
FZWWFST	VTXA	Inde	94	Su		FZWWFST	VTXA	Inde	94	Su		FZWWFST	VTXA	Inde	94	Su	
01/01/2020					08/11/2023	01/01/2020					08/04/2023	01/01/2020					07/28/2023
1D	3D	1M	6M	YTD	1Y	1D	3D	1M	6M	YTD	1Y	1D	3D	1M	6M	YTD	1Y
Date						Date						Date					
Last Px						Last Px						Last Px					
Fr 08/11/2023						Fr 08/04/2023						Fr 07/28/2023					
102.926k						101.748k						104.126k					
Fr 08/04/2023						Fr 07/28/2023						Fr 07/21/2023					
105.335k						107.366k						107.703k					
Fr 07/28/2023						Fr 07/21/2023						Fr 07/14/2023					
107.492k						106.429k						111.066k					
Fr 07/21/2023						Fr 07/14/2023						Fr 07/07/2023					
101.807k						109.407k						123.918k					
Fr 07/14/2023						Fr 07/07/2023						Fr 06/30/2023					
107.016k						119.648k						110.308k					
Fr 07/07/2023						Fr 06/30/2023						Fr 06/23/2023					
113.739k						105.631k						133.236k					
Fr 06/30/2023						Fr 06/23/2023						Fr 06/16/2023					
104.561k						125.781k						118.616k					
Fr 06/23/2023						Fr 06/16/2023						Fr 06/09/2023					
125.059k						114.804k						102.426k					
Fr 06/16/2023						Fr 06/09/2023						Fr 06/02/2023					
114.605k						98560						104.266k					
Fr 06/09/2023						Fr 06/02/2023						Fr 05/26/2023					
98183						102.284k						96982					
Fr 06/02/2023						Fr 05/26/2023						Fr 05/19/2023					
101.73k						95875						97833					

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) There weren’t any large revisions by region or in total to the originally posted (as of 9am Aug 5) floating oil storage for Aug 4. Rather the largest revisions to Aug 4 by region were Other revised 2.55 mmb, and West Africa revised -2.19 mmb. (ii) The one item to note is that Other is now up to 31.56 mmb as of Aug 11, but we don’t have where 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 4 that was posted on Bloomberg at 9am MT on Aug 5.

Vortexa floating storage by region

Figure 46: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Aug 11/23	Aug 4/23	WoW	Aug 4/23	June 23/23	Aug 11 vs June 23
Asia	50.10	45.91	4.19	44.07	68.04	-17.94
Europe	6.63	10.15	-3.52	8.69	6.36	0.27
Middle East	6.86	10.14	-3.28	10.11	9.06	-2.20
West Africa	6.99	8.17	-1.18	10.36	3.85	3.14
US Gulf Coast	0.79	1.40	-0.61	1.50	1.23	-0.44
Other	31.56	29.57	1.99	27.02	36.52	-4.96
Global Total	102.93	105.34	-2.41	101.75	125.06	-22.13
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Aug 12						

Source: Vortexa, Bloomberg
Source: Bloomberg, Vortexa

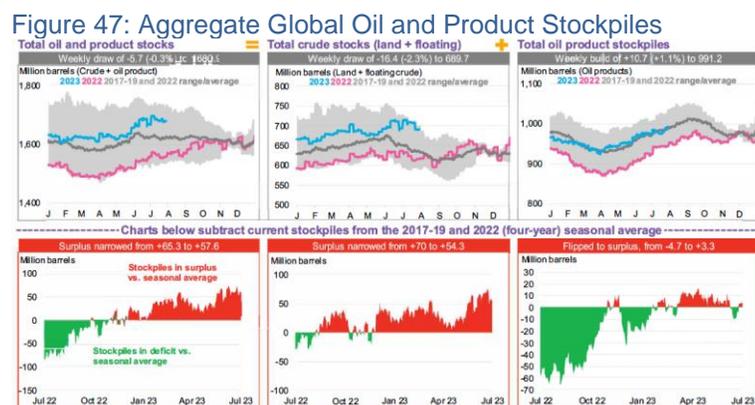
Oil: BNEF – global oil and product stocks surplus narrowed WoW to 57.6 mmb

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending July 28, which is a week earlier than the EIA US oil inventory data that is for the week ending August 4. So, the BloombergNEF global oil stocks data won’t include the US crude oil

Global oil and product stocks

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inventory build of 5.9 mmb for the week ending August 4. On Monday, BloombergNEF posted its “Oil Price Indicators” weekly, which provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products surplus narrowed from 65.3 mmb to 57.6 mmb for the week ending July 28. Land crude oil inventories decreased by -18.5 mmb WoW to 581.2 mmb, flipping the surplus to a deficit of -7.4 mmb against the five-year average (2016-2019, 2022). Total crude inventories (incl. floating) decreased by -16.4 mmb WoW to 689.7 mmb, narrowing the surplus from +70.0 mmb to +54.3 mmb. Total product stocks were up by +10.7 mmb WoW to 991.2 mmb, flipping the deficit to a surplus of +3.3 mmb against the 4-year average (2017-2019, 2022) for the July 28 week. The gas, oil, and middle distillate stocks decreased by -0.1 mmb WoW to 150.4 mmb/d, with the deficit against the four-year average narrowing to -20.5 mmb. Jet fuel consumption by international departures for the week of August 14 is set to increase by +33,200 b/d WoW, while consumption by domestic passenger departures is forecast to increase by +3,400 b/d WoW. Below is a snapshot of aggregate global stockpiles.



Source: BloombergNEF

Oil: Global air travel continues to ramp up, now 94.2% of pre-Covid levels

On Tuesday, the International Air Transport Association (IATA) released air passenger data for June 2023 [\[LINK\]](#) and the June data showed the same air passenger trends. Domestic air travel around the world was above pre-Covid levels for the 3rd consecutive month. International air travel keeps recovering but is still below pre-Covid levels. (i) Total traffic in June, measured in revenue passenger kilometers (RPK), rose +31.0% YoY. Please note the IATA splits out total market air travel into International travel vs Domestic travel. (ii) For June 2023, total global RPKs were -5.8% vs June 2019 levels, but that was split between International RPKs -11.8% vs June 2019 and Domestic RPKs +5.1% vs June 2019 levels. (iii) The IATA commented “North American carriers, being among the first airlines to resume operations, led the way in terms of recovery. With an additional 20.0% growth over 2022 levels in the first six months of the year, their RPKs outperformed pre-pandemic traffic by 0.8%.” Our Supplemental Documents package includes the IATA release.

