Energy Tidbits

July 14, 2024

Produced by: Dan Tsubouchi

No Changes in Oil Demand Growth Forecasts for 2024: IEA Still at +1.0 mmb/d YoY, OPEC Still at +2.2 mmb/d YoY

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. My 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 the review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. My target is to write on 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. IEA and OPEC July forecasts both did not change oil demand growth forecast for 2024 – IEA is still at +1.0 mmb/d YoY, and OPEC is still at +2.2 mmb/d YoY. [click here]

2. Wood Mackenzie, like most others, is in the middle of IEA and OPEC with its forecast of +1.5 mmb/d YoY in 2024. [click here]

3. Wood Mackenzie calls for peak oil demand by 2031 but revised up its post-2025 demand by an average of 0.8 mmb/d vs its Oct 2023 long term demand forecast. [click here]

4. EIA estimates US tight/shale oil in June was the 5th consecutive month of shale/tight oil at ~8.6 mmb/d, and this is down from ~8.75 mmb/d in Nov/Dec 2023. [click here]

5. Dominion Energy, the #1 electricity provider for data centers, says their adding "*a substantial amount of highly efficient #NatGas generation in the last decade*" allowed them to add in renewables. [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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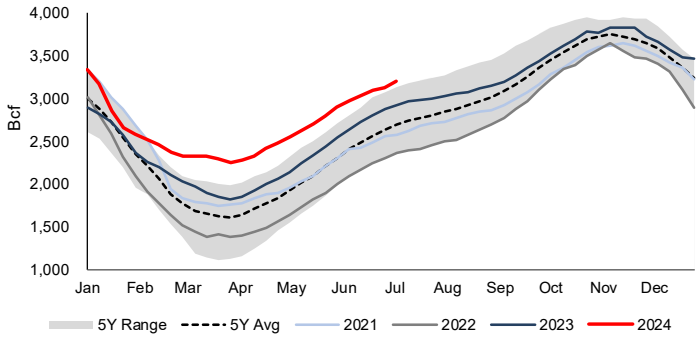
Table of Contents

Natural Gas: A really hot June means less risk US natural gas storage gets filled early

Less risk for US gas storage to be filled early?

It was a really hot June in the Lower 48, which helped to narrow the YoY gas storage surplus from looking like a strong probability to storage being filled early to a lesser but still potential probability to do so. The YoY gas storage surplus has dropped from +444 bcf YoY to +275 bcf over the past two months. There may very well be items such as hurricane interruptions, a big spike up in natural gas for data centers, etc. that can change the outlook either up or down but the really hot June has lessened the risk to storage being filled early. As noted below, US natural gas storage is now +283 bcf YoY, which is up WoW from +275 bcf YoY last week.

Figure 1: US Natural Gas Storage



Source: EIA

Natural Gas: +35 bcf build in US gas storage; now +283 bcf YoY

+35 bcf build in US gas storage

For the week ending July 5, the EIA reported a +35 bcf build. Total storage is now 3.199 tcf, representing a surplus of +283 bcf YoY compared to a surplus of +275 bcf last week. Since February, total storage has remained above the top end of the 5-yr range. Total storage is +504 bcf above the 5-year average, below last week's +504 bcf surplus. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK] and a table showing the US gas storage over the last 8 weeks.

Figure 2: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (07/05/23)		5-year average (2019-23)	
Region	07/05/24	06/28/24	net change	implied flow	Bcf	% change	Bcf	% change
East	682	660	22	22	650	4.9	576	18.4
Midwest	800	779	21	21	719	11.3	661	21.0
Mountain	245	239	6	6	178	37.6	164	49.4
Pacific	289	282	7	7	222	30.2	258	12.0
South Central	1,183	1,174	9	9	1,146	3.2	1,036	14.2
Salt	327	326	1	1	325	0.6	291	12.4
Nonsalt	856	848	8	8	822	4.1	745	14.9
Total	3,199	3,134	65	65	2,916	9.7	2,695	18.7

Source: EIA

Figure 3: Previous US Natural Gas Storage

Previous 8 weeks (Bcf)				
Week Ended	Gas in Storage	Weekly Change	Y/Y Diff	Diff to 5 yr Avg
May/17	2,711	78	402	606
May/24	2,795	84	380	586
May/31	2,900	105	380	588
Jun/07	2,974	74	364	573
Jun/14	3,045	71	343	561
Jun/21	3,102	57	319	533
Jun/28	3,134	32	275	496
Jul/05	3,199	65	283	504

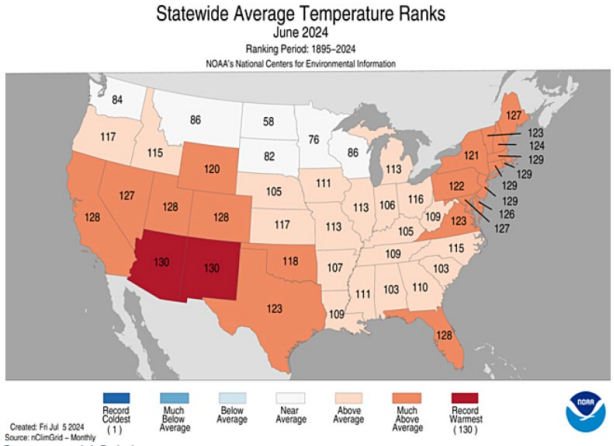
Source: EIA, SAF

Natural Gas: NOAA, 2nd warmest June in last 130 years in the US

2nd warmest June in last 130 years

On Tuesday, the NOAA posted their June recap for assessing the U.S. Climate, which showed June 2024 was the 2nd warmest the US has seen in the past 130 years. It was well above normal and really hot almost everywhere in the Lower 48. In the news release [LINK], the NOAA wrote "*The average temperature of the contiguous U.S. in June was 71.8°F, 3.4°F above average, ranking second warmest in the 130-year record. Approximately 24 million people across portions of the West, South and Northeast experienced their warmest June for overnight temperatures. Heat waves impacted the Southwest, Great Lakes, Northeast and Puerto Rico this month, breaking temperature records and creating life-threatening conditions.*" Below is NOAA's Statewide Average Temperature Ranks maps for June 2024.

Figure 4: NOAA Statewide Average Temperature Ranks – June 2024



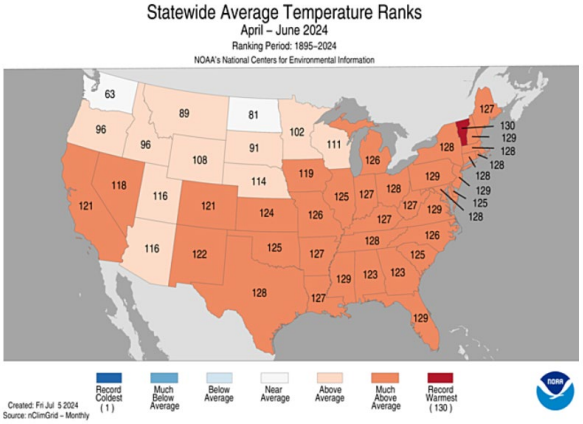
Source: NOAA

Natural Gas: NOAA, 4th warmest Apr/May/June in last 130 years in the US

4th warmest AMJ in last 130 years

On Tuesday, the NOAA's June recap also included the ranking maps for Apr/May/June 2024, which was that AMJ 2024 was the 4th warmest the US has seen in the past 130 years. It was well above normal and really hot almost everywhere in the Lower 48. Below is NOAA's Statewide Average Temperature Ranks for Apr/May/June 2024.

Figure 5: NOAA Statewide Average Temperature Ranks – Apr/May/June 2024



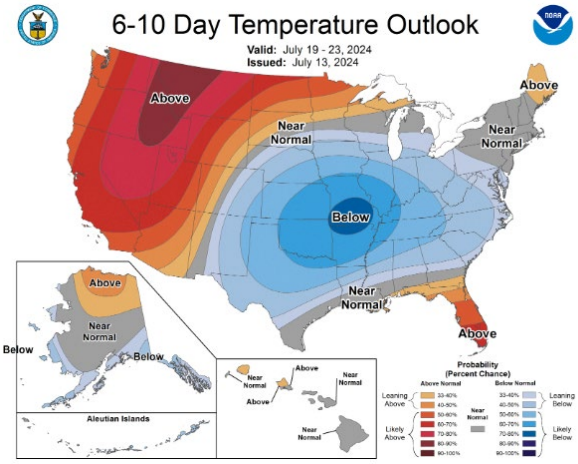
Source: NOAA

Natural Gas: NOAA forecasts normal/below normal temps in E1/2 for July 19-27

NOAA temperature outlook for July 19-27

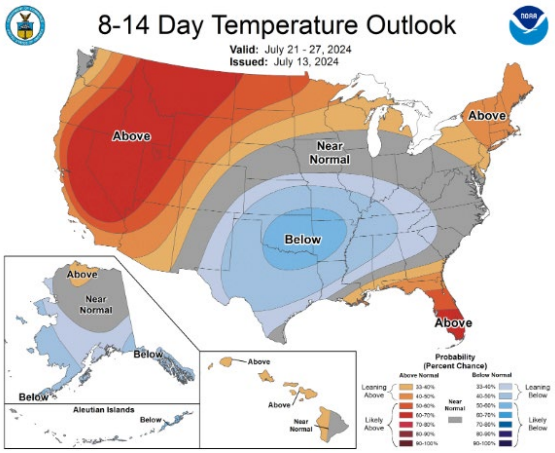
Yesterday, we tweeted [LINK] '*Hot across Lower 48 this weekend. @weatherchannel, BUT @NOAA's today 6-10 & 8-14 day temperature outlook covering July 19-27 calls for normal/below normal temps for most of East Half of Lower 48. #NatGas #OOTT.'* Our tweet included The Weather Channel's map [LINK] and their warning "*A dangerous heat wave is intensifying across the nation this weekend, threatening widespread health impacts and the potential for record-breaking temperatures.*" And then we also included NOAA's Saturday update to its short term 6-10 day and 8-14 day temperature outlooks. Yesterday's update has NOAA forecasting a return to normal to below normal temperatures for most of the eastern half of the Lower 48 for July 19-27. Below are NOAA's updated, as of yesterday, 6-10 day and 8-14 day temperature outlook maps covering July 19-27.

Figure 6: NOAA 6-10 day temperature outlook for July19-23



Source: NOAA

Figure 7: NOAA 8-14 day temperature outlook for July 21-27

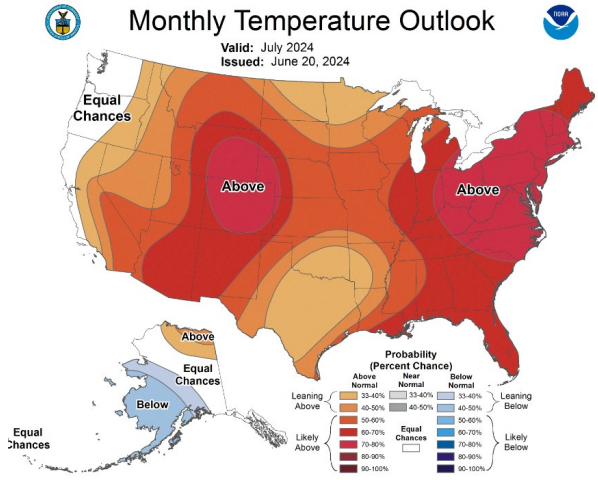


Source: NOAA

06/20/24: NOAA forecasts hot weather in July for all of the Lower 48

The above NOAA 6-10 and 8-14 day temperature outlooks are in line with NOAA's recent June 20, 2024 forecast for July. Here is what we wrote in last week's (July 23, 2024) Energy Tidbits memo. "*It looks like the hot weather in the US is going to continue for at least another month. On Thursday, NOAA posted its 30-day outlook, which is its Monthly Temperature Outlook for July [LINK]. NOAA's temperature forecast shows above average probability for much warmer than normal temperatures for all of the Lower 48. Below is NOAA's monthly temperature outlook for July.*"

Figure 8: NOAA Monthly Temperature Outlook for July



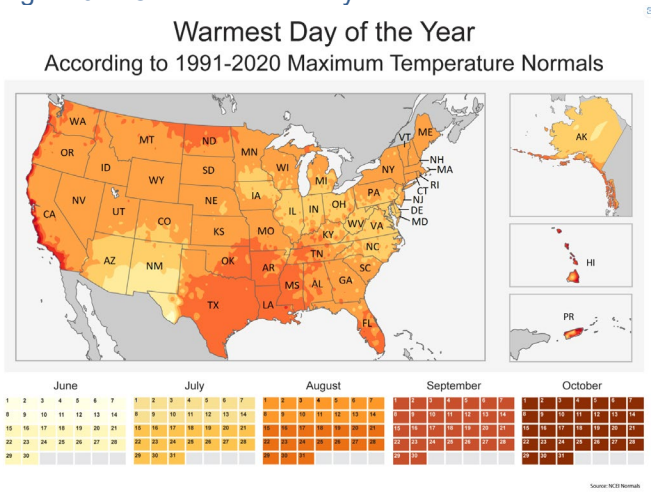
Source: NOAA

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

Normal warmest day of the year across the US

It was a hot June and start to July. But we remind that the normal hottest day of the year is still to come for most of the US in August. Here is where we wrote in our July 2, 2023 Energy Tidbits memo. "*Yesterday, we tweeted [LINK] "Here's why temperature watch gets important in July ie. don't want below normal temps when it is supposed to be the hottest. @NOAA map when to expect Warmest Day of the Year. Mid July starts to see hottest day of the year in states like IL, IN, OH, WV, VA, NC. And current @NOAA 8-14 day expects below normal temps in some of these states. #OOTT #NatGas." On Thursday, NOAA posted "When to expect the Warmest Day of the Year" [LINK]. Our tweet included the NOAA map, which reminds that mid-July is when we start to see the hottest day of the year in many states. It's why the temperatures are important in July as we don't' want to see below normal temps when it is supposed to be peak heat and peak summer electricity/natural gas residential/commercial demand*." We checked the link and it still works.

Figure 9: NOAA Warmest Day of the Year



Source: NOAA

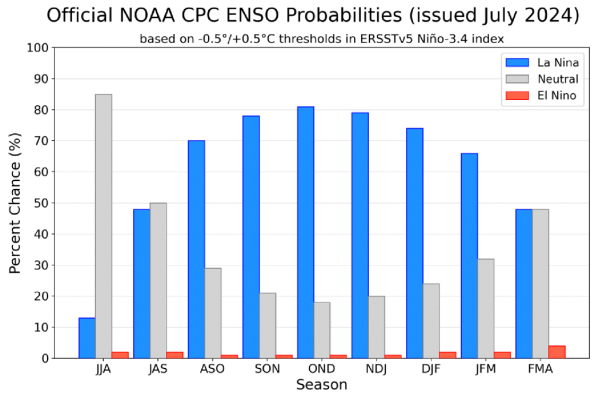
Natural Gas: NOAA sees La Nina ~70% chance for A/S/O peak hurricane season

Expecting La Nina summer/fall

On Thursday, the NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. Our El Nino/La Nina focus is on peak Atlantic hurricane season which is Aug/Sep/Oct. The probability forecast is at ~70% for La Nina conditions from Aug/Sep/Oct, and ~79% for La Nina in Nov/Dec/Jan. NOAA writes *"Compared to the previous month, the most recent IRI plume delayed the emergence of La Niña to September-November 2024, with La Niña then persisting through the Northern Hemisphere winter. The forecast team is also favoring a delayed development of La Niña this month, but is anticipating the transition to occur earlier (August-October). This is, in part, supported by the continuation of below-average subsurface ocean temperatures and near-term forecasts suggesting a resurgence of easterly wind anomalies in July. In summary, ENSO-neutral is expected to continue for the next several months, with La Niña favored to emerge during August-October (70% chance) and persist into the Northern Hemisphere winter 2024-25 (79% chance during November-January)."* Again, weather is never 100% the

same, but La Nina summers normally bring a better chance for normal hurricane activity whereas El Nino summers tend to have lesser hurricane activity. Below is the NOAA El Nino/La Nina update for the month of July.

Figure 10: NOAA El Nino/La Nina Outlook

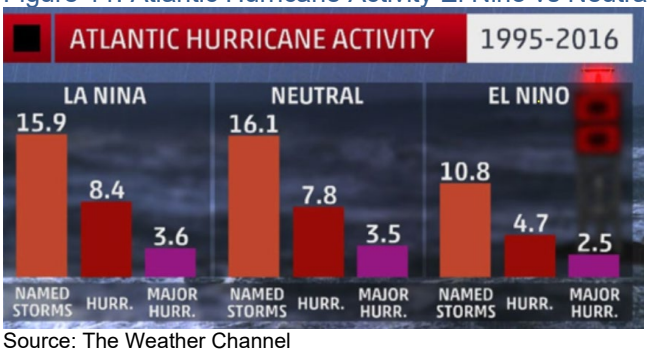


Source: NOAA CPC, IRI

La Nina summers tend to have normal to above normal hurricane seasons

Here's what we wrote in our June 16, 2024 Energy Tidbits Memo: "*Our above tweet included the below Weather Channel graph. As noted above, the latest NOAA summer outlook for El Nino/La Nina conditions calls for La Nina conditions during the summer and the normal peak Atlantic hurricane season of Aug/Sept/Oct. Weather is never 100% accurate but, historically, Neutral and La Nina conditions tend to have normal to above normal hurricane activity, whereas El Nino years tend to have lower hurricane activity seasons. Our May 24, 2020 Energy Tidbits memo included The Weather Channel Aug 28, 2018 story that had the below graphic.*"

Figure 11: Atlantic Hurricane Activity El Nino vs Neutral vs La Nina



Source: The Weather Channel

Natural Gas: EIA, Shale/tight gas production essentially flat MoM, down -2.3% YoY

Shale/tight gas production

Last month marked the first month that the EIA stopped releasing its Drilling Productivity Report, and began releasing shale/tight oil and natural gas data with the monthly Short Term Energy Outlook. (i) Please note this came with some major reporting changes, namely there

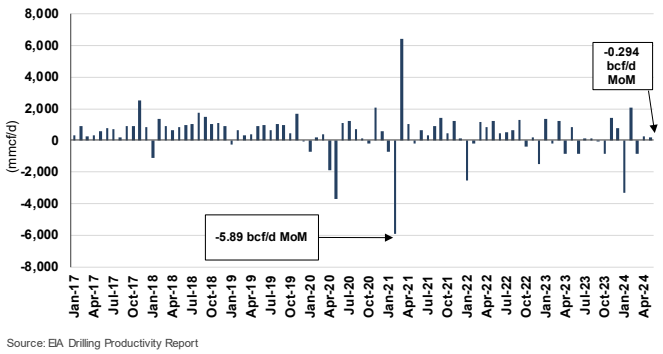
are no longer monthly forecasts for tight gas production by basin. Previously, the EIA would provide an estimate of the current month tight/shale production (in this case July) and then a forecast for the next month (in this case Aug). But now, the EIA only provides estimates for the just past month for tight/shale. So in the case of the new July report, there is only shale/tight for the just finished month ie. June. (ii) On Tuesday, the EIA released its monthly STEO for July 2024 [LINK]. (iii) The key takeaway is that US shale/tight natural gas is roughly flat in June at ~79 bcf/d, which is the 4th consecutive month at ~79 bcf/d. And this compares to ~82 bcf/d for Nov and Dec 2023. (iv) The key reason for the lower production has been because a number of major natural gas producers shut-in natural gas production in response to the low natural gas prices to end February, and they also cutting back on rigs/fracks. (v) Note that the EIA revised their data for shale/tight gas production back to 2020 from June's STEO, and we have adjusted our table to reflect the updated data. Our Supplemental Documents package includes excerpts from the EIA STEO.

Figure 12: EIA Major Shale/Tight Natural Gas Production

	2023							2024							
mmcf/d	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June MoM%	June YoY%
Permian	15,949	16,270	16,612	16,781	16,775	17,110	17,429	16,660	17,342	17,657	17,475	17,609	17,450	-0.9%	9.4%
Haynesville	14,509	14,644	14,634	14,554	14,425	14,290	13,911	13,676	14,363	13,503	13,665	13,215	13,087	-1.0%	-9.8%
Marcellus	25,744	25,595	25,497	25,086	25,407	26,390	26,553	25,190	25,694	24,358	24,969	24,964	24,964	0.0%	-3.0%
Utica	5,170	4,790	4,773	4,713	4,444	4,473	4,391	3,996	4,119	4,103	4,086	4,070	4,054	-0.4%	-21.6%
Eagle Ford	4,495	4,513	4,448	4,556	4,487	4,470	4,451	4,329	4,326	4,326	4,327	4,328	4,328	0.0%	-3.7%
Bakken	2,397	2,440	2,461	2,554	2,527	2,569	2,611	2,220	2,488	2,508	2,580	2,528	2,539	0.4%	5.9%
Barnett	1,836	1,814	1,779	1,790	1,771	1,778	1,760	1,696	1,723	1,712	1,701	1,690	1,679	-0.6%	-8.5%
Fayetteville	897	890	885	884	878	872	862	774	846	846	846	846	846	0.0%	-5.6%
Mississippian	2,112	2,134	2,072	2,151	2,027	2,051	2,122	2,030	2,149	2,149	2,149	2,149	2,149	0.0%	1.8%
Niobrara-Codell	2,640	2,655	2,712	2,698	2,730	2,783	2,813	2,674	2,857	2,871	2,885	2,900	2,915	0.5%	10.4%
Woodford	2,979	2,951	2,864	2,907	2,901	2,846	2,911	2,730	2,875	2,875	2,875	2,875	2,876	0.0%	-3.5%
Rest of U.S.	2,270	2,256	2,255	2,248	2,213	2,277	2,324	2,198	2,272	2,260	2,237	2,229	2,223	-0.3%	-2.1%
Total	80,998	80,950	80,992	80,922	80,585	81,908	82,137	78,172	81,053	79,169	79,796	79,404	79,110	-0.4%	-2.3%

Source: EIA, SAF

Figure 13: MoM Change – Major Shale/Tight Natural Gas Production



Source: EIA Drilling Productivity Report

Source: EIA, SAF

Natural Gas: EIA STEO, raises forecast for 2024 natural gas production

EIA US natural gas production forecast

On Tuesday, the EIA released its monthly Short Term Energy Outlook for July 2024 [LINK]. (i) The EIA increased its 2024 US natural gas production estimate by +1.4 bcf/d to 103.5 bcf/d, which, on a full year average basis, now gives a YoY decline of -0.3 bcf/d from 2023. The EIA wrote "*We forecast the Henry Hub natural gas spot price will average almost $2.90 per million British thermal units (MMBtu) in 2H24, up from $2.10/MMBtu in 1H24. Natural gas*

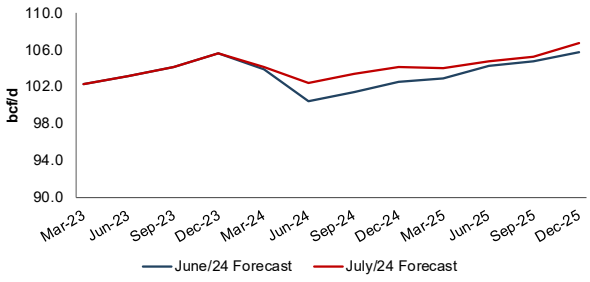
prices fell in early 2024 because of mild winter weather that reduced demand for natural gas for space heating. However, low prices reduced natural gas-directed drilling and led producers to curtail some production, and we expect dry production of U.S. natural gas in 2H24 to remain near 104 billion cubic feet per day (Bcf/d) compared with a record of more than 106 Bcf/d in December 2023." (ii) The EIA raised its 2024 HH price forecast +$0.02/mcf to $2.58/mcf (was $2.56/mcf), and increased their 2025 forecast +$0.05/mcf to $3.42/mcf (from $3.37/mcf). (iii) The quarterly changes in Natural Gas production are as follows: Q1/24 +0.2 bcf/d to 104.1 bcf/d, Q2/24 +2.0 bcf/d to 102.4 bcf/d, Q3/24 +2.0 bcf/d to 103.4 bcf/d, and Q4/24 +1.6 bcf/d to 104.1 bcf/d. (iv) The EIA increased its 2025 forecast +0.8 bcf/d to 105.2 bcf/d, which, on a full year average basis, would be up +1.7 bcf/d YoY. The quarterly changes to 2025 are as follows: Q1/25 +1.1 bcf/d to 104.0 bcf/d, Q2/25 +0.4 bcf/d to 104.7 bcf/d, Q3/25 +0.6 bcf/d to 105.3 bcf/d, and Q4/25 up +1.0 bcf/d to 106.7 bcf/d. The EIA did not comment on the changes in their natural gas consumption forecast.

