Energy Tidbits

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Produced by: Dan Tsubouchi

Vortexa Floating Oil Storage is Lowest Since Covid at 56.75 mmb: Positive if Revisions Keep it in 60's & 60's are Maintained.

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. Vortexa estimates crude oil floating storage of 56.75 mmb on Aug 2, lowest since Covid. Positive indicator for summer demand if revisions keep it in the 60s and 60s can be maintained. [click here]

2. Looks like ball is back in Biden's court as long as the army keeps supporting Maduro to hold back the opposition movement against the election. [click here]

3. TMX impact is working: Precisions surprised by Cdn oil drilling as producers see narrower WCS less WTI differentials and certainty to deliver oil via pipeline instead of risk of crude by rail. [click here]

4. Game changer as data centers want to get NatGas directly from TC Energy's gas pipeline for their own #NatGas power plants instead of getting power downstream from LDCs. [click here]

5. Overlooked PJM nine-fold increase in electricity price to be paid to generators to reserve power starting June 2025. [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].

Dan Tsubouchi
Chief Market Strategist
dtsubouchi@safgroup.ca

Ryan Dunfield
CEO
rdunfield@safgroup.ca

Aaron Bunting
COO, CFO
abunting@safgroup.ca

Ian Charles
Managing Director
icharles@safgroup.ca

Ryan Haughn
Managing Director
rhaughn@safgroup.ca

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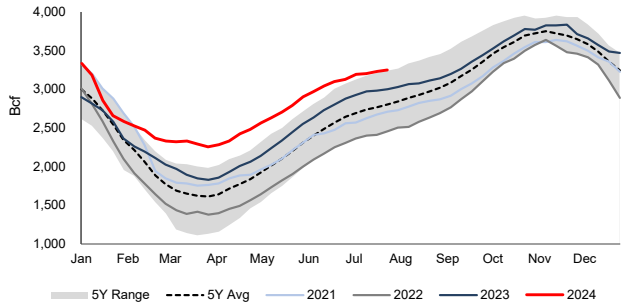
Natural Gas: Really hot June/July = less risk US gas storage gets filled early

Less risk for US gas storage to be filled early

HH continues to be weak with US natural gas storage above the high end of the 5-yr range. The hot June and July in the Lower 48 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 on May 3 to +252 bcf YoY. 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 and July has lessened the risk to storage being filled early. As noted below, US natural gas storage is now +252 bcf YoY, which is up small WoW from +249 bcf YoY last week. And, as noted below, storage could be a lot worse.

Figure 1: US Natural Gas Storage



Source: EIA

Natural Gas: Storage would be worse if EQT & others didn't curtail production

Storage could be worse

Earlier this morning, we tweeted [LINK] "*Holdback to HH #NatGas prices.Gas storage is +252 bcf YoY & well above high end of 5 yr range. Would be worse if key US #NatGas producers haven't shut-in production due to prices. EQT alone strategic curtailment was 82 bcfd in H1, expect another 90 in H2 for total 172 in 2024. Others are on top of that. #OOTT.*" We reminded that gas storage cold be a lot worse than it is if key producers hadn't shut-in natural gas production due to low prices. We highlighted US natural gas production leader, EQT, and their Q2 report disclosure of continuing to shut-in production due to prices. Our tweet included an excerpt from their Q2 report. *"On March 4, 2024, we announced our decision to strategically curtail approximately 1.0 Bcf per day of gross production (the Strategic Curtailment) beginning on February 24, 2024 in response to the low natural gas price environment resulting from warm winter weather and elevated storage inventories. The Strategic Curtailment resulted in total decreased sales volume of 82 Bcfe during the period beginning on February 24, 2024 through June 19, 2024, of which decreases of 54 Bcfe occurred during the second quarter of 2024. In response to market fundamentals, we may continue to strategically curtail our production. Our sales volume guidance for the second half of 2024 assumes additional strategic curtailments of approximately 90 Bcfe of net production."*

Natural Gas: +18 bcf build in US gas storage; now +252 bcf YoY

+18 bcf build in US gas storage

For the week ending July 26, the EIA reported a +18 bcf build. Total storage is now 3.249 tcf, representing a surplus of +252 bcf YoY compared to a surplus of +249 bcf last week. Since February, total storage has remained above the top end of the 5-yr range. Total storage is +441 bcf above the 5-year average, below last week's +456 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)				Year ago (07/26/23)		5-year average (2019-23)	
Region	07/26/24	07/19/24	net change	implied flow	Bcf	% change	Bcf	% change
East	711	697	14	14	677	5.0	623	14.1
Midwest	842	827	15	15	770	9.4	722	16.6
Mountain	253	251	2	2	190	33.2	175	44.6
Pacific	286	289	-3	-3	231	23.8	262	9.2
South Central	1,157	1,167	-10	-10	1,128	2.6	1,025	12.9
Salt	307	313	-6	-6	301	2.0	264	16.3
Nonsalt	851	854	-3	-3	828	2.8	761	11.8
Total	3,249	3,231	18	18	2,997	8.4	2,808	15.7

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/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
Jul/12	3,209	10	250	465
Jul/19	3,231	22	249	456
Jul/26	3,249	18	252	441

Source: EIA, SAF

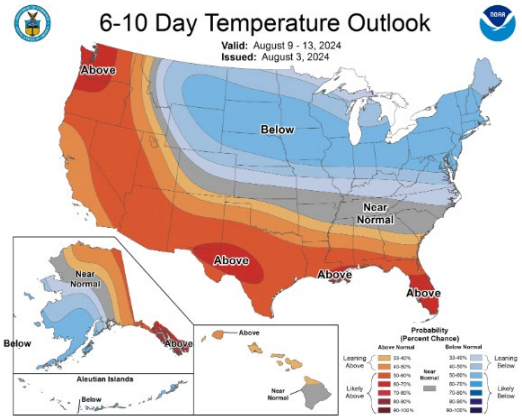
Natural Gas: NOAA forecasts for normal type weather for Aug 9-17

NOAA temperature outlook for Aug 9-17

Yesterday, we tweeted [LINK] "*Updated @NOAA 6-10 & 8-14 day temperature outlook moves away from hot across all the Lower 48. But not likely to do much to already low HH #NatGas price of $1.97 despite the hot Jun/July. Issue remains storage is +252 bcf YoY & above the high end of 5-yr range. Plus it's now Aug so past the normal hottest day of the year for much of US. #OOTT."* We have been highlighting how it's been hot but HH prfices keep drifting lower because it's all about storage. It was hot in June and July but HH went down from over $3 in mid-June to close at $1.97 on Friday. That's because storage is still +252 bcf YoY and well above the high-end of the 5-yr range. And, it's now Aug so much of the US is now past the normal hottest day of the year. NOAA's updated 6-10 and 8-14 day temperature forecast call for more normal type weather but we wouldn't expect it to have a

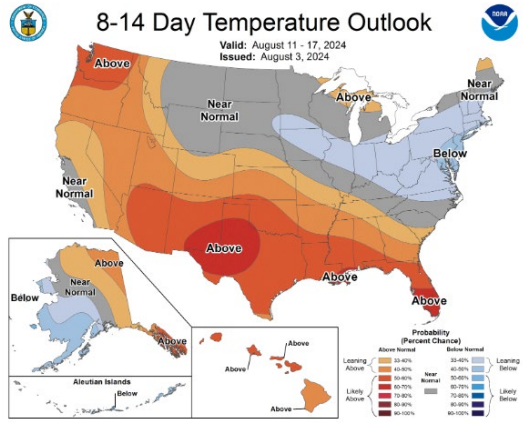
huge negative impact on prices given HH is $1.97. Below are NOAA's updated, as of yesterday, 6-10 day and 8-14 day temperature outlook maps covering Aug 9-17.

Figure 4: NOAA 6-10 day temperature outlook for Aug 9-13



Source: NOAA

Figure 5: NOAA 8-14 day temperature outlook for Aug 11-17



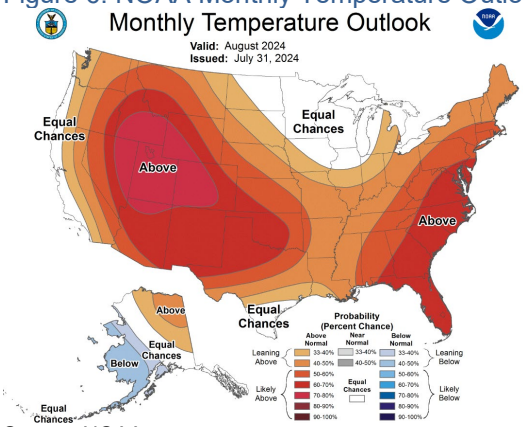
Source: NOAA

Natural Gas: NOAA forecasts hot weather for August for most of the Lower 48

US forecast for August

The above 6-10 and 8-14 day temperature outlook cover Aug 9-17 is only 3 days different timing so we have to assume they are incorporated in NOAA's forecast for August made on July 31. The aug forecasts is for the hot weather in the US to continue for at least another month across almost all of the Lower 48 except the western Great Lakes. On Wednesday, the NOAA posted its 30-day outlook, which is its Monthly Temperature Outlook for August [LINK]. NOAA's temperature forecast shows above average probability for much warmer than normal temperatures for the majority of the Lower 48 except for around the western Great Lakes. Below is NOAA's monthly temperature outlook for August.

Figure 6: NOAA Monthly Temperature Outlook for August



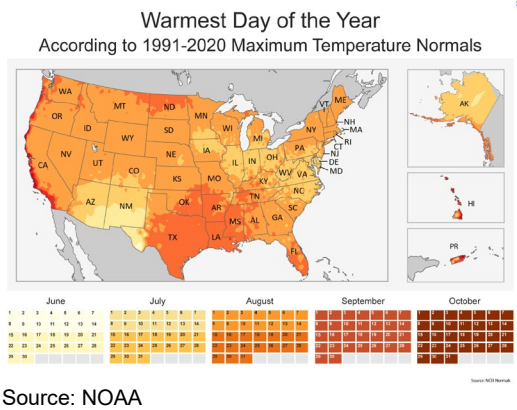
Source: NOAA

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 now that we are in August, most of the Lower 48 has passed their normal hottest day of the year. 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 7: NOAA Warmest Day of the Year



Source: NOAA

Natural Gas: US May natural gas production below 102 bcf/d for 2nd month in a row

US gas production 101.3 bcf/d in May

On Wednesday, the EIA released its Natural Gas Monthly [LINK], which includes its estimated "actuals" for May dry gas production. Key items to note are as follows: (i) May was 101.3 bcf/d, which followed April's revised 101.5 bcf/d for two consecutive months below 102 bcf/d for the first time since Jan 2023. (ii) May at 101.3 bcf/d is -2.2 bcf/d YoY, but down -5.2 bcf/d since Dec 2023. (iii) April's data was revised down small, from 101.6 bcf/d to 101.5 bcf/d. (iv) May's production of 101.3 bcf/d was -0.2 bcf/d MoM and -2.2 bcf/d YoY from May 2023 of 103.6 bcf/d. The EIA does not provide any commentary. (v) Something to keep in mind as we look ahead to June actuals is if Texas production is impacted by some reported maintenance in infrastructure. Our Supplemental Documents package includes the EIA Natural Gas Monthly.

Figure 8: US dry natural gas production

bcf/d	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Jan	65.3	66.8	73.4	73.6	70.6	78.7	89.3	97.4	92.6	96.2	101.9	103.6
Feb	65.4	68.4	73.8	74.6	71.5	80.4	89.9	95.5	85.8	96.0	102.0	106.0
March	65.3	68.9	74.1	73.8	73.2	81.3	90.3	95.3	93.6	97.6	102.9	102.7
Apr	66.1	70.5	75.2	73.7	73.3	81.2	90.7	95.0	94.3	98.3	102.6	101.5
May	65.9	70.2	74.1	72.9	73.3	82.1	91.4	87.9	94.2	99.1	103.6	101.3
June	65.8	70.5	74.0	72.2	74.0	82.5	91.7	90.4	93.9	99.3	103.3	
July	67.1	72.0	74.2	72.8	74.7	84.2	92.2	90.3	94.8	100.4	103.4	
Aug	66.9	72.4	74.3	72.2	74.7	85.9	94.4	90.4	95.0	100.9	104.5	
Sept	66.8	72.4	74.7	71.7	76.0	87.3	94.8	91.3	95.7	102.4	104.5	
Oct	67.0	73.1	74.2	71.4	77.3	88.4	95.6	89.7	97.2	102.2	104.3	
Nov	67.7	72.6	73.9	72.0	79.8	89.9	97.2	92.5	98.3	102.2	105.9	
Dec	66.5	73.2	73.9	71.2	80.4	89.5	97.1	93.1	99.1	100.2	106.5	
Average	66.3	70.9	74.2	72.7	74.9	84.3	92.9	92.4	94.5	99.6	103.8	103.0

Source: EIA

Natural Gas: US May natural gas pipeline exports to Mexico +9.2% YoY to 6.8 bcf/d

US to Mexico May natural gas exports

The EIA's Natural Gas Monthly report on Wednesday also included the actuals for US natural gas pipeline exports to Mexico of 6.8 bcf/d in May. Last week's (July 28, 2024) Energy Tidbits memo highlighted the DOE's U.S. Natural Gas Imports and Exports Monthly, which included the DOE's estimate that US natural gas pipeline exports to Mexico were up +7.6% MoM to 6.8 bcf/d in May from 6.3 bcf/d in April and were up +9.2% YoY from 6.2 bcf/d in May 2023. We also reminded that the EIA is a group under the DOE so the data is the same data but the DOE report comes out days earlier than the EIA's Natural Gas Monthly. May 2024 at 6.8 bcf/d is just below the all-time high for pipeline exports of 6.9 bcf/d in August 2023. US natural gas pipeline exports to Mexico are now in line with Q3/23 exports of ~6.8 bcf/d. Below is a summary of natural gas via pipeline exports to Mexico from the US. Our Supplemental Documents package includes excerpts from the DOE US Natural Gas Imports and Exports Monthly.

Figure 9: US Natural Gas Pipeline Exports to Mexico

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	0.9	4.3	4.7	5.3	5.4	5.6	5.7	5.5	6.0
February	3.4	4.6	5.0	5.1	5.3	5.4	5.5	5.5	5.8
March	3.4	4.5	5.2	5.1	5.6	5.9	5.5	5.8	5.9
April	3.5	4.2	4.7	5.0	4.6	6.1	5.9	5.6	6.3
May	3.7	4.3	4.9	5.6	4.7	6.2	6.0	6.2	6.8
June	3.8	5.3	5.5	5.8	5.4	6.6	6.2	6.8	
July	4.0	4.8	5.6	6.2	5.8	6.4	6.1	6.8	
August	4.4	4.6	5.6	5.9	6.1	6.3	5.9	6.9	
September	4.2	4.5	5.4	5.8	6.2	6.0	5.6	6.7	
October	4.2	4.5	5.1	5.7	6.2	6.0	5.5	6.5	
November	4.4	4.8	4.9	5.4	5.6	5.5	5.4	6.0	
December	3.8	4.5	4.9	5.2	5.3	5.4	5.1	5.6	
Average	3.6	4.6	5.1	5.5	5.5	5.9	5.7	6.2	

Source: DOE, SAF

Natural Gas: US LNG exports +1.8 bcf/d, +17.1% MoM to 11.9 bcf/d in May

US May LNG exports

The EIA Natural Gas Monthly report on Wednesday noted that US LNG exports were +1.8 bcf/c, +17.1 % MoM to 11.9 bcf/d in May. As noted above, last week's (July 28, 2024) Energy Tidbits memo highlighted the DOE's U.S. Natural Gas Imports and Exports Monthly, which also included the same LNG export volumes of 11.9 bcf/d in May. And we remind that the EIA is part of the DOE and the DOE releases the same LNG data in advances of the more referenced Natural Gas Monthly report. Here is what we wrote last week. "*The restart of Freeport LNG in mid-May led to a partial recovery of US LNG exports. On Wednesday, the Department of Energy (DOE) posted its US LNG exports estimates for May 2024 [LINK]. The DOE normally posts the US LNG export data before the more commonly referenced US LNG exports from the EIA's Natural Gas Monthly, and in this case, on Wednesday whereas the EIA data is set to be released next Wednesday. The EIA is a group within the DOE so the data for LNG exports is either identical or just a rounding issue. US LNG exports were up MoM to 11.9 bcf/d in May from 10.1 bcf/d in April, and down -0.1 bcf/d YoY from May 2023. US LNG exports averaged 11.9 bcf/d per month over 2023, which is +1.3 bcf/d compared to 2022. April was the big month for maintenance at the Freeport LNG 2.1 bcf/d terminal, which returned to full production around May 14, which is reflected in the reported MoM increase. The top five countries destinations were India 1.5 bcf/d, Japan 1.3 bcf/d, Netherlands 1.2 bcf/d, South Korea 0.9 bcf/d and Germany 0.8 bcf/d. The DOE did not comment on the MoM or YoY changes. Our Supplemental Documents package includes excerpts from the U.S. Natural Gas Imports and Exports Monthly."*

Figure 10: US Monthly LNG Exports

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023	2024
January	0.0	1.7	2.3	4.1	8.1	9.8	11.4	10.9	12.8
February	0.1	0.9	2.6	3.7	8.1	7.4	11.3	11.7	12.4
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7	11.8	11.9
April	0.3	1.7	2.9	4.2	7.0	10.2	11.0	12.5	10.1
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3	11.8	11.9
June	0.5	1.7	2.5	4.7	3.6	9.0	10.0	10.9	
July	0.5	1.7	3.2	5.1	3.1	9.7	9.7	11.3	
August	0.9	1.5	3.0	4.5	3.6	9.6	9.7	11.4	
September	0.6	1.8	2.7	5.3	5.0	9.5	9.8	11.6	
October	0.1	2.6	2.9	5.7	7.2	9.7	10.0	12.4	
November	1.1	2.7	3.6	6.4	9.4	10.2	10.1	12.9	
December	1.3	2.7	4.0	7.1	9.8	11.1	11.0	13.6	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	10.6	11.9	

Source: EIA, DOE

Freeport LNG 2.1 bcf/d returned from maintenance on May 14

As noted above, the reason for the MoM increase in LNG exports was the 2.1 bcf/d Freeport LNG returning from maintenance on May 14. Note that Freeport LNG subsequently had issue post Hurricane Beryl. Here is what we wrote in our May 19, 2024 Energy Tidbits memo on Freeport LNG. "*On Tuesday, we tweeted [LINK] "Freeport LNG is back! #NatGas supplying Freeport LNG is back to its capacity of ~2.1 bcf/d. Thx @ruthcoverslng #OOTT. Bloomberg reported that repairs and maintenance were completed and natural gas flows had returned to full capacity of 2.1 bcf/d. Our tweet included the below Bloomberg graph of natural as flows into Freeport LNG*. " Note that Freeport LNG had production down post Hurricane Beryl so its July loadings will be well below its 2.1 bcf/d capacity.

