Energy Tidbits

April 14, 2024

Produced by: Dan Tsubouchi

Game Changer? Iran Unleashes Massive Drone/Missile Attack Against Israel i.e. Didn't Hide Behind its Proxies

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. My priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is the review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. My target is to write on 50 weekends per year and to post by noon MT on Sunday. The Sunday noon timing was because PMs said they didn't have research to read on Sundays and Sundays are a day when they start to think about the investing week ahead.

This week's memo highlights:

1. 15 hours ago, Seems like a game change! Iran launched a massive drone/missile attack vs Israe itself, launched directly from Iran directly at Israel and didn't get proxies to attack Israel. How will Israel respond? [LINK]
2. Russia escalates with missile hits on Ukraine's natural gas storage. [LINK]
3. US must decide if it wants to extend the General Licence 44 by April 18 to keep Venezuela oil flowing to Gulf Coast. [LINK]
4. IEA reaffirms it still see peak oil demand by 2030. [LINK]
5. Vitol CEO sees oil demand growth of +1.9 mmb/d YoY in 2024. [LINK]
6. Please note that we had an earlier than normal 5am MT news cut off and we didn't get to many items due to spending a lot of time following yesterday's Iran missile attack on Israel.
7. 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.
8. 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: +24 bcf build in US gas storage; now +435 bcf YoY with draw season over

+24 bcf build in US gas storage

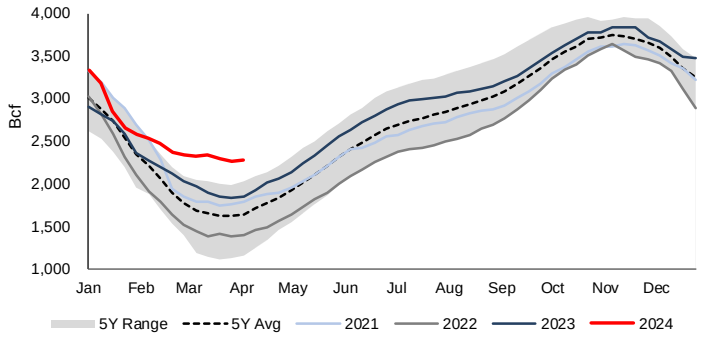
US natural gas storage continues to be above the top end of the 5-yr range. Now that we've passed the end of "draw season" on April 1st, builds will become more frequent. There was a build from gas storage in the US this week. For the week of April 5, the EIA reported a +24 bcf build. Total storage is now 2.283 tcf, representing a surplus of +435 bcf YoY compared to a surplus of +422 bcf last week. For this week, and the past few, total storage is above the top end of the 5-yr range. Total storage is +633 bcf above the 5-year average, the same as last week's surplus. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (04/05/23)		5-year average (2019-23)	
Region	04/05/24	03/29/24	net change	implied flow	Bcf	% change	Bcf	% change
East	362	363	-1	-1	342	5.8	296	22.3
Midwest	512	510	2	2	425	20.5	369	38.8
Mountain	165	162	3	3	80	106.3	89	85.4
Pacific	229	227	2	2	74	209.5	153	49.7
South Central	1,014	996	18	18	927	9.4	744	36.3
Salt	299	294	5	5	262	14.1	224	33.5
Nonsalt	714	701	13	13	664	7.5	519	37.6
Total	2,283	2,259	24	24	1,848	23.5	1,650	38.4

Source: EIA

Figure 2: US Natural Gas Storage



Source: EIA

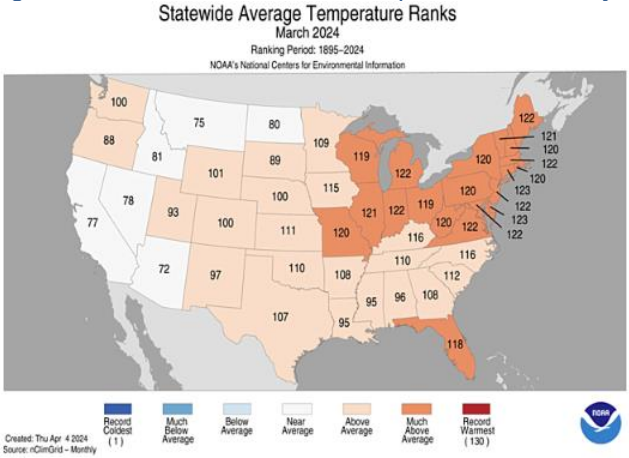
Natural Gas: NOAA, 16th warmest March on record for the contiguous United States

16th warmest March on record

We started warning on the hot winter in Q4/23 with the reminder that it is always tough for natural gas markets to catch up from a warm start to winter. And that the only way that happens is if there is sustained cold weather in Jan and Feb. Unfortunately, the hot weather played out all winter. On Friday, the NOAA released their March recap for statewide average temperatures, which revealed March 2024 was the 16th warmest the US has seen in the past 130 years. For the most part, temperatures were normal except for NE states which were "much above" average. In a news release [LINK], the NOAA wrote "*The average temperature of the contiguous U.S. in March was 45.1°F, 3.6°F above average, ranking 17th warmest in*

the 130-year record. March temperatures were above average across much of the contiguous U.S., while below-average temperatures were observed in small pockets of the West and Southwest". Below is a picture of statewide average temperature ranks in March.

Figure 3: NOAA Historical US Temperature Ranks by State – March 2024



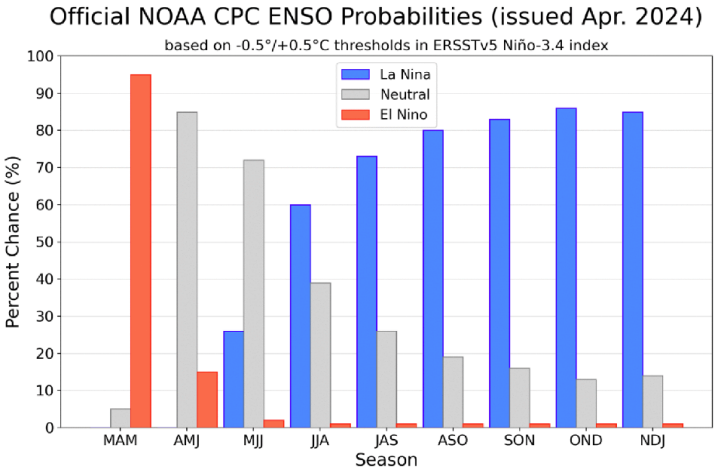
Source: NOAA

Natural Gas: NOAA sees ~80% probability for La Nina conditions during Aug/Sep/Oct

La Nina/El Nino focus to turn to summer

On Friday, we tweeted [LINK] "*Potential for higher than normal Atlantic hurricane activity this summer. @noaa latest outlook is for La Nina summer. Hurricane are from predictable but La Nina summers tend to have increased hurricane activity. @weatherchannel #OOTT #NatGas #LNG*". On Thursday, the NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. Winter 2023-2024 is essentially over and has turned out to be the warmest on record and will support the general, but not 100%, correlation that strong El Ninos lead to warm winters in the US. The El Nino/La Nina focus shifts to the summer and to hurricane season. The probability forecast is at ~80% for La Nina conditions in the peak hurricane months of Aug/Sep/Oct. However, the qualifier is said by NOAA that forecasting El Nino/La Nina conditions for the summer is difficult ahead of the spring. NOAA writes "*The forecast team continues to favor the dynamical model guidance, which is slightly more accurate than statistical models during this time of year. La Niña tends to follow strong El Niño events, which also provides added confidence in the model guidance favoring La Niña. In summary, a transition from El Niño to ENSO-neutral is likely by April-June 2024 (85% chance), with the odds of La Niña developing by June-August 2024 (60% chance*". Again, weather is never 100% the same, but La Nina summers normally bring a better chance for normal hurricane activity whereas El Nino summers tend to have lesser hurricane activity. Below is the NOAA El Nino/La Nina Mar update.

Figure 4: NOAA El Nino/La Nina Outlook

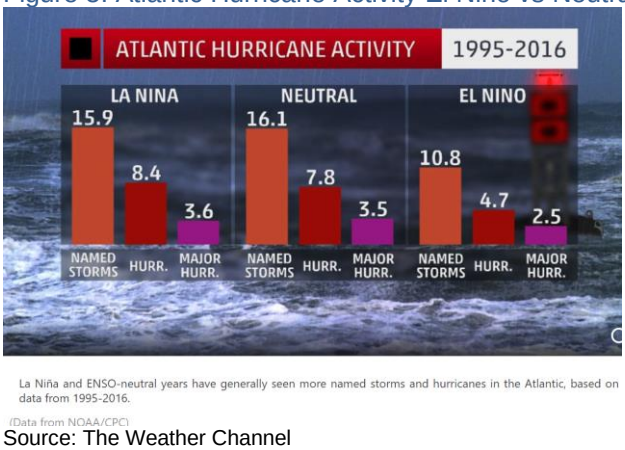


Source: NOAA CPC, IRI

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

Our tweet on Friday included the below chart from prior years by The Weather Channel on Atlantic hurricane activity in La Nina, Neutral and El Nino summers. The latest NOAA summer outlook for El Nino/La Nina conditions calls for La Nina conditions in the summer and the peak Aug/Sep/Oct hurricane season. Weather is never 100% accurate but, historically, Neutral and La Nina conditions tend to have normal to above normal hurricane activity, whereas El Nino years tend to have lower hurricane activity seasons. Our May 24, 2020 Energy Tidbits memo included The Weather Channel Aug 28, 2018 story that had the below graphic.

Figure 5: Atlantic Hurricane Activity El Nino vs Neutral vs La Nina



Source: The Weather Channel

Natural Gas: EIA models US gas production down YoY in 2024 with lower HH prices

EIA US natural gas production forecast

The EIA continues to forecast a small YoY decline in US gas production in 2024 due to lower HH prices and then a return to growth in 2025 with higher assumed HH prices and increasing associate natural gas production with high oil production. (i) On Tuesday, the EIA released its monthly Short Term Energy Outlook for April 2024 [LINK]. The EIA raised its 2024 US natural gas production estimate by +0.2 bcf/d to 103.6 bcf/d, which, on a full year average basis, still gives a YoY decline of 0.2 bcf/d from 2023. The lower YoY 2024 is likely due to the lower HH prices used in their modeling and that would be offset by higher associated natural as production from higher oil production. (ii) The EIA lowered its 2024 HH price forecast -$0.12/mcf to $2.24/mcf (was $2.36/mcf), and reduced their 2025 forecast -$0.05/mcf to $3.01/mcf (was $3.06/mcf). The EIA did not comment on the change in HH gas prices. (iii) The quarterly changes are as follows: Q1/24 +0.7 bcf/d to 103.9 bcf/d, Q2/24 -0.8 bcf/d to 103.0 bcf/d, Q3/24 +0.10 bcf/d to 103.4 bcf/d, and Q4/24 +0.8 bcf/d to 104.0 bcf/d. (iv) The EIA increased its 2025 forecast +0.5 bcf/d to 104.9 bcf/d, which, on a full year average basis, would be up +1.30 bcf/d YoY. The quarterly changes to 2025 are as follows: Q1/25 +0.4 bcf/d to 103.9 bcf/d, Q2/25 +0.3 bcf/d to 105.0 bcf/d, Q3/25 +0.5 bcf/d to 105.0 bcf/d, and Q4/25 up +0.8 bcf/d to 105.7 bcf/d. The EIA did not comment on the changes in their natural gas consumption forecast. (v). (iv) Our Supplemental Documents package includes excerpts from the STEO.

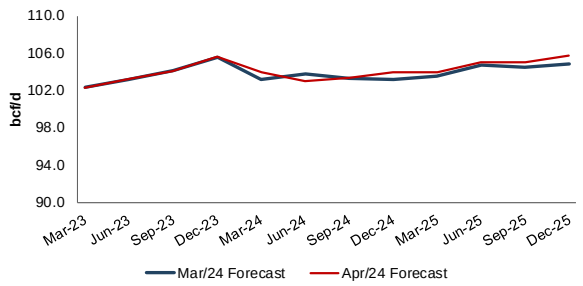
Figure 6: EIA STEO Natural Gas Production Forecasts

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
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 Short Term Energy Outlook, Updated Apr 9, 2024

Source: EIA, STEO

Figure 7: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

Natural Gas: EIA STEO estimates Nov 1, 2024 storage at 4.120 tcf, highest since 2016

EIA April STEO storage forecast

There was a short cold snap in Jan but last week's (Mar 10, 2024) Energy Tidbits memo highlighted that Dec/Jan/Feb was record warm temperatures in the US. Now that we're past the end of draw season (April 1st), we turn our attention to next winter. (i) The EIA forecasts US Gas Storage out to the end of 2025. Gas storage started the summer 2023 refill season was estimated to be 1.850 tcf on April 1, 2023, which was +0.448 tcf YoY. For the winter 2023 draw season, the EIA estimated storage on Nov 1, 2023 at 3.809 tcf, which is +0.240 tcf YoY. (ii) The EIA forecasts gas storage on April 1st of 2024 was 2.290 tcf, which would be +0.440 tcf YoY and up vs Mar STEO of 2.269 tcf., so a small revision. (iii) The EIA forecasts the 2024/2025 winter starting with 4.120 tcf, up +0.002 tcf from the Mar STEO, ending the winter in Apr 2025 at 2.178 tcf, and finally a start to the 2025/2026 winter at 4.091 tcf, up slightly from 4.089 tcf in the Mar STEO. If the estimates are true, the winter we are about to go into (2024/2025) will have the highest storage since 2016. Below is a table tracking the working gas inventory forecasts and actuals since 2016.

Figure 8: EIA STEO US Natural Gas in Storage (2016-2025)

US Working Natural Gas in Storage (billion cubic feet)						
	Storage	2016-2025				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,119.5	883.2	3,677.9	9.1%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,119.5	883.2	3,677.9	3.8%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,119.5	883.2	3,677.9	-12.0%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,119.5	883.2	3,677.9	2.3%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,119.5	883.2	3,677.9	6.8%
Mar 2021	1,801.2	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,236.3	4,119.5	883.2	3,677.9	-0.3%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,569.4	3,236.3	4,119.5	883.2	3,677.9	-3.0%
Mar 2023	1,849.9	1,184.9	2,486.3	1,301.4	1,835.6	0.8%
Oct 2023	3,809.4	3,236.3	4,119.5	883.2	3,677.9	3.6%
Mar 2024	2,290.0	1,184.9	2,486.3	1,301.4	1,835.6	24.8%
Oct 2024	4,119.5	3,236.3	4,119.5	883.2	3,677.9	12.0%
Mar 2025	2,178.5	1,184.9	2,486.3	1,301.4	1,835.6	18.7%
Oct 2025	4,091.5	3,236.3	4,119.5	883.2	3,677.9	11.2%

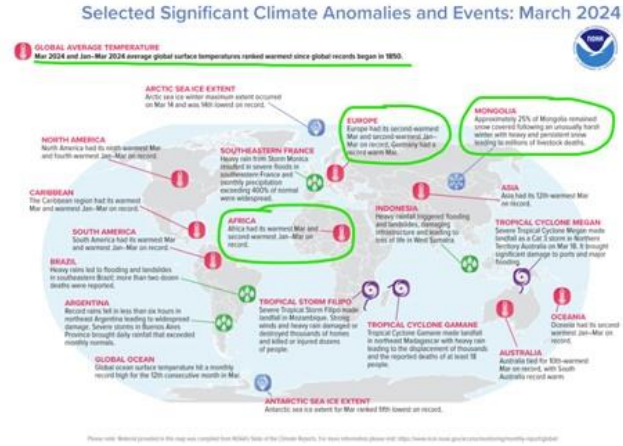
Source: EIA, STEO

Natural Gas: March 2024 had the hottest average global temperature on record

Hottest March on record globally

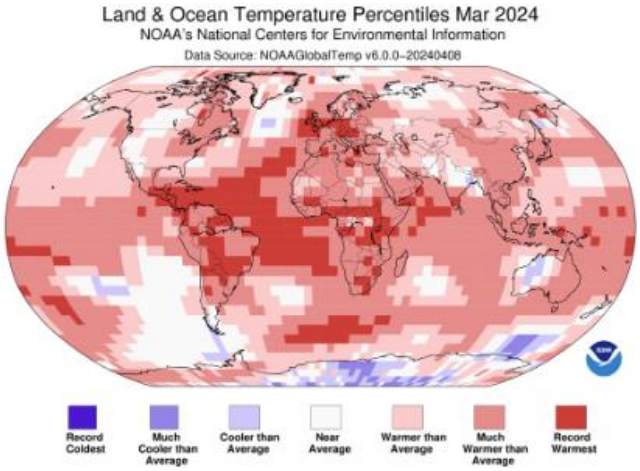
On Thursday, the NOAA posted its global climate recap for March, and it was another month of the hottest on record. And importantly, it was warm around the world. It was the warmest March on record for Africa and South America. The Jan-Mar 2024 average was also the highest on record for the first three months of the year. Going forward into spring and the shoulder season, these averages matter less for natural gas as the northern hemisphere comes out of winter but isn't in summer quite yet where air condition is needed, and the southern hemisphere is in their fall. Below are the NOAA graphics for Mar.