Air travel up significantly in June

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Figure 48: June 2023 Air Passenger Market

	<i>World</i>	June 2023 (% year-on-year)		
	<i>share</i> ¹	RPK	ASK	PLF (%-pt) ²
TOTAL MARKET	100.0%	31.0%	28.8%	1.4%
Africa	2.1%	31.8%	40.5%	-4.6%
Asia Pacific	22.1%	90.1%	73.3%	7.1%
Europe	30.8%	13.0%	11.5%	1.2%
Latin America	6.4%	18.7%	17.1%	1.1%
Middle East	9.8%	28.3%	24.5%	2.4%
North America	28.8%	12.9%	13.8%	-0.7%
International	58.0%	33.7%	31.7%	1.3%

Source: IATA

Oil: Air cargo in June “Air cargo records the smallest contraction since Feb 2022”

We look at international air cargo as the data that reaffirms the level of export orders and trade. So continued YoY contraction in air cargo reflects the continued YoY contraction in trade, at least trade via air. The IATA also notes that air cargo is losing market share to cheaper shipping cargo. On Monday, the International Air Transport Association (IATA) announced cargo data for the month of June [\[LINK\]](#). The global demand in air cargo markets remained in a YoY deficit for the 16th consecutive month in June 2023. However, the IATA wrote “Major trade lanes including Europe-North America and Asia-North America experienced smaller annual contractions in international air cargo demand in June, improving by 2.1 percentage points compared to May”. Global demand, measured in cargo tonne-kilometres, fell -3.4% YoY in June, compared to last month’s -5.2% YoY decline. Despite the YoY weakness total demand was +9.9% above pre-pandemic levels. Cargo demand continues to be above 2019 levels, since total demand broke the threshold in April. On the international level, all regions except Latin America and the Middle East saw YoY declines in volume for June and continue to remain below levels seen a year ago. Latin American carriers realized an increased of +7.3% YoY in air cargo volumes in June (+3.8% in May), Middle Eastern Carriers experienced a +0.5% YoY increase (-3.1% YoY in May), Asia-Pacific airlines decreased by -3.6% YoY in June (-3.3% YoY in May), Africa carriers saw a -2.8% YoY decline (-2.4% YoY in May), North American carriers posted a -6.5% YoY decrease (-8.1% YoY in May), and finally, European carriers saw a -2.8% YoY decline (-7.2% YoY in May). Our Supplemental Documents package includes the IATA release.

**Air cargo
demand down
YoY in June**

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Figure 49: June 2023 Air Cargo Market

	June 2023 (% year-on-year)			
	World share ¹	CTK	ACTK	CLF (%-pt) ²
TOTAL MARKET	100.0%	-3.4%	9.7%	-5.8%
Africa	2.0%	-2.8%	-3.7%	0.4%
Asia Pacific	32.4%	-3.6%	24.4%	-13.6%
Europe	21.8%	-2.8%	4.4%	-3.5%
Latin America	2.7%	7.3%	15.4%	-2.5%
Middle East	13.0%	0.5%	11.1%	-4.7%
North America	28.1%	-6.5%	0.7%	-2.9%

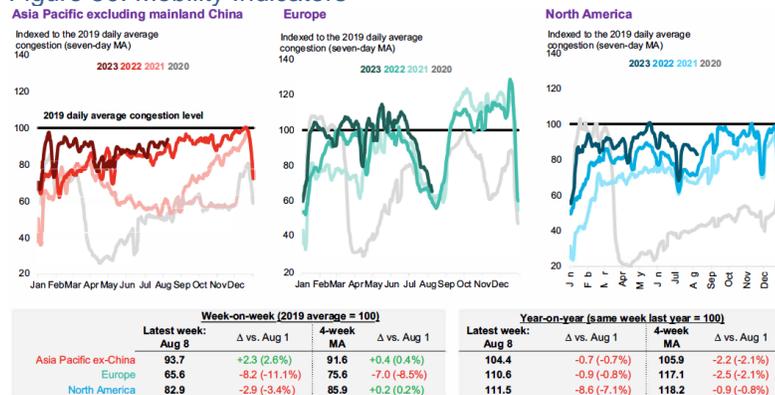
Source: IATA

Oil: TomTom city road congestion – Asia Pacific increases, while EU and NA 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 8, Asia Pacific (ex-China) city road congestion levels increase by +2.6% WoW, while Europe and North American city level congestion level decreased -11.1% and -3.4% 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 -34.4%, -17.1% and -6.3% below the 2019 average and are +10.6%, +11.5% and +4.4% YoY, respectively. It is important to note that last week was the August long weekend in North America. City traffic in Europe significantly dropped in July 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 start August. It's 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 50: Mobility Indicators



Source: BloombergNEF's calculation based on TomTom data. Note: Data up to August 8, 2023. Δ = change. MA = moving average.

Source: BloombergNEF

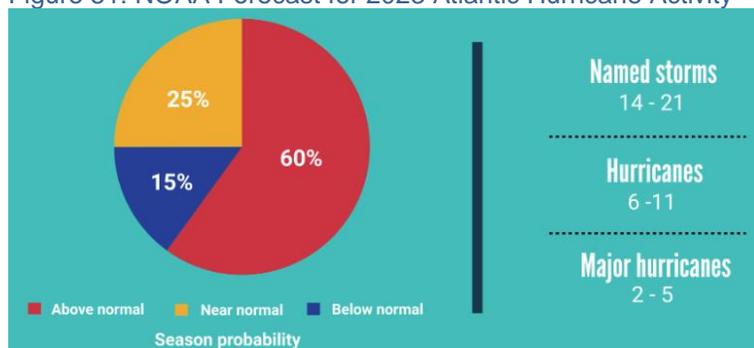
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Oil & Natural Gas: NOAA forecasts above-normal Atlantic hurricane season

On Thursday, NOAA released its updated forecast for the 2023 Atlantic hurricane season [\[LINK\]](#). The NOAA increased its forecast to an above-normal hurricane season, estimating that there will be between 14-21 total named storms, with between 6-11 of them having potential of becoming hurricanes. The NOAA estimations are comparable to recent hurricane forecast updates by Philip Klotzbach at Colorado State University and AccuWeather (see our Aug 6, 2023 Energy Tidbits). The NOAA's lead hurricane season forecaster, Matthew Rosencrans, commented *"The main climate factors expected to influence the 2023 Atlantic hurricane activity are the ongoing El Nino and the warm phase of the Atlantic Multi-Decadal Oscillation, including record-warm Atlantic sea surface temperatures; Considering those factors, the updated outlook calls for more activity, so we urge everyone to prepare now for the continuing season"* El Nino conditions are currently being observed, and it is noted that there is a >95% chance that El Nino will continue through the Northern Hemisphere winter. Below is the NOAA forecast table. Our Supplemental Documents package includes NOAA's forecast.