Shell/MET 10 yr LNG supply deal

Natural Gas: MET signs a 10-year LT LNG supply contract with Shell

On July 9, Swiss-based MET announced that they signed a 10-year LNG supply deal with Shell for the delivery of LNG into Europe [LINK]. There was limited information on the deal. They have not disclosed the start date for the deal or the volume of LNG. György Vargha, CEO of MET International AG said, *"The long-term FOB source fits perfectly into MET's LNG strategy. We have a diverse European downstream position building on a regasification capacity portfolio around Europe, optimizing our downstream requirements with flexible supply sources. As a natural next step, we have entered a long-term FOB position enabling diversification to the global LNG markets."* Tom Summers, Senior Vice President of Shell LNG Marketing and Trading, said *"LNG has a crucial role to play in delivering energy security and agreements such as this are instrumental in achieving that. We look forward to working with MET Group to fulfil their gas requirements and help to meet the needs of its diverse customer base."* Our Supplemental Documents package includes the MET announcement.

There have been 24.56 bcf/d of long-term LNG supply deals since July 1, 2021

We have not included MET's deal with Shell in our LT LNG supply deals table because of the missing information regarding the deal, but here is what we wrote in last week's (July 28, 2024) Energy Tidbits Memo: *The abrupt big wave of LNG deals started in July 2021 and we highlighted this 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 continue to update that table, which now shows 24.56 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 11: Long-Term LNG Buyer Deals Since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021

Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2046
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan / Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea / US	0.05	19.0	2027	2046
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh / Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	Bangledesh / Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China / 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 8, 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	End
			Buyer / Seller	(bcf/d)	Years		
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	PKN ORLEN	Sempra Infrastructure	EU/US	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	2026	2046
Apr 24, 2023	Hartree Partners LP	Delfin Midstream	US / US	0.08	20.0	n.a.	n.a.
Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	15.0	2027	2042
Jun 22, 2023	SEFE	Venture Global LNG	EU//US	0.30	20.0	2026	2046
Jul 14, 2023	ONEE (Morocco)	Shell	Africa/US	0.05	12.0	2024	2036
Jul 18, 2023	IOCL	Adnoc	India/UAE	0.16	14.0	2026	2040
Jul 28, 2023	OMV	BP	Austria/UK	0.13	10.0	2026	2036
Aug 4, 2023	ConocoPhillips	Mexico Pacific Ltd	US/Mexico	0.29	20.0	2025	2045
Aug 22, 2023	BASF	Cheniere	Germany / US	0.10	17.0	2026	2043
Aug 30, 2023	Shell	Oman LNG	US / Oman	0.11	10.0	2025	2035
Oct 11, 2023	TotalEnergies	QatarEnergy	France / Qatar	0.46	27.0	2026	2053
Oct 18, 2023	Shell	QatarEnergy	Netherlands / Qata	0.46	27.0	2026	2053
Oct 23, 2023	ENI	QatarEnergy	Italy / Qatar	0.13	27.0	2026	2053
Oct 31, 2023	Vitol	Chesapeake Energy	Sweden / US	0.13	15.0	2028	2043
Nov 29, 2023	OMV	Cheniere	Netherlands / US	0.11	15.0	2029	2044
Dec 5, 2023	Woodside Energy	Mexico Pacific Ltd	Australia / Mexico	0.17	20.0	2024	2044
Mar 18, 2024	SEFE	ADNOC	Germany / UAE	0.13	20.0	2024	2044
Apr 17, 2024	Shell	Oman LNG	US / Oman	0.21	10.0	2025	2035
Apr 22, 2024	TotalEnergies	Oman LNG	France / Oman	0.11	10.0	2025	2035
May 8, 2024	EnBW	ADNOC	Germany / UAE	0.08	15.0	2028	2043
June 13, 2024	Saudi Aramco	NextDecade	Saudi Arabia / US	0.16	20.0	2028	2048
June 26, 2024	Saudi Aramco	Sempra Infrastructure	Saudi Arabia / US	0.66	20.0	2029	2049
July 23, 2024	Fluxys	ConocoPhillips	Belgium / US	0.10	18.0	2027	2045
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**9.17**			

Total New Long Term LNG Contracts since Jul/21	**24.56**

*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/

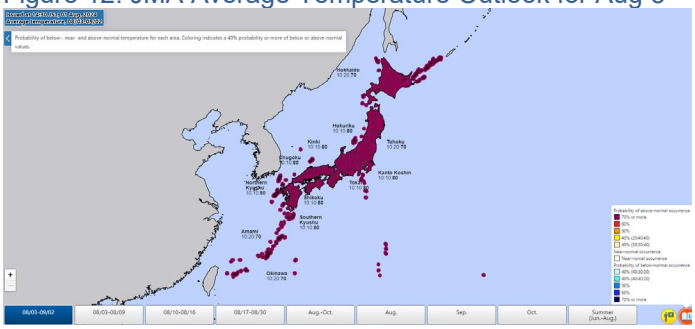
Source: SAF

Natural Gas: Japan expects hot temperatures to continue thru at least early Sept

JMA temperature forecast for the next 30 days

It's been a hot summer 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, Aug 3 thru Sept 2, in Japan [LINK]. There is no JMA commentary on the forecast. JMA is calling for well above normal temperatures for the month of August, with a +70% probability of above normal temperature occurrence. We checked AccuWeather and they are forecasting daily highs in of 31-36C for the next 30 days. Anyone who has been to Tokyo in August 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 12: JMA Average Temperature Outlook for Aug 3 – Sept 2



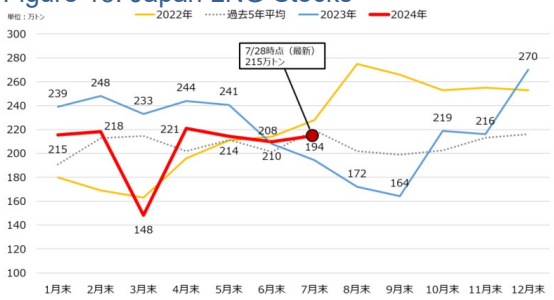
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks down WoW, up YoY

Japan LNG stocks down WoW

Japan's LNG stocks are down WoW, but are up YoY, and are down from the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on July 28 were 103.3 bcf, down -8.5% WoW from July 21 of 112.9 bcf, and up +10.8% from 93.2 bcf from a year ago. Stocks are down -1.2% from the 5-year average of 105.2 bcf. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 13: Japan LNG Stocks



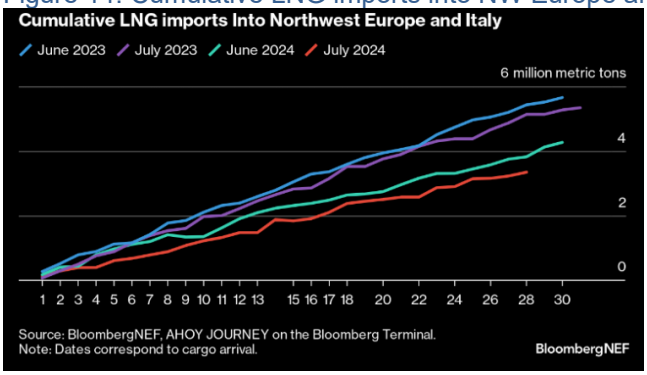
Source: METI

Natural Gas: NW Europe LNG imports slowed in July with fears of being full early

NW Europe LNG imports slowed

We have been warning that Europe gas storage looking to be full before winter would start to slow down injections to gas storage. The biggest way to slow down injections to gas storage is to redirect LNG cargos away from NW Europe to other places like Asia. On Tuesday, Bloomberg reported that this happened in July with its report "*Northwest Europe's LNG Imports Fall Further in July: BNEF Chart. The Northwest Europe and Italy region imported nearly 1.8 million metric tons less liquefied natural gas over July 1-28 than a year earlier. Meanwhile, North Asia, South Asia, Southeast Asia and the Middle East took in around 1 million, 0.3 million, 0.3 million and 0.4 million tons more, respectively. Growth in the Middle East was primarily driven by deliveries to Egypt.*" Below is the graph to the Bloomberg report.

Figure 14: Cumulative LNG imports into NW Europe and Italy



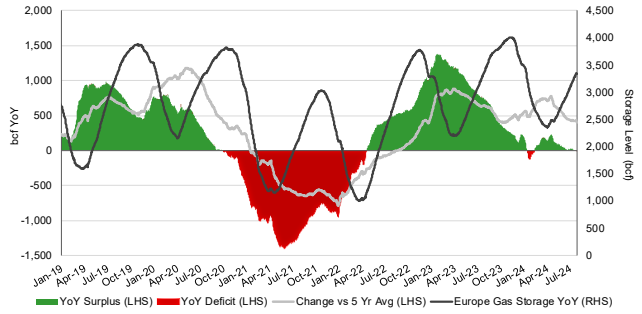
Source: BloombergNEF

Natural Gas: Europe storage builds WoW to 85.3%, flat YoY

Europe gas storage

Europe gas storage has slowed down in July with the redirecting of LNG cargoes as it looked like Europe gas storage would be full early. This week, Europe storage increased by +1.6% WoW to 85.3% vs 83.7% on July 25. Storage is down -0.7% from last year's levels of 86.0% on Aug 1, 2023 but 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 early and looks like pointing to it being full in line or ahead of BloombergNEF's May 31 forecast for 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, as noted above, LNG inbound cargoes get redirected to other regions. Our fear remains that if this, reaching the low 90s, 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 15: European Gas Storage Level



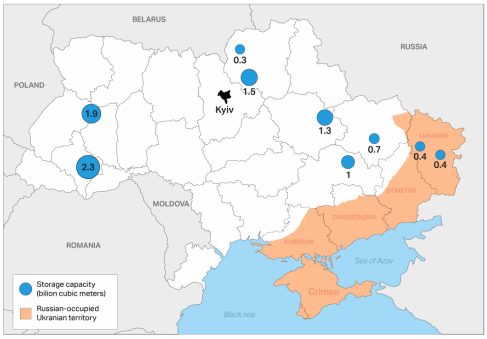
Source: Bloomberg, SAF

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 August

1st, natural gas in Ukraine storage was at 20.5% of its total capacity, up from 19.8% of its total capacity on July 25th. 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 16: Ukraine Gas Storage Facilities as of July 2023



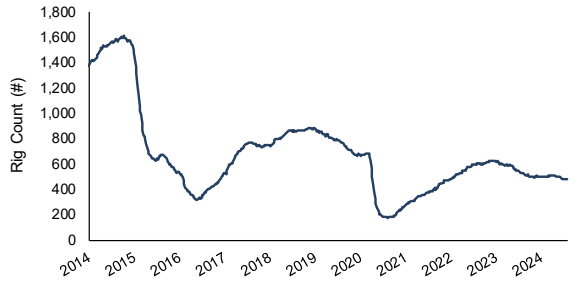
Source: Bruegel

Oil: US oil rigs flat WoW but -43 rigs YoY to 482 rigs

US oil rigs down -43 YoY

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 flat WoW at 482 oil rigs as of August 2. US oil rigs went below 520 rigs on Aug 25, 2023 and has been around 490-510 rigs for the past several months, however, July 19th's 477 rigs marks the lowest oil rig count since December 2021. (iii) Note we are able to see the basin changes but not by type of rig. The major basin changes were DJ-Niobrara -1 rig WoW to 9 rigs, Haynesville -1 rig WoW to 34 rigs, Marcellus -1 rig WoW to 24 rigs, and Permian -1 rig WoW to 303 rigs. (iv) The overlooked US rig theme is the YoY declines. Total US rigs are -73 YoY to 589 rigs including US oil rigs -43 oil rigs YoY to 482 oil rigs. And for the key basins, the Permian is -26 rigs YoY, Haynesville is -10 rigs YoY and Marcellus -9 rigs YoY. (v) US gas rigs were down -3 rigs this week to 98 gas rigs.

Figure 17: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

Oil: Permian oil rigs to be impacted by Waha natgas prices being very low or negative

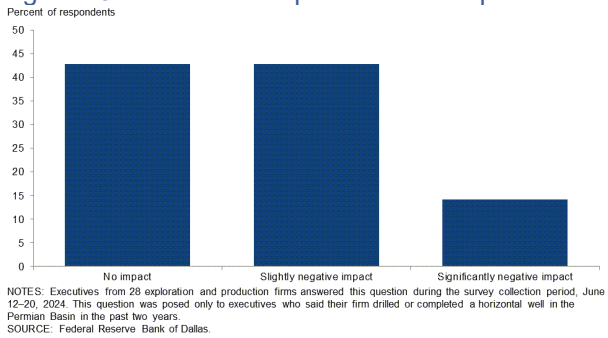
Waha gas prices closed at -$1.10

On Friday, we tweeted [LINK] "*A key reason why Permian rigs stuck just over 300. Weak Waha #NatGas prices. -$2.02 WoW to -$1.10 so back to negative at Aug 2 close. Have bounced in negative at some time every mth since Apr. Permian #Oil wells produce associated #NatGas. Low or negative Waha prices may not impact big Permian players drilling plans but cause some small Permian players to cut back on Permian oil drilling.* 👇 *@DallasFed. #OOTT.*" This week, Waha natural gas prices were -$2.02 WoW to close at -$1.10 on Aug 2. Waha prices have dipped into the negative at times every month since April. 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 three weeks ago [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 18: Waha Natural Gas Prices to Aug 2 close

Source: Bloomberg

Figure 19: Percent of responses what impact low Waha prices on rest of 2024 drilling plans



Source: Dallas Fed

Oil: Nabors survey, Lower 48 rigs modestly lower from Q2 to yr-end 2024

Nabors: US rigs modestly lower to yr-end

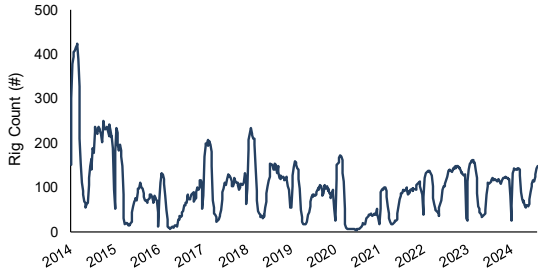
Here is what we wrote in last week's (July 28, 2024) Energy Tidbits from Nabors Q2 call "*On Wednesday, we tweeted [LINK] "Lower 48 rigs modestly lower to yr-end. "latest survey indicates this group's year-end 2024 rig count will be modestly lower than the total at the end of the second quarter" Nabors survey of 16 operators accounting for ~47% of Lower 48 working rigs at end of Q2. Supports 👇07/18 tweet Liberty Energy (big US fracker) view why flat #Oil #NatGas production at best in H2. #OOTT." Nabors held its Q2 call on Wednesday and, as always, mgmt gives a near-term outlook for Lower 48 rig activity based on their survey of the US big oil and gas companies. These companies represent 47% of the working rigs at the end of Q2 are calling for a modest decline in rig activity to year-end. Nabors said "We surveyed the largest lower 48 clients at the end of the second quarter. Our survey covers 16 operators, which accounted for approximately 47% of the Lower 48 industry's working rigs at the end of the quarter. The latest survey indicates this group's year-end 2024 rig count will be modestly lower than the total at the end of the second quarter. Essentially, all of the projected decline relates to announced merger activity. The operators not involved in mergers project activity to remain at current levels. Aside from the mergers, we believe that clients remain cautious about their plans for 2024, particularly in gas-focused spaces."*

Oil: Total Cdn rigs up +8 rigs WoW, consistent with seasonal ramp-up

Cdn total rigs up WoW

As happens every year in Canada, rigs start a strong seasonal ramp up after Spring breakup. Spring break up is when melting snow leads to road access being limited/restricted in many parts of Alberta and BC and rigs dramatically decrease from peak winter drilling levels. Then after spring break-up (normally in early June), Cdn rigs start their steady ramp up. Total Cdn rigs declined from 231 at the beginning of March to 114 in early June. This week's rig count was up +8 rigs WoW to 219 rigs. This week looks to continue the ramp up we saw beginning in June that follows every spring break up, despite the increasing wildfires. Cdn oil rigs were up +6 rigs WoW this week to 150 rigs and are up +32 rigs YoY. Gas rigs are up +2 rigs WoW this week to 69 rigs and are down -1 rig YoY, and miscellaneous rigs are flat WoW at 0 rigs total and flat YoY. Baker Hughes did not update their old format report, so we weren't able to see the provincial breakouts.

Figure 20: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: Precision, substantially higher Cdn heavy oil drilling is due to TMX value lift

TMX value lift is working

There is another great example of why we say the Q&A part of earnings call tends to give the best insights. Precision Drilling reported Q2 on Wednesday and we tweeted [LINK] *"TMX is working for Cdn oil producers! Precision CEO: Cdn heavy oil drilling at higher than expected levels because TMX has narrowed discount (better Cdn prices) + now have certainty of export capacity and NOT be at risk of crude by rail uncertainty. #OOTT."* On the Q2 call, mgmt highlighted that the start up of TMX and narrower has led to a surprising strength in Cdn heavy oil drilling. This is the first cause and effect example we have seen where industry is saying TMX is leading to better differentials and more activity ie. more oil drillilng and therefore more production. In the prepared remarks, Precision said "*Customer demand has been substantially stronger than we anticipated earlier this year and we have been more than pleasantly surprised by the acceleration in heavy oil drilling across the full spectrum of Clearwater, Manville, conventional heavy oil and SASB. The Precision super single rig is a clear market leader with 26 different heavy oil customers using our rigs. Our Canadian super single rig fleet includes 48 rigs with 43 running and a third of those are pad equipped, significantly increasing the value for our customers.*" Then in the Q&A, mgmt was asked what triggered the acceleration. CEO Neveu said "*I'll start with kind of why I think we were a little surprised by the activity, and I think what we underestimated. So, first of all, the math for our customers works out quite well. Right now, they're realizing somewhere between $77 and $83 a barrel, minus the Canadian discount, which has shrunk with the opening of Trans Mountain expansion. So they're realizing somewhere typically around $65 for oil. When you convert that Canadian dollars, it's between CAD90 and CAD100, depending on the range. So it's the highest realized returns they made on oil in a long time. But I think what this really means now is that they've got certainty of export capacity, and there's no uncertainty. They're not relying on train cars to move oil out. They've got a pipeline that's flowing, and they can move the oil. So I think besides having a firm and better price than they've ever realized in the past, they also have certainty of export capacity. So I think when you reduce the risk and the uncertainty increase the price, it unlocked more drilling demand than we expected. So that's been clearly our experience in the oil side*."

Oil: US weekly oil production flat WoW at 13.300 mmb/d

US oil production flat 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 is flat WoW at 13.3 mmb/d for the fourth consecutive week. We have to give the EIA credit for putting out weekly oil supply estimates for the prior week.

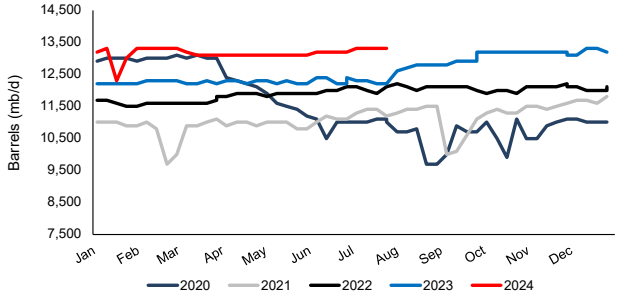
That can't be easy so no one should be surprised that the EIA weekly oil supply estimates, based on the Form 914 actuals, will sometimes require re-benchmarking. And sometimes the re-benchmarking can be significant and other times, it is relatively small. On July 9, the EIA released its July STEO. There 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. The upward adjustment makes sense given what the new Form 914 (see below item) that had May actuals 78,000 b/d higher than the May weekly estimates. This week, the EIA's production estimates were flat at 13.300 mmb/d for the week ended July 26. Alaska was down -0.019 mmb/d WoW to 0.395 mmb/d from 0.414 mmb/d last week. Below is a table of the EIA's weekly oil production estimates.