Figure 9: Selected Significant Climate Anomalies and Events: Mar 2024



Source: NOAA

Figure 10: Land & Ocean Temperature Percentiles for Mar 2024



Source: NOAA

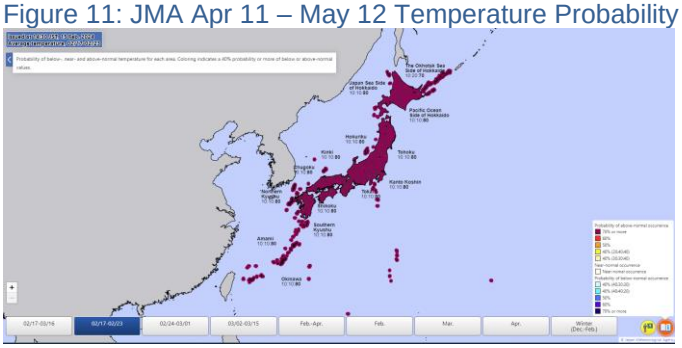
Natural Gas: Japan forecast warmer than normal next 30-days but its shoulder season

Japan is the #2 LNG importer just behind China. It's now April, which is shoulder season so not any big weather driven demand for electricity and natural gas in Japan. The big reason why Japan LNG stocks dropped last month were because some coal plants went offline and they had to draw on LNG instead. We haven't been reporting on Japan near-term weather as it's shoulder season. We decided to put in this week's JMA 30-day temperature outlook to support that much warmer than normal temperatures in shoulder season really don't have much impact on natural gas consumption. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The Apr 11 update calls for much warmer than normal temperatures for the rest of April and first week of May. Since the JMA forecast is for Apr 13 – May 12, we want to point out that "warmer than normal" in the shoulder season

Japan's 30-day temperature forecast

translates into high 20's in Japan, which isn't hot enough to drive air conditioning demand, nor are the nights cold enough to warrant much heating. Below is the JMA's 30-day temperature probability forecast for Apr 13 – May 12.

Figure 11: JMA Apr 11 – May 12 Temperature Probability Forecast



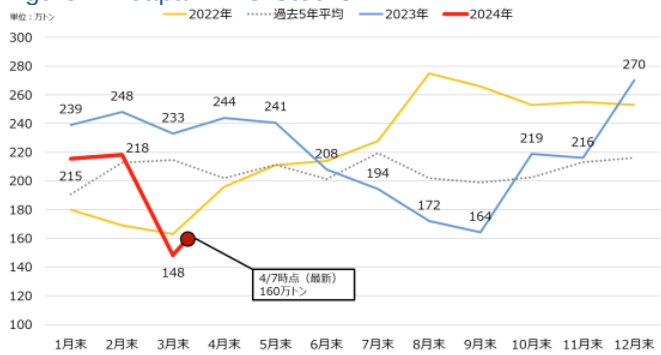
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks up WoW, YoY, week still lowest in past three years

Japan LNG stocks up +8.1% WoW

Japan's LNG stocks are below 2023 levels and well below the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on April 7 were 76.8 bcf, up +8.1% WoW from Mar 31 of 71.1 bcf, and are down -34.4% YoY from 117.2 bcf a year earlier. Stocks are well below the 5-year average for the end of April of 97.0 bcf and is still the lowest it has been over past 3 years (on a weekly basis). The build was helped by Japan shutting in some natural gas generation two weeks ago to conserve natural gas use and drain on LNG stocks. Prior to that, part of the reason for the drain on LNG stocks was that there were some unplanned coal plant outages in Feb/Mar. METI did not comment on the WoW decrease. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 12: Japan LNG Stocks



Source: METI

Japan's JERA suspends production at 4 natural gas plants to save LNG

The low LNG stocks in March led to shutting in some natural gas power generation to conserve LNG *stocks.* Here is what we wrote in our Mar 31, 2024 Energy Tidbits memo. *"The low LNG stocks noted above have led to an immediate reaction in*

Japan – JERA is temporarily halting natural gas power generation at four natural gas plants to save drawing on its dwindling LNG stocks. On Friday, Reuters reported "Japan's biggest power generator JERA said it has suspended production at four of its gas-fired power stations and curtailed output at another plant from to secure sufficient LNG inventory. The move comes as a recent drop in temperatures in the Tokyo area boosted power demand while stormy weather caused delays in the arrival of LNG cargoes, causing a drop in LNG stock levels, a JERA spokesperson said.Operations were temporarily suspended at power plants in Futtsu, Yokohama, Kawasaki and Chiba, all near Tokyo, and curtailed at Higashi-Ohgishima."

Natural Gas: Russia bombs Ukraine gas storage, damages above ground facilities

Russia hits ground Ukraine gas storage infra

Our March 31, 2024 Energy Tidbits noted our surprise that the Russia missile attack on a Ukraine natural gas storage facility didn't get any attention. But that wasn't the case this week with Russia's Apr 11 attack on another Ukraine natural gas storage facility. Early Thursday morning, we tweeted [LINK] "*Europe TTF #NatGas prices up but still down 1/3 YoY. Russia attacks two Ukraine underground gas storage faciltiies ... "still operating while specialists assess the impact of the shelling" report @kchoursina @priazrocha. #OOTT. [LINK]."* On April 11, the storage operator, Ukrtransgaz JSC, posted a short report on its website [LINK]. The Google Translate was "*During the attack on the energy infrastructure, on the morning of April 11, the enemy fired at underground gas storage facilities. The ground infrastructure of two gas storage facilities was damaged. PSG continue to function. The staff was in shelter, no one was injured."* As of 11pm MT last night, we have not seen any update on the damage on the Ukrtransgaz JSC website. But Ukrtansgaz is admitting there was damage to the ground infrastructure. We just don't know the extent of the damage. Regardless, Europe TTF gas prices were up as markets finally realize Ukraine gas storage is at risk.

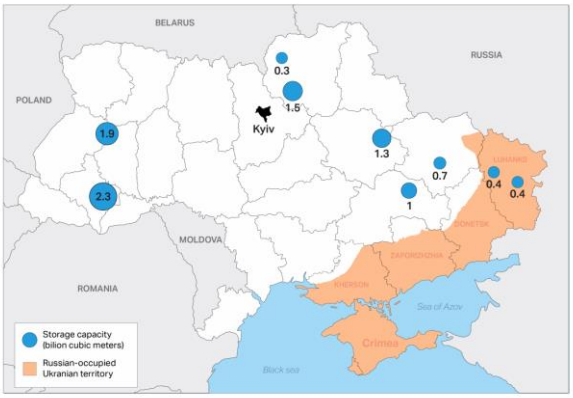
Putin said forced to attack gas storage after Ukraine hit Russia oil refineries

On Thursday, we tweeted [LINK] "*Why Russia hit Ukraine #NatGas storage. Putin "In the energy sector, unfortunately, we have seen a series of strikes on our energy facilities recently and had to respond". Ukrtransgaz storage operator "ground infrastructure of 2 gas storage facilities was damaged." #OOTT."* TASS reported on Putin basically said Russia had no choice but to hit back at Ukraine's energy infrastructure given Ukraine's missile/drone attacks on Russia oil refineries. TASS reported "*In the energy sector, unfortunately, we have seen a series of strikes on our energy facilities recently and had to respond,"* And he didn't hit the gas storage in the winter for humanitarian reasons "*I mean that they did not want to leave social institutions, hospitals and so on without power supply. But after a series of strikes on our energy facilities, we were forced to respond.*" Our Supplemental Documents package includes the two TASS reports that were attached to our tweet.

Ukraine storage was 10% of Europe's pre-winter gas storage volume

The reason why natural gas markets reacted to the Russian bombing of the Ukraine natural gas storage was that Ukraine's natural gas storage is an important part of Europe natural gas storage. We broke out the Ukraine storage data from the below Europe data we monitor weekly from the GIE AGSI website [LINK], and we found that on April 11th natural gas in Ukraine storage was at 11.67% of total capacity, and started the winter on Nov 1, 2023 at 39.38%. Right now, Ukraine makes up ~5% of Europe's natural gas in storage and, at the beginning of the winter, it was ~10% of Europe's natural gas in storage. So not an unnoticeable portion at risk of being destroyed if the Russians target their facilities well. We don't know how deep down are the Ukraine storage caverns so are unable to assess the potential for underground natural gas in storage to be blown up. But, as seen this week, Russia bombs can damage or destroy above ground infrastructure for the natural gas storage operations. Below is a map of Ukraine's major gas storage facilities.

Fig 13: Ukraine Gas Storage Facilities as of July 2023



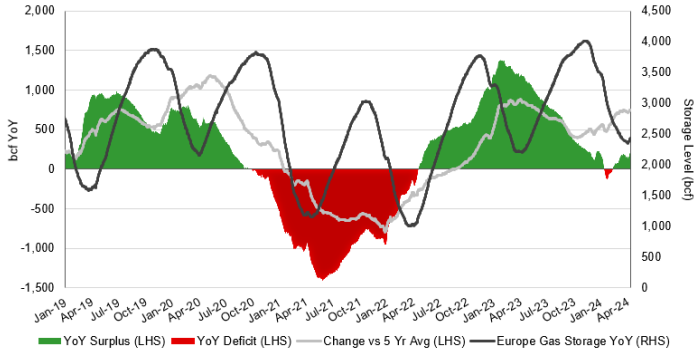
Source: Bruegel

Natural Gas: Europe storage builds WoW to 61.16%, YoY surplus widens

Europe gas storage

This week, Europe storage increased by 1.57% WoW to 61.16% on Apr 11 vs 59.59% on April 4. Storage is now +5.05% higher than last year's levels of 56.11% on Apr 11, 2023. Even though the YoY surplus is modest, up until this week's Russia bombing of Ukraine natural gas storage facility, there weren't fears for natural gas and LNG supply over the summer months. The issue for Europe natural gas markets over the coming months will be if Russia can damage or put out of operation any Ukraine natural gas storage. Below is our graph of Europe Gas Storage Level.

Figure 14: European Gas Storage Level



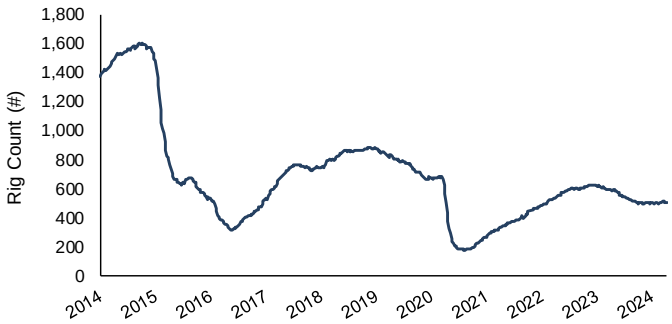
Source: Bloomberg, SAF

Oil: US oil rigs down -2 rigs WoW to 506 rigs, US gas rigs down -1 WoW at 109 rigs

US oil rigs down WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note, Baker Hughes has restored their old reporting format so we have been able to break out regional data, however they forgot to update the old format file with this week's rig data, so we aren't able to see the basin breakout by type of rig. (ii) Total US oil rigs were down -2 rigs WoW to 506 oil rigs as of April 12. US oil rigs went below 520 rigs on Aug 25 and has been around 490-510 rigs for the past several months. (iii) Note we are able to see the basin changes but not by type of rig. The major changes were Ardmore Woodford up +1 rig to 1 total, Cana Woodford -2 to 20 total rigs, Permian -1 rig to 316 rigs, Eagle Fod -1 rig to 55 rigs and Granite Wash +1 rig to 4 rigs. Others were flat at 98 total rigs. We think there might be a shifting of Permian rigs from Texas to New Mexico based on the state data. (iv) US gas rigs were down -1 rig this week to 109 gas rigs.

Figure 15: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

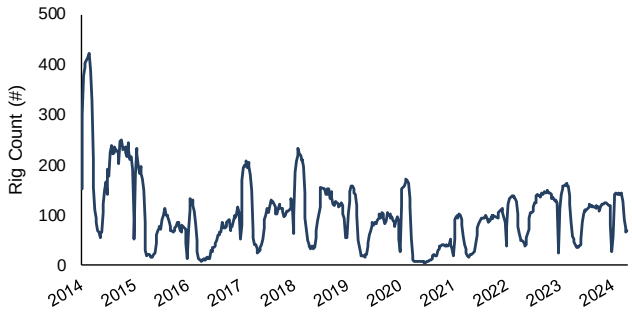
Oil: Total Cdn rigs up +5 rigs WoW

Cdn total rigs up WoW

The last several weeks have seen total Cdn rigs decline drop from 231 in March to 136 last week as winter drilling season comes to an end. Normally, Cdn rigs seasonally decline until late April or early May. However, as we have been highlighting, there was extremely low snowfall this winter, which means there are likely some areas that are returning earlier to a post spring breakup drilling. Otherwise we normally would have assumed Cdn rigs would be

down in mid-April. For the week of April 12, as a bit of a surprise, total Cdn rigs were up +5 rigs WoW to 141 rigs total. Cdn oil rigs were up +5 rigs WoW to 70 oil rigs and are up +18 rigs YoY. Baker Hughes did not update their old format report, so we weren't able to see the province breakouts.

Figure 16: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

US oil production flat WoW

Oil: US weekly oil production estimates flat WoW at 13.100 mmb/d

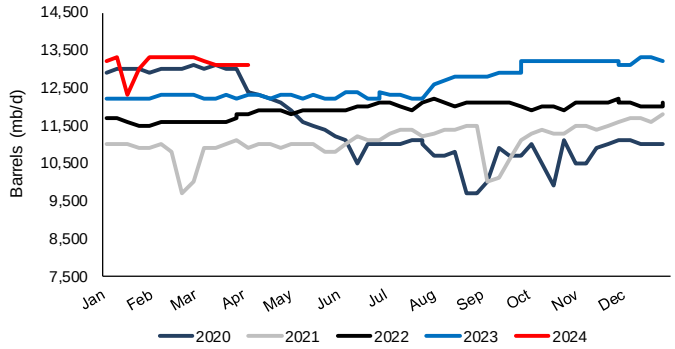
It's worth noting that the EIA has benchmarking has led to a revision downward in weekly oil estimates instead of what have been upward revisions. Here's what the EIA wrote on their website earlier this month: "*When we release the Short-Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude oil production are reviewed to identify any differences between recent trends in survey-based domestic production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that decreased estimated volumes by 177,000 barrels per day, which is about 1.3% of this week's estimated production total".* On Tuesday, the EIA released its Apr STEO and they'd revised down Q1/24 production estimates to 12.84 mmb/d from 12.91 mmb/d in March's STEO, so this message is consistent. The latest Form 914 (with January actuals) was -0.416 mmb/d lower than the weekly estimates of 12.533 mmb/d. This week, the EIA's production estimates were flat WoW at 13.100 mmb/d for the week ended Apr 5. Alaska was up +0.004 mmb/d WoW at 0.436 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 17: EIA's Estimated Weekly US Field Oil Production

	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								

Source: EIA

Figure 18: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

Oil: North Dakota Feb oil up MoM to 1.247 mmb/d after extreme cold shut-ins in Jan

North Dakota oil production

On Friday, the North Dakota Industrial Commission posted its monthly Director's Cut, which includes February's oil and natural gas production data as well as other data such as well completions, DUCs, number of producing wells, etc. [LINK] As we expected, due to the extreme cold shut-ins we saw in January, the estimates for North Dakota's oil production in February was back up again MoM at +143,715 b/d MoM to 1.247 mmb/d, and is now up +7.6% YoY against 1.159 mmb/d in February 2023. Our Supplemental Documents package includes NDIC Director's Cut.

Figure 19: North Dakota Oil Production by Month

(b/d)	2018	2019	2020	2021	2022	2023	2024	*24/23*
Jan	1,179,564	1,403,808	1,430,511	1,147,377	1,088,613	1,060,708	1,102,976	*4.0%*
Feb	1,175,316	1,335,591	1,451,681	1,083,554	1,089,091	1,158,837	1,246,691	*7.6%*
Mar	1,162,134	1,391,760	1,430,107	1,108,906	1,122,640	1,122,693		
Apr	1,225,391	1,392,485	1,221,019	1,123,166	900,597	1,133,435		
May	1,246,355	1,394,648	859,362	1,128,042	1,059,060	1,135,009		
June	1,227,320	1,425,230	893,591	1,133,498	1,096,783	1,166,604		
July	1,269,290	1,445,934	1,042,081	1,076,594	1,072,632	1,180,611		
Aug	1,292,505	1,480,475	1,165,371	1,107,359	1,075,307	1,223,617		
Sept	1,359,282	1,443,980	1,223,107	1,114,020	1,121,063	1,280,052		
Oct	1,392,369	1,517,936	1,231,048	1,111,910	1,121,754	1,254,475		
Nov	1,375,803	1,519,037	1,227,138	1,158,622	1,098,389	1,278,909		
Dec	1,402,741	1,476,777	1,191,429	1,144,999	957,864	1,274,869		

Source: NDIC, NDPA

Potential pause in North Dakota production in March/April

North Dakota oil industry gets impacted much like Saskatchewan in terms of road bans/restrictions as snow melts as temperatures warm up leaving the winter. The melting snow/warming temperatures puts secondary and rural roads at risk so North Dakota will put weight restrictions on roads and this impacts the ability to move any heavy road equipment on these non-primary roads. Every month North Dakota Industrial Commission holds a webcast to discuss the just issued Director's Cut and there are always good insights. The call was on Friday afternoon. Yesterday, we tweeted [LINK] "*It's temporary but North Dakota warns Mar road restrictions should impact #Oil production in Mar/Apr. "March completions fell off pretty dramatically …. 92 completions in Feb and only 56 in Mar., That's not enough to sustain and grow production" NDIC's Lynn Helms. #OOTT."* Our tweet included the transcript we made of Helms' comments. SAF Group created transcript of comments by North Dakota Director of Mineral Resources, Lynn Helms on the monthly Director's Cut webcast on April 12, 2024. Items in "*italics"* are SAF Group created transcript. At 3:10 min mark, Helms "*March completions fell off pretty dramatically. So we had 92 completions in February and only 56 in March. That's not enough to sustain and grow production. We think again that is a temporary thing. The weather in March was not really very conducive to a lot of truck traffic and movements. Particularly in late March when we had the return of winter weather. My grandmother used to say in like a lamb, out like a lion. That's what we experienced this year.* " At 4:46 min mark, Helms "*down to 12 frack crews today. So again, as we are coming out of winter weather, we're looking at road restrictions, weight restrictions on the road*." Note, there were 102 well completions in Jan.