Above-normal hurricane season expected

Figure 51: NOAA Forecast for 2023 Atlantic Hurricane Activity



Source: NOAA

NOAA's hurricane forecast is in line with Klotzbach and AccuWeather

There were no surprises from the NOAA hurricane forecast as it lined up with the other top hurricane forecasters. Last week's (August 6, 2023) Energy Tidbits memo highlighted the Colorado State University (Phil Klotzbach) updated Atlantic hurricane season forecast calling for above-average hurricane activity in 2023 [\[LINK\]](#). Klotzbach estimated a total of 18 named storms, with 9 of them having the potential to become a hurricane. The Atlantic hurricane season runs from Jun 1 to Nov 30. And we also highlighted AccuWeather is forecasting above-average activity for the 2023 hurricane season [\[LINK\]](#), which is in-line with the NOAA and Klotzbach. On average, a normal hurricane season produces 14 named storms with roughly 50% of them reaching hurricane strength and storm seasons accompanied by El Nino characteristics are typically less intense. With that said, AccuWeather estimates that there will be 13-17 named storms with 35-50% of them potentially reaching hurricane strength, which implies slightly below normal activity levels relative to the historical 30-year average.

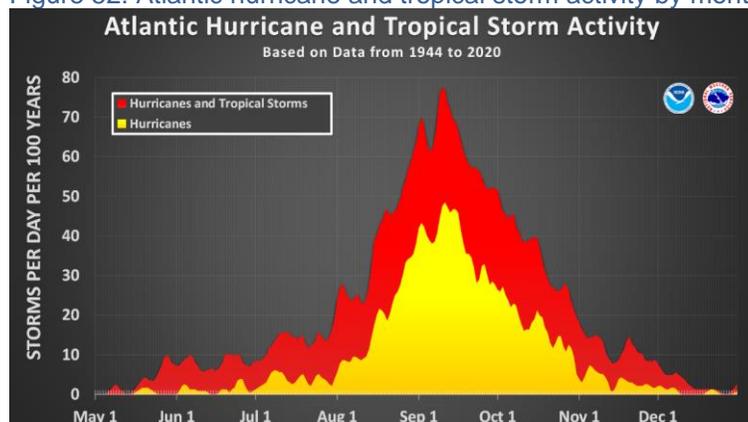
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Oil & Natural Gas – 90% of Atlantic hurricanes are after Aug 1, peak is mid-Sept

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. [\[LINK\]](#)

90% of
hurricanes after
Aug 1

Figure 52: Atlantic hurricane and tropical storm activity by month



Source: NOAA

Oil & Natural Gas: CNBC Halftime Report on Thurs highlighted deepwater drilling

We had CNBC Halftime Report on in the background on Thursday, when they opened with a major focus on oil and gas deepwater drilling. One of the panel gave his trade alert on buying Transocean [\[LINK\]](#) and another of the panel member joined in on his longer term holding. They spent a lot of time (9 minutes video is at [\[LINK\]](#)) at the start of the show on this theme of deepwater drilling. We listened to them talk about the general theme of increasing deepwater drilling activity so there wasn't any specifics on how the major service companies all highlighted this theme in the just completed Q2 calls. So we tweeted [\[LINK\]](#) "For those watching the opening focus on deepwater drilling, see [👉 tweets on big service co's seeing multi year across the globe deepwater drilling upcycle. Schlumberger \[LINK\]. Weatherford \[LINK\]. NOV \[LINK\]. #OOTT @TheDomino.](#)" The links were to our tweet on Schlumberger, Weatherford and NOV. We highlighted this multi-year across the globe deepwater drilling cycle in our writeups of the Q2 service sector calls in our July 30, 2023 Energy Tidbits. Here is what we wrote "Note that we just put the oil and gas service company comments that are linked to what we saw the biggest theme to emerge from their Q2 calls – they are seeing a broad based international capex recovery that points to higher than expected international oil and gas supply. The major oil and gas service companies don't necessarily come out and say there is going to be stronger than expected growth in international oil and natural gas but that seems to be where they are all pointing. They are

Deepwater drilling

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speaking to their books and their books are all pointing to a multi-year growth in international oil and gas capex.” Below are our comments from the July 30, 2023 Energy Tidbits memo.

Core Labs: multi year international recovery in exploration & development

Core Labs reported Q2 on Wednesday night and held its call on Thursday morning and they had a pretty clear message on increased spending on exploration and development and across the globe. Hard not to take their clear comments as anything but pointing to stronger than expected international oil and gas supply growth. On Wednesday night, we tweeted [\[LINK\]](#) “#CoreLabs Q2 “multi-yr international recovery increased spending on exploration across the globe & expanded development of existing fieldscontinued improvement in international onshore & offshore activity, with on-going projects across the globe” Better than expected international #Oil #NatGas supply in 2020s?? #OOTT.” Core Labs said “Based on conversations with the Company’s global client base, Core Lab maintains its constructive outlook on international upstream activity for the second half of 2023 and beyond, as a higher level of investment will be required to maintain and grow hydrocarbon production. The Company anticipates spending on long-cycle upstream projects in both onshore and offshore environments will continue to expand. In the near-term, the global crude-oil market may remain volatile due to global recession fears and uncertainty about the extent and timing of China’s economic recovery. The recent OPEC+ crude-oil production cuts being implemented to support the current market are not expected to be maintained or required long-term. Additionally, production growth in areas outside of OPEC+ continue to face constraints due to prolonged underinvestment, as well as the loss of production due to natural declines from existing fields. Core continues to anticipate a multi-year international recovery supported by increased spending on exploration in many regions across the globe and expanded development of existing fields to fortify crude-oil and natural gas reserves. This underlies Core's outlook for continued improvement in international onshore and offshore activity, with on-going projects across the globe, most notably across the Middle East, South Atlantic Margin and West Africa.”

NOV: “more brownfield, tie-back focused” international development projects”

NOV is a great example of why we read earnings call transcripts – mgmt. will say a lot more in the call than they write in their release/report. NOV is a great example and mgmt. directly says they will give more color. NOV is the former National Oilwell Varco and reported Q2 on Wednesday and held its Q2 call on Thursday. NOV’s insights were the same on the big international capex ahead BUT their comments point to increasing international production in the short term. (i) On Wednesday night, we tweeted on the Q2 release [\[LINK\]](#) ““substantial backlog of #Oil & #NatGas development projects across offshore and international land markets” #NOV CEO in Q2. Stronger than expected international oil & gas supply in 2020s?? #OOTT.” (ii) But they gave more insight in the Q2 call saying “I’m going to also add a little more color. I think there’s sort of two-parts to this wave early part. I think is going to be a little more brownfield, tie-back focused and following that though, I think you’re going to see a lot more FIDs, I’ve seen estimates of 500 billion in offshore FIDs through 2026 which point the more greenfield developments and both brownfield as well as greenfield fit sort of our product offering And so one of he is prepared to really meet

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that demand. But looking at our situation.” Brownfield/Tie-backs means short term supply adds. Also note their comments on the capex -this is not capex that is down the road 5 years before there is oil production. This is brownfield, tie-back focused ie. within a year or two or three max. It reinforces the point that all this offshore activity will lead to higher than expected oil and natural gas supply from offshore. And the brownfield/tie-back focus means the impacts is sooner than later. (iii) It’s not just near-term brownfield and tie-backs but also for medium and long-term supply with their bullish offshore outlook that is broad-based across the world. Mgmt said ““Our customers are mobilizing for significant offshore and international drilling campaigns over the next few years, which will require support” “we expect international and offshore markets to overcome these near-term North American headwinds as most and offshore focused IOCs are pressing forward with aggressive campaigns. Specifically, we are pleased to see growing activity in West Africa, Asia, the North Sea and offshore Mexico and continued strength in the Middle-East, Guyana, Brazil and North Africa.”