Figure 14: EIA STEO Natural Gas Production Forecasts

bcf/d	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024	Q1/25	Q2/25	Q3/25	Q4/25	2025
July-24	102.3	103.2	104.1	105.6	103.8	104.1	102.4	103.4	104.1	103.5	104.0	104.7	105.3	106.7	105.2
June-24	102.3	103.2	104.1	105.6	103.8	103.9	100.4	101.4	102.5	102.1	102.9	104.3	104.7	105.7	104.4
May-24	102.3	103.2	104.1	105.6	103.8	104.0	102.3	102.4	103.3	103.0	103.8	104.9	105.0	105.5	104.8
Apr-24	102.3	103.2	104.1	105.6	103.8	103.9	103.0	103.4	104.0	103.6	103.9	105.0	105.0	105.7	104.9
Mar-24	102.3	103.2	104.1	105.6	103.8	103.2	103.8	103.3	103.2	103.4	103.5	104.7	104.5	104.9	104.4
Feb-24	102.3	103.2	104.1	105.4	103.8	103.5	105.0	104.4	104.7	104.4	105.5	106.7	106.5	107.2	106.5
Jan-24	102.3	103.2	104.2	104.6	103.6	105.1	105.0	104.6	105.5	105.0	106.6	106.7	106.1	106.2	106.4
Dec-23	102.3	103.2	104.0	105.1	103.7	104.8	104.8	104.7	105.3	104.9					
Nov-23	102.3	103.2	104.1	105.1	103.7	105.1	104.8	104.7	105.9	105.1					
Oct-23	102.4	103.2	104.4	104.9	103.7	104.7	104.8	104.8	106.1	105.1					
Sep-23	102.1	102.8	102.7	103.1	102.7	104.3	104.7	104.9	105.9	104.9					
Aug-23	102.1	102.8	103.4	103.6	103.0	104.0	103.9	104.0	104.6	104.1					
July-23	102.0	102.2	103.0	102.2	102.4	101.8	101.5	102.5	103.7	102.4					
June-23	102.0	103.7	103.4	101.9	102.7	102.8	102.8	103.0	103.6	103.0					
May-23	102.1	101.9	99.9	100.4	101.1	100.7	101.1	101.4	101.8	101.2					
Apr-23	101.6	100.5	100.5	100.9	100.9	101.2	101.5	101.8	101.8	101.6					
Mar-23	101.0	100.2	100.6	101.0	100.7	101.4	101.4	102.0	102.0	101.7					
Feb-23	99.9	100.0	100.3	100.9	100.3	101.2	101.6	102.0	101.9	101.7					
Jan-23	100.8	99.9	100.1	100.6	100.3	101.1	101.8	102.7	103.6	102.3					

Source: EIA, STEO

Figure 15: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

Natural Gas: EIA STEO est storage 3.968 tcf at Nov 1/24, 1.971 tcf at Apr 1/25

The EIA STEO also includes its forecast for US gas storage. (i) Please note that our bias is to not pay much attention to gas storage forecasts past the start of winter 2024/25 on Nov until

EIA July STEO storage forecast

we get just before Nov 1, 2024 and there is some better near term certainty to the start of winter temperatures. The reason is that winter temperatures are the driving force by far on natural gas demand and it's hard to have confidence on a winter 2024/25 temperature forecasts when we are still in Q2. (ii) EIA estimates US gas storage ended winter 2023/24 at 2.302 tcf at April 1, 2024, which was +0.452 tcf YoY and flat from the June STEO. (iii) The EIA forecasts gas storage to start winter 2024/25 at 3.968 tcf at Nov 1, 2024, which is +0.159 bcf YoY. The July STEO estimate is immaterially below the June STEO of 3.979 tcf at Nov 1, 2024. (iv) It's early and ultimately winter temperatures will determine if storage is high or low. But, for now, the EIA forecasts gas storage to end winter 2024/25 at 1.971 tcf, which would be -330.3 bcf lower YoY. The key reason for less storage to end winter is that the EIA is assuming this winter is colder than last year's hot winter. The EIA assumes heating degree days are 5% higher YoY. (v) There is even more uncertainty as you look out to winter 2025/26. The July STEO forecasts winter 2025/26 storage to be 3.881 tcf at Nov 1, 2025, which would be a little better than its forecast for Nov 1, 2024 at 3.968 tcf. Below is a table tracking the working gas inventory forecasts and actuals since 2016.

Figure 16: EIA STEO US Natural Gas in Storage (2016-2025)

US Working Natural Gas in Storage (billion cubic feet)

	Storage	2016-2025				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,012.7	776.4	3,624.5	10.7%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,012.7	776.4	3,624.5	5.3%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,012.7	776.4	3,624.5	-10.7%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,012.7	776.4	3,624.5	3.8%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,012.7	776.4	3,624.5	8.4%
Mar 2021	1,801.2	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,236.3	4,012.7	776.4	3,624.5	1.1%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,569.4	3,236.3	4,012.7	776.4	3,624.5	-1.5%
Mar 2023	1,849.9	1,184.9	2,486.3	1,301.4	1,835.6	0.8%
Oct 2023	3,809.4	3,236.3	4,012.7	776.4	3,624.5	5.1%
Mar 2024	2,301.5	1,184.9	2,486.3	1,301.4	1,835.6	25.4%
Oct 2024	3,968.3	3,236.3	4,012.7	776.4	3,624.5	9.5%
Mar 2025	1,971.1	1,184.9	2,486.3	1,301.4	1,835.6	7.4%
Oct 2025	3,880.6	3,236.3	4,012.7	776.4	3,624.5	7.1%

Source: EIA, STEO

BloombergNEF storage forecast

Natural Gas: BloombergtNEF est storage 3.937 tcf at Nov 1/24, 1.741 tcf at Apr 1/25

On Monday, BloombergNEF posted its updated forecast for US natural gas storage. BloombergNEF's US gas storage forecast is in line with the EIA STEO for Nov 1/24 but is lower for Apr 1/25. But we always warn there is so much unpredictability for winter gas storage draws as it all depends on the weather, which can have huge swings on winter natural gas demand. BloombergNEF forecasts US gas storage at 3.937 tcf at Nov 1/24 and 1.741 tcf at Apr 1/25. And BloombergNEF says "*BNEF's end-of-summer 2024 inventory forecast sits above the five-year average under all 12 modeled weather scenarios.*"

Figure 17: BloombergNEF forecast US gas storage

Source:BloombergNEF

Natural Gas: LNG Canada moves closer to startup of project for mid-2025 shipments

LNG Canada project

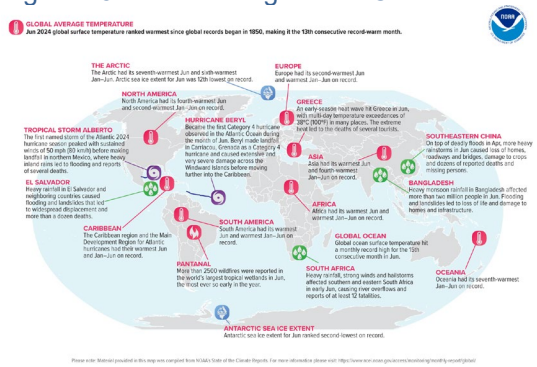
No one should be surprised that LNG Canada continues to be on track for its first commercial LNG cargoes "by" mid-2025. On Monday, Fluor announced "*Fluor Joint Venture Moves One Step Closer to Completion and Startup of LNG Canada Train One with Placement of Final Weld*." [LINK] Note that LNG Canada Phase 1 of 1.8 bcf/d has two trains. Fluor is saying Train 1 is done. Fluor kept with the official LNG Canada line of first LNG cargoes b the middle of 2025. We remind this refers to the first commercial LNG cargoes and we expect to see a number of commissioning LNG cargoes in the months before the first LNG commercial LNG cargoes. Fluor wrote "T*his marks a pivotal moment in the construction of one of the largest energy projects in Canadian history. "The significance of achieving the last weld to support Train One completion is a testament to the collaborative efforts of the JGC-Fluor project team, subcontractors and a skilled and dedicated workforce". The final weld took 48 hours of continuous work from teams of welders working in shifts. More than 380 pipe welders have worked on the project since construction began in 2018.* Our Supplemental Documents package includes the Fluor release.

Natural Gas: NOAA, warmest June globally in the last 175 years

Warmest June on record globally

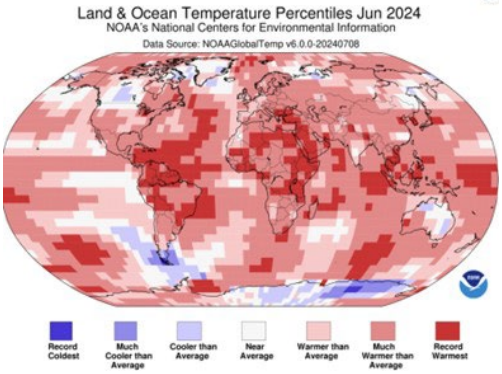
On Friday, the NOAA published their June recap for the global climate, which revealed June 2024 was the warmest June on record [LINK]. One notable exception on the map of The NOAA wrote "*June 2024 was the warmest June on record for the globe in NOAA's 175-year record. The June global surface temperature was 1.22°C (2.20°F) above the 20th-century average of 15.5°C (59.9°F). This is 0.15°C (0.27°F) warmer than the previous June record set last year, and the 13th consecutive month of record-high global temperatures. This ties with May 2015-May 2016 for the longest record warm global temperature streak in the modern record (since 1980). June 2024 marked the 48th consecutive June with global temperatures, at least nominally, above the 20th-century average."* Below is a map of selected significant climate anomalies and events from June.

Figure 18: Selected Significant Climate Anomalies and Events: June 2024



Source: NOAA

Figure 19: Land & Ocean Temperature Percentiles for June 2024



Source: NOAA

Natural Gas: Woodside signs LT LNG supply contract with Taiwan's CPC

Woodside signs LT LNG contract with CPC

On Tuesday, Australia's Woodside Energy signed a 10-year LNG supply deal with CPC Corporation (Taiwan) for the delivery of 6 mmtpa or 0.79 bcf/d of LNG beginning in July 2024 [LINK]. Woodside may also deliver 8.4 mmtpa or 1.11 bcf/d to CPC for an additional 10 years beginning in 2034, subject to conditions and agreement on terms for this period. Woodside CEO Meg O'Neil said, *"This agreement with CPC for long-term supply to Taiwan is a first for Woodside and another demonstration of the ongoing demand for Australian LNG in Asian markets. It also reinforces the value our customers place on Woodside's ability to maintain safe and reliable supply of energy into the 2030s."* Our Supplemental Documents Package includes the Woodside press release.

There have been 24.47 bcf/d of long-term LNG supply deals since July 1, 2021

Here is what we wrote in May 12, 2024's Energy Tidbits memo. "*The big wave in buyers locking up long term supply started in July 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 24.47 bcf/d of long-term LNG deals since July 1, 2021. 63% 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 47% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long-term supply deals since July 1, 2021.

Figure 20: Long-Term LNG Buyer Deals Since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021

Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan / Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea / US	0.05	19.0	2027	2046
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh / Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	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
Sep 7, 2023	Petrochina	ADNOC	China / UAE	n.a.	n.a.	n.a.	n.a.
Nov 2, 2023	Foran	Cheniere	China / US	0.12	20.0	n.a.	n.a.
Nov 4, 2023	Sinopec	QatarEnergy	China/Qatar	0.39	27.0	2026	2053
Nov 27, 2023	Gunvor Singapore Pte	Delfin Midstream	Singapore / US	0.10	15.0	n.a.	n.a.
Dec 20, 2023	ENN	ADNOC	Singapore / UAE	0.13	15.0	2028	2043
Jan 5, 2024	GAIL	Vitol	India / Singapore	0.13	10.0	2026	2036
Jan 8, 2024	Shell	Ksi Lisims LNG	Singapore / Canada	0.26	20.0	2027	2047
Jan 16, 2024	ExxonMobil	Mexico Pacific Ltd	Singapore / Mexico	0.16	20.0	2024	2044
Jan 29, 2024	Excelerate	QatarEnergy	Bangladesh / Qatar	0.13	15.0	2026	2041
Jan 30, 2024	ADNOC	GAIL India	UAE / India	0.07	10.0	2024	2034
Feb 6, 2024	Petronet LNG	QatarEnergy	India / Qatar	0.99	20.0	2028	2048
Feb 19,2024	Deepak Fertilisers	Equinor	India / Norway	0.09	15.0	2026	2041
Feb 28, 2024	Kogas	Woodside	Korea / Australia	0.07	10.5	2026	2037
Feb 29, 2024	Sembcorp	TotalEnergies	Singapore / France	0.11	16.0	2027	2043
Apr 29, 2024	Kogas	BP	Korea / Singapore	0.12	11.0	2026	2037
May 26, 2024	AMNS	Shell	India / Canada	0.05	10.0	2027	2037
May 28, 2024	Hokkaido	Santos	Japan / Australia	0.05	10.0	2027	2037
Jun 4, 2024	IOCL	TotalEnergies	India / France	0.11	10.0	2026	2036
Jun 5, 2024	CPC	QatarEnergy	Taiwan / Qatar	0.53	27.0	2025	2052
Jul 11, 2024	CPC	Woodside	Taiwan / Australia	0.79	10.0	2024	2034
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**15.39**			

Long-Term LNG Buyer Deals Since July 1, 2021

Date	Buyer	Seller	Country	Volume	Duration	Start
			Buyer / Seller	(bcf/d)	Years	
Non-Asian LNG Deals						
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025
Jan 25, 2023	PKN ORLEN	Sempra Infrastructure	EU//US	0.13	20.0	2027
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	2026
Apr 24, 2023	Hartree Partners LP	Delfin Midstream	US / US	0.08	20.0	n.a.
Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	15.0	2027
Jun 22, 2023	SEFE	Venture Global LNG	EU//US	0.30	20.0	2026
Jul 14, 2023	ONEE (Morocco)	Shell	Africa/US	0.05	12.0	2024
Jul 18, 2023	IOCL	Adnoc	India/UAE	0.16	14.0	2026
Jul 28, 2023	OMV	BP	Austira/UK	0.13	10.0	2026
Aug 4, 2023	ConocoPhillips	Mexico Pacific Ltd	US/Mexico	0.29	20.0	2025
Aug 22, 2023	BASF	Cheniere	Germany / US	0.10	17.0	2026
Aug 30, 2023	Shell	Oman LNG	US / Oman	0.11	10.0	2025
Oct 11, 2023	TotalEnergies	QatarEnergy	France / Qatar	0.46	27.0	2026
Oct 18, 2023	Shell	QatarEnergy	Netherlands / Qata	0.46	27.0	2026
Oct 23, 2023	ENI	QatarEnergy	Italy / Qatar	0.13	27.0	2026
Oct 31, 2023	Vitol	Chesapeake Energy	Sweden / US	0.13	15.0	2028
Nov 29, 2023	OMV	Cheniere	Netherlands / US	0.11	15.0	2029
Dec 5, 2023	Woodside Energy	Mexico Pacific Ltd	Australia / Mexico	0.17	20.0	2024
Mar 18, 2024	SEFE	ADNOC	Germany / UAE	0.13	20.0	2024
Apr 17, 2024	Shell	Oman LNG	US / Oman	0.21	10.0	2025
Apr 22, 2024	TotalEnergies	Oman LNG	France / Oman	0.11	10.0	2025
May 8, 2024	EnBW	ADNOC	Germany / UAE	0.08	15.0	2028
June 13, 2024	Saudi Aramco	NextDecade	Saudi Arabia / US	0.16	20.0	2028
June 26, 2024	Saudi Aramco	Sempra Infrastructure	Saudi Arabia / US	0.66	20.0	2029
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**9.07**		

Total New Long Term LNG Contracts since Jul/21	**24.47**

*Excludes Asian short term/spot deals
*on Dec 20, 2021 CNOOC agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period
Source: Bloomberg, Company Reports
Prepared by SAF Group https://safgroup.ca/news-insights/

Source: SAF

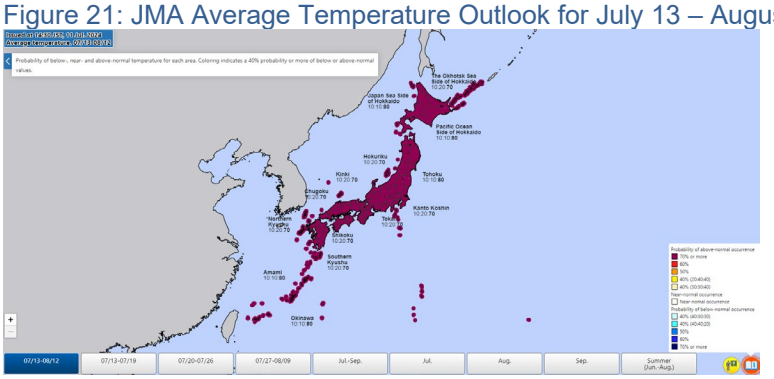
Natural Gas: Japan expects hot temperatures thru July into mid Aug

It's been hot in Japan and the hot weather is expected to continue for the next 30 days. On Thursday, the Japan Meteorological Agency updated its forecast for the next 30 days in Japan

JMA temperature forecast for the next 30 days

[LINK]. There is no JMA commentary on the forecast. JMA is calling for well above normal temperatures for the rest of July and the first two weeks of August, with a +70% probability of above normal temperature occurrence. We checked AccuWeather and they are forecasting daily highs in of 29-32C for the next 30 days. Anyone who has been to Tokyo in July knows that it is humid so we should see temperature driven demand for electricity incl natural gas. Below is the JMA temperature forecast for the next 30 days.

Figure 21: JMA Average Temperature Outlook for July 13 – August 12

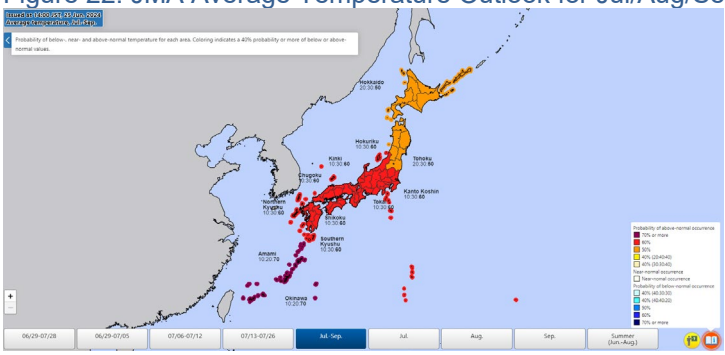


Source: Japan Meteorological Agency

In line with JMA 06/27/24 forecast for hot temperatures for Jul/Aug/Sept

The JMA's updated 30-day temperature outlook is in line with their June 27, 2024 forecast for Jul/Aug/Sept to be hot throughout Japan. Here is what we wrote in our June 30, 2024's Energy Tidbits memo. "*On Thursday, the Japan Meteorological Agency posted its seasonal temperature outlook for Jul/Aug/Sept for Japan. We tweeted [LINK] "May not drive up #LNG prices but Japan Meteorological Agency forecasts a hot July and hot Jul/Aug/Sep so should provide near term support for prices. #OOTT #NatGas." There is no JMA commentary on the forecast but it is calling for above average temperatures throughout the summer and September. It looks to be in line with Jul/Aug/Sep 2023 that was above average temps. Below is the JMA temperature forecast for Jul/Aug/Sep."*

Figure 22: JMA Average Temperature Outlook for Jul/Aug/Sep



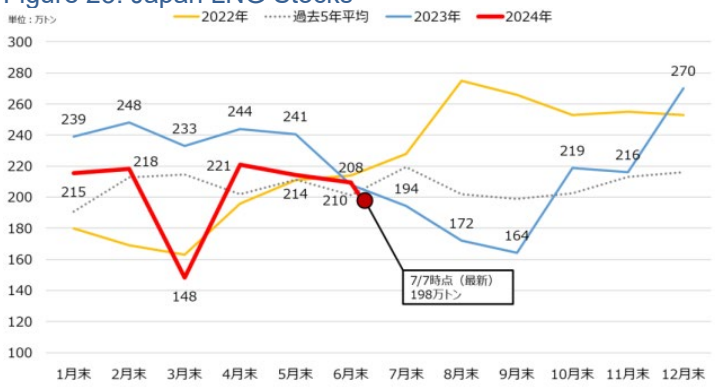
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks down WoW, up small YoY

Japan LNG stocks down WoW

Japan's LNG stocks are down WoW, are up small YoY, and are below the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on July 7 were 95.1 bcf, down -5.7% WoW from June 30 of 100.9 bcf, and up +2.1% from 93.2 bcf from a year ago. Stocks are down -9.6% below the 5-year average of 105.2 bcf. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 23: Japan LNG Stocks



Source: METI

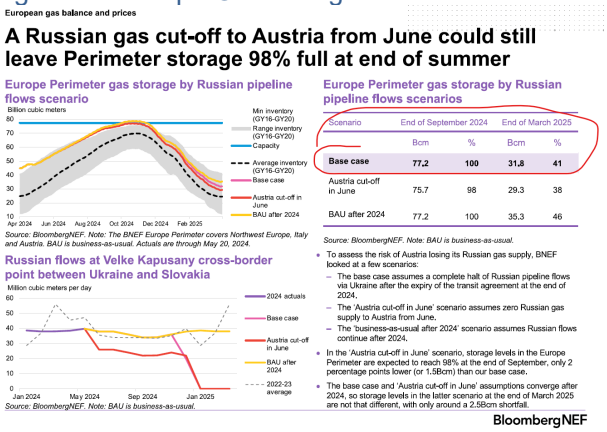
Natural Gas: BloombergNEF forecast Europe gas storage full by end of Sept

EU gas storage forecast to be full

When we look at the weekly Europe gas storage data, it continues to look like Europe gas storage is on track to be full before winter, although it is still too early to tell if it will be full by Sept 30 as BloombergNEF forecast on May 31. We suspect it may be summer holiday related but, as our 7am MT news cut off, we haven't seen an update to BloombergNEF's European Gas Monthly report. Here is what we wrote in our June 2, 2024 Energy Tidbits on the then new BloombergNEF forecast for Europe gas storage to be full by the end of Sept.

"*On Friday, we tweeted [LINK] "ICYMI. @BloombergNEF base case forecasts Europe #NatGas storage full by Sept 30! If so, it won't just hurt Europe TTF prices but also push back on US #HH prices. #OOTT." BloombergNEF's European Gas Monthly also had its base case forecsat for Europe natural gas storage and they call for storage to be full by Sept 30. BloombergNEF also highlights that Eruope natural gas storage would still be 98% by Sept 30 if there is a cut off of any Russian natural gas to Austria in June. IF Europe natural ags storage is full by Sept 30, there should be some strong downward price pressure on Europe natural gas prices in Sept and Oct. And if so, there should also be some push back on US HH natural gas prices.* "

Figure 24: Europe Gas storage forecast



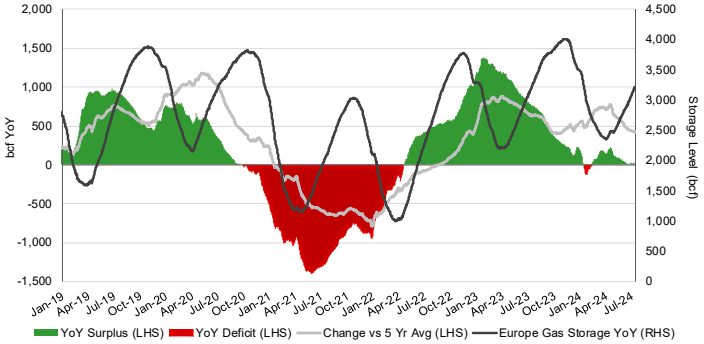
Source: BloombergNEF

Natural Gas: Europe storage builds WoW to 80.3%, flat YoY

Europe gas storage

This week, Europe storage increased by +2.0% WoW 80.3% vs 78.3% on July 4. Storage is now flat from last year's levels of 80.3% on July 11, 2023, and up huge vs the 5-year average of 64.33%. As noted above, it looks like Europe gas storage is on track to be filled before winter and looks like pointing to it being full in line with BloombergNEF's May 31 forecast forr Europe gas storage to be full by Sept 30. Note that this doesn't necessarily mean 100% but as storages gets to the low to mid 90%, injections start to slow down and LNG inbound cargoes will start to be redirected to other regions. Our fear remains that if this is likely by the end of Aug, we should see low Europe gas prices in Sept/Oct. Below is our graph of European Gas Storage Level.

Figure 25: European Gas Storage Level



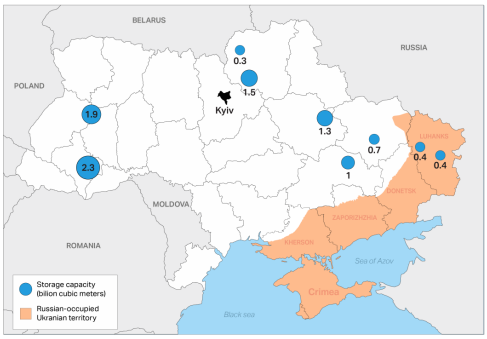
Source: Bloomberg, SAF

Ukraine storage is currently ~7% of total Europe gas storage volume

We have been breaking out Ukraine gas storage levels since the Mar/Apr Russian bombing of the Ukraine natural gas storage, which only impacted some above ground natural gas infrastructure. But it also reminded that of the risk to Europe gas storage from Russia attacks. We broke out the Ukraine storage data from the above

Europe data we monitor weekly from the GIE AGSI website [LINK], and, on July 11th, natural gas in Ukraine storage was at 18.6% of its total capacity, up from 17.9% of its total capacity on July 4th. Last year, Ukraine storage started the winter on Nov 1, 2023 at 39.38%. Right now, Ukraine makes up ~7% of Europe's natural gas in storage and, at the beginning of winter 2023/24, it was ~10% of Europe's natural gas in storage. Below is a map of Ukraine's major gas storage facilities.