All of extreme cold Jan shut-in oil production were fully recovered by Mar 14

Here is what we wrote in our March 17, 2024 Energy Tidbits memo. "*On the January 19, 2024 Directors Cut webcast, Director Helms warned some of the shut-in oil volumes from the extreme cold would take some time to recover. On Thursday's monthly webcast, Helms said North Dakota oil production has basically recovered to Dec levels so it did take time for all of the oil to be returned to production. We created a transcript of Helms comments. SAF Group created transcript of comments by the North Dakota Director of Mineral Resources, Lynn Helms, Ph.D., and Justin J. Kringstad, Director North Dakota Pipeline Authority on the monthly Directors Cut webcast on March 14, 2024. [LINK] Items in "italics" are SAF Group created transcript. At 1:02 min mark, Helms on the hit to North Dakota oil production in January from the extreme cold and has it recovery, he said "it looks like, as of today, we've probably fully recovered and maybe we are actually above that December production, which was a really good number at 1.27 mmb/d. So we ought to be pressing that 1.3 mmb/d number."*

Oil: North Dakota crude by rail up MoM to 136,650 b/d in February

North Dakota CBR up MoM in February

On Friday, the North Dakota Pipeline Authority posted its Monthly Update "*March 2024 Production & Transportation"* [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority that provide low and high estimates for Williston crude by rail exports. While the NDPA's chart shows a high and low estimate by month, we always take the midpoint when summarizing the update. In the backup excel, the NDPA estimates crude by rail in February from a low of 121,650 b/d and a high of 151,650 b/d for an average of 136,650 b/d. There was an upward revision to January's numbers which used to have an average of 101,849 b/d, but is now 120,328 b/d. Because of this, the MoM increase is slightly smaller. The NDPA did not comment on the MoM changes. Below is a chart showing the crude by rail volumes since 2014. Our Supplemental Documents package includes excerpts from the NDPA Monthly Update.

Figure 20: Estimated North Dakota Rail Export Volumes

Source: NDPA

EIA STEO US oil production

Oil: EIA Apr STEO increases 2024, 2025 US oil production growth forecasts

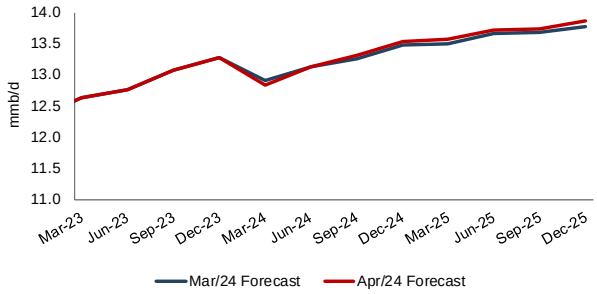
On Tuesday, the EIA released its Short-Term Energy Outlook for Apr 2024 [LINK] and increased its 2024 and 2025 US oil production forecasts. (i) The April STEO forecasts for 2024 and 2025 US oil production estimates was revised up vs the last STEO in March, which was already bumped up from Februray. (ii) The April STEO estimate for 2023 was kept flat at 12.93 mmb/d from the March STEO of 12.93 mmb/d. The only quarterly revision was Q4/23 -0.01 mmb/d to 13.27 mmb/d from 13.28 mmb/d in the March 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 April STEO forecasts for 2024 US oil production estimates were revised up small vs the March STEO. The April STEO forecast for 2024 is up +0.02 mmb/d to 13.21 mmb/d from the Mar STEO of 13.19 mmb/d. The revisions by quarter were Q1/24 -0.07 mmb/d to 12.84 mmb/d, Q2/24 flat at 13.13 mmb/d, Q3/24 +0.07 mmb/d to 13.32 mmb/d, and Q4/24 exit +0.07 mmb/d to 13.54 mmb/d. Recall the extreme cold in Jan that caused shut-ins; the recent Form 914 (released Mar 29) actuals came in ~0.4 mmb/d below the weekly estimates, so we expect this is why the EIA slashed their March estimates. (iv) The EIA also revised upwards their 2025 forecast. The EIA expects oil production to ramp up to 13.72 mmb/d over 2025, up +0.07 mmb/d from the Mar STEO. The revisions by quarter were Q1/25 +0.07 mmb/d to 13.56 mmb/d, Q2/25 +0.06 mmb/d to 13.72 mmb/d, Q3/25 +0.06 mmb/d to 13.74 mmb/d, and Q4/25 +0.08 mmb/d to 13.86 mmb/d. If true, these would be record quarters for US oil production. Below is our EIA STEO forecast comparison by month.

Figure 21: 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
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 22: Estimated US Crude Oil Productions by Forecast Month



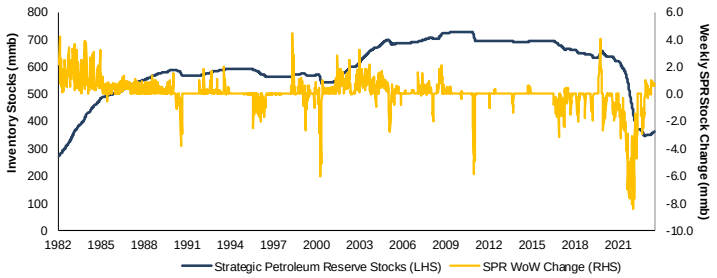
Source: EIA, STEO

US SPR reserves

Oil: US SPR less commercial reserve deficit widens, now -93.022 mmb

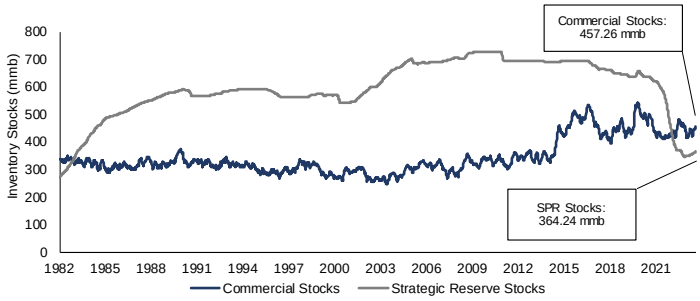
The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022 week. This week, there was a build on the SPR side, but the commercial build was bigger. The EIA's weekly oil data for Apr 5 [LINK] saw the SPR reserves increase +0.595 mmb WoW to 364.236 mmb, while commercial crude oil reserves increased +5.841 mmb to 457.258 mmb. There is now a -93.022 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 23: Strategic Petroleum Reserve Stocks and SPR WoW Change



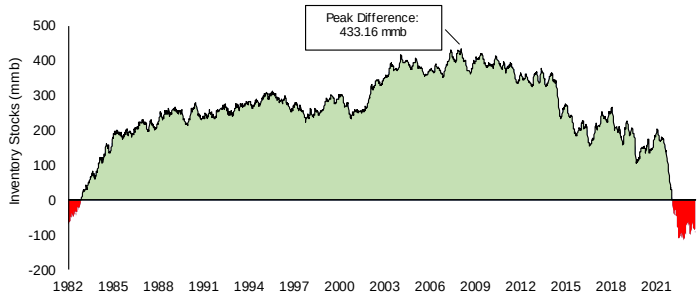
Source: EIA

Figure 24: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 25: US Oil Inventories: SPR Less Commercial



Source: EIA

US gasoline prices

Oil: US national average gasolines prices +$0.04 this week to $3.63

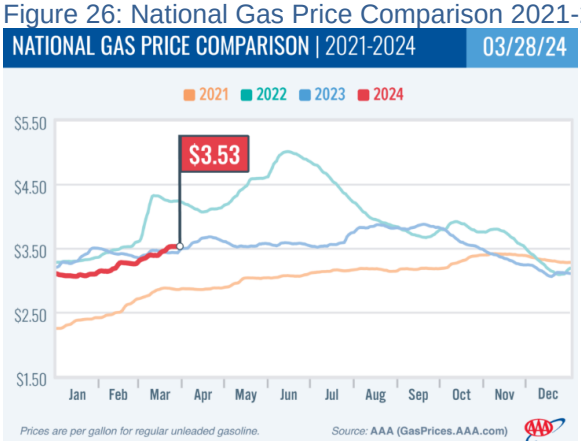
Yesterday, we tweeted [LINK] "*US gasoline prices keep creeping higher. US +$0.04 WoW, +$0.23 MoM to $3.63. California +$0.13 WoW, +$0.57 MoM to $5.45. Plus US gasoline prices normally seasonally increase into June. Biden doesn't want $4 gas in election year. Thx @AAAnews #OOTT.*" Yesterday, AAA reported that US national average prices were $3.63, which was +$0.04 WoW, up $0.23 MoM and down $0.02 YoY. As of yesterday, the California average gasoline prices were +$0.13 WoW to $5.45, which is a $1.82 premium to the national average gasoline price of $3.63. California gas prices are +$0.57 MoM and $0.56 YoY.

AAA "*Don't get April fooled by wobbling gas prices*"

US gasoline prices have been creeping higher and we remind we are still early in the normal season for increasing US gasoline prices. AAA reminded this last week. Here is what we wrote in our March 31, 2024 Energy Tidbits memo. "*On Thursday, AAA reminded that US gasoline prices are currently moving up and down but that they are expected to go higher. They posted a blog "Don't get April fooled by wobbling gas prices." [LINK]. AAA wrote "After an early spring surge, the national average for a gallon of gas spent the past week drifting up and down by a fraction of a cent before settling a penny higher at $3.53. But the break may be temporary, as*

gas pump prices will likely resume a spring increase." Our Supplemental Documents package includes the AAA blog.

Figure 26: National Gas Price Comparison 2021-2024 (as of 03/28/24)



Source: AAA

Seasonal increase in US gasoline prices

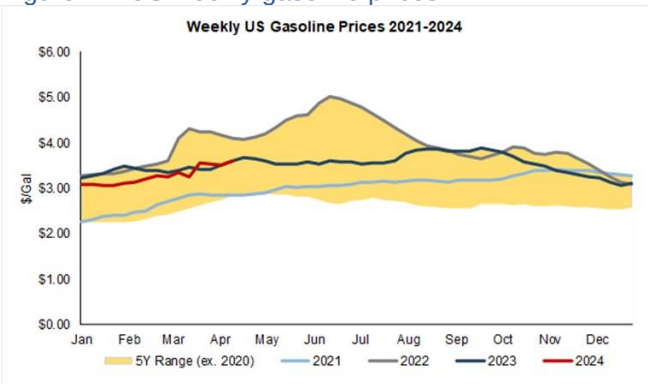
Oil: US gasoline prices normally start seasonal ramp up in March

Normally US gasoline prices increase in the run up to the start of the big driving season – Memorial Day weekend. On Mar 28, we tweeted [LINK] "*Gasoline 101. See 👇Mar 9 tweets. ~Mar 1 is when US gas prices start normal seasonal ramp up in driving post winter into the summer. Plus @NACSonline reminds switch to more summer blend fuels costs as much as $0.15 more to produce. Gas +$0.15 since Mar 9.* #OOTT."

Around Mar 1 is when gasoline prices normally start to ramp up

Here is what we wrote in our Mar 17, 2024 2024) Energy Tidbits memo on the normal seasonal increase in US gasoline pries. "*Yesterday, we tweeted [LINK] "Reminder March is normally when US #Gasoline prices start to seasonally ramp up. Like air travel, Presidents' Day marks start of increasing driving thru Labor Day. Plus May 1 is when the switch to more expensive summer blend gasolines to minimize evaporation. #OOTT." Gasoline prices are impacted by more than seasonal trends, in particular, refinery outages as seen in the recent gasoline price increases from the unplanned outage of BP Whiting. However, there are seasonal reasons why US gasoline prices normally increase from March thru at least Memorial Day. Key reason is that this is the normal seasonal pickup in driving. It's like the Delta Airlines CEO said last month, the recent Presidents Day weekend marks the start of their increase travel that goes right thru Labor Day. The second reason is that the switch to summer blend gasoline blend starts on May 1. Summer blend gasoline is more expensive to make and is higher quality to minimize emissions that evaporate into the air. Hot temperatures lead to more evaporation. And szCalifornia Gov Newsom allowed an early switch to winter blend to lower the price of gasoline and it worked. NACS (see following item) estimates summer blend gasoline can cost up to 15 cents per gallon to cost to produce."* Below is our updated US weekly gasoline price graph.

Figure 27: US weekly gasoline prices



Source: EIA

Switch to summer blend gasoline can add 15¢/gallon to cost

Here is what we wrote in our Mar 10, 2024 Energy Tidbits memo on the reminder on why summer blend gasoline costs more than winter blend gasoline – it costs more to make. Here is what we wrote last week. "*Yesterday, we tweeted [LINK] "Summer blend #Gasoline is more expensive as production process takes longer & overall yield of gasoline per barrel of oil is lower. 02/28/24, 👇@NACSonline "these complexities add as much as 15 cents per gallon to the cost to produce these higher-grade fuels." #OOTT." Our tweet included the NACS (Association for Convenience & Fuel Retailing, originally founded as National Association of Convenience Stores) Feb 28, 2024 "Seasonal Gas Prices Explained. From refinery maintenance to consumer demand, seasonal fuel production affects gasolines prices at the dispenser." [LINK]. NACS led off "Traditionally, gasoline prices are at their lowest during the first week of February and then begin to climb, often peaking right before Memorial Day. Seasonal increases in demand plus a transition to unique fuel blends put pressure on gas prices each spring." And they highlighted how the switch to summer blend can add 15 cents a gallon to cost. NACS wrote "Summer-blend fuel is also more expensive to make than winter-blend fuel. First, the production process takes longer and, second, the overall yield of gasoline per barrel of oil is lower. These complexities add as much as 15 cents per gallon to the cost to produce these higher-grade fuels." Our Supplemental Documents package includes the NACS report."*

Oil: Crack spreads widened $0.94 WoW to $30.39

Crack spreads closed at $29.45

On Friday, we tweeted [LINK] "*Positive support for WTI. 321 crack spreads still high. WTI -$1.25 WoW to close $85.66. 321 crack spreads widened $0.94 WoW to $30.39. Crack spreads ~$30 provide big margins for refineries ie, big incentive to buying crude to maximize runs. #OOTT #Oil Thx @business."* The message for the past two months is unchanged - crack spreads continue to be at high levels and certainly high enough to incentivize refineries to run as much crude as possible. Crack spreads closed at $30.39 on Apr 12, which was a widening of $0.94 WoW from $29.45 on Apr 5. Crack spreads around $30 are still big and a huge incentive for refiners to maximize crude runs. We remind that oil demand is driven by refiners and their ability to make money by processing oil and selling petroleum products. So crack spreads are a good indicator if refiners will be looking to buy more or less oil. And when

crack spreads are around or over $30, it's a very big incentive to refiners to want more crude and produce more product. This week, crack spreads widened $0.94 WoW to $30.39 on Apr 12, which followed $29.45 on Apr 5, $29.73 on Mar 29, $32.20 on Mar 22, $33.00 on Mar 15, $29.61 on Mar 8, $31.11 on Mar 1, $30.61 on Feb 23, $25.23 on Feb 16, and $30.03 on Feb 9. Crack spreads at $30.39 are well above the high end of the more normal pre-Covid that was more like $15-$20, which is why we believe refineries continue to be incentivized to take more oil. And if refiners are incentivized to take more oil, it should provide positive near-term support for WTI.

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

We have focused on crack spreads for since the 90s as they are an unchanged fundamental of refineries – big crack spreads provide incentives for refineries to buy more crude because there are big profit margins to be made. People often just say "cracks", which refers to the 321 crack spread. This is the spread or margin that refiners make from buying crude at a certain price and then selling the finished petroleum products at their respective prices. The 321 crack spread is meant to represent what a typical US refinery produces. It assumes that for every three barrels of crude oil, the refinery will produce two barrels of gasoline and one barrel of distillates. So the crack spread is based on that formula and worked back to a crack spread per barrel. Below is the current 321 crack spread vs WTI that we put in our tweet where we marked the gaps where the crack spread normally drags up oil prices. The crack spread was $30.39 as of the Friday April 12, 2024 close.

Figure 28: Cushing Oil 321 Crack Spread & WTI Apr 12, 2014 to Apr 12s, 2024

Source: Bloomberg

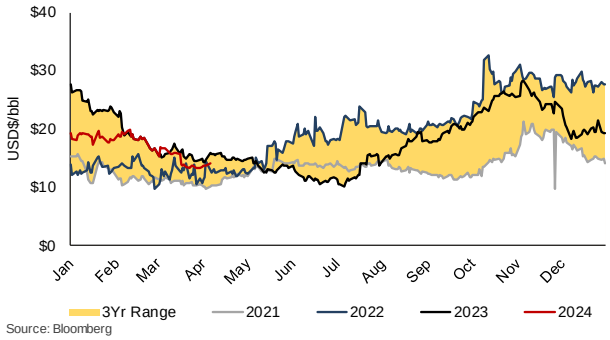
Oil: Cdn heavy oil differentials narrowed $0.80 WoW to close at $13.30 on Apr 12l

WCS differentials widens

Early in the year, every year, we start to remind that that Cdn WCS less WTI differentials normally narrow in late Feb thru May as US refiners maximize production of asphalt for annual paving season. Refineries have, for the most part, finished planned winter turnarounds and are moving to maximize production of summer grade fuels as well as asphalt ahead of the annual summer driving and paving season. As is said in Canada, there are two seasons in Canada – winter and paving season. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials from Feb thru May. The seasonal narrowing is in motion. The WCS less WTI differential closed on Apr 12 at $13.30, which was a narrowing of $0.80 WoW vs $14.10/b on Apr 5. These are both well below the Feb peak of $19.75. And remember we should be seeing more of the

impact on WCS less WTI differentials with the estimated May 1 start of commercial operations at TMX.

Figure 29: WCS less WTI oil differentials to April 5 close



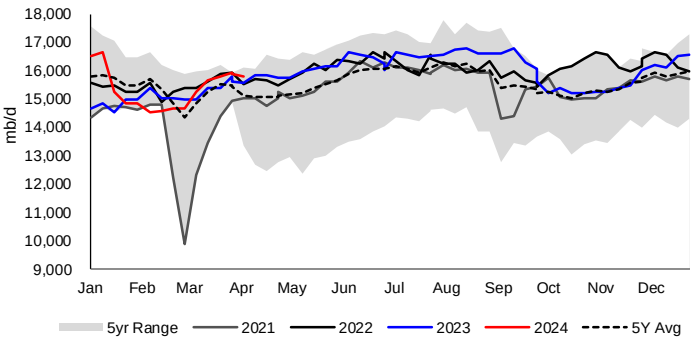
Source: Bloomberg

Oil: Refinery Inputs down -0.115 mmb/d WoW to 15.782 mmb/d, Joliet refinery is down

Refinery inputs -0.115 mmb/d WoW

There are always unplanned refinery items that impact crude oil inputs into refineries. And there are always different timing for refinery turnarounds. And last week's (Apr 7, 2024) Energy Tidbits memo highlighted Exxon's 250,000 b/d Joliet refinery going down for ~50 days turnaround. But, as a general rule, this is the normal seasonal ramp up in refinery runs following winter maintenance. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended April 5 [LINK]. The EIA reported crude inputs to refineries were down -0.115 mmb/d this week to 15.782 mmb/d and are up +0.197 mmb/d YoY. Refinery utilization was down -30 bps WoW to 88.3%, which is -100 bps YoY.