Figure 21: 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	07/12	13,300	07/19	13,300	07/26	13,300		

Source: EIA

Figure 22: EIA's Estimated Weekly US Oil Production



Source: EIA

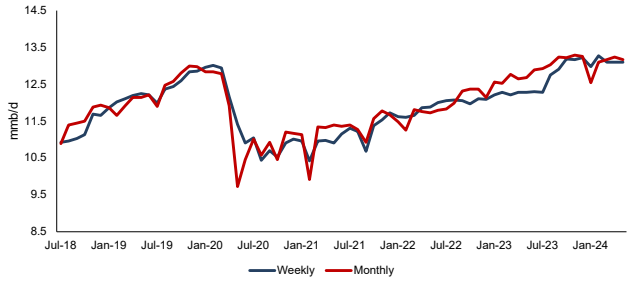
Oil: EIA Form 914 – US May oil production down MoM, but up YoY

EIA Form 914 May

On Wednesday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for May US oil and natural gas production. (i) This month, the EIA revised April down by -90,000 b/d from 13,248 mmb/d to 13,239 mmb/d. As a result, the April actuals were +139,000 b/d vs the weekly supply estimates of 13,100 mmb/d. (ii) The EIA Form 914 reported May "actuals" at 13,178 mmb/d, which was +78,000 b/d above the weekly supply estimates of 13,100 mmb/d. (iii) May "actuals" of 13,178 mmb/d are -61,000 b/d MoM vs 13,239 mmb/d in

April. And also +484,000 b/d YoY vs May 2023 of 12,694 mmb/d. Below is a chart of monthly actuals vs. weekly estimates. Our Supplemental Documents package includes an excerpt from the Form 914 figures.

Figure 23: EIA Form 914 US Oil Production vs Weekly Estimates



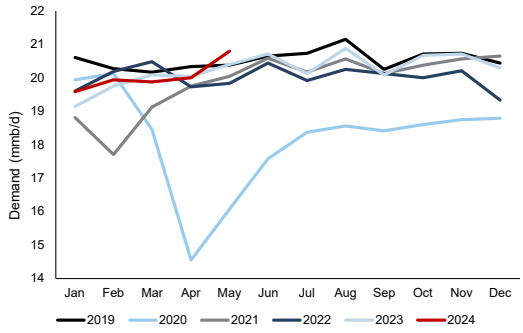
Source: EIA, SAF

Oil: US oil demand in May was 733,190 b/d above EIA STEO forecast for May

US oil demand

One of the overlooked items from the EIA actuals for May is that oil demand is way higher than in their STEO forecast and at record levels for May. On Wednesday, the EIA posted its "actuals" oil data for May, which includes oil and products demand. Two weeks ago, the EIA posted its monthly Short Term Energy Outlook and their backup data includes splitting their 2024 forecast into the monthly splits so we can compare how the actuals compare to the monthly forecast. The EIA forecast from the STEO for monthly demand are Jan 19.59 mmb/d, Feb 19.95 mmb/d, Mar 19.88 mmb/d, Apr 20.01 mmb/d, May 20.07 mmb/d, and June 20.66 mmb/d ie. the EIA forecast for Q2/24 is 20.25 mmb/d. On Wednesday, the EIA posted the actuals for May demand at 20.80 mmb/d, which is 0.73 mmb/d above the STEO forecast for May of 20.07 mmb/d. This is a record high for the month of May, and the highest monthly demand since last August. The below graph shows the EIA's reported monthly crude demand for the last 5 years.

Figure 24: EIA's Monthly US Oil Demand



Source: EIA

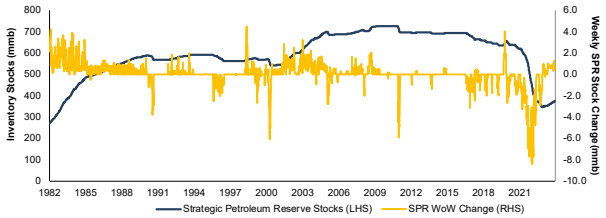
Oil: US SPR less commercial reserve deficit narrows, now -57.952 mmb

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

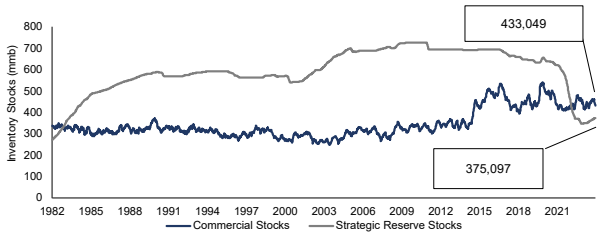
1983 in the Sep 16, 2022 week. This week, we saw a build on the SPR side and a draw on the commercial side. The EIA's weekly oil data for July 26 [LINK] saw the SPR reserves increased +0.685 mmb WoW to 375.097 mmb, while commercial crude oil reserves decreased -3.436 mmb to 433.049 mmb. There is now a -57.952 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 25: Strategic Petroleum Reserve Stocks and SPR WoW Change



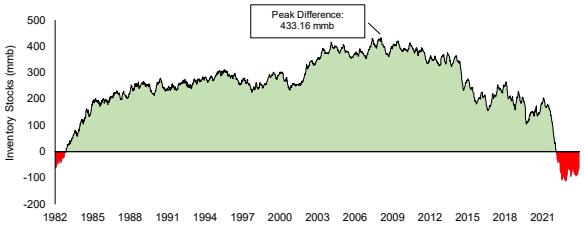
Source: EIA

Figure 26: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 27: US Oil Inventories: SPR Less Commercial



Source: EIA

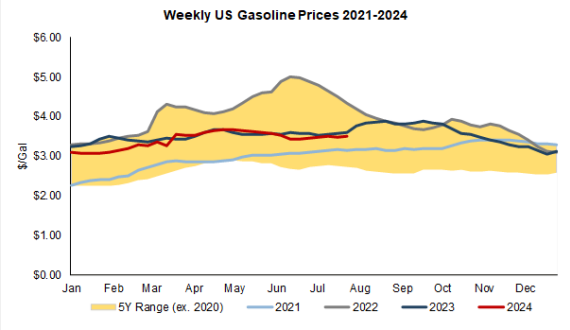
Oil: US national average gasoline price -$0.03 WoW to $3.48

US gasoline prices

Yesterday, we tweeted [LINK] "*US gasoline prices been marginally lower during summer driving season. AAA National average prices -$0.03 WoW to $3.48 on Aug 3, -$0.03 MoM and -$0.34 YoY. California at $4.63 on Aug 3,, which was -$0.02 WoW, -$0.16 MoM & -$0.41 YoY. Thx @AAAnews #OOTT.*" Yesterday, AAA reported that US national average prices were $3.48 on Aug 3, which was -$0.03 WoW, -$0.03 MoM, and -$0.34 YoY. Yesterday, AAA also reported California average gasoline prices were $4.63 on Aug 3, which was -$0.02

WoW, -$0.16 MoM, and -$0.41 YoY. Below is our graph of Bloomberg's National Average Gasoline prices.

Figure 28: Bloomberg's National Average Gasoline Prices Thru Aug 2, 2024



Source: Bloomberg

Oil: Crack spreads -$1.14 WoW to $23.77, WTI -$3.64 WoW to $73.52 on Aug 2

Crack spreads closed at $23.77

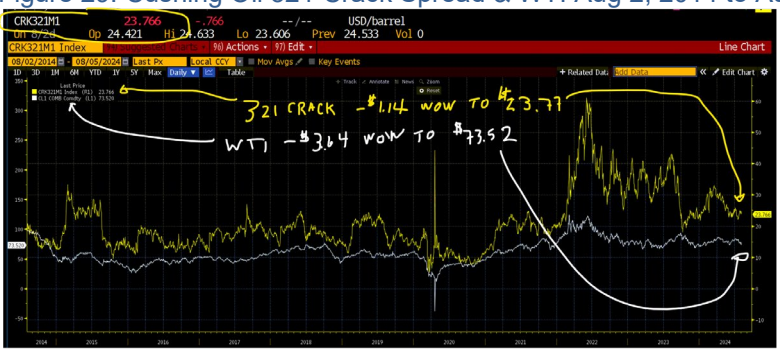
On Friday, we tweeted [LINK] "*Clear reminder WTI is driven by much bigger factors than 321 crack spreads. 321 crack -$1.14 WoW to $23.77 on Aug 2. Yet WTI was -$3.64 WoW to $73.52. WTI was +$0.75 to Wed close of $77.91. But then hammered -$4.39 with broad market crash on Thurs/Fri raising economy worries. Thx @business #OOTT.*" It was a solid week for WTI being +$0.75 to close at $77.91 on Wed. But then there was the reminder that there are much bigger factors at play driving WTI prices than 321 crack spreads. Because WTI was down $4.39 on Thurs/Fri to close at $73.52 on Friday and that was driven by the market sell-off and concerns on the US economy. Crack spreads were -$1.14 WoW to $23.77 on Aug 2 and WSTI was -$3.64 WoW to $73.52 on Aug 2. Crack spreads of $23.77 on Aug 2 followed $24.91 on July 26, $22.43 on July 19. $23.22 on July 12, $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 $23.77 are 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

As we saw to close the week, WTI prices are affected by much bigger factors than 321 crack spreads. The brutal equity markets to close the week also dragged down oil prices with WTI down $4.39/b from Wed close to the Friday close of $73.52. 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 $23.77 as of the Friday Aug 26, 2024 close.

Figure 29: Cushing Oil 321 Crack Spread & WTI Aug 2, 2014 to Aug 2, 2024



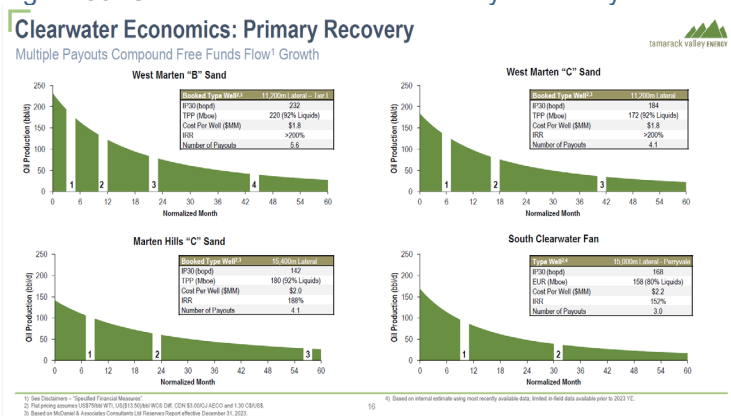
Source: Bloomberg

Oil: Tamarack Valley's Clearwater heavy oil economics are very strong

Very strong Clearwater oil economics

As a reminder, I don't run valuations and models on companies and stopped doing that a decade ago when I stopped being a sell-side analyst. And I consider it an advantage that I have the luxury to look at quarterly reporting to identify company comments or events that have a broader applicability to the commodity or sector views. So any references to companies is not for stock picking or selling purposes but for a sector or commodity context. Last week's (July 28, 2024) Energy Tidbits had a reminder point of some of the advantages of the Cdn "no frack" oil plays. So we wanted to look at Q2 reporting for any confirmation of the economics of these plays. On Thursday, we tweeted [LINK] "*Cdn #Oil play advantage. Cdn "No Frack" oil plays like $TVE Clearwater have great economics: payout is fast, IRR is huge and payout original cost 4-5 times. It's why Cdn E&P CEOs see their shareholder return models working even if low oil price. That's before waterflood upside. #OOTT."* Our tweet included the Tamarack Valley Q2 call slide on the very strong Clearwater primary recovery economics. The wells have short payout period, huge IRR and payback the original capital cost multiple times. This is why when you talk to Cdn oil executives or directors, they feel confident in the sustainability of their return to shareholder models, The economics are very strong and without the need to frack a well, the well costs are low. The reason we picked the Clearwater is not Tamarack but because many other companies have exposure, albeit smaller, to the Clearwater.

Figure 30: Clearwater Economics: Primary Recovery



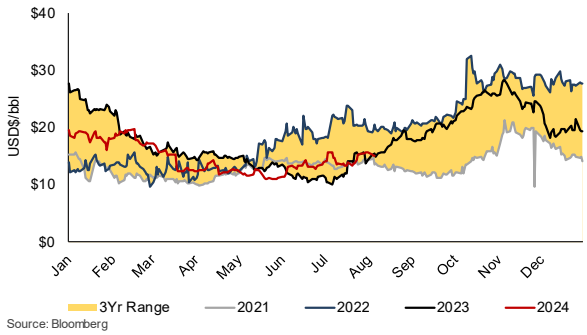
Source: Tamarack Valley

Oil: Cdn heavy oil differentials narrow $0.50 WoW to close at $15.00 on Aug 2

WCS differential narrows

It looks like the help to lower WCS less WTI differentials of continued shut-in of some Cdn heavy oil with nearby wildfires has been more or less offset by the outages and maintenance at the Exxon Joliet refinery and Cenovus Toledo refinery. The WCS less WTI spread narrowed $0.50 WoW to $15.00 on Aug 2. As we look ahead through August, we should start to see the real test of how much the startup of the 590,000 b/d TMX expansion will impact WCS less WTI differentials. Aug is normally when we normally see a widening of the WCS less WTI differentials. And we will see if TMX will lessen that widening. But even with the TMX startup, there will always be the unexpected impact on WCS less WTI differentials from 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 Aug 2 at $15.00 which was a narrowing of $0.50 WoW vs $15.50 on July 26.

Figure 31: WCS less WTI oil differentials to August 2 close



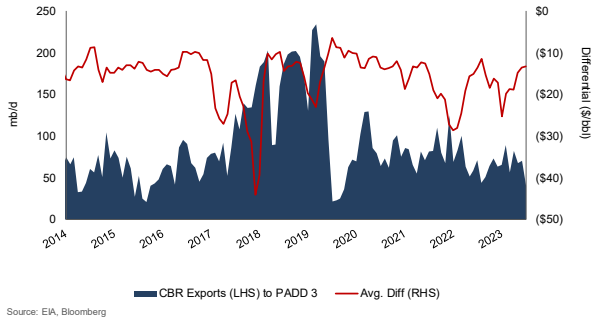
Source: Bloomberg

Oil: EIA reports total Cdn crude by rail imports -41,100 b/d MoM in May, PADD 3 down

EIA Cdn crude by rail imports

On Wednesday, the EIA posted its "*U.S. Movements of Crude Oil by Rail*" [LINK], which includes the EIA data on US imports of Cdn crude by rail. EIA estimates total US imports of Cdn crude by rail were 54,000 b/d in May, which was –41,100 b/d MoM from 95,100 b/d (revised) in April. The EIA estimates Cdn crude by rail into PADD 3 (Gulf Coast) was 40,839 b/d in May, which was -29,561 b/d MoM from 70,400 b/d (revised) in April. We have been highlighting how the EIA imports of oil by rail from Canada are less than the CER estimates of Cdn oil exports by crude to the US. That continues in the May data. The CER reported that 89,141 b/d of crude was exported by rail out of Canada during May vs the EIA estimates of 54,000 b/d of Cdn oil imported by rail in May. There is no explanation given but we expect this the difference is due to Canada crude by rail exports that go directly to US Gulf Coast ports for exports ie. do not stay in the US. Below is our graph of Cdn CBR exports to the Gulf Coast and WCS differential over time.

Figure 32: US Imports of Canada CBR to US Gulf Coast vs WCS Differential



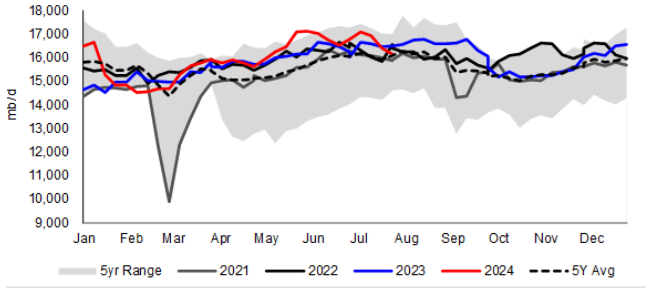
Source: EIA, Bloomberg

Oil: Refinery Inputs down -0.258 mmb/d WoW to 16.150 mmb/d

Refinery inputs -0.258 mmb/d WoW

As expected, there was a modest WoW decrease in crude oil processing at US refineries, which was due to a number of unplanned outages. 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. Although we may see some refineries advance their turnarounds from Sept to August. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended July 26 [LINK]. The EIA reported crude inputs to refineries were down -0.258 mmb/d this week to 16.150 mmb/d and are down -0.368 mmb/d YoY. Refinery utilization was down -1.5% WoW to 90.1%, and was down -2.6% YoY.

Figure 33: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports down -0.651 mmb/d WoW as oil exports up +0.733 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were down -0.651 mmb/d to 2.034 mmb/d for the July 26 week. US imports were up +0.082 mmb/d to 6.953 mmb/d, while exports were up +0.733 mmb/d to 4.919 mmb/d. Top 10 was down -0.420 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 were 224,000 b/d for May. 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 -0.331 mmb/d to 4.033 mmb/d, which we expect was due to some refineries being down in Ohio. Although this week shows a small WoW decrease, weekly imports have been higher of late with the increased Cdn crude coming off TMX and hitting west coast US refineries. (ii) Saudi Arabia was down -0.077 mmb/d to 0.144 mmb/d. (iii) Mexico was up +0.149 mmb/d to 0.504 mmb/d. Even with the increase, oil imports from Mexico have been significantly lower than prior year's levels with the new Olmeca (Dos Bocas) refinery ramping up and Pemex's other refineries increasing crude oil processing. (iv) Colombia was down -0.107 mmb/d to 0.207 mmb/d. (v) Iraq was up +0.028 mmb/d to 0.178 mmb/d. (vi) Ecuador was up +0.058 mmb/d to 0.160 mmb/d. (vii) Nigeria was down -0.084 mmb/d to 0.113 mmb/d.