Schlumberger: a broad resurgence in offshore

Schlumberger kicked off the Q2 earnings for the service companies a week ago. Here is what we wrote on Schlumberger’s Q2 call in last week’s (July 23, 2023) Energy Tidbits memo. “Schlumberger points to stronger growth from offshore for long term. We recommend reading the Schlumberger Q2 call transcript from the Friday call as it seemed like a significant change to its long term outlook for oil and natural gas. (i) On Friday morning before the Q2 call we compared the SLB outlook comments from the Q2 results vs the outlook from the Q1 results. We tweeted [LINK](#) “Positive but less bullish long term #Oil#NatGas outlook from #Schlumberger. 1st sentence of outlook. Q2: “We continue to see positive upstream investment momentum in the international and offshore markets” Q1: “Looking at the macro, we maintain our very constructive multiyear outlook as the upcycle attributes and key activity drivers continue to evolve very positively.” #OOTT.” There wasn’t any statement as such, but we thought it was a big change in view towards the long term. (ii) Then when saw the Q2 call transcript, SLB didn’t come out and specifically say that they see a big increase in offshore oil and natural gas supply but their comments certainly pointed to that. SLB had many bullish comments on offshore activity – how it was pickup broadly around the world, FIDs were working below \$50 oil, new players are in, etc. Yesterday, we tweeted [LINK](#) “ Stronger than expected #Oil #NatGas supply from offshore in long term? #Schlumberger may not specifically say it, but their Q2 call comments point to it. international “investment momentum of past few years is accelerating” “witness a broad resurgence in offshore” “operators all over the world are making large scale commitments to ascend discovery, accelerate development times and increase the productivity of their assets” “new projects in offshore basins across the world” “vast majority of the FID [Offshore] are below \$50” And more. #OOTT.”

Weatherford: deepwater offshore activity increasing in 2024 and 2025

Weatherford held its Q2 call on Wednesday and highlighted the growth in offshore deepwater activity in 2024 and 2025. (i) On Wednesday, we tweeted [LINK](#) “Stronger than expected #Oil#NatGas supply in 2020s from resurgence of offshore?”

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#Weatherford "Broader indicators support the positive story we see unfolding for offshore. CapEx growth, a significant step up in project sanctions, tightening rig utilization, and rising activity validate our positive outlook for the next few years, especially for deepwater where we expect market activity to grow around 10% in 2024 and continue into 2025." (ii) See "pockets" of international growth outside Middle East and Latin America. Weatherford didn't speak as bullish on an across the entire globe pickup as other service companies. Weatherford said "Internationally, the activity outlook is robust in the near to mid-term, led by the Middle East and Latin America, with additional pockets of growth in Asia-Pacific, Mediterranean, and other regions. In the Middle East, continued field development investment in Saudi Arabia, UAE, Kuwait, and others, along with regional exploration projects, set the stage for robust rig and well count growth that should enable double-digit growth in 2024. In Latin America, rig and well activity are showing steady growth in the high single digits, led by a significant step up in offshore investment in Mexico, Guyana, Brazil, and in unconventional in Argentina."

Oil & Natural Gas: Alberta wildfires down, BC wildfires still high

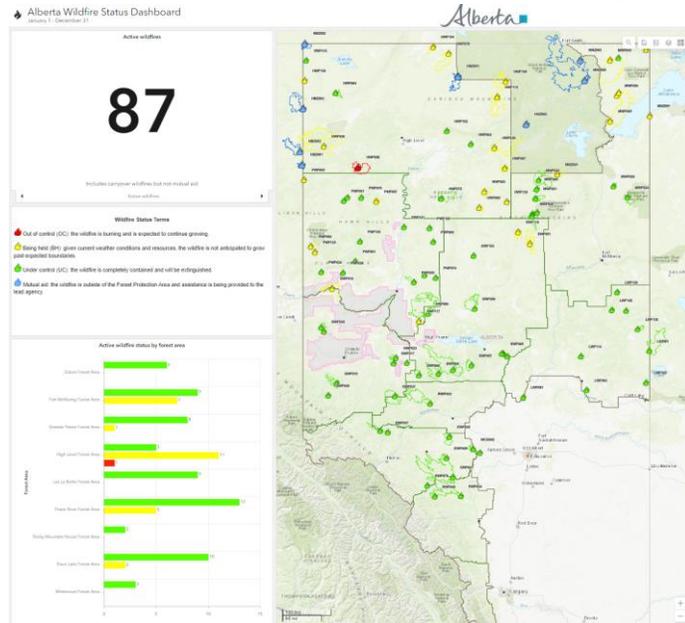
Alberta wildfires continue to decline but BC wildfires were up again this week. As of 7pm MT last night, there were 87 Alberta wildfires including only 1 Out of Control, which compares to a week ago at 93 Alberta wildfires included 2 Out of Control. As of 7pm MT last night, there were 378 BC wildfires including 172 Out of Control, which compares to a week ago at 368 BC wildfires included 189 Out of Control.

BC and Alberta Wildfires

Links to Alberta and BC wildfire status maps

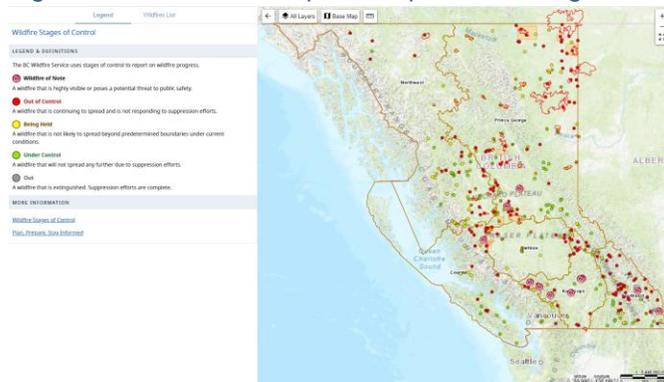
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [\[LINK\]](#) and the BC Active Wildfires interactive map [\[LINK\]](#). Please note these links have changed over the past few years. Both maps are interactive and open up for the information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