Figure 26: Ukraine Gas Storage Facilities as of July 2023



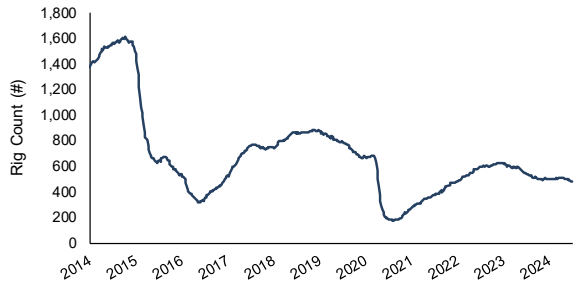
Source: Bruegel

Oil: US oil rigs down -1 rig WoW to 478 rigs, US gas rigs down -1 rig WoW to 100 rigs

US oil rigs down WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note Baker Hughes no longer breaks out the basin changes by oil vs gas rig type. (ii) Total US oil rigs were down -1 rig WoW at 478 oil rigs as of July 12. US oil rigs went below 520 rigs on Aug 25 and has been around 490-510 rigs for the past several months, however, this week's 478 rigs marks the lowest oil rig count since December 2021. (iii) Note we aren't able to see the basin changes but not by type of rig. The major basin changes were Ardmore Woodford -1 rig WoW to 3 rigs, Eagle Ford -1 rig WoW to 48 rigs, and Granite Wash +2 rigs WoW to 5 rigs. (iv) The overlooked US rig theme is the YoY declines. Total US rigs are -91 YoY to 584 rigs including US oil rigs -59 oil rigs YoY to 478 oil rigs. And for the key basins, the Permian is -32 rigs YoY, Haynesville is -9 rigs YoY and Marcellus -10 rigs YoY. (v) US gas rigs were down -1 rig this week to 100 gas rigs.

Figure 27: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

Oil: Permian oil rigs to be impacted by Waha natural gas prices being zero or negative

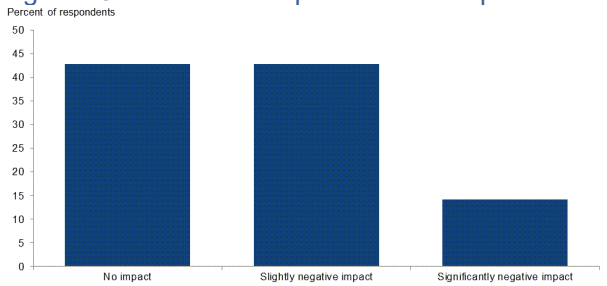
Waha gas prices closed at nine cents

On Friday, we tweeted [LINK] "*Waha #NatGas slid to close at $0.09 on Fri. But better than last week's negative pries. Remember Permian #Oil wells produce oil + associated NGLs + #NatGas. Low or negative Waha prices may not impact big Permian players oil drilling plans but expected to cause small Permian players to cut back on Permian oil drilling plans.* 🤟 *@DallasFed #OOTT."* It was better week for Waha (Permian) natural gas prices that were positive this week before sliding down to close at $0.09 on July 12. So only nine cents but positive after a brutal last week when Waha was negative prices, closing at -$3.99 on July 5. Waha prices have been negative at times in April, May, June and last week when there has been some infrastructure maintenance being the main cause. This price volatility is also a reason why Permian oil rigs have been soft. The natural gas from the Permian is the associated natural gas that is produced from Permian oil wells. So if there is near term concerns on Waha natural gas prices, it will impact oil drilling from smaller Permian players. Our tweet included an excerpt from the Dallas Fed quarterly energy survey that was posted last week [LINK] One of their special questions was "*What impact will low Waha Hub natural gas prices likely have on your firm's drilling and completion plans in the Permian for the rest of 2024?* " Dallas Fed summarized the responses "*The Waha Hub is a gathering location for natural gas in the Permian Basin that connects to major pipelines. Of the executives surveyed, 43 percent said low Waha Hub natural gas prices won't likely affect their firm's drilling and completion plans in the Permian for the rest of 2024. Meanwhile, 43 percent expect a slightly negative impact, and an additional 14 percent said the low Waha Hub prices will have a significantly negative impact on drilling and completion plans for the rest of this year in the Permian. Small E&P firms were more likely to expect negative impacts."*

Figure 28: Waha Natural Gas Prices to July 12 close

Source: Bloomberg

Figure 29: Percent of responses what impact low Waha prices on rest of 2024 drilling plans



NOTES: Executives from 28 exploration and production firms answered this question during the survey collection period, June 12–20, 2024. This question was posed only to executives who said their firm drilled or completed a horizontal well in the Permian Basin in the past two years.
SOURCE: Federal Reserve Bank of Dallas.

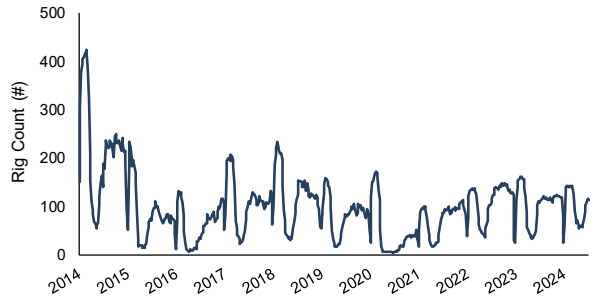
Source: Dallas Fed

Oil: Total Cdn rigs up +14 rigs WoW, consistent with seasonal ramp-up

Cdn total rigs up WoW

As happens every year in Canada, the rig count drops dramatically from early March thru the end of April/beginning of May as winter drilling season ends and the industry moves into spring break up. Spring break up is when melting snow leads to road access being limited/restricted in many parts of Alberta and BC. Then after spring break-up (normally in June), Cdn rigs start their steady ramp up . Total Cdn rigs declined from 231 at the beginning of March to 114 one month ago. This week's rig count was up +14 rigs WoW to 189 rigs. This week looks to continue the ramp up we saw beginning last month that follows every spring break up, although we are slightly surprised by the large increase given the increasing wildfires. Cdn oil rigs were up +11 rigs WoW this week to 126 rigs and are up +12 rigs YoY. Gas rigs are up +3 rigs WoW this week to 63 rigs and are down -10 rigs YoY, and miscellaneous rigs are flat WoW and flat YoY. Baker Hughes did not update their old format report, so we weren't able to see the provincial breakouts.

Figure 30: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production up +0.100 WoW to 13.300 mmb/d

US oil production up WoW

The EIA's weekly oil supply estimates have been essentially unchanged for the last nine months ranging from 13.1 to 13.3 mmb/d with the weekly estimates in June all at 13.2 mmb/d, and this week's estimate for the first week of July is up +0.1 mmb/d to 13.3 mmb/d. We have to give the EIA credit for putting out weekly oil supply estimates for the prior week.

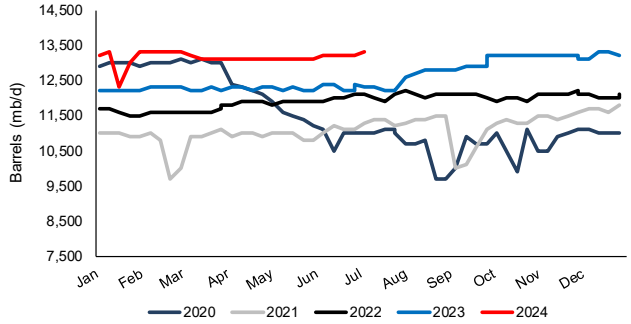
That can't be easy so no one should be surprised that the EIA weekly oil supply estimates, based on the Form 914 actuals, will sometimes require re-benchmarking. And sometimes the re-benchmarking can be significant and other times, it is relatively small. Here's what the EIA wrote on their website back in April with the April STEO: "*When we release the Short-Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude oil production are reviewed to identify any differences between recent trends in survey-based domestic production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that decreased estimated volumes by 177,000 barrels per day, which is about 1.3% of this week's estimated production total".* On July 9, the EIA released its July STEO. There was an upward revision to Q2/24 production estimates to 13.21 mmb/d from 13.17 mmb/d, and Q1/24 production estimates were unchanged at 12.94 mmb/d. This week, the EIA's production estimates were up +0.100mmb/d WoW to 13.300 mmb/d for the week ended July 5. Alaska was up +0.001 mmb/d WoW to 0.384 mmb/d from 0.383 mmb/d last week. Below is a table of the EIA's weekly oil production estimates.

Figure 31: EIA's Estimated Weekly US Field Oil Production (mb/d)

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2023-Jan	01/06	12,200	01/13	12,200	01/20	12,200	01/27	12,200		
2023-Feb	02/03	12,300	02/10	12,300	02/17	12,300	02/24	12,300		
2023-Mar	03/03	12,200	03/10	12,200	03/17	12,300	03/24	12,200	03/31	12,200
2023-Apr	04/07	12,300	04/14	12,300	04/21	12,200	04/28	12,300		
2023-May	05/05	12,300	05/12	12,200	05/19	12,300	05/26	12,200		
2023-Jun	06/02	12,400	06/09	12,400	06/16	12,200	06/23	12,200	06/30	12,400
2023-Jul	07/07	12,300	07/14	12,300	07/21	12,200	07/28	12,200		
2023-Aug	08/04	12,600	08/11	12,700	08/18	12,800	08/25	12,800		
2023-Sep	09/01	12,800	09/08	12,900	09/15	12,900	09/22	12,900	09/29	12,900
2023-Oct	10/06	13,200	10/13	13,200	10/20	13,200	10/27	13,200		
2023-Nov	11/03	13,200	11/10	13,200	11/17	13,200	11/24	13,200		
2023-Dec	12/01	13,100	12/08	13,100	12/15	13,300	12/22	13,300	12/29	13,200
2024-Jan	01/05	13,200	01/12	13,300	01/19	12,300	01/26	13,000		
2024-Feb	02/02	13,300	02/09	13,300	02/16	13,300	02/23	13,300		
2024-Mar	03/01	13,200	03/08	13,100	03/15	13,100	03/22	13,100	03/29	13,100
2024-Apr	04/05	13,100	04/12	13,100	04/19	13,100	04/26	13,100		
2024-May	05/03	13,100	05/10	13,100	05/17	13,100	05/24	13,100	05/31	13,100
2024-Jun	06/07	13,200	06/14	13,200	06/21	13,200	06/28	13,200		
2024-Jul	07/05	13,300								

Source: EIA

Figure 32: EIA's Estimated Weekly US Oil Production



Source: EIA

Oil: US shale/tight oil production flat for the last 5 months

Shale/tight oil production

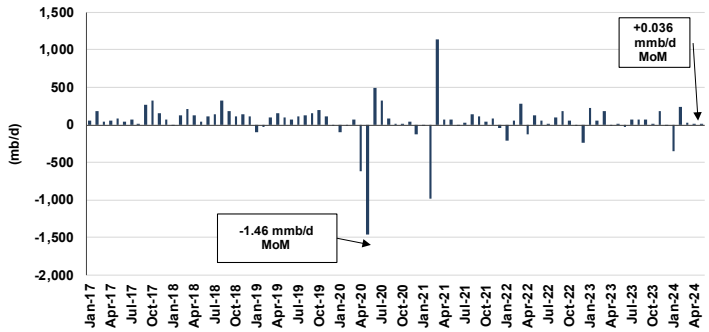
As mentioned earlier, the EIA combined its prior shale/tight oil information with its STEO, which was released on Tuesday for July 2024 [LINK]. The EIA stopped forecasting future oil production by region and has updated their data until June for oil production from the major shale/tight oil and gas plays. Note that the EIA revised their data for shale/tight oil production back to 2020 from June's STEO, and we have adjusted our table to reflect the updated data. Shale/tight oil production in June was 8.626 mmb/d, flat MoM from May and up 3% YoY. June marks the 5th consecutive month of shale/tight oil at ~8.6 mmb/d, and this is down from ~8.75 mmb/d in Nov/Dec 2023. Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 33: US Major Shale/Tight Oil Production

	2023							2024							
Thousand b/d	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June MoM%	June YoY%
Austin Chalk + Eagle Ford	1,158	1,163	1,143	1,143	1,110	1,100	1,063	1,014	1,057	1,056	1,053	1,049	1,045	-0.3%	-10%
Bakken	1,133	1,145	1,180	1,259	1,226	1,252	1,246	1,078	1,222	1,198	1,210	1,195	1,194	-0.1%	5%
Mississippian + Woodford	242	239	225	216	216	220	220	196	212	212	211	211	211	-0.2%	-13%
Niobrara	460	454	463	457	471	482	494	450	478	479	479	480	480	0.1%	4%
Permian	5,040	5,119	5,176	5,183	5,239	5,398	5,442	5,221	5,380	5,406	5,419	5,429	5,438	0.2%	8%
Rest of US L48	305	285	291	289	294	289	283	268	275	264	259	258	258	-0.2%	-16%
Total	8,338	8,405	8,477	8,548	8,556	8,740	8,748	8,226	8,624	8,614	8,631	8,623	8,626	0.0%	3%

Source: EIA, SAF

Figure 34: MoM Changes in US Major Shale/Tight Oil Production



Source: EIA, SAF

Oil: EIA DUCs essentially flat MoM in June, DUCs down -12% YoY

DUCs flat MoM in June

We have been warning that we see a key risk to how much US oil production can sustainably grow in 2024 and 2025 is the need to increase rig counts (not have less frac spreads) to replenish the inventory of Drilled Uncompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. The EIA's STEO [LINK] now contains the estimate of Drilled Uncompleted wells. (i) The EIA estimates DUCs were essentially flat MoM (-12% YoY) in June at 5,452 DUCs. Note that the EIA revised their data for DUC wells from June's STEO back until 2020, and we have adjusted our table to reflect the updated data. (ii) To put in perspective, there were 9,775 DUCs in the height of the Covid slowdown in June 2020, 7,086 DUCs in June 2021, 6,012 DUCs in June 2022, 6,177

in June 2023, and now 5,452 DUCs in June 2024. (iv) We still believe there is still the need for drilling rigs to pick up to replenish the DUC inventory if the US is to have sustained strong oil growth in 2024 and beyond. (v) The largest YoY June DUCs declines are the Bakken (-33% YoY), and Eagle Ford (-40% YoY). (vi) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DUC Wells.

Figure 35: Estimated Drilled Uncomplete Wells in 2023/24

	2023				2024							
DUCs	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June MoM%	June YoY%
Appalachia region	845	832	821	819	812	802	795	791	790	786	-0.5%	-7%
Bakken region	379	376	350	331	334	336	337	337	334	331	-0.9%	-33%
Eagle Ford region	438	407	388	404	381	347	330	328	327	324	-0.9%	-40%
Haynesville region	799	795	787	788	793	798	801	800	801	807	0.7%	3%
Permian region	978	909	898	891	888	888	891	893	892	887	-0.6%	-11%
Rest of Lower 48 States, excluding GOM	2441	2404	2394	2369	2366	2363	2359	2350	2338	2317	-0.9%	-8%
Total	5,880	5,723	5,638	5,602	5,574	5,534	5,513	5,499	5,482	5,452	-0.5%	-12%

Source: EIA, SAF

Bakken insights

Oil: Bakken play reminders from Devon's $5b of private Bakken player Grayson Hill

There were some good Bakken play reminders from Devon on Monday in their discussion of the $5b acquisition of private Bakken player, Grayson Hill. We always say we are lucky that we don't have to provide stock earnings estimates and valuations because it lets us look at plays and any insights to the sector instead estimates. (i) On Monday, we tweeted [LINK] "*Bakken reminders from Devon's $5b acquisition. It's a maintain production rather than a growth play. "our plan right now is to maintain 150,000 BOE per day level for the foreseeable future" says COO. It's fairly gassy. Oil is 57% of DVN Bakken boe production. #OOTT."* (ii) The Bakken is primarily a maintain production levels, maybe some small growth, for as long as possible. Not everyone, but we think most of the larger Bakken players will have a similar approach as Devon that the Bakken is a maintain production play that throws off cash flow and not a growth play. Devon says "*our plan right now is to maintain 150,000 boe per day level for the foreseeable future."* The question becomes when will the Bakken start to decline and then how fast. The more important disclosure is that with new completions and refracs, they say they have 10 years of inventory. 10 years isn't that huge a number that someone would accelerate and ramp up drilling activity because the more they do that, it shortens the 10 years. (iii) Devon's Oil cut is 57% of boe/d production. The press release noted the boe/d production. The deal slide deck notes oil is 57% of total production. Ion the Williston, which is 85,500 b/d of oil. It sounds big but the oil leg is only 85,000 b/d proforma in the Williston. The last NDIC Director's Cut said Bakken/Three Forks production was 1.208 mmb/d in April. (iv) North Dakota oil cut is 67%. Bakken/Three Forks is 97% of total North Dakota oil production. And for total North Dakota, oil production was 1.208 mmb/d and natural gas was 3.490 bcf/d (or 0.582 mmb/d oil equivalent), which puts oil cut at 67%. Devon at 57% would point to more mature production as natural gas share of boe/d production increases.

EIA STEO US oil production

Oil: EIA June STEO small increase to 2024 and to 2025 US oil production

On Tuesday, the EIA released its Short-Term Energy Outlook for June 2024 [LINK], which included a small increase to its 2024 oil production forecasts and a small increase to its 2025 US oil production forecast. (i) The July STEO forecasts for 2024 US oil production estimates were revised up vs the last STEO in June, which had been also bumped up from May. The 2025 forecasts for US oil production were revised up for 2025, after were bumped up down in June from May. (ii) The lookback to 2023 was unchanged with the July STEO estimate for

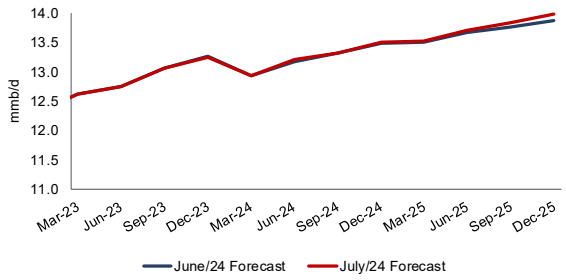
2023 was kept flat at 12.93 mmb/d from the June STEO. Recall the big +140,000 b/d revision in October's STEO from the September STEO's forecast of 12.78 mmb/d, as the EIA had to play catch-up with higher oil production actuals being reported over weekly estimates. (iii) The July STEO forecast for 2024 is up +0.01 mmb/d to 13.25 mmb/d from the June STEO of 13.20 mmb/d. There were some small revisions by quarter: Q1/24 flat at 12.94 mmb/d, Q2/24 up +0.04 mmb/d to 13.21 mmb/d, Q3/24 down -0.01 mmb/d to 13.32 mmb/d, and Q4/24 down -0.4 mmb/d to 13.10 mmb/d. (iv) The EIA expects oil production to ramp up to 13.77 mmb/d over 2025, up +0.06 mmb/d from the June STEO. The revisions by quarter were Q1/25 +0.01 mmb/d to 13.52 mmb/d, Q2/25 +0.04 mmb/d to 13.72 mmb/d, Q3/25 up +0.08 mmb/d to 13.84 mmb/d, and Q4/25 +0.10 mmb/d to 13.98 mmb/d. Below is our EIA STEO forecast comparison by month.

Figure 36: EIA STEO Oil Production Forecasts by Month

(million b/d)	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024	Q1/25	Q2/25	Q3/25	Q4/25	2025
July-24	12.63	12.75	13.07	13.26	12.93	12.94	13.21	13.32	13.10	13.25	13.52	13.72	13.84	13.98	13.77
June-24	12.63	12.75	13.07	13.26	12.93	12.94	13.17	13.33	13.50	13.24	13.51	13.68	13.76	13.88	13.71
May-24	12.63	12.75	13.07	13.26	12.93	12.96	13.10	13.25	13.50	13.20	13.55	13.73	13.76	13.87	13.73
Apr-24	12.63	12.75	13.07	13.27	12.93	12.84	13.13	13.32	13.54	13.21	13.56	13.72	13.74	13.86	13.72
Mar-24	12.63	12.75	13.07	13.28	12.93	12.91	13.13	13.25	13.47	13.19	13.49	13.66	13.68	13.78	13.65
Feb-24	12.63	12.75	13.07	13.29	12.93	13.03	13.12	13.06	13.18	13.10	13.37	13.46	13.50	13.64	13.49
Jan-24	12.63	12.75	13.07	13.22	12.92	13.27	13.22	13.15	13.21	13.21	13.36	13.44	13.43	13.53	13.44
Dec-23	12.63	12.75	13.06	13.26	12.93	13.09	13.07	13.07	13.23	13.11					
Nov-23	12.63	12.75	13.07	13.17	12.90	13.06	13.08	13.11	13.35	13.15					
Oct-23	12.63	12.75	13.13	13.16	12.92	13.07	13.02	13.07	13.31	13.12					
Sep-23	12.63	12.71	12.86	12.94	12.78	13.03	13.09	13.15	13.36	13.16					
Aug-23	12.63	12.67	12.81	12.93	12.76	12.98	13.01	13.08	13.27	13.09					
Jul-23	12.61	12.55	12.48	12.63	12.56	12.67	12.71	12.88	13.13	12.85					
Jun-23	12.60	12.56	12.57	12.70	12.61	12.69	12.63	12.76	13.00	12.77					
May-23	12.54	12.51	12.46	12.61	12.53	12.63	12.58	12.68	12.85	12.69					
Apr-23	12.54	12.50	12.50	12.61	12.54	12.69	12.71	12.77	12.83	12.75					
Mar-23	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.71	12.63					
Feb-23	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65					
Jan-23	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81					

Source: EIA STEO

Figure 37: Estimated US Crude Oil Productions by Forecast Month



Source: EIA STEO

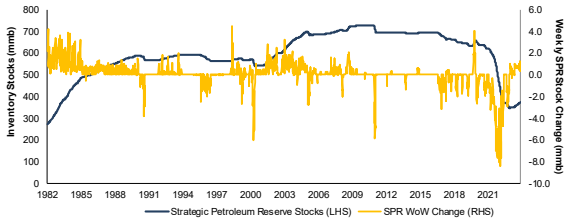
Oil: US SPR less commercial reserve deficit narrows, now -72.024 mmb

US SPR reserves

The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022 week. This week, we saw a build on the SPR side and a draw on the commercial side. The EIA's weekly oil data for July 5 [LINK] saw the SPR reserves increase +0.477 mmb WoW to 373.072 mmb, while commercial crude oil reserves decreased -3.443 mmb to 445.096 mmb. There is now a -72.024 mmb difference between SPR reserves

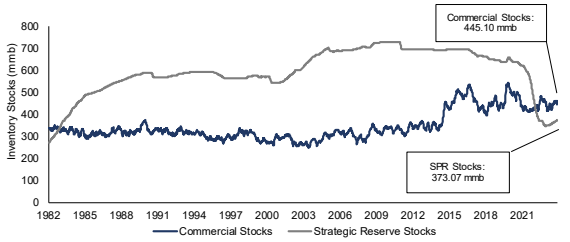
and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles, along with the weekly changes to SPR stockpiles.

Figure 38: Strategic Petroleum Reserve Stocks and SPR WoW Change



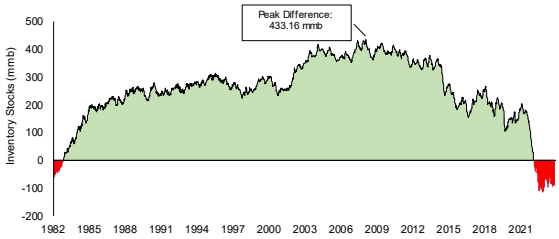
Source: EIA

Figure 39: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 40: US Oil Inventories: SPR Less Commercial



Source: EIA

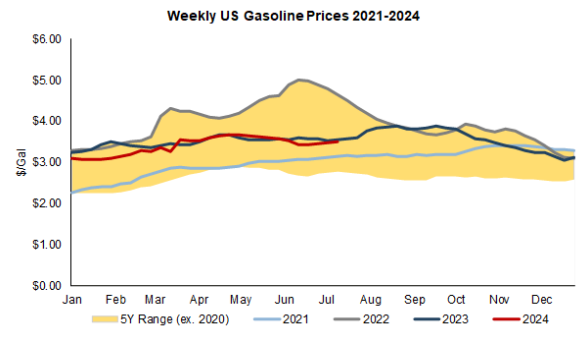
Oil: US national average gasoline price +$0.02 WoW to $3.53

US gasoline prices

Yesterday, we tweeted [LINK] [LINK] "*AAA National average prices +$0.02 WoW to $3.53 on July 13, +$0.07 MoM & -$0.04 YoY. Texas +$0.07 WoW to $3.17, likely re temporary refinery shut-ins for Hurricane Beryl. California at $4.79 on July 6, down $0.01 WoW, down $0.19 MoM & down $0.05 YoY. Thx @AAAnews #OOTT.*" Yesterday, AAA reported that US national average prices were $3.53 on July 13, which was +$0.02 WoW, +$0.07 MoM and -$0.04 YoY. One of the key reasons for the WoW increase is a modest impact from some refineries temporarily shut down for Hurricane Beryl safety precautions. Texas is always well below the national average gasoline prices but was +$0.07 WoW to $3.17. Yesterday, AAA reported California average gasoline prices were $4.76 on July 13, which was -$0.03 WoW, -

$0.11 MoM, and -$0.14 YoY. Below is our graph of Bloomberg's National Average Gasoline prices.