Figure 34: US Weekly Preliminary Imports by Major Country

	Jun 7/24	Jun 14/24	Jun 21/24	Jun 28/24	Jul 5/24	Jul 12/24	Jul 19/24	Jul 26/24	WoW
Canada	3,974	4,137	3,890	3,918	3,611	4,418	4,364	4,033	-331
Saudi Arabia	278	372	162	146	275	394	221	144	-77
Venezuela	0	0	0	0	0	0	0	0	0
Mexico	987	563	372	332	619	388	355	504	149
Colombia	75	306	83	276	237	79	314	207	-107
Iraq	228	164	195	191	317	220	150	178	28
Ecuador	149	199	210	152	87	50	102	160	58
Nigeria	208	86	57	222	315	164	197	113	-84
Brazil	134	201	341	74	251	331	271	71	-200
Libya	87	0	86	89	0	0	0	144	144
Top 10	6,120	6,028	5,396	5,400	5,712	6,044	5,974	5,554	-420
Others	2,184	1,026	1,215	1,147	1,048	993	897	1,399	502
Total US	**8,304**	**7,054**	**6,611**	**6,547**	**6,760**	**7,037**	**6,871**	**6,953**	**82**

Source: EIA, SAF

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

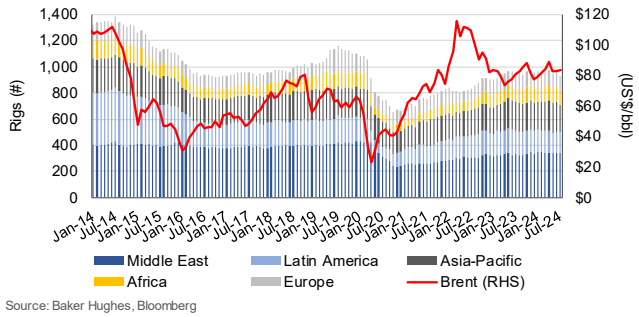
We haven't seen any updated estimates of how much oil from TMX is being shipped to US West Coast refineries. The weekly EIA oil imports from Canada do not split out how much Canadian oil is hitting each PADD district. We won't have any sense of the EIA numbers until their upcoming EIA August Natural Gas Monthly, which will show US oil imports from Canada by PADD for June and we can get some color on how much TMX oil is being shipped to US West Coast refineries. Here is what we wrote in our June 30, 2024 Energy Tidbits memo. "*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."*

Oil: Baker Hughes International -23 rigs MoM to 934 rigs in July, down -3% YoY

International rigs -23 MoM in July

On Friday, Baker Hughes posted its monthly update to international rigs, in total, that show rigs in July decreased MoM. (i) Note that Baker Hughes has changed its report format which doesn't allow us to break out country-by-country information. (ii) Total international rigs decreased by -23 rigs MoM to 934 rigs in July, and total rigs are now up +128 rigs from the recent low of 806 in April 2022. The MoM rig count is as follows: Africa +3 rigs, Asia-Pacific -21 rigs, Europe -1 rig, Latin America -7 rigs, and the Middle East +3 rigs. The YoY rig count is Africa +4 rigs, Asia-Pacific +4 rigs, Europe -3 rigs, Latin America -28 rigs, and the Middle East +13 rigs. (iii) We weren't able to summarize the MoM data by country due to Baker-Hughes' new format. (iv) July's count of 934 rigs was -3% YoY from 961 in July 2023, and down -14% vs pre-Covid February 2020 of 1,085 rigs (March 2020 is when the pandemic kicked off). Below is our graph of international rigs by region and avg monthly Brent price.

Figure 35: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg, SAF

Oil: Maduro toss ball back into Biden's court as to what the US wants to do

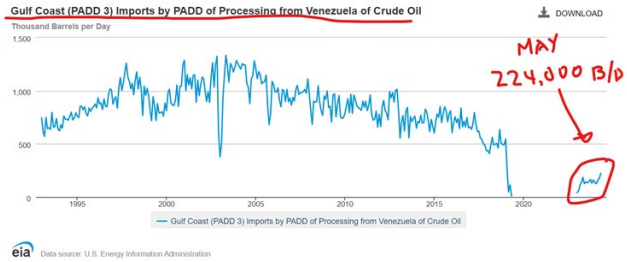
What does US do now re Maduro?

No one will ever know the exact results of the Venezuela election, but Venezuela's National Electoral Council announced Maduro won despite the pre-election polls pointing to a strong Urrutia win. The opposition announced they saw the data from 80% of the polling stations that pointed to a massive Urrutia win. Post election, it seems like the Army is holdlng tight in supporting Maduro in making arrests and putting down protests. Then on Thursday, Sec Blinking issued a statement saying "*Given the overwhelming evidence, it is clear to the United States and, most importantly, to the Venezuelan people that Edmundo González Urrutia won the most votes in Venezuela's July 28 presidential election."* And "*We congratulate Edmundo González Urrutia on his successful campaign. Now is the time for the Venezuelan parties to begin discussions on a respectful, peaceful transition in accordance with Venezuelan electoral law and the wishes of the Venezuelan people. We fully support the process of re-establishing democratic norms in Venezuela and stand ready to consider ways to bolster it jointly with our international partners."* Blinken said Maduro lost and then he seemed to hold a carrot out to the opposition that the US will provide some future help as an incentive for them to keep trying to get the win. No surprise, Maduro responded telling the US to keep its nose out of Venezuela. We tweeted [LINK] "*Maduro tosses ball back in US court. @SecBlinken "given the overwhelming evidence, it is clear to the US..... Urrutia won the most votes..." Maduro response "the US should get its nose out of Venezuela". If military stays for Maduro & quells any citizens overthrow, what will US do? #OOTT."* As long as the military holds and can keep any opposition protests down, it puts the US in the position of what do they do. To date, the US hasn't threatened any additional hits against Maduro including no threats to pull oil licenses. Our Supplemental Documents package includes the Blinken statement and AVR reporting of Maduro's response.

Will Biden revoke VEN oil licenses given Blinken's election statement?

On Friday, we tweeted [LINK] ".*@EIAgov data show US imported 224,000 b/d from Venezuela in May , all of which was to PADD 3 Gulf Coast refineries. Highest level since Biden eased off sanctions when Maduro committed to a legitimate election. What will Biden do now that Blinken says opposition won? #OOTT."* As noted above, the US has given no indication they would pull any existing oil license or no tissue new oil licenses. But there is a decision to be made in the near term. Biden issued licences to reopen Venezuela oil because Maduro agreed to have legitimate elections. Now Blinken is saying the election wasn't legitimate. It's hard to see how Biden doesn/t have to pull oil licenses. We recognize Biden is a lame duck and only has >5 months as President but we worry that it will open the door for other world leaders to test Biden more than they might if they though Biden would say what he means and does what he says. This week, the EIA released its actuals for May, which showed the US imported 224,000 b/d of Venezuela oil into the Gulf Coast refineries.

Figure 36: US oil imports from Venezuela



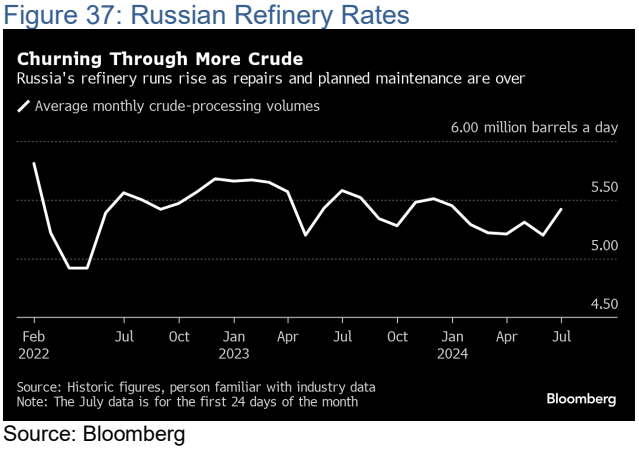
Source: EIA

Oil: Russia's Oil Refining Rate Nears 2024 High

Russia's Oil Refinery runs climb in July

Last Friday, Bloomberg reported that Russia's oil refining rate in July was close to the highest of the year as seasonal maintenance was completed. Processing reached 5.42 mmb/d from July 1- July 24, which was just below January's rates when Ukraine started attacking Russian processing plants. Bloomberg reported *"As the nation's oil producers complete planned downstream maintenance, they're re-directing export flows to supply the domestic market with more fuel ahead of peak demand during vacations and the harvest season."* The below graph from the Bloomberg Report shows Russia's refinery rates over the last two years. Our Supplemental Documents Package contains the report from Bloomberg.

Figure 37: Russian Refinery Rates



Source: Bloomberg

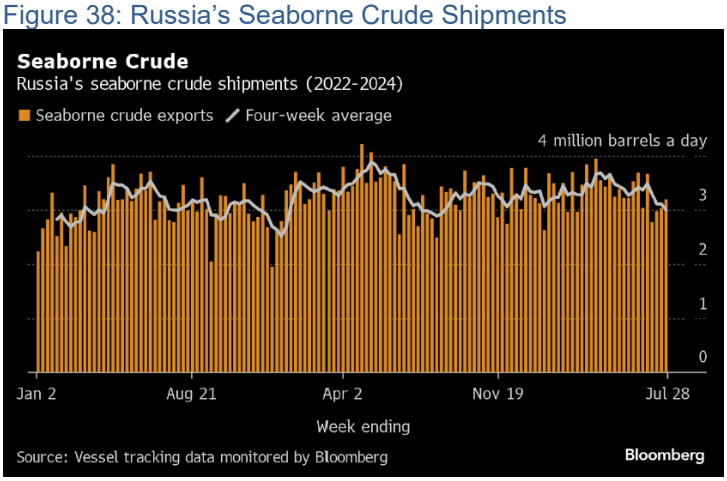
Oil: Russia's seaborne crude oil exports four-week average hit 11-month low

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, and Russian refineries are returning to operations after recovering from drone attacks. So no surprise to see Bloomberg's Tuesday report *"Russia's four-week average crude exports dropped to the lowest since late August of last year amid a plunge that's cut 710,000 barrels a day from the recent peak in April. The slump comes despite a small increase in weekly flows. The decline — the fourth straight — likely stems from Russia's improving compliance with an OPEC+ output target, coupled with a recovery in domestic refining. Moscow plans to make extra*

production cuts later this year and during the warmer months of 2025 to compensate for pumping above its quota, set by the group, earlier this year. Meanwhile, refinery runs are edging closer to a six-month high in July. A Ukrainian drone attack on July 22 caused a fire at Rosneft's Tuapse refinery, but didn't stop the plant from running. A five-day gap in the loading program for Ust-Luga, covering most of the past week, suggests that maintenance cut into flows from the port, with just a single tanker leaving in the seven days to July 28."
Russia's seaborne crude exports in the week to July 28 rose by 75,000 b/d to 3.11 mmb/d, but the four-week average fell by 140,000 b/d to 2.97 mmb/d, its lowest since August 2023. Crude shipments so far this year are 30,000 b/d below 2023's average. 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 and June, however they were still above their promised targets. Our Supplemental Documents package includes the Bloomberg report.

Figure 38: Russia's Seaborne Crude Shipments



Source: Bloomberg

Russia oil exports to China down vs early April driven by 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 1.00 mmb/d for the week ending July 28, down from last week's 1.05 mmb/d for the July 21 week and down from 1.36 for the first half of April. The last six weeks average is now 1.00 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 39: 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 23, 2024	1.02	1.86	0.00	0.06	0.00	2.95
June 30, 2024	1.08	1.87	0.00	0.06	0.00	3.01
July 7, 2024	0.90	2.00	0.00	0.03	0.00	2.93
July 14, 2024	0.96	1.84	0.00	0.03	0.00	2.83
July 21, 2024	1.05	1.70	0.00	0.09	0.01	2.85
July 28, 2024	1.00	1.51	0.00	0.22	0.01	2.74

Source: Vessel tracking data compiled by Bloomberg — Bloomberg

Source: Bloomberg

OPEC+ JMMC meeting

Oil: No recommended changes from OPEC+ JMMC

On Thursday, we tweeted [LINK] "*No surprises from #OPEC As expected, no changes recommended by OPEC+ JMMC. "reiterated that the gradual phase-out of the voluntary reduction of oil production could be paused or reversed, depending on prevailing market conditions" "will continue to closely assess market conditions" #OOTT"* On Thursday, OPEC reported that the Joint Ministerial Monitoring Committee reviewed the crude oil production data for May and June, and noted the compliance from participating OPEC and non OPEC countries of the DoC regarding the production cut agreement and did recommend any changes. However, the JMMC stressed that the gradual phase-out of the voluntary cuts could be paused or reversed depending on prevailing market conditions. [LINK].OPEC reported "*During today's meeting, the member countries that participated in the June 2nd, 2024 meeting in Riyadh along with Oman, reiterated that the gradual phase-out of the voluntary reduction of oil production could be paused or reversed, depending on prevailing market conditions. These countries had announced the extension of the voluntary reduction of oil production by 2.2 million barrels per day until the end of September 2024 and outlined plans for this reduction to be gradually phased out on a monthly basis until the end of September 2025."* Our Supplemental Documents package includes the OPEC release.

If OPEC+ doesn't add back barrels on Oct 1, it points to no barrels until Q2/25

We believe one of the key challenges for OPEC+ is that if they don't start to add back barrels per their schedule on Oct 1, 2024, it could point to no barrels added back until Q2/25. The reason is that global oil demand always seasonally decreases in Q1 of every years relative to the preceding Q4. So it the market can't support the adding back of barrels in starting on Oct 1, 2024, it's hard to see adding barrels back on Jan 1, 2025 when the expectation will be that Q1/25 oil demand will be less than Q4/24.

OPEC's current Monthly Oil Market Report July 2024 forecasts Q4/24 demand of 105.62 mmb/d and Q1/25 demand of 105.33 mmb/d. Normally the Q1 oil demand decline vs Q4 is much greater.

Oil: Bloomberg OPEC production -60,000 b/d MoM to 26.990 mmb/d in July

OPEC July production -60,000 b/d

On Friday, Bloomberg posted its monthly survey of OPEC production. (i) The Bloomberg survey estimates OPEC production in July was down -60,000 b/d MoM to 26.990 mmb. (ii) June's estimates were revised up from 26.980 mmb/d to 27.050 mmb/d, with Iran being revised up +70,000 b/d to 3.310 mmb/d from 3.240 mmb/d, (iii) The largest MoM changes in July vs June were: Iran was down -50,000 b/d MoM to 3.260 mmb/d, Iraq was up +30,000 b/d to 4.250 mmb/d, and Venezuela was down -60,000 b/d MoM to 0.830 mmb/d. Below is the Bloomberg survey table.

Figure 40: Bloomberg Survey OPEC production in July (mmb/d) test

Production ('000 b/d)	Jul	June	Chg	Capacity
▾ Total OPEC	26,990	27,050	-60	33,490
Algeria	900	900	0	1,060
Congo, Republic	240	250	-10	300
Equatorial Guinea	60	50	+10	120
Gabon	220	210	+10	220
Iran	3,260	3,310	-50	3,830
Iraq	4,280	4,250	+30	4,800
Kuwait	2,450	2,440	+10	2,820
Libya	1,150	1,160	-10	1,200
Nigeria	1,430	1,430	0	1,600
Saudi Arabia	9,000	8,990	+10	12,000
U.A.E.	3,170	3,170	0	4,650
Venezuela	830	890	-60	890

Source: Bloomberg

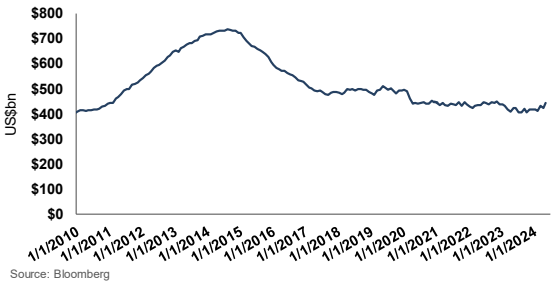
Oil: Saudi nest egg, its net foreign assets were up +$0.5b MoM in June

Saudi net foreign assets

There have been a number of major Saudi Arabia transactions raising outside capital so, no surprise, we have seen some months with big increases in Saudi net foreign assets, however this month is nearly flat MoM. Last Sunday, the Saudi Central Bank (SAMA) released its Monthly Statistical Bulletin for the month of June [LINK]. Our long-stated view is 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. It continues to play out as expected. We believe this has been obvious with how Saudi Arabia's net foreign assets dropped by ~33% or $222.7b 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. Recently we have been seeing much larger MoM changes, both up and down. There was a $0.5b MoM increase to Saudi Arabia's net foreign assets which are now $445.1 in June vs $423.6b in April. Last month's data reflected an increase of +$21.0b MoM in May. But the thesis and big picture remains, Saudi net foreign assets as of June 30 of $445.1b is a decline of ~40% or $291.9b 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 119 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 June data.

Figure 41: Saudi Arabia Net Foreign Assets



Source: Bloomberg

Oil: When/where will Hezbollah, Iran or who hit back at Israel for assassinations?

When will they hit Israel?

As of our 7am MT news cut off, there still hasn't been any major Hezbollah, Hamas, Houthi or Iran attack on Israel. They threatened retaliation for Israel's assassination of Hezbollah military commander Shuk in Beirut and a senior Hamas leader and chief negotiator Haniyeh while he was in Tehran. Haniyeh's assassination has been viewed by everyone as a game changer and dramatically escalating the potential for a broader Middle East war. On Wednesday, we tweeted [LINK] *"Brent +$1.62 to $80.25. Iran Supreme Leader response to Israel air strike killing Hamas leader in Tehran. "it is our duty to take revenge" "also prepared the ground for a severe punishment". #OOTT #Oil."* This seems to be in line with the expectation that a major response wouldn't happen right away and is likely to be a coordinated attack. This weekend, media are referencing Sky News Arabia reporting Iran is allegedly planning to carry out its Big Attack against Israel on Tisha B'Av, a day of on which multiple, historic tragedies befell the Jewish People, according to Western intelligence sources who spoke this weekend with Sky News Arabia. We have to believe Israel is going to be vigilant every day and not bank on some broad media reports. But the point is that an attack could happen any day now. There have been other warnings this weekend including Iran warning Hezbollah intends to hit deep into Israel and include civilian targets. And then the real big question comes what happens after an attack?

Oil: Houthis wasted no time in saying they will be joining in the revenge vs Israel

Houthis Leader support

The Houthis leader has made a number of statements indicating their support and joining in the revenge against Israel for assassinating the Hamas negotiator while he was in Tehran. And he wasted no time in announcing that support. On Wednesday, Saba reported [LINK] the Houthis leader saying '*and we will spare no effort, Allah willing and in cooperation with our brothers in the axis of jihad and resistance in revenge for the martyr and all the martyrs and for the oppression of the Palestinian people and to support our dear mujahideen brothers in the Gaza Strip and the Palestinian people who are subjected to genocide committed by the Israeli enemy with American participation over ten months, and whatever the sacrifices, the*

inevitable consequence is victory and the demise of the Israeli enemy and its temporary entity."

Qatar on Israel Hamas mediation

Oil: Qatar, how can mediation succeed when Israel assassinates Hamas negotiator

No surprise, Qatar PM & Minister of Foreign Affairs stated the obvious after Israel's assassination of the Hamas negotiator. Qatar has been playing the role of mediator in the Israel/Hamas ceasefire talks. Qatar PM & Minister of Foreign Affairs tweeted [LINK] "*Political assassinations & continued targeting of civilians in Gaza while talks continue leads us to ask, how can mediation succeed when one party assassinates the negotiator on the other side? Peace needs serious partners & a global stance against the disregard for human life*."

