Energy Tidbits

Sept 15, 2024

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Chinese Consumer Hit: New Home Prices Down for 15th Straight Month, 2nd Hand Home Prices Down for 16th Straight Month

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 1998 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. Chinese consumer hit once again as New Home prices down for 15th straight month and 2nd Hand Home prices down for 16th straight month. [click here]

2. Netanyahu says Houthis will pay a heavy price for this morning's Houthis hypersonic ballistic missile attack. [click here]

3. Floating storage isn't why oil has been soft. Vortexa floating storage, post revisions, average 66.67 mmb for last 7 weeks and only been 21 weeks since Covid below 70 mmb. [click here]

4. 321 crack spreads below $15 for 2nd week are no incentive for refineries to try to take any extra crude oil. [click here]

5. Fair to expect UK high court ruling on UK coal mine sets up potential challenges on other fossil fuel projects in UK and a similar argument to use in Canada. [click here]

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

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

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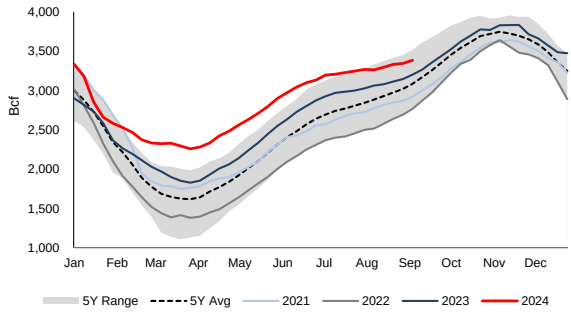
Natural Gas: Really hot summer = less risk US gas storage gets filled early

Less risk for US gas storage to be filled early

HH continues to be held back with US natural gas storage at or near the high end of the 5-yr range and producers still shutting in natural gas with low prices. The hot June, July & August 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 +198 bcf YoY this week. 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, July, and August lessened the risk to storage being filled early. As noted below, storage could be a lot worse.

Figure 1: US Natural Gas Storage



Source: EIA

Natural Gas: Storage would be way worse if EQT, Coterra etc. didn't curtail production

Storage could be worse

The big holdback to Henry Hub prices, aside from the hot June, July, and August, was that higher YoY storage would be way worse if producers didn't shut-in production or hold back on planned completions. On Aug 20, 2024, we tweeted [LINK] "*Risk continues HH #NatGas is stuck in show-me state until Nov & theoretical start to winter withdraw from gas storage season. Hold back remains 👇@NOAA Nov/Dec still looking warmer than normal. Especially with EQT ~0.5 bcf/d and Coterra 0.275 bcf/d shut-in production. #OOTT."* We reminded that gas storage would 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, which is about 90 bcf for H2/24. Note for our tweet, we wrote ~0.5 bcf/d, which is the 90 bcf over the last six months but we would assume EQT is assuming it could restore the natural gas before Dec 31. Our tweet also noted Coterra's announced shut-in of 0.275 bcf/d for H2/24. There are others like Chesapeake who have shut-in natural gas due to low natural gas prices.

Natural Gas: +40 bcf build in US gas storage; now +198 bcf YoY

+40 bcf build in US gas storage

For the week ending September 6, the EIA reported a +40 bcf build [LINK]. Total storage is now 3.387 tcf, representing a surplus of +198 bcf YoY compared to a surplus of +208 bcf last week. Since February, total storage had remained above the top end of the 5-yr range, until 1 month ago when storage dipped into the 5-yr range. This week's data shows that storage is now -33 bcf below the 5-yr maximum of 3.420 tcf. Total storage is now +296 bcf above the 5-year average, below last week's +323 bcf surplus. Below is the EIA's storage table from its

Weekly Natural Gas Storage report and a table showing the US gas storage over the last 8 weeks.

Figure 2: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (09/06/23)		5-year average (2019-23)	
Region	09/06/24	08/30/24	net change	implied flow	Bcf	% change	Bcf	% change
East	780	761	19	19	772	1.0	737	5.8
Midwest	950	922	28	28	896	6.0	875	8.6
Mountain	273	270	3	3	223	22.4	195	40.0
Pacific	285	289	-4	-4	258	10.5	264	8.0
South Central	1,098	1,105	-7	-7	1,039	5.7	1,020	7.6
Salt	266	267	-1	-1	241	10.4	235	13.2
Nonsalt	832	838	-6	-6	799	4.1	785	6.0
Total	3,387	3,347	40	40	3,189	6.2	3,091	9.6

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
Jul/19	3,231	22	249	456
Jul/26	3,249	18	252	441
Aug/02	3,270	21	248	424
Aug/09	3,264	-6	209	375
Aug/16	3,299	35	221	369
Aug/23	3,334	35	228	361
Aug/30	3,347	13	208	323
Sep/06	3,387	40	198	296

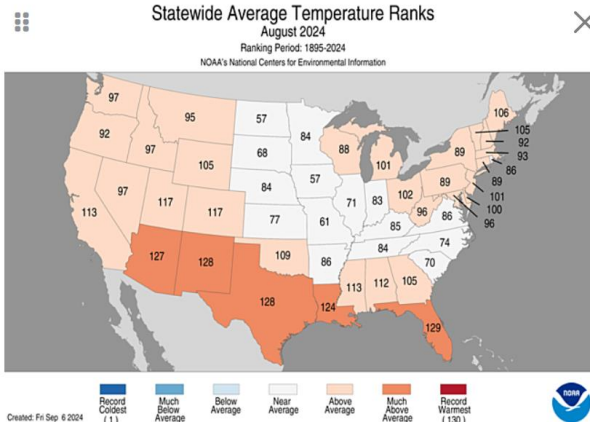
Source: EIA

Natural Gas: NOAA, 15th warmest August in last 130 years in the U.S.

It was hot in July and August. On Tuesday, the NOAA posted their July recap for assessing the U.S. Climate, which showed last month was the 15th warmest August the US has seen in the past 130 years. It was an above average temperature August across the western and northeastern U.S.; a number of cities across the West, South, and East Coast, saw record summer heat. In the news release [LINK], the NOAA wrote "T*he average temperature of the contiguous U.S. in August was 74.0°F, 1.9°F above average; the month tied with August 1998 as the 15th warmest in the 130-year record. Debby made landfall as a Category 1 Hurricane on August 5 near Steinhatchee, Florida and a second landfall as a tropical storm near Bulls Bay, South Carolina on August 8. The storm brought heavy rains, flooding and strong winds to the Southeast."* Below is NOAA's Statewide Average Temperature Ranks map for August 2024.

15th warmest August in last 130 years in U.S.

Figure 4: NOAA Statewide Average Temperature Ranks – August 2024

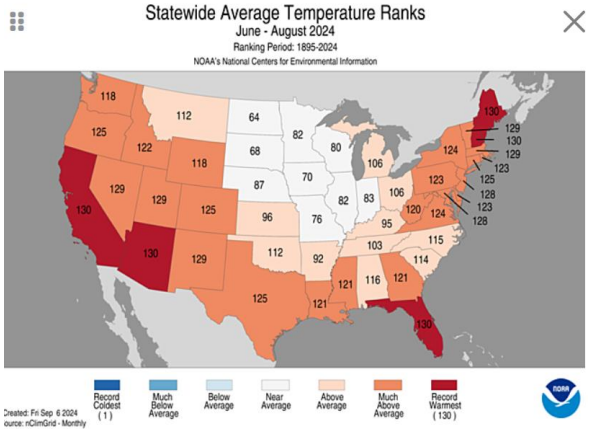


Source: NOAA

NOAA, Jun/Jul/Aug was 4th hottest in the last 130 years

It's been a really hot summer in the US, which has helped make a big reduction in the YoY gas storage surplus. NOAA's updated Aug temperature outlook above, when combined with June and July, makes Jun/Jul/Aug as the 4th hottest Jun/Jul/Aug in the last 130 years. Below is the NOAA's Statewide Average Temperature Ranks map for Jun/Jul/Aug 2024.

Figure 5: NOAA Statewide Average Temperature Ranks – Jun/Jul/Aug 2024



Source: NOAA

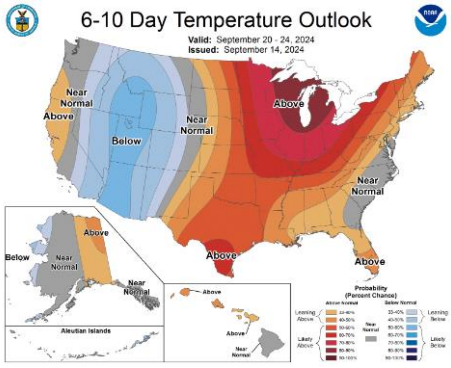
Natural Gas: NOAA forecasts warm temperatures in E ½ of US for Sept 20-28

HH prices closed at $2.318 on Friday and our concern remains that HH stays stuck around this level or a little weaker until the start of the winter unless there are some supply interruption as storage is still +198 bcf YoY and would be worse if producers like EQT, Coterra and others haven't been shutting in natural gas production due to low prices.

Warm E ½ of US for Sept 20-28

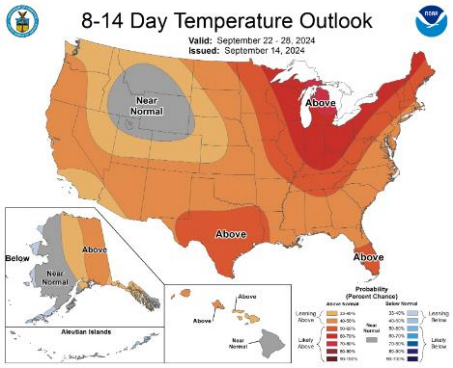
Yesterday, we tweeted [LINK] "*Updated @NOAA 6-10 & 8-14 day temperature outlook moves to warmer than normal Sept 20-28. But outside of south, that means leave the windows open temp. Not likely to impact prices with storage still +198 bcf YoY & lots of shut-in #NatGas due to low prices. #OOTT."* Our reminder is that warmer than normal Sept temperatures don't drive as much A/C demand as warmer than normal July or Aug temperatures. Texas will still have daily highs above 30C but for places like Chicago and New York City, it means daily highs that average around 24C, which is what we describe as leave the windows open temperatures. Below are NOAA's updated, as of yesterday, 6-10 day and 8-14 day temperature outlook maps covering Sept 20-28

Figure 6: NOAA 6-10 day temperature outlook for Sept 20-24



Source: NOAA

Figure 7: NOAA 8-14 day temperature outlook for Sept 22-28



Source: NOAA

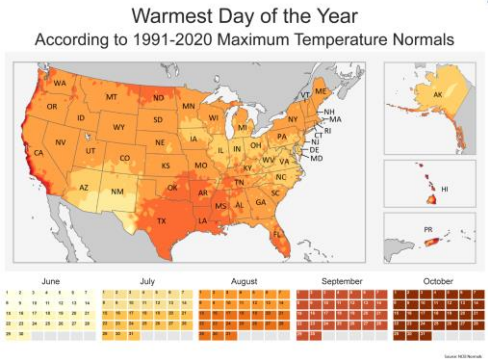
Natural Gas: Past NOAA's normal warmest day of the year for the Lower 48S

Normal warmest day of the year across the US

It's mid-September, which means it is past the warmest day of the year for the Lower 48 and so hot weather relative to normal isn't as hot for temperatures as during July and August. So when NOAA posts its temperature outlook map and it shows well above normal temperatures for late September, it doesn't have the air conditioning demand impact as a well above normal temperature in July or August. Our July 2, 2023 Energy Tidbits included the below map from NOAA's post "*When to expect the Warmest Day o the Year*" [LINK]. We checked

the link and it still works.

Figure 8: NOAA Warmest Day of the Year



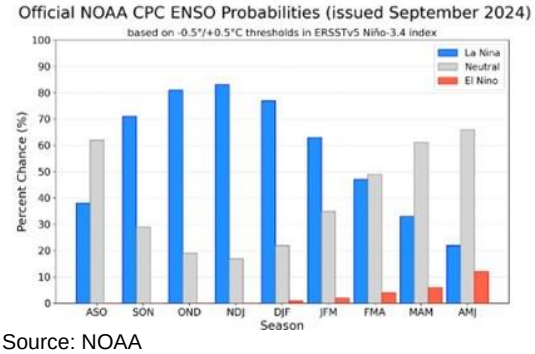
Source: NOAA

Natural Gas: NOAA sees La Nina/Normal conditions for winter 2024-25

La Nina/Normal forecast for winter 2024/25

Summer is over so the focus for El Nino conditions is for the winter. On Thursday, NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. NOAA continues to forecast La Nina conditions in the Northern Hemisphere Winter 2024-25. The takeaway from the September update is that there has been an increase in the probability of a La Nina, expected to begin in September-November and persist through January 2025-March 2025. The probability forecast for Dec/Jan/Feb is 99% expectation for La Nina/Normal conditions; NOAA wrote: *"The IRI plume predicts a weak and a short duration La Niña, as indicated by the Niño-3.4 index values less than -0.5°C. This month, the team relies more on the latest North American Multi-Model Ensemble (NMME) guidance, which predicts La Niña to emerge in the next couple of months and continue through the Northern Hemisphere winter. The continuation of negative subsurface temperatures and enhanced low-level easterly wind anomalies supports the formation of a weak La Niña. A weaker La Niña implies that it would be less likely to result in conventional winter impacts, though predictable signals could still influence the forecast guidance (e.g., CPC's seasonal outlooks). In summary, La Niña is favored to emerge in September-November (71% chance) and is expected to persist through January-March 2025".*

Figure 9: NOAA Warmest Day of the Year



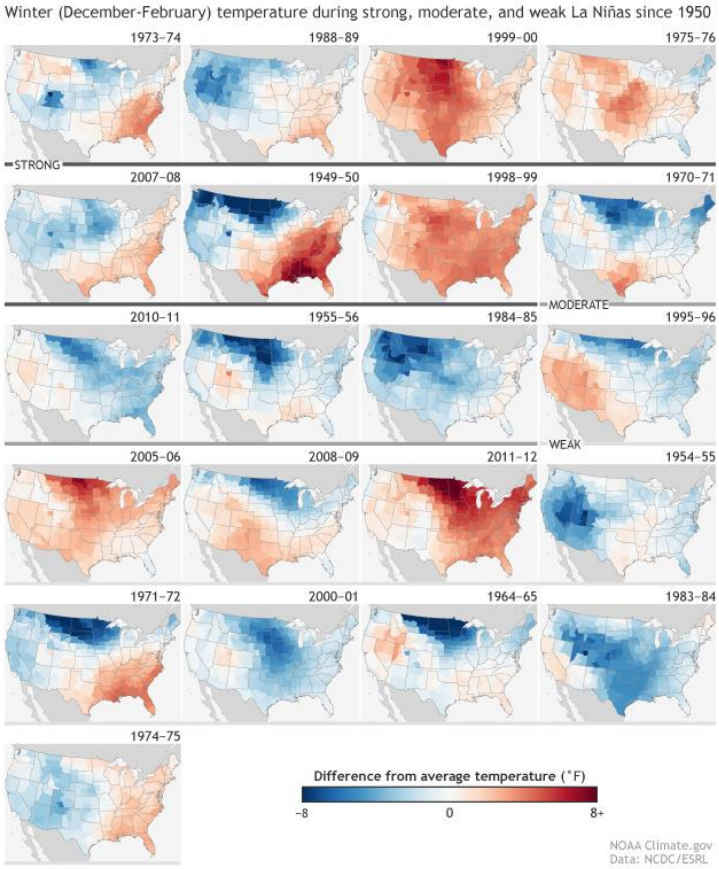
Source: NOAA

Natural Gas: La Nina correlations to colder winters aren't perfect

La Nina winters are typically colder than normal in the northern U.S., but we remind of an October 6, 2017 NOAA brief: "*Temperature patterns during every La Niña winter since 1950". In this brief* the NOAA looked at all El Nina winters since 1950, and classified them as strong, moderate or weak La Ninas while also showing the average winter (Dec thru Feb) temperature map. We checked this weekend and the link still works [LINK]. NOAA wrote: *"[the following] series of maps shows temperature patterns across the continental United States compared to the 1981-2010 average for every winter season—December through February—since 1950 that coincided with La Niña conditions in the equatorial Pacific Ocean. The years are ranked by how far below average the temperatures were in the central/eastern tropical Pacific: strong (at least -1.5° Celsius colder than average), moderate (between -1° and -1.5°C), and weak (between -0.5° and -1°C colder-than-average… In general, the stronger the La Niña, the more reliable the impacts on the United States. The typical U.S. impacts are warmer- and drier-than-average conditions across the southern tier of the United States, colder-than-average conditions across the north-central Plains, and wetter-than-average conditions in the Pacific Northwest stretching into northern California… However, as is evident in these maps, there is a great deal of variability even among strong La Niña events. For example, 8 of the 11 strong and moderate events show the cool conditions in the Northern Great Plains, which is most winters, but not all. This "failure" of the typical pattern occurs because La Niña is never the only thing that influences the climate over the United States during the winter. Other climate phenomena, such as the Arctic Oscillation or the Madden Julian Oscillation, as well as the random nature of weather can also play a large part in how a winter turns out".* It is important to note that in current forecast is for a weak and brief La Nina, which the NOAA notes above, is less correlated with significant impacts on conditions. Below are the La Nina maps from the NOAA brief.

El Nino forecast for winter 2024/25

Figure 10: Winter (Dec-Feb) temp in strong, moderate and weak La Ninas since 1950



Source: NOAA

Natural Gas: EIA, Shale/tight gas production been fairly flat around 80 bcf/d all year

Shale/tight gas production

June marked the first month that the EIA stopped releasing its Drilling Productivity Report and began releasing shale/tight oil and natural gas data with the monthly Short Term Energy Outlook. (i) Please note this came with some major reporting changes, namely there are no longer monthly forecasts for tight gas production by basin. Previously, the EIA would provide an estimate of the current month tight/shale production (in this case September) and a forecast for the next month (in this case October). But now, the EIA only provides estimates for the just finished month for tight/shale. So, in the case of the new September report, there is only shale/tight for the just finished month, i.e., August. (ii) On Tuesday, the EIA released its monthly STEO for September 2024 [LINK]. (iii) The key takeaway is that US shale/tight natural gas has been relatively flat all year around ~80 bcf/d. March was 78.38 bcf/d and Feb was 80.72 bcf/d but all other months have been 79.1 to 79.8 bcf/d. August was +0.148 bcf/d in August, at 79.846 bcf/d. And 2024 at ~80 bcf/d is lower than ~82 bcf/d for Nov and Dec 2023. (iv) The key reason for the lower production has been because several major natural gas producers shut-in natural gas production in response to the low natural gas prices, and

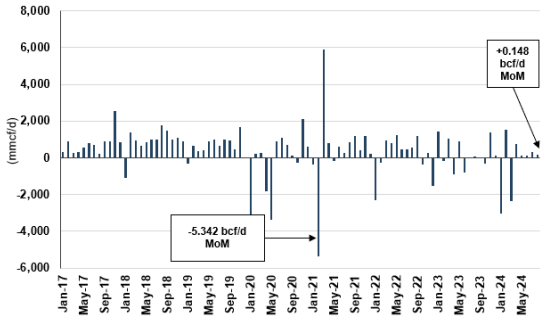
they also cutting back on rigs/fracks. (v) Note that the EIA revised their data for shale/tight gas production back to 2020 from September's STEO, and we have adjusted our table to reflect the updated data. For the last 12 months August 2023 thru July 2024, the EIA revised production figures in each month and the average revision for the past 12 months is -0.343 bcf/d. The two areas with the most revisions are Haynesville and Mississippian. Our Supplemental Documents package includes excerpts from the EIA STEO.

Figure 11: EIA Major Shale/Tight Natural Gas Production

mcf/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	August	August MoM%	August YoY%
Permian	16,593	16,765	16,751	17,088	17,419	16,659	17,368	17,823	17,772	17,860	17,912	17,902	17,951	0.3%	8.2%
Haynesville	14,648	14,568	14,432	14,314	13,793	13,736	13,791	13,003	12,479	12,257	12,214	12,662	12,612	-0.4%	-13.9%
Marcellus	25,497	25,061	25,356	26,338	26,500	25,826	25,622	23,840	25,344	25,538	25,624	25,710	25,797	0.3%	1.2%
Utica	4,902	4,838	4,555	4,586	4,507	4,173	4,193	4,175	3,889	3,957	4,022	3,795	3,845	1.3%	-21.6%
Eagle Ford	4,362	4,481	4,411	4,399	4,374	4,261	4,316	4,263	4,327	4,328	4,328	4,329	4,326	-0.1%	-0.8%
Bakken	2,462	2,555	2,530	2,571	2,613	2,221	2,493	2,513	2,579	2,596	2,608	2,619	2,631	0.4%	6.9%
Barnett	1,779	1,790	1,771	1,778	1,760	1,673	1,711	1,719	1,698	1,688	1,678	1,668	1,658	-0.6%	-6.8%
Fayetteville	885	884	878	872	862	774	846	852	834	825	816	811	816	0.6%	-7.8%
Mississippian	2,250	2,413	2,294	2,290	2,382	2,320	2,449	2,288	2,288	2,288	2,288	2,289	2,289	0.0%	1.8%
Niobrara-Codell	2,711	2,697	2,729	2,782	2,813	2,673	2,828	2,866	2,910	2,925	2,940	2,955	2,969	0.4%	9.5%
Woodford	2,826	2,843	2,881	2,858	2,913	2,712	2,853	2,852	2,851	2,851	2,850	2,849	2,849	0.0%	0.8%
Rest of U.S.	2,255	2,247	2,215	2,286	2,329	2,181	2,253	2,186	2,167	2,169	2,121	2,108	2,105	-0.2%	-6.6%
Total	81,169	81,142	80,803	82,162	82,264	79,208	80,722	78,381	79,138	79,281	79,402	79,699	79,846	0.2%	-1.6%

Source: EIA

Figure 12: MoM Change – Major Shale/Tight Natural Gas Production



Source: EIA

Natural Gas: EIA STEO small increases to 2024 & 2025 natural gas production forecast

EIA US natural gas production forecast

On Tuesday, the EIA released its monthly Short Term Energy Outlook for September 2024 [LINK]. (i) The EIA made an immaterial increase to its 2024 US natural gas production estimate by +0.1 bcf/d to 103.4 bcf/d, which, on a full year average basis, now gives a YoY decline of -0.4 bcf/d from 2023. The key reason for the YoY decline is the decision by some major natural gas producers such as EQT to shut-in natural gas due to low prices. (ii) The EIA lowered its 2024 HH price forecast -$0.12/mcf to $2.27/mcf (was $2.39/mcf) and decreased their 2025 forecast -$0.13/mcf to $3.26/mcf (from $3.39/mcf). The EIA wrote "*We forecast natural gas prices will remain relatively flat in the upcoming shoulder season during September and October before generally rising in 2025. Price increases in 2025 reflect U.S. natural gas production that does not keep pace with growth in U.S. liquefied natural gas (LNG) exports. We expect the Henry Hub spot price will rise from less than $2.00 per million British thermal units (MMBtu) in August to around $3.10/MMBtu next year.*" (iii) The quarterly changes in Natural Gas production are as follows: Q1/24 flat at 104.0 bcf/d, Q2/24 +0.4 bcf/d to 102.1 bcf/d, Q3/24 -0.3 bcf/d to 103.3 bcf/d, and Q4/24 +0.2 bcf/d to 104.0 bcf/d. (iv) The EIA increased its 2025 forecast +0.2 bcf/d to 104.8 bcf/d, which, on a full year average basis, would be up +1.4 bcf/d YoY. The EIA says the reasons for the YoY increase are driven by

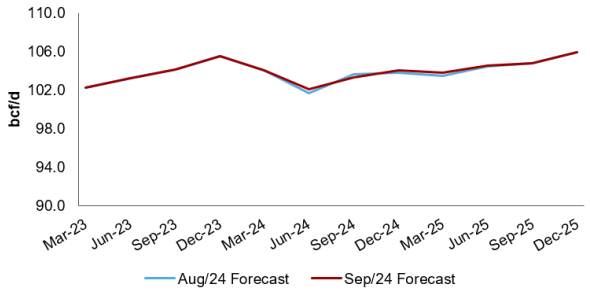
their increased HH gas price assumption. The quarterly changes to 2025 are as follows: Q1/25 +0.3 bcf/d to 103.8 bcf/d, Q2/25 +0.1 bcf/d to 104.5 bcf/d, Q3/25 flat at 104.8 bcf/d, and Q4/25 flat at 105.9 bcf/d.