Figure 41: Bloomberg's National Average Gasoline Prices



Source: Bloomberg

Oil: Crack spreads -$2.16 WoW to $23.22, WTI -$0.95 WoW to $82.21

Crack spreads closed at $23.22

On Friday, we tweeted [LINK] "*321 crack -$2.16 WoW to $23.22 on Jul 12. WTI was +$0.95 WoW to $82.21. No surprise, cracks dropped as Beryl hit Houston & refineries started to shut down. Key will be how much cracks bounce back as refineries restart. Thx @business #OOTT.*" If it wasn't for Hurricane Beryl hitting Houston and refineries shutting down, we would have tweeted that $23.22 crack spreads were pointing to WTI being weaker this week. Rather we were expecting to see some weakness in 321 crack spreads with some refineries shutting down for hurricane safety. We did not see any reports of significant refinery damage. And some refineries restarted late this week. Crack spreads were -$2.16 WoW to close at $23.22 on July 12 and WTI was -$0.95 WoW to close at $82.21. Crack spreads of $23.22 on July 12 followed $25.38 on July 5, $24.36 on June 28, $24.36 on June 21, $23.45 on June 14, $24.31 on June 7, $24.04 on May 31, $25.65 on May 24, $27.04 on May 17, $25.89 on May 10, $27.59 on May 3 and $28.96 on Apr 26. Crack spreads at $23.22 are only a little bit about above the high end of the more normal pre-Covid that was more like $15-$20.

Crack spreads point to near term oil price moves, explaining 321 crack spread

We have focused on crack spreads for since the 90s as they are an unchanged fundamental of refineries – big crack spreads provide incentives for refineries to buy more crude because there are big profit margins to be made. 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 vs WTI that we put in our tweet where we marked the gaps where the crack spread normally drags up oil prices. The crack spread was $23.22 as of the Friday July 12, 2024 close.

Figure 42: Cushing Oil 321 Crack Spread & WTI July 12, 2014 to July 12, 2024

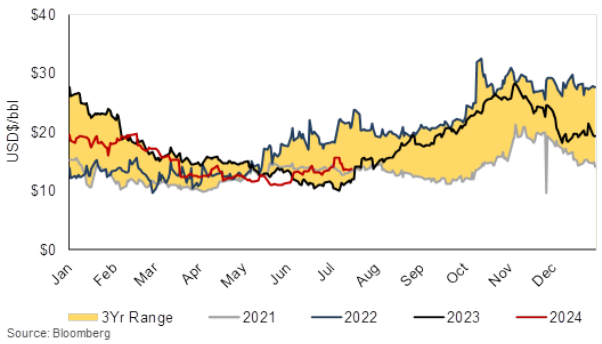
Source: Bloomberg

Oil: Cdn heavy oil differentials narrow $1.06 WoW to close at $13.64 on July 12

WCS differential widens

As expected, there was a bit of help (narrowing) of WCS less WTI differentials this week when last week we saw some oil sands production, in particular Suncor's Firebag project, temporarily shut-in with nearby wildfires. And as we look ahead, we should see the real test of how much the startup of the 590k,000 b/d TMX expansion will impact WCS less WTI differentials is still to come in the coming weeks. Aug is normally when we normally see a widening of the WCS less WTI differentials. But even with the TMX startup, we still expect to see WCS less WTI differentials moving up and down based on items like refineries up and downs, wildfires, etc. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials that normally start to widen in Aug. The WCS less WTI differential closed on July 12 at $13.64, which was a narrowing of $1.06 WoW vs $14.70 on July 5.

Figure 43: WCS less WTI oil differentials to July 12 close



Source: Bloomberg

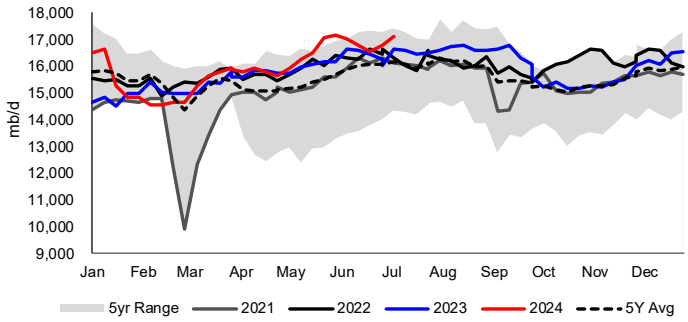
Oil: Refinery Inputs up +0.317 mmb/d WoW to 17.109 mmb/d

Refinery inputs +0.317 mmb/d WoW

There are always unplanned refinery items that impact crude oil inputs into refineries. And there are always different timing for refinery turnarounds. But, as a general rule, this is the

normal seasonal ramp up in refinery runs for the summer that normally peaks in August. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended July 5 [LINK]. The EIA reported crude inputs to refineries were up +0.317 mmb/d this week to 17.109 mmb/d and are up +0.450 mmb/d YoY. Refinery utilization was up +1.9% WoW to 95.4%, and was up +1.7% YoY.

Figure 44: US Refinery Crude Oil Inputs



Source: EIA, SAF

Next week's refinery inputs should be lower due to Hurricane Beryl

There were a number of Gulf Coast refineries that temporarily shut down some of their operations for safety reasons when Hurricane Beryl was about to hit. We are not seeing reports of any major damage but, during the temporary shut down period, this would reduce crude oil input into refineries. This should be reflected in the EIA data for the week ended July 12.

Oil: US net oil imports up +0.616 mmb/d WoW as oil exports down -0.402 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up +0.616 mmb/d to 2.761 mmb/d for the July 5 week. US imports were up +0.214 mmb/d to 6.760 mmb/d, while exports were down -0.402 mmb/d to 3.999 mmb/d. Top 10 was up +0.004 mmb/d. (i) Venezuela weekly imports. We know why the EIA doesn't have any data in the row for Venezuela weekly oil imports but we still don't know if the weekly oil imports are off or if Venezuela is included in the weekly oil imports in the Others number. But we do know the EIA monthly data shows Padd 3 imports from Venezuela >150,000 b/d. Give the EIA credit for putting out weekly oil import estimates, but it's a reminder that we have to be careful about using the weekly oil import estimates. Rather we need to make sure we go to the monthly data for oil imports. (i) Canada was down -0.307 mmb/d to 3.611 mmb/d. Weekly imports have been higher of late with reports of increased Cdn crude coming off TMX and hitting west coast US refineries. (ii) Saudi Arabia was up +0.129 mmb/d to 0.275 mmb/d. (iii) Mexico was up +0.287 mmb/d to 0.619 mmb/d, which was likely due to some Mexico refinery downtime. (iv) Colombia was down -0.039 mmb/d to 0.237 mmb/d. (v) Iraq was up +0.126 mmb/d to 0.317 mmb/d. (vi) Ecuador was down -0.065 mmb/d to 0.087 mmb/d. (vii) Nigeria was up +0.093 mmb/d to 0.315 mmb/d.

Figure 45: US Weekly Preliminary Imports by Major Country

	May 10/24	May 17/24	May 24/24	May 31/24	Jun 7/24	Jun 14/24	Jun 21/24	Jun 28/24	Jul 5/24	WoW
Canada	3,812	3,495	3,666	3,768	3,974	4,137	3,890	3,918	3,611	-307
Saudi Arabia	196	486	422	375	278	372	162	146	275	129
Venezuela	0	0	0	0	0	0	0	0	0	0
Mexico	507	184	551	538	987	563	372	332	619	287
Colombia	211	215	32	496	75	306	83	276	237	-39
Iraq	123	239	233	126	228	164	195	191	317	126
Ecuador	207	163	103	200	149	199	210	152	87	-65
Nigeria	212	144	71	0	208	86	57	222	315	93
Brazil	293	315	127	254	134	201	341	74	251	177
Libya	86	0	262	0	87	0	86	89	0	-89
Top 10	5,647	5,241	5,467	5,757	6,120	6,028	5,396	5,400	5,712	312
Others	1,097	1,422	1,302	1,301	2,184	1,026	1,215	1,147	1,048	-99
Total US	**6,744**	**6,663**	**6,769**	**7,058**	**8,304**	**7,054**	**6,611**	**6,547**	**6,760**	**213**

Source: EIA, SAF

150,000 b/d Cdn crude from TMX expansion is hitting US West Coast refineries

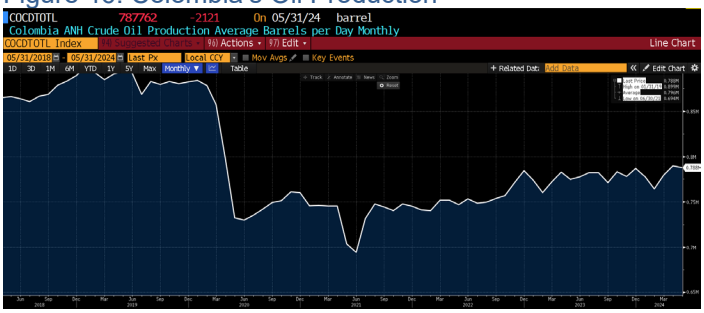
June 30, 2024's Energy Tidbits memo highlighted that the latest EIA estimates of US oil imports by country by PADD was for April and the 590,000 b/d TMX expansion did not start up until May. So we don't have EIA data on how much Cdn oil is hitting US West Coast refineries including TMX. The EIA's weekly oil import splits does not provide imports from Canada by PADD. On June 30 we wrote "*But, on Monday, Bloomberg's report "Cheap Canadian Oil Displaces Iraqi Imports on US West Coast" referenced Vortexa data showing about 150,000 b/d of Cdn crude is expected to hit US West Coast refineries coming off TMX. Bloomberg wrote "US West Coast refiners are replacing their heavy Iraqi oil imports with cheaper crude from Canada as the newly expanded Trans Mountain pipeline reshuffles trade flows across the Pacific. California and Washington are set to import about 150,000 barrels a day of Canadian crude by tanker in June — a seven-fold increase from average volumes, according to preliminary Vortexa data. At the same time, imports of Iraq's Basrah Heavy crude are poised to plunge to just 3,587 barrels a day from 76,000 barrels in May." Our Supplemental Documents package includes the Bloomberg report."*

Oil: Colombia oil production still well below pre-Covid, May was 0.788 mmb/d

We continue to believe it's hard to see how Colombia oil production ever sustainably rallies anywhere back to 1 mmb/d or even 900,000 b/d. Despite stronger oil prices post Covid, Colombia oil production has been stuck below 800,000 b/d. On Thursday, the Colombia oil production source data from The National Hydrocarbons Agency for May was available on Bloomberg. Production in May was down -0.3% MoM to 0.788 mmb/d from 0.790 mmb/d. This puts May's production up +1.7% YoY vs 0.774 mmb/d in May 2023. Production is now -11.07% below pre-Covid levels of 0.886 mmb/d in 2019.

Colombia oil production stuck below 800,000 b/d

Figure 46: Colombia's Oil Production



Source: Hydrocarbons Colombia, Bloomberg

Figure 47: Colombia's Oil Production by Month

mmb/d	2016	2017	2018	2019	2020	2021	2022	2023	2024	24/23
Jan	0.986	0.860	0.860	0.899	0.884	0.745	0.740	0.774	0.777	0.4%
Feb	0.955	0.864	0.823	0.893	0.878	0.746	0.740	0.759	0.764	0.7%
Mar	0.917	0.804	0.856	0.885	0.857	0.745	0.751	0.771	0.780	1.2%
Apr	0.915	0.857	0.865	0.891	0.796	0.745	0.751	0.782	0.790	1.0%
May	0.904	0.851	0.866	0.895	0.732	0.703	0.746	0.774	0.788	1.7%
June	0.888	0.857	0.864	0.892	0.730	0.694	0.752	0.778		
July	0.843	0.856	0.860	0.869	0.735	0.731	0.748	0.782		
Aug	0.827	0.858	0.866	0.883	0.742	0.748	0.749	0.782		
Sept	0.859	0.851	0.869	0.879	0.749	0.744	0.754	0.771		
Oct	0.846	0.864	0.879	0.883	0.751	0.740	0.757	0.778		
Nov	0.855	0.851	0.883	0.880	0.761	0.747	0.771	0.783		
Dec	0.837	0.870	0.889	0.882	0.759	0.745	0.784	0.787		

Source: Bloomberg, The National Hydrocarbons Agency

Oil: Aker BP reminds giant Johan Sverdrup oilfield to start decline in late 24/early 25

Giant Johan Sverdrup oilfield to begin decine

Norway produces ~1.7 mmb/d of oil but Norway forecasts its country production will begin to decline in 2025. This is driven by the start of decline from Norway's largest oilfield, Johan Sverdrup, in late 24/early 25. It's only math. If Norway's giant oilfield starts to decline, it likely means Norway's oil production begins to decline. On Friday, we tweeted [LINK] "*Positive for #Oil in 2025. Norway produces ~1.7 mmb/d, on track to hit peak oil in 2025 & then decline therefrom. Why? Giant ~750,000 b/d Johan Sverdrup Aker field. Aker BP Q2. JS continues to produce at elevated plateau, drilling "will help to maintain this level until late 24 or early 25" ie. then moves into decline. In line with 👇03/12 tweet on Norway forecast for country to hit peak oil production in 2025 & then decline therefrom. #OOTT.*" Aker BP is a non-operating partner in Johan Sverdrup and held its Q2 call on Friday. Mgmt reiterated the Johan Sverdrup partners expectation that its elevated plateau of 750,000 b/d of oil can only be maintained until late 24/early 25, which means production declines therefrom. Mgmt also noted the fundamental reason for decline is no different than any other conventional oilfields – increasing water cut. Part of mgmt's comments were "*At Johan Sverdrup. It's a pleasure to see just how it keeps on performing. This giant field with almost 3 billion barrels in initial reserves was originally designed for a gross oil capacity of 660,000 barrels per day. Last year this was increased to 755,000 barrels, if we also include natural gas, the field has a capacity to deliver close to 800,000 barrels of oil equivalents per day and the performance has been nothing but remarkable with high production efficiency, very low production cost of around $2 per barrel and with maybe the lowest emission intensity in the industry of less than I kilogram of CO2 per barrel. In the second quarter, Aker BP share of production from Johan Sverdrup increased to 241,000 barrels of oil equivalents per day. As we have previously discussed, water production has been increasing in some of the wells over the last year. This is as*

expected and something that the operator is managing but continuously optimizing production on a well by well basis. We are also adding new wells with four added in the first half of 2024 and the fifth well have been started up now in July. Another five wells are planned for the second half. As of today, Johan Sverdrup continues to produce at the elevated plateau and the ongoing drilling activity will help to maintain this level until late '24 or early '25": . Our Supplemental Documents package includes mgmt prepared remarks and the Q&A on Johan Sverdrup.

03/12/24: Norway fcasts reaching peak oil production in 2025, then to decline

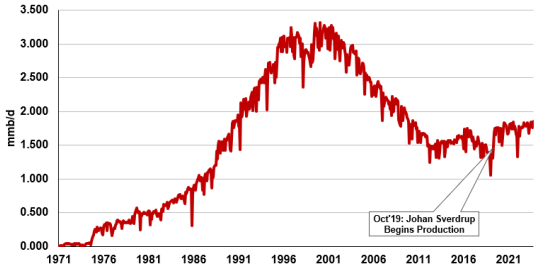
Our Friday tweet forwarded our March 12, 2024 tweet on Norway forecasting its country oil production will reach peak oil production in 2025 and then move to decline. This links to Norway's largest oilfield, Johan Sverdrup, starting to decline in late 2024/early 2025. Here is what we wrote in our Mar 17, 2024 Energy Tidbits memo. "*No one should be surprised to see Norway forecast that Norway will hit peak oil production in 2025 and then begin to decline. That conclusion was obvious on Feb 8 when Aker BP, a partner in the giant Johan Sverdrup oilfield, told investors that Johan Sverdrup was going to reach peak production level around year-end 2024 and then begin to decline. Our thesis on Norway oil production has been that we expect Norway oil production to peak around end of 2024 or early 2025 based on the recent Aker BP comments that Norway's giant Johan Sverdrup oil field will start to decline in late 2024, which we believe would likely lead to Norway hitting peak oil production and then begin to decline. It looks like that these is supported by Norway's energy agency (the Norwegian Offshore Directorate) blog on Monday. On Tuesday we tweeted [LINK] "ICYMI. Norway forecasts it will hit peak #Oil production in 2025 & then decline therefrom. Jan 2024 was 1.8 mmb/d. See 👇Feb 8 tweet. Giant oil field Johan Sverdrup to hit peak & begin decline ~yr-end 2024. Start of decline in giant oilfield = decline in oil for Norway. #OOTT." On Monday, we tweeted [LINK] "Norway #Oil production peak in 2025 and in decline says @sokkeldir. Makes sense, see 👇Feb 8 tweet. massive Johan Sverdrup oil field led to a return to Norway oil growth. But it starts to decline in late 2024/early 2025. Positive for #Oil post 2024. #OOTT." Norway's Mar 11 blog was "High price to pay for halting exploration for oil and gas" [LINK] Their blog was a big picture warning that Norway shouldn't stop further exploration, production development activity as it will be a big hit to Norway. It's worth a read as it sounds like the Norway Climate committee is saying they want to stop all new exploration but also production, installation and operation. So that means an ever earlier end of life for oil and gas production and facilities. Ie. no more tie-in of smaller satellite fields to an existing platform. But included in the blog is a sente3nce that fits our Feb thesis – Norway oil production will peak in 2025 and then start to decline. They write "Production is declining on its own. The Committee presumes that activity in the oil and gas industry on the Norwegian shelf is too high leading up to 2050, which means that measures must be implemented to cut production. On the other hand, the Norwegian Offshore Directorate expects activity in the industry to naturally decline following a production peak in 2025. The production decline towards 2050 is within what the Intergovernmental Panel on Climate Change and the IEA have projected is in line with successfully following up the Paris Agreement." Norway is forecasting reaching peak oil production in 2025 and then*

beginning a decline therefrom. Our Supplemental Documents package includes the Norwegian Offshore Directorate blog."

02/08/24: Aker BP warned of Johan Sverdrup field moving to decline

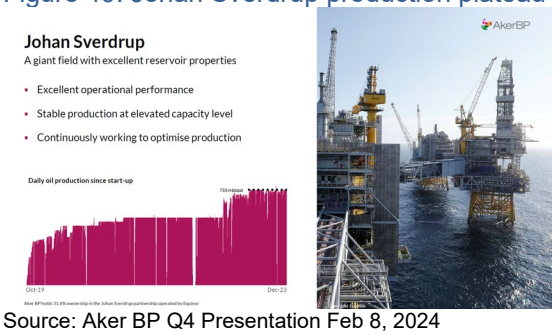
As noted above, Aker BP management said they previously noted the future decline of Johan Sverdrup oilfield. They did so on Feb 8, 2024. Here is what we wrote in our Feb 11, 2024 Energy Tidbits memo on why Norway would e hitting peak oil production. "*We have to believe Norway will be in a "show me" phase over the next 12 months. There was big news on Thursday, when Aker BP said Norway's biggest oil field, the 755,000 b/d Johan Sverdrup, is moving from plateau to decline in late 2024 or early 2025. There was no disclosure of how much it will decline in 2025 or if the decline can be offset, but it will raise the question what does it mean to Norway's oil production base. (i) On Thursday, we tweeted [LINK] "#Oil bulls will like this. Johan Sverdrup 0 to 0.75 mmbd led to Norway 1.31 mmbd in 09/19 to 1.85 mmbd today. BUT Aker BP says JS moving from plateau to decline in late 24/early 25. Water now hitting some wells. Can they arrest decline with H2O handling, more wells, etc? Are there other fields to offset? Or is Norway #Oil about to start to decline? #OOTT." (ii) Our tweet included the below graphs that reminded Johan Sverdrup started production in Oct 2019 and is now 755,000 b/d. And Norway oi production was 1.31 mmb/d in Sept 2019 and is now 1.85 mmb/d in Dec 2023. Johan Sverdrup is currently 40% of total Norway oil production. (iii) There was a great Q&A exchange on the Aker BP Q4 call on Thursday that led to the CEO noting a few key points. Aker BP has 31.6% in Johan Sverdrup but is not the operator. Equinor is the operator. CEO noted that water is hitting some undisclosed number of wells. And everyone knows water in conventional oil wells is a negative. And the more water, the more water handling capacity is required. The CEO said there is sufficient water handling capacity, didn't specify how much more longer that would be the case and that water handling capacity will impact some operations. The CEO noted that plateau is ending and declines should start in late 2024 or early 2025. This is earlier than expected. But he would not say what decline rate going forward and if their development options (adding more water handling, drilling more wells, etc) can offset or more than offset the start of declines. There is more in the Q&A and we recommend reading the excerpt. (iv) The key items to come out in 2024 is what will the declines look like at Johan Sverdrup in 2025, can they offset the declines at Johan Sverdrup and for how long, are there other Norway projects that can more than offset any declines at Johan Sverdrup. (v) Until these questions are answered, we have to take the Aker CEO comments at face value and that Johan Sverdrup plateau oil production is ending in late 2024/early 2025 and declines are about to start."*

Figure 48: Norway oil production



Source: Norwegian Offshore Directorate

Figure 49: Johan Sverdrup production plateau 755,000 b/d



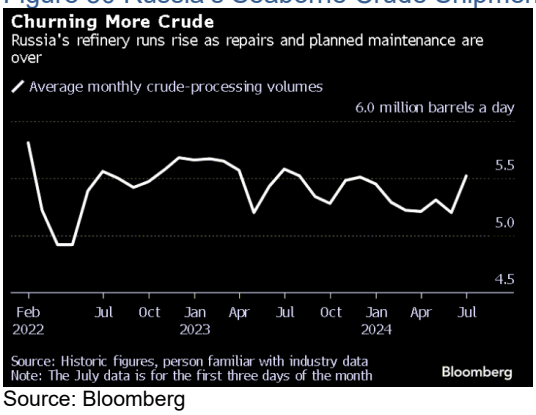
Source: Aker BP Q4 Presentation Feb 8, 2024

Oil: Russia's crude oil refining rate rose in early July

Russian refinery runs increased

Last week's (July 7, 2024) Energy Tidbits memo highlighted the return of refineries on the Black Sea and in central Russia and our July 5, 2024 tweet [LINK]: "*Less Russian #Oil for export as Russia restarts refineries hit by drones. Restarts at 240,000 bd Tuapse refinery on Black Sea & 340,000 b/d NORSI refinery in central Russia. Black Sea loadings expected down ~220,000 b/d in July vs June. Thx @Reuters #OOTT,"* On Monday, Bloomberg reported on the increase in oil processing in Russia as seasonal maintenance and repairs as Ukrainian drone attacks have been completed. Bloomberg reported "*The nation churned through 5.52 million barrels a day of crude on July 1-3, according to a person with knowledge of industry data. If sustained, that would be the highest weekly level since the second half of December, the last month before flurries of Ukrainian drone attacks on Russia's downstream, historical figures show. Daily refinery runs rose by more than 325,000 barrels a day over the first three days of July compared with the average formost of June, when several independent facilities were targeted in one of the largest swarm attacks from drones since the war in Ukraine began. Last week, Russia's Energy Ministry said two unnamed refineries, one in the central European part of Russia and the other in the south, were finalizing their seasonal repairs.*" Below is a chart from the Bloomberg article showing the average monthly crude processing volumes, noting the increase in refinery runs as of just the first few days in July. Our Supplemental Documents package contains the report from Bloomberg.

Figure 50 Russia's Seaborne Crude Shipments



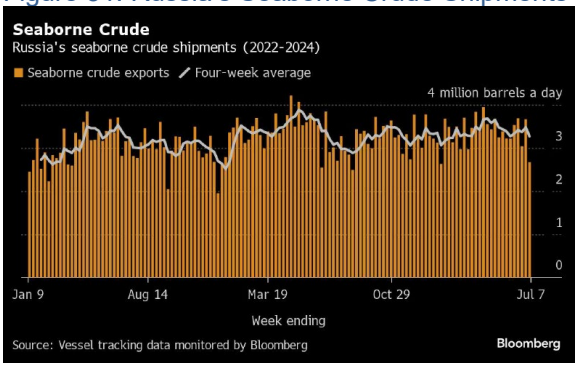
Source: Bloomberg

Oil: Russia's seaborne crude oil exports drop by the most since Ukraine invasion

Russia's seaborne crude exports

Our July 5, 2024 tweet [LINK] reminded "*Less Russian #Oil for export as Russia restarts refineries hit by drones."* The simple comment is that as Russian refineries process more Russian crude, it means that there is less Russian crude oil for export. So no surprise to see Bloomberg's Tuesday report "*Russia's weekly crude exports crashed by the most since before the 2022 invasion of Ukraine in the seven days to July 7, with the less volatile four-week average falling to the lowest since February. There was no clear cause for the slump in shipments. There were no gaps in loading programs to suggest maintenance work and no reports of storms affecting the berthing or loading of vessels. But shipments were down week-on-week from the Baltic, the Black Sea and the Pacific…. Russia's seaborne crude flows in the week to July 7 slumped by about 990,000 barrels a day to 2.67 million, its lowest since the final week of January, when storms slashed shipments from the Pacific port of Kozmino. The less volatile four-week average was also down, falling by about 215,000 barrels a day to a 20-week low of 3.27 million."* Russia has pledged to compensate for overproduction against its April target, which was attributed to "technicalities of making significant output cuts". Russia made significant output cuts in May, however they were still above their promised target. Our Supplemental Documents package includes the Bloomberg report.