Netanyahu warned Congress on Iran nuclear

Oil: Reminder Netanyahu said it's not if but when Israel acts on Iran nuclear program

We don't know if Netanyahu will use any subsequent counter attack as an opportunity to go after Iran's nuclear program. Here is what we wrote in last week's (July 28, 2024) Energy Tidbits memo on Netanyahu's warning to congress. "*We understand the focus was on Israel vs Hamas, but we are still surprised that Netanyahu's clear warning to Congress on Iran's nuclear program didn't get much attention. On Wednesday, we tweeted [LINK] "Netanyahu tells congress. it's not if but when Israel takes action vs Iran nuclear program! Overlooked geopolitical & #Oil wildcard/risk! 'And one more thing. When Israel acts to prevent Iran from developing nuclear weapons, nuclear weapons that could destroy Israel and threaten every American city, every city that you come from, we're not only protecting ourselves. We're protecting you." Netanyahu to congress. See 👇07/21 tweet. Blinken: Iran now 1 or 2 weeks from breakout capacity to produce nuclear material for a weapon. Thx @TimesofIsrael #OOTT." Netanyahu seemed clear it was a question of when they take action against Iran's nuclear program, not if. We don't think anyone knows how this would play out but it doesn't seem to be an issue on geopolitical risk or oil risk screens. As a reminder, the Biden Admin has been consistent that they won't let Iran develop a nuclear weapon. Israel's bar is lower as they won't let Iran have the potential to develop a nuclear weapon and reaching break out capability would appear to do so."*

07/19/24: US says Iran is 1 or 2 weeks from breakout to produce fissile material

The reason why we were surprised US media and politicians didn't make more of Netanyahu's warning on Iran nuclear program is Blinken warned two weeks ago that Iran was 1 or 2 weeks from reaching breakout potential for nuclear capability. Here is what we wrote in last week's (July 21, 2024) Energy Tidbits memo. "*Earlier this morning, we tweeted [LINK] "Go Time for Israel? Overlooked major geopolitical and #Oil risk factor! Blinken: Iran now 1 or 2 weeks from breakout capacity to produce nuclear material for a weapon. If Israel won't let Iran reach breakout potential, when will it take action? #OOTT." An overlooked geopolitical risk item is Iran's nuclear advancement and when will Israel do something to prevent Iran from reaching breakout. It didn't get much attention but, on Friday, Secretary Antony Blinken spoke at the Aspen Security Forum Fireside Chat and he highlighted how close Iran is to having the capacity to produce fissile material for a nuclear weapon. Blinken said "Iran, because the nuclear agreement was thrown out, instead of being at least a year away from having the breakout capacity of producing fissile material for a nuclear weapon, is now probably one or two weeks away from doing that. Now, they haven't developed a weapon itself --." We weren't surprised by the progress but*

surprised by how he framed it as he made it sound like the US didn't really have a good plan to stop Iran rather they had an idea and they tested it. Blinken noted the mistake of the Trump administration in throwing out the JCPOA so Biden admin had to find a way to put Iran back in a box "so we were testing the proposition about whether we could at least create something that looked like that". The reason why we were surprised by his framing is that that was 3.5 years ago and he is effectively admitting by the progress that the "test" didn't work. And then he continued the administration line that "Second, we of course have been maximizing pressure on Iran across the board. We've imposed more than 600 sanctions on Iranian persons, entities of one kind or another. We haven't lifted a single sanction." As noted earlier in the memo, there may be sanctions but Iran has cranked up its oil revenues and exports because the Biden administration hasn't really enforced sanctions ie. sanctions need to be enforced to be effective. Our Supplemental Documents package includes the Bloomberg transcript of the Blinken Iran comments."

Oil: Libya oil production nearing 1.3 mmb/d, reached 1.271 mmb/d on Aug 1

Libya oil production 1.271 mmb/d

It looks like Libya is finally going to get its oil production to 1.3 mmb/d after being stuck above 1.2 mmb/d for almost the last year. On Thursday, the Libya National Oil Corporation tweeted [LINK] "*1,545,638 million barrels of equivalent...daily production rates of crude oil, condensates and natural gas during the past 24 hours*." Their tweet included a grahic that noted the oil portion was 1.271 mmb/d, which was essentially flat WoW vs 1.277 mmb/d the prior Friday. 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: Partial shutdown of some Libya Sharara oil field, -30,000 b/d to 230,000 b/d

Sharara oil field

As of our 7am MT news cut off, we only have this overnight breaking news at Libya's largest oilfield, Sharara and we have not seen any Libya National Oil Corporation comment. Earlier this morning, we tweeted [LINK] "*LIbya said to start partial shutdown of its biggest oil field, Sharara, -30,000 b/d to 230,000 b/d. Still unknown, full reason for shutdown, how long and if more barrels will be shut in. No comment yet from @NOC_Libya Thx @S_Elwardany #OOTT."* We have to believe there is more to come as it seems an odd number to only have 30,000 b/d shut0in. But there is much that is unknown as to why and what and how long and how much more? Bloomberg wrote "*Libya started a partial production shutdown of its largest oil field, three people with direct knowledge of the operations said. Output at the Sharara field dropped by 30,000 barrels a day to 230,000 as of Saturday night after operators received orders to start partially shutting down production, according to the people, who asked not to be named because they are not authorized to speak to the media. It wasn't immediately clear what the reason was for the shutdown or when the field will come to a complete halt. The field in southeast Libya is a venture between state oil firm the National Oil Corp., France's Total SE, Spain's Repsol SA, Austria's OMV AG and Norway's Equinor ASA. Libya has Africa's biggest oil reserves but energy production has often been at the heart of the political conflict, with armed groups or protesters periodically shutting down facilities to press demands."*

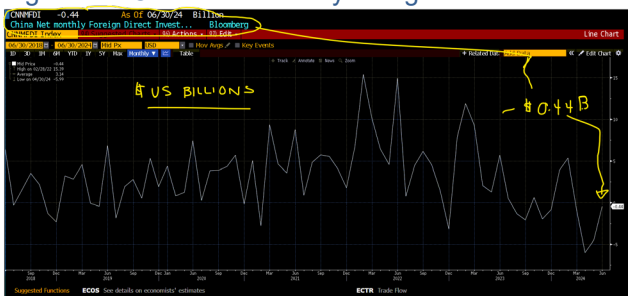
Oil: June sees 4th Consecutive Negative Net Monthly FDI into China

Negative net monthly FDI into China

There was another negative indicator for China's recovery this week – Net monthly foreign direct investment in China was negative for the 4th consecutive month and now for 6 of the

last 8 months. On Tuesday, we tweeted [LINK] "*Negative indicator to China recovery 4th consecutive mth of negative net monthly foreign direct investment flows. US$b June: -0.44 May: -4.50 Apr: -5.99 Mar: -0.9 Feb: 5.3 Jan: 3.9 Dec: -0.8 Nov: -2.0 June is normally one of best mths every yr for FDI into China. Thx @business #OOTT.*" Foreign direct investment has been a huge driver of China over the decades and that is, at least for now, not a strength. The negative net monthly Foreign Direct Investment into China was a negative $0.44b. Here is what we wrote in our May 12th, 2024 Energy Tidbits memo after the first negative net monthly FDI: *"This was a reversal of what happened to start 2024, which saw positive inflows during January and February. However, recall before that in the months to close 2023, four of the five months saw negative net monthly direct investment in China."* Our tweet included the below Bloomberg graph and we also included a table showing the actual net monthly foreign direct investment by month for the last two years. Below is the Bloomberg graph and the historical table, which we added the notation is in US$.

Figure 42: China net monthly foreign direct investment



Source: Bloomberg

Figure 43: Historical table of China's net monthly foreign direct investment

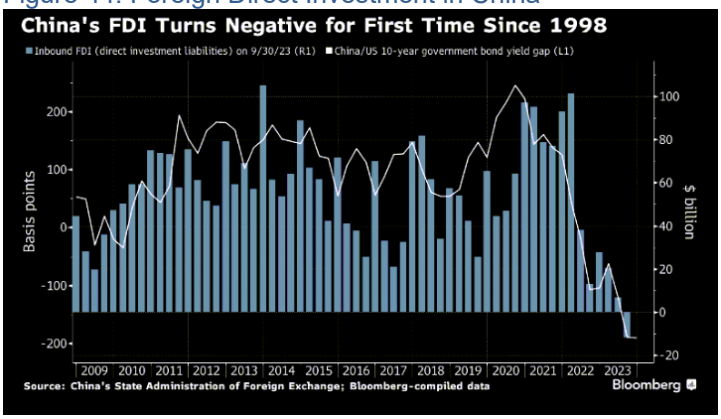
Date	Mid Px
06/30/2024	-.44
05/31/2024	-4.50
04/30/2024	-5.99
03/31/2024	-.90
02/29/2024	5.33
01/31/2024	3.89
12/31/2023	-.84
11/30/2023	-1.96
10/31/2023	.59
09/30/2023	-2.07
08/31/2023	-1.35
07/31/2023	.51
06/30/2023	5.71
05/31/2023	1.26
04/30/2023	2.05
03/31/2023	9.25
02/28/2023	11.89
01/31/2023	7.86
12/31/2022	-3.14

Source: Bloomberg

11/08/23: Q3/23 was 1st net outflow of net foreign direct investment in China

Here is what we wrote in our Nov 12, 2023 Energy Tidbits memo. "*There is a big negative to the China recovery that we haven't been tracking – the net inflow or outflow of foreign direct investment in China. And likely because it never got much attention because there has always been a net inflow. FDI is significant as foreign companies disproportionately contribute to trade, generated more tax revenue and urban employment. But this week, we saw the first ever net outflow of FDI since records have been kept in 1998. On Wednesday, we tweeted [LINK] "Here's why China recovery is slow. Huge exodus in foreign direct investment in China & more FDI flowing out for 1st time. Q3/23 saw $11.8b outflow, vs recent $101b in Q1/22. Foreign co's drive disproportionate trade, tax revenue & urban employment. Thx @business #OOTT." Bloomberg wrote "China is struggling in its attempt to lure foreigners back as data shows more direct investment flowing out of the country than coming in, suggesting companies may be diversifying their supply chains to reduce risks. Direct investment liabilities in the country's balance of payments have been slowing in the last two years. After hitting a near-peak value of more than $101 billion in the first quarter of 2022, the gauge has weakened nearly every quarter since. It fell $11.8 billion in the July-to-September period, marking the first contraction since records started in 1998.""*

Figure 44: Foreign Direct Investment in China



Source: Bloomberg

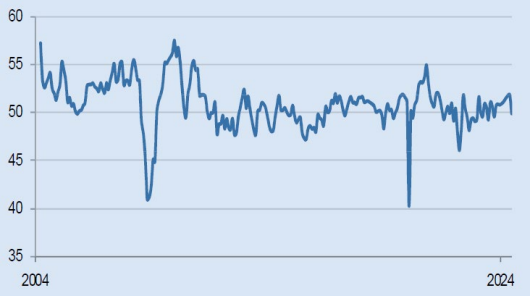
Oil: Caixin Manufacturing PMI at 49.8.8 in July, surprise contraction

Caixin Manufacturing July PMI 49.8

Out of the two China manufacturing PMI data reports that come out each month, the Official Manufacturing PMI that the National Bureau of Statistics publishes, and the Caixin Manufacturing PMI from S&P Global, we have focused on the Caixin Manufacturing PMI as it is viewed as more of a leading indicator for how the China recovery is doing as it is a more of a smaller Chinese company who are export-oriented PMI and exports have been the big driver of China for the past 20 years. Commenting on the official manufacturing PMI on Wednesday, we tweeted [LINK] "*Negative China indicator. Surprise contraction in July following 8 straight mths of expansion for China smaller & export oriented firms. China Caixin Manufacturing PMI Jul 49.8 vs Est 51.5 Jun 51.8 May 51.7 Apr 51.4 Mar 51.1 Feb 50.9 Jan 50.8 Dec 50.8 Nov 50.7 Thx @SPGlobalPMI #OOTT".* The Caixin Manufacturing PMI for July

was released at 7:45pm MT Wednesday, July 31th [LINK]. The seasonally adjusted headline Caixin PMI was 49.8 in July, down from June's 51.8. July was the first contraction after 8 consecutive months of expansion. Our Supplemental Documents package includes the China Caixin Manufacturing PMI report.

Figure 45: China Caixin General Manufacturing PMI



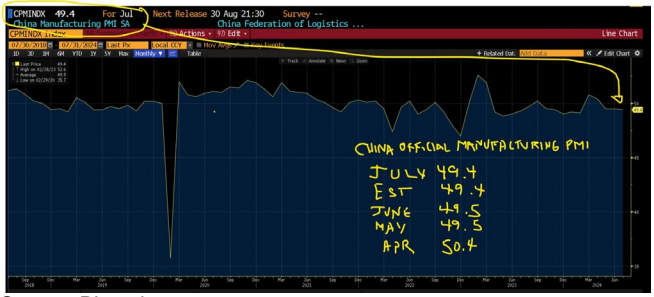
Source: S&P Global

Oil: China official Manufacturing PMI 3rd consecutive month of contraction

China official Manufacturing PMI

As a reminder, there are two China manufacturing PMI data reports that come out each month, The Official Manufacturing PMI that the National Bureau of Statistics publishes, and the Caixin Manufacturing PMI from S&P Global. The Caixin Manufacturing PMI is for more smaller, export-oriented companies. The Official Manufacturing PMI normally comes out earlier the same day or the day before the Caixin Manufacturing PMI data that we track, and this week the Official Manufacturing PMI was released on Tuesday. On Tuesday, we tweeted [LINK] "*3rd mth of contraction after 2 mths of expansion. China official National Bureau of Statistics Manufacturing PMI July 49.4. Est 49.4 Jun 49.5 May 49.5 Apr 50.4M Mar 50.8 Feb 49.1 Jan 49.2. Export oriented smaller firm Caixin Manufacturing PMI is tomorrow. #OOTT Thx @business.*" Note the Caixin Manufacturing PMI has been expansion since Nov.

Figure 46: China Official General Manufacturing PMI



Source: Bloomberg

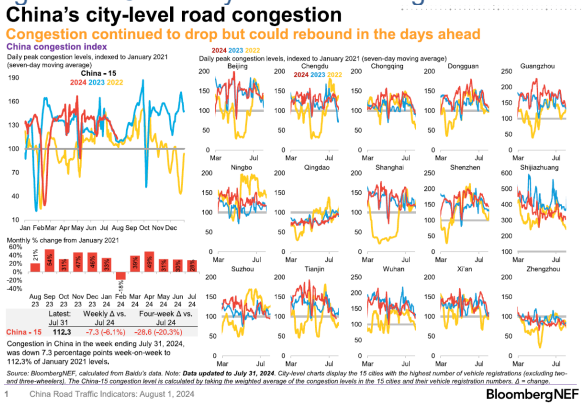
Oil: Baidu China city-level road congestion in July is up YoY despite holiday season

China city-level traffic congestion

Yesterday, we tweeted [LINK] "*Chinese consumer still on sideline with their summer vacation spending? July is holiday time. But Baidu city-level road congestion is +4.4% YoY ie. more Chinese staying in cities rather than going on holiday. Feels like staycation ie. what people do when they want to spend less on their vacations. Thx @BloombergNEF #OOTT.*" China

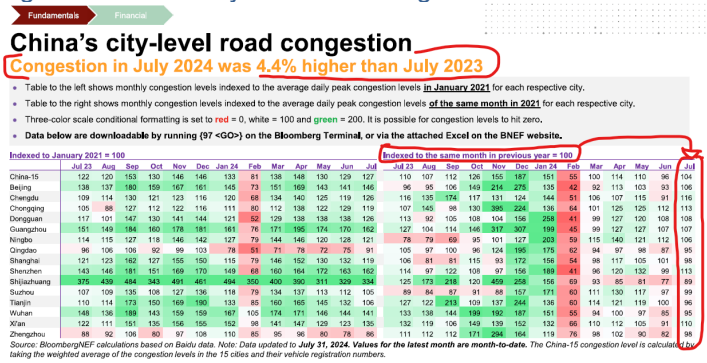
Baidu city-level road congestion is only an indicator but we can't help think that more Chinese consumers are having staycations this summer versus last summer. And one of the primary drivers for staycations in North America is to save money ie. a cheaper holiday. July in China is much like in the western world, it's holiday season. So, like seen in any holiday in China, it means the Chinese leave the cities for holidays and city-level road congestion should be lower. It's only an indicator but July 2024 city-level road congestion for the top 15 cities is 104% of July 2023, which suggests less people are leaving the city for holidays. On Thursday, BloombergNEF posted its China Road Traffic Indicators Weekly August 1 report, which includes the Baidu city-level road congestion for the week ended July 31. Note that this report was formerly titled Road Traffic indicators, and is now China Road Traffic Indicators, but the content of the report is unchanged. BloombergNEF's report was titled "*Congestion continues to fall, likely to bottom next week* This week, BloombergNEF reported Baidu city-level road congestion was down by -6.1% WoW to 112.3% of Jan 2021 levels, but compared to July 2023, July's average daily peak congestion levels so far are up +4.4% YoY. Bloomberg noted that 7 of the top 15 cities are down YoY, and 8 are up YoY. Below are the BloombergNEF key graphs.

Figure 47: China city-level road congestion for the week ended July 31



Source: Bloomberg

Figure 48: China city-level road congestion for the week ended July 31



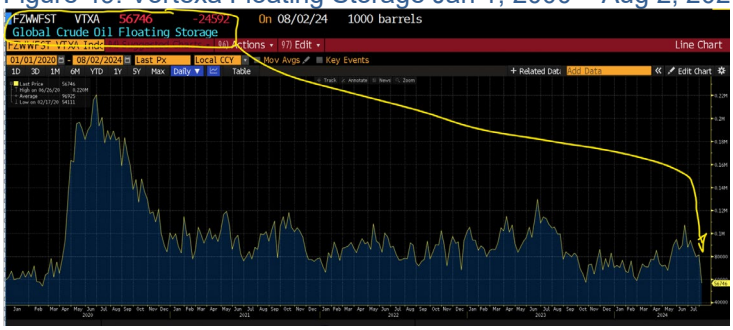
Source: Bloomberg

Oil: Vortexa crude oil floating storage est 56.75 mmb at Aug 2, -24.59 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 27 at 9am MT. (i) Yesterday, we tweeted [LINK] "*To good to be true? Vortexa #oil floating storage est -24.59 mmb WoW to 56.75 mmb at Aug 2. Lowest since Covid & only 1 of 3 wks in 50s since Covid. Always revisions over the week so question is by how much? But even if revised up into 60s, if subsequent weeks can be in 60s, it would provide support that normal summer demand is kicking in. Maybe a good sign, coincidentally Aug 2, 2019 was 56.54. Thx @vortexa @business #OOTT."* (ii) All eyes will be on the revisions over the coming week as 56.75 mmb is the lowest since Covid and right in line with pre-Covid Aug 2, 2019 of 56.54 mmb. The key will be where does it get revised to, will it stay in the 60s and will we see followup weeks in the 60s, which would provide support that summer demand is kicking in. (iii) As of 9am MT Aug 3, Bloomberg posted Vortexa crude oil floating storage estimate for Aug 2 at 56.75 mmb, which was -24.59 mmb WoW vs revised up July 26 of 81.34 mmb. Note July 26 was revised +5.21 mmb to 81.34 mmb vs 76.13 mmb originally posted at 9am MT on July 27. (iv) Revisions. The last two weeks were both revised up +5 mmb and all other revisions were very small upward revisions. Here are the revisions for the past seven weeks compared to the estimates originally posted on Bloomberg at 9am MT on July 27. July 26 revised +5.21 mmb. July 19 revised +5.85 mmb. July 12 revised +0.55 mmb. July 5 revised +1.09 mmb. June 28 revised +0.49 mmb. June 21 revised +0.08 mmb. June 14 revised +0.19 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 84.69 mmb vs last week's then prior seven-week average of 87.44 mmb. The decline is due to including the very low 56.75 mmb for Aug 2 in the rolling last 7-week average. (vi) Also remember Vortexa revises these weekly storage estimates on a regular basis. 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) Aug 2 estimate of 56.75 mmb is -72.77 mmb vs the 2023 peak on June 23, 2023 of 129.52 mmb. Recall Saudi Arabia stepped in on July 1, 2023 with its voluntary cuts. (ix) Aug 2 estimate of 56.75 mmb is -46.71 mmb YoY vs Aug 4, 2023 of 105.46 mmb. Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Aug 3, 9am MT July 27, and 5am MT July 22.