Figure 30: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports +1.131 mmb/d WoW as oil exports down -1.314 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up +1.131 mmb/d to 3.726 mmb/d for the April 5 week. US imports were down -0.183 mmb/d to 6.434 mmb/d against exports which were

down -1.131 mmb/d WoW to 2.708 mmb/d. (i) Venezuela weekly imports. We know why the EIA doesn't have any data in the row for Venezuela weekly oil imports but we still don't know if the weekly oil imports are off or if Venezuela is included in the weekly oil imports in the Others number. But we do know the EIA monthly data shows Padd 3 imports from Venezuela >150,000 b/d. Give the EIA credit for putting out weekly oil import estimates, but it's a reminder that we have to be careful about using the weekly oil import estimates. Rather we need to make sure we go to the monthly data for oil imports. (ii) Top 10 was down -0.314 mmb/d. Some items to note on the country data: (i) Canada was down -0.328 mmb/d to 3.546 mmb/d, which was likely impacted by the Exxon 250,000 b/d Joliet refinery going on turnaround. due to . (ii) Saudi Arabia was up +0.210 mmb/d to 0.531 mmb/d. (iii) Mexico was down -0.054 mmb/d to 0.209 mmb/d, which is an all-time lowand due to the ramp up of Pemex's new 340,000 b/d Olmeca (Dos Bocas) refinery. (iv) Colombia was down -0.202 mmb/d to 0.114 mmb/d. (v) Iraq was up +0.051 mmb/d to 0.142 mmb/d. (vi) Ecuador was up +0.085 mmb/d to 0.231 mmb/d. (vii) Nigeria was down -0.093 mmb/d to 0.043 mmb/d.

Figure 31: US Weekly Preliminary Imports by Major Country

	Feb 9/24	Feb 16/24	Feb 23/24	Mar 1/24	Mar 8/24	Mar 15/24	Mar 22/24	Mar 29/24	Apr 5/24	WoW
Canada	3,999	3,669	3,766	3,632	3,458	3,735	3,652	3,874	3,546	-328
Saudi Arabia	390	224	139	366	265	254	338	321	531	210
Venezuela	0	0	0	0	0	0	0	0	0	0
Mexico	294	784	569	640	303	353	525	263	209	-54
Colombia	150	286	71	351	0	289	143	316	114	-202
Iraq	43	226	240	176	93	252	244	91	142	51
Ecuador	201	158	0	218	102	147	9	146	231	85
Nigeria	137	159	165	222	132	57	215	136	43	-93
Brazil	148	44	234	178	272	114	230	147	257	110
Libya	63	92	65	0	66	0	88	117	24	-93
Top 10	5,425	5,642	5,249	5,783	4,691	5,201	5,444	5,411	5,097	-314
Others	1,045	1,012	1,136	1,439	800	1,077	1,258	1,207	1,337	130
Total US	**6,470**	**6,654**	**6,385**	**7,222**	**5,491**	**6,278**	**6,702**	**6,618**	**6,434**	**-184**

Source: EIA, SAF

Oil: Reality setting in, Pemex (Mexico) to cut exports by >330,000 b/d in May

Mexico cutting oil exports by >330,000 b/d in May

The reality of Pemex (Mexico) cutting oil exports in Q2 seems to be finally setting in with markets. It's been a long time coming and we have been warning of this day for years as it impacts US and Cdn crude oil because less Pemex oil exports means less Mexico oil into the Gulf Coast refineries, which should only help Cdn oil differentials. (i) 04/01/24, Pemex cancelled some export contracts. Last week's (Apr 7, 2024) Energy Tidbits memo highlighted our Apr 1, 2024 tweet) [LINK] "*Less MEX #Oil to PADD 3 = Positive to Cdn oil. Pemex canceled some export contracts, incl to PADD 3, as 340 kbp Olmeca refinery ramps up. @lkassai. Plus Q2 start of 590 kbd Trans Mountain TMX expansion will move Cdn oil to Asia. Biden needs 👇155 kbd VEN oil to Padd 3. #OOTT."* (ii) Pemex to cut >330,000 b/d of oil exports in May. This week, we saw the followup on how many barrels are being cut from exports. On Monday, Reuters reported [LINK] "*Mexico's state energy company, Pemex, is planning to cut at least 330,000 barrels per day (bpd) of crude exports in May, leaving customers in the United States, Europe and Asia with a third less supply, two sources said. The plan follows the withdrawal of 436,000 bpd of Maya, Isthmus and Olmeca crudes this month, ordered by Pemex to its trading arm PMI Comercio Internacional because it needs to supply more to its domestic refineries as it targets energy self-sufficiency."* There was no indication of the Reuters report on the specific cuts by region ie. how much was being cut from the Gulf Coast refineries. But Apr 1, 2024 tweet included a Bloomberg report that also said "*Petroleos Mexicanos, also called Pemex, canceled contracts to supply its flagship Maya*

crude oil to refiners in the US, Europe and Asia, according to people with knowledge of the situation, who asked not to be named because the information is private. " And "*US refiners are likely to bear the brunt of the cut in Maya exports. Fuelmakers including Valero Energy Corp, Chevron Corp and Marathon Petroleum Corp import 420,000 barrels of the heavy sour variety per day. In 2023, Maya exports reached 612,000 barrels a day."* (iii) Our Supplemental Documents package includes the Bloomberg Apr 1 report and Reuters Apr 8 report.

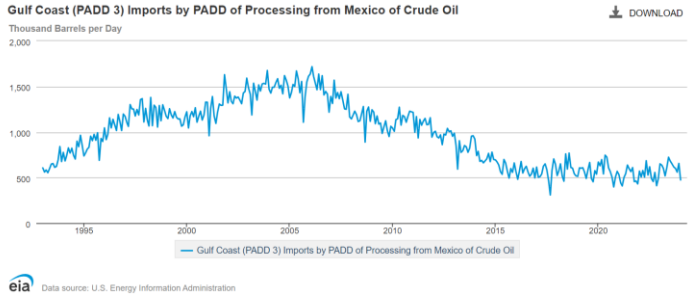
It's also why Biden will do all he can to keep Venezuela oil into the Gulf Coast

The loss of Mexico crude oil into the Gulf Coast couldn't come at a worse time given the startup of Trans Mountain's 590,000 b/d TMX expansion that will be moving Cdn crude to the west coast for tanker exports. Here is all what we wrote in our Mar 31, 2024 Energy Tidbits memo. "*No surprise, Biden unlikely to reimpose oil sanctions on Venezuela.The US elections are now just over six months away on Nov 5, 2024. We have been highlighted gasoline and grocery prices as the key priorities for Biden. But gasoline prices may be #1 because Biden can indirectly influence gasoline prices by ensuring maximum oil on the market. And one of his direct levers on oil supply is oil sanctions on Venezuela. Our view is unchanged – Biden isn't going to reimpose oil sanctions even if he stopips the leading opposition candidate, Machado, from running. Yesterday, we tweeted [LINK] "Gasoline prices is Biden focus for Nov 5 election. "Biden Is Unlikely to Reimpose Oil Sanctions on Venezuela" "US officials are concerned that reverting to Trump-era sanctions that accelerated the decline of Venezuela's #oil production would raise the price of gas at US pumps" report @WSJForero @kejalvyas #OOTT." The WSj wrote [LINK] "Biden Is Unlikely to Reimpose Oil Sanctions on Venezuela. Nicolás Maduro of Venezuela has barred presidential candidates, but U.S. officials worry that new penalties would raise gas prices in a U.S. election year. The Biden administration is leaning away from reimposing sanctions on Venezuela's oil industry despite President Nicolás Maduro's moves to bar leading opposition candidates from the country's July elections, said people familiar with the matter. U.S. officials are concerned that reverting to Trump-era sanctions that accelerated the decline of Venezuela's oil production would raise the price of gas at U.S. pumps and prompt more migration from Venezuela as President Biden campaigns for re-election in November." The unnamed US officials said it clearly, they worry reimposing oil sanctions would raise US gasoline prices. Our Supplemental Documents package includes the WSJ report."*

Cdn crude filled in when Venezuela & Mexico oil declined into Gulf Coast

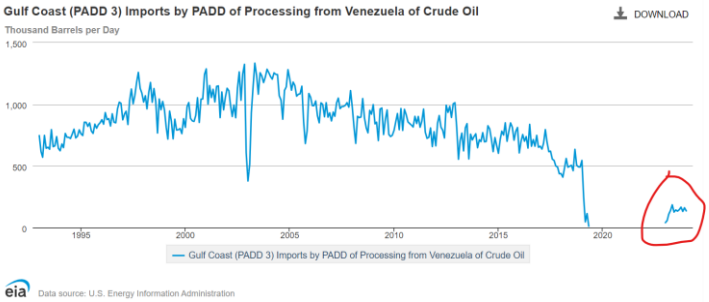
For a decade or more, we have highlighted how Cdn oil started going into the Gulf Coast refineries because it was needed by the refineries as Venezuela and Mexico oil into the Gulf Coast declined. Mexico's decline was driven by the huge drop in production as the super giant Cantarell oil field started to decline. So the Gulf Coast refineries needed to find replacement for Mexico and Venezuela crude quality and Cdn heavy/medium filled that void. Below are the EIA's current Gulf Coast Padd 3 oil imports from Canada, Mexico and Venezuela.

Figure 32: Gulf Coast Padd 3 oil imports from Mexico



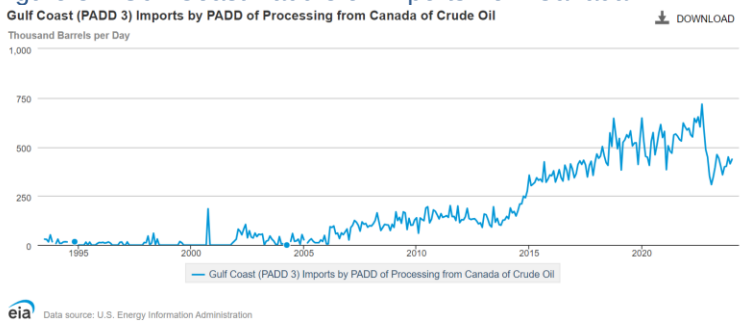
Source: EIA

Figure 33: Gulf Coast Padd 3 oil imports from Venezuela



Source: EIA

Figure 34: Gulf Coast Padd 3 oil imports from Canada



Source: EIA

Oil: Pemex Apr 6 fire at Akai-B oil platform only knocked out 20,000 b/d

Pemex platform fire

Last week's (Apr 7, 2024) Energy Tidbits memo highlighted the Apr 6 breaking news of Pemex reporting [LINK] "*Petróleos Mexicanos (PEMEX) reports that today, at 4:48 p.m., a fire broke out on one of the platforms of the Akal-B Process Center (Akal-B1), in the area where the pipelines that handle fuel gas for turbomachinery are located. The Emergency Response Plan (PRE) was immediately activated at the facility, bringing the fire under control at 5:04 p.m. PEMEX workers and 7 company workers (3 from DIAVAZ, 4 from COTER) were reported with non-serious injuries. They are sent to Ciudad del Carmen for evaluation."* At

that time, there was no Pemex statement on how this will impact production. And Bloomberg had reported "*Akal-B, which is part of the Cantarell production complex, produces 200,000 barrels per day of oil and 900,000 cubic feet of gas, the Reforma newspaper reported. The fire began where gas fuel pipes feed the platform's turbo machinery, Pemex said."* Last week, we thought this would impact exports but it seems that any impact is small. On Tuesday, Reuters reported [LINK] "*Exclusive: Mexican Pemex crude output reduced by 20,000 bpd after platform fire, source says. Mexican Pemex crude oil production is down some 20,000 barrels per day following a fire at an offshore platform on Saturday that left several injured and at least one dead, a source at the state energy company said. While the reduction amounts to a 1% decrease, a prolonged outage would further dent already falling crude oil production that hit its lowest level in 45 years in February. The Akal-B platform in the Gulf of Mexico was still out of service on Tuesday as workers sought to restore operations, the source told Reuters, speaking on condition of anonymity because he was not authorized to speak publicly."*

Figure 35: Fire at Pemex Akai Bravo offshore platform in Campeche complex

Source: Reforma

Oil: US deadline is Apr 18 to renew General License 44 on Venezuela oil

Deadline for US to renew Venezuela licence

As of our 5am MT news cut off, we haven't seen any clear indication of what Biden will do with the Venezuela General Licence 44, which has a Apr 18 deadline if it is to be renewed. This is the licence Biden used to reopen the Venezuela oil industry and it expires unless it is renewed ie. action must be taken if Biden wants to renew the licence. We continue to believe Biden will renew the licence as the last thing he wants is to lose another ~150,000 b/d of crude oil into the Gulf Coast refineries in an election year. Less crude oil into the Gulf Coast refineries will inevitably flow thru to an impact to increase gasoline prices. So it was no surprise to see the Bloomberg Thursday report "*US, Venezuela Secretly Meet in Mexico Before Sanctions Deadline."* The Biden Administration is trying to convince Maduro to make some concessions to keep his oil flowing. Our concern has been that Maduro has to be well aware that the US really Venezuela oil in the face of declining Mexico oil exports, the startup of the 590,000 b/d Trans Mountain TMX expansion that will move Cdn crude to the west coast for tankers and OPEC continuing its cuts thru Q2/24. Maduro has the leverage in an election year for Biden. But, at the same time, we have to believe he will at least give some token or small concession to let Biden save face when he renews the licence. Bloomberg wrote "*US officials met secretly this week with members of Venezuelan President Nicolás*

Maduro's administration to keep him engaged in negotiations over democratic reforms as a deadline nears to reinstate sanctions against the nation's oil industry. Representatives from Joe Biden's administration and the Venezuelan government, including Daniel Erikson of the US National Security Council and Maduro's head negotiator Jorge Rodríguez, met Tuesday in Mexico City to discuss electoral conditions, according to people with direct knowledge of the matter. The same day, Colombian President Gustavo Petro flew to Caracas with US backing, meeting with Maduro for nearly three hours before sitting down with opposition presidential candidate Manuel Rosales the following morning. The visit took place after Colombia took the unusual step of criticizing Maduro for blocking the participation of several opposition candidates in the July 28 election." Our Supplemental Documents package includes the Bloomberg report.

Oil: What can stop Russia/Ukraine escalation?

Russia/Ukraine escalation

Ukraine hitting Russian refineries over the past few weeks and Russia hitting Ukraine natural gas storage twice reinforces that the them of Russia/Ukraine is escalation. It is impossible to know what is in the minds of Putin and Zelensky but it's clear there has been an escalation over the past few weeks and that it seems linked to the continued uncertainty of what Biden can do for relief to Zelensky. Ukraine stepped up attacks on Russian refineries despite knowing the US didn't want that as it didn't want to see oil markets run away. And Putin said he had to respond to the attacks on the refineries but also likely sees an opportunity to hit Ukraine hard while it's relief packages are still not settled. Earlier in the memo, we noted our Thursday tweet [LINK] "*Why Russia hit Ukraine #NatGas storage. Putin "In the energy sector, unfortunately, we have seen a series of strikes on our energy facilities recently and had to respond". Ukrtransgaz storage operator "ground infrastructure of 2 gas storage facilities was damaged." #OOTT."* TASS reported on Putin basically said Russia had no choice but to hit back at Ukraine's energy infrastructure given Ukraine's missile/drone attacks on Russia oil refineries. The question becomes can a US relief package stop the escalation?

Helima Croft, multiple geopolitical risk premium items in coming wks/mths

The escalation of Russia/Ukraine and Israel bombing the Iran consulate in Syria reminds of a great thought recent thought piece by RBC's Helima Croft. Our recent March 31, 2024 Energy Tidbits memo was titled "*Helima Croft "closely watching whether Ukraine moves at some stage to target actual [Russian] export facilities".* Here is what we wrote in the March 31, 2024 memo. "*We recommend reading a great food for thought oil comment from well regarded RBC Helima Croft on Wed, who identified a number of major potential geopolitical risk premium events for oil over the coming weeks and next few months. On Wed, we tweeted [LINK] "Must read from well plugged-in, not subject to hyperbole @CroftHelima. Multiple geopolitical risk premium events over the coming weeks/months, NOT years. #OOTT." (i) One of the key pluses to oil in the last few weeks has been Ukraine drone success hitting Russian refineries. Croft noted that this has Russian refineries down 650,000 b/d YoY n March. And it is important to note that this Ukraine focus on refineries is against the reported Biden request to Ukraine to not go after refineries. It raises the risk if Ukraine is going ahead against the US wishes.. Croft wrote "• There have been reports that the White House has tried to dissuade Kyiv from this strategy, fearing the energy price impact – we find this entirely credible based on our conversations. As we have repeatedly noted, the White House has sought to avert a Russian supply*

disruption and has shaped policy towards this end; including price caps designed as a release valve to ensure Russian barrels locked out of Europe would flow to Asia, or directly telling Ukraine to not target Black Sea oil tankers. However, with US assistance being held up in Congress, and Russia making battlefield gains, Ukraine and key regional allies appear to be questioning the utility of this energy bargain with Washington." (ii) Croft raises the risk that Ukraine will go after Russia oil export terminals. Croft wrote "Hence, we will be closely watching whether Ukraine moves at some stage to target actual export facilities to strike a deeper blow on the Russian balance sheet. We continue to contend that Ukraine seemingly has the capability to target the majority of export facilities in western Russia, which would put ~60% of Russia's crude exports at risk". (iii) Croft doesn't see OPEC ramping up production to help ease prices. Crost wrote "While OPEC is sitting on over 2 mb/d of spare capacity, we do not think the producer group would rush in to cool the rally and ramp up output given what transpired in the months immediately following the Russian invasion of Ukraine. Washington made unprecedented interventions in the market by releasing 180 mb from the SPR after the IEA and other market participants warned of a multimillion b/d Russian disruption that never materialized." (iv) There was more in the comment. Our Supplemental Documents package includes the Croft comment."