Figure 51: Russia's Seaborne Crude Shipments



Source: Bloomberg

Russia oil exports to China down vs three months ago with lesser discounts

Russia oil shipments to China averaged 1.36 mmb/d for the first half of April. But they have been down since then with the reports that Russia had cut its discounts to China and that meant China was taking less Russian oil. Bloomberg's above report this week highlighted Russia oil shipments to China were down to 0.90 mmb/d for the week ending July 7, down from last week's 1.14 mmb/d for the June 30 week and down from 1.36 for the first half of April. The last six weeks average is now 1.15 mmb/d. We were warned that China oil imports from Russia were being hit on April 22 by one of our favorite commentators on the Gulf Intelligence Daily Energy Podcasts is Victor Yang, Senior Analyst JLC Network Technology. He is based in China so we like hear his on-the-ground views on oil, natural gas and markets in China. Here is what we wrote in our April 28, 2024 Energy Tidbits memo referencing Yang's comments from our April 22, 2024 tweet [LINK] that included a transcript we made of Yang's comments. "*And for the second quarter, we see a lot of refinery maintenance, is imports will actually come down. And for now, the premium for Russian cargoes have strengthened this year, from -0.5 barrels to -0.3 barrels. And now it's flat to Brent, meaning 0 now. So this has dampened refiners, particularly independents, interest in Russian crude. Their margins for imported crude, including Russian crude, actually turned negative late last month and the beginning of this month. So it's now kind of [inaudible] slightly above the breakeven point. So the interest in this has been dampened too. So we are not expecting imports to grow much in the second quarter, yes.*" Below is the table from Bloomberg's Russia oil exports report this week.

Figure 52: Russian Crude Exports to Asia

Crude Shipments to Asia

Shipments of Russian crude to Asian buyers in million barrels a day

4 weeks ending	China	India	Other	Unknown Asia	Other Unknown	Total
June 2, 2024	1.17	1.66	0.00	0.10	0.00	2.93
June 9, 2024	1.34	1.53	0.00	0.10	0.00	2.97
June 16, 2024	1.25	1.72	0.00	0.03	0.00	3.00
June 23, 2024	1.09	1.83	0.00	0.04	0.00	2.95
June 30, 2024	1.14	1.78	0.00	0.06	0.03	3.01
July 7, 2024	0.90	1.75	0.00	0.17	0.08	2.90

Source: Vessel tracking data compiled by Bloomberg Bloomberg

Source: Bloomberg

Oil: OPEC MOMR no change to oil demand growth in 2024 and 2025

OPEC Monthly Oil Market Report

On Wednesday at 6:00am MT, OPEC released its July Monthly Oil Market Report. (i) Our takeaway was threefold. First, on the numbers, they look fairly neutral as there are only immaterial changes if any. There are no changes to YoY growth in oil demand and non-DOC oil supply. And the global oil + products stocks show an immaterial narrowing of the deficit to the 2015-2019 average. OPEC+ June production was down small MoM. So fairly neutral on the numbers. Second, on whether OPEC demand is too optimistic, the skeptics will continue that OPEC is overly optimistic on demand as it continues to make zero changes to their

demand forecast ie. no real tweaks. Third, Saudi Arabia is probably satisfied as there continues to be a deficit in oil + products stocks as the world got thru its seasonally lower demand period. So the test becomes will global oil + products demand have its normal big seasonal increase in the summer. (ii) There was no change to YoY growth forecasts in oil demand for 2024 and 2025. 2024 still shows a +2.25 mmb/d YoY growth to 104.46 mmb/d, and 2025 is up +1.85 mmb/d YoY to 106.31 mmb/d. (iii) Note that MOMR no longer provides full by country data for non-OPEC supply so we can't do a full analysis on by country non-OPEC supply. They are now reporting on a non-Declaration of Cooperation ("non-DoC") country/region basis (the countries not participating in OPEC+). For example, there is no split out of Russia in the forecasts. (iv) Non-DOC supply, immaterial changes to 2024 and 2025. For 2024, July MOMR has non-DOC at +1.23 mmb/d YoY to 52.98 mmb/d (was +1.23 YoY to 52.96). It is due to the higher starting point in 2023. There were immaterial changes to countries/regions. For 2025, July MOMR has non-DOC at +1.10 mmb/d YoY to 54.08 mmb/d (was +1.10 mmb/d to 52.96). The difference is to 2024 starting point. (v) Key non-DOC growth areas: 2024 are US +0.51 mmb/d YoY, Canada +0.23 mmb/d YoY and Brazil +0.11 mmb/d YoY. For 2025, US +0.50 mmb/d YoY, Brazil +0.18 mmb/d YoY, Canada +0.16 mmb/d YoY, and Norway +0.10 mmb/d YoY. (vi) Call on DOC oil is revised down by 0.1 mmb/d for 2024 and 2025. (vii) OPEC only production. July MOMR has -80,000 b/d MoM to 26,566 mmb/d in June. The largest MoM change was Saudi Arabia -76,000 b/d MoM to 8.934 mmb/d. Non-OPEC DOC countries: July MOMR has -45,000 b/d MoM to 12.235 mmb/d in June. The largest MoM changes were Russia -114,000 b/d MoM to 9.139 mmb/d and Kazakhstan +47,000 b/d MoM to 1.549 mmb/d. Novak had said Russia would be moving gradually to reduce. (viii) One overlooked positive in looking at global oil stocks is that the comparisons for oil stocks are to the 2015-2019 average. Oil demand is higher than that period. OPEC's forecast for 2024 oil demand is probably 6 mmb/d higher than the 2015-2019 average oil demand. (ix) We have to believe Saudi is reasonably pleased with stocks coming out of the seasonally low Q1 demand period with global stocks still in a deficit ahead of the normal ramp up in demand in Q2, and more in Q3. What I don't know is if they expected more or less of a deficit. (x) Reminder "commercial oil stocks" refers to total crude oil + products stocks. Crude oil + products stocks at May 31. July MOMR has total crude oil + products stocks at +24.7 mmb MoM to 2,813 mmb, which is 142 mmb below the 2015-2019 average. Crude oil only stocks at May 31. July MOMR has crude oil only stocks at down 5.4 mmb MoM to 1,366 mmb, which is 120 mmb below the 2015-2019 average. Products only stocks at May 31. July MOMR has products only stocks +30.1 mmb MoM to 1,447 mmb, which is 23 mmb below the 2015-2019 average. (vii) Our Supplemental Documents package includes excerpts from the OPEC July MOMR.

Oil: IEA OMR has no change to YoY oil demand growth for 2024 and 2025

IEA Oil Market Report

On Wednesday, the IEA released its monthly Oil Market Report for June data at 2am MT. (i) The IEA continues to message a clear negative to oil demand, but there is no change to YoY growth in demand for 2024 and 2025. After 3 consecutive months of revising up 2023's oil demand data, the IEA did the opposite this month and revised down the data by -0.1 mmb/d. This means that the despite the same YoY oil demand growth of +1.0 mmb/d YoY in 2024 and +1.0 mmb/d YoY in 2025, July OMR forecasts oil demand of 103.1 mmb/d in 2024 and 104.0 mmb/d in 2025. There are some rounding items. (ii) We thought the takeaway from the IEA July OMR numbers vs June OMR was neutral to slightly negative - oil demand YoY growth rates are unchanged. But non-OPEC supply is up marginally +0.1 mmb/d, OECD

May 31 oil stocks have a narrowing of the deficit to the 5-yr average and there is a sharp upward revision to non-OECD oil stocks. (iii) The underlying support for oil is reinforced by IEA in that oil demand is entering its big seasonal demand growth period. The IEA notes preliminary OECD June 30 stocks data shows a draw instead of a build like the last four months, and IEA forecasts oil demand +1.6 mmb/d QoQ in Q2/24 vs Q1/24, and +1.2 mmb/d QoQ in Q3/24 vs Q2/24. (iv) Non-OPEC supply for 2024 is increased +0.100 mmb/d to 70.3 mmb/d from last month's forecast, and for 2025 increased +0.100 mmb/d to 72.0 mmb/d. The IEA forecasts non-OPEC supply growth at +1.8 mmb/d to 72.0 mmb/d, an increase from last month's at +1.7 mmb/d to 71.9 mmb/d. (v) There was a slight decrease to IEA's calls on OPEC for 2024 and 2025. Bloomberg wrote *"Call on OPEC crude 2024 was revised to 27.2 m b/d from 27.4m b/d. Call on OPEC crude 2025 was revised to 26.4m b/d from 26.7m b/d"* (vi) Global oil inventories expected lower in June. The IEA wrote, "*Preliminary data show global oil stocks falling by 18.1 mb in June, dominated by crude while products built.*" Our Supplemental Documents package includes the IEA release and the Bloomberg tables and reports.

Figure 53: IEA Global Demand Forecast by OMR Report

mmb/d	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024	*24-23*	Q1/25	Q2/25	Q3/25	Q4/25	2025	*25-24*
July 24	**102.1**	101.3	102.9	104.1	103.9	**103.1**	*1.0*	102.3	103.7	105.1	104.9	**104.0**	*1.0*
June 24	**102.2**	101.5	103.0	104.2	104.1	**103.2**	*1.0*	102.6	103.9	105.3	105.1	**104.2**	*1.0*
May 24	**102.1**	101.7	102.9	104.1	103.9	**103.2**	*1.1*	102.8	104.1	105.3	105.1	**104.3**	*1.1*
Apr 24	**102.0**	102.0	103.0	103.9	103.8	**103.2**	*1.2*	103.1	104.0	105.1	105.0	**104.3**	*1.1*
Mar 24	**101.9**	102.0	103.0	104.0	103.7	**103.2**	*1.3*						
Feb 24	**101.8**	101.7	102.8	103.8	103.7	**103.0**	*1.2*						
Jan 24	**101.7**	101.7	102.7	103.7	103.8	**103.0**	*1.3*						
Dec 23	**101.7**	101.4	102.4	103.4	103.9	**102.8**	*1.1*						
Nov 23	**102.0**	101.5	102.4	103.5	104.1	**102.9**	*0.9*						
Oct 23	**101.9**	101.3	102.2	103.5	103.9	**102.7**	*0.8*						
Sep 23	**101.8**	101.1	102.6	104.0	103.5	**102.8**	*1.0*						
Aug 23	**102.2**	101.5	102.6	104.2	104.3	**103.2**	*1.0*						
July 23	**102.1**	101.4	102.6	104.3	104.5	**103.2**	*1.1*						
June 23	**102.3**	101.5	102.5	104.1	104.4	**103.1**	*0.8*						

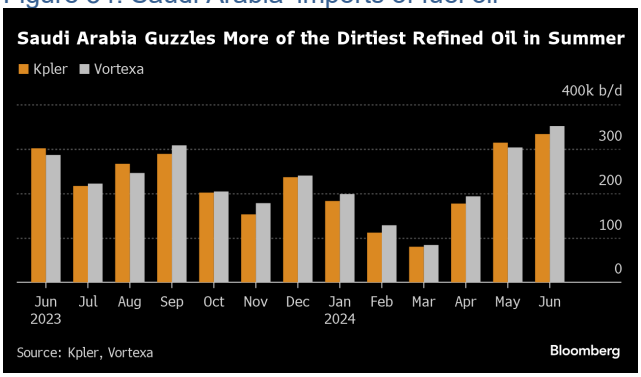
Source: IEA, Bloomberg, SAF

Oil: Saudi Arabia boosts fuel oil imports to 3-year high amid summer demand

Saudi Arabia increases fuel oil imports

It's been hot in the Middle East in June and also in early July, even hotter than normal. So there is a big air conditioning burn. On Friday, Bloomberg reported that Saudi Arabia had increased imports of fuel oil to a 3-year high to match the demand from the hot summer and increased air conditioning. Shipments have increased to about 350,000 b/d according to Vortexa. Bloomberg reported *"Saudi Arabia is the region's biggest buyer of fuel oil, a type of dirty product that's left over after refineries produce transport fuels like gasoline and diesel. It also burns crude oil directly to produce electricity, which likely contributed to the kingdom's exports dropping to a 10-month low of about 5.6 million barrels a day in June, according to data compiled by Bloomberg. Fuel oil is mostly sold at a discount to crude since it's heavier and more polluting……..In April, the kingdom resumed purchases from Russia after a five-month pause. Supplies from there have nearly doubled since then though are still below the levels of last summer."* Below is a graph showing Saudi Arabia's fuel oil imports, and a graph showing Saudi Arabia's fuel oil imports from Russia alone. Our Supplemental Documents package contains the report from Bloomberg.

Figure 54: Saudi Arabia' imports of fuel oil



Source: Bloomberg

Figure 55: Saudi Arabia's Imports of Russian Fuel Oil

Source: Bloomberg

Oil: Why would Saudi attack Houthis?

Did Saudi's attack the Houthis

On Monday, we tweeted [LINK] "*Why? If accurate, why would Saudis resume attacks on the Houthis? Especially following 👇 Houthi leader gave firm, clear warning to Saudi that Houthis will respond. IF accurate, would seem Houthis almost obligated to hit back at Saudi. #OOTT."* We were surprised by the Mehr (Iran news) report that Saudi Arabia had attached the Houthis twice in the last week in Houthis territory. The Saudi's don't use ground troops, which means any attack is by rockets/missiles. Our surprise was that this followed the Houthis leader clear warning to Saudi Arabia to not attack them. It just didn't make sense why Saudi would re-open this can of worms. We haven't seen any real followup on this Mehr report but we will keep watching as this would reopen risk to oil if Houthis start launching drones and missiles at Saudi Arabia.

Oil: Another big Saudi OPM deal, Saudi Aramco sells $6b of bonds

Saudi Arabia leads the way in issuing debt

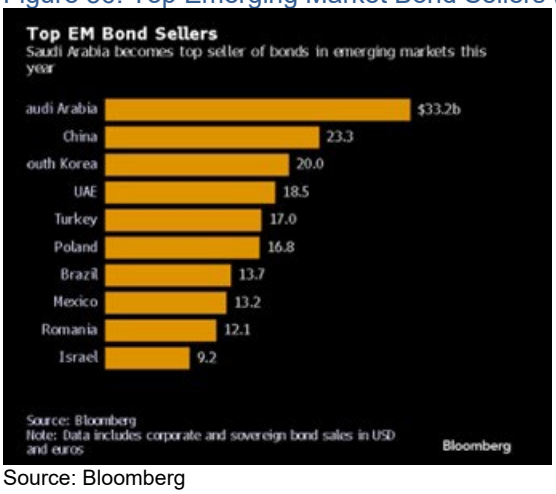
For years, we have highlighted the massive reduction in Saudi Arabia's net foreign assets and how that is a key reason for why Saudi Arabia will be working hard to keep oil prices high and our views that the #1 financial theme for Saudi Arabia is the increasing access/need for Other People's Money as they move to help fund Vision 2030. It's tens of billions every year.

And there are so many transactions, we cannot keep track of all of them. But we do note the visible ones especially when it's Saudi Aramco. On Wednesday, Bloomberg reported Saudi Aramco had sold $6bn of bonds, its first dollar-debt offering in three years. Bloomberg reported *"The strong demand — final order books topped $23 billion — allowed the company to cut spreads offered on each of the tranches by at least 35 basis points."* Prior to pricing the order books were reported at $31 billion. Saudi Arabia ended up issuing $2 billion in 5.25% due July 2034s, $2 billion in 5.75% due July 2054s and $2 billion in 5.875% July 2064s.

Saudi Arabia leads the way in issuing debt in 2024

Here is what we wrote in our June 23, 2024 Energy Tidbits memo. "*This week brings another reminder what we have called for years as Saudi Arabia's #1 financial theme – the increasing need for Other People's Money. On Wednesday, we tweeted [LINK]: "Reinforces #1 financial theme for Saudi Arabia in the 2020s is accessing more Other People's Money for Vision 2030. Saudi #1 in EM bond sales by large margin! Also reminds why Saudi will do all it can to keep strong #Oil prices at Brent $80 or more. Thx @selcukgokoluk #OOTT." On Wednesday, Bloomberg released a report on Saudi Arabia's data for new bond sales for corporate and government bonds, reporting "Saudi Arabia has displaced China as the most prolific issuer of international debt among emerging markets, breaking Beijing's 12-year run at the top." Saudi Arabia is borrowing at a record breaking pace which aligns with Crown Prince's Mohammed bin Salman's Vision 2030 plan. "The latest data suggest improving sentiment as Riyadh seeks funding for projects to diversify the economy from oil and position it as a link between Asia and Europe. Meanwhile, the rest of emerging markets are also witnessing a blockbuster year for bond issuance, amid falling borrowing costs and a hunt for juicy yields……. . It [Saudi Arabia] expects total funding activities for the year to reach about $37 billion, to help accelerate Vision 2030. In fact, the country has turned to the bond market on such a scale partly because foreign direct investment has fallen short of its targets, while oil revenue has been crimped by supply cuts." Bond sales from Saudi Arabian entities have increased +8% so far this year, already exceeding $33b, with the government accounting for over half of this. Below is the Bloomberg chart of the top emerging market bond sellers. Our Supplemental Documents package includes the Bloomberg report.*

Figure 56: Top Emerging Market Bond Sellers (In USD)



Source: Bloomberg

Vision 2030 stretches Saudi finances

Oil: Bloomberg recaps why Saudi needs for high oil prices and Other People's Money

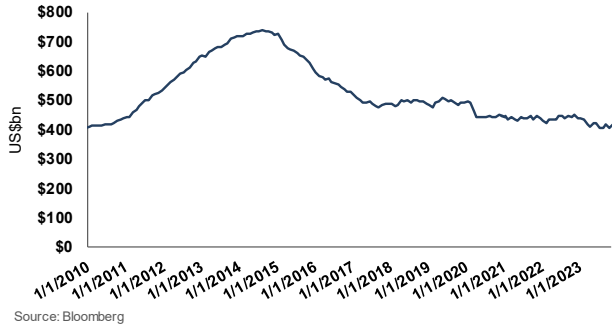
Every month for years, we highlight how Saudi Arabia has seen a massive reduction in its Net Foreign Assets, which is really its piggy bank for the future. This massive reduction is why we have believed Saudi Arabia will do all it can to keep oil prices strong and also why the #1 financial theme for Saudi Arabia for the 2020s is needing and accessing increasing amounts of Other People's Money (OPM) to help fund Vision 2030. We think it's a great indicator as it really reflects the results of all Saudi's revenues, costs, fund raising, spending etc. Earlier this morning, Bloomberg posted "*Saudi Arabia's Transformation Stretches Economy and Petrowealth*" led off with "*Saudi Arabia faces the most precarious moment yet of its economic reinvention. Eight years after now-Crown Prince Mohammed bin Salman unveiled Vision 2030, his blueprint for a life after oil, delays and scalebacks with the multitrillion dollar makeover are laying bare the pressure on the kingdom's finances. With the budget in deficit for six straight quarters, Saudi Arabia has become the biggest issuer of international debt in emerging markets. And its decision to cut oil production with other OPEC+ members in 2023 has failed to raise export revenues substantially."* The Bloomberg report is a good quick read and it takes through the economic reality that Saudi needs high oil prices and to keep accessing OPM. Our Supplemental Documents package includes the Bloomberg report.

Saudi nest egg, its net foreign assets is down $227.5b in last 9 years

Here is what we wrote in last week's (July 7, 2024) Energy Tidbits memo on our monthly update of Saudi's net foreign assets, which have declined by $227.5 billion since March 2015. Even for Saudi, that is a lot. "*There have been a number of major Saudi Arabia transactions raising outside capital so, no surprise, we are seeing some months with big increases in Saudi net foreign assets. Last Sunday, the Saudi Central Bank (SAMA) released its Monthly Statistical Bulletin for the month of May [LINK]. We continue to believe in our long-stated view that the #1 financial theme for Saudi Arabia in the 2020s will be their continued, and increasing, use of Other People's Money as they try to fund MBS's Vision 2030. We believe this has been obvious with how Saudi Arabia's net foreign assets dropped by ~34% or $227.5b*

over the last nine years (since March 2015). We are surprised that markets and oil watchers didn't seem to pay attention to the Saudi net foreign assets data i.e., what we call their nest egg to help them their push to MBS's Vision 2030. We are seeing much larger MoM changes, both up and down. There was a $21.0b MoM increase to Saudi Arabia's net foreign assets which are now $444.6 in May vs $423.6b in April. Last month's data reflected a decrease of -$10.6b MoM in April. But the thesis and big picture remains, Saudi net foreign assets as of May 31 of $444.6b is a decline of ~40% or $292.4b over the last 10 years from its peak of $737.0b on Aug 31, 2014. That is an average of $2.5b per month for the last 118 months since the peak. Saudi Arabia is far from going broke but there has been a huge decline in the last 10 years. This net foreign asset depletion is why we have been highlighting that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money (OPM) to fund as much of their Vision 2030 as possible. And no question, accessing OPM has helped to slow down and temporarily pause the decline in net foreign assets. Below is our graph of Saudi Arabia net foreign assets updated for the May data."

Figure 57: Saudi Arabia Net Foreign Assets



Source: Bloomberg

Oil: Iran's new President message to the new world is worth a read

Iran's new President message

Earlier this morning, we tweeted [LINK] "*ICYMI. Iran President "my message to the new world". Seems no change to key foreign policy of former Pres Raeisi ie. anti-Israel. But also seems to want to accelerate ones he is onside with (ie better Saudi relations) or even start some momentum for others that should be acceptable (ie. get Europe going). Seems to infer it's up to US if it wants to correct its mistake of pulling out of JCPOA ie. Iran was onside with JCPOA. #OOTT."* It didn't get much attention but new Iran President Pezeshkian posted his "My message to the new world" on Friday [LINK]. It's worth a read. It's a well-written message and he covers all the major foreign policy areas. After reading Pezeshkian's message to the world, it seems like he is a realist on how he has to continue the major foreign policy objectives of former President Raeisi (as the Supreme Leader recommended to Raeisi). but also start the process to either accelerate ones he is onside with or start some momentum for acceptable foreign policy. And, as we wonder if he is playing a longer game recognizing that the potential pivot point for Iran in the world won't come until the Supreme Leader is no longer the Supreme Leader. One example is Iran, under Raeisi, started the move to improve relations with Saudi Arabia and Pezeshkian highlighted the "*we will prioritize*

strengthening relations with our neighbours". Another continuing foreign policy stance is against Israel, saying *"Israel remains an apartheid regime to this day, now adding "genocide" to a record already marred by occupation, war crimes, ethnic cleansing, settlement-building, nuclear weapons possession, illegal annexation, and aggression against its neighbors.*." He also continued the strength with China and Russia – "*China and Russia have consistently stood by us during challenging times. We deeply value this friendship. Our 25-year roadmap with China represents a significant milestone towards establishing a mutually beneficial "comprehensive strategic partnership," and we look forward to collaborating more extensively with Beijing as we advance towards a new global order. In 2023, China played a pivotal role in facilitating the normalization of our relations with Saudi Arabia, showcasing its constructive vision and forward-thinking approach to international affairs. Russia is a valued strategic ally and neighbor to Iran and my administration will remain committed to expanding and enhancing our cooperation."* It's worth reading his US and JCPOA comments as he leaves the door open for the US to return to the JCPOA by highlighting that it was the US pulled out and "*The U.S. and its Western allies, not only missed a historic opportunity to reduce and manage tensions in the region and the world, but also seriously undermined the Non-Proliferation Treaty (NPT) by showing that the costs of adhering to the tenets of the non-proliferation regime could outweigh the benefits it may offer."* It seemed to us like it was Pezeshkian suggesting they would go back to the JCPOA as it was. The one area that seemed to be different and starting to try to get some new momentum was to improve relations with Europe. He said "*Despite these missteps, I look forward to engaging in constructive dialogue with European countries to set our relations on the right path, based on principles of mutual respect and equal footing*." Our Supplemental Documents package includes the Pezeshkian message to the new world.