Figure 49: Vortexa Floating Storage Jan 1, 2000 – Aug 2, 2024, posted Aug 3 at 9am MT



Source: Bloomberg, Vortexa

Figure 50: Vortexa Estimates Posted 9am MT on Aug 3, 9am MT on July 27, 5am MT July 22

Posted Aug 3, 9am MT

Date	FZWWFST VT... Last Px
Fr 08/02/2024	56746
Fr 07/26/2024	81338
Fr 07/19/2024	79889
Fr 07/12/2024	85984
Fr 07/05/2024	93861
Fr 06/28/2024	87810
Fr 06/21/2024	107.182k
Fr 06/14/2024	89459
Fr 06/07/2024	85987
Fr 05/31/2024	94987
Fr 05/24/2024	89874
Fr 05/17/2024	80153

July 27, 9am MT

Date	FZWWFST VT... Last Px
Fr 07/26/2024	76128
Fr 07/19/2024	74041
Fr 07/12/2024	85434
Fr 07/05/2024	92767
Fr 06/28/2024	87318
Fr 06/21/2024	107.103k
Fr 06/14/2024	89273
Fr 06/07/2024	85814
Fr 05/31/2024	94367
Fr 05/24/2024	89447
Fr 05/17/2024	79987
Fr 05/10/2024	68037

July 22, 5am MT

Date	FZWWFST VT... Last Px
Fr 07/19/2024	72962
Fr 07/12/2024	85777
Fr 07/05/2024	95516
Fr 06/28/2024	90178
Fr 06/21/2024	108.62k
Fr 06/14/2024	89129
Fr 06/07/2024	86023
Fr 05/31/2024	94473
Fr 05/24/2024	89823
Fr 05/17/2024	80182
Fr 05/10/2024	68649
Fr 05/03/2024	70770

Source: Bloomberg, Vortexa

Vortexa floating storage by region

Oil: Vortexa crude oil floating storage WoW changes by regions

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 26, in total, was revised +5.21 mmb with the key revisions being Asia revised +5.97 mmb, Other revised +3.20 mmb and Middle East revised -2.84 mmb. (ii) Total floating storage at Aug 2 was down a massive -24.59 mmb WoW vs the revised up July 26 of 81.34 mmb. The major WoW changes were Asia -13.45 mmb WoW, Other revised -6.26 mmb, and US Gulf Coast revised -2.75 mmb. (iii) Aug 2 estimate of 56.5 mmb is -72.77 mmb vs the 2023 high on June 23, 2023 of 129.52 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 -37.54 mmb and Other -23.31 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 26 that was posted on Bloomberg at 9am MT on July 27.

Figure 51: Vortexa crude oil floating by region

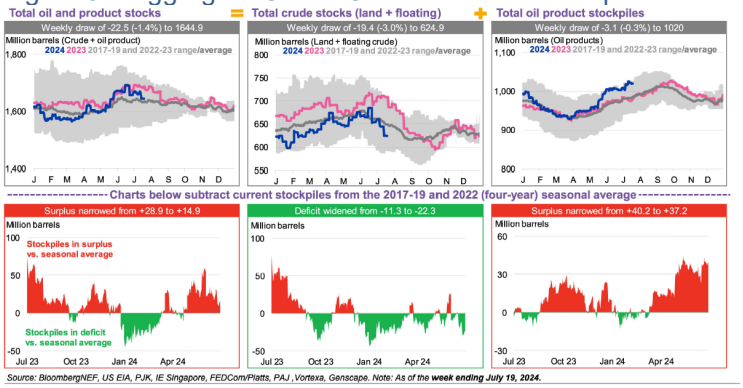
Region	Aug 2/24	Jul 26/24	WoW	Jul 26/24	Jun 23/23	Aug 2 vs Jun 23/23
Asia	35.72	49.17	-13.45	43.20	73.26	-37.54
North Sea	2.27	2.53	-0.26	2.81	5.42	-3.15
Europe	5.26	6.39	-1.13	6.62	6.14	-0.88
Middle East	2.05	1.90	0.15	4.74	6.76	-4.71
West Africa	4.96	5.85	-0.89	6.39	7.62	-2.66
US Gulf Coast	0.48	3.23	-2.75	3.30	1.00	-0.52
Other	6.01	12.27	-6.26	9.07	29.32	-23.31
Global Total	56.75	81.34	-24.59	76.13	129.52	-72.77
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Aug 3						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil: BNEF, global oil & product stocks surplus narrows to +14.9 mmb from +28.9 mmb

On Tuesday, BloombergNEF posted its "*Oil Price Indicators*" weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022-2023, and other times using a five-year average 2017-2019 + 2022-2023. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products narrowed from a surplus of +28.9 mmb for the week ending July 12 to a surplus of +14.9 mmb for the week ended July 19. (iii) Total crude inventories (incl. floating) decreased -3.0% WoW to 624.9 mmb, while the stockpiles deficit widened from a deficit of -11.3 mmb to a deficit of -22.3 mmb. (iv) Land crude oil inventories fell -2.1% WoW to 547.4 mmb, widening their deficit from -25.9 mmb to -30 mmb against the five-year average (2017-2019 + 2022-23). (v) The gas, oil, and middle distillate stocks fell -1.4% WoW to 232.3 mmb, with the surplus against the four-year average narrowing to a surplus of +2.9 mmb from +6.3 mmb. Jet fuel consumption by international departures in the week to August 5 is set to increase by +19,800 b/d WoW, while consumption by domestic passenger departures is forecast to decrease by -4,400 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 52: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

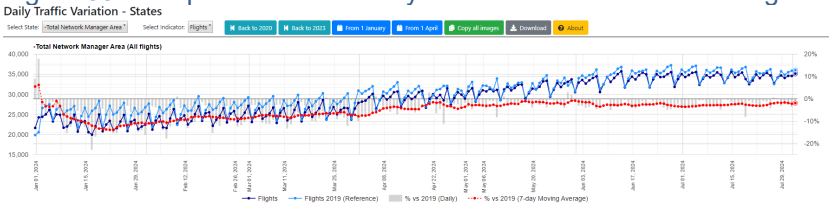
Oil: Europe airports daily traffic 7-day moving average is -1.9% below pre-Covid

Europe airports daily traffic

Yesterday, we tweeted [LINK] "*Daily Europe air traffic still stuck below pre-Covid. 7-day moving average as of: Aug 1: -1.9% below pre-Covid. Jul 25: -2.2%. Jul 18: -2.6%. Jul 11: -2.9%. 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%. 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 -1.9% below pre-Covid as of Aug 1, which followed –2.2% below as of July 25, which followed -2.6% below as of July 18, -2.9% below as of July 11, -3.3% below as of July 4, and -2.9% below as of June 27. Please note that we try to pull the data on Saturday mornings for a consistent weekly comparison. Eurocontrol updates this data daily and it is found at [LINK].

Figure 53: Europe Air Traffic: Daily Traffic Variation to end of Aug 1



Source: Eurocontrol

Oil: IATA June international air travel up YoY and continues to surpass pre-Covid

June air travel up YoY

On Wednesday, the International Air Transport Association (IATA) released air passenger data for June 2024 [LINK]. (i) The key message from the data is that international air travel continues to surpass pre-Covid levels. And that all but one route have now reached or surpassed pre-Covid. The IATA wrote "*Air travel from Europe marked in June another optimistic picture for international RPK, save for Europe – Asia, the only pair not to have surpassed preCovid traffic levels. Route-pair Europe - Middle East continues to defy previously seen seasonal patterns with demand being on a solid upward trend. Growth YoY decreased for all route pairs but Europe – South America and Europe – Middle East. Growths spanned from 22.7%, for Europe - Asia, to 4.1%, for route Europe - Central America. Second and third were routes Europe - South America and Europe – Middle East, respectively at 15.7% and 10.3%.* (ii) The IATA also wrote *"Industry total Revenue Passenger-Kilometer (RPK) in June grew 9.1% year-on-year (YoY), versus 8.5% YoY growth in Available Seat-Kilometer (ASK). Passenger load factor (PLF) outgrew the previous year's value, indicating stronger demand for air travel in June."* (iii) Total global traffic in June, measured in revenue passenger kilometers (RPK), rose +9.1% YoY. Please note the IATA splits out total market air travel into international travel vs domestic travel. (iv) The split was between International RPKs which were up +12.3% vs June 2023 and Domestic RPKs which were up +4.3% vs June 2023. (v) Willie Walsh, IATA's Director General, commented *"Demand grew across all regions as the peak Northern summer travel season began in June. And with overall capacity growth lagging demand we saw a very strong average load factor of 85% achieved in both domestic and international operations. Operating with such high load factors is both good and challenging. It makes it even more important for all the stakeholders to operate with equal levels of efficiency to minimize delays and get travelers to their destinations on schedule."* Our Supplemental Documents package includes the official IATA report.

Figure 54: June 2024 Air Passenger Market

	World share [1]	June 2024 (% year-on-year)				June 2024 (% year-to-date)			
		RPK	ASK	PLF (%-pt)	PLF (level)	RPK	ASK	PLF (%-pt)	PLF (level)
TOTAL MARKET	***100.0%***	**9.1%**	**8.5%**	**0.5%**	**85.0%**	**13.4%**	**11.6%**	**1.3%**	**82.3%**
International	*60.1%*	12.3%	12.7%	-0.3%	85.0%	17.4%	17.2%	0.1%	81.9%
Domestic	*39.9%*	4.3%	2.1%	1.7%	85.0%	7.4%	3.6%	3.0%	83.0%

[1]% of industry RPKs in 2023

Source: IATA

Asian Pacific air traffic in June

Oil: Asia/Pacific intl June passenger air travel up +21.0% YoY but -9.8% vs 2019

On Monday, the Association of Asia Pacific Airlines released its June traffic results [LINK] which is comprised of aggregate data across a total of 40 Asia Pacific airline carriers. (i) Air travel. International passenger air travel on the 40 airlines is up big YoY, but still 9.8% below 2019 levels. The AAPA reports preliminary June 2024 travel figures were up +21.0% YoY from June 2023. The AAPA wrote *"Preliminary June 2024 traffic figures released today by the Association of Asia Pacific Airlines (AAPA) showed robust growth in international air passenger markets, fuelled by healthy demand for air travel approaching the peak summer holiday season. International air cargo demand also expanded strongly, in tandem with a pick-up in manufacturing activity across the Asian economies, including China and India. Overall, Asia Pacific airlines recorded a 21.0% year-on-year increase in the number of international passengers carried to a combined total of 28.9 million in June, with traffic volumes averaging 90.2% of the corresponding month in 2019. Correspondingly, demand in revenue passenger kilometres (RPK) grew by 23.8% year-on-year, almost matching the 24.0% expansion in available seat capacity. As a result, the international passenger load factor edged 0.2 percentage points lower to average 82.2% in June."* (ii) Air cargo was up +16.4% YoY, measured in Freight Tonne Kilometres (FTK), and the load factor increased to 62.8%. Meanwhile, headline capacity measured in Available Seat Kilometres (ASK) expanded +24.0%. (iii) Subhas Menon, Director General of the AAPA, said *"Asian airlines are seeing robust traffic growth, in tandem with expansion in global economic activity and improvements to connectivity within the region and globally. In summary, during the first half of the year, the region's airlines carried a combined total of 173 million international passengers, a 40% increase compared to the same period last year… "International air passenger and cargo markets are poised for further growth in the latter half of the year, driven by sustained positive momentum in the global economy, despite some uncertainties in the geopolitical landscape. Increased services to new and existing destinations will further boost travel demand, with traffic volumes expected to recover to pre-pandemic levels by the end of the year."* Below is a snapshot of the APAA's traffic update.

Figure 55: APAA Preliminary International Air Traffic Data

International	Jun-24	Jun-23	% Change
Passengers (Thousand)	28,853	23,843	+ 21.0%
RPK (Million)	104,089	84,094	+ 23.8%
ASK (Million)	126,942	102,355	+ 24.0%
Passenger Load Factor	82.0%	82.2%	- 0.2 pp
FTK (Million)	6,206	5,331	+ 16.4%
FATK (Million)	9,880	8,772	+ 12.6%
Freight Load Factor	62.8%	60.8%	+ 2.0 pp

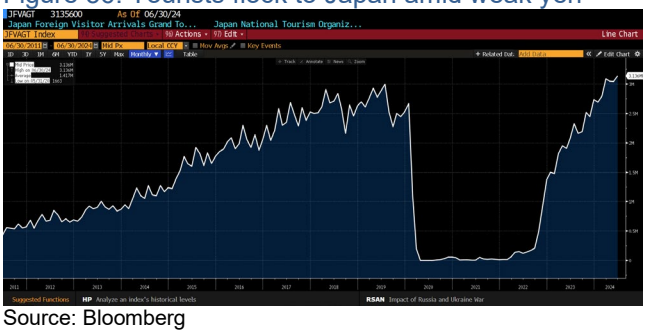
Source: AAPA

Oil: Visitors to Japan continue reach record highs in 2024

Weak yen drives record visitors to Japan

Japan continues to be major travel destination from all parts of the world driven by the low yen. For decades, Japan was viewed as an expensive travel destination but that has changed with the weak yen. As a result, visitors in Japan hit an new all-time record in March and broke that record this June after hovering just below that level in April and May. The record set in March was 3,081,600. April was 3,042,900. May was 3,040,100. And this week, the Japan National Tourist Organization released June data [LINK] that there were 3,135,600 visitor arrivals in June, which is +8.9% vs June 2019, and 17,777,200 visitors to YTD June 30, which is +6.9% vs the same period in 2019. Our Supplemental Documents package includes the JNTO data.

Figure 56: Tourists flock to Japan amid weak yen



Source: Bloomberg

Oil: IATA, global air cargo June was 7th consecutive month of double-digit YoY growth

June Air cargo +14.1% YoY

We look at international air cargo as the data that affirms the level of export orders and trade. On Tuesday, the International Air Transport Association (IATA) announced cargo data for the month of June [LINK]. The IATA wrote "*Total demand, measured in cargo tonne-kilometers (CTKs*), rose by 14.1% compared to June 2023 levels (15.6% for international operations). This is the seventh consecutive month of double-digit year-on-year growth. Capacity, measured in available cargo tonne-kilometers (ACTKs), increased by 8.8% compared to June 2023 (10.8% for international operations). Total half-year (H1) demand increased by 13.4% compared to H1 2023, by 4.3% compared to H1 2022, and by 0.02% compared to H1 2021.*" Willie Walsh, IATA's Director General, commented "*Air cargo demand surged in June. Strong growth across all regions and major trade lanes combined for a record-breaking first-half*

performance in terms of CTKs. Maritime shipping constraints and a booming e-commerce sector are among the strongest growth drivers. Meanwhile, the sector has remained largely impervious to ongoing political and economic challenges, and the US customs crackdown on e-commerce deliveries from China. Air cargo looks to be on solid ground to continue its strong performance into the second half of 2024," Our Supplemental Documents package includes the official IATA report.

Figure 57: June 2024 Air Cargo Market

	World share [1]	June 2024 (% year-on-year)				June 2024 (% year-to-date)			
		CTK	ACTK	CLF (%-pt)	CLF (level)	CTK	ACTK	CLF (%-pt)	CLF (level)
TOTAL MARKET	***100.0%***	**14.1%**	**8.8%**	**2.1%**	**45.8%**	**13.4%**	**9.4%**	**1.6%**	**45.4%**
International	*86.6%*	15.6%	10.8%	2.1%	50.8%	14.3%	12.2%	0.1%	51.1%

Note 1: % of industry CTKs in 2023

Source: IATA

Oil: Spain petroleum products consumption down MoM, down MoM in June

Spain's Oil consumption

There were some mixed signals from Spain's reported petroleum production in June. On Wednesday, Cores reported Spain's monthly oil and petroleum consumption for the month of June [LINK], showing consumption for automobiles was down -5.8% YoY, which included gasoline +1.9% YoY that was more than offset diesel for automobiles -7.9% YoY for an overall -5.8% for automobiles. Jet fuel sales increased +13.7% YoY, and fuel oil increased +8.8% YoY. Diesel for trucks, etc was -7.2% YoY. Below is a table showing the breakdown of demand by fuel type.

Figure 58: Spain's May Oil Demand Product Breakdown (thousand mt)

	Consumos			Tasas Variación (%) Interanuales		
Productos Petrolíferos	Junio 2024	Acumulado Anual	Año Móvil	Junio 2024	Acumulado Anual	Año Móvil
Gasolinas Automoción	542	3.080	6.292	1,9%	8,0%	6,5%
Gasóleos Automoción	1.770	10.892	21.830	-7,9%	1,7%	-0,4%
Combustibles de Automoción	**2.313**	**13.972**	**28.122**	**-5,8%**	**3,0%**	**1,1%**
GLP	197	1.185	2.194	23,1%	8,9%	5,6%
Gasolinas*	543	3.082	6.297	1,9%	8,0%	6,5%
Querosenos	666	3.438	7.039	13,7%	13,0%	12,5%
Gasóleos*	2.341	14.877	29.696	-7,2%	1,1%	-3,2%
Fuelóleos	689	4.339	8.399	8,8%	9,1%	7,0%

* Productos de automoción incluidos en el grupo de productos correspondiente

Unidad: GWh

Source: Cores

Oil: Tropical Storm Debby expected to be Hurricane cat 1 when it hits NW Florida

Tropical Storm Debby

Earlier this morning, we tweeted [LINK] "*Tropical Storm Debby expected to be Hurricane 1 strength when it hits NW Florida. Other negative is Debby's movement slowed down from 16 to 13 mph & expected to further slow down. Slower moving = more time for winds to impact and dump more rain. Be safe Florida! Thx @NHC_Atlantic #OOTT.*" Debby is a late developing storm and wasn't even Tropical Depression strength until it crossed over Cuba. One of the negatives is that Debby slowed down from 16 mph to 13 mph overnight. Anyone who has been in a Tropical Storm or Hurricane knows its scary but it's even scarier if it's slow moving so it lingers for longer over a spot. And the more it lingers, the time it has to drop as much rain as possible and flooding tends to bring the most damage. Below is the National Hurricane Center Tropical Storm Debby map as of 3am MT that was attached to our tweet.