Figure 13: EIA STEO Natural Gas Production Forecasts

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

Source: EIA, STEO

Figure 14: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

Natural Gas: EIA STEO est. storage 3.811 tcf at Nov 1/24, +68.9 bcf YoY

EIA Sept STEO storage forecast

The EIA STEO also includes its forecast for US gas storage. (i) Please note that our bias is to not pay much attention to gas storage forecasts past the start of winter 2024/25 on Nov until we get to Nov/Dec, and there is some better near-term certainty to the start of winter temperatures. The reason is that winter temperatures are the driving force by far on natural gas demand and it is hard to have confidence on a winter 2024/25 temperature forecasts when we are still in Q3. (ii) EIA estimates US gas storage ended winter 2023/24 at 2.562 tcf at April 1, 2024, which was up +0.446 tcf YoY and revised up 0.260 tcf from August. (iii) As noted earlier, we remind that US gas storage would be a lot worse if producers like EQT hadn't shut-in natural gas production in response to low prices. The EIA forecasts gas storage to start winter 2024/25 at 3.811 tcf at Nov 1, 2024, which is an increase of +68.9 bcf YoY. The September STEO estimate is below the August STEO of 3.984 tcf at Nov 1, 2024. (iv) It's early and ultimately winter temperatures will determine if storage is high or low. But, for now, the EIA forecasts gas storage to end winter 2024/25 in April at 2.228 tcf, which

would be -333.8 bcf lower YoY. The key reason for less storage to end winter is that the EIA is assuming this winter is colder than last year's hot winter. The EIA assumes heating degree days are +9% higher YoY, and cooling days are +6% higher YoY. (v) There is even more uncertainty as you look out to winter 2025/26. The September STEO forecasts winter 2025/26 storage to be 3.741 tcf at Nov 1, 2025, which would be a little lower than its forecast for Nov 1, 2024, at 3.811 tcf. Below is a table tracking the working gas inventory forecasts and actuals since 2016.

Figure 15: EIA STEO US Natural Gas in Storage (2016-2025)

US Working Natural Gas in Storage (billion cubic feet)						
	Storage	2016-2025				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,562.4	1,377.6	1,873.7	32.7%
Oct 2016	4,012.7	3,236.3	4,012.7	776.4	3,624.5	10.7%
Mar 2017	2,062.5	1,184.9	2,562.4	1,377.6	1,873.7	10.1%
Oct 2017	3,816.5	3,236.3	4,012.7	776.4	3,624.5	5.3%
Mar 2018	1,184.9	1,184.9	2,029.4	844.5	1,653.4	-28.3%
Oct 2018	3,236.3	3,236.3	4,012.7	776.4	3,624.5	-10.7%
Mar 2019	1,559.4	1,559.4	2,332.5	773.1	1,919.0	-18.7%
Oct 2019	3,610.0	3,501.1	3,931.6	430.6	3,663.5	-1.5%
Mar 2020	2,332.5	1,559.4	2,332.5	773.1	1,919.0	21.5%
Oct 2020	3,931.6	3,501.1	3,931.6	430.6	3,663.5	7.3%
Mar 2021	1,975.0	1,559.4	2,332.5	773.1	1,919.0	2.9%
Oct 2021	3,532.8	3,501.1	3,931.6	430.6	3,663.5	-3.6%
Mar 2022	1,611.8	1,559.4	2,332.5	773.1	1,919.0	-16.0%
Oct 2022	3,501.1	3,501.1	3,931.6	430.6	3,663.5	-4.4%
Mar 2023	2,116.5	1,559.4	2,332.5	773.1	1,919.0	10.3%
Oct 2023	3,742.2	3,501.1	3,931.6	430.6	3,663.5	2.1%
Mar 2024	2,562.4	1,559.4	2,332.5	773.1	1,919.0	33.5%
Oct 2024	3,811.1	3,501.1	3,931.6	430.6	3,663.5	4.0%
Mar 2025	2,228.6	1,559.4	2,332.5	773.1	1,919.0	16.1%
Oct 2025	3,740.9	3,501.1	3,931.6	430.6	3,663.5	2.1%

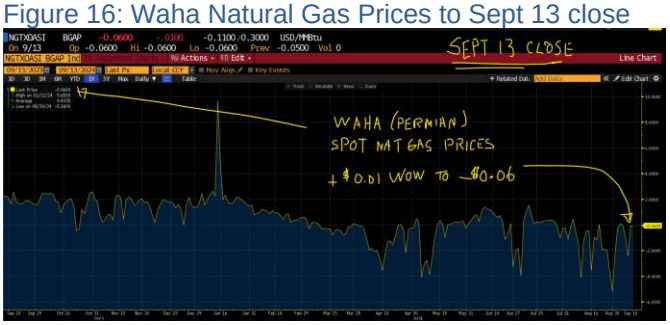
Source: EIA, STEO

Natural Gas: Matterhorn 2.5 bcf/d pipeline should get Waha spot prices above zero

Waha spot prices are -$0.06

We have been highlighting how Waha (Permian) spot natural gas prices have been negative and that is impacting Permian oil rig levels given all Permian "oil" wells produce natural gas and NGLs. It looks like the negative Waha prices may be getting some relief. On Friday, we tweeted [LINK] "*Hopefully start up 2.5 bcfd Matterhorn Express moves Waha (Permian) spot #NatGas price to positive for a bit. Waha +$0.01 WoW to close -$0.06. Sept 3: $PR CEO "Matterhorn is online, moving a little bit of gas & coming online in a real way over the next month or 2." #OOTT."* Waha spot natural gas prices were +$0.01 WoW to close at -$0.06 on Friday. And our tweet noted the comments from Permian Resource co-CEO that Matterhorn is online, moving a little bit of gas and is ramping up. So we should see over the next few weeks if Matterhorn will take Waha spot prices above zero for a bit. Below is the Waha spot natural gas price as of Friday close and the Whitewater Midstream (operator) Matterhorn Express pipeline map. Our Supplemental Documents package includes the Matterhorn Express pipeline project sheet.

Figure 16: Waha Natural Gas Prices to Sept 13 close



Source: Bloomberg

Figure 17: Matterhorn Express Pipeline, 2.5 bcf/d

Source: Matterhorn Express

09/03/24: Permian Resource "*Matterhorn is online, moving a little bit of gas*"

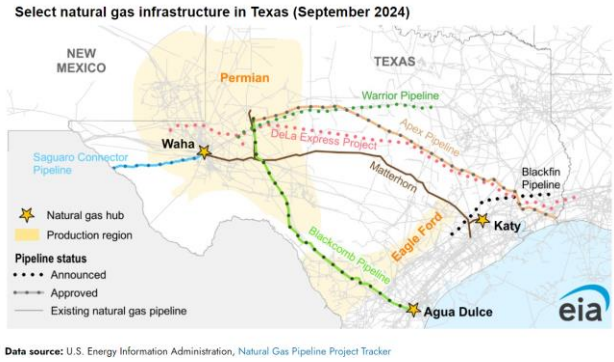
Our tweet included the transcript excerpt of Permian Resource co-CEO William Hickey update on the 2.5 bcf/d Matterhorn Express pipeline in the Q&A of his sellside presentation on Sept 3. His comments that Matterhorn is not moving a little bit of gas and is ramping up is consistent with the timing we have been highlighting for mid-Sept. Hickey said "*Having said that, I think the specific one that you're probably referencing is WAHA pricing today. It's been about as bad as it's ever been over the last few weeks. But Matterhorn is online, moving a little bit of gas and coming online in a real way over the next month or 2. And so I think although it continues to get delayed more than we would hope, I feel like I've said it will be on line a month from today, two or three times over the last two or three months. that is going to be on line and moving a real amount of gas over the next couple of months. And so hopefully, that we'll see at least WAHA turn positive. I don't think this is going to be the big game changer for gas. Like ultimately, we have a lot more work to do, I think, with logistics of how we move gas around the nation and really the other countries to solve the supply/demand side of the gas part of the equation. But generally speaking, that would be a nice relief."*

Natural Gas: EIA highlights 2.5 bcf/d Matterhorn Express pipeline about to start

EIA highlights Matterhorn Express pipeline

It was good to see the EIA add its views on Matterhorn Express pipeline. On Tuesday, the EIA posted its blog "*Natural gas pipeline capacity from the Permian Basin is set to increase"* [LINK] that highlights the starting up of the 2.5 bcf/d Matterhorn Express pipeline and how this should help Waha spot natural gas prices. The EIA wrote "*When regional growth in natural gas production outpaces pipeline takeaway capacity additions, capacity constraints exert downward pressure on spot natural gas prices at the Waha Hub, which is near Permian Basin production. Prices at the Waha Hub have been below zero for 46% of trading days in 2024, including every day since July 26, according to data from Natural Gas Intelligence. The lowest price recorded at the Waha Hub this year was -$6.41 per million British thermal units on August 29. The price difference (also known as the basis) between the Waha Hub and the U.S. benchmark Henry Hub widens under constrained pipeline conditions and narrows as those constraints ease. So far in 2024, the Waha Hub spot price has traded an average $2.07 below the Henry Hub price, compared with an average 42 cents below the Henry Hub price in the second half of 2021. The takeaway capacity added when the Matterhorn pipeline enters service should allow producers to increase deliveries of natural gas out of the Permian Basin and help to increase the natural gas price at the Waha Hub, making its price difference to the Henry Hub less negative or even positive."* The EIA blog also highlights other upcoming natural gas pipelines out of the Permian. Our Supplemental Documents package includes the EIA blog.

Figure 18: Selected natural gas infrastructure in Texas



Source: EIA

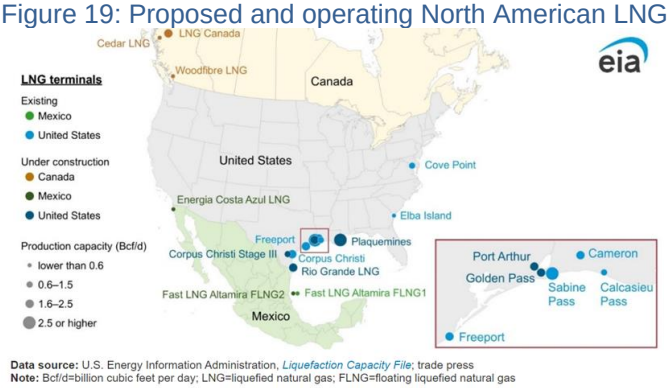
Natural Gas: North American LNG projects to double export capacity by 2028

North American LNG transport capacity to double by 2028

Last week the EIA posted a brief on North American LNG export capacity [LINK]. In 2023 North America maintained the capacity to move 11.4 bcf/d. The EIA reports that if currently planned projects are completed, North America will double its capacity to ~24.4 bcf/d in 2028. The EIA said: "*we estimate LNG export capacity will grow by 0.8 Bcf/d in Mexico, 2.5 Bcf/d in Canada, and 9.7 Bcf/d in the United States from a total of 10 new projects that are currently under construction in the three countries".* The projects in Mexico include Fast LNG Altamira, two floating LNG production units, each with the capacity to liquefy 0.199 bcf/d, and the Energia Costa Azul LNG export terminal with 0.4 bcf/d capacity. Canada currently has three LNG export projects under construction, with a combined capacity of 2.5 bcf/d, and four LNG export projects authorized by the CER with proposed export capacity 4.1 bcf/d; and the U.S.

has five projects under construction with 9.7 bcf/d combined capacity. The map below shows the existing and under construction facilities in North America. Our Supplemental Documents Package includes the EIA brief.

Figure 19: Proposed and operating North American LNG facilities



Data source: U.S. Energy Information Administration, *Liquefaction Capacity File*; trade press
Note: Bcf/d=billion cubic feet per day; LNG=liquefied natural gas; FLNG=floating liquefied natural gas

Source: EIA

LNG Canada liquefying natural gas

Natural Gas: LNG Canada flaring marks its start up of liquefaction of natural gas

It looks like LNG Canada has started liquefaction of natural gas at its 1.8 bcf/d Phase 1 LNG project. On Monday, we tweeted [LINK] "*LNG Canada 1.8 bcfd Phase 1 has started to liquefy #NatGas. LNG Canada "low-level flaring has commenced at our export facility in Kitimat. More visible flaring will begin in the coming weeks." "Flaring is normal during facility start-ups." Commissioning #LNG cargos sb in Q4. Should help provide support to winter AECO prices as they ramp up #NatGas receipts & LNG production in commissioning phase. #OOTT."* Last Thurs (Sept 5), LNG Canada announced [LINK] "*Community Notification: Low-Level Flaring Has Commenced,. LNG Canada is now safely receiving gas from the Coastal GasLink pipeline and low-level flaring has commenced at our export facility in Kitimat. More visible flaring will begin in the coming weeks."* Flaring is the norm during facility startup and shutdown. So the flaring represents the startup of liquefaction at Phase 1. In fact, LNG Canada's "*3 Things to Know About Flaring at the LNG Canada Facility*" states flaring is expected during the start u of operations.

Difference between "commissioning" vs "commercial" LNG Canada cargoes

Note that, while no one knows how long LNG Canada will be producing commissioning LNG cargoes, we believe that LNG Canada will not stay in commissioning phase any longer than needed given Shell's negative experience with Venture Global LNG commissioning period noted below. We want to remind readers that we are talking about commissioning LNG cargoes at LNG Canada and not commercial LNG cargoes. And we responded to tweets reminding us that LNG Canada plan is for first cargoes in mid 2025 by explaining LNG Canada is talking about first commercial LNG cargoes in the mid 2025. And our comments have been talking about the commissioning LNG cargoes that will be done in the coming weeks/months as LNG Canada processes natural gas into LNG and loads onto LNG tankers during this commissioning phase. Look at commissioning phase as the period that LNG Canada takes to work out the bugs in the process before it moves to

commercial LNG cargoes. There is no set number of commissioning LNG cargoes or no set time to complete the commissioning phase. But now that LNG Canada has noted they are processing natural gas in the LNG facility, they will be producing LNG that will go onto commissioning LNG cargoes. We just don't know when and how many commissioning cargoes. But the key is that whether its commissioning or commercial LNG cargoes, LNG Canada will be consuming natural gas to make LNG.

08/29/24: LNG Canada started introducing natural gas to LNG facilities

The start of flaring and start of liquefaction is in line with the expected timing from LNG Canada's Aug 29, 2024 release that they had started to receive natural gas into the LNG facility. Here is what we wrote in our Sept 1, 2024 Energy Tidbits memo. "*On Thursday, LNG Canada announced [LINK] "This week, LNG Canada expects to introduce natural gas to its Kitimat facility for the first time. Once natural gas is received from the Coastal GasLink pipeline and all safety checks are satisfied, a small flare pilot will be activated at our vapour flare tower, followed by low-level flaring that will occur over several weeks prior to more visible flaring. All activities will be closely monitored with advance notifications provided to provincial regulatory authorities, local governments and First Nations. The introduction of natural gas and flaring activities mark a pivotal step in LNG Canada's safe start-up program as we prepare to ship our first cargoes of made-in-B.C. LNG by the middle of 2025." Note that the first cargoes referred to by LNG Canada are the first commercial LNG cargoes. Prior to the first "commercial" LNG cargoes, LNG Canada will be delivering "commissioning" LNG cargoes. No one knows how long the commissioning phase will take but, for now, LNG Canada keeps its stated timeline for commercial cargoes by the middle of 2025. But the reminder is that LNG Canada will be shipping commissioning LNG cargoes but we would assume they are before year end*."

Natural Gas: LNG Canada continues to work towards FID on 1.8 bcf/d Phase 2

LNG Canada 1.8 bcf/d Phase 2

On Thursday, LNG Canada posted a video of CEO Jason Klein's fall update and also posted a transcript of his comments. [LINK]. His update on Phase 1 startup is in line with the recent LNG Canada press releases. But Klein also reminded that LNG Canada is still working towards setting up conditions for their five joint venture participants to FID the 1.8 bcf/d Phase 2. Phase 2 is the brownfield expansion of Phase 1. Klein wasn't specific on the conditions. But he reminded that LNG Canada has paid $5 billion to BC businesses. Klein said "*For our part, I'm proud to announce that the value of contracts and procurement to British Columbia based businesses awarded by LNG Canada and its contractors has just exceeded $5 billion. That includes more than $4.1 billion to local and Indigenous-owned businesses. We see opportunities to deliver even more benefits with our proposed Phase 2 expansion. We continue to work towards conditions needed for our five joint venture participants to reach a Phase 2 final investment decision."* Our Supplemental Documents package includes the LNG Canada update.

Natural Gas: Shell, Venture Global 'wrongfully earned' $3.5b LNG commissioning delay

Shell and Venture Global LNG dispute

As noted above, we may not know how many commissioning LNG cargoes or how long it will take for the commissioning phase, we expect LNG Canada will not stay in commissioning phase any longer than required. A key reason for our view is the negative experience, Shell (the major LNG Canada joint venture participant) has had a negative experience being on the

other end of a commissioning period being extended longer than Shell believes was needed. On Sept 5, Platts reported "*Shell says Venture Global 'wrongfully earned' $3.5 bil from Calcasieu Pass LNG commissioning delay*." [LINK] Times were different than as there was big money to be made by Venture Global selling commissioning LNG cargoes for high spot LNG prices instead of selling commercial cargoes to Shell and others. Shell argues that Venture Global sold cargoes as commissioning cargoes at huge spot market prices instead of selling these LNG cargoes as commercial cargoes to its contracted buyers such as Shell at the much lower contract price. Platts wrote "*Calcasieu Pass, which has a nameplate capacity of 10 million metric tons per year, has loaded more than 360 cargoes since the first export from the facility in March 2022, S&P Global Commodity Insights data showed Sept. 5*." And "*Venture Global has said it expects to begin full operations in late 2024, having attributed the prolonged commissioning to the novel design of Calcasieu Pass and problems with power generation facilities at the plant. Edison said in a recent filing with US energy regulators that the issue is being litigated in six arbitrations between Venture Global and the foundational customers."* Our Supplemental Documents package includes the Platts report.

CN frac sand to NE BC

Natural Gas: CN Rail pointing to active winter NE BC natural gas completions activity

CN Rail didn't come out and say they expected a more active NE BC completions activity this winter but their comments on frac sand point to more active NE BC completions. CN presented at a US sellside conference on Wednesday. In their prepared remarks, mgmt highlighted a couple of areas that *are seeing higher rail volumes, one of which was frac sand deliveries to NE BC. Mgmt said "But give you a few example we have, and we've talked about it in Toronto, a fuel distribution facility, this is a significant investment by our customers that invested in this facility in Mac [ph] yard, that started to be on line in May, and that's giving us great carloads. We have frac sand going to our Northeast BC, where we have tons of projects over there. And we have a customer that actually is now expanding -- is the receiving facility. So that bodes well for -- on that front."*

ADNOC / IOC sign 15-yr LNG supply deal

Natural Gas: ADNOC signs 0.13 bcf/d 15-year LT LNG deal with Indian Oil

On Monday, the Abu Dhabi Media Office reported that ADNOC signed a 0.13 bcf/d 15-year LNG supply deal with Indian Oil for the delivery of LNG assumed to begin in late 2028 [LINK]. The government media office reported *"The LNG will mainly come from ADNOC's Ruwais LNG project".* The project which has awarded a 10% stake to each, Shell, BP, TotalEnergies, and Japan's Mitsui, is expected to begin output in 2028 and will run on clean power. ADNOC said this in their press release: "*The agreement further strengthens ADNOC's position in India's fast-growing energy market. By 2029, IndianOil is expected to become ADNOC's biggest LNG customer, with a total offtake of 2.2 mmtpa, comprising 1.2 mmtpa from Das Island and 1 mmtpa from Ruwais LNG*". Reuters also said the following regarding the LNG deal: "*ADNOC has big ambitions in gas and LNG, which along with renewable energy and petrochemicals it sees as pillars for its future growth, putting it in competition with regional rivals Qatar - one of the world's top LNG exporters - and Saudi Arabia, which also has LNG ambitions"*.

There have been 25.74 bcf/d of long-term LNG supply deals since July 1, 2021

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 25.74 bcf/d of long-term LNG deals since July 1, 2021. 64% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (i.e. Chevron, Shell, etc.) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 43% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long-term supply deals since July 1, 2021.