Oil: Is real oil wildcard for Iran and oil is when the Supreme Leader passes away

Iran Supreme Leader turns 85 yrs old tomorrow

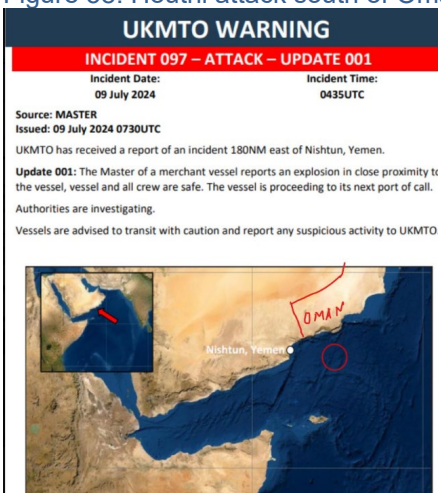
As noted above, we have to wonder if Pezeshkian is playing a longer game recognizing that the potential pivot point for Iran in the world won't come until the Supreme Leader is no longer the Supreme Leader. Iran's Supreme Leader turns 85 tomorrow. Last week's (July 7, 2024) Energy Tidbits memo highlighted the Supreme Leaders congratulations to newly elected Iran President Pezeshkian, which included his recommendation to Pezeshkian to continue the ways of former President Raeisi, a hardliner. . On July 6, 2024 we tweeted [LINK] "*Supreme leader gives advice to new Iran President, reformist Pezeshkian. "recommend President-elect Pezeshkian trust in God the Most Merciful and look forward to long and bright horizons, and in the continuation of the path of Martyr Raeisi...." Raeisi was a hardliner! #OOTT."* An analyst in Riyadh reminded that changing direction in Iran wasn't something that happened easily or quickly. And we replied "*Agreed. what will be really interesting is what happens in Iran whenever the Supreme Leader passes away. the revolution was 45 years ago and the Supreme Leader is coming up on 35 years. Thanks."* As we look ahead, something to think about as we look to oil in the mid term – what happens in Iran when Khamenei dies? It will be really interesting to see what happens whenever the Supreme Leader passes away. He turns 85 on Monday. The revolution was completed in early 1979. Call it anyone under 55 or 60 will only know the revolution from what they were taught and heard from the establishment. And Khamenei has been the Supreme Leader since 1989. We can't help believe there is some decent probability that that will be the potential pivot point.

Oil: Houthis remind they will attack in Arabian Sea, this time south of Oman

Houthis attack in Arabian Sea

The vast majority of the Houthis drones and missile attacks have been in the Red Sea and the Bab el Mandeb. But the Houthis leader previously warned that they would be attacking in the Arabian Sea, Mediterranean Sea and south along towards the Cape of Good Hope. On Tuesday, we tweeted [LINK] "*UKMTO, explosion in close proximity to merchant ship 180NM east of Nishtun, Yemen. Note I added approx. Oman border as this also remind Houthis launch drones at ships south of Oman in Arabian Sea. #OOTT [LINK].*" Our tweet included the UKMTO report map with our hand drawn line for Oman border. The UKMTO report didn't use Oman as a reference but when we saw the UKMTO description for distance, we realized that this attack was clearly south of Oman's borders more in the Arabian Sea. So it was a Houthi reminder they will attack almost anywhere.

Figure 58: Houthi attack south of Oman



Source: UKMTO

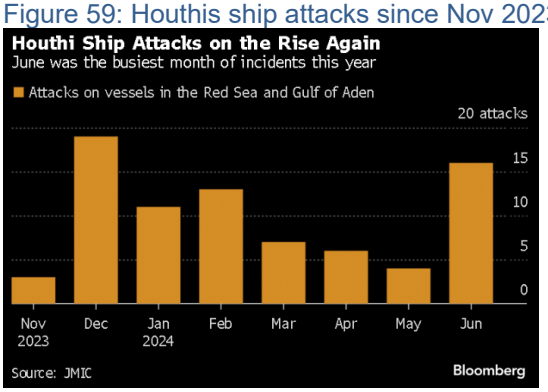
Oil: June saw most Houthis attacks in 2024

Houthi attacks in June

There was a huge push this week by the US/UK on attacking Houthi missile and radar onshore infrastructure, which we expect was due to the Houthis stepping up their attacks in June. The US and UK have really stepped up their attacks in the last few months and, at first, it seemed like they must have been successful in significantly reducing the Houthis ability to attack. However, June changed that view, and we suspect that is why the US and UK have stepped up their attacks. Here is what we wrote in last week's (July 7, 2024) Energy Tidbits memo on the Houthis June attacks. "*On Tuesday, we tweeted [LINK] "June saw most Houthis attacks in 2024. 👇 @alexlongley1. Prior to, it was looking like the big increase in US/UK attacks on Houthis missile & radar sites was working ie. less missile sites = Houthi attacks down. Houthis aren't going away for now. #OOTT." Our tweet included the below Bloomberg graph that showed Houthis attacks have steadily decreased in Mar, April and May but jumped up in June to the most attacks this year. The monthly declines made sense given the US/UK have cranked up their attacks on Houthi missile and radar sites. So the June increase is a surprise. Bloomberg wrote "Yemen's Houthi rebels conducted the largest number of attacks on commercial ships so far in 2024 in June, fresh proof that the group's*

threat to trade intensified in recent weeks. There were 16 confirmed attacks on ships in June, according to figures published by the naval forces operating in the region. That's the most for any single month in 2024, and was only eclipsed in December when more vessels were still sailing through the region. Separate figures published by the Washington Institute show a similar trend." The Houthis have somehow been able to add additional missile sites to offset the losses. And as we have been warning, we just don't see the Houthis giving up anytime soon. Our Supplemental Documents package includes the Bloomberg report. "

Figure 59: Houthis ship attacks since Nov 2023



Source: Bloomberg

Oil: Seems like Houthis are advancing their drones/missile capabilities

Are Houthis advancing their capability

The above Bloomberg report on the most Houthis attacks in the Red Sea in 2024 would fit with our wondering if the Houthis have been able to do what they say – advance their drone and missile capabilities. Here is what we wrote in our June 30, 2024 Energy Tidbits memo on this subject. "*We recognize that the Houthis, even with Iran support, don't have drones and missiles with anywhere the capability as US drones and missiles. However, they have already disrupted global shipping markets and our concern is that people overlook they are advancing their drones/missiles capabilities. It was another week of Houthis attacking and also hitting multiple merchant ships as well as the US hitting Houthi launch sites. One of the takeaways this week is that the Houthis seem to be advancing their drone/missile capabilities. (i) The Houthis hit their first merchant ship with a sea drone in the Red Sea. (ii) Houthis claim to have advanced their sea drones. Yesterday, Al Masirah (Houthi news) reported [LINK] "On Friday, the war media disclosed that the drone boat used in the attack was a "Tufan-1" type, noting that it is an attack boat carrying a 150-kilogram warhead, featuring high speed and great maneuverability and stealth, reaching speeds of up to 35 nautical miles per hour. The war media confirmed that the boat is used against nearby marine targets, both stationary and moving." (iii) The Houthis claim that the latest missile, Hatem-2, is a solid fuel missile. This is the first time we have seen them claim solid fuel missiles that are typical cheaper and, more importantly, launch quicker. (iv) Houthis attacking ships farther away in the Gulf of Aden and Arabian Sea. On Monday, UK MTO reported a Houthi missile landed in close proximity to a merchant ship east of the island of Socotra."*

Figure 60: Houthis missile attack east of Socotra

Source: Google Maps

Oil: Kurdish oil smuggling to Iran could be ~200,000 b/d and a lesser extent to Turkey

Kurdish unreported exports to Iran

We haven't seen reports before of the potential volumes for Kurdistan oil being smuggled by truck to Iran until we saw the Reuters Thursday report "*Kurdish oil smuggling to Iran flourishes.*" [LINK] that noted it could be 200,000 b/d and a lesser extend also to Turkey. On Friday, we tweeted [LINK] "*Scoop! "...conversations with over 20 people ...Iraqi and Kurdish oil engineers, traders and government officials, ...oil industry sources. ... booming business .. 1,000 tankers carry at least 200,000 barrels of cut-price oil every day to Iran and, to a lesser extent, Turkey." @timourazhari #OOTT [LINK].*" It was a good scoop. Reuters said they *"pieced together the details of this flourishing trade through conversations with over 20 people including Iraqi and Kurdish oil engineers, traders and government officials, politicians, diplomats and oil industry sources."* It sounds like a pretty good cross industry group. And th*ey painted a picture of a booming business in which more than 1,000 tankers carry at least 200,000 barrels of cut-price oil every day to Iran and, to a lesser extent, Turkey – bringing in about $200 million a month."* No surprise, smuggling means a big discount to the sales price. Reuters reported "*The crude is sold by oil companies in Kurdistan to local buyers at cut-price rates of $30 to $40 a barrel, or about half the global rate, which equates to at least $200 million a month in revenue, industry and political sources said*." And as the case with any good smuggling operation, no one knows whose crude, who gets the money, etc. The question will be will or can Iraq crack down as all external oil sales are to be conducted by SOMO. Our Supplemental Documents package incudes the Reuters report.

No updates from APIKUR or Rudaw on movement to a restart deal

As of our 7am MT news cut off, we have not seen any reports or comments from APIKUR (the industry association for Kurdistan oil companies) or reported on Rudaw (Kurdistan news) for any updates or progress on talks with Baghdad to restart Kurdistan oil exports via the pipeline in Turkey to the Ceyhan export terminal.

Oil: Libya oil production was 1.258 mmb/d on July 13

Libya oil production 1.258 mmb/d

No Libya National Oil Corporation oil production updates for almost three weeks and then three updates this week, the latest was yesterday when the NOC tweeted [LINK] "*Production rates of crude oil, condensates and natural gas during the past 24 hours. #NOC #OIL #LIBYA*." The NOC included a graphic that noted oil production was 1.258 mmb/d, which is in line with their mid-June update of 1.246 mmb/d. Other than when there

were temporary interruptions at the Sharara oil field, Libya oil production has been steady just over 1.2 mmb/d for almost a year.

Oil: Chinese household savings increase MoM in May to $20.03T after dip in April

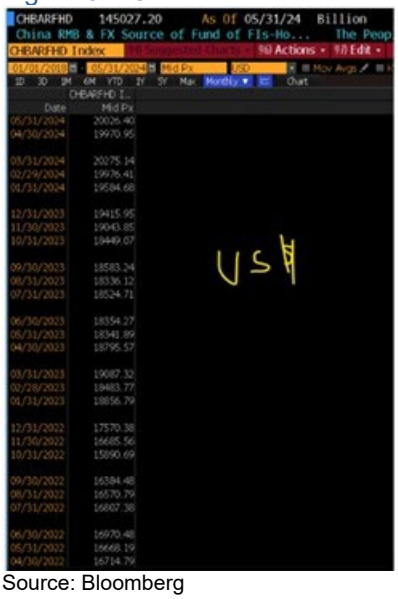
Chinese household savings

One of the biggest reasons for the weak China recovery is that consumers have been on the sidelines and therefore keep adding to savings instead of spending. The increasing savings fits with the commentary that Chinese consumers are not yet confident in the recovery to start to spend more. On Monday, we tweeted [LINK]: *"Still waiting for Chinese consumer being convinced to spend more. Household savings increased MoM in May. Whereas most years household savings decrease MoM in April and again MoM in May before increasing MoM in June. Thx @business #OOTT"* China's household savings at the end of May were US $20.03T, up MoM from $19.97T at the end of April. Our tweet reminded that the normal seasonal pattern is for Chinese household savings to decline in April and May. However, this year showed an increase in May versus a typical seasonal further decrease in May. Keep in mind that every dollar that stays in savings is dollar not being spent in the economy and not contributing to company earnings, which fuels wages, taxes, etc. So while household savings are at record highs, Chinese consumers are holding back, which would add to the recovery once they come off the sidelines. Our Monday tweet included the below graph and table that notes every April/May normally sees a seasonal dip in savings.

Figure 61: China Household Savings

Source: Bloomberg

Figure 62: China Household Savings



Source: Bloomberg

Oil: Chinese stocks trading activity falls typically led to weaker stock markets

Chinese stock trading activity is down

Chinese stocks rallied on Thursday and Friday to have the CSI 300 end up +1.2% on the week after seven down weeks. But the indicators have continued to be negative. We saw a good Bloomberg TV graph on Wed night that noted how Chinese stock trading activity was falling and we added the CSIv300 performance as CSI 300 tends to be weak when there is low trading activity, On Wednesday, we tweeted [LINK] "*China stocks continue to decline. Added CSI300 performance to @business graph to remind periods where Chinese stock trading activity falls typically link to a decline in CSI300 price. @business reminds 3rd plenum of China communist party central committee is next week! #OOTT.*"

Figure 63: China stock trading activity and CSI 300 performance

Source: Bloomberg,

Chinese stocks 1st weekly gain after seven weekly losses

It was good to see for Chinese investors that they finally had an up week. As noted above, Chinese stocks kept their decline thru Wednesday before rallying on Thursday and Friday for their first up week after seven prior weekly losses. We updated the below graph showing the CSI 300 and the S&P 500. It reminds how Chinese investors have had a tough last eight weeks especially compared to US investors. Since the CSI 300 recent 2024 high on May 17, the CSI 300 is -5.6% vs the S&P 500 that is +5.9% in that same period.

Figure 64 CSI 300 and S&P 500 weekly close YTD July 12, 2024

Source: Bloomberg

Oil: Wood Mackenzie forecasts oil demand +1.5 mmb/d YoY in 2024

Wood Mackenzie oil demand +1.5 mmb/d YoY

It seems like all forecasts for oil demand growth in 2024 are somewhere in between the IEA July OMR calling for oil demand to be +1.0 mmb/d YoY in 2024 and and the OPEC July MOMR calling for oil demand to be +2.2 mmb/d YoY in 2024. Wood Mackenzie looks to be almost exactly in the middle. Last Thursday (July 4, 2024), Wood Mackenzie posted its "*Forecasting the future of oil demand: five key questions answered"* [LINK]., which calls for "*total liquids demand peaks at 109 million b/d by 2031"* and "*Post-2025, demand is revised up by an average of 0.8 million b/d".* Their release also included their oil demand growth forecast for 2024. Wood Mackenzie wrote "*While the journey to net zero continues, the global demand for oil remains high. Wood Mackenzie has reported that demand is due to rise by 1.5 million barrels a day (b/d) this year, with a significant portion of this growth anticipated in the latter half of the year."*

Oil: Wood Mackenzie calls for peak oil demand by 2031 and then to decline

Wood Mackenzie peak oil by 2031

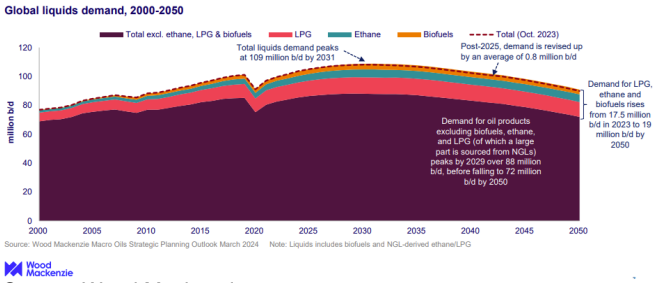
Last Thursday (July 4, 2024), Wood Mackenzie posted its "*Forecasting the future of oil demand: five key questions answered"* [LINK]., which calls for "*total liquids demand peaks at 109 million b/d by 2031"* and "*Post-2025, demand is revised up by an average of 0.8 million b/d".* This is versus their Oct 2023 forecast. Whether you agree or not with the 2031 call, this is a good forecast to review as they step thru their views on the key all the key liquids demand sectors. It's a good read and good tables. The key assumption in their peak oil demand call is the key variable in all peak oil demand calls and the one that has not materialized to date – how fast EVs displace oil consumed in cars. No one disagrees that EVs sales are increasing but also no one should disagree that the rate of adoption outside of China is less than expected. The reason why we place more credibility in the Wood

Mackenzie forecast is that they don't seem to have as aggressive an assumption as the IEA that EVs displace ~6 mmb/d of fuels by 2030. Rather, Wood Mackenzie seems to assume a much lesser impact. Wood Mackenzie says "*liquids demand is anticipated to reach a peak for light vehicles by 2027 and road freight by 2035*": Our Supplemental Documents package includes the Wood Mackenzie release.

Figure 65: Global liquids demand 2000-2050

Global liquids demand peaks at 109 million b/d by 2031, falling to 91 million b/d by 2050

The 2020s represent the final phase of long-run growth in global liquids demand

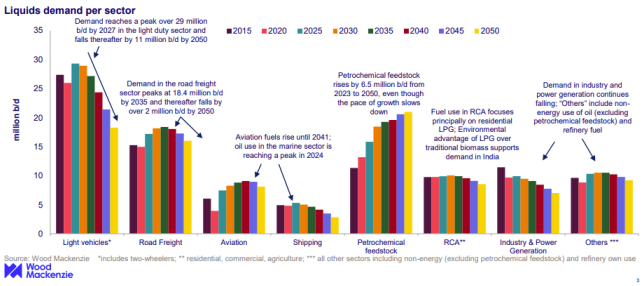


Source: Wood Mackenzie

Figure 66: Liquids demand per sector

Road sector sets the tone for energy transition away from oil

Liquids demand is anticipated to reach a peak for light vehicles by 2027 and road freight by 2035



Source: Wood Mackenzie

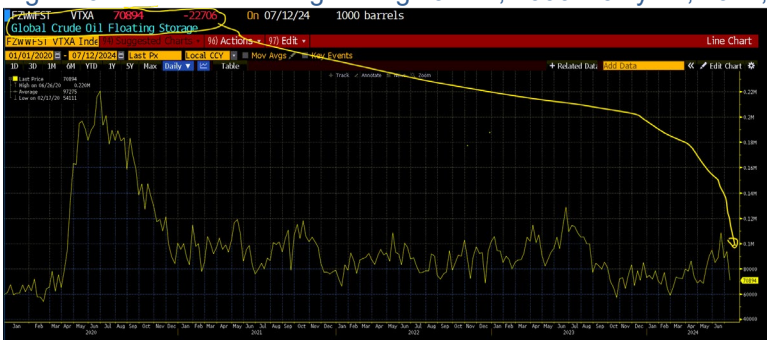
Oil: Vortexa crude oil floating storage est 70.89 mmb at July 12, -22.71 mmb WoW

Vortexa floating storage

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 July 5 at 9am MT. (i) Yesterday, we tweeted [LINK] "*Vortexa #oil floating storage est down a whopping -22.71 mmb WoW to 70.89 mmb at Jul 12. BUT big upward revisions: Jul 5 +15.41 mmb (incl Asia revised +12.88), Jun 28 +12.92. Jun 21 +9.82 to 108.46 mmb, 1st >100 since Aug 2023. Too early to celebrate. Thx @vortexa @business #OOTT.*" (ii) Our tweet highlighted that we have to wait to celebrate given the big upward revisions to prior three weeks including the first week over 100 mmb since Aug 4, 2023. (iii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for July 12 at 70.89 mmb, which was down a huge -22.71 mmb WoW vs hugely revised up July 5

of 93.60 mmb. Note July 5 was revised +15.41 mmb to 93.60 mmb vs 78.91 mmb originally posted at 9am MT on July 5. (iv) Revisions. There were major upward revisions to the last three prior weeks. Here are the revisions for the past seven weeks compared to the estimates originally posted on Bloomberg at 9am MT on July 6. July 5 revised +15.41 mmb. June 28 revised +12.92 mmb. June 21 revised +9.82 mmb. June 14 revised +3.82 nnb. June 7 revised -2.53 mmb. May 31 revised +1.16 mmb. May 24 revised -1.06 mmb. (v) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the prior seven weeks is 89.98 mmb vs last week's then prior seven-week average of 87.04 mmb. The big upward revisions more than offset adding a low 70.89 mmb week to the 7-wk average. (vi) 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. (vii) Note the below graph goes back to Jan 1, 2020 to show the run up to Covid and then how Covid started to impact Covid in March/April 2020. (viii) July 12 estimate of 70.89 mmb is -57.89 mmb vs the 2023 peak on June 23, 2023 of 128.78 mmb. Recall Saudi Arabia stepped in on July 1, 2023 with its voluntary cuts. (ix) July 12 estimate of 70.89 mmb is -42.32 mmb YoY vs July 14 of 113.21 mmb. Below are the last several weeks of estimates posted on Bloomberg as of 9am MT July 13, July 6, and June 29.

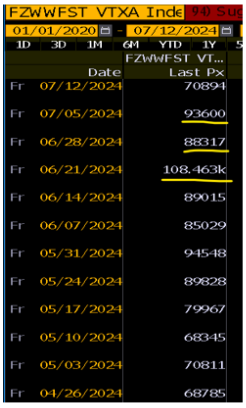
Figure 67: Vortexa Floating Storage Jan 1, 2000 – July 12, 2024, posted July 13 at 9am MT



Source: Bloomberg, Vortexa

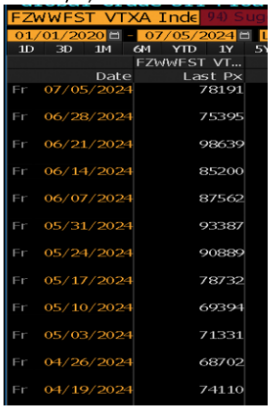
Figure 68: Vortexa Estimates Posted 9am MT on July 13, July 6, and June 29.

Posted July 13, 9am MT



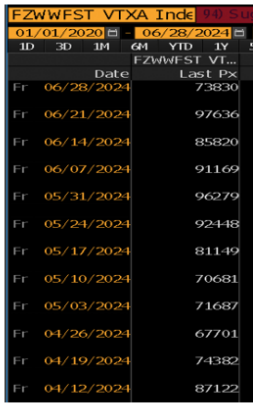
Date	Last Px
Fr 07/12/2024	70894
Fr 07/05/2024	93600
Fr 06/28/2024	88317
Fr 06/21/2024	108.463k
Fr 06/14/2024	89015
Fr 06/07/2024	85029
Fr 05/31/2024	94548
Fr 05/24/2024	89828
Fr 05/17/2024	79967
Fr 05/10/2024	68345
Fr 05/03/2024	70811
Fr 04/26/2024	68785

July 6, 9am MT



Date	Last Px
Fr 07/05/2024	78191
Fr 06/28/2024	75395
Fr 06/21/2024	98639
Fr 06/14/2024	85200
Fr 06/07/2024	87562
Fr 05/31/2024	93387
Fr 05/24/2024	90889
Fr 05/17/2024	78732
Fr 05/10/2024	69394
Fr 05/03/2024	71331
Fr 04/26/2024	68702
Fr 04/19/2024	74110

June 29, 9am MT



Date	Last Px
Fr 06/28/2024	73830
Fr 06/21/2024	97636
Fr 06/14/2024	85820
Fr 06/07/2024	91169
Fr 05/31/2024	96279
Fr 05/24/2024	92448
Fr 05/17/2024	81149
Fr 05/10/2024	70681
Fr 05/03/2024	71687
Fr 04/26/2024	67701
Fr 04/19/2024	74382
Fr 04/12/2024	87122

Source: Bloomberg, Vortexa

Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Bloomberg also posts the Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, North Sea, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. (i) As noted above, last week's July 5, in total, was revised +15.41 mmb with the key s being Asia revised +12.88 mmb and Other revised +4.75 mmb. (ii) Total floating storage was -22.71 mmb WoW vs the revised up July 5. The major WoW changes were Asia -16.99 mmb WoW and West Africa -5.10 mmb WoW. (iii) July 12 estimate of 70.89 mmb is -57.89 mmb vs the 2023 high on June 23, 2023 of 128.78 mmb. Recall Saudi Arabia started its voluntary 1 mmb/d production cuts on July 1, 2023. The major changes by region vs the last year June 23, 2023 peak are Asia -41.60 mmb and Other -21.32 mmb. (v) Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for July 5 that was posted on Bloomberg at 9am MT on July 6.