Figure 53: Alberta wildfire map as of 7pm MT on Aug 12



Source: Alberta Wildfire Status Dashboard

Figure 54: BC wildfire map as of 7pm MT on Aug 12



Source: BC Wildfire Service

Oil & Natural Gas: Above average rainfall in Alberta in July helped on wildfires

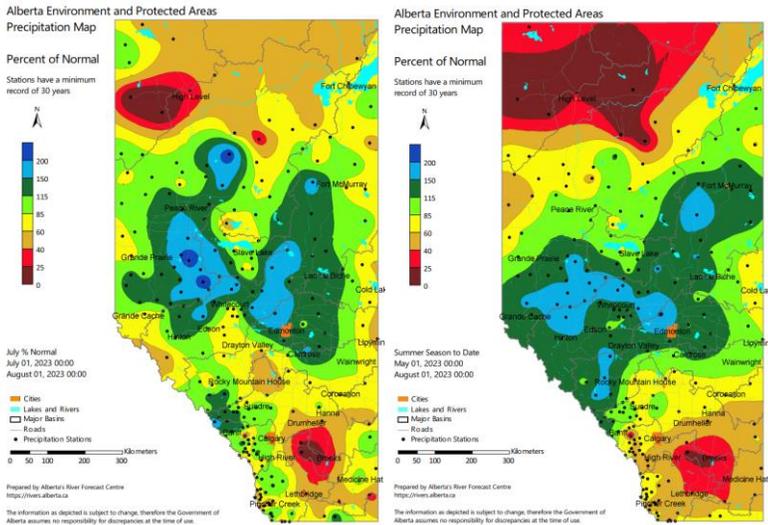
We have been noting how we have been unable to access the Alberta government data on precipitation for June and we kept getting the message “Server Error. 404 – File or directory not found. The resources you are looking for might have been removed, had its name changed, or is temporarily unavailable.” That changed this week. It looks like they made changes to their website as the maps this week were different from than a month ago. July [\[LINK\]](#) had average to above average precipitation for most of central Alberta, but it was very dry in the north. And the precipitation for the summer season to date (May 1-Aug 1) [\[LINK\]](#) is

Rain in Alberta in July

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now much the same. And this rain in July has to have been the key factor for reducing Alberta wildfires in July.

Figure 55: Alberta Precipitation % of Normal for July 1-Aug 1, and May 1-Aug 1



Source: Alberta Environment

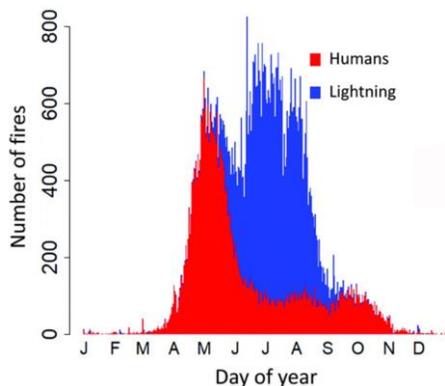
Oil & Natural Gas: Peak Cdn wildfire season is normally Jul/Aug & lightning is #1

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

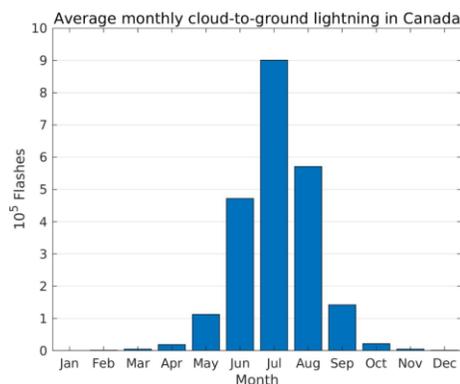
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Figure 56: Canada Wildfires Distribution Over Year



Source: Wildfire Today

Figure 57: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Energy Transition: Biden just can't say the words climate change national emergency
 We listened to more of Biden's Aug 9 interview with Weather Channel but the headlines were on two items. (i) Biden says "*practically speaking*" he has declared climate change a national emergency. We can understand why reporters and Democrats on the left want to get Biden to officially declare a climate emergency as it would allow the Administration to access added funds without Congress approval and open up a big uncertainty on what emergency actions he could enact. But we can't see him declaring something in the summer, the question to us is if he will do so ahead of COP28. Ultimately, we think the key consideration will be if he thinks it helps him in the 2024 election. And everyone knows Biden, even moreso than other politicians, likes to run on his record of accomplishments. We have previously seen climate side say that Biden could then do things like stopping crude oil exports. On Wednesday, the Weather Channel interviewed Biden and tried to get him to officially say the was calling a climate emergency but Biden wouldn't directly say he has or will do so. Rather he says that "*practically speaking*", he has already done so. (ii) Climate change is an "*existential threat*". Biden obviously didn't get the message from the new UN IPCC head Jim Skea that the focus

Biden on climate change emergency

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shouldn't be to constantly communicate the world is facing an existential threat if the climate change side wants to make as much progress as possible on climate change. Biden stuck to his normal line on climate change "*It is the existential threat to humanity.*" (iii) Here is the transcript we created of comments by President Biden to Weather Channel's Stephanie Abrams on August 9, 2023. Video clip at [\[LINK\]](#). Items in "*italics*" are SAF Group created transcript. Abrams "*Mr. President, you called climate change a code red for humanity. The World Health Organization said it would cause an additional quarter of a million deaths a year starting in 2030, are you prepared to declare a national emergency with respect to climate change? Biden "I've already done that. National or we've conserved more land. We've moved into, we rejoined the Paris climate accord. We passed the \$368 billion dollar climate control facility. We're moving. It is the existential threat to humanity."* Abrams "*So you've already declared that national emergency?"* Biden "*Well, practically. You've got a bug on you,*" Abrams "*So you've already declared that national emergency?"*. Biden "*practically speaking, Yes*"

New UN IPCC head Jim Skea's message

Last week's (Aug 6, 2023) Energy Tidbits memo highlighted the new UN IPCC head Jim Skea. Here is what we wrote "*It will be interesting to learn more about how Jim Skea, the new appointed head of the UN's Intergovernmental Panel on Climate Change (IPCC), plans to lead the IPCC in this period where the energy transition isn't on track and more supporters are backing off their plans. We thought he made a good first impression as someone who is less focused on finding out who to blame and focused on getting everyone focused on taking measures to reduce emissions. If anything, he seemed to be warning others on the climate change side to tone down their fear approach of the world facing an existential crisis and focus on getting things done. Jim Skea, spoke to two major German news outlets over the weekend, soon after his appointment. Last Sunday night, we tweeted [\[LINK\]](#) "Finally! @JimSkeaIPCC, new head of UN IPCC climate panel, priority seems to be attack the problem to reduce emissions and get as many people to take as many actions as possible to do so. And not the existing priority to make people scared 1.5C is an existential threat and who is to blame for it. Thx @DeutscheWelle [\[LINK\]](#)." It was nice to see Skea wasn't as focused on created the fear of extinction but more on trying to get as many people focused on taking action to reduce emissions. DW wrote ""We should not despair and fall into a state of shock" if global temperatures were to increase by this amount, he said. In a separate discussion with German news agency DPA, Skea expanded on why. "If you constantly communicate the message that we are all doomed to extinction, then that paralyzes people and prevents them from taking the necessary steps to get a grip on climate change," he said. "The world won't end if it warms by more than 1.5 degrees," Skea told Der Spiegel. "It will however be a more dangerous world." DW also wrote ""Every measure we take to weaken climate change helps," he said, adding that measures were also becoming "ever more cost-effective." Skea said that one short-term focus should remain expanding renewable electricity to reduce emissions from fossil fuel electricity generation and from internal combustion engine vehicles. "Longer term, we probably will not be able to do without technological solutions like the underground capture of CO2," he said, referring to the greenhouse gas carbon dioxide. Individual abstinence is good, but new infrastructure required Skea predicted that one difficult area might*