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

Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan / Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea / US	0.05	19.0	2027	2046
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh / Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	Bangledesh / Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China / Qatar	0.53	27.0	2027	2054
Jun 26, 2023	ENN LNG	Cheniere	Singapore / US	0.24	20.0	2026	2046
Jul 5, 2023	Zhejiang Energy	Mexico Pacific Ltd	China / Mexico	0.13	20.0	2027	2047
Aug 8, 2023	LNG Japan	Woodside	Japan / Australia	0.12	10.0	2026	2036
Sep 7, 2023	Petrochina	ADNOC	China / UAE	n.a.	n.a.	n.a.	n.a.
Nov 2, 2023	Foran	Cheniere	China / US	0.12	20.0	n.a.	n.a.
Nov 4, 2023	Sinopec	QatarEnergy	China / Qatar	0.39	27.0	2026	2053
Nov 27, 2023	Gunvor Singapore Pte	Delfin Midstream	Singapore / US	0.10	15.0	n.a.	n.a.
Dec 20, 2023	ENN	ADNOC	Singapore / UAE	0.13	15.0	2028	2043
Jan 5, 2024	GAIL	Vitol	India / Singapore	0.13	10.0	2026	2036
Jan 8, 2024	Shell	Ksi Lisims LNG	Singapore / Canada	0.26	20.0	2027	2047
Jan 16, 2024	ExxonMobil	Mexico Pacific Ltd	Singapore / Mexico	0.16	20.0	2024	2044
Jan 29, 2024	Excelerate	QatarEnergy	Bangladesh / Qatar	0.13	15.0	2026	2041
Jan 30, 2024	ADNOC	GAIL India	UAE / India	0.07	10.0	2024	2034
Feb 6, 2024	Petronet LNG	QatarEnergy	India / Qatar	0.99	20.0	2028	2048
Feb 19,2024	Deepak Fertilisers	Equinor	India / Norway	0.09	15.0	2026	2041
Feb 28, 2024	Kogas	Woodside	Korea / Australia	0.07	10.5	2026	2037
Feb 29, 2024	Sembcorp	TotalEnergies	Singapore / France	0.11	16.0	2027	2043
Apr 29, 2024	Kogas	BP	Korea / Singapore	0.12	11.0	2026	2037
May 26, 2024	AMNS	Shell	India / Canada	0.05	10.0	2027	2037
May 28, 2024	Hokkaido	Santos	Japan / Australia	0.05	10.0	2027	2037
Jun 4, 2024	IOCL	TotalEnergies	India / France	0.11	10.0	2026	2036
Jun 5, 2024	CPC	QatarEnergy	Taiwan / Qatar	0.53	27.0	2025	2052
Jul 11, 2024	CPC	Woodside	Taiwan / Australia	0.79	10.0	2024	2034
Aug 6, 2024	Osaka Gas	ADNOC	Japan / UAE	0.11	10.0	2028	2038
Aug 26, 2024	KPC	QatarEnergy	Kuwait / Qatar	0.39	15.0	2025	2040
Aug 26, 2024	POSCO International	Mexico Pacific Ltd	Korea / Mexico	0.09	20.0	2027	2047
Sep 2, 2024	BOTAS	Shell	Turkey / UAE	0.39	10.0	2027	2037
Sep 2, 2024	Indian Oil	ADNOC	India / UAE	0.13	15.0	2028	2043
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**16.51**			

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	Austira/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
Aug 5 2024	Galp	Cheniere	Portugal / US	0.07	20.0	2030	2050
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**9.24**			

Total New Long Term LNG Contracts since Jul/21	**25.74**

*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/

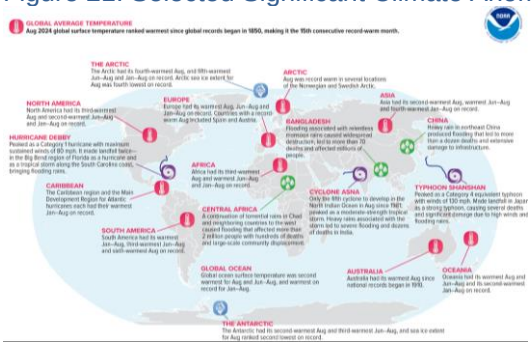
Source: SAF

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

Warmest August on record globally

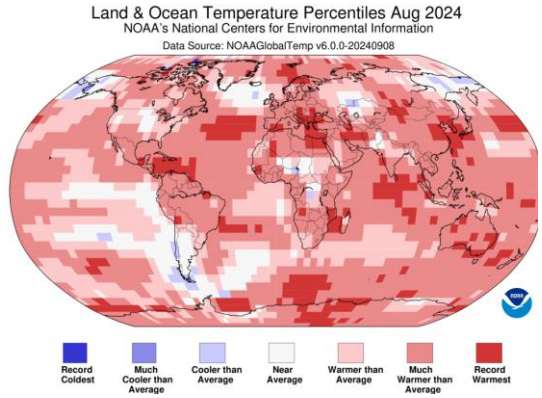
On Friday, the NOAA posted their August recap for the global climate, which was another record-breaking month of warm temperatures [LINK]. August 2024 was the warmest August on the record. The NOAA wrote "*The August global surface temperature was 1.27°C (2.29°F) above the 20th-century average of 15.6°C (60.1°F), making it the warmest August on record. This was 0.01°C (0.02°F) above the previous August record set last year, and the 15th consecutive month of record-high global temperatures. August 2024 marked the 46th consecutive August (since 1979) with temperatures at least nominally above the 20th-century average".* Below is a map of selected significant climate anomalies and events from August.

Figure 21: Selected Significant Climate Anomalies and Events for August 2024



Source: NOAA

Figure 22: Land & Ocean Temperature Percentiles for Aug 2024



Source: NOAA

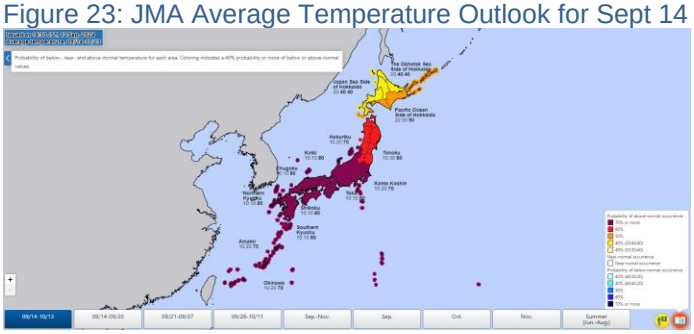
Natural Gas: Japan expects warmer than normal temps to continue to mid Oct

JMA temperature forecast for the next 30 days

It was a hot summer in Japan and the hot weather is expected to continue for the next 30 days. But we remind that hot for September is not as hot as being hot in August. On Thursday, the Japan Meteorological Agency updated its forecast for the next 30 days, Sept 14 thru Oct 13, in Japan [LINK]. There is no JMA commentary on the forecast. JMA is calling for well above normal temperatures for September and the first week of October, with a +70% probability of above normal temperature occurrence everywhere, except Tohoku with a

60% probability of above normal temperature occurrence, and Hokkaido with a 40%-50% probability of above normal temperature occurrence. We checked AccuWeather and they are forecasting daily highs in the next week in the low 30'sC which should drive some A/C demand but then the daily highs are in the 23-27C range, which won't drive any A/C demand. As a reminder Japanese offices and houses tend to have air conditioning set at much higher temperature levels than in North America. Below is the JMA temperature forecast for the next 30 days.

Figure 23: JMA Average Temperature Outlook for Sept 14 – Oct 13



Source: Japan Meteorological Agency

Fits JMA's Aug 20 forecast for a warmer than normal November for Japan

The JMA continuing to forecast a much warmer than normal next 30-days seems to keep tying into the JMA's recent Aug 20 forecast for a warm start to winter. Here is what we wrote in our Aug 25, 2024 Energy Tidbits memo. "*It's been a hot summer in Japan and it looks like the warmer than normal weather will continue at least thru November. On Tuesday, the Japan Meteorological Agency updated its forecast for November in Japan [LINK]. There is no JMA commentary on the forecast. JMA is calling for above normal temperatures in the northern part of Japan with a 40% probability of above normal temperature occurrence, and near-normal temperatures for the southern part of Japan. We checked AccuWeather and they are forecasting daily highs in the 17-20C range, and nighttime lows of around 12C. This shouldn't generate much natural gas demand for air conditioning. Rather it's what we call "leave the windows open" weather. Below is the JMA temperature forecast for November.*"

Figure 24: JMA Average Temperature Outlook for November

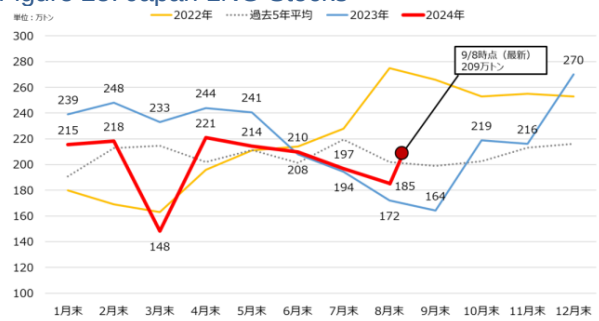
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks up WoW, up YoY

Japan LNG stocks up WoW

Japan's LNG stocks are up WoW, are up YoY and are now up from the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on September 8 were 100.4 bcf, up +14.2% WoW from September 1 of 87.9 bcf, and up +27.4% from 78.7 bcf from a year ago. Stocks are up 5.0% from the 5-year average of 95.6 bcf. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 25: Japan LNG Stocks



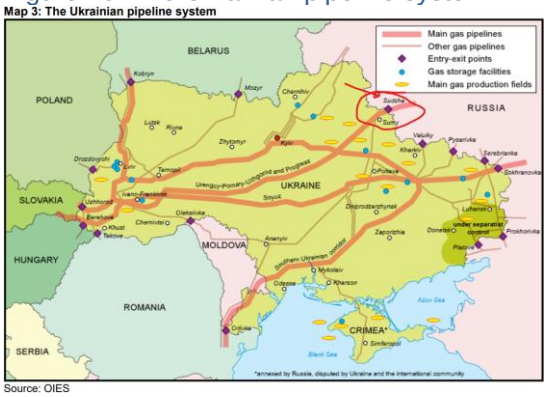
Source: METI

Natural Gas: Russia continues to ship NatGas despite Ukraine control of Sudzha

Ukraine captures key Russian gas infrastructure

It's now been over a month since Ukraine invaded the Russian region of Kursk and took over control of the Sudzha natural gas intake station in Russia for transport on the last remaining open natural gas intake station in Russia for transport on the last remaining open natural gas pipeline allowed to export Russian natural gas to central European countries. Europe TTF gas prices were up 5% when Ukraine took over Sudzha on fears of supply interruption. However, since then Gazprom has confirmed almost daily, if not daily, that there has been no interruption in natural gas supplies. The latest confirmation we saw the Bloomberg Sept 13 report that Gazprom continues to ship the same volume of natural gas of 1.50 bcf/d via Sudzha. That shouldn't surprise because if Gazprom stops natural gas from entering the pipeline at Sudzha, they will be forsaking any export natural gas revenues and Russia needs every dollar it can get. And, at the same time, Ukraine continues to take the transit fees revenue. So, for now at least, it looks like a reminder from Ukraine to Russia that they can cut off Russian natural gas at any time. Below is a 2018 map from Oxford Institute for Energy Studies showing Sudzha.

Figure 26: The Ukrainian pipeline system



Source: OIES

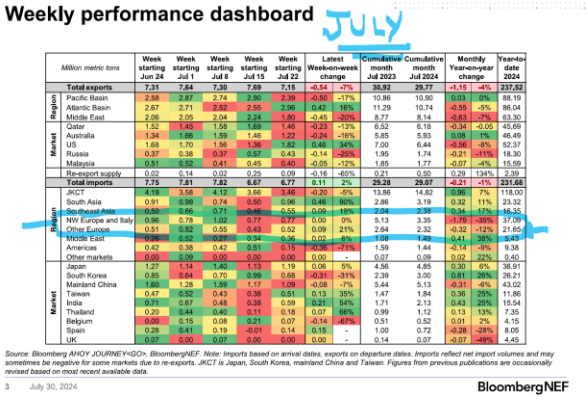
Source: Oxford Institute for Energy Studies

Natural Gas: Europe LNG imports down in Sept after down big in July/Aug

Europe LNG imports down big

We have been highlighting that a big holdback to Europe natural gas prices is that Europe gas storage would be way worse if Europe hadn't moved back in June to significantly reduce LNG imports in July and Aug. This has continued in Sept thru Sept 8. On Tuesday, BloombergNEF reported NW Europe LNG imports thru Sept 8 were down -21% or -1.50 bcf/d YoY. For July and Aug, on Sept 3, we tweeted [LINK] "*Holdback on TTF #NatGas prices. EU #NatGas storage would be at/very close to full IF #LNG imports hadn't been cranked down in July/Aug. Was 92.7% full as of Aug 30. But LNG imports down big. July: -35% or -2.85 bcfd YoY. Aug: -28% or -2.8 bcfd YoY. Thx @BloombergNEF. #OOTT.*" Our Sept 3 tweet reminds that Europe gas storage would have been full by now if NW Europe hadn't been pulling back on LNG imports in July and Aug because it was getting too full too fast. So they cut back LNG imports. On Sept 3, BloombergNEF posted its LNG Trade Weekly, which provided the data for the significantly lower Europe LNG imports that July was down 35% or down 2.85 bcf/d YoY and August was down 28% or down 2.8 bcf/d YoY. Our tweet included the below BloombergNEF charts.

Figure 27 Europe LNG Imports July



Weekly performance dashboard JULY

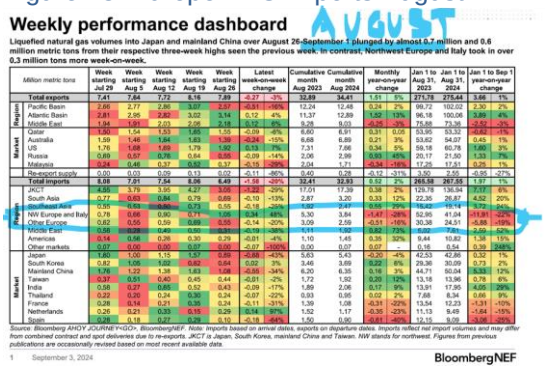
	Million metric tons	Week starting Jun 24	Week starting Jul 1	Week starting Jul 8	Week starting Jul 15	Week starting Jul 22	Latest Week-on-week change		Cumulative month Jul 2023	Cumulative month Jul 2024	Monthly Year-on-year change		Year-to-date 2024
	Total exports	**7.31**	**7.64**	**7.30**	**7.69**	**7.15**	**-0.54**	**-7%**	**30.92**	**29.77**	**-1.15**	**-4%**	**237.52**
Region	Pacific Basin	2.58	2.87	2.74	2.90	2.39	-0.50	-17%	10.86	10.90	0.03	0%	88.19
	Atlantic Basin	2.67	2.71	2.52	2.55	2.96	0.42	16%	11.29	10.74	-0.55	-5%	86.04
	Middle East	2.06	2.05	2.04	2.24	1.80	-0.45	-20%	8.77	8.14	-0.63	-7%	63.30
Market	Qatar	1.52	1.45	1.58	1.69	1.46	-0.23	-13%	6.52	6.18	-0.34	-0.05	45.69
	Australia	1.34	1.66	1.59	1.46	1.22	-0.24	-16%	5.85	5.93	0.08	1%	46.49
	US	1.68	1.70	1.56	1.36	1.82	0.46	34%	7.00	6.44	-0.56	-8%	52.37
	Russia	0.37	0.38	0.37	0.57	0.43	-0.14	-25%	1.95	1.74	-0.21	-11%	18.30
	Malaysia	0.51	0.57	0.41	0.45	0.40	-0.05	-12%	1.85	1.77	-0.07	-4%	15.99
	Re-export supply	0.02	0.14	0.02	0.25	0.09	-0.16	-65%	0.21	0.50	0.29	134%	2.39
	Total imports	**7.75**	**7.81**	**7.82**	**6.67**	**6.77**	**0.11**	**2%**	**29.28**	**29.07**	**-0.21**	**-1%**	**231.66**
Region	JKCT	4.19	3.59	4.12	3.66	3.46	-0.20	-6%	13.86	14.82	0.96	7%	118.00
	South Asia	0.91	0.99	0.74	0.50	0.96	0.46	90%	2.86	3.19	0.32	11%	23.32
	Southeast Asia	0.50	0.66	0.71	0.48	0.55	0.07	15%	2.04	2.38	0.34	17%	16.35
	NW Europe and Italy	0.96	0.78	1.02	0.77	0.77	0.00	0%	5.13	3.35	-1.79	-35%	37.09
	Other Europe	0.51	0.82	0.55	0.43	0.52	0.09	21%	2.64	2.32	-0.32	-12%	21.65
	Middle East	0.28	0.52	0.27	0.34	0.36	0.02	6%	1.08	1.49	0.41	38%	9.43
	Americas	0.42	0.38	0.42	0.51	0.15	-0.36	-71%	1.59	1.44	-0.14	-9%	9.38
	Other markets	0.00	0.09	0.00	0.00	0.00	0.00	-	0.07	0.09	0.02	22%	0.40
Market	Japan	1.27	1.14	1.40	1.13	1.19	0.06	5%	4.56	4.85	0.30	6%	36.91
	South Korea	0.85	0.84	0.70	0.99	0.68	-0.31	-31%	2.39	3.00	0.61	26%	26.21
	Mainland China	1.60	1.28	1.59	1.17	1.09	-0.08	-7%	5.44	5.13	-0.31	-6%	43.02
	Taiwan	0.47	0.52	0.43	0.38	0.51	0.13	35%	1.47	1.84	0.36	25%	11.86
	India	0.71	0.67	0.48	0.38	0.59	0.21	54%	1.71	2.13	0.43	25%	15.54
	Thailand	0.20	0.44	0.40	0.11	0.18	0.07	66%	0.99	1.12	0.13	13%	7.35
	Belgium	0.00	0.15	0.08	0.21	0.07	-0.14	-67%	0.51	0.52	0.01	2%	4.15
	Spain	0.28	0.41	0.19	-0.01	0.14	0.15	-	1.00	0.72	-0.28	-28%	8.05
	UK	0.07	0.00	0.07	0.00	0.00	0.00	-	0.14	0.07	-0.07	-49%	4.45

Source: Bloomberg AHOY JOURNEY<GO>, BloombergNEF. Note: Imports based on arrival dates, exports on departure dates. Imports reflect net import volumes and may sometimes be negative for some markets due to re-exports. JKCT is Japan, South Korea, mainland China and Taiwan. Figures from previous publications are occasionally revised based on most recent available data.

3 July 30, 2024 BloombergNEF

Source: BloombergNEF

Figure 28: Europe LNG imports August



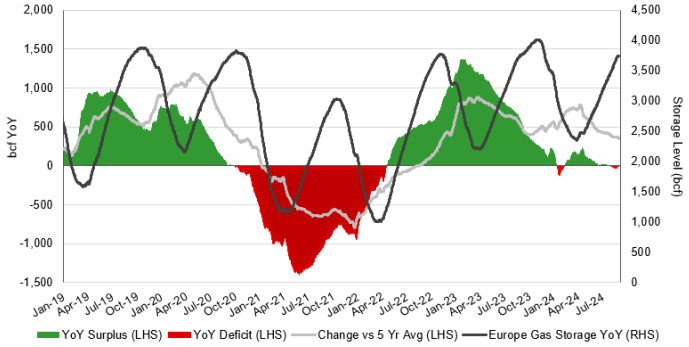
Source: BloombergNEF

Natural Gas: Europe storage up +0.6% WoW to 93.3% full, down -0.4% YoY

Europe gas storage

As expected, European natural gas storage has slowed down in filling up as LNG cargoes have been redirected for the past couple months away from NW Europe as it looked like Europe gas storage would be full early. But even still, it is now over 90% full. We remind that we don't necessarily expect Europe gas to get to 100% full. It's not like going to a gas station where you fill up your car to the limit. Rather, getting to mid 90%s would be considered full. This week, Europe storage was up +0.6% WoW to 93.3% vs 92.7% on September 5. Storage is now down -0.4% from last year's levels of 93.7% on September 12, 2023, but up huge vs the 5-year average of 70.26%. As noted above, Europe gas storage has now reached the low 90%'s, which is about where most will consider full ahead of winter. Below is our graph of European Gas Storage Level.

Figure 29: European Gas Storage Level



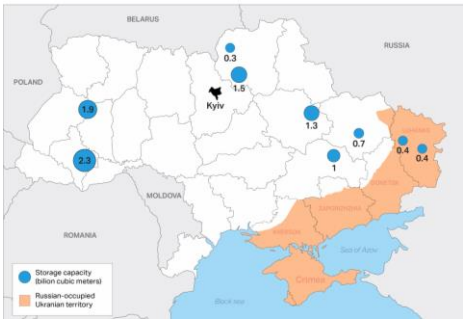
Source: Bloomberg, SAF

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

September 12, natural gas in Ukraine storage was at 24.1% of its total capacity, up from 23.5% of its total capacity on September 5. 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 30: Ukraine Gas Storage Facilities as of July 2023



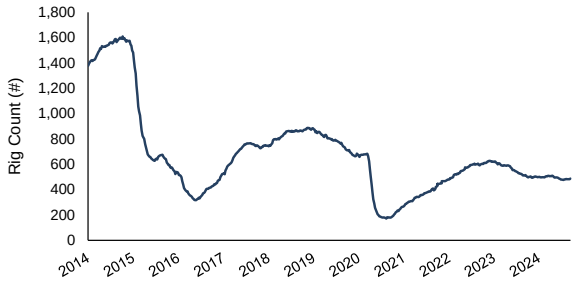
Source: Bruegel

Oil: US oil rigs up +5 WoW and down -27 rigs YoY to 488 oil rigs

US oil rigs down -27 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 up +5 WoW at 488 oil rigs as of September 13th. US oil rigs went below 520 rigs on Aug 25, 2023, were around 490-510 rigs for several months, but then dipped down to 477 on July 19, the lowest oil rig count since December 2021. (iii) Note we can see the basin changes but not by type of rig; the major basin changes were Granite Wash up +1 rig WoW to 5 rigs, Haynesville up +1 rig WoW to 33 rigs, and Marcellus +1 rig WoW to 24 rigs. (iv) The overlooked US rig theme is the YoY declines. Total US rigs are down -51 rigs YoY to 585 rigs including US oil rigs -27 oil rigs YoY to 488 oil rigs. And for the key basins, the Permian is -16 rigs YoY, Haynesville is -8 rigs YoY, DJ Niobrara is -6 rigs YoY and Marcellus -5 rigs YoY. (v) US gas rigs were up +3 rigs this week to 97 gas rigs. It is important to note that U.S. gas rigs must increase over the next several months as more U.S. LNG capacity comes onstream in 2025.

Figure 31: Baker Hughes Total US Oil Rigs

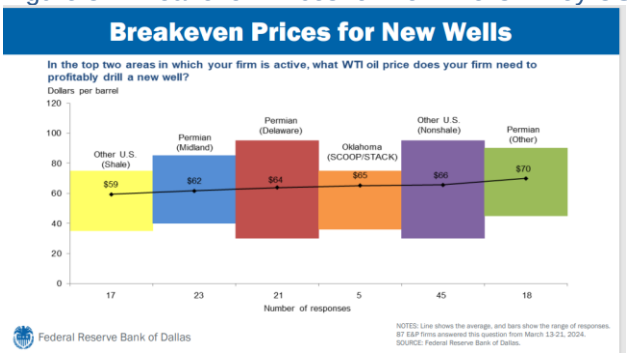


Source: Baker Hughes, SAF

Oil: WTI in $60's likely to keep pressure on US oil rigs

WTO closed up on the week at $69.xx on Sept 13, but it was ~$65 on Tuesday. We may only be speaking with Cdn oil players but we have to believe the US oil players have a similar view. It's now mid-Sept, most have hit or their production targets or can do so with some completions and would rather just be a little careful with spending until the end of the year. And that is especially so when they see WTI dip down to $65 and all the major research teams lowering their oil price forecasts. So we expect US oil rigs are more likely rangebound to US Thanksgiving. There is no one correct view of breakeven prices for new wells but we remind that most oil players don't drill wells with the expectation they will breakeven or get a 10% return. And that is likely moreso in the face of all the major research firms warning on potential oil price weakness. For perspective, below is the Dallas Fed "Breakeven Prices for New Wells" from their June 26, 2024 Energy Slideshow that generally has a breakeven price around $65 for major US shale/tight oil plays. [LINK]

Figure 32: Breakeven Prices for New Wells in key US shale/tight oil plays



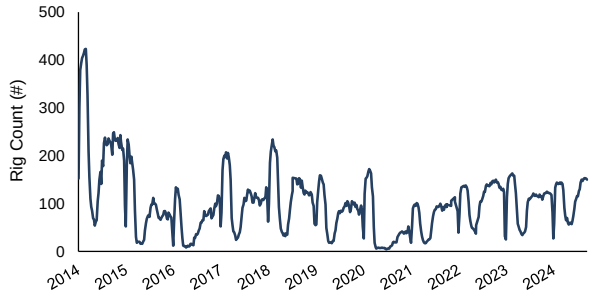
Source: Dallas Fed

Oil: Total Cdn oil rigs down -2 WoW on Friday, with gas rigs flat WoW

Cdn rigs -2 WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. Following the seasonal ramp up in the summer months after spring break-up, rigs are expected to continue to increase in September through to the middle of October. This week's total rig count was down -2 rigs WoW at 218 rigs. Cdn oil rigs were down -2 rigs WoW this week to 150 rigs and are up +31 rigs YoY. Gas rigs are flat WoW this week at 67 rigs and are down -4 rigs YoY, and miscellaneous rigs are up flat WoW at 1 rig total and are up +1 rig YoY. Baker Hughes did not update their old format report, so we weren't able to see the provincial breakouts.