Figure 59: Tropical Storm Debby as of 3am MT Aug 4

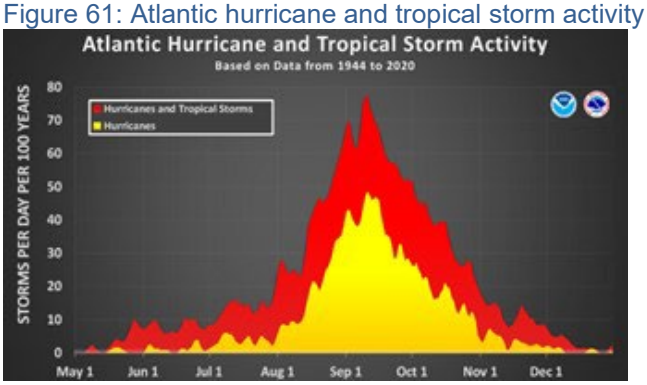
Source: National Hurricane Center

Oil: EIA's excellent live mapping of storms/hurricanes vs oi and gas wells/infra

Earlier this morning, we also tweeted [LINK] "*Reminder @EIAgov*

and the peak for Atlantic hurricane season is normally mid Sept. 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 61: Atlantic hurricane and tropical storm activity by month



Source: NOAA

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

Sector insights from Q1 calls

Please note that this is under Oil & Natural Gas but we include other sectors in our recap of earnings calls. This was a big week of Q2 reporting within Canada, the US and around the world. One of our focus areas for reporting are the non oil and gas producers as we typically get some of the best macro insights from the services, pipelines, refineries, commodities traders, and utilities. We find we get the best insights into a range of oil and gas themes/trends, sectors and plays form the conference calls. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts, or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks.

Diageo (Don Julio, Johnny Walker, etc) warns on a cautious US consumer

Diageo reported its Q2 on Tuesday and its CEO Debra Crew was interviewed on Bloomberg. Diageo is best known for its key brands like Don Julio, Johnny Walker and Crown Royal. On Bloomberg, The big hit to Diageo's Q2 was in Latin America but Crew highlighted the cautious US consumer. Our tweet included a clip of Crew's comments. We tweeted [LINK] "*Cautious US consumer. Diageo shares -8%. Don Julio, Johnny Walker, Crown Royal, etc. Biggest hit was Latin America But CEO Crew highlighted "We are faced with a challenging US environment like many other consumer-facing companies. We're calling it a very, a cautious consumer that is quite cautious in spending. Wallets are under pressure as inflation is persisting. You're seeing 30-year high grocery, you know food basket prices. And that has certainly impacted us." Thx @business.*"

EOG: US oil production +300-400,000 b/d YoY at yr-end 2024

There was another great example of the Q&A giving way better information than in mgmt prepared remarks from the EOG Q2 call on Friday. In the mgmt prepared remarks, mgmt said "*we expect Lower 48 US supply to exit 2024 roughly the same level as yar-end 2023 with only modest gains to total US oil supply from offshore as offshore production increase."* So far from clear how much mgmt was forecasting. However, in the Q&A, mgmt replied "*on U.S. supply, I think we've talked about on previous earnings calls for crude, we're looking -- we feel somewhere between 300,000 barrels a day and 400,000 barrels a day annually would be the increase. In total, liquids maybe closer to 500,000 barrels a day. When you look at what's happening in the Lower 48 specifically, as I said in the opening remarks, we think from December to December, it will be relatively flat. We've had relatively flat DUC counts for the past months. And even though, as you're highlighting, there's -- everybody seems to be reporting on the margin some increased operational efficiency, it's really rig count that's remained flat and then completion spreads that have remained flat as well. And so when we roll all that up, we continue to see not only the effects of consolidation in the industry, but just overall industry discipline really being the drivers of that more moderate U.S. growth. And we think that will continue not only into 2025, but really for the next few years moving forward. Immediately, as I discussed with the current rig counts where they have been for the last eight months, nine months, and where they look to be finishing the rest of this year at, that should drive moderate, potentially even less growth year-over-year than what we're seeing this year."*

Exxon: 2.4 bcf/d Golden Pass LNG start delayed 6 months to year end 2025

Exxon held its Q2 call on Friday. In the Q&A, CEO Woods confirmed first LNG will be delayed by about six months to the back end of 2025 at the 2.4 bcf/d Golden Pass LNG at Sabine, Texas. Woods said "*On your Golden Pass, the project, so we've just gotten through, reached – the venture just reached a settlement with Zachry. And so that venture is in the process of kind of restaffing and getting started back up again. Obviously, we're in the very early days of that. So there's still more work to be done. And of course, the teams are very focused on getting back to work, effectively executing and bringing that project in as quickly as they can and as close to the original schedule as they can. Right now, our estimate is we're going to see about a six-month slippage. So we had anticipated kind of first LNG the middle of next year. We now are looking at probably the back end of 2025 for first LNG. And that's kind of where the current schedule is. But I would just condition that with the teams are just getting back up and running.And they have a clear mandate to try to bring that in as effectively as they can. And again, my expectation is they'll do better than we currently think. But we've got work to do."*

Precision Drilling: Risk for smaller companies to get insurance

Precision Drilling held its Q2 call on Wednesday. (i) Earlier in the memo, we highlighted Precision's view that the TMX value lift has led to substantially higher Cdn heavy oil drilling. (ii) Strong Montney drilling, although a little bit of a pause now before ramping back up in Jan in a surge for the start of LNG Canada Phase 1 in mid 2025, much like seen with TMX. (iii) Another sign of a multi year demand for Cdn

rigs in particular the big gas rigs is that Cdn producers are finally now prepared to lock in multi year rig contracts. (iv) One potential increasing risk to the oil & gas sector is on getting insurance. Precisions says insurance companies are reducing capital for oil and gas. They are seeing higher prices but they can still get. But they raise the risk of being tougher for small drilling companies to get. Precisions was speaking to smaller drilling companies, but our concern is that if insurers are reducing their exposure to oil and gas, why won't it include E&P. In the Q&A, mgmt said *"Yes, I'd agree with you that there is a growing realization that there is a growing demand for energy and that's being driven by some of the datacenters. And look, AI provides huge benefits both internally and also from an external perspective to us internally to drive optimization for our customers, but also externally to drive growth for our equipment and the services that we provide."*

Data centers need 6-8 bcf/d

Energy Transition: TC Energy sees data centers needing 6-8 bcf/d of reliable NatGas

The TC Energy Q2 call on Tuesday was another great example of how the best insights come from the Q&A and not the management prepared remarks. (i) Added 6-8 bcf/d for data centers. Mgmt had bullish natural gas demand outlook for the next decade and but didn't provide detail on their bullish data center natural gas demand views. However, in the Q&A, mgmt provided the buildup to why they see data center added natural gas demand of 6-8 bcf/d. Mgmt said "*Of power, which is about enough of power to fuel 77,000 homes, by the way. These 300 new data centers are going to need somewhere around 45 to 50 gigawatts of power to operate. And then if you apply just an average heat rate to that, that's how we get this notion of around 6 to 8 bcf a day of capacity that's going to be needed to serve them.*" (ii) Access to reliable power like natural gas is the roadblock to timely data centers. We have been highlighting how data center growth is much faster than how long it takes to add power supply and that this is creating a supply gap. The customer comments to TC echo that view. Mgmt said "*So in our discussions with various entities, what we're learning is that while power costs represent a relatively small portion of the overall cost to operate a data center, the access to reliable power could be a roadblock towards the timely build-out*."

06/07/24: Huntsman, electricity supply gap inevitable with data center growth

The TC Energy comments on how access to reliable natural gas power will be a roadblock to timely data center reminds of what we still see as an overlooked issue that data center growth is faster than electdricity supply 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: Game changer, data centers want NatGas direct from TC pipeline

Game changer for NatGas for data centers

We were surprised that this game changer comment on natural gas for data centers from TC Energy Q2 call on Thursday morning didn't get attention. We suspect it was because it was a massive Q2 reporting day across all sectors and equities were crashing around the world and the comments were in the Q&A and not in the release or slides. (i) But it's why, on Friday morning, we tweeted [LINK] "*Every man for himself. Game changer in the fast approaching fight for 24/7 reliable, affordable #NatGas power in the US. Data Centers need reliable 24/7 #NatGas so much, they will buy it from the gas pipeline before the gas gets to LDCs to generate power!! TC Energy Q2 Q&A "And as an alternative to citing these data centers behind LDCs, we're now seeing a much greater potential for data center operators to seek laterals off of our main line and to use that gas supply to fuel onsite power generation that they would build and or own themselves." Data centers will ensure their own 24/7 #NatGas power supply and let LDCs & their other customers deal the volatility from having more interruptible power supply. See 07/01/24 tweet Ford CEO warning on this concept. [LINK]. See 07/01/24 tweet Amazon/Constellation potential nuclear power deal. [LINK] Bullish #NatGas for coming years. #OOTT."* (ii) Data centers need reliable 24/7 power to be able to go. TC Energy noted this in the above item that having the access to 24/7 natural gas is a roadblock to timely data center growth. (iii) Data centers want to take natural gas directly from TC Energy's mainline natural gas pipeline and not get from the LDC/utility. This is the game changer. In the Q&A, mgmt said data centers are now wanting to run laterals off the main line to their own power generation! They want to do like Amazon wants to do with nuclear power (see below item). So they would get the natural gas, build or have someone build a natural as power generation plant and get the reliable, 24/7 power source before it gets to a utility/LDC! So for anyone who doesn't believe data centers worry about securing reliable 24/7 natural gas power, think again. (iv) The TC Energy comments support our view that natural gas is the critical fuel for data center growth for the next decade. But the movement by data centers to take natural gas or nuclear before it can go on the grid sets up another of questions like the Ford CEO tweet noted below. Our Supplemental Documents package includes excerpts from the TC Energy Q2 call transcript and slides.

06/01/24: Will Amazon tie up 100% of 24/7 power from CEG's nuclear plant

Our TC Energy tweet linked our June 1, 2024 tweet on Amazing trying to tie up 100 of the power from a Constellation nuclear power, which would take that nuclear power from providing to the grid as it is now. Here is what we wrote in our June 7,

2024 Energy Tidbits memo. "*On Monday, we tweeted [LINK] "Game Changer! Smart move by Amazon IF can directly get 100% of clean 24/7 power from Constellation's nuclear power plant for AI data center. ie. get the 24/7 power before it goes into grid baseload power. What else but #NatGas #Coal if grid needs to replace 24/7 baseload power. Thx @Jennifer_Hiller @SebasAHerrera #OOTT." WSJ reported that Amazon was working to tie up 100% of the power generation from a Constellation nuclear power plant, which would mean that nuclear power generation won't be going into the grid for all customers, including Amazon. This fits with our views that the most profitable companies in the world, big tech players like Amazon, Microsoft, etc, will pay a premium to tie up clean energy and the result being higher costs to regular consumers and increasing grid stability risks. We continue to believe that they will push for mini nukes whenever they can come on for their AI data centers. That is assuming mini nukes can get over NIMBY resistance because they can be placed relatively close to where the tech companies want to put AI data centers. But that is a decade or more away. However, we hadn't played out this type of scenario that Amazon will go pay a premium to tie up existing nuclear power instead of the nuclear power going to the gid. What a smart move for Amazon. Get all the existing 24/7 nuclear power for themselves by paying a premium. The concern for the grid is that this would take away 24/7 power from the grid and leave the grid with a big hole in the grid's baseload 24/7 power, let alone 24/7 clean power. And this also fits our view that big winners for needing to replace 24/7 power for the grid will be natural gas and coal as 24/7 power can't be done with wind and solar. The question will be if big tech players will be allowed to cut out existing base load power generation from the grid by paying a premium. We still believe big tech will be looking to tie up or even possibly buy 24/7 power supply with the preference being tie-up instead of buy the fuel source. Our Supplemental Documents package includes the WSJ report."*

06/01/24: Ford CEO, will society accept Amazon type deals on 24/7 power

Our TC Energy tweet also linked to our June 1, 2024 tweet on Ford CEO raising some key questions on data center energy growth including will society accept deals where data centers take reliable power like nuclear way from the grid. Here is what we wrote in our June 7, 2024 Energy Tidbits memo. "*Ford CEO Jim Farley had some great comments and key questions on the huge and rapid growth in AI data center electricity consumption in the US. (i) On Monday, we tweeted [LINK] "Lot to unpack here. "Our grid can't handle what we have today. Are we going to build 20% more power plants to handle all these AI data centers? Or are the companies going to start to create their own power centers? What do we feel as a society when a private company operates a private power plant?" Ford CEO Farley to @JBoorstin. Bottom line: 24/7 power becomes a critical resource, especially if its nuclear or hydro, that big tech will pay up to control/acquire ie. Amazon below. Big need for 24/7 also means more #NatGas #Coal #OOTT." (ii) "Are we going to build 20% more power plants to handle all these AI data centers?" Farley started with the big picture concern on AI data centers – the growth is huge. We don't think 20% more power plants is the number but his point is valid, the US will need way more power plants than expected if its to handle the growth in consumption. (iii) What happens if there are Amazon type deals that take 24/7 power off the grid? Farley didn't note*

Amazon's name as his comments were on Friday and the WSJ Amazon report was on Sunday. But his comments address the similar situation on how will society react if big tech companies create their own power centers and take power away from going into the grid. If we use the above Amazon example, how will people feel if Amazon takes 24/7 nuclear power from the grid for its AI data centers and that means the grid operators have to find replacement 24/7 power to maintain grid stability? This is why we think this Amazon situation is a big test. (iv) Our tweet included the transcript we made of comments by Ford CEO Jim Farley with CNBC's Julia Boorstin at the Aspen Ideas Festival on June 28, 2024. [LINK]. Items in "italics" are SAF Group created transcript. At 26:14 min mark, Farley "The other part of AI that we have to think about as a society is what are we going to do with all the data centers that process all this data. Our grid can't handle what we have today. Are we going to build 20% more power plants to handle all these AI data centers? Or are the companies going to start to create their own power centers? What do we feel as a society when a private company operates a private power plant? Can the electrons in the batteries of these vehicles be used to offset some of the future power train, power plant build-out requirements. I think so. Normally our customers charge at night, late at night. And I think the grid will hopefully get more intelligent where they will charge at 2 or 3 in the morning where the electrons are cheapest. And then they're going to have a lot of electrons when there's peak. And will we be able to sell those electrons back to the grid to reduce the requirement. I think we're going to have to struggle with problems like that with this AI explosion."

Energy Transition: AEP admits it needs to add NatGas power for data center growth

AEP needs natural gas for data center growth

We continue to be amazed, not surprised, that many still aren't prepared to accept that data center power growth need reliable 24/7 baseload power as the fundamental power necessity. But on Tuesday, we saw another major US power company, American Electric Power, admit they need to add natural gas power generation, like they have just done, if they want to meet the strong electricity demand from AI data centers. (i) On Tuesday, we tweeted [LINK] "*AI Data Center 101: Need #NatGas Headline $AEP Q2: Have electricity demand for 15 GW for AI data centers by 2030, which is ~40% of existing 35 GW total AEP. Overlooked: Mgmt admits have to add #NatGas generation. Question ".. Your current outstanding RFPs don't have any gas in them. It's mostly renewables....how you think about the cadence of needing to add dispatchable generation there. And when it comes to gas, will you continue to have a bias towards acquiring existing assets, or will we see some new builds potentially?" Mgmt ".... And we do believe that dispatchable resources are needed to be added to the grid as well, and they will be part of the plan." Reminds AI data centers can't be run on interruptible solar & wind. #OOTT."* (ii) The headline, and rightly so, from the Q2 call is huge electricity demand growth over the next five years for AI data centers. They have letter agreements wanting 15 GW of electricity connections by 2030. This is the next five years and equal to ~40% of their existing capacity. So very fast and very big. (iii) Mgmt had to admit they need to buy more natural gas generation because the only projects they have on their books are renewable projects. They didn't say it, but the reason is that they have been on shift to renewable only track so they have only focused on renewable/clean energy generation in their internal generations process. So mgmt had to admit they will need to buy more natural gas generation to support the data center needs. They didn't say more natural gas but said more dispatchable assets. Mgmt was asked "*Got it, got it. Thank you. And then maybe a little*

bit more of an open-ended question. Your current outstanding RFPs don't have any gas in them. It's mostly renewables. And I'm just curious of how you think about the cadence of needing to add dispatchable generation there. And when it comes to gas, will you continue to have a bias towards acquiring existing assets, or will we see some new builds potentially?" Mgmt replied "*So our RFPs are all-source RFPs, so we're evaluating all technologies that come in. And we do believe that dispatchable resources are needed to be added to the grid as well, and they will be part of the plan. We continue to work with data center customers to meet their increased demand while ensuring contracts and new initiatives are fair and beneficial for all of our customers. In the fall, we will provide an update on what this large load opportunity means for our capital spend, including generation and transmission investment, and on our plan to responsibly finance this growth initiative. While we certainly encourage innovation when it comes to meeting the energy needs of our customers, data centers included, I want to emphasize that it's critically important that costs associated with these large loads are allocated fairly, and the right investments are made for the long-term success of our grid*." Our Supplemental Documents package includes excerpts from the AEP Q2 call transcript and slides.

Energy Transition: Who are they fooling? "dispatchable" power is "natural gas""

Dispatchable means Natural Gas

The AEP comments above and the Dominion Energy Q2 call comments remind us of how utilities don't mind saying renewable or wind or solar or nuclear power but they will do all they can to not use the words natural gas for power to be provided to generate electricity especially for the growth in data centers. It's like they are trying to make sure a word search of their comments won't bring their comments to attention of the climate change side. AEP did it above, and Dominion, the global leader in providing power for data centers did it in their Q2 call on Thursday. In the prepared remarks, mgmt said "*we're committed to pursuing solutions that support our customers and the continued growth of the region. This includes assessing dispatchable generation needs, especially during winter."* Then in the Q&A, mgmt said "*we need generation, which we've been saying for some time, both renewable and dispatchable in our service territory here in Virginia*."

07/11/24: Dominion CEO need #NatGas baseload to add renewables

Here is what we wrote in our July 14, 2024 Energy Tidbits memo on Dominion CEO specifically saying adding natural gas was what let them add renewable to power data centers. "*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.

PJM prices in June 2025

Energy Transition: Massive jump in PJM electricity prices starting June 2025

We continue to be surprised that the massive increase in how much PJM will pay to reserve power for 2025 isn't the major electricity story. (i) On Tuesday, we tweeted [LINK] "*Buckle up! "Power prices on the biggest US power grid are about to hit a record-high amid a wave of plant retirements and surging demand, thanks in part to new data centers being built. Generators that provide electricity to the 13-state grid ....will get a record $269.92 per MW-dayu from utilities to provide capacity over a 12-mth period starting in June ..... That's more than a ninefold increase from $28.92 in last yr's auction" report @naurtorious @markchediak. See 👇06/07 tweet, exactly what Peter Huntsman told @BeckyQuick - multiples of 30% price increase. Huge win for #NatGas #Coal #Nuclear power generators supplying PJM. #OOTT."* And [LINK] "*Massive jump in 👇PJM prices may not be getting any electricity headlines today as price roll-in won't hit retail electricity bills until 2025. BUT Constellation Energy +14%, Vistra +16% in pre-market. Big win for #NatGas #Coal #Nuclear generators feeding in to PJM. #OOTT.'* (ii) PJM includes most of the major NE Us states and also Virginia, which is the largest AI data center electricity demand area in the world. (iii) PJM announced the price it would be paying a nine-times multiple increase in the price it will pay generators to provide electricity in 2025 a price of $269.92 per megawatt-day from utilities to provide capacity over a 12-month period starting in June vs $28.92 in last year's auction. This is the price PJM is paying for the generators to reserve for them. (iv) This type of massive price increase shouldn't happen if you listen to the politicians with massive increase in renewable power. But it is happening and the question for markets is if this is signaling a pivot point or a realization that power prices are going to be higher and more volatile in the US increasing share of interruptible renewable power priority. Paying that huge a price is a signal that PJM worries about a potential electricity supply gap. (v) We are shocked that customers and states aren't up in arms about the huge price increase that is going to hit them in 12-months.