Oil: US reminded Ukraine to not hit Russia refineries.

US doesn't want Ukraine to hit RUS refineries

It's been a few days of no apparent missile attacks on Russian refineries and we have to wonder if its due to the Biden Administration publicly making it clear they don't want Ukraine to hit Russian refineries. Even in light of Russia hitting Ukraine's natural gas storage this week. It may not have been said directly to Ukraine, but it might as well have been with Defense Secretary Austin's public testimony on Tuesday before the Senate Armed Services Committee. Senator Cotto asks Austin "*Let me move on to Ukraine. The Biden administration has discouraged Ukraine from launching refinery strikes against Russia. Well, why is the Biden administration discouraging Ukraine from undertaking some of the most effective tax -- attacks on Russia's war-making capabilities?"* Austin replied "*Certainly, the - those attacks could have a -- a knock-on effect for -- in terms of the -- the global energy situation and -- but quite frankly, I think Ukraine is better served in -- in going after tactical and operational targets that -- that can directly influence the current fight, so."* Cotton then says "*So it sounds to me like the Biden administration doesn't want gas prices to go up in an election year, based on all the other actions they've taken to drive up gas prices further."*

Oil: Ukraine can hit all Russia's export terminals on Baltic and Black Sea

Ukraine drones

Here is what we wrote in last week's (April 7, 2024) Energy Tidbits memo. "*There was a good reminder from the Ukraine that their drones can reach all Russia oil, petroleum products and LNG export terminals on the Baltic and Black Sea. On Tuesday, Ukraine hit its Taneco refinery, which was over 1,000 km from the border. We tweeted [LINK] "Great map reminds Ukraine has capability to hit all Russia #Oil/#LNG export terminals on Baltic & Black Seas. This potential risk was on @CroftHelima 👇 03/27 Must Read temperature rising risks comment. Thx @SPGlobal Kelly Norways, Elza Turner #OOTT." Our tweet included the Platts maps on the below Taneco drone strike."*

Figure 36: Ukraine drone range and Russia refineries and terminals

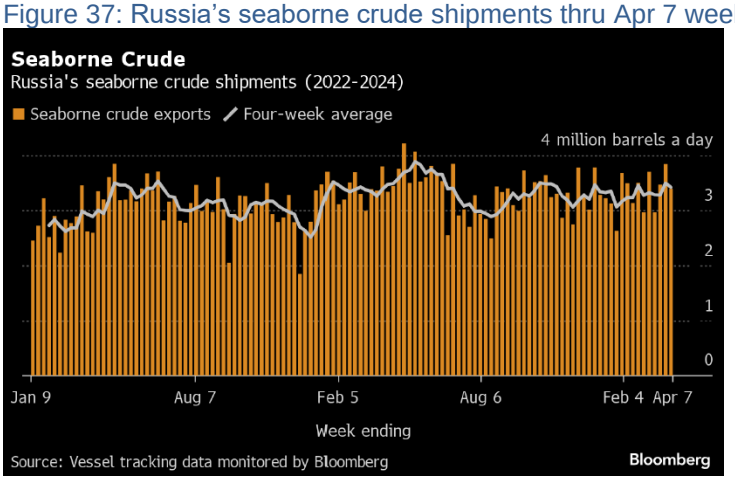
Source: Platts

Oil: Russia oil shipments fall, US allowing India's imports to avoid "supply shortages"

Russia oil shipments over commitment

We have been writing about how drone strikes reducing refinery capacity in Russia would free up crude for export assuming the crude oil volumes can be moved to export terminals. We think the surge in last week's record export volume may have been a reflection of that. And as noted last week, there are reports of Russia moving more crude and products via rail. Bloomberg reported "*Russia's seaborne crude flows in the week to April 7 fell by 450,000 barrels a day to 3.39 million, down from the previous week's year-to-date high. The less volatile four-week average also dropped, down by about 80,000 barrels a day to 3.42 million. Weekly shipments were about 200,000 barrels a day lower than the average seen in May and June, or about 75,000 barrels a day less than Russia's April target, which is part of the OPEC+ alliance's broader effort to curb supplies and support prices.".* Recall last week we saw 3.47 mmb/d, the highest so far this year, but on a quarterly basis Russia was pretty much in-line with their commitments: The average from Jan-Mar was only 16,000 b/d over the committed 300,000 b/d cut from the May-June 2023 average. Remember that Russia will be shifting towards a production-based cut rather than export control for their OPEC+ commitments this upcoming quarter. It also looks like the troubles Russia has had so far with placing Sokol shipments may be solved soon: India was previously turning away cargoes in fear of violating US sanctions, but apparently the US Treasury said they wanted to avoid "supply shortages" and wouldn't stop India importing Russian oil. We imagine this would still be under condition of the price cap. There are 7mm barrels going back to India now, although so far all the Sokol shipments since mid-Feb have been to China. We will keep an eye on loadings at Kozmino. Our Supplemental Documents package includes the Bloomberg report.

Figure 37: Russia's seaborne crude shipments thru Apr 7 week



Source: Bloomberg

Oil: OPEC MOMR, demand growth unchanged, oil stocks up but product stocks down

OPEC Monthly Oil Market Report

On Thursday at 6:00am MT, OPEC released its April Monthly Oil Market Report. (i) We thought it was neutral to slightly positive based on the numbers vs the Mar MOMR. But we also think less will consider OPEC crazy optimistic on oil demand as the last couple weeks have seen many analysts and agencies up their oil demand forecasts closer to OPEC. Apr MOMR had no changes in oil demand forecasts with 2024 unchanged at +2.25 mmb/d YoY. Apr MOMR had small decrease in non-OPEC supply. No change on call on OPEC ion 2024 but up a bit in 2025. OPEC production was flat MoM. Oil stocks up MoM but products stocks down MoM. (ii) There was no change to oil demand forecasts for 2024 and 2025. 2024 still shows a +2.25 mmb/d YoY growth to 104.46 mmb/d, and 2025 is only up +1.85 mmb/d to 106.31 mmb/d (was 106.30 mmb/d) due to a rounding adjustment. Apr MOMR increased China oil demand by +0.08 mmb/d to +0.68 mmb/d YoY and 16.90 mmb/d (was +0.63 mmb/d to 16.82 mmb/d), and 2025 at +0.41 mmb/d YoY to 17.31 mmb/d (was +0.41 mmb/d YoY to 17.23 mmb/d). (iii) OPEC still forecasts increasing oil demand for OECD countries at +0.26 mmb/d YoY (was +0.25 mmb/d due to rounding) to 46.06 mmb/d in 2024, i.e. not reaching peak oil demand. (iv) Non-OECD demand growth forecast is slightly bigger at +1.99 mmb/d YoY to 58.41 mmb/d (was +2.00 mmb/d to 58.39 mmb/d) in 2024 with the largest growth being China +0.68 mmb/d YoY to 16.90 mmb/d and the Middle East +0.29 mmb/d YoY to 8.93 mmb/d. (v) Non-OPEC supply was immaterially changed for 2023 at 69.45 mmb/d (was 69.46 mmb/d). OPEC forecasts non-OPEC supply growth at +0.99 mmb/d YoY to 70.44 mmb/d (was 70.53 mmb/d). Key YoY non-OPEC growth areas for 2024 are US +0.44 mmb/d (was +0.54 mmb/d), Canada +0.24 mmb/d (unchanged), Brazil at +0.12 mmb/d (unchanged), and Norway +0.11 mmb/d (was +0.12 mmb/d). (v) Non-OPEC supply in 2025 is expected to grow by +1.31 mmb/d (was +1.40 mmb/d) to 71.75 mmb/d (was 71.93 mmb/d), with major growth areas in North America at +0.64 mmb/d (was +0.70 mmb/d, US at +0.64 mmb/d) and Latin America +0.39 mmb/d (was +0.29 mmb/d). (vi) OPEC Secondary Sources for February were revised up +30,000 b/d MoM to 26.601 mmb/d (was 26.571 mmb/d). Mar data from Secondary Sources suggests OPEC was basically flat MoM at only +3,000 b/d to 26.604 mmb/d, with major changes being Nigeria -38,000 b/d to 1.398 mmb/d and Iran -23,000 b/d to 4.194 mmb/d. (vii) Direct Communications (what the OPEC countries report). There were a

few items to note vs what countries directly reported vs Secondary Sources estimates: Iran does not provide production numbers. Iraq does its norm and says it produced less at 3.903 mmb/d in Mar vs. Secondary Sources of 4.194 mmb/d, Venezuela does its norm and says it produced more at 874,000 b/d vs. Secondary Sources of 809,000 b/d, Libya said it produced 1.236 mmb/d vs. Secondary Sources of 1.161 mmb/d, and Nigeria does its norm and claims production of 1.231 mmb/d under Secondary Sources of 1.398 mmb/d. (viii) Global oil stocks were up MoM in Feb, but product stocks are down. Recall that "commercial oil stocks" means the total of crude + product stocks. Recall in the last MOMR, there was a huge commercial stock deficit compared to the benchmark average reported in January, -192 mmb below the 2015-19 average. This got revised up by +24 mmb to a total commercial stockpile of 2,759 mmb (-168 mmb below the average). Crude only oil stocks at Feb 29 were 1,342 mmb, or -106 mmb below the 2015-2019 average, which is narrower than the revised Jan 31 deficit of -117 mmb. Product only stocks at Feb 29 were 1,391 mmb or -81 mmb below the 2015-19 average, which is wider than the revised Jan 31 deficit of -59 mmb.(ix) Our Supplemental Documents package includes excerpts from the OPEC Apr MOMR.

Oil: Wouldn't know it but IEA OMR has 2024 demand & non-OPEC supply unchanged

IEA Oil Market Report

On Friday, the IEA released its monthly Oil Market Report for April at 2am MT. They only release very limited public info, but Bloomberg providesd tables and added colour from the report. (i) We thought the takeaway from the IEA Apr OMR vs Mar OMR was neutral based on 2024 numbers and slightly negative based on 2025 numbers. The IEA did not change its 2024 oil demand and non-OPEC supply forecast but revised its 2023 data such that the IEA ended up showing a slightly lower YoY growth in demand and a high YoY growth in non-OPEC supply. More on this in the following item. First look at 2025 is slightly negative as IEA's forecast growth in non-OPEC supply is +1.4 mmb/d YoY vs forecast growth in oil demand of +1.1 mmb/d YoY. (ii) 2024 demand was unchanged at 103.2 mmb/d. But YoY demand growth was lowered to +1.2 mmb/d from +1.4 mmb/d, but that was due to the IEA raising the 2023 starting point by +0.2 mmb/d to 102.0 mmb/d. (iii) 2025 demand. The IEA introduced their 2025 outlook for the first time this year. 2025 is estimated to be 104.3 mmb/d, which means +1.1 mmb/d YoY demand growth. (iv) There was no change to non-OPEC supply for 2024 at 70.4 mmb/d but IEA lowered the 2023 point -0.3 mmb/d ie. YoY growth was +0.3 mmb/d YoY higher despite no change to 2024. 2023 non-OPEC was lowered to 68.8 mmb/d from 69.1 mmb/d in the Mar OMR. 2025 non-OPEC supply was also introduced in the Apr OMR. The IEA forecasts supply growth at +1.4 mmb/d to 71.9 mmb/d. (v) There were no changes to IEA's call on OPEC for 2024 (27.3 mmb/d), and there was a slightly smaller call on 2025 at 26.8 mmb/d. (vi) Global oil inventories were up in Feb, +43.3 mmb, while land stocks fell to their lowest since 2016, possibly due to displaced storage in floating inventories as tankers spend longer on the water: "*Global observed oil inventories rose by 43.3 mb in February to a seven-month apex with oil on water at its highest level in 15 months. By contrast, on land stocks fell to their lowest since at least 2016. OECD industry stocks decreased by 7.6 mb in February, remaining 65.1 mb below the five-year average. Early data indicate that they built by 22 mb in March*". Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 38: IEA Global Demand Forecast by OMR Report

mmb/d	2023	23-22	Q1/24	Q2/24	Q3/24	Q4/24	2024	24-23	Q1/25	Q2/25	Q3/25	Q4/25	2025	25-24
Apr 24	**102.0**	*2.4*	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	**101.8**	*2.2*	102.0	103.0	104.0	103.7	**103.2**	*1.4*						
Feb 24	**101.8**	*2.2*	101.7	102.8	103.8	103.7	**103.0**	*1.2*						
Jan 24	**101.7**	*2.1*	101.7	102.7	103.7	103.8	**103.0**	*1.3*						
Dec 23	**101.7**	*2.1*	101.4	102.4	103.4	103.9	**102.8**	*1.1*						
Nov 23	**102**	*2.4*	101.5	102.4	103.5	104.1	**102.9**	*0.9*						
Oct 23	**101.9**	*2.3*	101.3	102.2	103.5	103.9	**102.7**	*0.8*						
Sep 23	**101.8**	*2.2*	101.1	102.6	104.0	103.5	**102.8**	*1.0*						
Aug 23	**102.2**	*2.2*	101.5	102.6	104.2	104.3	**103.2**	*1*						
July 23	**102.1**	*2.2*	101.4	102.6	104.3	104.5	**103.2**	*1.1*						
June 23	**102.3**	*2.4*	101.5	102.5	104.1	104.4	**103.1**	*0.8*						

Source: IEA, Bloomberg, SAF

IEA revised 2023 oil demand & non-OPEC supply to support its messaging

We haven't seen comments from Saudi Arabia energy minister Abdulaziz on the IEA OMR forecast but he, along with others, have previously noted how agencies will revised their historical numbers (starting point) to help their messaging. That was the case once again with the IEA Apr OMR to fit the messaging of lower oil demand growth and higher non-OPEC supply in 2024. The beauty of making revisions to history is that they never have to explain it or build it into the messaging. We don't think the IEA would want to say there is no change to our demand forecast for 2024 but, because we increased the historical demand numbers, we can say there is lower growth in oil demand. (i) Demand. On Friday morning, we tweeted [LINK] "*Two things can be true. @IEA Apr OMR "oil demand growth has nevertheless been revised down by roughly 100 kb/d since last month's Report, to 1.2 mb/d". Yet no change to 2024 oil demand of 103.2 mmbd vs Mar OMR. Why? IEA increased it 2023 oil demand starting point so lower YoY growth rate vs Mar OMR. Thx @business Kristian Siedenburg #OOTT."* No one can disagree that the tone of the writing on demand is negative. But the reality is that there was no change to the 2024 oil demand forecast of 103.2 mmb/d. However, the IEA increased its 2023 starting point, which then allowed them to state they were lowering their growth in oil demand in 2024. (ii) Non-OPEC supply. On Friday morning, we tweeted [LINK] "*IEA Non-OPEC supply. Apr OMR has no change to non-OPEC supply of 70.4 mmbd for 2024. BUT IEA lowered 2023 starting point to 68.8 mmbd vs Mar OMR of 69.1. So higher growth rate +1.6 YoY vs +1.3 YoY despite no change to 70.4 mmbd. Thx @business Kristian Siedenburg #OOTT*." The other negative messaging from the Apr OMR was the increasing non-OPEC supply. There was no change to the IEA's forecast of 70.4 mmb/d for 2024 non-OPEC supply,. But the IEA revised down its 2023 starting point by 0.3 mmb/d to 68.8 mmb/d vs 69.1 mmb/d in Mar OMR, which meant the YoY growth in non-OPEC supply in 2024 was +0.3 mmb/d higher in the Apr OMR despite no change to the 70.4 mmb/d forecast for 2024.

Oil: IEA's Apr OMR global gasoline consumption forecast is well above its peak oil call

IEA's increasing gasoline consumption forecast

It looks like the IEA has proved us wrong in our consistent view since last April that we believed the IEA will have to push out its forecast for peak oil demand by 2030 with one of the key factors being that they will have to reduce its gasoline/oil displacement assumption by EVs in the upcoming annual global EVs report. As noted later in the memo, the IEA posted a brief on Friday that reaffirmed they see peak oil demand by 2030. One of the problems with not paying up for the full IEA OMR report is that we don't get all the detail on their forecast numbers. Fortunately, we can see tweets from top oil followers that provide some of this detail. A good example is Bloomberg's Javier Blas who, on Friday, tweeted [LINK] "*Another tidbit about the IEA 2025 oil S/D: The agency keeps focusing on EVs impact on gasoline consumption. Yet, since June last year, it has revised HIGHER the level of gasoline demand for 2025 by a huge 700,000 b/d (~27.3m b/d vs ~26.6m b/d). #OOTT."* Blas is noting the IEA has introduced its 2025 forecast for gasoline consumption of 27.3 mmb/d, which is much higher than its June 2023 forecast for gasoline consumption of 26.6 mmb/d. Blas has been tweeting on the increasing gasoline consumption, which is a reason why we though it would be inevitable that the IEA will have to increase at least the gasoline consumption part of its upcoming Oil 2024 and forecast for oil and products demand to 2029. Below is the table from the IEA Oil 2023 forecast thru 2028.