Figure 33: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

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

US weekly oil production

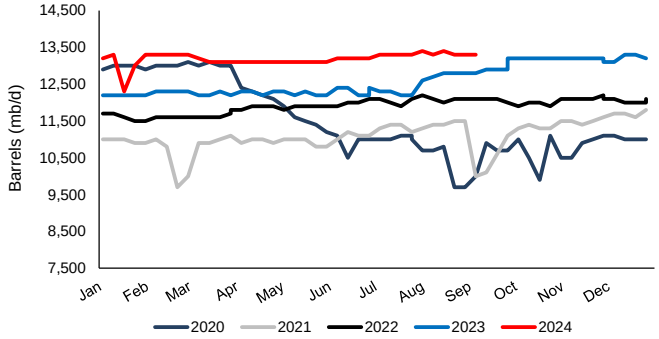
We don't place as much emphasis on the EIA weekly oil supply estimates as others do because we recognize the near impossibility for anyone to post an accurate estimate on a Wednesday for the totality of US oil production for the week ended the prior Friday. We have to give the EIA credit for putting 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 regularly require re-benchmarking. And sometimes the re-benchmarking can be significant and other times, it is relatively small. This week the EIA noted that domestic crude production was re-benchmarked, increasing estimated volumes by 0.057 mmb/d. The EIA's weekly oil supply estimates had been essentially unchanged for the last nine months ranging from 13.1 to 13.3 mmb/d with the weekly estimates in July all at 13.3 mmb/d. This week's estimate is flat WoW at 13.300 mmb/d for the week ending September 6. On Tuesday September 10, the EIA released its September STEO and the EIA provides the backup monthly estimates for US oil production, and they are more or less in line with July at 13.34 mmb/d, August at 13.39 mmb/d, and September at 13.40 mmb/d. This week, the EIA's production estimates were flat at 13.300 mmb/d for the week ended September 6. Alaska was down -0.046 WoW to 0.354 mmb/d, compared to 0.400 mmb/d last week. Below is a table of the EIA's weekly oil production estimates.

Figure 34: 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		
2024-Aug	08/02	13,400	08/09	13,300	08/16	13,400	08/23	13,300	08/30	13,300
2024-Sep	09/06	13,300								

Source: EIA

Figure 35: EIA's Estimated Weekly US Oil Production



Source: EIA

Oil: US shale/tight oil production flat for the last 7 months

Shale/tight oil production

As mentioned earlier, the EIA combined its prior shale/tight oil information with its STEO, which was released on Tuesday for September 2024 [LINK]. (i) The EIA stopped forecasting future oil production by region and has updated their data for oil production from the major shale/tight oil and gas plays up to August. (ii) Note that the EIA revised their data for shale/tight oil production back to 2020 from July's STEO, and we have adjusted our table to reflect the updated data. However, the revisions for the last 12 months were a mix of small ups and downs with the average revision for the past 12 months being up 2,000 b/d. (iii) Shale/tight oil production in August was 8.650 mmb/d, basically flat MoM to July and up +2% YoY. August marks the 7th consecutive month of shale/tight oil at ~8.6 mmb/d, and this is down from ~8.74 mmb/d in Nov/Dec 2023. Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil

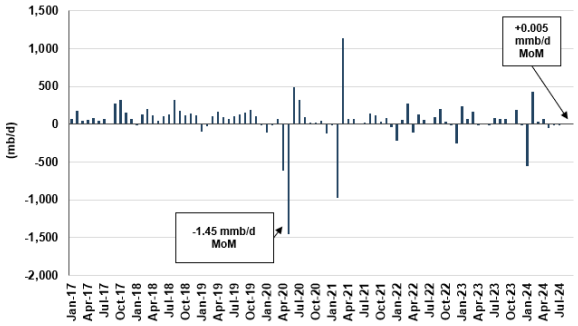
in total. Below is our table of running STEO estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 36: US Major Shale/Tight Oil Production

Thousand b/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	August	August MoM%	August YoY%
Austin Chalk + Eagle Ford	1,143	1,118	1,085	1,077	1,032	990	1,045	1,054	1,086	1,082	1,079	1,076	1,073	-0.3%	-7%
Bakken	1,180	1,260	1,227	1,253	1,247	1,079	1,226	1,202	1,213	1,167	1,166	1,164	1,162	-0.2%	3%
Mississippian + Woodford	236	231	229	231	230	207	220	211	215	208	206	204	202	-0.8%	-17%
Niobrara	462	456	470	481	494	449	473	476	481	482	482	483	483	0.1%	5%
Permian	5,172	5,180	5,236	5,398	5,437	5,173	5,369	5,429	5,437	5,442	5,448	5,457	5,468	0.2%	9%
Rest of US L48	293	293	291	288	281	266	266	262	267	270	261	257	257	0.2%	-16%
Total	8,486	8,537	8,539	8,728	8,720	8,164	8,600	8,633	8,698	8,651	8,641	8,641	8,646	0.1%	2%

Source: EIA, SAF

Figure 37: MoM Changes in US Major Shale/Tight Oil Production



Source: EIA, SAF

Oil: EIA DUCs down -1% MoM in August, DUCs down -11% YoY

DUCs down -1% MoM in August

We have been warning that we see a key risk to how much US oil production can sustainably grow in 2024 and 2025 is the need to increase rig counts (not have less frac spreads) to replenish the inventory of Drilled Uncompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. The EIA's STEO [LINK] now contains the estimate of Drilled Uncompleted wells. (i) The EIA estimates DUCs were down -1% MoM (-11% YoY) in August at 5,383 DUCs. Note that the EIA revised their data for DUC wells from July's STEO back until 2020, and we have adjusted our table to reflect the updated data. (ii) To put in perspective, there were 9,757 DUCs in the height of the Covid slowdown in June 2020, 6,693 DUCs in August 2021, 6,004 DUCs in August 2022, 5,965 in August 2023, and now 6,080 DUCs in August 2024. (iv) The largest YoY August DUCs declines are the Bakken (-23% YoY), and Eagle Ford (-34% YoY). (v) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DUC Wells.

Figure 38: Estimated Drilled Uncomplete Wells in 2023/24

DUCs	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	August	August YoY%	August YoY%
Appalachia region	856	839	830	820	820	813	803	796	792	791	787	783	776	-1%	-9%
Bakken region	417	389	391	373	364	382	378	379	373	356	345	335	323	-4%	-23%
Eagle Ford region	471	443	412	393	415	392	358	337	331	327	321	316	313	-1%	-34%
Haynesville region	811	813	812	804	807	812	817	818	806	805	811	817	825	1%	2%
Permian region	999	1002	925	924	917	914	896	899	901	900	895	888	876	-1%	-12%
Rest of Lower 48 States, excluding GOM	2526	2478	2441	2421	2391	2383	2372	2365	2356	2343	2320	2297	2270	-1%	-10%
Total	6,080	5,964	5,811	5,735	5,714	5,696	5,624	5,594	5,559	5,522	5,479	5,436	5,383	-1%	-11%

Source: EIA, SAF

Oil: EIA Sept STEO no real changes to 2024 and 2025 US oil production forecast

EIA STEO US oil production

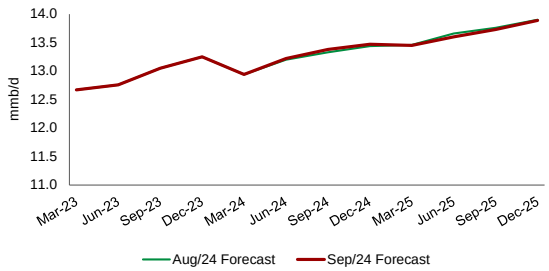
On Tuesday, the EIA released its Short-Term Energy Outlook for September 2024 [LINK], which included a small increase to its 2024 and a small decrease to its 2025 oil production forecasts. (i) The September STEO forecasts for 2024 was essentially unchanged and there was a small decrease to 2025 US oil production estimates vs the August STEO which had been slightly down from July. (ii) The lookback to 2023 was unchanged with the August STEO estimate for 2023 was kept flat at 12.93 mmb/d from the August STEO. Recall the big +140,000 b/d revision in October's STEO from the September STEO's forecast of 12.78 mmb/d, as the EIA had to play catch-up with higher oil production actuals being reported over weekly estimates. (iii) The September STEO forecast for 2024 is essentially unchanged at +0.02 mmb/d to 13.25 mmb/d from the August STEO of 13.23 mmb/d. There were some small revisions by quarter: Q1/24 flat at 12.94 mmb/d, Q2/24 up +0.02 mmb/d to 13.22 mmb/d, Q3/24 up +0.05 mmb/d to 13.38 mmb/d, and Q4/24 up +0.03 mmb/d to 13.47 mmb/d. (iv) The EIA forecasts US oil production of 13.67 mmb/d for 2025 is essentially unchanged at down -0.02 mmb/d from the August STEO. The revisions by quarter were Q1/25 -0.01 mmb/d to 13.45 mmb/d, Q2/25 -0.06 mmb/d to 13.60 mmb/d, Q3/25 down -0.03 mmb/d to 13.73 mmb/d, and Q4/25 -0.01 mmb/d to 13.89 mmb/d. Below is our EIA STEO forecast comparison by month.

Figure 39: EIA STEO Oil Production Forecasts by Month

(million b/d)	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024	Q1/25	Q2/25	Q3/25	Q4/25	2025
Sep-24	12.67	12.76	13.05	13.25	12.93	12.94	13.22	13.38	13.47	13.25	13.45	13.60	13.73	13.89	13.67
Aug-24	12.67	12.76	13.05	13.25	12.93	12.94	13.20	13.33	13.44	13.23	13.46	13.66	13.76	13.90	13.69
July-24	12.63	12.75	13.07	13.26	12.93	12.94	13.21	13.32	13.10	13.25	13.52	13.72	13.84	13.98	13.77
June-24	12.63	12.75	13.07	13.26	12.93	12.94	13.17	13.33	13.50	13.24	13.51	13.68	13.76	13.88	13.71
May-24	12.63	12.75	13.07	13.26	12.93	12.96	13.10	13.25	13.50	13.20	13.55	13.73	13.76	13.87	13.73
Apr-24	12.63	12.75	13.07	13.27	12.93	12.84	13.13	13.32	13.54	13.21	13.56	13.72	13.74	13.86	13.72
Mar-24	12.63	12.75	13.07	13.28	12.93	12.91	13.13	13.25	13.47	13.19	13.49	13.66	13.68	13.78	13.65
Feb-24	12.63	12.75	13.07	13.29	12.93	13.03	13.12	13.06	13.18	13.10	13.37	13.46	13.50	13.64	13.49
Jan-24	12.63	12.75	13.07	13.22	12.92	13.27	13.22	13.15	13.21	13.21	13.36	13.44	13.43	13.53	13.44
Dec-23	12.63	12.75	13.06	13.26	12.93	13.09	13.07	13.07	13.23	13.11					
Nov-23	12.63	12.75	13.07	13.17	12.90	13.06	13.08	13.11	13.35	13.15					
Oct-23	12.63	12.75	13.13	13.16	12.92	13.07	13.02	13.07	13.31	13.12					
Sep-23	12.63	12.71	12.86	12.94	12.78	13.03	13.09	13.15	13.36	13.16					
Aug-23	12.63	12.67	12.81	12.93	12.76	12.98	13.01	13.08	13.27	13.09					
Jul-23	12.61	12.55	12.48	12.63	12.56	12.67	12.71	12.88	13.13	12.85					
Jun-23	12.60	12.56	12.57	12.70	12.61	12.69	12.63	12.76	13.00	12.77					
May-23	12.54	12.51	12.46	12.61	12.53	12.63	12.58	12.68	12.85	12.69					
Apr-23	12.54	12.50	12.50	12.61	12.54	12.69	12.71	12.77	12.83	12.75					
Mar-23	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.71	12.63					
Feb-23	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65					
Jan-23	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81					

Source: EIA STEO

Figure 40: Estimated US Crude Oil Productions by Forecast Month



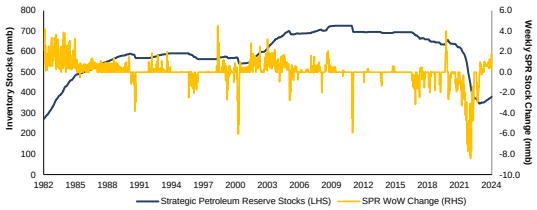
Source: EIA STEO

Oil: US SPR less commercial reserve deficit widens, now -39.192 mmb

US SPR reserves

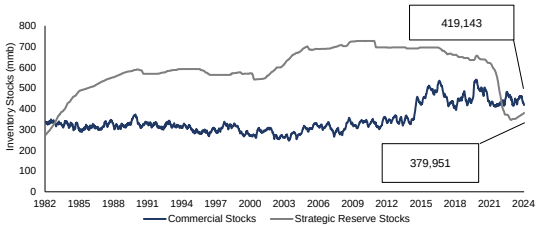
The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022 week. This week, we saw a build on the SPR side and a build on the commercial side. The EIA's weekly oil data for September 6 [LINK] saw the SPR reserves increase +0.279 mmb WoW to 379.951 mmb, while commercial crude oil reserves increased +0.833 mmb to 419.143 mmb. There is now a -39.192 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 41: Strategic Petroleum Reserve Stocks and SPR WoW Change



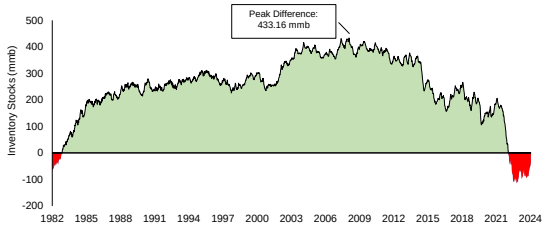
Source: EIA

Figure 42: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 43: US Oil Inventories: SPR Less Commercial



Source: EIA

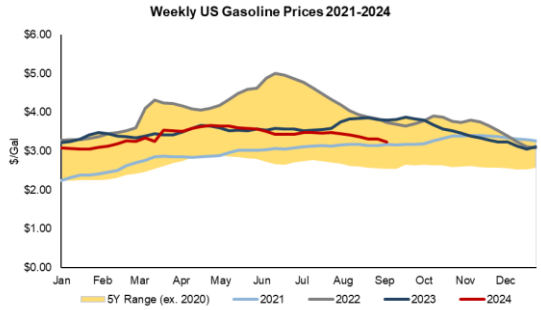
Oil: US national average gasoline price -$0.06 WoW to $3.22

US gasoline prices

Yesterday, we tweeted [LINK] "*US National average gasoline prices keep drifting lower, but California moving higher in Sept. AAA National average prices -$0.06 WoW to $3.22 on Sept 14, -$0.23 MoM and -$0.64 YoY. California $4.77 on Sept 14, +0.08 WoW, +$0.17 MoM, and -$0.74 YoY. Thx @AAAnews #OOTT."* Yesterday, AAA reported that US national

average prices were $3.22 on Sept 14, which was -$0.06 WoW, -$0.23 MoM and -$0.64 YoY. Yesterday, AAA also reported California average gasoline prices were $4.77 on Sept 14, which was +$0.08 WoW, +$0.17 MoM, and -$0.74 YoY. Below is our graph of Bloomberg's National Average weekly gasoline prices.

Figure 44: National Average Gasoline prices



Source: Bloomberg

Oil: Crack spreads -$0.49 WoW to $14.30, WTI +0.98 WoW to $68.65

Crack spreads closed at $14.30

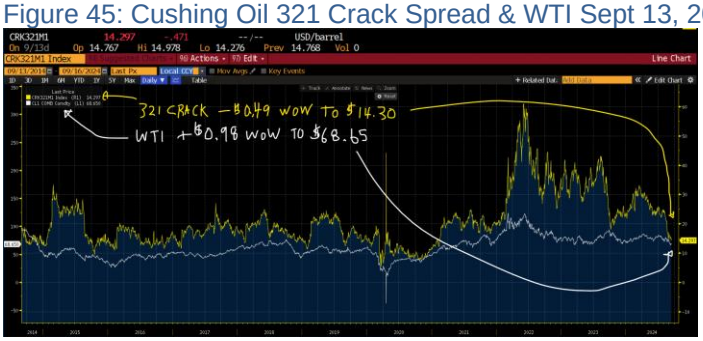
On Friday, we tweeted [LINK] "*321 crack spreads stay weak, -$0.49 WoW to $14.30. WTI was +$0.98 WoW to $68.65. Crack spreads haven't been <$15 since Feb/21 when WTI was ~$60. Other factors aside, $14.30 cracks are no incentive for refineries to take extra crude & drive up WTI. Thx @business #OOTT.*" It was the second consecutive week of sub $15 for 321 crack spreads. Crack spreads were -$0.49 WoW to $14.30 and WTI was +$0.98 WoW to $68.64. Crack spreads of $14.30 are very low and below the normal pre-Covid ranges of $15-$20. The last time crack spreads were below $15 was in Feb 2021 when WTI was ~$60. There is no real financial incentive for refineries to refine any extra oil. Crack spreads of $14.30 on Sept 13 followed $14.79 on Sept 6, $17.06 on Aug 30, $17.10 on Aug 23, $20.75 on Aug 16, $22.92 on Aug 9, $23.77 on Aug 2, $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, and $23.45 on June 14.

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

There are other global oil and market items that impact WTI. But, other factors aside, we have focused on crack spreads for since the 90s as they are an unchanged fundamental of refineries – wide/high crack spreads provide incentives for refineries to buy more crude because there are big profit margins to be made. We track US crack spreads but there is also an influence on global refining capacity on US crack spreads as the increasing global refining capacity would also tend to have downward pressure on US crack spreads especially with demand being less than most expect. So if crack spreads are wide/high, it is normally a positive for the very near term look ahead to WTI. Conversely, if crack spreads are narrow/low ,it doesn't give refineries any real incentive to take more crude, which is normally softness for the very near term look ahead to WTI. 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 $14.30 as of the Friday Sept 13, 2024 close.

Figure 45: Cushing Oil 321 Crack Spread & WTI Sept 13, 2014 to Sept 13, 2024



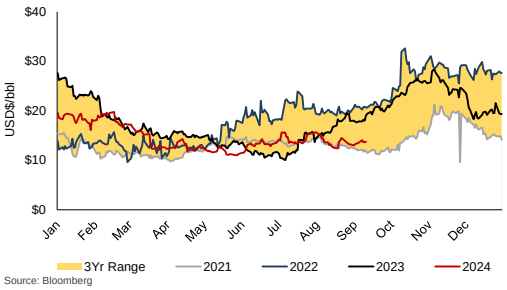
Source: Bloomberg

Oil: Cdn heavy oil differentials widen +$0.10 WoW to close at $13.75 on September 13

WCS differential widened slightly

As a reminder, there is no work stoppage or rail strike in Canada as last month the parties were ordered back to work under their existing contract and to go to binding arbitration for a new contract. WCS less WTI differentials have been moving up this week and closed the week up +$0.10 WoW at $13.75. We should have the first good test of how the start of the 590,000 b/d TMX will impact WCS less WTI differentials as the 435,000 b/d BP Whiting production goes into turnaround next week. The WCS less WTI spread widened +$0.10 WoW to $13.75 on September 13. Now that we are in September, 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 August. The WCS less WTI differential closed on September 13, at $13.75 which was a widening of +$0.10 WoW vs $13.65 on September 6.

Figure 46: WCS less WTI oil differentials to September 13 close



Source: Bloomberg

Oil: Good test for TMX impact on WCS less WTI dffs with BP Whiting turnaround

BP Whiting refinery turnaround

For the past few months, we have been saying that the big test for the impact of the start of the 590,000 b/d TMX expansion on WCS less WTI differentials will be in Aug and Sept when differentials normally start to widen with seasonal refinery turnarounds. BP Whiting 435,000 b/d refinery runs on Cdn crude and is expected to start an approx. 2 month turnaround this week. Yesterday, we tweeted a reply [LINK] "T*hx @garquake for good reminder of TMX impact. WCS less WTI diffs had already started their seasonal decline at this time of year in 2022 and 2023. Here is WCS less WTI differentials to Sept 13 close. #OOTT."* @garquake had tweeted out about the BP Whiting turnaround and the potential impact on WCS less WTI differentials. Our tweet included the below chart that shows how WCS less WTI differential have been stronger this summer and how differentials had already started to widen at this time of year in 2022 and 2023.

Figure 47: WCS less WTI differentials

Source: Bloomberg

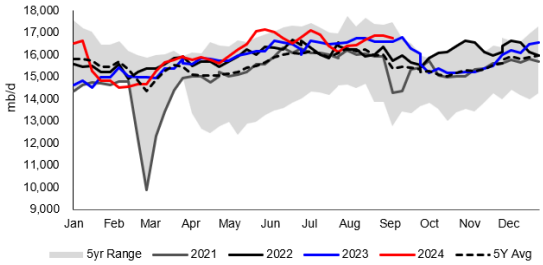
Oil: Refinery Inputs down -0.141 mmb/d WoW to 16.759 mmb/d

Refinery inputs -0.141 mmb/d WoW

There are always unplanned refinery items that impact crude oil inputs into refineries. And there is always different timing for refinery turnarounds; generally late August/early September is when refineries start their fall turnarounds so we would expect to see oil input into refineries start to seasonally decline. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended September 6 [LINK]. The EIA reported crude inputs to refineries were down -0.141 mmb/d this week to 16.759 mmb/d and are up -

0.041 mmb/d YoY. Refinery utilization was down -0.5% WoW to 92.8% and was down -0.9% YoY.

Figure 48: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports up +1.526 mmb/d WoW as oil exports down -0.451 mmb/d WoW

The EIA reported US "NET" imports were up +1.526 mmb/d to 3.562 mmb/d for the week of September 6. US imports were up +1.075 mmb/d to 6.867 mmb/d, while exports were down -0.451 mmb/d to 3.305 mmb/d. Top 10 was up +0.911 mmb/d. (i) 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. However, EIA monthly data shows Padd 3 imports from Venezuela were 226,100 b/d for June. Give the EIA credit for putting out weekly oil import estimates, but it's a reminder that we must be careful about using the weekly oil import estimates. Rather we need to make sure we go to the monthly data for oil imports. (ii) Canada was up +0.510 mmb/d to 4.026 mmb/d. We should a decrease in the coming weeks with the 435,000 b/d BP Whiting going into turnaround for approx. 2 months. Weekly imports have been higher of late with the increased Cdn crude coming off TMX and hitting west coast US refineries. (iii) Saudi Arabia was up +0.122 mmb/d to 0.326 mmb/d. (iv) Mexico was up +0.136 mmb/d to 0.510 mmb/d. Oil imports from Mexico lately 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. (v) Colombia was up +0.050 mmb/d to 0.229 mmb/d. (vi) Iraq was up +0.021 mmb/d to 0.222 mmb/d. (vi) Ecuador was down -0.001 mmb/d to 0.103 mmb/d. (vii) Nigeria was up +0.143 mmb/d to 0.175 mmb/d.