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prove to be changing people's lifestyles. He said that no scientist could tell people how to live or what to eat. "Individual abstinence is good, but it alone will not bring about the change to the extent it will be necessary," Skea said. "If we are to live more climate consciously, we need entirely new infrastructure. People will not get on bikes if there are no cycle paths." Our Supplemental Documents package includes the DW report."

Energy Transition: E.ON CEO, it's better but EU energy crisis is not over

E.ON CEO on energy crisis

E.ON reported on Q2 on Wednesday and its CEO Leonhard Birnbaum made a number of comments on Bloomberg Markets Today on Aug 9, 2023. (i) Birnbaum was more positive than before on Europe's progress on the energy transition. His overall comment was that they are facing less headwinds and getting more tailwinds. And that will be the headlines. But, as usual, there are the real insights beyond the headlines such as natural gas price are less than last Q4 but still double or triple pre-Covid and that isn't going away quickly, E.ON had a good year in approving investments to build out infra, but Germany is not on track to meet its renewable goals. (i) Our tweets included transcripts of Birnbaum's comments and any items below in *"italics"* are SAF Group created transcript. (ii) EU energy crisis is not over. We tweeted [\[LINK\]](#) *"EU energy crisis is not over. "we see a little bit of less headwinds from the market and more tailwind when it comes to the energy transition" says \$EOAN CEO Birnbaum to @TomMackenzieTV. BUT also "the [EU Energy} crisis is not over". #OOTT #natGas."* Birnbaum said *".... We see a little bit of less headwinds from the market and more tailwind when it comes to the energy transition. Now the likelihood of a repetition of the crisis of last winter has gone down significantly, which also can be seen in the futures, in the forward markets. We have to be clear that the structural change due to the Russian war against Ukraine and the drop out of Russian gas for the supply of Europe is going to stay and therefore the crisis is not over and we have to do our part to make sure we stabilize the situation as much as we can in Europe."* (iii) High natural gas prices here for awhile. We tweeted [\[LINK\]](#) *"2/2. Elevated EU #natgas prices here for awhile. Germany has "roughly a doubling to tripling of prices on the gas side [natural gas] and that is a fact that is not going to go away anymore I am afraid. Not in the short term" says \$EOAN CEO Birnbaum #OOTT #natgas @TomMackenzieTV."* Birnbaum said *"We can see forward markets significantly down vs Q4 last year but significantly up vs the last pre-Covid year 2019. So there we have roughly a doubling to tripling of prices on the gas side and that is a fact that is not going to go away anymore I am afraid. Not in the short term."* (iv) Germany infrastructure build out is not on track. We tweeted [\[LINK\]](#) *"3/3. Germany energy infra buildout not on track! " this acceleration enough? The answer is clearly No. We are not & we still not fast enough in the expansion of the infrastructure. Across EU by the way, we need to further improve" says \$EOAN CEO Birnbaum. #OOTT #natgas."* Birnbaum was asked on Germany's goal for renewable energy to make up to 80% of the energy complex and if that was feasible given the painfully slow rollout of the grid. Birnbaum replied *".. We, as E.ON, have been able to increase our investments significantly year over year. So, we see an acceleration. Is this acceleration enough? The answer is clearly No. We are not and we still not fast enough in the expansion of the infrastructure. Across Europe by the way, we need to further improve. But for us, especially relative to Germany because this is our largest market."*

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03/15/23: E.ON CEO reality check on energy infrastructure build out

The reason why we follow E.ON CEO Birnbaum's energy infrastructure comments is that Birnbaum has been warning that the buildout is far behind schedule. Here is what we wrote in our March 19, 2023 Energy Tidbits memo. "E.ON reported Q4 on Wednesday and its CEO Leonard Birnbaum made a number of comments on Bloomberg Markets Europe that had a clear message – Europe is far behind on the energy transition and how Germany's energy policies have led to lost competitiveness and Germany facing the danger of deindustrialization. Here are a few of his key points. (i) Windmills & EVs aren't enough. We continue to believe that many just focus on wind/solar installations and EV penetration and not focus enough on being able to transmit wind/solar power and strengthening the grid to take more intermittent power. As Birnbaum reminded, every windmill added to the grid drives the need for more grid strengthening. On Wed, we tweeted [LINK](#) "#NatGas & its existing power infra will be needed for longer. #EnergyTransition is much more than windmills & EVs. #E.ON CEO every windmill needs a great a grid connection, every grid connection drives for more backbone reinforcement ...

Thx @annaedwardsnews M. Cudmore. #OOTT." Our tweet included a 25-second clip of his comments on windmills. (ii) need to massively invest in energy infrastructure. This was his key warning. On Wednesday, we tweeted [LINK](#) "over/under? #E.ON CEO "do not have the infra in place for the #EnergyTransition" "need to massively invest into infra" if can "achieve at sufficient speed" can make it happen. "If not, we are going to run into trouble"#NatGas will be needed for longer. Thx @annaedwardsnews #OOTT." Our tweet included a 1:10 min clip of these comments. (iii) High energy prices have led to Germany loss of competitiveness. Birnbaum was blunt on how Germany has been hard hit by high energy prices. We tweeted [LINK](#) "E.ON CEO on #EnergyTransition ""we [Germany] have clearly lost competitiveness with the high energy costs" "unless we actually save energy & get prices down..... we will not see investments that we need and then, Yes, the danger of deindustrialization can not be neglected" #OOTT." Our tweet included the transcript we made of Birnbaum's comments to Bloomberg's Anna Edwards. "Edwards ". do you see Germany as deindustrializing right now how different is the German economy going to look when we get to the other side of all this Energy Transition?" Birnbaum "I see investment, let me put it this way, I see investment decisions more and more taking place to the detriment of Europe and actually also Germany. Because we have clearly lost competitiveness with the high energy prices and we have not delivered any compensation for that. And so for me, unless we actually save more energy and get prices down. Unless we work much harder to compensate for the loss of competitiveness in energy somewhere else, we will not see investments that we need and then, Yes, the danger of deindustrialization can not be neglected. So that is challenge". (iv) our reminder is that any delays on having the energy infrastructure to support the energy transition should be a positive for natural gas."