Figure 39: IEA global oil demand by productd (mb/d), 2019-2028t

Global oil demand by product (mb/d), 2019-2028

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2022-28 Growth Rate	2022-28 Growth
LPG/Ethane	13.2	13.2	13.8	14.2	14.4	14.6	14.8	15.1	15.5	15.9	1.9%	1.7
Naphtha	6.6	6.4	6.9	6.8	7.0	7.4	7.8	8.0	8.2	8.3	3.4%	1.5
Gasoline	26.7	23.7	25.6	26.0	26.6	26.6	26.6	26.4	26.1	25.8	-0.2%	-0.3
Jet/Kerosene	8.0	4.7	5.2	6.2	7.3	7.5	7.6	7.9	8.0	8.2	4.7%	2.0
Gasoil/Diesel	28.3	26.1	27.5	28.3	28.4	28.5	28.7	28.7	28.8	28.9	0.4%	0.6
Residual fuel oil	6.2	5.6	6.2	6.5	6.7	6.7	6.7	6.7	6.7	6.7	0.4%	0.2
Other products	11.8	11.9	12.2	11.8	11.8	11.9	11.9	12.0	12.0	12.0	0.3%	0.2
Total products	**100.7**	**91.7**	**97.5**	**99.8**	**102.3**	**103.1**	**104.1**	**104.8**	**105.3**	**105.7**	**1.0%**	**5.9**
Annual change	*0.6*	*-9.0*	*5.8*	*2.3*	*2.4*	*0.9*	*1.0*	*0.7*	*0.5*	*0.4*		

Source: IEA Oil 2023, posted June 2023

Oil: Game Changer? Iran unleashed massive direct drone/missile attack against Israel

Iran massive direct attack on Israel

As of our 5am MT news cut off, it's only been 15 hours since Iran launched the massive drone/missile attack against Israel. It seems longer as we were glued to cable news and the internet. We had several tweets on the developments yesterday, so we aren't going back to a play-by-play of the last 15 hours. Rather here is where we think this stands. (i) It's different this tie. There is so much that isn't clear and is unknown but this time it is different. It's not Iran proxies that are attacking Israel, it's Iran itself, launching the missiles from Iran directly at Israel targets. Last week, we called it a potential "*tipping point*" depending on how Iran responded. The first difference is Iran responded and didn't hide behind its proxies. (ii) It was a massive attack. The end of night tally was that there were ~300 drones/missiles launched. The size of this attack caught most off guard as they had been listening the US signaling to Iran that an appropriate response size wouldn't escalate the conflict. If you listened to all the Iran watchers and military experts on cable news, they were all surprised by the size of the attack as they were all expecting a more modest attack in line with the US signaling. Clearly, Iran ignored the US signaling. (iii) Iran tried to message that it was done but we have to believe that message was for the US to try to get Israel to stand down. Iran tweeted "*The*

matter can be deemed concluded. However, should the Israeli regime make another mistake, Iran's response will be considerably more severe. It is a conflict between Iran and the rogue Israeli regime, from which the U.S. MUST STAY AWAY". (iv) Israeli media reported that Biden encouraged Netanyahu to respond. We don't know if the lead up to that was at linked to Iran 's tweet that inferred it was prepared to stop attacking. (v) An undisclosed tidbit until late last night was Arab News reporting "*#BREAKING: #Israel army spokesperson Daniel Hagari says some of the overnight launches were from #Iraq and #Yemen, in addition to #Iran."* That shouldn't have surprised. Yesterday afternoon, we tweeted [LINK] "*Will Iran proxies (ie. in Iraq, Houthis) try to support Iran or be opportunistic while Israel/US prepare to defend against the slow moving drones. Map courtesy of @Alissanyt @LazaroGamio. #OOTT."* It just seemed like a perfect opportunity for them to attack. (vi) Also, post the Biden Netanyahu call, we tweeted [LINK] "*Defense only! Post Biden/Netanyahu call @mj_lee just said official told her Biden told Netanyahu US will not be involved in any offensive attacks vs Iran. New WH statement Biden "..... reaffirm America's ironclad commitment to the security of Israel" #OOTT."* Lee is with CNN and broke the news that Biden said the US would not participate in any attack against Iran. (vii) Then late last night, NY Times reported that an Israel response may not be imminent. (viii) So as of 5am MT, we are still in the camp that expects Israel to respond but the question remains when and how. Our concern is that any significant response has to draw an Iran response and it keeps going and who knows what then happens. The bottom line is that we think it was a game changer for Iran to have a massive attack direct on Israel and the risk for continues escalation is higher not lower. The caveat being it has only been 15 hours since it started so a lot can change.

Figure 40: Iran and its proxies

Source: New York Times

Tipping point? How/when Iran retaliates to Israel bombing its consulates

Here is what we wrote in last week's (April 7, 2024) Energy Tidbits about the potential tipping point. *"Please note we wrote this item as of last night before we saw the above PressTV report this morning. Oil markets are intently watching what Iran does in retaliation to Israel, but we are surprised that the world on an overall basis doesn't seem as concerned on what is next. Who knows what Iran will do but they*

have warned they will be retaliating. And then the question because what does Israel then do in response? Oil markets this week were primarily driven by increased geopolitical risk following Israel's bombing of Iran's consulate in Damascus to kill some major IRGC leaders. We should note that Israel, as is their practice, did not confirm or deny the attack. As of our 5am MT news cut off, the world is still waiting for how Iran will retaliate. (i) On Monday morning, we tweeted [LINK] "Breaking! How/what will Iran do in retaliation? @AJEnglish "Israeli strikes have hit Syria's capital, Damascus, in an attack on Iran's consulate and the ambassador's residence, killing at least six people, according to the Syrian Observatory for Human Rights" #OOTT." The Israeli airstrike reportedly killed 16 including IRGC Brigadier General Mohammad Reza Zahedi and several other IRGC officers. (ii) Iran warns US must also be held accountable. On Monday dinner time, we tweeted [LINK] "Breaking! Increasing geopolitical risk Iran/Israel/US. Iran message to US via Swiss re Israel bombing of Iran consulate in Syria. "important message was sent to the US govt as a supporter of the Zionist regime, the Foreign Minister said, "America must be held accountable." #OOTT." (iii) Iran states "this cowardly crime will not go unanswered". On Tuesday Iran's Supreme Leader and President separately stated there will be retaliation. On Tuesday, we tweeted [LINK] "Iran Supreme Leader "The evil regime will be punished by our brave men". Iran President "this cowardly crime will not go unanswered". Per state media. How/when will Iran retaliate vs Israel? Brent currently +$1.50 to $88.92. #OOTT." Our Supplemental documents package include the Iran Foreign Minister, President and Supreme Leader comments."

Oil: Iran says any future counterattacks against Israel will come from within Iran

US ironclad commitment to Israel

Perhaps the most significant change from Iran is how they did this attack directly on Israel. Earlier this morning, Iran's IRGC chief commander stated any future counterattacks against Israel will be coming from within Iran. We tweeted [LINK] "*Iran says no more hiding behind proxies. "From now on, if the Zionist regime attacks our interests, assets, figures, and citizens at any point, it will face counterattack from within the Islamic Republic of Iran," says Chief Commander of IRGC. #OOTT."* So no more hiding behind the proxies. Our Supplemental Documents package includes the PressTV report.

Oil: Biden says ironclad commitment to Israel's "security" from Iran & its proxies

US ironclad commitment to Israel

Prior to yesterday's Iran missile/drone attack, Biden made a point of reiterating his "ironclad" support for Israel's security. (i) At Biden's Wednesday press conference with Japan Prime Minister Kishida, Biden made a point of reiterating his defense support for Israel from attack by Iran and its proxies. Biden made a point of including the proxies. The other point Biden highlighted that it is a commitment to Israel's "security" and not just an attack on Israeli land. The White House transcript [LINK] said "*We also want to address the Iranian threat to launch a sign- — they — they're threatening to launch a significant attack on Israel. As I told Prime Minister Netanyahu, our commitment to Israel's security against these threats from Iran and its proxies is ironclad. Let me say it again: ironclad. We're going to do all we can to protect Israel's security."* (ii) Yesterday afternoon, the White House issued a statement [LINK] "*President Biden has been clear: our support for Israel's security is ironclad. The United States will stand with the people of Israel and support their defense against these threats from Iran*."

Iran on Strait of Hormuz

Oil: Iran reminds could shut Strait of Hormuz if it wanted

Iran's IRGC Navy Commander Admiral Alireza Tangsiri's April 9 interview had a number of Iran reminders/warnings. On Tuesday, we tweeted [LINK] *"Worth a read: Iran IRGC navy comd interview. could shut Strait of Hormuz if they wanted. will be responding to bombing of consulate in Syria. warned neighbour countries with Israel relations - an attack on Iran better not start from there. Houthis make their own weapons. #OOTT."* Tangsiri warned Iran could close the Strait of Hormuz if they want and that the Strait of Hormuz are "*our waters*". Tangsiri said " *During talks with neighboring countries regarding the Strait of Hormuz, our message has always been that of peace and friendliness. Iran suffered under the oppression of a tyrant, so it revolted and offered martyrs in the quest for victory, but since then, we have been faced with the enmity of those same countries, as well as the United States and more. The US Army has now come to the Strait of Hormuz and the Persian Gulf, but they do not belong in our waters. We previously told our neighbors that the Persian Gulf and Oman's Sea are national concerns of both them and Iran and that Iran's security is theirs. We told them the West does not want this region to be stable or secure. The West considers these countries as a "milk cow", but when the milk runs out, as in oil and gas resources in the region, it would slaughter us. Therefore, we have always advocated for the security of the region, and have assured that we can host joint military exercises in the Strait, in collaboration with our brothers from the Persian Gulf's neighboring countries. We can maintain the region's peace and security. Our oil and gas terminals are close to those of the neighboring countries. If we really wanted to, we could close these waterways down."* Our Supplemental Documents package includes the interview.

Yesterday morning, Iran seized an Israeli-linked ship near Strait of Hormuz

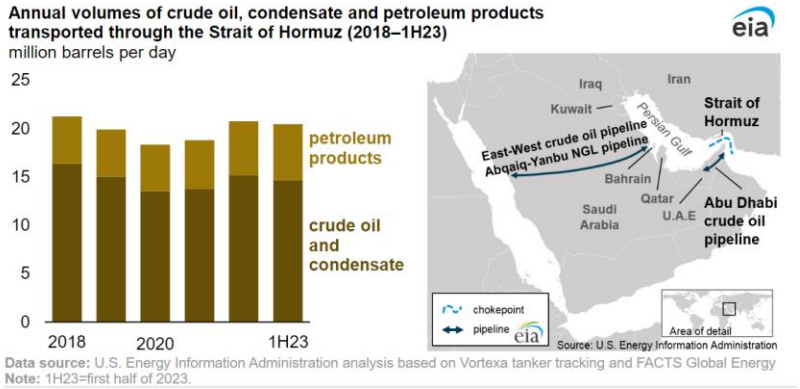
Lost in yesterday afternoon's breaking news was the early Saturday morning news that Iran Iran's IRGC seized an ship linked to Israel near the Strait of Hormuz. At the time, it didn't seem like a huge deal, but by yesterday afternoon, it seems like it was just one of Iran's moves. Yesterday morning, we tweeted the Al Jazeera report [LINK] "*Iranian armed forces have seized a container ship near the Strait of Hormuz amid rising tensions across the region after a deadly Israeli attack on Iran's consulate in Syria. The ship was commandeered by the Islamic Revolutionary Guard Corps (IRGC), the elite force that lost seven members, including two generals, in the Syria strike, Iranian state media reported on Saturday. "The ship has now been guided towards the territorial waters of our country," state-run IRNA reported. The vessel was identified as the Portugal-flagged MSC Aries, which reportedly departed from a port in the United Arab Emirates en route to India. It is associated with the London-based Zodiac Maritime, a part of the Zodiac Group run by Israeli billionaire Eyal Ofer and his family."* Our Supplemental Documents package includes the Al Jazeera report.

There are no workarounds to fully compensate for the Strait of Hormuz closure

The reason why the Strait of Hormuz is considered the most important chokepoint for oil and LNG is that there isn't a workaround, to the most part, if the Strait of Hormuz becomes closed. The Red Sea/Bab el Mandeb can be worked around, it just means a much longer voyage. Here is what we wrote in our Nov 26, 2023 Energy Tidbits memo. *"To dated, the market has been focused on the Strati of Hormuz risk as it is the most important world oil chokepoint. We have been more worried to date on*

interruptions via the Red Sea and Bab el Mandeb but have also been noting how the Strait of Hormuz is more significant to supply if any interruption. And we have been included the EIA's latest Strait of Hormuz blog, which is four years old. But on Tuesday, the EIA updated its Strait of Hormuz blog "The Strait of Hormuz is the world's most important oil transit chokepoint" [LINK]. "The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because large volumes of oil flow through the strait. In 2022, its oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. In the first half of 2023, total oil flows through the Strait of Hormuz remained relatively flat compared with 2022 because increased flows of oil products partially offset declines in crude oil and condensate." "Between 2020 and 2022, volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz rose by 2.4 million b/d as oil demand recovered after the economic downturn from the COVID-19 pandemic. In the first half of 2023, shipments of crude oil and condensates dropped because OPEC+ members implemented crude oil production cuts starting in November 2022. Flows through the Strait of Hormuz in 2022 and the first half of 2023 made up more than one-quarter of total global seaborne traded oil. In addition, around one-fifth of global liquefied natural gas trade also transited the Strait of Hormuz in 2022." Our Supplemental Documents package includes the EIA blog. "

Figure 41: Crude oil, Condensate & Petroleum Products Flows Thru Strait of Hormuz



Source: EIA

Figure 42: Volumes thru the Strait of Hormuz 2018-1H23

Volume of crude oil, condensate, and petroleum products transported through the Strait of Hormuz (2018–1H23)
million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Strait of Hormuz	**21.3**	**19.9**	**18.3**	**18.8**	**20.8**	**20.5**
Crude oil and condensate	16.4	15.0	13.5	13.7	15.2	14.7
Petroleum products	4.9	4.9	4.8	5.1	5.6	5.8
World maritime oil trade	**77.4**	**77.1**	**71.9**	**73.2**	**75.2**	**76.3**
World total petroleum and other liquids consumption	**100.1**	**100.9**	**91.6**	**97.1**	**99.6**	**100.3**
LNG flows through Strait of Hormuz (billion cubic feet per day)	**10.3**	**10.6**	**10.4**	**10.6**	**10.9**	**10.8**

Source: EIA

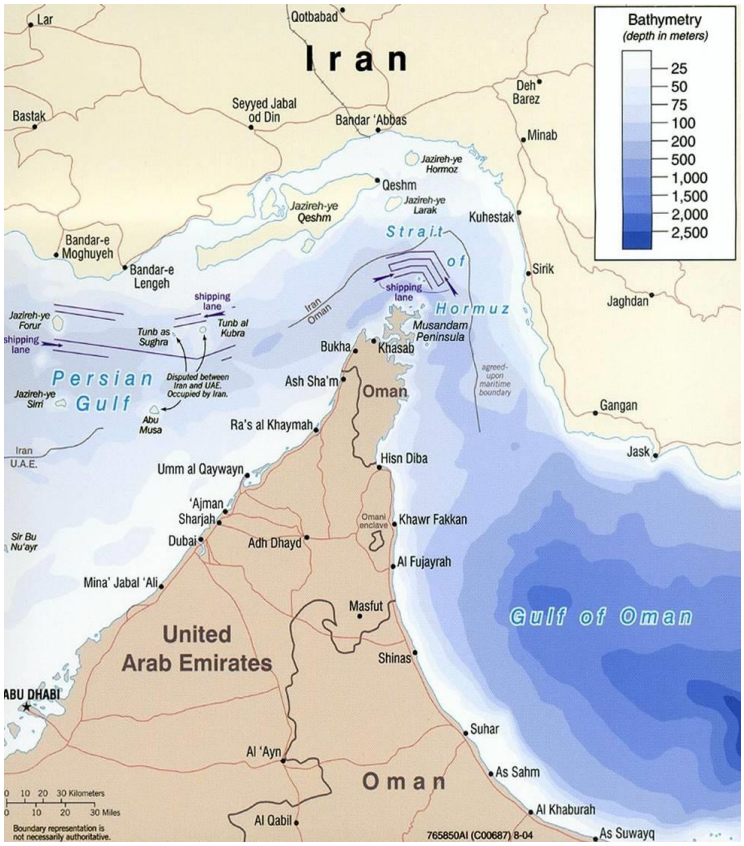
Iran says Strait of Hormuz are "*our waters*", US says its international waters,

IRGC Navy Commander made a point of calling the Strait of Hormuz "*our waters*". The US has never acknowledged that the Strait of Hormuz is Iran waters. Rather we have only ever see the US call the Strait of Hormuz as international waters. The US does not recognize Iran's claim to three small islands (Abu Mousa, Greater and Lesser Tunbs) that are right in the Strait of Hormuz. Whereas Iran has physical control and also claims territorial control. The Strait of Hormuz is located between Oman and Iran in the Persian Gulf, although Iran claims the Strait of Hormuz lies within Iranian territory due to its claim over the islands of Abu Mousa and the Greater and lesser Tunbs. These islands are strategically located at the west (north) side of the Strait of Hormuz and in theory provide support to Iran's territorial rights over part of the Strait of Hormuz. There is a long-standing dispute on the islands since the Nov 1971 Memorandum of Understanding signed between Iran and Great Britain. The MOU was signed by Great Britain since the UAE was not formally founded as a country until Dec 1971. UAE has claimed the islands as theirs from the start. The US and UK and others didn't make this an issue in the 70's because of their support for the Shah of Iran. But post the 1979 Iranian revolution, UAE has had strong support for their position. However, the UAE has not yet been successful in getting its claim to international courts.

The significance of these islands is water depth for super tankers

Here is what we wrote in our April 26, 2020 Energy Tidbits memo. "*There is no dispute that the Strait of Hormuz is the most important oil transit chokepoint in the world. The logistical issue for tanker traffic comes because it is an extremely narrow traffic route at least for the greater water depths to allow ease of supertanker traffic. There are separate inbound and outbound shipping lanes plus a two-mile wide buffer zone. The below map [LINK] shows Abu Mousa, Greater and Lesser Tunbs and the water depths in the Strait of Hormuz*."