Figure 49: US Weekly Preliminary Imports by Major Country

	Jul 19/24	Jul 26/24	Aug 2/24	Aug 9/24	Aug 16/24	Aug 23/24	Aug 30/24	Sep 6/24	WoW
Canada	4,364	4,033	3,478	3,785	4,083	3,874	3,516	4,026	510
Saudi Arabia	221	144	353	183	207	311	204	326	122
Venezuela	0	0	0	0	0	0	0	0	0
Mexico	355	504	224	714	167	619	374	510	136
Colombia	314	207	215	71	213	212	179	229	50
Iraq	150	178	143	194	166	153	201	222	21
Ecuador	102	160	235	137	163	103	104	103	-1
Nigeria	197	113	170	109	190	33	32	175	143
Brazil	271	71	267	428	177	302	180	113	-67
Libya	0	144	115	2	86	1	86	83	-3
Top 10	5,974	5,554	5,200	5,623	5,452	5,608	4,876	5,787	911
Others	897	1,399	1,024	662	1,200	952	916	1,080	164
Total US	**6,871**	**6,953**	**6,224**	**6,285**	**6,652**	**6,560**	**5,792**	**6,867**	**1,075**

Source: EIA

More US sanctions on Venezuela

Oil: New US sanctions target Venezuelan individuals and not its oil exports

Last week's (Sept 8, 2024) Energy Tidbits highlighted the reports that US was expected to put new sanctions on Venezuela but these would not impact Venezuela's oil production or exports including to the US. That happened and on Thursday, the US Treasury announced "*Treasury Targets Venezuelan Officials Aligned with Nicolas Maduro in Response to Electoral Fraud."* [LINK] And "*Today, the Department of the Treasury's Office of Foreign Assets Control (OFAC) designated 16 Maduro-aligned officials who obstructed a competitive and inclusive presidential election process in Venezuela and violated the civil and human rights of the people. The individuals sanctioned today pursuant to Executive Order (E.O.) 13692, as amended, include leaders of the Maduro-aligned National Electoral Council (CNE) and the Supreme Tribunal of Justice (TSJ) who impeded a transparent electoral process and the release of accurate election results, as well as the military, intelligence, and government officials responsible for intensifying repression through intimidation, indiscriminate detentions, and censorship. The officials were appointed by Nicolas Maduro, whom OFAC sanctioned in 2017.*" The new US sanctions were on individuals. We continue to believe that, if the US wanted to really impact Maduro and Venezuela, they should go back to the enforcement of sanctions on Venezuela oil that would hurt their oil production and oil exports revenue.

US importing 226,000 b/d from Venezuela

As noted above, if the US wanted to hurt Maduro and Venezuela, the US would go back and enforce sanctions such that Venezuela oil production and oil exports are hurt. The EIA's latest monthly data is for June and the EIA estimates the US imported 226,000 b/d from Venezuela in June, which was flat MoM from 224,000 b/d in May. Below is the current EIA graph of oil imports from Venezuela.

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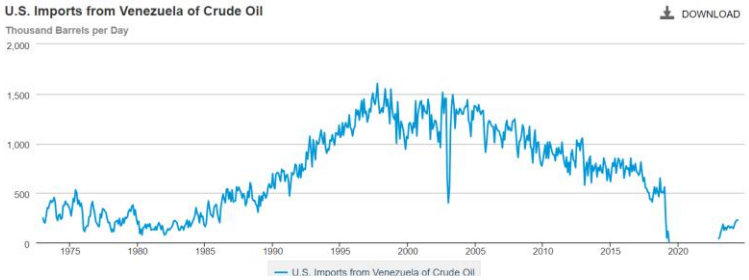
Figure 50: US oil imports from Venezuela



Source: EIA

Putin warns the west

Oil: Putin, US & EU are at war with Russia if provide long-range missiles to Ukraine

No one knows what Putin will do but Putin gave a clear warning to the US, UK and NATO on Thursday if they provide and help Ukraine use long-range missiles. On Friday, we tweeted [LINK] "*Will Putin follow up on this threat? "direct participation [of Western countries in the conflict in UKR] already significantly changes the very essence, the very nature of the conflict. This will mean that NATO countries, the US, European countries are at war with RUS" #OOTT #NatGas #LNG."* And [LINK] "*here is transcript for Putin's answer on US/UK providing/helping Ukraine use long-range missiles at Russia means "the US and European countries - are at war with Russia"... we will make appropriate decisions in response to the*

threats that will be posed to us". #OOTT #NatGas." Our 2nd tweet included the full Kremlin transcript of Putin's complete answer when asked about Ukraine being allowed to strike targets deep inside Russia "using Western long-range weapons". Putin explained that it wasn't just giving the long-range missiles, Ukraine would be having western radar and technical assistance to use long-range missiles. And he concluded with the headline *"If this decision is made, it will mean nothing short of direct involvement – it will mean that NATO countries, the United States, and European countries are parties to the war in Ukraine. This will mean their direct involvement in the conflict, and it will clearly change the very essence, the very nature of the conflict dramatically. This will mean that NATO countries – the United States and European countries – are at war with Russia. And if this is the case, then, bearing in mind the change in the essence of the conflict, we will make appropriate decisions in response to the threats that will be posed to us."* Our Supplemental Documents package includes the Kremlin transcript.

US says no change to banning Ukraine using long-range missiles into Russia

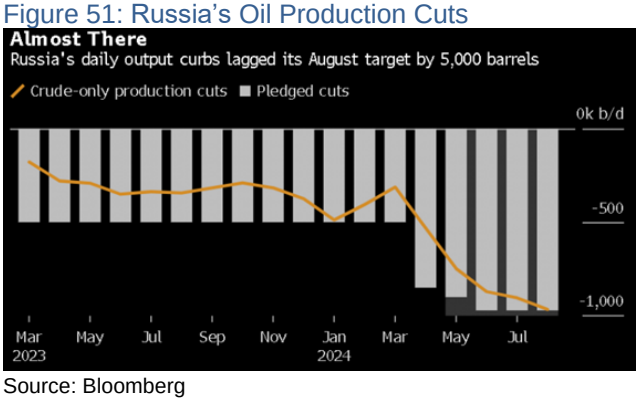
No surprise that the first question at the On-the-Record press gaggle by White House National Security Communications Advisor John Kirby on Friday was if there was any change to the US policy of banning Ukraine using long-range missiles deep into Russia. Kirby said no. The White House transcript wrote "*MR. KIRBY: I would not expect there to be any announcements on this coming out of the meeting today. There's been no change to our policy, Lara, with respect to the long-range strike capability inside Russia, and I'd leave it at that."*

Oil: Russia's August oil production down MoM -0.062 mmb/d to 8.983 mmb/d

On Tuesday Bloomberg reported that Russia's August oil production fell -0.062 mmb/d in August to 8.953 mmb/d; this figure is -0.005 mmb/d above Russia's current output target under OPEC+. This decrease is in line with promises by Russia to make production cuts, following previous overproduction. Regarding the cuts, Bloomberg reported "*Improved compliance of the laggard nations has become a focus for OPEC+ as the alliance aims to demonstrate discipline amid falling prices. Last week, in response to a recent price decline, OPEC+ postponed by two months a supply hike planned for October, but the move wasn't enough to spur a price recovery*". Our Supplemental Documents Package contains the Bloomberg report.

Russia's August oil production down MoM

Figure 51: Russia's Oil Production Cuts



Source: Bloomberg

Oil: Russia's oil refining rate hits 7-week low

Russia's oil refinery falls to start September

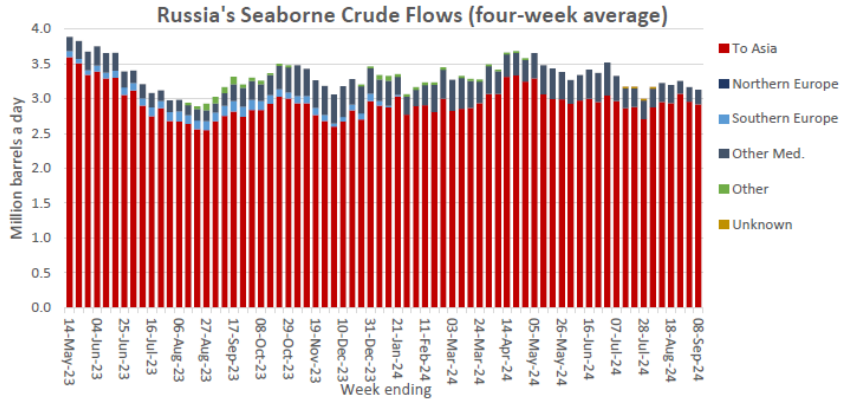
On Tuesday Bloomberg reported that Russia's oil refining rate through September 1-September 4, averaged 5.330 mmb/d, which is down -0.190 mmb/d compared to the monthly average in August; this marks the lowest levels since mid-July. The reduced refinery runs continue be primarily due to Ukraine drone attacks on Russian refineries. Bloomberg reported that someone with knowledge of industry data said: *"Crude processing rates at Gazprom Neft's refinery in Moscow, attacked by drones on Sept. 1, fell by some 150k b/d from the average in August".* Our Supplemental Documents Package contains the Bloomberg report.

Oil: Russia's seaborne crude oil exports dip lower -0.03 mmb/d WoW

Russia's seaborne crude exports

This week, the four-week average for Russia's seaborne crude exports decreased further -0.03 to 3.13 mmb/d WoW. This marks the continuation of a downward trend that was interrupted two weeks ago with an increase. It is tough to know exactly what is going on with the Ukraine focused drone attacks on Russian infrastructure and refineries. But, as a general rule, when refineries go down because of a drone attack or for turnaround, it means there is more oil for export. The four-week average of Russian seaborne crude shipments is down to 3.13 mmb/d for the week to September 8. Of the four-week average of 3.13 mmb/d, shipments to Asia averaged 2.92 mmb/d. Crude shipments so far this year are -0.04 mmb/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, June, and July however they were still above their promised targets. Our Supplemental Documents package includes the Bloomberg report.

Figure 52: 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, meaning China was taking less Russian oil. Bloomberg's above report this week highlighted the four-week average of Russia oil shipments to China were up +0.020 mmb/d to 1.250 mmb/d for the week ending September 8, up from last week's 1.230 mmb/d for the week of September 1, and down from 1.360 for the first

half of April. The last six weeks average is now 1.220 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 to 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.

Oil: OPEC MOMR lowers oil demand growth forecasts for 2024 and 2025

OPEC Monthly Oil Market Report

On Tuesday, OPEC released it's September Monthly Oil Market Report. (i) On Tuesday, we tweeted [LINK]: *"Shouldn't impact #Oil price as most view OPEC MOMR as too optimistic on demand. OPEC Sept MOMR makes another small reduction to #Oil demand growth. Likely see another small reduction in Oct MOMR as Sept MOMR demand will still be viewed as too optimistic, even to Aramco demand 👇SAF table. #OOTT"* (i) First, on the numbers, they look slightly negative as OPEC reduced their global oil demand forecast by -0.08 mmb/d for 2024 and a further -0.04 mmb/d for 2025. A reduction was expected but this was less than expected. OPEC made no changes to non-DOC supply growth in 2024 and 2025 but had an increase due to an upward revision to 2023 figures. And the global oil + products stocks show a widening of the deficit to the 2015-2019 average. OPEC+ July production was up +0.052 mmb/d MoM. (ii) Brent oil price was unchanged in the first couple hours post the release as most had assumed OPEC was going to reduce oil demand. But even still OPEC maintains a more optimistic view on demand then all others. (iii) OPEC reduced their global oil demand forecast for 2024 by -0.08 mmb/d to +2.03 mmb/d YoY and a further -0.04 mmb/d to +1.74 mmb/d in 2025. (iv) OPEC now reports on a non-Declaration of Cooperation ("non-DoC") country/region basis (the countries not participating in OPEC+). For example, there is no split out of Russia in the forecasts. (v) Non-DOC supply, immaterial to 2024 and 2025. For 2024, Sept MOMR has non-DOC at +1.23 mmb/d YoY to 53.07 mmb/d. For 2025, Sept MOMR has non-DOC at +1.10 mmb/d YoY to 54.17 mmb/d. (vi) Key non-DOC growth areas: 2024 are: US +0.51 mmb/d YoY, Canada +0.23 mmb/d YoY and Brazil +0.11 mmb/d YoY. For 2025, US +0.50 mmb/d YoY, Brazil +0.18 mmb/d YoY, Canada +0.16 mmb/d YoY, and Norway +0.10 mmb/d YoY. (vii) Call on OPEC is now called Call on DoC Oil and is revised down by -0.1 mmb/d to 42.8mmb/d for 2024 and by -0.2 to 43.4 mmb/d in 2025. (viii) OPEC only production, based on secondary sources, Sept MOMR is -197,000 b/d MoM to 26.588 mmb/d in August. The largest MoM change was Libya -219,000 b/d MoM to 0.956 mmb/d with the recent shut-down caused by change in domestic central bank leadership. Non-OPEC DOC countries were -108,000 b/d MoM to 14.068 mmb/d in August with the largest MoM changes were Kazakhstan -115,000 b/d MoM to 1.450 mmb/d. (ix) One overlooked positive in looking at global oil stocks is the comparison for oil stocks to the 2015-2019 average. Oil demand is

higher than that period. OPEC's forecast for 2024 oil demand is probably 6 mmb/d higher than the 2015-2019 average oil demand. (x) Reminder "commercial oil stocks" refers to total crude oil + products stocks. Crude oil + products stocks at July 31. Sept MOMR has total crude oil + products stocks at -11.7 mmb MoM to 2,815 mmb, which is -154 mmb below the 2015-2019 average. Crude oil only stocks at July 31. Sept MOMR has crude oil only stocks at down -5.1 mmb MoM to 1,350 mmb, which is -112 mmb below the 2015-2019 average. Products only stocks at July 31. September MOMR has products only stocks -6.6 mmb MoM to 1,466 mmb, which is 42 mmb below the 2015-2019 average. (xi) Our Supplemental Documents package includes excerpts from the OPEC September MOMR.

OPEC's still optimistic oil demand YoY growth in 2024 and 2025d

Our tweet on OPEC MOMR included a comparison of OPEC's oil demand YoY growth forecast vs Saudi Aramco, EIA and IEA. The EIA and IEA subsequently posted their Sept monthly reports so we updated our tweeted table to include the new EIA Sept STEO and IEA Sept OMR forecast. OPEC is still way more optimistic on oil demand YoY growth than the others.

Figure 53: Comparison oil demand YoY growth forecasts

Comparison of oil demand YoY growth for OPEC Sept & Aug MOMR, EIA Sept & Aug STEO, IEA Sept & Aug OMR and Saudi Aramco Q2 demand outlook.

OPEC Sept MOMR:	+2.03 mmb/d YoY in 2024 and +1.74 mmb/d YoY in 2025
Aug MOMR:	+2.11 mmb/d YoY in 2024 and +1.78 mmb/d YoY in 2025
Saudi Aramco Q2:	+1.6 mmb/d YoY in 2024 and +1.4 YoY mmb/d in 2025
EIA Sept STEO:	+0.94 mmb/d YoY and +1.52 mmb/d YoY in 2025
Aug STEO:	+1.14 mmb/d YoY in 2024 and +1.61 mmb/d YoY in 2025
IEA Sept OMR	+0.90 mmb/d YoY in 2024 and +0.95 mmb/d YoY in 2025
Aug OMR:	+0.97 mmb/d YoY in 2024 and +0.95 mmb/d YoY in 2025

Prepared by SAF Group https://safgroup.ca/news-insights/

Source: EIA, IEA, OPEC, Saudi Aramco

Oil: OPEC+ will have to wait until Q2/25 if it doesn't add back barrels on Dec 1, 2024

Can OPEC add back oil in 2024?

We continue to believe the challenge for OPEC+ in adding back barrels is that, if they don't start adding back barrels on Dec 1, 2024 as per their revised plan, they will have to wait until at least Q2/25. The reason is that global oil demand is always seasonally lower in Q1 than in the preceding Q4 and we would think OPEC+ wouldn't' want to add oil into a declining demand period. OPEC's Sept MOMR forecasts Q4/24 oil demand at 105.61 mmb/d and then down -1.01 mmb/d QoQ to 104.60 mmb/d in Q1/25. Then it forecasts oil demand to be +0.66 mmb/d QoQ to 105.26 mmb/d in Q2/25, and then +1.53 mmb/d QoQ to 106.79 mmb/d in Q3/25, and then +0.47 mmb/d QoQ to 107.26 mmb/d in Q4/25. This is the normal seasonal pattern for oil demand that sees oil demand increase throughout the year with the largest QoQ increase in Q3 every year.

Oil: IEA OMR, slight decrease to YoY 2024 oil demand, 2025 oil demand unchanged

IEA Oil Market Report

On Thursday, the IEA released its monthly Oil Market Report for September. (i) The IEA continues negative messaging for oil demand but we thought the numbers were neutral. There was a small decrease of -70,000 b/d to its oil demand growth for 2024 that is now down to +900,000 b/d YoY. There was no change to 2025 demand or non-OPEC supply growth. Then there was an overlooked positive of continued global oil stocks decline that

declined "counter-seasonally" by down 47.1 mmb in July. (ii) The IEA's forecasts demand growth of +0.90 mmb/d YoY to 103.0 mmb/d for 2024 and an unchanged +0.95 mmb/d YoY to 103.9 mmb/d in 2025. Note that there are rounding items. (iii) The messaging in the press release infers OECD demand is lower but there is no change. Sept OMR has OECD demand for 2024 at 45.6 mmb/d (unchanged) and for 2025 at 45.6 mmb/d (unchanged). However, the messaging infers gong down. Here is what the IEA wrote "*Outside of China, oil demand growth is tepid at best. Latest data for the United States show a sharp decline in gasoline deliveries in June, following unexpected strength in May. As such, gasoline use in the world's largest oil consumer declined y-o-y in five out of the first six months of this year. Structural headwinds and anaemic economic growth mean that deliveries continue to contract in a number of advanced economies. This could leave advanced economies' oil use this year nearly 2 mb/d below its pre-pandemic level.*" (iv) China weakness is the theme of the Sept OMR. "*The recent slowdown in China has seen its oil consumption declining y-o-y for a fourth consecutive month in July, by 280 kb/d. This stands in marked contrast to the 1 mb/d average pace of growth over the preceding 12 months, or the post-Covid surge of 1.5 mb/d in 2023. The country's oil demand is now set to expand by only 180 kb/d in 2024, as the broad-based economic slowdown and an accelerating substitution away from oil in favour of alternative fuels weigh on consumption. Surging EV sales are reducing road fuel demand while the development of a vast national high-speed rail network is restricting growth in domestic air travel. The implications of the fundamental shift in the Chinese economic outlook and rapid changes to its vehicle fleet and transport modes are discussed in detail in our recent reports Oil 2024 and World Energy Outlook 2023*." (v) The IEA noted that in July, OECD industry stocks fell counter-seasonally to end July down -78.500 mmb compared to the five-year average. The IEA reports preliminary OECD August data shows a continued stock decline for the month. (vi) Non-OPEC supply for 2024 is unchanged at 70.2 mmb/d from last month's forecast, and 2025 is unchanged at 72.0 mmb/d. (vii) The IEA's call on OPEC for 2024 was unchanged at 27.2 mmb/d, and for 2025 was revised down -0.1 to 26.2 mmb/d from 26.3 mmb/d. (vii) Our Supplemental Documents package includes the IEA release and the Bloomberg tables and reports.

Figure 54: IEA Global Demand Forecast by OMR Report

mmb/d	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024	24-23	Q1/25	Q2/25	Q3/25	Q4/25	2025	25-24
Sep 24	**102.1**	101.4	102.9	103.9	103.7	**103.0**	*0.9*	102.4	103.7	104.8	104.7	**103.9**	*0.9*
Aug 24	**102.1**	101.3	103.1	104.1	103.7	**103.1**	*1.0*	102.3	103.8	105.0	104.8	**104.0**	*1.0*
July 24	**102.1**	101.3	102.9	104.1	103.9	**103.1**	*1.0*	102.3	103.7	105.1	104.9	**104.0**	*1.0*
June 24	**102.2**	101.5	103.0	104.2	104.1	**103.2**	*1.0*	102.6	103.9	105.3	105.1	**104.2**	*1.0*
May 24	**102.1**	101.7	102.9	104.1	103.9	**103.2**	*1.1*	102.8	104.1	105.3	105.1	**104.3**	*1.1*
Apr 24	**102.0**	102.0	103.0	103.9	103.8	**103.2**	*1.2*	103.1	104.0	105.1	105.0	**104.3**	*1.1*
Mar 24	**101.9**	102.0	103.0	104.0	103.7	**103.2**	*1.3*						
Feb 24	**101.8**	101.7	102.8	103.8	103.7	**103.0**	*1.2*						
Jan 24	**101.7**	101.7	102.7	103.7	103.8	**103.0**	*1.3*						
Dec 23	**101.7**	101.4	102.4	103.4	103.9	**102.8**	*1.1*						
Nov 23	**102.0**	101.5	102.4	103.5	104.1	**102.9**	*0.9*						
Oct 23	**101.9**	101.3	102.2	103.5	103.9	**102.7**	*0.8*						
Sep 23	**101.8**	101.1	102.6	104.0	103.5	**102.8**	*1.0*						
Aug 23	**102.2**	101.5	102.6	104.2	104.3	**103.2**	*1.0*						

Source: IEA, Bloomberg

Iran President at UN

Oil: Will Iran President Pezeshkian get a return to JCPOA talks?

It will be interesting to see how Iran President Pezeshkian's upcoming UN General Assembly address and any meetings play out. His election platform had some key priorities such as better relations with the neighbours and also to see if there can be a return to the JCPOA. We don't know when he is to address the General Assembly that is over on Sept 24 but it will

be interesting to see if he can build any momentum to consider a return to the JCPOA.