(vi) Natural gas and coal are big winners. And this fits one of our major themes for the past few years – there will be increasing value to existing, relatively new natural gas generation. And another key theme – it is increasingly difficult to retire existing coal generation. Both are going to be big money makers under the PJM pricing. Our Supplemental Documents package includes excerpts from the PJM announcement.

06/06/24: Huntsman warned of a multiples of 30% electricity price increase

Our tweet noted above noted Huntsman CEO Peter Huntsman had warned that the electricity supply gap was happening quickly and would lead to very big price increases in electricity ie. multiples of 30% price increases. Here is what we wrote our June 9, 2024 Energy Tidbits memo on Huntsman's warning that of a mulitples of 30% price increase. "*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."*

Energy Transition: New Zealand look to reopen oil refinery for fuel security

Air New Zealand pulls carbon intensity

We have been highlighting the New Zealand government's backing away on multiple prior climate change commitments as they move to an energy security and affordability priority. There was another example this week – this time on future fuel security. On Tuesday, New With New Zealand looking at reopening its recently closed Marsden Point oil refinery because they want to have some form of fuel security by not depending only on fuel imports. New Zealand had just closed the Marsen Point refinery in 2022. New Zealand wrote

"*Ensuring New Zealand is a resilient and self-sufficient country is a priority for this government, and a secure and reliable fuel supply is critical to this. "Since Marsden Point was mothballed by the previous government, we have relied on imports for all our liquid fuels, which leaves us completely vulnerable to international supply chain disruptions. Fuel is crucial for keeping our economy running and our communities moving*." We tweeted [LINK] *"Energy Security Reality Check. New Zealand to look at reopening ~96,000 b/d Marsden Point #Oil refinery that was shut down in Q2/22 announces @mangonui08. "Ensuring New Zealand is a resilient and self-sufficient country is a priority for this government, and a secure and reliable fuel supply is critical to this." "Fuel is crucial for keeping our economy running and our communities moving." Latest NZ move to focus on energy security, which means going back to more #Oil #NatGas. 👇06/09/24 was return to drilling for #NatGas. #OOTT."* Our Supplemental Documents includes the New Zealand announcement. [LINK]

Energy Transition: Air New Zealand removes 2030 carbon intensity target

Air New Zealand pulls carbon intensity

We have been highlighting the New Zealand government's backing away on multiple prior climate change commitments so we shouldn't be surprised to see Air New Zealand remove its 2030 carbon intensity reduction commitments. On Tuesday, we tweeted [LINK] "*Surely, other airlines have to follow? "Air New Zealand is removing its 2030 science based carbon intensity reduction target and will withdraw from the Science Based Targets initiative. Many of the levers needed to meet the target, including the availability of new aircraft, the affordability and availability of alternative jet fuels, and global and domestic regulatory and policy support, are outside the airline's direct control and remain challenging." #EnergyTransition is happening, just going to take way longer, cost way more and be a rocky/bumpy road. #Oil will be needed for longer. #OOTT."* Air New Zealand highlighted the lack of availability of new more fuel efficient aircraft, "*it has also become apparent that potential delays to our fleet renewal plan pose an additional risk to the target's achievability. It is possible the airline may need to retain its existing fleet for longer than planned due to global manufacturing and supply chain issues that could potentially slow the interoduction of newer, more fuel-efficient aircraft into the fleet."* Air New Zealand didn't highlight it but noted the simple reality of sustainable aviation fuels – they aqre two expensive and not available. Air New Zealand cited a reason for the removal of the carbon intensity targets was "*the affordability and availability of alternative jet fuels."* Our Supplemental Documents package includes the Air New Zealand release.

New Zealand PM Luxon is the former New Zealand CEO

Most assume that the vast majority of politicians are long, long term poiticians to reach the top but that is not the case in New Zealand. We couldn't help having a follow up Air New Zealand Air tweet [LINK] "*Air New Zealand tidbit. Prior to becoming New Zealand Prime Minister, Christopher Luxon was CEO Air New Zealand 2013 to 2019. #OOTT."*

Energy Transition: Vopak, hydrogen/ammonia projects being pushed out or postponed

Hydrogen ammonia projects delayed

Vopak's Q2 call was another example where the best insights come from the Q&A. No one should be surprised to see Vopak's comments that ammonia/hydrogen projects are being pushed out or postponed. We have been highlighting this problem for the last couple years. Vopak held its Q2 call on Friday July 26. Note that Vopak is speaking the challenge of getting even "low carbon" hydrogen going, which refers to blue natural gas fueled hydrogen. On

Monday, we tweeted [LINK] "*Ammonia/Hydrogen 101 from Vopak Q2. Ammonia projects being pushed out or postponed. Ammonia is a carrier of hydrogen. Focus is Low Carbon ammonia that comes from Low Carbon hydrogen. Ammonia imports to be from Middle East & US, which means will carry Blue #NatGas Hydrogen. Ammonia/hydrogen projects = more #NatGas #OOTT."* Vopak is encouraged by the realism in the hydrogen/ammonia market despite saying the sentiment is subdued given projects are being pushed out longer term, or maybe even postponed. In the Q&A, mgmt wa asked about plans for ammonia import in Rotterdam. Vopak CFO Michiel Gilsing replied ""*If you then want to talk about or hear something about ammonia, indeed, a lot that is happening in ammonia, if I would put it on a bit of a high level, I would almost say we're moving from hype to realism in the low-carbon hydrogen space, and therefore, low-carbon ammonia as a carrier for that. And what I mean with it is maybe the noise and the general sentiment might be a bit subdued because some of the projects are being pushed out longer term, or maybe even postponed. I think if you look on the ground to the attractiveness of some of the supply chains that they're going to be building, and the realism that is being put in, I'm actually quite encouraged by what I see in that sense. And I base that on what I see happening in places like Japan, Korea, what I see happening in terms of demand development for low-carbon ammonia in places like Singapore, that needs to be (inaudible) -- sorry, and the third one is ARA, so both Antwerp and Rotterdam, where you definitely see the willingness to start committing to ammonia imports in the coming -- in the period between now and 2030, is quite real and realistic, and it needs to be supplied by Middle Eastern and US materials. So that's the overarching comment*". Vopak's comments also point to the ammonia projects will be fueled by natural gas and not renewable solar or wind. And if the ammonia is to be supplied by Middle easter and US materials, then it fits the low-carbon and will be blue hydrogen by someone like Saudi Aramco.

Reminder: Energy is lost in converting natural gas to hydrogen to ammonia

Most overlooked there is energy loss in converting naturla gas to hydrogen to ammonia, and a greater energy loss in converting clean energy to hydrogen to ammonia. Here is what we wrote in our April 7, 2024 Energy Tidbits memo. "*Another of the overlooked parts of the JERA ammonia replacing 20% of coal is that there are energy losses in converting natural gas to hydrogen to ammonia works and ammonia that burns clean. We did not put that in our tweet. We have been fortunate that, for the most part, the comments we get on our tweets on Twitter/X are meant for constructive dialogue or for pointing out other items to consider on a tweet. A good example was on the JERA, when a Twitter follower replied "Stacked losses/inefficiencies are what kill so many energy storage concepts, few understand this". If this was a follower with a real name, we would have sent an direct message to make sure we understood his point. But we interpreted it as a reminder that there is a loss of energy take a joule of natural gas to make it into a lesser amount of hydrogen to make that into a lesser amount of ammonia. The end result is to start with so much energy from natural gas and end up with a lesser % of that starting point by the time JERA uses the ammonia to replace coal. The US Dept of Energy Alternative Fuels Data Center website's "Hydrogen Basics" reminds of this energy loss in converting natural gas to hydrogen and it also reminds that the losses are more when converting wind and solar to hydrogen. [LINK] The DOE AFDC doesn't say how much energy is lost. But we found a paper "Energy and the Hydrogen*

Economy" [LINK], not authored by any DOE people, that is posted on the AFDC website that suggests 10% loss for natural gas to hydrogen. Note this is not a DOE authored paper. But they suggest 10% losses, which seems reasonable. That is just the energy loss in converting natural gas to hydrogen and doesn't' include the loss converting from hydrogen to ammonia. The bottom line is that there is a loss of energy in the process to use ammonia for power generation instead of using the starting natural gas for power generation. Our Supplemental Documents package includes the DOE Hydrogen Basics and the excerpt from the Energy and the Hydrogen Economy paper."

EIA reminds hydrogen is an energy carrier, not an energy source

One other reminder that is still overlooked by many is that hydrogen is an energy carrier, it's not an energy source. Here is another item from our April 7, 2024 Energy Tidbits memo. "*Our above tweet on the JERA ammonia demonstration project included our Jan 21, 2022 tweet that reminded a Hydrogen 101 basic – Hydrogen is not an energy source. We continue to see many overlook that hydrogen is not an energy source and forget or omit that hydrogen is an energy carrier that is produced from an energy source like natural gas. Here is what we wrote in our Jan 23, 2022 Energy Tidbits memo on this Hydrogen 101 basic. "On Friday, we tweeted [LINK] ""takes more energy to produce #hydrogen (by separating it from other elements in molecules) than hydogren provides when it is converted to useful energy" "an energy carrier that must be produced from another substance". nice to see @EIAgov give facts not fiction. #OOTT #NatGas." This follows the new Jan 20 update from the EIA "Hydrogen explained". Hydrogen is considered one of the must be a significant contributor to any and all plans to get to Net Zero. Our view is unchanged, we understand why the Net Zero side pushes it for items like heavy industry, but it seems to get overlooked that hydrogen is not an energy sources like natural gas or solar. Rather it is an energy carrier. The EIA stuck to the basics on hydrogen and didn't politicize their message in their Jan 20 update on hydrogen. The EIA explained this concept clearly. "Hydrogen is an energy carrier Energy carriers allow the transport of energy in a usable form from one place to another. Hydrogen, like electricity, is an energy carrier that must be produced from another substance. Hydrogen can be produced—separated—from a variety of sources including water, fossil fuels, or biomass and used as a source of energy or fuel. Hydrogen has the highest energy content of any common fuel by weight (about three times more than gasoline), but it has the lowest energy content by volume (about four times less than gasoline). It takes more energy to produce hydrogen (by separating it from other elements in molecules) than hydrogen provides when it is converted to useful energy. However, hydrogen is useful as an energy source/fuel because it has a high energy content per unit of weight, which is why it is used as a rocket fuel and in fuel cells to produce electricity on some spacecraft. Hydrogen is not widely used as a fuel now, but it has the potential for greater use in the future". Our Supplemental Documents package includes the EIA Jan 20 update Hydrogen explained. [LINK] "*

Energy Transition: Volkswagen 1st ever EU plant closing is Audi Brussels EV plant

Volkswagen had a bad quarter and outlook so its shares were -5.1% following its Q2 release. One factor was Volkswagen's first ever plant closing in Europe – an EV plant based on

Volkswagen to close its Brussels EV plant

demand. We were watching Bloomberg TV's Europe show and they noted Volkswagen was closing a plant in Europe. So we went to the financial statements and saw the post period note to the Q2 financial statements, we tweeted [LINK] "*Volkswagen signals 1st ever plant closure in Europe. Starts Belgian law process for restructuring of Audi Brussels #EVs plant "against the backdrop of the development of demand for the Audi Q8 e-tron vehicle manufactured in Brussels" €1.3b expense. Thx @ocrook #OOTT."* This is Volkswagen's first ever auto plant closing in Europe and it's Audi EV plant in Brussels. Volkswagen didn't give any specific color on the call or in the press release but the closure is due to less than expected demand. Our tweet included Note 18 to the Q2 financial statements that said this was "*against the backdrop of the development of demand for the Audi Q8 e-tron model family manufactured in Brussels."* But Volkswagen is closing a large passenger EV plant despite them highlighting "*The performance of the large individual passenger car markets in this region was positive across the board."* And Volkswagen noted "*The number of new passenger car registrations in Germany from January to June 2024 was noticeably up on the previous year's level. The change in electric vehicle subsidies at the end of 2023 weighed on new registrations of all-electric vehicles, but this effect was more than offset by rising demand for vehicles with conventional and hybrid drivetrains."* Our Supplemental Documents package includes excerpts from the Volkswagen Q2 financial statements.

Energy Transition: Vopak: biofuels short/medium term economics not looking great

Not great biofuels economics

Vopak Q2 call is another example of getting better insight from the Q&A portion of the earnings call. We were a little surprised by Vopak CEO comments on how short and medium term economics for biofuels were not looking that great because all we see from uers like airlines is that they can't get enough sustainable aviation fuel. There is something to investigate further as to what is the story. But, on Monday, we tweeted [LINK] "*Biofuels: short and medium-term economics not looking that great. "so the renewable diesels, and sustainable aviation fuel that there's quite a bit of pressure on the capacity that is in the market. And the economics, medium-term and short-term, are not looking that great" Vopak CEO. #Oil will be needed for longer. #OOTT."* In the Vop0ak Q2 call, Vopak CEO was negative on biofuels returns. In its slide deck, it said "*Oversupply of low-carbon products in the market, while demand for low-carbon fuels and feedstocks continues to be robust*." In the Q&A, mgmt was asked "*what kind of impact you see of the weakness in the biofuel market right now?*" Vopak CEO Dick Richelle replied said "*Yeah, so the way we look at it, Thijs, and it's, obviously, we're following it closely, I think there's a few ways to look at. On the feedstock side, in countries of origin, talking about India, Brazil to a certain extent, also Singapore, sometimes Malaysia, we see actually positive development, or still continued healthy development, I would say. You see on the production capacity of some of the biofuels, so the renewable diesels, and sustainable aviation fuel that there's quite a bit of pressure on the capacity that is in the market. And the economics, medium-term and short-term, are not looking that great. Longer term, when the demand mandates are falling more in line with the supply that has already been put into place, we expect a longer-term outlook as I said in the presentation as well, still to be very, very positive. But this is -- remains a bit of a period where that supply of production, basically, with the demand is adjusting. And again, in the feedstock markets, we're quite comfortable in the end markets, we have mainly quite a bit of long-term contracts in place that serve as well, and we keep on monitoring that, but there's no reason to be concerned, in our view, at least for what we see now*."

Capital Markets: Warren Buffett and Gretzky sayings were popular on Friday morning

Warren Buffett and Wayne Gretzky

Following the brutal day in stock markets on Thursday and brutal open on Friday, we had seen a number of PMs and strategists on TV trying to message that there are better times ahead. And, in doing so, we heard two multiple people use famous sayings from Warren Buffett and Walter Gretzky, although they all attributed it to Wayne Gretzky. On Friday morning we tweeted [LINK] "*Two expressions being widely used by PMs/advisors on TV in looking thru today's brutal market. #WarrenBuffett: in the short run the stock market acts like a "voting machine" while functioning in the long run more like a "weighing machine". Walter Gretzky to @WayneGretzky "go where the puck is going, not where it's been". I had the honor and great pleasure to chat for few minutes with Walter Gretzky ~30 years ago - what a wonderful person!"* Here is what Buffet wrote in his 1993 annual letter [LINK] "*Let me add a lesson from history: Coke went public in 1919 at $40 per share. By the end of 1920 the market, coldly reevaluating Coke's future prospects, had battered the stock down by more than 50%, to $19.50. At yearend 1993, that single share, with dividends reinvested, was worth more than $2.1 million. As Ben Graham said: "In the short-run, the market is a voting machine - reflecting a voter-registration test that requires only money, not intelligence or emotional stability - but in the long-run, the market is a weighing machine."* As to Gretzky, everyone seems to attribute it to Wayne but it has been our understanding for decades it was his dad, Walter Gretzky, advice to Wayne.

Capital Markets: Wayfair consumer home spend drop decline as bad as financial crisis

Wayfair on consumer home spending

We probably shouldn't have been surprised to see the negative Wayfair consumer home spending comments given the recent reports on US home sale activity such as last week's Redfin report that deals to purchase homes fell through at a monthly record rate across the U.S. in June [LINK] that 15% of home purchases that went under contract were cancelled through the month of June, and 20% of homes for sale had a price cut – the highest cancellation rate and price cut rate for June on record. But, on Thursday morning, we were watching Jim Cramer highlighting comments from Q2 reporting and we then tweeted [LINK] "*Wayfair CEO consumer home spending warning! "Customers remain cautious in their spending on the home, and our credit card data suggests that the category correction now mirrors the magnitude of the peak to trough decline the home furnishing space experienced during the great financial crisis"* Thx @jimcramer @davidfaber #OOTT." Hopefully the drop in interest rates will start to turn this around.

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

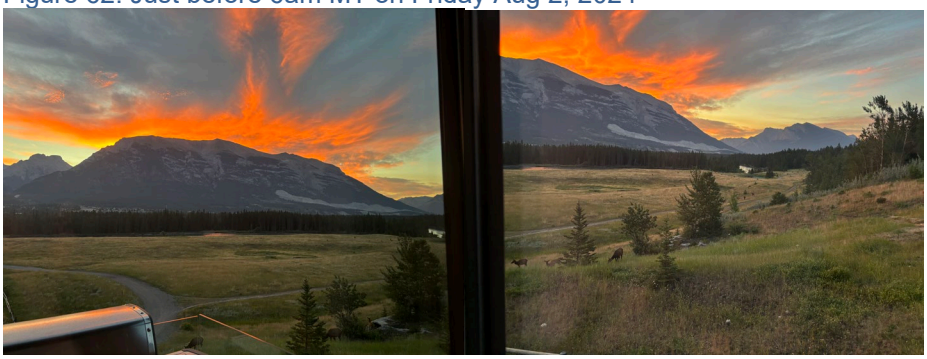
Misc Facts and Figures.

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.

Great sunrise in Canmore in Canadian Rockies

Anyone who follows me on Twitter/X knows I will often post pictures of Canmore in the Cdn Rockies, especially when we see the local wildlife. One of the advantages of living in the Cdn Rockies is that the sunrises and sunsets are often spectacular. We have seen many over the past 25 years but Friday's may have been our most dramatic sunrise to date. Plus some of the local elk are feeding in the right hand picture. Below are the photos from just before 6am MT on Friday.

Figure 62: Just before 6am MT on Friday Aug 2, 2024



Source: SAF Group

End of an era, Ontario large cases of beer are now more than a "two-four"

We missed the Ontario July 15 announcement "*Ready-to-Drink Beverages and Large Beer Pack Sizes Available in Grocery Stores Sooner Than Planned*" and these changes included a move to cases of beer that include 30 beer per case instead of the historical large case of beer of 24 beer. Don't remember when Ontario wen to the 24 beer per case size, but it had to be at least >50 years ago. And the saying wasn't that you asked for a case of twenty-four beer, you asked for a "two-four". Can't remember anyone, at least from the working class environment, ever referring to the case as anything but a "two-four". And we suspect won't be referring to the new cases as a "three-zero". Doesn't roll off the tongue like a "two-four"