Energy Transition – Biden \$1.2b to “advance” direct air capture carbon demonstration

On Friday, the US Dept of Energy announced [LINK](#) "up to \$1.2 billion to advance the development of two commercial-scale direct air capture facilities in Texas and Louisiana. These projects—the first of this scale in the United States—represent the initial selections

Direct air capture
carbon

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from the President's Bipartisan Infrastructure Law-funded Regional Direct Air Capture (DAC) Hubs program, which aims to kickstart a nationwide network of large-scale carbon removal sites to address legacy carbon dioxide pollution and complement rapid emissions reductions." It is important to note that the DOE says this \$1.2b is to "advance" these two direct air capture projects and it isn't know what is the total cost of these projects including the DOE advance. These are to be "commercial-scale" direct air capture facilities and, as far as we can tell, will be the largest by far of any direct air capture of carbon projects in the world. This is not cheap for these demonstration projects but the reality is that if Biden wants to try these, he has to give them money to help encourage someone to try. So give Biden some credit for recognizing that they have to kick in \$1.2 b to advance these projects or else it won't be tried. The DOE evaluates the impact "Together, these projects are expected to remove more than 2 million metric tons of carbon dioxide (CO2) emissions each year from the atmosphere—an amount equivalent to the annual emissions from roughly 445,000 gasoline-powered cars." And that Biden's goal is "DOE estimates that reaching President Biden's ambitious plan for a net-zero emissions economy will require that between 400 million and 1.8 billion metric tons of CO2 be removed from the atmosphere and captured from emissions sources annually by 2050. The two DAC Hubs selected for award negotiations today will help further demonstrate the ability to capture and store atmospheric CO2 at scale." Our Supplemental Documents package includes the DOE announcement.

Not clear of cost saving in US vs world's largest direct air capture project

We don't have enough information to be able to compare the relative costs for the two US projects being advanced \$1.2b by the DOE vs the current largest direct air capture project, Orca, in Iceland. The DOE release only says their \$1.2b is to "advance" these two projects. So it isn't clear how much these projects will cost on an all-in basis including the \$1.2b DOE advance. The saving of the equivalent of 2 mm tons of CO2 is 500 times the savings from the world's largest direct air capture demonstration, Orca, in Iceland that started operations in Sept 2021. Orca's cost were estimated at \$15 million to reduce the equivalent of ~900 cars. A 500 times cost would \$7.5b. All we know so far is that the DOE is kicking in \$1.2b to the costs of these two projects. But we would hope that moving to commercial-scale and some technology developments over the past few years would make the all-in costs of these two project far less than \$7.5b.

World's largest direct air capture of carbon plant had start up bumps

The US DOE proposed direct air capture projects will have 500 times the impact of the world's largest direct air capture project in Iceland that started up in Sept 2021, but had some start up bumps in the road. Here is what we wrote in our April 24, 2022 Energy Tidbits memo. "We were surprised to see the reported reasons for the Carbon Herald headline "World's Largest Carbon Removal Plant 'Orca' Freezes Over In Iceland" [\[LINK\]](#) that reported "The world's largest carbon removal plant located to the east of Reykjavik, Iceland, has frozen, putting its operations behind schedule." We would have just attributed the issues to not uncommon issues that often hit new start up plants. This is the Orca direct air capture plant in Iceland, which started up in Sept. However, we were surprised to see the reason. Carbon Herald wrote "However, as it became apparent, the plant was not equipped to handle the harsh weather conditions in Iceland and some of the machinery froze. Climeworks was

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thus forced to urgently make modifications, which will inevitably be a bump in the road towards the company's carbon removal goals in Iceland." We would have thought a plant designed for Iceland would have been designed for cold winters."

Biggest direct air capture of carbon plant offsets <900 cars

The DOE forecasts the US demonstration direct air capture projects to remove the carbon equivalent of 445,000 cars, which is 500 times the impact of the Orca Iceland project impact of ~900 cars. Here is what we wrote in our Sept 26, 2021 Energy Tidbits, when we first reported on Orca. *"We are well aware that governments and capital providers are going to make sure the world is put on a push to get to Net Zero, we just don't want to see that ambition result in an massive energy crisis for multiple years in the 2020s. But it gets increasingly harder to not believe a massive energy crisis is coming because we continue to see capital allocation go to energy transition technologies that are Not Ready for Prime Time. Yet, capital continues to pour into them. A good example is the push into direct capture of carbon from the air. On Tuesday, NowThis news tweeted a video [\[LINK\]](#) from Climeworks CEO (Jan Wurzbacher) on how they just turned into operation their Orca plant in Iceland, "which is the largest direct air capture plant currently operational in the world with a capacity of 4,000 tonnes of CO2 that are captured from the air every year. So that's phenomenal capacity." We hadn't realized that the capacity of the direct air capture plants was that low, which is why we tweeted [\[LINK\]](#) "World needs massive cuts to #CO2 emissions & need demonstration projects like this to show it can be done. But world's biggest project can remove 4,000 tonnes CO2/yr only offsets <900 cars, EPA est tycpial car emits ~4.6 tonnes CO2/yr. #EnergyTransition will be hugely expensive." Our tweet included the main page from the EPA's Greenhouse Gas Emissions from a Typical Passenger Vehicle [\[LINK\]](#) "a typical passenger vehicle emits about 4.6 metric tons of carbon dioxide per year" . The math perspective is that the world's largest operating direct air capture of carbon plant will only offset the CO2 emissions of <900 cars. Climeworks did not disclose the capital or operating costs of the Orca plant. But this must be hugely expensive to take the equivalent of <900 cars off the road. Yet direct air capture of carbon is still able to attract massive capital. To illustrate the challenge, the number of cars in the US is approx. 290 million, or the equivalent of ~325,000 Orca direct air capture of carbon plants.*

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Figure 58: Climeworks Direct Air Capture Plant