Oil: Still no indication if/when Iran will hit Israel with its announced retaliation

Waiting for Iran's response

As of our 7am MT news cut off, it's the same story that Iran has yet to make its declared revenge attack on Israel that is to come at time of maximum surprise. Our Sept 1, 2024 Energy Tidbits memo noted that one timing issue might be that Iran President Pezeshkian is planning to travel to New York to the annual UN General Assembly meetings on Sept 10-24. Our initial thoughts were that Iran wouldn't hit Israel until Pezeshkian is back from the UN. However, who knows as we don't really know how much stroke Pezeshkian has with the Supreme Leader and the IRGC. After all recall what Iran said on Aug 21. Here is what we wrote in our Aug 25, 2024 Energy Tidbits memo. "*Iran says its response to Israel "occurs at a moment of maximum surprise" On Wednesday, IRNA (State media) reported [LINK] "Iran's Permanent Mission to the United Nations in New York has said that the Islamic Republic's response to Israel's assassination of Hamas chief Ismail Haniyeh will be carried out in a way to ensure that it "occurs at a moment of maximum surprise." "The timing of Iran's response will be meticulously orchestrated to ensure that it occurs at a moment of maximum surprise", the mission said on Wednesday when asked whether Tehran is withholding its response to Israel so the ongoing Gaza ceasefire talks can proceed. Ismail Haniyeh was martyred in an Israeli airstrike on his accommodation in the Iranian capital on July 31, a day after he attended the inaugural of Iran's new president Masoud Pezeshkian. Iran says Haniyeh was an official guest of the Islamic Republic, and that the Israeli attack was a violation of the country's sovereignty. "Iran's response must punish the aggressor for its act of terrorism and infringements upon Iran's national sovereignty", the mission said, adding that the response should serve as a deterrent as well. The Islamic Republic's response must "bolster Iran's deterrence capabilities to induce profound regret within the Israeli regime, thereby serving as a deterrent...Iran's response must be carefully calibrated to avoid any possible adverse impact that could potentially influence a prospective ceasefire" in Gaza."*

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

Netanyahu warned Congress on Iran nuclear

The reason why we have reminded on Iran's advancing nuclear capability is that we worry Israel uses any subsequent attack on Iran whenever Iran retaliates as an opportunity to hit Iran's nuclear facilities. As of our 7am MT news cut off, there is still the unknown of what will Iran do in retaliation. And then it opens up another wildcard, what will Netanyahu then do. 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 our 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 said Iran is 1 or 2 weeks from breakout to produce fissile material

We continue to be surprised that Iran's reported advancing nuclear capability doesn't get more attention. 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 a month 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."*

Houthis hypersonic ballistic missle

Oil: Houthis hypersonic missile gets thru Israel defense to some degree this morning

Earlier this morning, Al Masirah (Houthi news) reported [LINK] "*In a televised statement, the spokesman for the Armed Forces, Brigadier General Yahya Saree, said: "Our Rocketry Forces carried out a special military operation targeting a military objective in the Jaffa area of occupied Palestine." Brigadier General Saree explained that the operation was executed with a new hypersonic ballistic missile, which successfully reached its target, and the enemy's defenses failed to intercept or counter it. He stated that the new missile covered a distance of 2,040 kilometers in 11.5 minutes, causing fear and panic among the Zionists, with more than two million Israelis seeking refuge in shelters, marking the first time in Israeli history."* The key being its' the Houthis hypersonic missile that covered the distance to Israel in 11.5 minutes and that the missile evaded their Arrow and Iron Dome didn't shoot it down.

Israel confirmed the hypersonic missile got thru the defense system despite several attempts to down it, but that it disintegrated prior to hitting the ground. The Times of Israel reported [LINK] "*The military made several attempts to intercept a ballistic missile fired from Yemen by the Iran-backed Houthis at central Israel this morning, the IDF says, though the results of the attempts are still being investigated. The army says the missile fell apart in the air, citing an initial probe. "From a preliminary examination, it appears that the missile apparently disintegrated in the air," the IDF says. The missile was launched at around 6:21 a.m., and sirens sounded across central Israel at 6:32 a.m. According to the Houthis, the missile reached hypersonic speeds and reached Israel in 11 minutes. Some have questioned more warning time was not given. The military attempted to shoot down the missile using both the long-range Arrow defense system and the Iron Dome, which is usually used for shorter-range attacks, the IDF says. Shrapnel from the missile and the interceptors impacted open areas in the Ben Shemen forest, close to Kfar Daniel, as well as at a train station near Modiin. No serious injuries were reported."*

Netanyahu says Houthis will pay a heavy price for this missile

Earlier this morning, we tweeted [LINK] "*No one expects Houthis to shoot down Israeli jets but any major attack can have unforeseen impact. Netanyahu "Houthis launched a surface-to-surface missile from Yemen into our territory. They should have known by now that we charge a heavy price for any attempt to harm us," #OOTT."* There were videos posted of Netanyahu's warning to the Houthis following this morning's Houthis hypersonic missile attack. France24 reported ""*The Houthis launched a surface-to-surface missile from Yemen into our territory. They should have known by now that we charge a heavy price for any attempt to harm us," Netanyahu said, according to a statement from his office."* The Houthis must have considered this before they launched their hypersonic as they don't have any real air defense against Israel jets. So they launched knowing Israel will be hitting back with some sort of major jet strike. No one expects the Houthis to shoot down Israeli jets but we always say war is unpredictable as to what happens.

Oil: Libya oil exports down81% to 194,000 b/d last week

Libya oil production is unclear

As of our 7am MT news cut off, we have not seen any oil production updates from the Libya National Oil Corporation since their Aug 29 update. (i) Our Sept 1, 2024 Energy Tidbits memo wrote "*Finally, on Thursday, the Libya NOC gave a production update and we tweeted [LINK] "Ouch! Libya #Oil production down 688,000 b/d to 591,024 b/d yesterday. See 👇@NOC_Libya update by operating company. #OOTT."* (ii) We would expect that number is lower given ther has subsequently been a force majeure at the El Feel field. (iii) On Thursday Bloomberg reported *"Libyan Oil Flows Slide Further as UN Fails to Break Bank Impasse"* and "*Daily oil output in the nation that's home to Africa's largest reserves has fallen to about 450,000 barrels from more than 1 million before the crisis, although exports have continued to trickle out to global markets."* (iv) Yesterday, the Libya Observer j(Tripoli based) reported [LINK] "*Libya's oil exports dropped by 81% last week as the National Oil Corporation (NOC) halted shipments amid a growing crisis involving the Central Bank of Libya and oil revenues, according to Reuters. Libyan ports averaged 194,000 barrels of crude oil per day during the period, a sharp decline from previous levels."*

Oil: UN envoy warned Libya is headed to "greater domestic and regional instability"

UN warned Libya heading the wrong direction

The one thing that seems clear on Libya is that there is still huge risk to the domestic situation and uncertainty as to what happens and when. Here is what we wrote in our Aug 25, 2024 Energy Tidbits memo on the UN's warning on Libya. "*UN envoy warned Libya is headed to "greater domestic and regional instability. We have been surprised that Libya hasn't had more domestic crisis/battles as it's been almost four years since the last minute cancelled Dec 2021 national election that was supposed to be the unifying event for the future. And there have been times when there were rumbles that haven't emerged to a return to the east vs west conflict. So it is hard to predict if the latest signs of unrest can be put back to rest or if it accelerates. But, on Tuesday, we tweeted [LINK] "Libya watch! "the status quo is not sustainable. In the absence of renewed political talks leading to a unified government and elections – you see where this is heading - greater political financial and security instability, entrenched political and territorial divisions, and greater domestic and regional instability." @stephaniekoury1 👇warns US Security Council. #OOTT [LINK]." UN Special Envoy Stephanie Koury briefed the UN Security Council on Tuesday with a recap of recent events in Libya and a clear waning that things are breaking down and there needs to be a big change and some sort of unified efforts from all parties or else Libya is heading for domestic trouble. Her message is clear and worth a read. Our Supplemental Documents package includes the Koury briefing*."

Is more trouble or domestic unrest about to come in Libya?

The domestic uncertainty hasn't gone away and is an area that has been obvious as a risk. Here is another part of the above item we wrote in last week's (Aug 25, 2024) Energy Tidbits memo. "Is more trouble or domestic unrest about to come in Libya., Koury's briefing to the UN Security Council on Tuesday recapped some of the key events that we have been tracking. Here is what we wrote in our Aug 11, 2024 Energy Tidbits memo on Libya's path ahead. *"Is more trouble or domestic unrest about to come in Libya? We go thru the Libyan news sites at least a few times a week, more this week as we were following the force majeure at Sharara oilfield in SW Libya. Our primary news outlets are Libya Herald, Libya Observer and Libya Review. And starting midweek, there were a few separate reports that make us wonder if there is the risk of domestic unrest about to come. And the reason why domestic unrest is significant is that it could easily lead to Libya going back down to zero oil production. On Tuesday, reported clashes in Aljmail (west of Tripoli) injured several. On Wednesday, there were the reports that Haftar had moved more troops down into southwest Libya, ostensibly to protect Libya's southern border. On Thursday, there were the reports that forces for the Tripoli based Libya government were mobilized in what was described as a response to Haftar moving his forces into SW Libya. On Friday, Libya Observer (and the others similarly) "Nine people were killed and 16 others injured, including a civilian, in armed clashes in Tajoura at noon on Friday, as reported by Libya's Ambulance and Emergency Service. Hostilities broke out between the Rahbat Al-Duroo Battalion and the Martyr Sabriya Battalion following an alleged assassination attempt on Rahbat Al-Duroo's commander, Bashir Khalaf Allah." Tajoura sits on the eastern edge of Tripoli. Yesterday, the Libya Herald reported "UNSMIL expressed concern in a statement yesterday over the mobilisation of forces by Hafter and anti-Hafter forces. This comes as Western Libyan forces aligned with the Tripoli based Libyan government mobilised in what they said was a*

response to Hafter's forces expanding out of their usual southern territory and heading northwest towards Ghadames on the Libyan Algerian border. UNSMIL's statement read: "UNSMIL monitors with concern the recent mobilization of forces in various parts of Libya, particularly in the southern and western regions. We commend ongoing efforts to de-escalate the situation and prevent further tension. UNSMIL urges all parties to exercise maximum restraint and avoid any provocative military actions that could be perceived as offensive and might jeopardize Libya's fragile stability and the safety of its people. The Mission calls for continued communication and coordination between forces affiliated to the LNA and GNU." We don't know what will evolve but it seems like the domestic tensions are rising and so the issue for Libya will be can they put a lid on the domestic tensions?"

Oil: China home prices keep losing value, 15 mths for new & 16 mths for old,

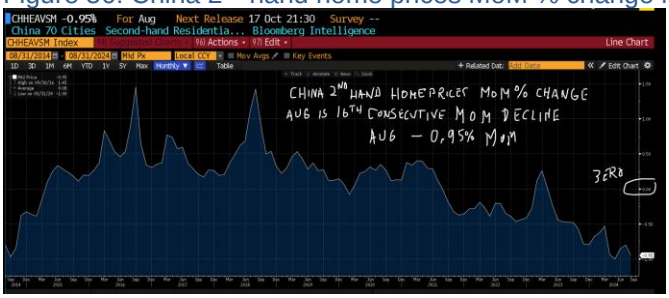
China houses keep losing value

The big negative to the Chinese consumer is that they keep losing value in their homes, their biggest asset value keeps decreasing month after month. On Friday, we tweeted [LINK] *"No wonder Chinese consumer is still on sidelines. Their most important asset, home values keep going lower. New home prices: 15th straight MoM % drop. Aug -0.73%. July -0.65%. June -0.67%. 2nd hand home prices: 16th straight MoM % drop. Aug -0.95%. July -0.80%. June -0.85%. Thx @business #OOTT."* Just like in North American, the home is the most important asset for most Chinese is their home and all the Chinese have seen is the value of their homes decline month after month with no end in sight. In Aug, Chinese new home and 2nd home prices were down MoM vs July. China new home prices were -0.73% MoM and that is the 15th consecutive month of MoM declines. China 2nd hand home -0.95% MoM and that is the 16th consecutive MoM decline. prices Below are the Bloomberg graphs with the July data.

Figure 55: China new home prices MoM % change incl Aug 2024

Source: Bloomberg, National Bureau of Statistics

Figure 56: China 2nd hand home prices MoM % change incl Aug 2024



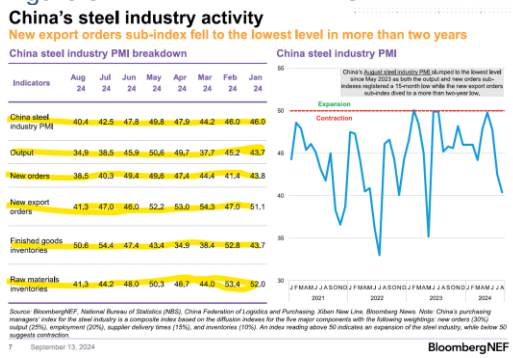
Source: Bloomberg, National Bureau of Statistics

Oil: Negative across-the-board China steel indicators

Negative China steel indicators

Steel is always viewed as a key indicator for economies. So no surprise, China's steel indicators are all negative. Earlier this morning, we tweeted [LINK] "*Across-the-board negative China steel indicators. Steel industry PMI, Output, New Orders, New Export Orders and Raw Materials Inventories indicators all down MoM. Finished Goods Inventories indicator up MoM but still high.Great recap table @BloombergNEF #OOTT."* On Friday, BloombergNEF posted its Industrial Metals Monthly, which tracks short term developments in iron ore, steel, copper, aluminum and other base metals. One of the many slides that jumped out at us was the across the board negative indicators for China steel industry. Everything was negative – China steel industry PMI was down, output was down, new orders were down, new export orders down to lowest level in two years, finished goods inventories were up, and raw materials inventories are down.

Figure 57: Historical table of China's net monthly foreign direct investment



Source: Bloomberg

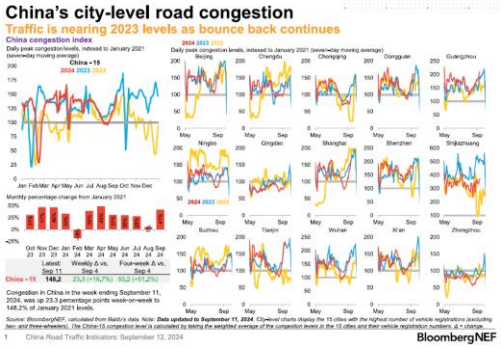
Oil: Baidu China city-level road congestion in September is down -8.0% YoY

China city-level traffic congestion

On Thursday, BloombergNEF posted its China Road Traffic Indicators Weekly September 12 report, which includes the Baidu city-level road congestion for the week ended September 11. The China Baidu city-level road congestion is for the week ended September 11, marks the first full week of data for September. City-level road congestion is up vs Aug, which should be expected with end of holiday season. However, city-level road congestion is still down YoY and we don't know if this is due to the timing of summer holiday/return to city vs last year. One other reminder is that we expect to see city-level road congestion with the

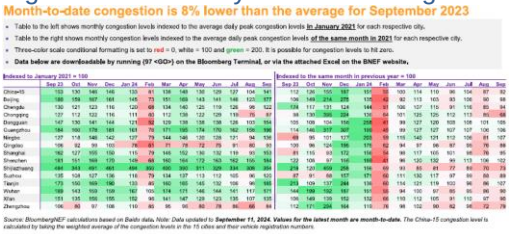
mid-Autumn festival this week. Note that this report was formerly titled Road Traffic indicators, and is now China Road Traffic Indicators, but the content of the report is unchanged. BloombergNEF's report was titled "*Congestion continues to close the gap with 2023".* This week, BloombergNEF reported Baidu city-level road congestion was up by +18.7% WoW to 148.2% of Jan 2021 levels, but compared to September 2023, September's average daily peak congestion levels so far are down -8.0% YoY. Bloomberg noted that 10 of the top 15 cities are down YoY. Below are the BloombergNEF key figures.

Figure 58: China city-level road congestion for the week ended September 11



Source: Bloomberg

Figure 59: China city-level road congestion for the week ended September 11



Source: Bloomberg

Oil: Mid-Autumn Festival in China is Sept 17

China mid-Autumn Festival

As noted above, China city-level road congestion should be down this week with the Mid-Autumn Festival. Yesterday, Xinhua (state media) reported [LINK] "*China is expected to see an average of 1.8 million daily cross-border trips around this year's Mid-Autumn Festival holiday, a 21.9 percent increase from the same period last year, official data shows.According to the National Immigration Administration, cross-border travel will peak on Saturday and next Tuesday. Passenger flow at major international airports as well as land crossings to Hong Kong and Macao will see a significant increase."* And "*he Mid-Autumn Festival is one of China's most important traditional holidays. Taking place annually on the 15th day of the eighth month in the Chinese lunar calendar, it will be observed on Sept. 17 this year.* " The Mid-Autumn Festival is also know as the Mooncake festival.

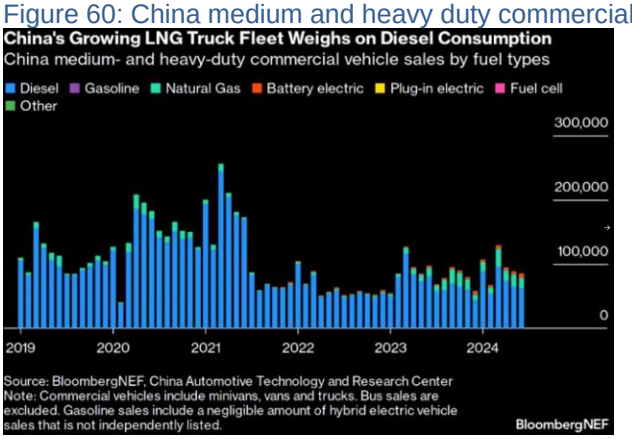
Oil: China LNG fueled trucks should lead to diesel demand peak sooner than expected

China diesel demand to peak

We continue to see more highlight the increasing percentage of LNG-fueled medium and heavy duty trucks in China impacting oil demand. The IEA Sept OMR this week was another

example. We have been highlighting how China's rapid adoption of LNG fueled medium and heavy duty trucks looks to be a game changer for China diesel demand and one that will lead to China diesel demand peaking sooner than expected. We have never been believers that electric medium and heavy duty trucks would take off as aspired. But buy into LNG for medium and heavy duty trucks. On Sept 10, we tweeted [LINK] *"China diesel demand to peak sooner than expected. Good @BloombergNEF Luxi Hong chart on LNG fuel taking share of medium/heavy duty trucks in China. See 👇SAF 06/30 Energy Tidbits memo excerpt on peak diesel demand. Thx @WoodMackenzie Alan Gelder. Also diesel will be less of an indicator of China economy. #OOTT #Oil."* BloomergNEF wrote "*Diesel's dominance in China's medium- and heavy-duty commercial vehicles is set to ease as the use of liquefied natural gas and electric trucks gathers pace. LNG truck sales have accelerated since 2023, now accounting for roughly 20% of China's new sales for the segment."* Below is the BloombergNEF chart attached to our tweet. Our tweet also included what we wrote in our June 30, 2024 Energy Tidbits memo tha tis below.

Figure 60: China medium and heavy duty commercial vehicle sales by fuel types



Source: BloombergNEF

06/25/24: China to reach peak diesel demand sooner than expected

Here is what we wrote in our June 30, 2024 Energy Tidbits as to the logic why China diesel demand should peak sooner than expected. "*China to reach peak diesel demand sooner than expected. On Tuesday, we saw the rationale for why China should hit peak diesel demand sooner than expected. Wood Mackenzie said something we, and it seems many others, hadn't realized in that 25% of new heavy-duty trucks in China are now LNG fueled and not diesel fueled. We say others must be realizing because we saw comments later this week on this very subject of 25% of heavy-duty trucks being LNG fueled so we suspect they also saw the Wood Mackenzie comments. We assume that this didn't go from zero to 25% overnight so there has been some buildup of this LNG truck sales. Diesel is driven by trucks so this will have a direct impact on diesel demand. And if China reaches peak diesel demand, it also points to peak oil demand as diesel demand is roughly 25% of China's 16 mmb/d oil consumption. And on early Tuesday morning, we tweeted [LINK] "Good China insights from @WoodMackenzie Alan Gelder. Chinese distillate demand is not particularly great. so negative indicator for economy today. But*

decoupling of China diesel demand vs economy indicator is starting for mid-term as 25% of new heavy duty trucks are LNG fuel so "that decouples the manufacturing & movement of goods from diesel demand"' Would also be a factor to China oil demand peaking sooner than prior forecasts. #OOTT @gulf_intel." Our tweet included the transcript we made of comments by Alan Gelder (Downstream Global SME, VP Refining, Chemicals & Oil Markets, Commodities Research, Wood Mackenzie) on Gulf Intelligence's Daily Energy Markets June 25 podcast. [LINK] Items in "italics" are SAF Group created transcript. At 10:40 min mark, Gelder "The Chinese economy hasn't materially returned to growth. So there is a degree to which how you measure that. We look at Chinese distillate demand – it's not particularly great, not particularly strong. There is a challenge in that actually there is a akin to what China has done around electrification of the passenger car fleet. They are shifting trucks onto LNG. So something like 25% of new heavy duty truck purchases are LNG. So in a sense, we are having that move decouples the manufacturing and movement of goods from diesel demand. Just that activity of changing their fuel type."

Diesel consumption will become less of an economy indicator in China

Our June 25, 2024 tweet noted above on diesel demand included the note that this mean diesel consumption will be less of an indicator for the economy. Many look at diesel consumption as an indicator for the China economy and increasing LNG heavy duty trucks will delink this relationship. Wood Mackenzie's Alan Gelder said "*They are shifting trucks onto LNG. So something like 25% of new heavy duty truck purchases are LNG. So in a sense, we are having that move decouples the manufacturing and movement of goods from diesel demand. Just that activity of changing their fuel type."*

Oil: China oil imports 11.6 mmb/d in August, up +15.6% MoM but down -7.0% YoY

China oil imports August

On Tuesday, Bloomberg released a report with data from China's General Administration for Customs (GACC) on the summary data of China's oil and natural gas imports for August. China's imports of crude oil in August were 49.1 million tons, or 11.56 mmb/d, a +15.6% increase from 10.00 mmb/d in July, but down -7.0% YoY from 12.5 mmb/d in August 2023. Our Supplemental Documents package includes Bloomberg report.

Oil: EIA forecasts global oil stocks -0.9 mmb/d in H2/24 with further declines in Q1/25

EIA forecasts global oil stock draws

On Tuesday, the EIA STEO also included their forecast for changes in global oil stocks [LINK]. (i) The EIA forecasts OPEC production in September 2024 at 31.11 mmb/d and for Dec 2025 at 32.04 mmb/d. (ii) The EIA forecasts global oil stocks decline by -0.9 mmb/d in H2/24 with further declines in Q1/25 before returning to oil stocks build thereafter. The EIA wrote "*Despite a drop in the Brent crude oil spot price to $73 per barrel (b) on September 6, we expect ongoing withdrawals from global oil inventories will push prices back above $80/b this month. More oil will be taken out of inventories in the fourth quarter of 2024 (4Q24) that we previously expected because OPEC+ announced that they will delay production increases until December. Those increases had been set to start in October. Although market concerns over economic and oil demand growth, particularly in China, have increased, causing oil prices to fall, OPEC+ production cuts mean less oil is being produced globally*

than is being consumed. We expect the Brent crude oil spot price to average $82/b in 4Q24 and average $84/b in 2025".