Figure 69: Vortexa crude oil floating by region

				Original Posted	Recent Peak	
Region	Jul 12/24	Jul 5/24	WoW	Jul 5/24	Jun 23/23	Jul 12 vs Jun 23/23
Asia	31.64	48.63	-16.99	35.75	73.24	-41.60
North Sea	3.48	4.46	-0.98	4.46	5.42	-1.94
Europe	11.38	10.80	0.58	10.48	5.80	5.58
Middle East	11.21	11.80	-0.59	13.68	6.76	4.45
West Africa	2.87	7.97	-5.10	8.95	7.62	-4.75
US Gulf Coast	2.69	1.82	0.87	1.50	1.00	1.69
Other	7.62	8.12	-0.50	3.37	28.94	-21.32
Global Total	70.89	93.60	-22.71	78.19	128.78	-57.89
Vortexa crude oil floating storage posted on Bloomberg 9am MT on July 13						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

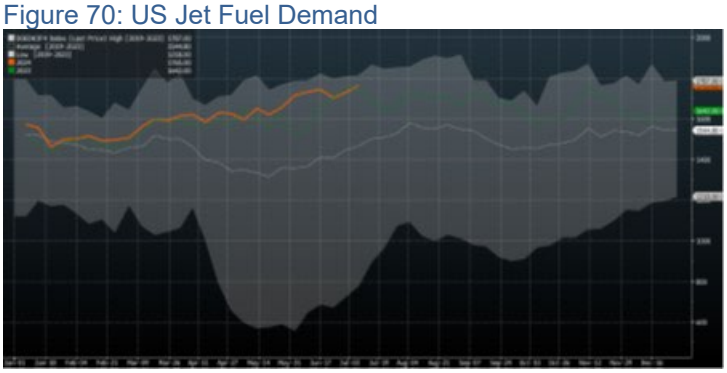
Oil: Bloomberg Oil Demand Monitor "Summer Travel Boosts Aviation; China Worries"

Bloomberg oil demand monitor

The Bloomberg Oil Demand Monitor is a good recap of key oil demand indicators around the world. This month's report discusses the seasonal increase in air travel, and the decrease in oil demand in Asia. Global flight levels have surpassed last year's levels and average pre-pandemic levels. Oil inventories are declining globally with OPEC+'s production cuts, coupled

with increased temperature-driven demand in the Middle East, and global demand is up by 1.5 mmb/d from last year. Oil demand is down in China, as imports reached a 2-year low. Bloomberg reported *"The summer glow isn't being felt everywhere. Traders will be watching a major policy meeting in Beijing next week to see whether China can invigorate its economy. The nation has flashed warning signs on demand, including a two-year low in inbound supertankers and slumping freight rates. In its monthly outlook, the International Energy Agency said China's oil consumption slipped in the second quarter from a year earlier, adding that its "post-pandemic rebound has run its course." "* Bloomberg continues to highlight the discrepancy in outlooks from the major market watchers, as OPEC is forecasting demand growth of 2.25 mmb/d this year, which is significantly above the IEA's forecast which is just shy of 1.0 mmb/d. The below chart from Bloomberg's Oil Demand Monitor shows annual US jet fuel demand levels. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 70: US Jet Fuel Demand



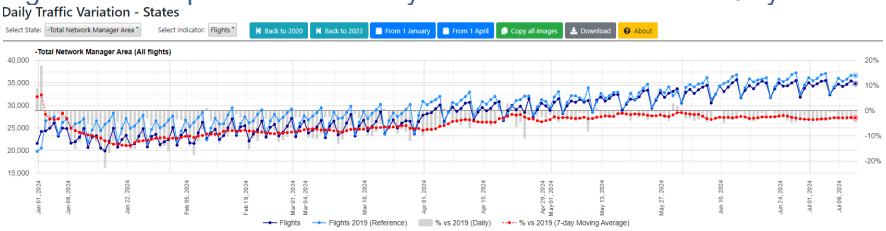
Source: Bloomberg

Europe airports daily traffic

Oil: Europe airports daily traffic 7-day moving average is -2.93% below pre-Covid

Yesterday, we tweeted [LINK] "*Daily Europe air traffic still stuck below pre-Covid. 7-day moving average as of: Jul 11: -2.9% below pre-Covid. Jul 4: -3.3%. Jun 27: -2.9%. Jun 20: -2.5%. Jun 13: -2.6%. Jun 6: -3.2%. May 30: -0.8%. May 23: -1.9%. May 16: -1.2%. May 9: -3.2%. Thx @eurocontrol #OOTT #Oil."* Other than over Christmas, European daily traffic at airports has been below pre-Covid. The 7-day moving average has got close a few times including at only 0.8% below pre-Covid as of May 30, but the 7-day moving average is now -2.9% below pre-Covid as of July 11, which followed -3.3% below as of July 4, and -2.9% below as of June 27. Please note that we try to pull the data around 8am MT on Saturdays for a consistent weekly comparison. Eurocontrol updates this data daily and it is found at [LINK].

Figure 71: Europe Air Traffic: Daily Traffic Variation to end of July 11



Source: Eurocontrol

Record number of travelers at US airports

Oil: TSA screened record 3 million air travellers on a single day at US airports

Last week's (July 7, 2024) Energy Tidbits noted the expectation that the US was expected to screen a record 3 million air passengers on July 7. They hit 3 million. On Monday, the TSA reported that on Sunday, July 7, they screened over three million travellers at US airports [LINK]. This was the most screenings the TSA has done since its inception in November 2001. Secretary of Homeland Security Alejandro N. Mayorka commented *"Yesterday, for the first time since its founding in November 2001, Transportation Security Administration officers screened more than three million travelers on a single day at airports across the country. It was an extraordinary achievement: TSA fully, unerringly, and efficiently checked 35 passengers every second, along with all their luggage and carry-on baggage, while demonstrating unwavering professionalism and respect for travelers during the intensely busy holiday weekend."*

Above-average hurricane activity

Oil & Natural Gas: Klotzbach hurricane forecast "will be extremely active"

On Tuesday, Phil Klotzbach and his team at Colorado State University posted their updated forecast for the 2024 Atlantic hurricane season [LINK]. They moved to an even higher level of hurricane activity and the new forecast points to an extremely active hurricane season. They estimate there will be 25 named storms this season, with 12 having the potential to become a hurricane. The forecast commented "*We have slightly increased our forecast and continue to call for an extremely active Atlantic hurricane season in 2024. Sea surface temperatures averaged across the hurricane Main Development Region of the tropical Atlantic and Caribbean remain near record warm levels. Extremely warm sea surface temperatures provide a much more conducive dynamic and thermodynamic environment for hurricane formation and intensification. We anticipate cool neutral ENSO or La Niña during the peak of the Atlantic hurricane season, resulting in reduced levels of tropical Atlantic vertical wind shear. Hurricane Beryl, a deep tropical Category 5 hurricane, is also a likely harbinger of a hyperactive season. This forecast is of above-normal confidence."* Our Supplemental Documents package includes excerpts from the updated July 9 Klotzbach forecast.

Figure 72: Klotzbach updated 2024 Atlantic Hurricane Forecast

Forecast Parameter and 1991–2020 Average (in parentheses)	Statistical Forecast	Final Forecast
Named Storms (NS) (14.4)	20.7	25
Named Storm Days (NSD) (69.4)	102.3	125
Hurricanes (H) (7.2)	10.6	12
Hurricane Days (HD) (27.0)	44.9	50
Major Hurricanes (MH) (3.2)	5.3	6
Major Hurricane Days (MHD) (7.4)	13.9	16
Accumulated Cyclone Energy (ACE) (123)	201	230
Net Tropical Cyclone Activity (NTC) (135%)	215	240

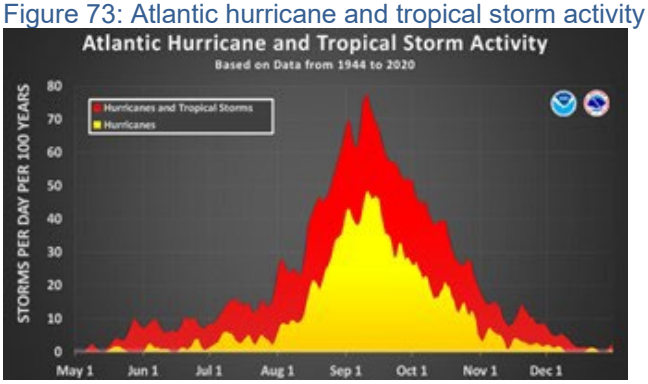
Source: Colorado State University

Oil & Natural Gas: 90% of Atlantic hurricanes come after Aug 1, peak is normally mid-Sept

90% of hurricanes are after Aug 1

Hurricane Beryl was the earliest Category 5 hurricane on record. It is important to remember that normally 90% of Atlantic hurricanes typically come after Aug 1. Here is what we wrote in our Aug 6, 2023 Energy Tidbits memo. "*90% of Atlantic hurricanes come after Aug 1, peak is normally mid-Sept It may already be the hottest time of the year, but we always remind that 90% of Atlantic hurricanes typically come after Aug 1. And August normally marks the start of the ramp up of hurricane season with high hurricane activity typically from mid-Aug thru mid-Oct with a normal peak in mid-Sept. Below is NOAA's graph showing the distribution of Atlantic hurricanes and tropical storms based on data from 1944 to 2020. [LINK].*"

Figure 73: Atlantic hurricane and tropical storm activity by month



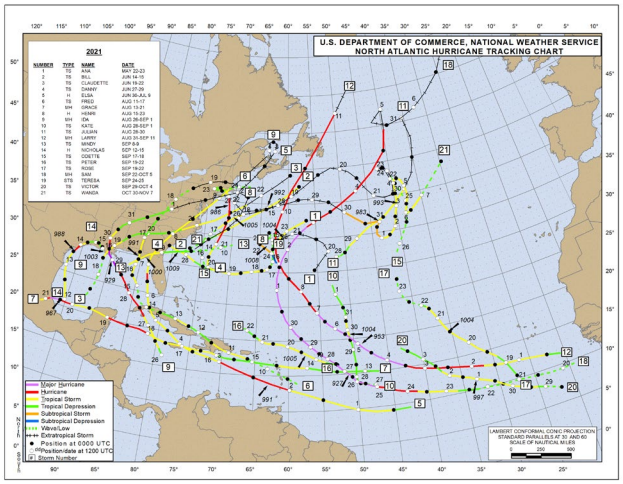
Source: NOAA

Oil & Natural Gas: Hurricane track map rule of thumb – the Dominican Republic

Hurricane track map rule of thumb

Hurricanes and tropical storms are always unpredictable in terms of speed, wind strength and path. But, based on history, there are some rules of thumb. One pretty good rule of thumb is that tropical storms or hurricanes that move south of the Dominican Republic are likely to either hit the Yucatan Peninsula or come into the Gulf of Mexico and hit the Gulf Coast. Our tweet included the last four years of NHC track maps and we maintain the track maps since 2000 and they provide support for this rule of thumb On June 27, we tweeted [LINK] "*Hurricane Track Map Rule of Thumb. Hurricanes that move south of the Dominican Republic are the ones that are likely to hit Yucatan Peninsula or come into the GoM to hit Gulf Coast. Last 4 yrs of @NHC_Atlantic track maps 👇 are indicative of track maps since 2000. #OOTT #NatGas "*

Figure 74: Atlantic hurricane track map for 2021



Source: National Hurricane Center

Energy Transition: bp warns of risk to a costly and disorderly energy transition

Bp on the energy transition

It's unfortunate for bp that they were the longest holdout to the reality that the aspirations of the energy transition and net zero weren't going to be met and that, as we have said for years, the energy transition will take way longer, cost way more and be a bumpy/rocky road. Because by holding out and being a energy denier, it cost them billions in share price value and investments they wouldn't have made. And unfortunately, it reminds of the way big corporations work – the boss decides and everyone gets on board the train. But better late than never and their energy outlook made it clear that they now see the risk from the prolem of not being able to have a timely transition. In the opening message bp writes "*The challenge is to move – for the first time in history – from the current energy addition phase of the energy transition to an 'energy substitution' phase, in which low carbon energy increases sufficiently quickly to more than match the increase in global energy demand, allowing the consumption of fossil fuels, and with that carbon emissions, to decline. The longer it takes for the world to move to a rapid and sustained energy transition, the greater the risk of a costly and disorderly adjustment pathway in the future.'* Companies like bp are filled with smart people but anyone who knows big company people know the big personal value comes with longevity and pensions. We just don't see a company of really smart people didn't object to denying just going along with the aspirations when they could see their competitor doing something different. It's not that the energy transition aspirations aren't valid and are the aspirations and the path for the world but that they didn't realize it wasn't executable anywhere near aspirations and they would waste investment dollars. But power to bp for now acknowledging that the energy transition taking way longer than expected will lead to a period of costly and disorderly energy. We will have comments on the bp analysis in the coming weeks, but we think the most important reminder from the report is for people to prepare for and think thru what is shaping up to be a period of disorderly and costly energy. There are many outcomes but the one realistic one will the focus on energy security, reliability and affordability, which means oil and natural gas will be needed for longer.

Need NatGas baseload for data centers

Energy Transition: Dominion CEO need #NatGas baseload to add renewables

We still can't believe that many don't accept that renewable power isn't baseload power especially for electricity users like AI data centers that need 24/7 reliable, available, affordable power. We have been highlighting Dominion Energy AI data centers actions and views because Dominion is the world's largest provider of electricity to AI data centers and it's key operating state, Virginia, has the world's most data center electricity consumption. On Thursday, Dominion CEO Robert Blue was on CNBC and we tweeted [LINK] "*AI Data Center 101. Need #NatGas baseload if want to add renewables. "we've built a substantial amount of highly efficient #NatGas generation in the last decade. That has allowed us to add in quite a few renewables" $D CEO, #1 power to data centers in the world. Also "we're going to need to add some more #NatGas and we have plans to do that". Reminds #NatGas is not a transition fuel for power generation. Thx @DavidFaber #OOTT."* CNBC's David Faber asked about increasing the renewable % of the power generation to meet the unprecedented demand in electricity driven by data centers. Blue didn't' go into the numbers of how much renewable was being used but his answer was straightforward – Dominion's early buildout of efficient natural gas generation was what allowed them to add in some renewable. Note that renewables are a very small part of the actual generation for Dominion. But it was having baseload natural gas that let them add in some renewable. We created a transcript of Blue's response ""*It's a really important question. … we're very fortunate to have a Governor who is focused on reliable, affordable and increasingly clean energy, which is the mission of our company. So, we've built a substantial amount of highly efficient natural gas generation in the last decade. That has allowed us to add in quite a few renewables. We're building a substantial amount of solar. We're building the largest offshore farm in the US. We're going to need to add some more natural gas as well and we have plans to do that. There is no silver bullet. And I think that's a mistake that some people make in addressing energy challenges is that there is one approach that is going to solve all of the challenges. That's just not true. It requires some of everything. It requires renewables. It requires continuing to operate our existing nuclear fleet, they are the workhorses of our fleet today. They are carbon-free. It requires adding more natural gas. And it requires investments in transmission, the big wires that are moving electricity around our area."* Our tweet included the video clip we made of this Q&A.

06/06/24: Huntsman, data centers can't be run on renewables

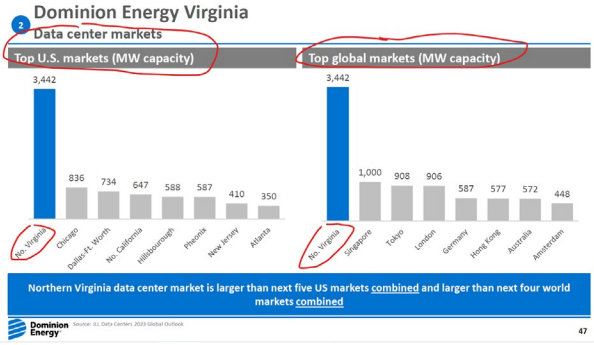
There are two key AI data center 101 issues/opportunities – the electricity demand is big and fast, and natural gas is the go-to fuel for 24/7 power. Renewables can be added in as Dominion has done but natural gas is the go-to fuel for the rapid growth in AI data center electricity demand. Huntsman CEO Peter Huntsman was on CNBC Squawk Box on Thursday June 6 and he warned of an electricity gap coming and it is coming faster than expected. He also reminded that AI data centers can't be run on renewables. Here is what we wrote in our June 9, 2024 Energy Tidbits memo on renewables and AI data centers. "*There was another reminder about AI data centers fundamentals from Huntsman CEO Peter Huntsman on CNBC Squawk Box on Thursday – they need fossil fuels to provide 24/7 reliable, affordable power. On Friday, we tweeted [LINK] "Data center reality check. "if the projected amount of electricity that is going to be needed to power all this .....the capacity that will be built will have to be hydrocarbon based. You cannot have reliable wind that is going to running 100% of the time" Huntsman CEO. Also why he expects power costs are*

going way higher. #OOTT #NatGas @SquawkCNBC @BeckyQuick." Huntsman was highlighting his view that energy costs are going way higher and linked in his view that data centers need fossil fuels for power. Here is the transcript we made of his comments with CNBC's Becky Quick. CNBC's Becky Quick asks "electricity prices you think will go up 30% because we won't be able to meet demand?" Huntsman "There's a 30%. The last electron available electricity, how much is that going to be worth? It's not going to be 30% up, it's going to be multiple times up. And when we have consumers and utilities, they're competing against these multi-trillion dollar high tech companies". Quick "for the data centers." Huntsman "for the data centers and so forth. They want to buy it, the reliable and affordable electricity. And I have no problem with them doing it. It's a free market, heaven bless them. But on one hand, we're out here saying we don't want hydrocarbons and we're willing to fund that. On the other hand, that's, we're extending the life of coal, we're extending" Quick " it's not a free market though, you have regulators who say you can't raise prices. Does that mean we will have shortages?" Huntsman "if that's the case, Yes. You are not building the capacity. It's been projected, these are not Huntsman's numbers. These are New York Times and Wall Street Journal. If the projected amount of electricity that is going to be needed to power all this, if that indeed comes on, we are not building the electrical capacity today. The capacity that will be built will have bo be hydrocarbon based. You cannot have reliable wind that is going to be running 100% of the time.",

Dominion Energy: renewables 14% of capacity but only 5% of actual power

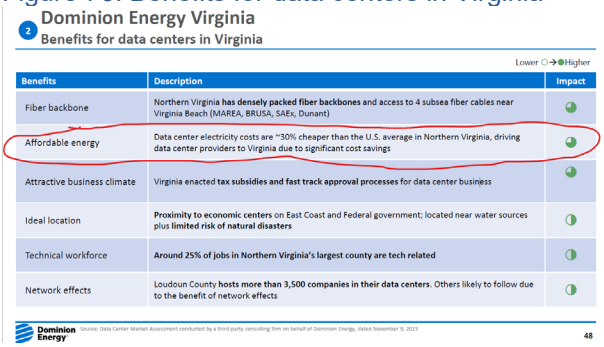
Dominion Energy is the #1 power provider for data centers in the world so provide a good reminder of why renewables can't be the key power provider for data centers. Renewables are 14% of Dominion's electricity capacity but only provide 5% of the actual power. Here is what we wrote in our Mar 10, 2024 Energy Tidbits memo. "*We were watching CNBC Squawk on the Street on Monday morning and the hosts opening banter highlighted how data centers were the hot discussion point among their contacts and how the huge ramp up in their electricity requirements would be driven by solar power. They highlighted how the data center owners were only going to go solar due to their environmental views. We were surprised that there was zero discussion on the fundamental need for 24/7 reliable, affordable power. We just don't see the solar power call. Yes solar will be used as much as possible but there is no solar power at night. So we tweeted [LINK] "Data Centers 101; Need 24/7 available, affordable power, not intermittent solar/wind. $D: Northern Virginia is #1 for data centers in US & the world. Why? Affordable energy from #NatGas, #Nuclear & #Coal. Vs Clean energy is 14% of capacity but 5% of actual energy. #OOTT." We have been highlighting the recent Dominion Energy investor day and how northern Virgina is the global leader in data centers. And how Dominion's Virgina power generation is basically driven by natural gas, nuclear and coal. Whereas renewable energy was 14% of capacity but only provided 5% of actual power. The Dominion Energy data on power for data centers is the Data Center 101 – they need 24/7 reliable affordable power. Below are the Dominion Energy slides/data from our tweet."*

Figure 75: Northern Virginia is #1 global data center market



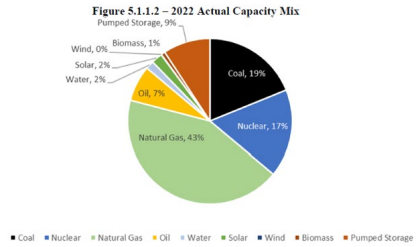
Source: Dominion Energy

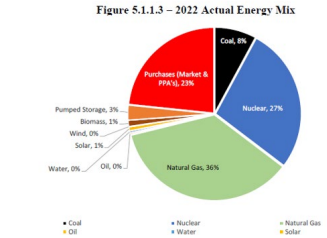
Figure 76: Benefits for data centers in Virginia



Source: Dominion Energy

Figure 77: Dominion Virginia 2022 actual energy capacity mix and actual energy mix





Source: Dominion Energy

Electricity: Huntsman, is an electricity supply gap inevitable with data center growth?

Electricity supply gap coming?

Earlier, we noted Huntsman CEO Peter Huntsman's June 6, 2024 CNBC interview that remind renewables can't power AI data centers. In that interview, Huntsman made a key point that has been overlooked – the rate of growth in electricity demand from AI data centers is faster than the ability to provide reliable 24/7 electricity for that growth. Here is what we wrote in our June 9, 2024 Energy Tidbits memo. "*It's pretty amazing how AI and data center electricity needs has gone from a non-event to the largest variable to electricity consumption over the coming years. Our Energy Tidbits memos have been highlighting that the major issue is that this AI data centers growth in electricity consumption is happening right away. This is our concern – we are in a calm before the storm where data centers electricity consumption is being met but can the rapid large growth in electricity consumption be met on a timely basis with increased electricity generation? On Friday, we tweeted [LINK] "Electricity Gap is coming! "a new data center takes a little over a yr to build, it takes 10 yrs to permit these new #NatGas burning power plants. It takes even longer for Wind & Solar. So that's a disconnect we have" Huntsman CEO. Higher power costs ahead! #OOTT @SquawkCNBC." Huntsman CEO Peter Huntsman was on CNBC Squawk Box on Thursday morning. There is an electricity gap coming and it is coming faster than expected because there is no way new supply can keep up with projected electricity growth coming from data centers. This was a great reminder from Huntsman. The other part that Huntsman didn't specifically address is the big problem is transmission approval, which is even harder than getting approvals for new natural gas plants and for solar/wind projects. Our tweet included an mobile clip, where Huntsman said "… AI coming on, we're building data centers, a new data center takes a little over a year to build. It takes 10 years to permit these new gas burning power plants . it takes even longer for wind and solar. So that's the disconnect we have." It was a great point by Huntsman, data centers are being ramped up quickly but approvals take way longer to get new natural gas power generation and even more for wind and solar power generation. We also note how an even longer timeline is power transmissions lines."*

Energy Transition: Hurricane Beryl reminds of AI data centers risk in Gulf Coast

Texas AI data centers hurricane risk

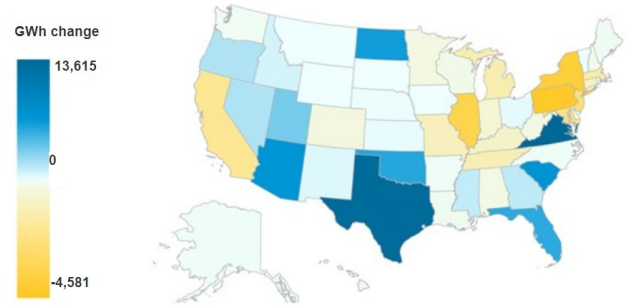
Last week's (July 7, 2024) Energy Tidbits memo highlighted ERCOT (Texas electricity system operator) forecast for huge growth in Texas electricity demand in the 2020s driven by AI data centers. This week, Hurricane Beryl reminded that the means more AI data centers will be exposed to power supply risks from hurricanes – risk of wind damage, flooding and third party power outages. On Tuesday, we tweeted [LINK] "*AI data centers operations risk. Beryl reminds hurricanes can cause multi-day power outages. @EIAgov 👇map notes Texas and Virginia are the big AI data center electricity demand growth states. [LINK] #OOTT #NatGas."* Bloomberg wrote "*Lumen Technologies Inc. said post-hurricane power outages were prompting partial service disruptions for its Houston-area clients. The internet-service provider's local data center, a 51,300-square-foot property in the Greenspoint neighborhood, is relying on backup generators. "The commercial power failure is impacting multiple companies in the area, including Lumen," spokesman Mark Molzen said in an email. "We are maintaining partial service using generators" while working with the power company on the issue."* We don't mean to downplay Beryl but it was fortunate that it was a Category 1 that was moving fast at 12 mph thru Houston so had less time to drop rain. Even still, the CenterPoint Energy (Houston area power company) outages lasted days. Data centers, like

other businesses that want or need 24/7 power will have backup generators to kick in when the electricity provider has outages.