Figure 43: Strait of Hormuz – Abu Mousa, Greater and Lesser Tunbs



Source: Project/2000

Oil: Other reminders/warnings from Iran IRGC Navy Commander

Yemen makes its own missiles

In addition to the his reminder/warning on the Strait of Hormuz, Iran's IRGC Navy Commander Admiral Alireza Tangsiri's April 9 interview had a number of other Iran reminders/warnings. (i) On Tuesday, we tweeted [LINK] *"Worth a read: Iran IRGC navy comd interview. could shut Strait of Hormuz if they wanted. will be responding to bombing of consulate in Syria. warned neighbour countries with Israel relations - an attack on Iran better not start from there. Houthis make their own weapons. #OOTT."* (ii) Tangsiri reiterated Iran will respond to the consulate bombing and will "*act and respond when we see fit. But we will definitely respond, and as the leader said, we will not leave the matter unanswered*." (iii) Warns neighbour countries with formal relations with Israel that any attack on Iran better not come from their countries. Tangsiri said "*What are we to understand from such a gesture to us, to a country whose sea spans the entire length of the Persian Gulf, to a country that has beaches in the sea of Oman, to a country with such glory and greatness? Should we not consider this a threat? Is bringing Zionists to a neighboring country not a threat? They should acknowledge that if harm comes in our country's way, then the place they came from will cease to exist. If they [neighboring countries] were indeed looking for security, then they would know that there is no room for Zionists in the region."* (iv) Yemen makes their own

missiles, makes their own military decisions, and its missiles can hit targets 1,000 km away. Tangsiri said "*Western powers have brought in their ships to support the occupation, but the brave Yemenis withstood against them. As our leader said, if Yemen was not under siege, we would have certainly aided it. Yemen today produces its own artillery, missiles, and boats, and is standing strong against the enemies, against the US and Britain, in support of the oppressed people of Palestine and Gaza." "Tangsiri said that after eight years of an imposed and harsh war against the country, Ansar Allah, and the Yemeni Army, it has now reached a level where it can confront great powers such as the United States. He said that Ansar Allah is manufacturing missiles and unmanned aerial vehicles (UAVs) and has established a naval force, despite the embargo and sanctions imposed on the country. Sayyed Abdul-Malik al-Houthi affirmed that they could target the West's ships, even if they were in Southern Africa. Today, Tangsiri said, Ansar Allah is targeting ships 600, 700, and even 1,000 kilometers away." ""Yemen is an independent country, and the Resistance is an independent force that was born to crush oppression. Yemen and its Resistance do not wait for our orders, but we are indeed concerned with the Resistance*."

Oil: Reminder, all of Saudi Arabia & UAE are in range if Houthis can hit Eilat, Israel

Houthis can Israel bombs Iran consulate hit all of Saudi and UAEW

Here is what we wrote in our March 31, 2024 Energy Tidbits memo. "*On Mar 21, we tweeted [LINK] "ICYMI. 1st time a Houthi missile wasn't shot down by IDF missile defense systems and hit near Eilat in southern Israel. IDF says no damage/injuries. Reminds if Houthis can hit Israel, their missiles can reach all of Saudi Arabia and UAE. Thx Calcmaps, @manniefabian #OOTT." Our tweet on the Houthi missile getting thru the Israeli defense system also included the reminder that if the Houthis can hit Eilat in Southern Israel, aoo fo Saudi Arabia and the UAE are in range of Houthi missiles. That shouldn't surprise as Houthis, in prior years, did hit long distance in Saudi Arabia and UAE. Our tweet included the below radius map for the long-distance Houthi missile at Eilat assuming that the missile was launched a little north of Sana'a.*

Figure 44: Approx radius assuming Houthi cruise missile was a little north of Sana'a

Source: Calcmaps

Oil: Can the new Libya oil minister unlock the political infighting

Libya oil political infighting

It's probably too early to tell if the new Libya oil minister will be able to be the key to resolving any political infighting between the Tripoli government and the Libya NOC. On Wednesday,

Platts reported [LINK] "*Feature: New Libyan oil minister expected to unfreeze key projects, but political risks remain*" And "*The suspension of Libyan Oil Minister Mohamed Aoun and the appointment of his well-connected deputy could unblock major hydrocarbons projects, but also demonstrates the oil and gas sector's vulnerability to the country's chronic political instability, analysts said. Aoun was suspended March 25 by the Administrative Control Agency, a government oversight body, due to "legal violations" and quickly replaced by Deputy Oil Minister Khalifa Abdul Sadiq, an associate of the nephew of Prime Minister Abdul Hamid al-Dbeiba. Although Aoun contested the suspension, which sources said was likely politically motivated, it is unlikely to be undone. Libya has been chaotic since the NATO-backed uprising against Moammar Qadhafi in 2011 and is run by parallel governments in the east and west. The oil sector, which accounts for 95% of government revenue, is the primary arena for political wrangling. Hamish Kinnear, senior Middle East and North Africa analyst at Verisk Maplecroft, said Aoun's dismissal was "a mixed bag for Libya's oil sector and IOCs." "On the one hand, the suspension could unblock progress on major oil projects -- Aoun was behind a halt to the development of the NC7 Hamada field on the basis that it granted excessive concessions to foreign operators," said Kinnear. "On the other hand, Aoun retains the support of parties with the ability to disrupt Libya's oil and gas production."* Platts reminds that Aoun still has support so it's hard to tell if the new oil minister, being an associate of the PM's nephew can be the catalyst to eliminate the political infighting between the Tripoli govt and the NOC. Our Supplemental Documents package includes the Platts report.

Oil: No production update from Libya NOC since the political infighting

No Libya oil production update

As noted above, it seems that there are some steps to resolving the political infighting in the Libya oil industry. But, at least for now, we haven't seen any oil production updates from the Libya National Oil Corporation since their Mar 21 update that oil production was 1.241 mmb/d. Other than the short protest that briefly shut in Sharara oil field in Q1/24, Libya's oil production has been stable at ~1.2 mmb/d for the past several months. Our March 31, 2024 Energy Tidbits memo highlighted the suspension of then Libya Oil Minister Aoun for undisclosed reasons and the subsequent accusation of Libya NOC Chair Bengdara of conflict of interest.

Oil: Trafigura on China "*that's an economy that's actually doing quite well*"

China economy "*doing quite well*"

There were bullish comments on the China economy from Trafigura Chief Economist Saad Rahim at the FT Commodity Summit on Monday. Rahim highlighted how everyone assumes the China economy is weak because real estate is weak, but then he went thru why Trafigura sees the Chinese economy as doing "*quite well*". On Monday, we tweeted [LINK] ""*We saw record high demand for copper, for aluminium, for oil and for gas in China. That tells you that that's an economy that's actually doing quite well." @saadrahim. Thx @FT @gulf_intel #OOTT."* Our tweet included the transcript we made of his comments. SAF Group created transcript of comments by Saad Rahim (Chief Economist Trafigura) at FT Commodity Summit, video courtesy of Gulf Intelligence Daily Energy Markets on April 8, 2024. [LINK] Items in "*italics*" are SAF Group created transcript. At 1:28 min mark, Rahim "*And China, our view on this , very much so has been that China did actually do quite well last year. But not if you're so focused on property which is where everyone is. Everyone goes commodities equals China, China equals property therefore Chinese property is weak, China growth is weak therefore commodities are weak. In fact that's not what we've seen. We saw record high demand for copper, aluminium, for oil and for gas in China. That tells you that's an*

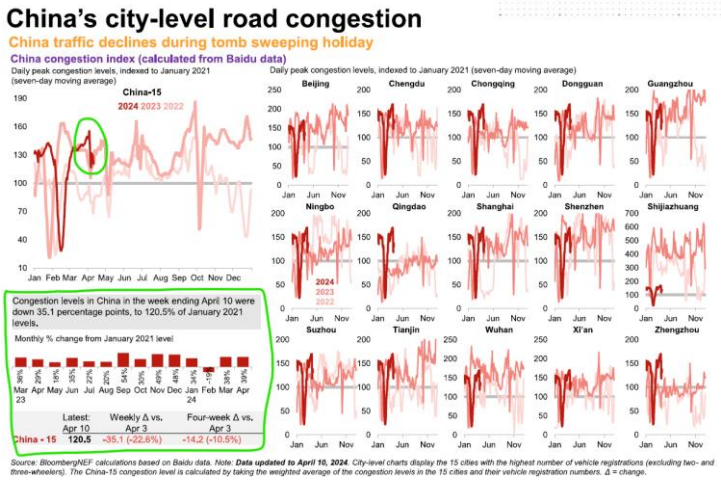
economy that's doing quite well. Because it's been able to offset some of this weakness in property via growth in new sectors."

China city-level traffic congestion

Oil: Baidu China city-level road congestion down big during tomb-sweeping holidays

It's only one indicator but it is positive to see the Baidu city-level road congestion continue to increase, save for this week where there was the national holiday with the annual tomb-sweeping festivities. More driving activity in cities is a good indicator. On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly Apr 11 report, which includes the Baidu city-level road congestion for the week ended Apr 10. Note that this data includes China's "Tomb-Sweeping" festival, a day where people go to visit the graves of their loved ones and tidy up their tombs. We have been seeing an uptick in Chinese road congestion over the past month, but this week there was a -22.6% WoW decrease in congestion levels across select Chinese cities. Baidu city-level road congestion was -3510bps WoW to 120.5% of Jan 2021 levels. Below is the BloombergNEF key graph.

Figure 45: China city-level road congestion for the week ended Apr 10



Source: BloombergNEF

IEA peak oil demand by 2030

Oil: IEA keeps call for peak oil demand by 2030

On Friday morning, we tweeted [LINK] "*No change to @IEA call peak #Oil demand by 2030. See 👇IEA post. But absent added energy/climate policies & increased $$ push into clean energy, "decline in global oil demand following the peak will note be a steep one, leaving demand close to current levels for some time" #OOTT."* Separate but alongside the OMR, the IEA posted a brief "*Oil demand growing at a slower pace as post-Covid rebound runs its course"* [LINK] It's a good recap of the reasons why IEA sees slowing oil demand ahead. The conclusion from the piece is that there is no change to the IEA view that they see peak oil demand by 2030. We were surprised that the IEA came out with this call as we have been vocal in our view that we expected the IEA to push back its forecast of peak oil demand by 2030 in light of the EV assumptions they used in their April 2023 global EVs outlook major report. So they have certainly proven us wrong in that call. And the IEA highlighted that, after reaching peak demand, they don't see a steep drop off in demand. Rather, they see oil demand remaining around current levels for some time. They are certainly suggesting a long

plateau. The IEA wrote "*Global consumption of oil is set to peak, but its centrality remains. While we expect growth in oil consumption in 2024 (1.2 mb/d) and 2025 (1.1 mb/d) to remain robust by historical standards, structural factors will lead to a gradual easing of oil demand growth over the rest of this decade. Continued rapid gains in the market share of EVs, particularly in China; steady improvements in vehicle fuel economies; and, notably, efforts by Middle Eastern economies, especially Saudi Arabia, to reduce the quantity of oil used in power generation are together expected to generate an overall peak in demand by the turn of the decade. Oil remains extremely important to the global economy, and across some of its key applications, alternatives still cannot easily be substituted. In the absence of additional energy and climate policies and an increased investment push into clean energy technologies, the decline in global oil demand following the peak will not be a steep one, leaving demand close to current levels for some time. Nevertheless, cooling Chinese demand growth and considerable progress on the deployment of clean energy transition technologies mean that the oil market is set to enter a new and consequential period of transformation.*" Our Supplemental Documents package includes the IEA brief.

09/12/23: IEA Birol says peak demand for oil, natural gas & coal by 2030

The IEA call for peak oil demand by 2030 is the same view put forward in 2023. It started with IEA Executive Director Fatih Birol on Sept 12, 2023. Here is what we wrote in our Sept 17, 2023 Energy Tidbits memo. "*On Tuesday (local time), the Financial Times front page story was "World at beginning of end of fossil fuel era, says IEA." The FT posted an op-ed by IEA Executive Director Birol titled "Peak fossil fuel demand will happen this decade" [LINK]. (i) The difference to other calls is that Birol is calling for peak demand for oil, coal and natural gas. Birol wrote "There's a taboo in the traditional energy sector against suggesting that demand for the three fossil fuels — oil, gas and coal — could go into permanent decline. Despite recurring talk of peak oil and peak coal over the years, both fuels are hitting all-time highs, making it easier to push back against any assertions that they could soon be on the wane. But according to new projections from the International Energy Agency, this age of seemingly relentless growth is set to come to an end this decade, bringing with it significant implications for the global energy sector and the fight against climate change. Every year, the IEA's World Energy Outlook maps out potential pathways the global energy system could take in the coming decades to help inform decision-making. This year's report, to be released next month, shows the world is on the cusp of a historic turning point. Based only on today's policy settings by governments worldwide — even without any new climate policies — demand for each of the three fossil fuels is set to hit a peak in the coming years. This is the first time that a peak in demand is visible for each fuel this decade — earlier than many people anticipated." (ii) We don't think anyone will disagree that the world is on track to have demand for each of the fossil fuels peak sometime. But it comes down to when. Not many would disagree with peak coal demand by 2030. The debate on peak oil demand is generally around 2030 with oil bulls more like mid 2030s, and oil bears just before 2030. But not many would expect peak natural gas demand before 2030. (iii) Birol doesn't really emphasize it, but we suspect a significant factor in the new IEA forecast for the timing of peak fossil fuels will be a very large assumed contribution from energy conservation and energy efficiency. (iv) One thing missing from Birol's op-ed is any concern on what this will do to the cost of energy ie. is the*

world looking at an era that energy will be higher forever? Birol doesn't say he sees these clean alternatives are able to provide reliable, available and affordable energy. (v) Birol gave himself the out to say he warned that there can still be spikes. But he is clearly inferring it isn't a higher price energy environment. Birol says "The declines in demand also won't be linear. Although fossil fuels are set to hit their peaks this decade in structural terms, there can still be spikes, dips and plateaus on the way down." (vi) And of course, Birol says there will still be a need for investment in oil and gas supply even in the face of peak oil and gas demand. Birol says "And even as demand for fossil fuels falls, energy security challenges will remain as suppliers adjust to the changes. The peaks in demand we see based on today's policy settings don't remove the need for investment in oil and gas supply, as the natural declines from existing fields can be very steep. At the same time, they undercut the calls from some quarters to increase spending and underline the economic and financial risks of major new oil and gas projects — on top of their glaring risks for the climate." Our Supplemental Documents package includes the Birol op-ed."

IEA unchanged call for only modest demand decline post peak to 2050

On Oct 24, 2023, the IEA posted its flagship report "*World Energy Outlook*" [LINK], which included the long term outlook forecast to 2050 that tied to IEA Executive Director Fatih Birol's Sept 12, 2023 comments on peak oil, natural gas and coal demand. Unfortunately, the IEA only provided numbers for 2022, 2030 and 2050 and then some small graphs. But the WEO data fits to Friday's IEA brief (above) that said "*global oil demand following the peak will not be a steep one, leaving demand close to current levels for some time."* The IEA's WEO forecast global oil demand of 96.5 mmb/d in 2022, 101.5 mmb/d in 2030 and 97.4 mmb/d in 2050. So basically flat demand post 2030 to 2050, and "*world liquids demand*" of 98.6 mmb/d in 2022, 104.4 mmb/d in 2030 and 101.8 mmb/d in 2050.

Figure 46: Global liquids demand and supply by scenario (million b/d)

Table 3.5 ▷ **Global liquids demand and supply by scenario** (mb/d)

			STEPS		APS		NZE	
	2010	2022	2030	2050	2030	2050	2030	2050
Road transport	36.5	41.3	41.1	35.5	37.6	15.9	29.1	1.6
Aviation and shipping	9.9	10.6	13.5	17.2	12.5	9.0	10.5	2.1
Industry	17.2	20.6	23.3	25.5	21.4	17.8	20.3	14.3
Buildings and power	12.4	11.4	9.5	6.7	8.6	4.1	6.1	0.5
Other sectors	11.1	12.6	14.0	12.5	12.4	7.9	11.4	5.7
World oil demand	87.1	96.5	101.5	97.4	92.5	54.8	77.5	24.3
Liquid biofuels	1.2	2.2	3.0	4.5	4.8	6.9	5.6	5.3
Low-emissions hydrogen-based fuels	-	-	0.0	0.2	0.2	3.6	0.7	6.0
World liquids demand	88.4	98.7	104.5	102.1	97.5	65.3	83.7	35.5
Conventional crude oil	67.4	62.8	61.3	58.2	54.9	29.8	48.0	15.8
Tight oil	0.7	8.3	11.1	10.2	10.3	6.9	7.6	1.8
Natural gas liquids	12.7	19.0	21.2	19.4	20.1	13.6	16.2	4.4
Extra-heavy oil and bitumen	2.0	3.7	4.4	5.5	3.9	2.5	3.0	1.5
Other production	0.5	0.9	1.0	1.2	0.9	0.3	0.3	0.0
World oil production	83.1	94.8	99.1	94.5	90.2	53.1	75.1	23.5
OPEC share	40%	36%	35%	43%	35%	45%	37%	53%
World processing gains	2.2	2.3	2.4	2.9	2.4	1.6	2.3	0.7
World oil supply	85.3	97.1	101.5	97.4	92.5	54.8	77.5	24.3
IEA crude oil price (USD [2022]/barrel)	103	98	82	80	74	60	42	25

Notes: mb/d = million barrels per day; OPEC = Organization of the Petroleum Exporting Countries. Other production includes coal-to-liquids, gas-to-liquids, additives and kerogen oil. Historical supply and demand volumes differ due to changes in stocks. Liquid biofuels and low-emissions hydrogen-based liquid fuels are expressed in energy equivalent volumes of gasoline and diesel, reported in million barrels of oil equivalent per day. See Annex C for definitions.