Figure 61: EIA Aug STEO forecast OPEC production

	2024												2025				
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Production (million barrels per day) (a)													0.23				
World total	100.68	101.93	102.61	102.29	101.98	101.88	102.83	102.79	101.78	101.91	102.53	102.96	103.02	103.02	103.49	103.69	104.23
Crude oil	75.92	76.65	77.08	76.48	75.81	75.48	76.61	76.59	75.90	76.07	76.67	77.28	77.72	77.69	78.02	77.90	77.98
Other liquids	24.75	25.28	25.52	25.82	26.16	26.40	26.23	26.20	25.88	25.83	25.86	25.68	25.30	25.33	25.47	25.79	26.26
World total	100.68	101.93	102.61	102.29	101.98	101.88	102.83	102.79	101.78	101.91	102.53	102.96	103.02	103.02	103.49	103.69	104.23
OPEC total (b)	31.80	32.00	32.26	32.14	31.95	31.52	32.05	31.85	31.11	31.10	31.37	32.04	32.16	32.23	32.34	32.45	32.50
Crude oil	26.34	26.63	26.92	26.87	26.69	26.25	26.76	26.54	25.83	25.83	26.04	26.64	26.88	26.94	27.06	27.16	27.22
Other liquids	5.46	5.38	5.35	5.27	5.26	5.27	5.29	5.31	5.28	5.26	5.33	5.40	5.28	5.28	5.28	5.28	5.28
Non-OPEC total	68.88	69.93	70.34	70.16	70.03	70.36	70.78	70.94	70.67	70.81	71.16	70.91	70.86	70.79	71.15	71.24	71.73
Crude oil	49.58	50.02	50.17	49.61	49.12	49.23	49.85	50.05	50.07	50.24	50.63	50.63	50.84	50.74	50.96	50.73	50.76
Other liquids	19.29	19.90	20.17	20.55	20.91	21.13	20.93	20.89	20.60	20.57	20.53	20.28	20.02	20.04	20.19	20.51	20.97

Source: EIA

Figure 62: OPEC Production Level Schedule

	2024		2025												Required Production Level as per 37th ONOMM (1)
Country	Oct-Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Algeria	908	912	917	921	925	929	934	938	942	946	951	955	959	959	1,007
Iraq	4,000	4,018	4,037	4,055	4,073	4,092	4,110	4,128	4,147	4,165	4,183	4,202	4,220	4,220	4,431
Kuwait	2,413	2,424	2,436	2,447	2,458	2,469	2,481	2,492	2,503	2,514	2,526	2,537	2,548	2,548	2,676
KSA	8,978	9,061	9,145	9,228	9,311	9,395	9,478	9,561	9,645	9,728	9,811	9,895	9,978	9,978	10,478
UAE	2,912	2,926	2,972	3,020	3,067	3,114	3,161	3,207	3,254	3,301	3,348	3,361	3,375	3,375	3,519
Kazakhstan	1,468	1,475	1,482	1,489	1,495	1,502	1,509	1,516	1,523	1,530	1,536	1,543	1,550	1,550	1,628
Oman	759	763	766	770	773	777	780	784	787	791	794	798	801	801	841
Russia	8,978	9,017	9,057	9,096	9,135	9,174	9,214	9,253	9,292	9,331	9,371	9,410	9,449	9,449	9,949

Source: OPEC

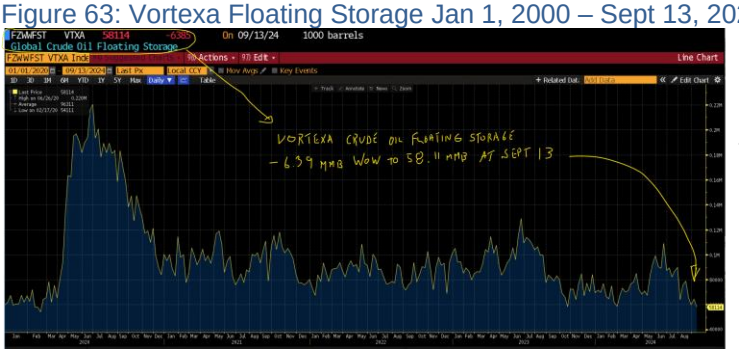
Vortexa floating storage

Oil: Vortexa crude oil floating storage est 58.11 mmb at Sept 13, -6.39 mmb WoW

We are referencing the Vortexa crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Sept 7 at 9am MT. (i) Yesterday, we tweeted [LINK] "*Floating storage isn't why oil has been soft. Vortexa crude #Oil floating storage 58.11 mmb at Sept 13. Only been 4 wks <60 mmb since Covid. Revisions for last 7 wks average +2.31 mmb/wk. Post revisions, last 7 wks average 66.67 mmb, only been 21 wks <70 mmb since Covid. Thx @vortexa @business #OOTT."* Brent oil was +$0.55 WoW to close at $71.61 but continues to be held back by the lookahead concerns on China and OPEC+ wanting to add back its voluntary barrels. But the Vortexa crude oil floating storage over the past two months continues to be the lowest such period since Covid. (ii) As of 9am MT Sept 14, Bloomberg posted Vortexa crude oil floating storage estimate for Sept 13 at 58.11 mmb, which was -6.39 mmb WoW vs revised up Sept 6 of 64.50 mmb. Note Sept 13 of 64.50 mmb was revised +5.81 mmb vs 58.69 originally posted at 9am MT on Sept 7. (iii) Revisions. Six of the last seven weeks were revised up and the average revision was +2.31 mmb for the last seven weeks. .Sept 6 was revised +The last two weeks were revised up including +8.20 mmb to Aug 30 and +2.79 mmb to Aug 23. Rest or the weeks had modest +/- revisions. Here are the revisions for the past seven weeks compared to the estimates originally posted on Bloomberg at 9am MT on Aug Sept 7. Sept 6 revised +5.81 mmb. Aug 30 revised -0.14 mmb. Aug 23 revised +2.03 mmb. Aug 16 revised +3.13 mmb. Aug 9 revised +2.39 mmb. Aug 2 revised +1.95 mmb. July 26 revised +1.03 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple rolling average for the last seven weeks is

66.67 mmb vs last week's then seven-week rolling average of 68.85 mmb. The decline was due to adding a low 58.11 mmb week to the rolling 7-week average more than offsetting the upward revisions noted above. (v) 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. (vi) 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. (vii) Sept 13 estimate of 58.11 mmb is -70.89 mmb vs the 2023 peak on June 25, 2023 of 129.00 mmb. Recall Saudi Arabia stepped in on July 1, 2023 with its voluntary cuts. (viii) Sept 13 estimate of 58.11 mmb is -20.87 mmb YoY vs Sept 15, 2023 of 78.98 mmb. Below are the last several weeks of estimates posted on Bloomberg as of 9am on Sept 14, Sept 7, and Aug 31.

Figure 63: Vortexa Floating Storage Jan 1, 2000 – Sept 13, 2024, posted Sept 14 at 9am MT



Source: Bloomberg, Vortexa

Figure 64: Vortexa Estimates Posted 9am MT on Sept 14, Sept 7, and Aug 31

Posted Sept 14, 9am MT

FZWWFST VTXA Index — 01/01/2020 – 09/13/2024

Date	Last Px
Fr 09/13/2024	58114
Fr 09/06/2024	64499
Fr 08/30/2024	59835
Fr 08/23/2024	65857
Fr 08/16/2024	78965
Fr 08/09/2024	75403
Fr 08/02/2024	64024
Fr 07/26/2024	89585
Fr 07/19/2024	86777
Fr 07/12/2024	82084
Fr 07/05/2024	89373
Fr 06/28/2024	87416

Sept 7, 9am MT

FZWWFST VTXA Index — 01/01/2020 – 09/06/2024

Date	Last Px
Fr 09/06/2024	58692
Fr 08/30/2024	59982
Fr 08/23/2024	63828
Fr 08/16/2024	75836
Fr 08/09/2024	73011
Fr 08/02/2024	62074
Fr 07/26/2024	88555
Fr 07/19/2024	84259
Fr 07/12/2024	82071
Fr 07/05/2024	88470
Fr 06/28/2024	86397
Fr 06/21/2024	107.849k

Aug 31, 9am MT

FZWWFST VTXA Index — 01/01/2020 – 08/30/2024

Date	Last Px
Fr 08/30/2024	51779
Fr 08/23/2024	61036
Fr 08/16/2024	76132
Fr 08/09/2024	71141
Fr 08/02/2024	61644
Fr 07/26/2024	87766
Fr 07/19/2024	83651
Fr 07/12/2024	80504
Fr 07/05/2024	87643
Fr 06/28/2024	86628
Fr 06/21/2024	107.84k
Fr 06/14/2024	88718

Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Bloomberg also posts the Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, North Sea, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" for rest of world. (i) As noted above, last week's Sept 6 was revised +5.81 mmb with the key revision being Other +3.18 mmb. (ii) Total

floating storage at Sept 13 was -6.39 mmb WoW vs the revised up Sept 6 of 64.50 mmb. The major WoW changes were West Africa -3.99 mmb WoW, US Gulf Coast -3.70 mmb WoW, Other -3.01 mmb WoW, and Europe +2.83 mmb WoW. (iii) Sept 13 estimate of 58.11 mmb is -70.89 mmb vs the 2023 high on June 23, 2023 of 129.00 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 -46.41 mmb and Other -17.78 mmb. (iv) 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 Sept 6 that was posted on Bloomberg at 9am MT on Sept 7.

Figure 65: Vortexa crude oil floating by region

				Original Posted	Recent Peak	
Region	Sept 13/24	Sept 6/24	WoW	Sept 6/24	Jun 23/23	Sept 13 vs Jun 23/23
Asia	27.05	26.81	0.24	26.16	73.46	-46.41
North Sea	2.19	0.37	1.82	0.47	5.23	-3.04
Europe	3.99	1.16	2.83	1.30	5.63	-1.64
Middle East	5.56	4.14	1.42	3.10	6.76	-1.20
West Africa	7.82	13.81	-5.99	12.07	7.62	0.20
US Gulf Coast	0.00	3.70	-3.70	4.26	1.02	-1.02
Other	11.50	14.51	-3.01	11.33	29.28	-17.78
Global Total	58.11	64.50	-6.39	58.69	129.00	-70.89
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Sept 7						
Source: Vortexa, Bloomberg						

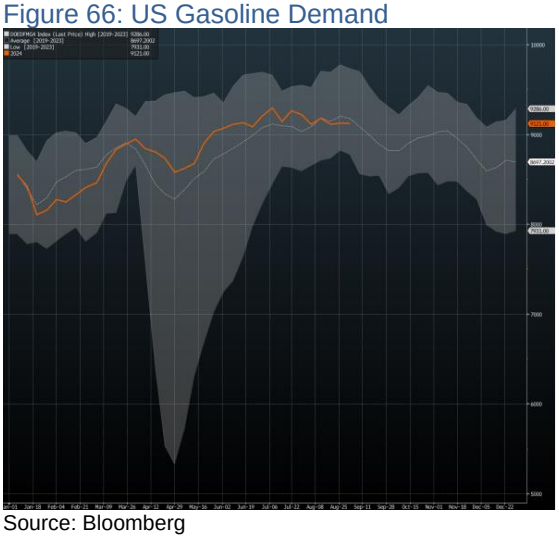
Source: Bloomberg, Vortexa

Bloomberg oil demand monitor

Oil: Bloomberg Oil Demand Monitor, *Stalling Economies Signal Tough Times*

The Bloomberg Oil Demand Monitor is a good recap of key oil demand indicators around the world. This week's report discusses potential economic headwinds from US, Europe, and China. The four-week average demand for gasoline in the U.S. has been flat, and further seasonal decreases are expected in the coming 5-weeks as travel demand slows. In addition to this, there are looming structural changes to consumer gasoline demand, particularly due to increased ICE efficiency, as well as heightened demand for EVs in China. Bloomberg reported: "*The nation's gasoline consumption is likely to peak this year or next as the fleet transitions toward EVs, Vitol Group CEO Russell Hardy said this week… Still, there's a range of views on the long-term outlook. On Tuesday, OPEC kept forecasts for demand broadly steady, still projecting that consumption will climb by two million barrels a day this year, a figure that's much higher than seen by other forecasters. The US Energy Information Administration pegs the gain at about half that. Global demand in 2050 will be the same — or even slightly higher — than current levels, according to Exxon Mobil Corp. Consumption will remain above 100 million barrels a day, driven by industrial uses such as plastic production and heavy-duty transportation, Exxon said in its Global Outlook*". The U.S. gasoline supplied fell by -4.1% YoY to 8.94 mmb/d as of August 30. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 66: US Gasoline Demand



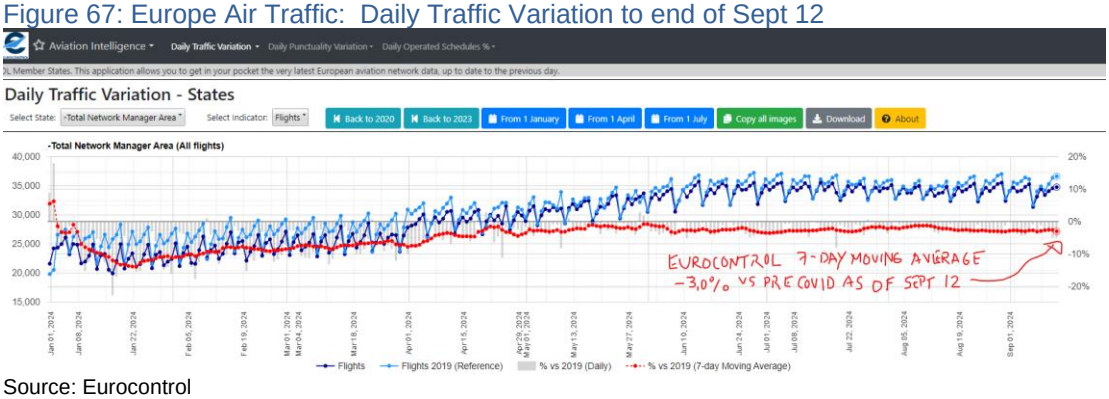
Source: Bloomberg

Oil: Europe airports daily traffic 7-day moving average is -3.0% below pre-Covid

Europe airports daily traffic

Yesterday, we tweeted [LINK] "*Daily Europe air traffic remains stuck below pre-Covid. 7-day moving average as of: Sept 12: -3.0% below pre-Covid. Sept 5: -2.8%. Aug 29: -3.1%. Aug 22: -2.8%. Aug 15: -2.2%. Aug 8: -1.3%. Aug 1: -1.9%. Jul 25: -2.2%. Jul 18: -2.6%. Jul 11: -2.9%. Thx @eurocontrol #Oil #OOTT."* Other than over Christmas, European daily traffic at airports has been stuck just a little bit below pre-Covid. The 7-day moving average has got close to pre-Covid including -0.8% below pre-Covid as of May 30, but the 7-day moving average is now -3.0% below pre-Covid as of Sept 12, which followed -2.8% as of Sept 5, which followed –3.1% as of Aug 29, -2.8% as of Aug 22, -2.2% as of Aug 15, -1.3% as of Aug 8, -1.9% as of Aug 1, –2.2% below as of July 25, -2.6% below as of July 18, and -2.9% below as of July 11. 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 67: Europe Air Traffic: Daily Traffic Variation to end of Sept 12



Source: Eurocontrol

Oil & Natural Gas: Still 522,000 b/d & 0.75 bcf/d still shut-in from Hurricane Francine

Hurricane Francine

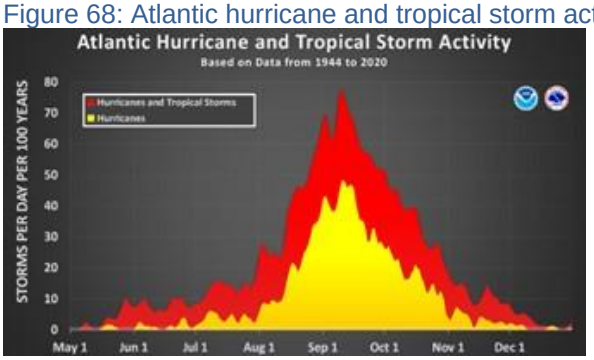
Hurricane Francine went thru the offshore GoM as a tropical storm on Wed morning but, as of yesterday, the BSEE reported there was still 522,233 of oil (29.84% of offshore GoM) and 0.756 bcf/d of natural gas (40.6% of offshore GoM) still shut-in. As of our 7amMT news cut off, we haven't seen any reports of major damage to offshore platforms or onshore refineries and export ports. Rather, the Louisiana ports were quickly reopened, albeit with some restrictions. And we did see reports of power outages impacting refinery restarts, which led Shell to advance its planned turnaround at its Norco (Louisiana) refinery after a hydrocracker was shut due to a brief power outage. So at least so far, no reports of any major damages.

Oil & Natural Gas: Sept is normally the busiest Atlantic hurricane month

Sept is normally the busiest hurricane emonth

Even with Hurricane Francine, it has been a relatively quiet in August'/September for Atlantic hurricane season. This is not the norm as the normal peak hurricane season is mid-Aug thru mid-Oct and that 90% of the Atlantic hurricanes typically come after Aug 1. The peak of peak hurricane season is normally mid-Sept and September normally sees 45% of Atlantic hurricanes. And don't forget all the hurricane forecasters are calling for a more active than normal hurricane activity. 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 68: Atlantic hurricane and tropical storm activity by month



Source: NOAA

Energy Transition: Major blow to any UK fossil fuels projects. Applied internationally?

Major blow to UK fossilfuels

There was big anti-fossil fuels news that puts at risk any future fossil fuels projects. On Friday, we tweeted [LINK] *"Breaking! Must read 👇 @SeabrookClimate. UK 1st new coal mine in 30 yrs blocked, "The ruling suggests all UK fossil fuel extraction projects can be challenged on similar grounds, and could have "ramifications internationally". Imagine if judge's standard is applied to any other sector's factory or farm or anything "The assumption that the proposed mine would not produce a net increase in greenhouse gas emissions, or would be a net zero mine, is legally flawed." Look for this UK precedent to be referenced in other countries ie. Canada. #OOTT #NatGas."* (i) We recommend reading the Sky report

[LINK] "*Controversial Cumbria coal mine plan thrown out by High Court judge. Climate campaigners have hailed a "huge victory" for the environment after a judge blocked the UK's first new coal mine in 30 years. The ruling suggests all UK fossil fuel extraction projects can be challenged on similar grounds, and could have "ramifications internationally".*" And "*Today's ruling likely forces Angela Rayner, the Labour government's housing, communities and local government secretary, to reconsider the planning application for the Whitehaven coal mine - this time taking into account the full damage it could do to the climate.*
Mr Justice Holgate said in his judgment: "The assumption that the proposed mine would not produce a net increase in greenhouse gas emissions, or would be a net zero mine, is legally flawed." (ii) The new UK Labour govt played a role as they decided to not defend the prior Conservative govt approval of the project. Surely they recognized the implications of this decision and it fits their plan to move UK off fossil fuels. (iii) Sky highlighted how the judge's concept of the mine not producing a net increase in GHG will inevitably be used to challenge all UK fossil fuel projects. And we have to believe the anti-fossil fuels side will make sure they do challenge on a full cycle basis including any GHG involved in anything related to a fossil fuel project. We find it impossible for any project let alone fossil fuel project to not add to net GHG if any possible GHG linked to the project is added. How can anything not add to GHG if there is a machine used in the project as an example. Think about a Net Zero house, it may be Net Zero once it is built but what about the GHG in building the house? (iv) It also seems this ruling gives the govt the ability to pick and choose sector winners ie. those that won't be impacted by a net add to GHG. (v) And the Sky report also warns that this ruling could have ramifications internationally. We agree and have to believe anti-fossil fuels groups in Canada will be working towards applying this precedent. It will be interesting to see what happens in places like Germany that have natural gas shortage and will German greens try to apply this to stop projects. (vi) What also isn't clear is where this ruling will go in the UK. We have to believe anti-fossil fuels side will use this to challenge whenever a license or permit has to be renewed ie. will this impact existing fossil fuels and not just new fossil fuels projects? Our Supplemental Documents package includes the Sky report.

Energy Transition: Scotland Grangemouth refinery to close w/ ban on ICE cars coming

Grangemouth 150,000 b/d refinery

It's hard to hear that Scotland, a global hotbed of the oil and gas industry in the 70s, 80s and 90s, is gong to have its last refinery, the 150,000 b/d Grangemouth refinery, stop refining oil will turn into a fuels import terminal in Q2/25. On Thursday, INEOS Group announced [LINK] "*Petroineos has today announced its intention to cease refinery operations at Grangemouth and transition to a finished fuels import terminal and distribution hub during the second quarter of 2025, subject to consultation with employees. The INEOS businesses at Grangemouth, namely INEOS O&P UK and INEOS FPS (Forties Pipeline System), will continue as normal delivering high quality services and products to our customers and are largely unaffected by this change. We wish to assure our customers, suppliers and other stakeholders that it is "business as usual" for the INEOS businesses at Grangemouth. INEOS Grangemouth remains committed to a long term successful future for the site which includes the commitment to deliver net zero by 2045."* The short release didn't say it was due to the upcoming ban on new ICE cars in the UK. But that is the key factor in this decision on how the govt is regulating increasing BEV sales and less ICE sales. Don't forget, as noted later in the memo, HEVs and PHEVs still use gasoline/diesel and are really just fuel efficient ICE vehicles. So the UK plan needs to see BEVs sales increase not HEVs. But The Times reported [LINK] "The site's owner *Petroineos, a joint venture between Sir Jim Ratcliffe's Ineos*

and PetroChina, believes that domestic demand for motor fuels will fall sharply with the forthcoming ban on new petrol and diesel cars. "Demand for key fuels we produce at Grangemouth has already started to decline and, with a ban on new petrol and diesel cars due to come into force within the next decade, we foresee that the market for those fuels will shrink,"

Restricting ICE/HEV is how UK EVs sales at 22% of total cars

As noted above, the key to the UK forthcoming ban on ICE vehicles will be getting UK consumers wanting to increasingly buy BEVs. We remind that BEVs should hit the UK govt target of sales at 22% of total car sales but that is not because of BEV demand. Rather it will be because car manufacturers are already holding off on meeting demand for ICE. Because if they sell more ICE, then they have sell increasing BEVs to hit the 22%. Conversely if they can hold off on ICE sales, it means the BEVs 22% share is a lower BEV target. Here is what we wrote in last week's (Sept 8, 2024) Energy Tidbits memo. "*The UK government will be able to say UK EVs sales should be near their regulated 22% of total car sales. But it won't be because EVs demand supports 22% of total car sales. Rather it will be because car manufacturers are holding back ICE and HEVs in 2024. It's math. If EVs sales are less, then the ICE/HEV sales have to be stopped or else the denominator will get too large. On Friday, we tweeted [LINK] "Blunt talk! UK EVs should hit UK regulated EVs to be 22% of total car sales BUT not because of EVs demand. RATHER @vertumotorsCEO explains: "some franchises there's a restriction on supply of petrol cars and hybrid cars, which is actually where the demand is." "It's almost as if we can't supply the cars that people want, but we've got plenty of the cars that maybe they don't want." "They [manufacturers] are trying to avoid the fines. So they're constraining the ability for us to supply petrol cars in order to try and keep to the government targets." "The new car market is no longer a market, unfortunately. It's a state-imposed supply chain." #OOTT." This is the concern that others have had but weren't as blunt as Vertu Motors CEO Forrester – disappointing demand for EVs means car manufacturers have to restrict deliveries of ICE and HEVs. Vertu Motors posted The Daily Telegraph story that included Forrester's comments. They also wrote "But the scheme has prompted stark warnings from bosses at major brands, such as Vauxhall owner Stellantis and Ford, which have said they cannot sacrifice profits by selling EVs at large discounts indefinitely. Instead, they have previously warned they may be forced to restrict petrol car supplies to artificially boost their ZEV mandate performance. The warning from Vertu is the first confirmation that carmakers have now begun doing so." Our Supplemental Documents package includes the Vertu posted story. [LINK]"*

07/30/24: New Zealand look to reopen oil refinery for fuel security

We will be watching to see if a change in the UK can drive the strong BEV sales growth assumed in its plan to regulate out a future ban on ICE vehicles. If this doesn't happen or if fuel imports become less reliable and more expensive, we can't help wonder if we see a reversal like just seen in New Zealand. Here is what we wrote in our Aug 4, 2024 Energy Tidbits memo. "*New Zealand looks to reopen oil refinery for fuel security. 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."