Texas and Virginia are the big AI data centers electricity growth states

Our tweet on Hurricane Beryl reminding of the AI data center risk included the below state map by the EIA showing that Texas and Virgina are the big growth states for commercial electricity demand driven in great part by AI data center growth. Here is what we wrote in last week's (July 7, 2024) Energy Tidbits memo on the EIA state map. "*The EIA increased their forecast for US commercial electricity demand driven by AI data centers in its recent June Short Term Energy Outlook. Last Friday, the EIA posted its "Commercial electricity demand grew fastest in states with rapid computing facility growth" [LINK] that gives context to that recent forecast increase. One thing that jumps out is the big growth areas are in Texas and Virgina, which matches to where the big AI data center growth is in the US. Note the EIA's below map shows Texas and Virginia as the two big growth aras with the dark blue color. The report discusses an ongoing trend we have focused on, which is the increasing growth and development of large scale data centres in the US and the electricity demand they bring. The EIA revised up their expectations for electricity demand through 2025 from their June STEO, reporting, "We made our largest revisions to the forecast in the South Atlantic and West South Central census divisions, which together account for 40% of U.S. commercial electricity demand. We now expect that commercial consumption in the South Atlantic will increase by 5% in 2024 and 2% in 2025 and in West South Central by 3% this year and 1% next year. Other regions with strong growth in sales of electricity to the commercial sector include the West North Central and Mountain census divisions (both with forecast annual growth averaging 3% in 2024 and 2025). Nationally, we expect U.S. sales of electricity to the commercial sector will grow by 3% in 2024 and by 1% in 2025. Data center developments are evolving rapidly, and we plan to re-evaluate our upcoming forecasts as we receive more information." Below is a map showing the change in electricity consumption by state. Our Supplemental Documents Package contains the report from the EIA."*

Figure 78: Change in Commercial Sector Electricity Consumption (2019-2023)



Source: EIA

AI data centers/bitcoin driving huge Texas electricity growth

Earlier we mentioned Ercot's forecast for huge Texas electricity growth driven by data centers and bitcoin mining. Here is what we wrote in last week's (July 7, 2024) Energy Tidbits on the Ercot forecast. "*On Tuesday, we tweeted [LINK] "Huge task even in energy friendly Texas. Texas may need to increase power supply by 43% in only 5 years says @GovAbbott. @AdamBennettKVUE adds that ~60% of the growth is AI data centers + bitcoin mining. #NatGas #Coal is ~80% of Aug 2024 est resource. @ERCOT_ISO #OOTT." (i) We hadn't seen the ERCOT June 12 presentation to the Texas Commerce and Business Committee. But, we did see Texas Gov Abbott's July 1 release [LINK] "In recent testimony before the Senate Business and Commerce committee, ERCOT CEO Pablo Vegas testified that Texas may need 150,000 megawatts of power to power our grid by 2030. That is only six years away. Currently, Texas typically has approximately 85,000 megawatts of power available counting wind, solar, coal, nuclear, and natural gas. If the new estimate is correct, the updated numbers provided by Mr. Vegas call for an immediate review of all policies concerning the grid." Abbott highlights ERCOT estimates Texas needs to increase its electricity supply by 43% in five years. (ii) But Abbott's short release did not give any detail on what was driving the increased demand. But we saw a KVUE report [LINK] that said 60% of the increase was due to bitcoin mining and data centers. KVUE wrote 'During a public hearing before the Texas Senate Business & Commerce committee, Lori Cobos with the Public Utility Commission of Texas (PUC) said ERCOT expects power demand to increase to 150 gigawatts by 2030, up from 85 gigawatts currently. That updated projection is 40 gigawatts higher than what was previously forecasted. Cobos said roughly 60% of the new demand is from Bitcoin mining and data centers, including those run by artificial intelligence (AI). Cobos attributed the rest to hydrogen production facilities, along with the expansion and electrification of existing industries, including oil and gas." (iii) KVUE is saying the prior forecast was to need 25 gigawatts in five years and that is now a need of 65 gigawatts in five years. This a huge increase in five years and will require a massive immediate ramp up in new electricity generation. (iv) Our tweet also included ERCOT's Aug resource supply that notes ~80% of the current supply. Given the time frame, Texas needs every possible electron. And the reality is natural gas in particular. Our Supplemental Documents package includes the Abbott release and the KVUE report."*

Energy Transition: Shell, electrofuels for airplanes is infeasible for project to proceed

Shell pauses in electrofuels

No one should be surprised to see another reminder that air travel is going to be a hard industry to decarbonize. Last Friday, July 5, Vattenfall had a short press release [LINK] on Shell's decision to pause its participation in the electrofuels project as it sees a different timeline for the project to be realized. That looks like polite speak for they don't see a way for this project to generate economic returns. Here is what Vattenfall release said *"Vattenfall and Shell have decided to pause their collaboration in the HySkies electrofuel project while Vattenfall continues the search for new partners to join potential industry decarbonisation developments in the Forsmark region. In 2021 Vattenfall took the initiative to develop the HySkies project together with Shell, aiming to speed up the transition towards electrofuels for aviation. Now Vattenfall and Shell have agreed to pause their collaboration, and invite other potential partners to join Vattenfall. "When new technologies are being investigated, like in*

HySkies, there can be adjustments in early stages of projects, such as the feasibility study phase. However, Vattenfall believes strongly in the opportunities of the Forsmark region to decarbonise heavy industries, and we will continue our investigations to identify potential suitable partners to join our ambitions towards a fossil free future," says Per Sundell, Senior Business Developer, Vattenfall. While Shell sees a future in the HySkies project, including opportunities for future potential collaborations, currently there is a different belief in timelines for the project to be realised. With Vattenfall´s high belief in the opportunities of the Forsmark region to decarbonise heavy industries through fossil free electricity, hydrogen and captured CO2, the full potential is currently under review and investigations are ongoing to identify potential suitable industrial partners to join our ambitions towards a fossil free future. Both companies have requested for a termination of the grant agreement for financial support via the EU Innovation Fund, considering it is infeasible for the project to succeed within the framework of that agreement and aiming to free up funds for others to use in their ambitions to decarbonise."

Vattenfall's description of electrofuel

Here is what Vattenfall has posted on its website to explain electrofuel..[LINK]
"Electrofuel. Collective name for several fuels such as sustainable jet kerosene or methanol. Produced by hydrogen reacting with carbon dioxide captured from process emissions, for example from the chimney of a paper mill or a waste incineration plant. Vattenfall has projects for the production of electrofuel working in partnerships with, among others, Shell, Preem and St1. • Advantages:Can replace or be mixed into fossil aviation kerosene and thus reduce the fossil CO2 footprint from air traffic. Is often a suitable solution where other solutions for electrification do not work. • Disadvantages:Lower efficiency than direct electric operation or direct use of hydrogen."

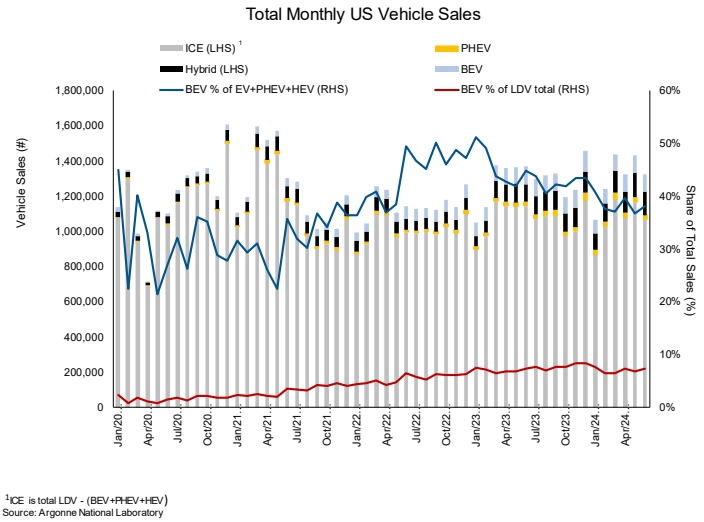
Energy Transition: Better month for US BEV sales, but still at low % penetration

US car sales down MoM in June

Argonne National Laboratory posted its monthly US sales data for Light Duty Vehicles (LDVs) broken out into Battery Electric Vehicles (BEVs), Plug-in Electric Hybrids (PHEVs) and Hybrid Electric Vehicles (HEVs) for June, which then allows us to back into ICE sales [LINK]. On Thursday, we tweeted [LINK]: "*Better month for EVs but still lost share in 2024. Total US LDV sales -7.62% MoM, -109,114 to 1.32 mm in June. BEVs: -1.16% MoM, -1,135 to 96,666. 7.3% share PHEVs: -18.65% MoM, -5,423 to 23,648. 1.8% share HEVs: -4.0% MoM, -5,520 to 133,533. 10.1% share ICE: -8.33% MoM, -97,036 to 1,068,085. 80.8% share Thx @argonne #OOTT*" (i) For EVs and hybrids, two recent trends have been the slowing growth rate in EVs and Hybrids taking more share from EVs. (ii). Hybrids are still showing the strongest growth and taking share from EVs. Hybrids are now 47.40% of total EV + PHEV + Hybrid, whereas it was ~60% in Jan 2023. June was a better month for BEVs, but they are still down in terms of % of total BEV + PHEV, and also in terms of % of total US LDV sales. (iii) Total US LDV car sales in June were down -109,114 cars or -7.62% MoM to 1,321,932 total car sales in June vs 1,431,046 in May. BEV: -1,135 or -1.16% MoM to 96,666 and 7.3% of total US. PHEV: -5,423 or -18.65% MoM to 23,648 and 2.2% of total US. HEV: -5,520 or -4.0% MoM to 133,533 and total 10.1% of total US. ICE: -97,036 or -8.3% MoM to 1,068,085 and 80.8% of total US. (iv) It was a better month for BEVs that have been underperforming HEVs. PHEVs look to be losing appeal. BEVs were back up to 7.3% of total US LDV sales from 6.8% in May. The high for BEVs was in Nov and Dec 2023, when BEVs were 8.3% of

total US LDV sales. It was a MoM decrease in ICE and the reminder is ICE are still 81% of total US car sales. Our Supplemental Documents package includes the data from Argonne.

Figure 79: US total monthly hybrid and electric vehicle sales vs LDV total



[1]ICE is total LDV - (BEV+PHEV+HEV)
Source: Argonne National Laboratory

Source: Argonne National Laboratory

Energy Transition: bp Pulse adding EV charging at 75 Simon Property malls

We don't normally report on charging stations being added but when we thought the bp Pulse announcement on their latest charger stations makes sense – adding charging stations at malls. We know it is being done but it's good to see some deals at scale. Bp Pulse has entered a partnership with Simon Property Group to install and operate ultra-fast EV charging gigahubs at 75 Simon shopping malls across the US, which will add 900 charging bays [LINK]. The locations are set to be open in early 2026. Richard Barlett, CEO of bp Pulse said, *"We're pleased to complete this deal with Simon and expand our ultra-fast charging network footprint in the US. The Simon portfolio aligns with bp pulse's strategy to deploy ultra-fast charging across the West Coast, East Coast, Sun Belt and Great Lakes, and we are thrilled to team up with Simon so that EV drivers have a range of retail offerings at their impressive destinations."* bp Pulse is aiming to expand to 100,000 public EV charging locations worldwide by 2040, and they currently have 29,000. Our Supplemental Documents package contains the EV report article.

bp Pulse adds 900 EV charging stations at malls

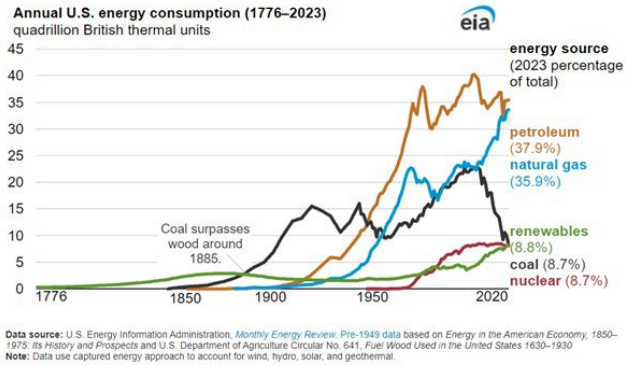
Energy Transition: Burning wood, incl in renewable energy, is use > wind & solar

One of the overlooked aspects of Renewable Energy is that it isn't just wind and solar, it includes other renewable energy such as burning wood. On Friday, we tweeted [LINK] "*Burning Wood for energy is included in #RenewableEnergy. Recognize this is total energy use by US ie. not just electricity. But US uses more energy from Wood than it gets from either #Solar or #Wind. Thx @EIAgov #NatGas #OOTT."* We, and it appears others, were surprised to see the EIA graphs that showed how US energy use of wood is more than from solar or wind. This is for total energy use and not just electricity consumption but we were still

US uses more wood than solar or wind

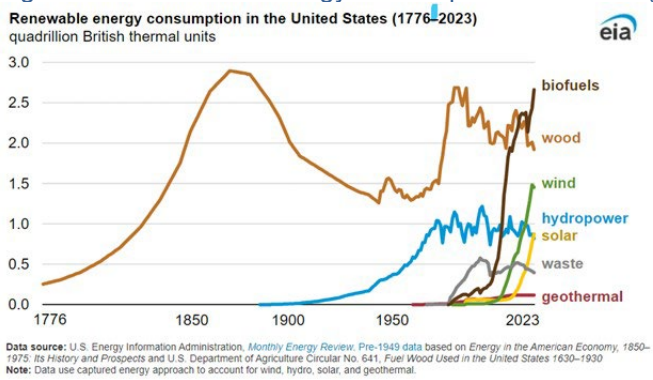
surprised. On July 3, 2024, the EIA posted a blog "*How has energy use changed throughout U.S. history?"* [LINK] It goes back to 1776 and shows how energy use in total from the various energy sources changes over time. It shows how energy use moved from the Wood age to the coal age to the oil age and now the natural gas age, and also how renewable energy has started to grow. We didn't think much of it until we saw the second graph that split out energy use from renewable energy sources and we were surprised to see there is more energy use from wood than from either solar or wind. And of course, we were reminded that in the case of wood, renewable energy doesn't mean clean energy. Below are the two key graphs. Our Supplemental Documents package includes the EIA blog.

Figure 80: Annual U.S. energy consumption (1776-2023)



Source: EIA

Figure 81: Renewable energy consumption in the U.S. (1776-2023)



Source: EIA

Capital Markets: Great news, Trump survives assassination attempt

Too close a call last night

I am saddened to see one of the spectators was killed at the Trump rally last night when it appears one of the assassins' shots at Trump hit them. That is wrong. But it is great news that former President Trump survived with a bullet hitting his right ear. There will be a time and place but it isn't today. Rather, I am not writing this item trying to have any view on how it will impact the election and markets but rather it is the news of the world that the US is fortunate that former President Trump survived the assassination attempt last night. To baby

boomers, it brings back the 60s and 70s when assassination attempts happened too much and too successful. So great news that Trump decided to go off prompter and turned his head to point out the graphs he showed because that looks to have saved his life. Our first tweet on it was right after and we tweeted [LINK] "*Whether you like Trump or not, got to give him credit for his reaction to whatever happened. Not many people would hear a bang, get hit by something in their ear and then do what he did. And talk about The Kodak Moment for the campaign."* Anyone who been anywhere near a shooting knows that the reaction is chaos and people fleeing away. So whether you like him or not, give him some credit for not panicking. And on the same note, the people on the stage didn't seem to panic. We also tweeted out the BBC interview with the eyewitness to the seeing the shooter and trying to get police and the secret service focused on the shooter. That is an amazing interview. [LINK]. Just glad to see the assassination attempt failed and Trump doesn't seem to have a major injury.

Capital Markets: Geopolitical risk is before election if Biden is forced out

Geopolitical risk now if Biden forced not to run

It's been a crazy week for Biden with the pressure from inside the party mounting for him to not run, yet the polls aren't showing any significant negative impact from his debate performance. It seems like people are positioning focused on who will win the election but, on Monday, we were reminded that the big geopolitical risk is before the election if Biden is forced to not run. Because if Biden is forced to not run, the question becomes can he stay on and be a lame duck President for the last of his term? Or for that mater would he want to do so? But the question was raised would world leaders try to take advantage of Harris if she took over right away? The answer is of course. At least we think some would and we used the sports example if a starting CB got injured and the first thing Brady would do is attack the backup. On Tuesday, we tweeted [LINK] "*Geopolitical risk to #Oil if Biden forced out? Can Biden stay on as lame duck President if says he won't run? @BBEnergyGroup Omar Najia wonders what if Biden has to give way to Harris right away? ie. would Netanyahu invade southern Lebanon? What other leaders would want Trial by Fire for Harris? Be like a starting CB getting hurt, Brady would go and test the backup! See 👇10:25 min mark. #OOTT @gulf_intel @sean_evers."* What made us think this was Omar Najia saying if Harris was suddenly in the seat, why wouldn't Netanyahu invade southern Lebanon? We don't know if that is the scenario but the point is that if Biden is forced not to run, it brings the geopolitical risk to before the election and not after. Food for thought.

Late Q2/early Q3 is when we wondered if Biden might step down

We are a little surprised that there hasn't been more talk about Biden stepping down and resigning as President so he could have on his legacy making Kamala Harris as the first woman President of the US. But we had always thought late Q2/early Q3 was when Biden might choose to step down. Here is what we wrote in our June 9, 2024 Energy Tidbits memo, when we learned of Biden agreeing to debate Trump. "*We are surprised that Biden agreed to the June 27 debate with Trump instead of the normal debate in late Sept and Oct in the closing last several weeks of the election. But assuming the rules allow for an actual debate, this debate could bring a key decision for Biden. If Biden does okay, we this will put to bed concerns on his age and mental acuity. However, it he does poorly, we think it could force him to change his mind about running and rather get the party behind who he would support to continue is legacy. We had actually thought late Q2 or early Q3 is when we might*

see a surprise announcement Biden wouldn't run. Here is what we wrote in our Nov 19, 2023 Energy Tidbits memo. "Capital Markets: Can Biden orchestrate a passing of the torch to who he anoints?It's a few weeks early for 2024 predictions but one of my top predictions for 2024 will be that Biden tries to orchestrate a passing of the torch to who he anoints. Just not clear if its Newsom or Harris or someone else, but right now I favor Newsom. Biden turns 81 tomorrow so his age will keep raising as a question mark for him and the Democrats in the 2024 elections. Everyone has their view if Biden will or will not run even though he is saying over and over he is running. I am just surprised that I don't see the political pundits with my view of Biden. With all the political pundits in the world, it must be that I am out in left field. So that is why I thought I would put it out there as one of my top prediction. Maybe it's because I believe he is fundamentally a decent guy is why I don't think he will do something really stupid. But I also believe he is underrated for his wanting to control politics. He is a President and, perhaps other than Jimmy Carter, all Presidents want to control politics. So my prediction is Biden wants to orchestrate who will be the next Democratic nominee. He doesn't want chaos and an unpredictable Democratic nominee, which is why he isn't going to say he isn't running. Rather he keeps running in the primaries, gets the nomination effectively locked up in March given the primary schedule. And sometime in late Q2 or early Q3. I think the timing will depend upon Trump's legal situation. But sometime ahead of the convention in late Aug. he announces he isn't going to run and is throwing his support behind someone who is his anointed candidate asking the Biden delegates to switch to his anointed one. This is as opposed to him saying he won't run soon and therefore taking control away from him as to who is his successor. If Biden runs, gets all the delegates, he more or less controls who will be the nominee even if the delegates won't be bound to vote for his anointed one. Maybe Prediction isn't the right word, but I just think Biden knows he runs a big risk of losing so the best thing for him in controlling politics is to set it up so the Democrats effectively have to go with his anointed pick. If so, will it be Newsom? Or Harris? Or someone else."

Capital Markets: Still not clear how far left France will go post election

France parliament uncertainty

It's only been a week since the France elections, and the message seems to be one of clear uncertainty as to what type of parliament will emerge. Current Prime Minister Attal is being called a caretaker head of government and reportedly unhappy with Macron calling the snap election that led to his party's showing in the election. The France constitution means Macron cannot call another election for at least 12 months. The left coalition, the Nouveau Front Populaire, has the most MPs but it's far from united coalition and the top party in the coalition led by hardliner Jean-Luc Melenchon is aggressive and likely to be approved as PM. So even the caretaker government isn't known. But if Macro is to get anything done, it would seem that the new government will have to have more left leaning policies. Last Sunday night, we did not foresee the chaos this week but we then tweeted [LINK] "*How much further left will France go on taxes & energy? Surely Macron will have to give on parts of Nouveau Front Populaire platform. See 👇where i pasted a few of the excerpts from their election platform. [LINK] #OOTT".* Our Supplemental Documents package includes the Google Translate of some of the points from the Nouveau Populaire election platform.

Capital Markets: Looks like 1st time buyers jumping into increased supply of homes

US <$500k homes moving fast

There was a good reminder of US home dynamics from CNBC Squawk Box on Wednesday morning. We tweeted [LINK] ""*makes buyers look for cheaper homes. You can see that in the months' supply of homes for sale in May by price tier. It is the lowest in the $100k-$500k price range because that's where most demand lives. And that is despite the fact supply has increased the most in those lower tiers. The homes are just getting eaten up that fast" @DianaOlick. Makes sense it's supply that has held back 1st time home buyers. But increased mortgage rates more a factor for existing home owners on more expensive homes who want to trade."* CNBC's Diana Olick noted how new home builds were slowly climbing back up and new home construction was making up a higher percentage She highlighted how the months' supply of cheaper homes were the lowest and that is despite the fact that supply has increased the most in those cheaper homes, and how these cheaper homes are "*just getting eaten up that fast."* It makes sense if many of these are 1st time home buyers who have been waiting for supply. Higher mortgage rates hurt any size monthly mortgage payment but for 1st time home buyers a 1% different rate isn't that huge. Whereas the if higher priced homes are more for existing home owners, then they are trading from a low rate to a much higher rate on a large mortgage, it makes a much bigger difference to monthly payments. So no one should be surprised to see the cheaper homes snapped up despite US mortgage rates still up a 7%.

Figure 82: US homes months' supply by price

Source: CNBC

Figure 83: US homes increase in month's supply

Source: CNBC

Twitter: Thank you for getting me to 11,000 followers

@Energy_Tidbits on Twitter

Earlier this month, I went over 11,000 followers on Twitter/X. I really appreciate the support and, more importantly, some excellent insights and items to look at from Twitter followers. It helps me do a better job. For new followers to our Twitter, we are trying to tweet on breaking

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

LinkedIn: Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

Misc Facts and Figures.

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

Berlin should be crazy today with England/Spain Euro2024 final today

Once again, England has another nail biter but pulls off another win at Euro2024 when they beat the Netherlands 2-1 on an Ollie Watkins goal in the 1st minute of a 5 minute stoppage time We recognize that England has been criticized pretty well every match for not looking good but, at the same time, they keep winning. As they say, it's better to be lucky than good sometimes. We have a 7am MT news cut off so have only seen a few tweets of UK fans hitting the Berlin establishments to get "ready" for today's Euro2024 final against Spain. Hard to believe that this will be the first ever final of a major tournament England has played in for a tournament that has been held outside of England. Match time is 9pm Berlin time or 1pm MT.

Pirates rookie pitcher Paul Skenes named started in the All Star game

We don't think people were necessarily surprised by the news that Pittsburgh Pirates rookie pitcher Paul Skenes was named National League starter in Tuesday's all-star game. Skenes started in the minors and didn't make his major league debut until May 11, but since then he is 6-0 with a 1.90 ERA with 89 strikeouts. He is only the 5th rookie to start in the all-star game. The prior four were Hideo "the tornado" Nomo in 1995, Fernando "El Toro" Valenzuela of Fernandomania fame in 1981, Mark "The Bird" Fidrych in 1976 and Dave Stenhouse in 1972. Back to Skenes, he had a great college career at LSU but, prior to this year, he was probably best known as the boyfriend of gymnast Livvy Dunne.

Calgary Stampede Breaks Attendance Records

There has been a lot of visitors to Calgary and nearby Banff and Canmore because it's Calgary Stampede time. And with the strength of the US$, we have had many of American friends comment on how cheap things were in Canada. The Calgary Stampede is wrapping up this weekend and has broken two attendance records, with the potential to break a third. On Sunday, July 7, more than 201,000 people stepped through the Stampede gates, breaking the previous single-day attendance record of

184,000 set in 2012 during the Stampede's 100th anniversary. This year's Stampede parade also broke the attendance record with over 350,000 viewers lining up along the parade's route downtown. Stampede attendance is on track to surpass the all-time record of 1.4 million attendees throughout the 10 days, which was also set in 2012.

Good thing Costco raised the membership fee and not the cost of hot dogs

Had a drink with some people during Stampede with some of retired friends who were talking about the Costco raising their membership fee for the first time since June 2017. [LINK] None of them seemed to mind because they love going to Costco. But what they said would have made them upset is if Costco raised the price of the hot dogs. I might make it to Costco three times a year but have never eaten there but these retired swear by the food.

The famous Hollywood sign in the hills turns 101 today

Heard this tidbit on the radio this week on how the famous Hollywood sign turns 101 today. We missed writing this up a year ago on the 100th anniversary. Wanted to learn some history so found this Smithsonian report from a year ago in the runup to the 100th anniversary. It's a fun read with the history from day 1. Smithsonian wrote *"Industry growth created real estate opportunities, too. In the early 1920s, railroad tycoons Eli P. Clark and Moses Sherman partnered with Los Angeles Times publisher Harry Chandler and real estate developers Tracy E. Shoults and Sidney H. Woodruff to build an exclusive hillside community called Hollywoodland. As Braudy writes, the addition of the suffix "land" was likely part of a slick marketing scheme, perhaps in tribute to Lewis Carroll's Alice's Adventures in Wonderland or "Neverland" in J.M. Barrie's Peter Pan. To promote the development, the syndicate erected a billboard bearing its name. The exact timing of the project—and who came up with the idea for the sign—is disputed, but the Hollywood Sign Trust notes that construction was completed by December 1923.'* The sign was Hollywoodland until 1947. It needed to be refurbished a few items. It was interesting to see Playboy magazine founder, Hugh Hefner, threw the fundraiser to finance the $250,000 rebuild in 1979 by getting celebrities to sponsor a letter for $27,700 each. Alice Cooper was one such donor. Our Supplemental Documents package includes the Smithsonian report.