Source: Climeworks, NowThis

Capital Markets: Six Flags doubles reserves for general liability

We don't normally tweet on items like reserves for general liability but, when we heard CNBC's Kelly Evans, mention the item from the Six Flags Q2, we thought that it was likely a sign of the times that would lead to higher costs/reserves for many other companies. Not necessarily for Six Flags type general liability but for other general liability issues. On Thursday morning, Six Flats Q2 hit the wire during CNBC Squawk Box, they reviewed the numbers but as they were moving to break, Evans brought up the Six Flags increasing its reserves for general liability. Six Flags almost doubled its self-insurance reserve! We then tweeted [LINK](#) "Surely, a rising cost for companies in any sector to some degree? #SixFlags doubles self-insurance reserves for ultimate loss indications "... in connection with our general liability and worker's compensation self-insurance reserves" Thx @KellyCNBC @SquawkCNBC #OOTT." Our tweet attached an excerpt from the Six Flags Q2 release and Q2 financials. Here is an excerpt of Six Flags near doubling. "The company had net income of \$21 million in second quarter 2023, compared to net income of \$45 million in second quarter 2022. The net income per share was \$0.25 compared to net income per share of \$0.53 in second quarter 2022, driven primarily by an increase in self-insurance reserves in second quarter 2023. Our self-insurance reserves are periodically reviewed for changes in facts and circumstances and adjustments are made as necessary. During the second quarter of 2023, we revised the estimate of our ultimate loss indications for both identified claims and incurred but not reported ("IBNR") claims in connection with our general liability and worker's compensation self-insurance reserves. The increase in our revised estimate was based on greater than previously estimated reserve adjustments on certain identified claims as well as an observed pattern of increasing litigation and settlement costs and changes to key actuarial assumptions utilized in determining estimated ultimate losses, including loss development factors. The change in estimate resulted in an increase to "selling, general and administrative expense" in our condensed consolidated statements of operation of \$38 million during the three and six months ended July 2, 2023." Our Supplemental Documents package includes the excerpts from the Six Flags Q2.

Six Flags doubles general liability reserve

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Demographics: Japan's aging reality check, it needs more older people to work

The big challenge facing any aging OECD country over the coming decade is how do they get more retirement age people to work longer to fill jobs. Japan is the flagship for an aging population and so what they face and do is probably a glimpse at what is to come for other countries in the future. No one should be surprised to see the Nikkei report today "*Japan Inc. turns to elderly to fill jobs. Facing labor shortages, 40% of businesses let employees work past 70*" [\[LINK\]](#) The problem is acute in Japan as Japan has the 3rd longest life expectancy only behind Hong Kong and Macau at an average life of ~84 years. Nikkei reports that the 39% of the companies allowing employees to work up to 70 years or more is twice the percentage from a decade ago. And the big trend is that the % of companies that let employees retire before 65 has increased from 12% to 25% in the last decade.

Japan needs more older people to work

Demographics: How a 101-yr old practicing doctor keeps his brain sharp

We saw the TV report of the tips of a 101 year old still practicing doctor on how his secrets to keep his brain sharp. We hadn't heard of him, Dr. Howard Tucker, before but he is real and got a lot of attention last year when he turned 100. Tucker posted an article [\[LINK\]](#) "At 101 years old, I'm the 'world's oldest practicing doctor': My No. 1 rule for keeping your brain sharp". Tucker wrote "*I've been a practicing doctor and neurologist for more than seven decades. And at 101 years old, people often ask me how I keep my brain sharp. Good genes and a bit of luck can give you a head start, but there is one principle I live by that anyone can implement: Keep your mind engaged through work, social and entertainment activities. As we age, we go through natural changes that affect our mental processing abilities. Some areas of the brain may shrink, communication between neurons may become less effective, and blood flow may decrease. But like any other muscle in the body, our mind needs consistent exercise to thrive. I use three daily rituals to boost my brain health.*" His three daily rituals were "*I go to work*", "*I stay social*", and "*I read for entertainment*" and his report gives more color on each item. Our Supplemental Documents package includes Tucker's report.

How a 101-yr old keeps his brain sharp.

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

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

@Energy_Tidbits on Twitter

LinkedIn: Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

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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.

Devastating fire at Lahaina on Maui

It breaks your heart to see the devastation and hear the stories of survivors of the fire that destroyed most of Lahaina on Maui. Anyone who has been to Maui has likely walked around Lahaina so can have some sense of the devastation. We were hit by the great Alberta flood of 2013 but getting your house flooded pales by what happens in a fire that destroyed Lahaina. For the flood, we knew it was coming so had a couple hours to pack our stuff, get in our cars and drive a few minutes to higher ground and then find a hotel. And the vast majority of Calgary wasn't flooded so there were places to stay. Whereas this fire hit so fast and furious and destroyed most of Lahaina so people had to escape thru the rapidly spreading fire. We can't imagine the terror that night. NBC News posted a 2 -minute drone footage post the fire at [\[LINK\]](#).

Hardly saw any coverage of our Cdn PGA stars at FedEx St. Jude

We have to wonder why NBC Sports only shows the Cdn men PGA stars at the bare minimum such as when they are the top few in a PGA event. Saturday is the biggest push day for the Energy Tidbits memo so we will normally have PGA coverage when the Cdns are in the hunt. And our guys were in good shape just off the top coming into round 3. They didn't have great days, but in the few hours of TV coverage, we only saw one Adam Hadwin shot and didn't see any others. There must be something. It's a long shot for any of them to win tomorrow but they are all in shape to make the top 50 and advance to next week. And we'll be watching to see how they end up tomorrow. Going into the final round, here is where our Cdn stars are currently projected to finish in the FedEx cup. The top 50 make it to next week. Nick Taylor is projected at 22, Corey Connors is projected at 31, Adam Hadwin is projected at 37, and Adam Svensson is projected at 40.

Highlight of NFL pre-season, Cdn QB Nathan Rourke TD pass vs Cowboyus

ICYMI, Cdn QB Nathan Rourke had the highlight of the start of the NFL pre-season this week. NFL pre-season kicked off this week and we recognize that it is mostly about guys fighting to make rosters. But at least the first game, we get to see the starters for a few series, then the backups and then the 3rd and 4th stringer. One of the many Canadians rookies trying is Nathan Rourke, who is 3rd on the QB depth chart behind starter Trevor Lawrence and backup for the last two seasons, C.J. Beathard. Rourke is from grew up outside Toronto, played at Ohio University, then was starred for BC Lions before signing with the Jaguars this year to give the NFL a go. Rourke was 3rd up, played solid for his first NFL exposure, importantly with no interceptions. His box score was 9/17, 153 yards, 9.0 ave yards per completion, 1 TD, no INT and a 103.3 rating. But then he had the highlight TD pass. 3rd and 16, somehow Rourke breaks off four separate tackles in the pocket, is on the way down and throws a 21-yard TD. If you haven't seen it, here is the NFL video [\[LINK\]](#).

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Figure 59: Jackson Jaguars QB Nathan Rourke



Source: NFL

Ontario's "cash for keys" to get tenants to move

Most people have heard of the growing number of tenants who just won't pay rent in Ontario in apartments and house rentals. And the inability for landlords to evict the non-rent paying landlords. What we hadn't heard was how there is a "cash for keys" process to get the tenants to leave and that is also happening for rent paying tenants at the end of a lease term. A friend renting out the main floor of a bungalow in the 905 region paid a rent paying tenant \$5,000 to leave at the end of the lease term in exchange for the tenant leaving ie. the cash for keys.

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