Energy Transition: EVs not noted as a factor for BMW's reduced guidance

BMW doesn't blame EVs

It's clear that disappointing EVs sales growth has been the reason for disappointment at Mercedes, Volkswagen and Volvo. So we found it interesting to note that BMW did not mention EVs as a factor in why it had to reduce its EBIT margin and ROCE guidance. On Tuesday, we tweeted [LINK] "*EVs not mentioned as a negative. BMW "adjusted" down its EBIT margin, ROCE guidance but not because of EVs. Rather it's the Integrated Braking System problems and "ongoing muted demand in China". #OOTT."* Our tweet include the BMW release on how they "adjusted" their guidance. We love how companies will go out of their way to not say they are lowering their guidance. Regardless, there was a big adjustment down in their EBIT margin and ROCE guidance and BMW did not list EVs sales as a factor for this downward adjustment. Rather they listed two items: "*This was triggered in part by additional headwinds in the Automotive Segment resulting from delivery stops and technical actions linked to the Integrated Braking System (IBS) that is provided by a supplier. The delivery stops for vehicles that are not already in customers hands will have a negative worldwide sales effect in the second half of the year. The IBS-related technical actions impact over 1.5 million vehicles and result in additional warranty costs in a high three-digit million amount in the third quarter. In parallel to this effect, the ongoing muted demand in China is affecting sales volumes. Despite stimulus measures from the government, consumer sentiment remains weak*." Our Supplemental Documents package includes the BMW release.

Energy Transition: EY, Battery life & maintenance costs = US less likely to buy EVs

EV mobility consumer index

On Monday, EY posted the results of its EV Mobility Consumer Index. (i) On Tuesday, we tweeted [LINK] "*US consumer EV insights from @Eynews Mobility Consumer Index. "dips in [EV] demand for the 1st time" "confidence in EV range and charging infrastructure has been overshadowed lately by US consumers' increasing concerns about battery life and maintenance fees. Expensive battery replacement was the top deterrent to purchase an EV for US consumers, overtaking lack of charging stations for the first time." "hybrid vehicles are on the rise with 21% of US consumers considering a hybrid vehicles" Reminder HEVs are really just fuel efficient ICE vehicles. #OOTT [LINK]*." (ii) EY wrote "*Of the US consumers*

planning on purchasing a new vehicle in the next 24 months, only 34% intend to purchase an EV, down 14% from 48% in the 2023 EY MCI." (iii) It was interesting to see how US consumers are less likely to buy an EV this year despite increasing confidence on the two historical big negatives – EV range and charging infrastructure. Rather, EY highlights the increased confidence in those issues "*has been overshadowed lately by US consumers' increasing concerns about battery life and maintenance fees. Expensive battery replacement was the top deterrent to purchase an EV for US consumers, overtaking lack of charging stations for the first time. This is especially true for potential first-time EV buyers, as 27% noted concerns about expensive batteries compared to 23% of current EV owners*." So the negative holdback to Americans buying EVs are now more linked to what people are finding after owning EVs – they are expensive to maintain. (iv) Note that in the EY release, they did not specifically mention one of the recent emerging big negatives – insurance costs are way higher than for an iCE. (v) Americans prefer security that comes with an HEV. EY wrote "*While EV demand has decreased, interestingly, hybrid vehicles have risen in popularity. In 2024, the share of US consumers intending to buy a hybrid vehicle as their next car rose 2 percentage points, compared to the global average, which decreased 2 points overall. This rise can be attributed to the overall versatility of hybrid vehicles. In fact, 21% of US consumers say they prefer a gradual transition from an ICE vehicle to a fully electric vehicle. What's more, 26% of US buyers like the security that comes with a hybrid engine (compared to only 19% of global respondents). This shows that optionality is key, and hybrids are stepping in for EVs as a bridge vehicle for those interested but not yet willing to give up the comfort of owning an ICE."* Our Supplemental Documents package includes the EY release. [LINK]

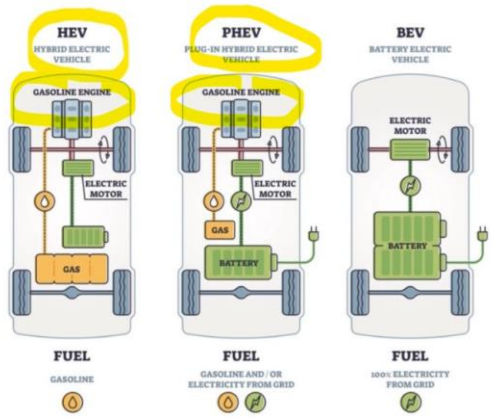
Energy Transition: HEVs & PHEVs are really just more fuel efficient ICE vehicles

HEVs/PHEVs are just fuel efficient ICE vehicles

No one can deny an HEV will burn less gasoline or diesel than its ICE counterpart. However, we still find many don't understand that HEVs and even PHEVs are really just more fuel-efficient ICE vehicles and, in particular, for PHEVs that are generally lumped in with EVs for an electrified car group. HEVs and PHEVs run on gasoline or diesel for likely at least half of the time for PHEVs and probably 90% for HEVs. (i) On Tuesday, we tweeted [LINK] "*Reminder HEVs and PHEVs are really just more fuel efficient ICE vehicles. See 👇Sept 4 tweet for the numbers. #OOTT*." Our tweet included our Sept 4 tweet [LINK] "*HEV/PHEV 101 - They are really just more fuel efficient ICE. Ford: HEV F150 does 23 mpg vs ICE150 at 19 mpg. Volvo: PHEVs km driven are split 1/2 using battery, 1/2 using petrol/diesel. #OOTT."* (i) Ford F150 Hybrid vs ICE mpg. Our tweet included the EPA rated mileage for the Ford F150 ICE vs Hybrid. The EPA rates the Hybrid fuel efficiency as being only 4 mpg more than the ICE. That increased fuel efficiency would be reduced if it was a full apples-to-apples comparison. The ICE has a much larger towing capacity. The F150 ICE 3.5L cyl F-150 does 19 MPG with a tow capacity of 13,500 lbs. The F150 HEV 3.5L 6 cyl F-150 does 23 MPG with a tow capacity of 11,200 lbs. (ii) Volvo PHEV. Most just lump PHEVs in with EVs because both are electrified. But the reality is that a lot of PHEV is driven in ICE mode. As noted earlier, Volvo backed off its fully electric plans and its press released noted "*Volvo Cars' most recent data shows that around half of the kilometres covered by the latest plug-in hybrid Volvo cars are driven on pure electric power."* So based on the "most recent data", Volvo PHEVs are driven around 50/50 between km driven in battery mode vs ICE mode. Given the press release was Volvo having to back away from its electrified goals, we have to be believe the "around half" driven by PHEV is likely below half. (iii) We also believe that

Volvo has likely picked the best time period for PHEVs driving in battery mode. We would assume the most recent data is referring to some spring/early summer period. and it does not include winter months where the PHEVs will be driven more in ICE mode.

Figure 69: HV vs PHEV vs BEV



Source: ACEA

Energy Transition: Stellantis suspends the production of BEV Fiat 500 for 4-weeks

BEV Fiat 500 production suspended

As noted earlier, BMW did not include EVs as a factor for their big reduction in guidance, which is different than what we have seen from the other major European car manufacturers at Mercedes, Volkswagen and Volvo that have all reduced their EVs plans. This week, Stellantis joined the latter group for their Fiat BEVs. On Thursday Stellantis announced that it would pause the production of the BEV Fiat 500 due to weak demand [LINK]. On Friday, we tweeted [LINK] *"More EU EVs disappointing sales growth - Fiat to pause 500 EV production. "is necessary due to the current lack of orders linked to the deep difficulties experienced in the European electric (car) market by all producers, particularly the European ones," Stellantis said in a statement." Reports 👇 @gpiov_report. #OOTT".* The shortfall in demand is reported to primarily stem from European markets, and in lieu of this demand slump Fiat announced the introduction of a hybrid version of the Fiat 500 which is expected to begin production in 2025 and 2026. Reuters reported: "*The suspension of production will start on Friday, Stellantis said, adding it was "working hard to manage at its best this hard phase of transition".As part of these efforts, the Franco-Italian group said it is investing 100 million euros ($110 million) in Mirafiori to adopt a higher performance battery and will produce a hybrid version of the 500 electric model, starting between 2025 and 2026*". Our Supplemental Documents package includes the Stellantis report.

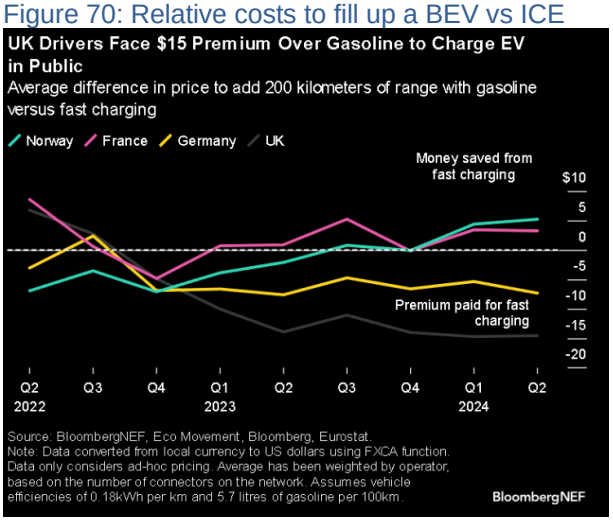
Energy Transition: Costs more to refill a BEV than an ICE in Germany & UK

Filling up costs more with BEVs in UK & Germany

Everyone works on the assumption that it costs less to refill a BEV with electricity than it does to refill an ICE with gasoline. That has always been the key to argument on why that, eventually, the higher cost of an EV can work out to a lesser cost over the long term. Pro-ICE always remind that these relative cost comparisons don't include all the costs such as the much higher insurance costs for BEVs. But we shouldn't have been surprised to see the BloombergNEF Friday report that noted it is costing more to fill up a BEV with fast charging in

Germany and the UK, but less in France and Norway. France and Norway make sense as France has big nuclear and Norway big hydro in addition to its cheaper surplus natural gas. Germany makes sense given it cut off cheap natural gas pipeline gas from Russia. BloombergNEF wrote "*UK electric vehicle owners can face a $15 premium to add 200 kilometers (124 miles) of range compared to the equivalent cost of gasoline. Public charging prices in the UK have risen significantly over the last 2 years, due to rising electricity and grid usage costs and a drive from investors to be profitable. Prices haven't risen everywhere. In Norway, mounting demand and competition have pushed them down by almost 35% since 2022, with drivers saving up to $5 over gasoline for a 200-km session.*"

Figure 70: Relative costs to fill up a BEV vs ICE



Source: BloombergNEF

Energy Transition: NTSB, 50,000 gallons of water needed to put out Tesla semi fire

Lots of water to put out Tesla semi fire

On Thursday, the NTSB (National Transportation Safety Board) released its "*Electric Truck-Tractor Roadway Departure and Postcrash Fire. What Happened*." [LINK]. This was the Tesla semi that caught fire on Aug 19 in California. The headline on the NTSB release was that "emergency responders worked to control the fire, *using about 50,000 gallons of water to extinguish the flames and cool the vehicle's batteries*." It is important to note that the NTSB described what happened but did not say what caused the fire. Rather the NTSB concludes "*All aspects of the crash remain under investigation while the NTSB determines the probable cause, with the intent of issuing safety recommendations to prevent similar events*." For perspective 50,000 gallons of water is equivalent to the water in four backyard 15' by 30' swimming pools.

Capital Markets: BlackRock equity shift to energy and utilities.

BlackRock equity shift to energy and utilities

There was an equity allocation shift in BlackRock's Weekly Investment strategy posted on Monday. BlackRock notes a shift in equity allocation "W*e move from a U.S. tech focus within our equity overweight, leaning further into a wider set of winners from the artificial intelligence (AI) buildout*." And then they go on to highlight that the winners will be "*energy and utilities*."

BlackRock doesn't split out where in Energy but energy is other than utilities. And given they didn't try to link to energy infrastructure to infer mid streamers, we think this has to also include some natural gas producers. But as we noted previously in their mid year global outlook, we think BlackRock goes out of its way to not use the words "natural gas". Rather they use "low carbon". Here is their new focus on "energy and utilities. " ". *In the first phase of AI now underway, investors are questioning the magnitude of AI capital spending by major tech companies and whether AI adoption can pick up. While we eye signposts to change our view, we think patience is needed as the AI buildout still has far to go. Yet we believe the sentiment shift against these companies could weigh on valuations. So we turn to first-phase beneficiaries in energy and utilities providing key AI inputs – and real estate and resource companies tied to the buildout. Outside the U.S., we trim our overweight to Japanese equities. The drag on corporate earnings from a stronger yen and some mixed policy signals from the Bank of Japan following hotter-than-expected inflation make us less positive. But we expect corporate reforms to keep improving shareholder returns*." They also continue to see one of their five mega forces is *"Transition to a low-carbon economy: The transition is set to spur a massive capital reallocation as energy systems are rewired*." And low carbon for really pro climate change groups means includes natural gas. Our Supplemental Documents package include excerpts from the BlackRock Sept 9 weekly commentary.

BlackRock mid-year outlook had a bullish need for natural gas

We realize this week that we hadn't posted our comments on BlackRock's July 9, 2024 Midyear Global Outlook. Here is what we wrote on this internally on July 12. (i) Assuming readers know the code words, BlackRock's new 2024 Midyear Global Outlook on Tuesday. [LINK] presents a bullish view for the need for natural gas. (ii) BlackRock's new outlook is all about AI. And how "*potential investment in AI*" is leading to a global transformation on par with the Industrial Revolution. Here is the opening "*The world could be undergoing a transformation on par with the Industrial Revolution – thanks to a potential surge in investment in artificial intelligence (AI), the low-carbon transition and a rewiring of global supply chains. But the speed, size and impact of that investment is highly uncertain. And it comes against an unusual economic backdrop post-pandemic: sticky inflation, higher interest rates, weaker trend growth and high public debt. We think taking risk by leaning into the transformation and adapting as the outlook changes will be key."* (iii) BlackRock is not saying anything different than the other electricity views we have been highlighting from AI. There is a "mega capex coming" for AI buildout and there are challenges to supply the energy needs. This is in line with other energy views. (iv) BUT what is different is that BlackRock does not mention natural gas, it's like there is an automatic word editor to not use natural gas if AI or power demand is mentioned. Rather they use the code words "*low carbon transition*". We think many or most should realize low carbon is code for natural gas, which is the lowest carbon fossil fuel. We recognize the politics but we don't think they are fooling people. (v) BlackRock highlights "*We are seeing the AI buildout boost demand for renewable energy"*. And in their chart highlighting the "*massive energy and investment needs*", they highlight "*meeting those needs could require massive investment in power grids and renewable energy*". So they don't mention natural gas at all in the massive needs. But they do note that early winders could include "*energy and utility firms*". So an energy firm is another code word for a natural gas company that isn't a utility

providing natural gas. (vi) Our Supplemental Documents package includes excerpts from the BlackRock 2024 Midyear Global Outlook.

Capital Markets: China raises retirement age & min # of years of pension contributions

China raises retirement age

No question China has an aging population problem that is accelerating and raising the retirement age is happening around the world and will be increasing with the aging baby boomers adding to a big seniors/pension liability. But we put this item in our Capital Markets section as the reality of raising retirement age in China and increasing the number of years of basic pension contributions is something that is being done more to help fix China's financial position. We haven't seen the math but with China's aging large population, there will be a big cash saving from postponing pension payouts by 3 years and more cash coming in from increasing the number of years for basic pension contributions. On Friday, People's Daily (China communist party media) reported [LINK] that China approved "*gradually raising the statutory retirement age in the country, marking the first adjustment in the arrangement since 1950s. According to the decision adopted at the 11th session of the Standing Committee of the 14th National People's Congress, the statutory retirement age for men will be gradually raised from 60 to 63 in the course of 15 years starting 2025, while that for women cadres and women blue-collar workers will be raised from 55 to 58 and from 50 to 55, respectively. Starting 2030, the minimum year of basic pension contributions required to receive monthly benefits will be gradually raised from 15 years to 20 years at the pace of an increase of six months annually. Meanwhile, people will be allowed to voluntarily retire by no more than three years in advance after reaching the minimum year of pension contributions. But it is not allowed to retire earlier than the previous statutory age."* Our Supplemental Documents package includes the People's Daily report.

Demographics: Hopefully the litterbugs realize their litter can have a big impact

Why do people litter?

On Monday, we tweeted [LINK] "*Butterfly Effect! Why do people litter anywhere let alone a national park? Cheetos "processed corn, softened by the humidity of the cave, formed the perfect environment to host microbial life and fungi. Cave crickets, mites, spiders and flies soon organize into a temporary food web, dispersing the nutrients to the surrounding cave and formations. Molds spread higher up the nearby surfaces, fruit, die and stink. And the cycle continues" @CavernsNPS thx @marniech."* People have to understand that if they litter, someone else will have to pick up their trash so we just don't get why people litter. How would people feel if some stranger threw garbage in their house. It's bad when people litter in cities but it gets even worse when people litter in national parks. We saw a CNN report on the Carlsbad Caverns National Park Facebook post on how someone throwing a Cheetos bag away impacted the ecosystem in the cavern. They didn't name the brand but people can see it's a Cheetos bag. Our tweet noted how the Cheetos bag garbage impacted the cavern. Our Supplemental Documents package includes the CNN report and the Carlsbad Caverns National Park Facebook post.

Figure 71: Cheetos bag littered in Carlsbad Caverns National Park

Source: Carlsbad Caverns National Park

Covid deaths stats in Alberta

Demographics: Covid still a risk for seniors in Alberta

Covid has been off the radar so we were a little surprised to see the CBC report on the Alberta Covid and flu numbers for the past year. "*Alberta's COVID-19 death toll more than 4 times higher than flu over past year. 732 Albertans have died due to COVID-19 since last August."* [LINK]. What seems clear, at least based on the last year's data, is that Covid is still a risk for seniors in Alberta. For the last year, "*Alberta's respiratory dashboard shows flu was responsible for 177 deaths while 732 people died of COVID-19 (between Aug. 27, 2023, and Aug. 24, 2024)." "While they're high compared to influenza, Alberta's COVID deaths are trending down from a peak of 2,409 during 2021-22."* The interesting part of the data is the age distribution and how it's a senior's risk as 713 of the 732 who died were 50 and over. CBC says "*Alberta Health data shows 632 of the people who died of COVID were ages 70 and up, 81 were between 50 and 69 and 15 were in the 20 to 49 age range. Four children under the age of 10 died of COVID in the past year."* The other part of the data is the 5% of the flu hospitalizations died and 12% of the COVID hospitalization died. Our Supplemental Documents package includes the CBC report. [LINK]

Russia's shrinking population

Demographics: Putin keeps asking Russians to have 7+ people in families

Putin continues to ask Russians to have more children and to make it fashionable to have large families of seven or more. On Sept 5, Putin spoke at length at the Plenary session of the 9th Eastern Economic Forum. The Kremlin posted a transcript. [LINK]. And, as he usually does in these broad speaking forums, Putin highlighted the need for an increasing birth rate in Russia and to have larger families of seven or more. Putin said "*As for the fact that there are not enough of us physically. Well, yes, even Alexander Solzhenitsyn, whom Mr Prime Minister [of Malaysia] recalled, said that the main task of the state is to preserve the people. We need, of course, to address demographic problems and take care of families with children and so on. But the labour market is indeed in a unique position, two something per cent, 2.4 per cent, I believe. This has never happened in our history. It is related to the needs of production, the real sector of the economy. How can this issue be addressed? First, of course, I repeat, it is necessary to take care of the population, to increase the birth rate, to*

create conditions for people to have a large family, to make it fashionable to have many children, as it used to be in Russia in the past – seven, nine, ten people in families."

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

Putin's focus on Russians having bigger families is not a new focus and not a new focus post Ukraine. Rather Russian's shrinking population, pre-Ukraine, was his greatest concern. Here is what we wrote in our Dec 26, 2021 Energy Tidbits memo. "*Putin's big press conference comments on Russia's population reminded us of an item we forgot to include in our Dec 5, 2021 Energy Tidbits – Putin's greatest concern is the shrinking Russia population. This week, Putin noted "There are issues that cannot but cause concern, including life expectancy, which has slightly decreased from 71.5 to 70.1 years." The item we forgot to include was Putin's comments at the "Russia Calling! Investment Forum" on Nov 30. [LINK]. Putin was asked "What keeps you awake at night?" In the sense, "What is your greatest concern?". Putin responds "We have domestic issues typical of Russia, primarily demographic problems. We had two natural declines in our demographic development: during World War II or the Great Patriotic War, as we call it, in 1943–1944, and in the early and middle 1990s after the collapse of the Soviet Union. There was an equal drop in the birth rate. It was the lowest in 1999 – I believe a little over 1,200,000. In 2006, we already had almost two million births – more than 1,900,000. This problem has acquired a systemic and economic character due to the shortage of workforce in the labour market. We have a little over 80 million there and our losses amount to 1.1–1.2 percent a year. In this context, demographics is one of our main problems both for humanitarian and economic considerations, and because we need to strengthen our statehood as well. I will not enumerate all the measures and instruments we are using and intend to continue using in the future in order to tackle this problem. In general, we managed to get things moving in the recent past. Overall, we understand what we can do and know how to do it."*

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

@Energy_Tidbits on Twitter

Last 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

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

Connors, Hughes & Silverman in hunt for PGA Procore Championship

Good day for Cdn golf fans to be watching the final round of the PGA Procore Championship with three of our Cdn golf stars in the hunt. Corey Connors and Mackenzie Hughes are -13 and T3. And Ben Silverman is at -12 and T7. The leader is Patton Kizzire at -18, and David Lipsky is -14. But the Cdns are all in a good position to challenge. It is great to see Connors and Hughes playing well in the leadup to next week's Presidents Cup. And for Silverman, this could be a chance for his highest ever finish in a PGA tour event.

Wine of the week: 2001 Conterno-Fantino Barolo Sori Ginestra

In August, I started the wine of the week when I realized I had to get to opening up some wines bought 20 to 30 years ago that included some that, unfortunately, were getting past their prime. One of the negatives of the change in life from Covid was a huge absence of entertaining at home, which means there has been a big shortfall in wine drinking at our home. So am now making sure some good wine of the week bottles get opened especially as many are 20 to 40 years old. On Friday, I tweeted out the wine of the week, which was the 2001 Conterno-Fantino Barolo Sori Ginestra. It was still as good as it was five years ago. And don't feel I have to rush to drink the last few bottles. 2001 was a good vintage for Barolo and the Wine Spectator loved this wine and put it #25 of the wine of the year.

Figure 72: 2001 Conterno-Fantino Barolo Sori Ginestra

Source: SAF Group

Photo radar raised $27mm for Calgary, $29mm for Edmonton in 2023

Early on Saturday and Sunday mornings, we will put on the 30-min CTV National News that they will run multiple times in the early weekend mornings. So we will hear the loop of stories. One of the early Saturday morning stories was on Alberta is planning to scale back the number of photo radar cameras being used. We are always surprised that photo radar is a lightning rod subject and how the anti-photo radar see it as a cash grab. Perhaps people's perspective would be different if they knew of or thought about the people who have been killed or injured by speeding

accidents. Regardless, there is a financial element for cities. The CTV report noted that, in 2023, photo radar fines totaled >$27 million for Calgary and >$29 million for Edmonton. That is needed revenue for municipal budgets.