Source: World Energy Outlook Oct 2023

Oil: We expected govts/IEA admit the #1 factor for peak oil demand isn't working **Peak oil demand**

The reason why we were surprised by the IEA confirmed call for peak oil demand by 2030 is their assumption on the miles driven displaced by every new EVs that we highlighted a year ago. That was before all the backing way by EV makers of their EV sales ambitions. So we were surprised by the IEA blog this week. And we reiterated this EV view prior to knowing of the IEA blog, in our Mar 31, 2024 Energy Tidbits memo. Here is what we then wrote "*We believe April could be a key month for the mid to long term view of oil as we should see the IEA push back their timing for peak oil demand. ie. oil is needed for longer. The IEA normally releases its annual global EVBs outlook in April and we have been saying since the April 2023 report that the IEA has been using overly optimistic assumptions for their forecast that EVs will displace ~5.5 mmb/d of oil consumption by 2030. It is their key factor for why they forecast peak oil demand will be by 2030. (i) It is important to remember that our view was assuming the IEA's EV sales growth forecast was accurate. And, as highlighted again by Ford CFO on Tuesday, EV sales growth is less than expected. We have to believe the IEA has no choice but to significantly reduce its forecast for EV sales growth starting in 2024 and for all years. And lower EV sales has to lead to lower oil displaced by EVs in the IEA's peak oil demand forecast. (ii) In addition, we still believe the IEA should be changing their overly optimistic assumption on EVs displacing mileage driven by ICE. On Tuesday, we tweeted [LINK] "IEA's peak oil demand by 2030 is more than how many & how quick EVs are sold. A huge overlooked ass. in IEA's peak oil demand before 2030 is 👇04/26/23 tweet. The IEA assumes every new EV displaces the distance driven by an ICE. ie. infers an ICE is effectively junked. #OOTT." Our tweet included one of the 7-part tweets on April 26, 2023 on the IEA's then new global EVs outlook. This tweet (3/7) included this rationale. On Apr 26, 2023, we tweeted "3/7. Oil bulls also note KEY assumption to @IEA #EVs replacing 6 mmbd is that distance travelled by EVs basically replaces the distance an ICE or hybrid would have driven. ie. infers a new EV is added to fleet, an ICE is effectively retired from fleet. #OOTT." Our tweet included what we thought was overlooked – the assumptions to their forecast. The key assumption was "Box 3.2 How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each). In the case of PHEVs, only the distance covered by electricity gets included. The stock average fuel consumption of gasoline and diesel vehicles determines the total liquid fuel displacement, where the biofuel portion is taken out of the estimate based on regional blending rates. As a result, it can be estimated that in 2022, the stock of EVs displaced 700 000 barrels of oil per day. This method of estimation assumes that EVs replace ICE or hybrid vehicles of the same segment, as opposed to some other means of transport, i.e. an electric car replaces an ICE car."*

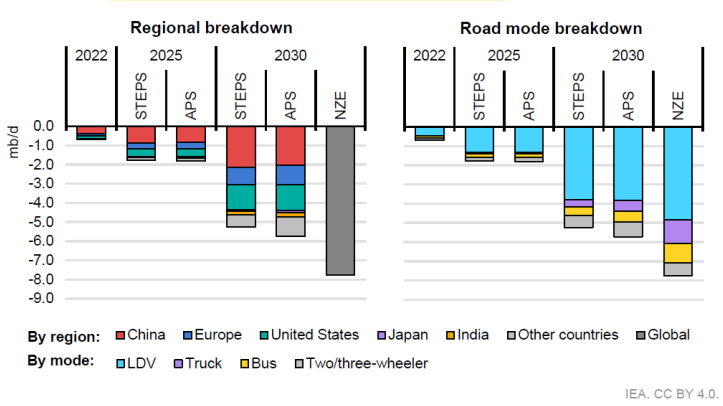
04/30/23 memo: Will EVs displace 5.5 mmb/d of oil as IEA forecast a year ago?

Our view on IEA's Global EVs forecast is not new. Rather we have highlighted our concern on their forecast for EVs to displace ~5.5 mmb/d of oil by 2030 since last April. Here is what we wrote in our Apr 30, 2023 Energy Tidbits memo on the IEA's report. "*The most important assumption on when peak oil demand hits is how quickly the accelerating share that EVs have of all new car sales leads to a big decline in oil consumption. The IEA forecasts EVs will displace nearly 6 mmb/d of oil demand by*

2030 if governments deliver on their stated policies. And says that EVs displaced 700,000 b/d of oil demand in 2022. We had a 7-tweet Twitter thread that reminded that the displacement is all about forecast assumptions. We agree that EVs have to displace some oil demand, but we question the primary assumption and therefore believe this nearly 6 mmb/d displacement is too optimistic. (i) On Wed, the IEA released its major report "Global EV Outlook 2023: Catching up with climate ambitions". [LINK]. There is no question it is an excellent report with a lot of data and global EV insights. We recommend adding to reference libraries. (ii) We tweeted [LINK] "1/7. @IEA Global EVs Outlook 2023. #Oil Bears and Bulls will both love it! Oil Bears and western leaders like headline, EVs to be 60% of total car sales in 2030, EVs to displace nearly 6 mmbd of oil by 2030, already displaced 0.7 mmbd in 2022. #OOTT." We expect western leaders will just run with the nearly 6 mmb/d displacement and not worry about the key assumption. (ii) Oil bears assume this nearly 6 mmb/d means the IEA expects oil demand to be down ~6 mmb/d by 2030. But we reminded in our tweet [LINK] "2/7. Oil bulls remember @IEA World Energy Outlook Oct/22 incl EVs to be 50% of total car sales in 2030, and IEA forecast #Oil demand to increase 0.8%/yr this decade to peak around 103 mmbd n mid 2030s." The IEA's flagship annual report World Energy Outlook in Oct 2022 assumed EVs would be 50% of total car sales in 2030, so less than its new forecast of 60% in 2030. But even including a 50% assumption, the IEA WEO forecast oil demand to keep increasing in the 2020s and not peak until the mid 2030s at ~103 mmb/d. (iii) Here is the key assumption to displacing ~6 mmb/d that most probably didn't read. We are big believers that it is important to look at the key forecast assumption on pg 132. We tweeted [LINK] "Oil bulls also note KEY assumption to @IEA #EVs replacing 6 mmbd is that distance travelled by EVs basically replaces the distance an ICE or hybrid would have driven. ie. infers a new EV is added to fleet, an ICE is effectively retired from fleet. #OOTT." The IEA wrote "How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each)." Basically, the IEA assumes the EV effectively replaces the distance driven by an ICE vehicle. (iv) We don't believe this effective one-for-one replacement in terms of distance driven has proved out so far. We tweeted [LINK] "4/7. But for many, an EV is a 2nd or 3rd car. Norway is recognized leader in terms of EVs penetration. 03/22 tweet. Yet #EVs distance driven 22.6% in 2022. EVs were >80% of new car sales in 2022, been 60% for ~4 years. [LINK] #OOTT". (v) On March 25, Equinor highlighted this EVs are 2nd or 3rd cars in Norway. We tweeted [LINK] "5/7. In Norway, EVs are 2nd or 3rd cars! 03/25 Equinor explains why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness [LINK] #OOTT." (vi) Absent governments mandating ICE vehicles get junked, the other key factor is that ICE vehicles are lasting longer. We tweeted [LINK] "6/7. A concept everyone has experienced - ICE vehicles are lasting longer. 03/31. @BloombergNEF. at least in China, ICE vehicles retirements are at a very low level even in the face of increasing EV and ICE sales. #OOTT." (vii) It is important to remember that the IEA forecasting a 60% EV share of total car sales means a displacement of nearly 6 mmb/d in 2030 is not an IEA forecast that says its

oil demand forecast will be reduced by 6 mmb/d. It's WEO Oct 2022 assumed EVs were 50% of total car sales in 2030 and didn't see peak oil demand until the mid 2030s. So the incremental 10% EV sales penetration, by itself, isn't likely to move its peak oil demand closer by very much. Our last tweet [LINK] "7/7. #Oil Bears and western leaders will love @IEA EVs headlines on increasing EV sales and oil displacement. #Oil Bulls (Saudi Arabia) will love the IEA report and think this won't have much impact on @IEA forecast for peak oil demand around 103 mmbd in mid 2030s. #OOTT." (viii) EVs are having an impact on oil and energy, but it isn't a one-for-one replacement. Plus we wonder if it's just additive on an "energy" basis in what it does to the demand for natural gas and other forms of reliable electricity to power the new EV ecosystem. Our Supplemental Documents package includes excerpts from the IEA Global EVs Outlook report."

Figure 47: Oil displacement by region and mode, 2022-2030



Source: IEA

Oil: EIA increases oil demand +0.4 mmb/d in 2024 and by +0.5 mmb/d in 2025

EIA increases oil demand forecast

We were a little surprised by the early headlines from the EIA's Short Term Energy Outlook forecast for oil demand were on how the EIA lowered the growth rate for oil demand for 2024 by 0.5 mmb/d ie. lower oil demand grow in 2024. Those headlines were right and the EIA April STEO forecast YoY growth of +0.95 mmb/d YoY in 2024 vs the March STEO forecast YoY growth of +1.43 mmb/d YoY in 2024. However, focusing only on the YoY growth rate doesn't tell the story of the EI"s April STEO oil demand forecast for 2024 and 2025. On Tuesday, we tweeted [LINK] "*Will IEA do same on Fri? EIA increases oil demand fcast by +0.4 mmbd to 102.9 in 2024 & by +0.5 mmbd to 104.3 in 2025. Note this is due to revisions to 2022 & 2023. So their YoY growth rates in 2024 & 2025 are less than Mar fcast. Regardless why, #oil demand is up big! #OOTT."* What some missed on their first go round was that the EIA made bid upward revisions to 2022 and 2023. So big upwaqrd revisions to history but a lower growth rate for 2024. As a result, the April STEO had a starting point of 101.96 mmb/d for 2023 oil demand vs the March STEO having 101.0 mmb/d for 2023. This then meant that, despite lower oil growth rate in 2024, the April STEO has 2024 oil demand of 102.91 mmb/d, which is higher than the March STEO of 102.43 mmb/d for 2024. And,

similarly for 2025, the April STEO has 2025 oil demand of 104.26 mmb/d, which is higher than the March STEO of 103.80 mmb/d for 2024. Our tweet included the excerpt from the April STGO that said "*This update increased our assessment of global liquid fuels consumption for 2022 by nearly 0.8 million barrels per day (b/d) compared with last month's STEO. Most of this change reflects non-OECD consumption that is higher than we previously estimated. The higher baseline historical data for 2022 in turn increased our estimate of consumption in 2023 and our forecasts for 2024 and 2025."*

Oil: Vitol CEO "*pushing back peak [Oil] demand by a few years to the early 2030s*"

Vitol CEO on peak oil demand

On Mar 26, Vitol CEO Russell Hardy posted his CEO statement "*Vitol 2023 volumes and review.* We did not see his March 26 letter until Monday, but there were multiple oil insights in this short statement. (i) Demand growth of +1.5 mmb/d in 2024. Note this +1.5 mmb/d YoY in 2024 was in the Mar 26 statement, and, as noted below, before Hardy's comments on Tuesday). Hardy wrote "*Last year oil demand finally recovered to pre-pandemic levels, though some products, such as jet fuel, have taken longer. Our crude oil and product volumes fell slightly (1.6%) to 349mT or 7.3mbpd with a 10% decline in crude volumes being partly offset by increases in gasoline and gasoil volumes. This year we anticipate refined product demand will increase by 1.5mbpd, taking overall oil demand to almost 105mbpd.*" (ii) Pushing back peak oil demand to early 2030s. On Monday, we tweeted [LINK] "*pushing back peak [Oil] demand by a few years to the early 2030s" @vitolnews CEO 03/26. "pace of EV adoption has moderated & oil demand from some developing markets may be higher than anticipated". "Even in developed markets, ensuring stable supply in the face of sustained demand .." #OOTT."* CEO Hardy wrote "*Longer term, we have revised our outlook, pushing back peak oil demand by a few years to the early 2030s. The pace of EV adoption has moderated and oil demand from some developing markets may be higher than anticipated*." (iii) Seeing "*sustained demand"* in developed markets. Most assumed developed markets have reached peak oil demand so it was positive to see CEO Hardy write "*Even in developed markets, ensuring stable supply in the face of sustained demand will require investment in both upstream and refining capacity*." Our Supplemental Documents package includes the Vitol CEO statement.

Oil: Apr 9, Vitol CEO sees oil demand +1.9 mmb/d YoY in 2024

Vitol CEO bullish on 2024 oil demand

As noted above, on Tuesday, Vitol CEO Hardy gave a more bullish view for 2024 oil demand than in his Mar 26 statement. On Tuesday, we tweeted [LINK] "*WOW!. Vitol CEO Hardy sees #Oil demand +1.9 mmb/d YoY in 2024! Vitol is a lot closer to OPEC's +2.2 mb/d YoY in 2024. Wonder how much the IEA increases its +1.3 mmb/d YoY demand forecast on Friday? Thx @dmitryZ_reuters #OOTT."* Vitol CEO Hardy spoke at a conference in Europe and his comments on oil demand were similarly reported by both Reuters and Bloomberg. We could not find any video clip of his comments. But both reported that Hardy stated oil demand growth in 2024 should be +1.9 mmb/d YoY.

Oil: Trafigura now seeing numbers like 1.7, 1.8 mmb/d for 2024 demand growth

Trafigura seeing increasing oil demand forecasts

Earlier, we highlighted the positive comments on China economy by Trafigura Chief Economist Saad Rahim. He also highlighted the bullish change in oil demand growth forecasts for 2024 since the beginning of the year ie. demand growth forecasts for 2024 are up about 0.6 mmb/d in the last few months. On Monday, we tweeted [LINK] "*Oil bulls will like this! "Instead, now we're getting numbers like 1.7, 1.8 million barrels a day [Oil Demand]*

because growth globally is holding up ...." @saadrahim. Thx @FT @gulf_intel #OOTT."
Our tweet included the transcript we made of Rahim's comments. SAF Group created transcript of comments by Saad Rahim (Chief Economist Trafigura) at FT Commodity Summit, video courtesy of Gulf Intelligence Daily Energy Markets on April 8, 2024. [LINK]. Items in "i*talics*" are SAF Group created transcript. At 2:05 min mark, Rahim "*If you look around these commodity markets, you know we're at $90 oil. We're at $8,500 on copper. And that's tell you again something about the state of the market. Right. I think where we've moved to, especially on oil was coming in the year the market was fairly balanced, 1.1 million barrels a day was the consensus number on growth, on demand I should say. 1.1 million of non-OPEC supply. So that's a balanced market. Instead, now we're getting numbers like 1.7, 1.8 million barrels a day because growth globally is holding up. Like I said, it's not just US or China, it's also a lot of the other emerging economies, we're seeing India in particular doing extremely well. That's going to be a big driver of growth."*

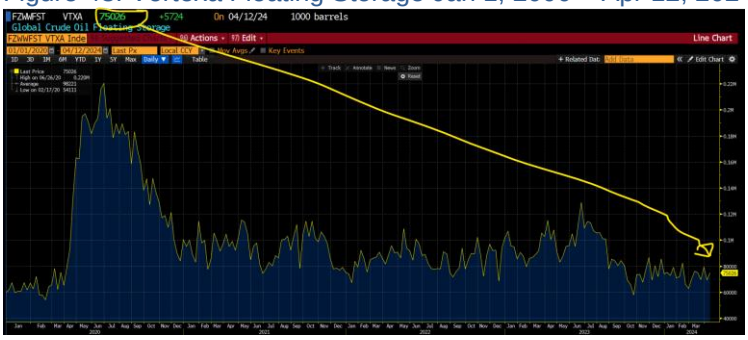
Vortexa floating storage

Oil: Vortexa crude oil floating storage est 75.03 mmb at Apr 12, +5.73 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 Apr 6 at 9am MT. (i) Yesterday, we tweeted [LINK] "*#Oil floating storage 75.03 mmb Apr 12. No major revisions. Last 7 wks ave 73.53 mmb. Refiners/tankers have worked in longer trips. So floating storage normalizing in 70s as OPEC+ keeps cuts thru Q2 but more oil moving on water. Thx @vortexa @business #OOTT."* (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Apr 12 at 75.03 mmb which is +5.73 mmb WoW vs upwardly revised Apr 5 of 69.30 mmb. Note Apr 5 was revised +2.11 mmb vs 67.19 mmb originally posted at 9am on Apr 6. (iii) It seems like oil floating storage/longer tanker travel has mostly sorted out to a new normal. It's been three months for refineries and tankers to work thru the longer tanker trips into deliveries/schedules, which seemed to return oil to storage that was used to fill in as deliveries took longer. If the oil delivery system has now adapted to the longer tanker travel, it makes sense that a world of longer tanker travel is likely to have floating storage at lower (ie. closer to 70 mmb as opposed to >80 mmb) levels. But longer trips means more oil on water in transit. (iv) Revisions. There were three weeks with upward revisions of ~2 mmb, the rest were small. Here are the revisions compared to the estimates originally posted on Bloomberg at 9am MT on Apr 6. Aor 5 revised +2.11 mmb. Mar 29 revised -0.65 mmb. Mar 22 revised -2.17 mmb. Mar 15 revised -0.94 mmb. Mar 8 revised +1.89 mmb. Mar 1 revised +0.51 mmb. Feb 23 revised +0.11 mmb. (v) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 73.53 mmb vs last week's then seven-week average of 71.67 mmb. The increase was due to dropping from the average a very low week of 62.77 and replacing with a 75.03 week and the upward revisions. (vi) Also remember Vortexa revises these weekly storage estimates on a regular basis. For example, when most report on the Vortexa data on Monday morning, they will be reporting on different estimates. We do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison. Normally we download the Vortexa data as of Saturday mornings around 9am MT. (vii) Note the below graph goes back to Jan 1, 2020 to show the run up to Covid and then how Covid started to impact Covid in March/April 2020. (viii) Apr 12 estimate of 75.03

mmb is -53.86 mmb vs the recent June 23, 2023 high of 128.89 mmb. Recall Saudi Arabia stepped in on July 1, 2023 for additional cuts. (ix) Apr 12 estimate of 75.03 mmb is -25.51 mmb YoY vs Apr 14, 2023 of 100.54 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Apr 13, 9am MT Apr 6, and 9am MT Mar 30.

Figure 48: Vortexa Floating Storage Jan 1, 2000 – Apr 12, 2024, posted Apr 13 at 9am MT



Source: Bloomberg, Vortexa

Figure 49: Vortexa Estimates Posted 9am MT on Apr 13, Apr 6, and Mar 30

Posted Apr 13, 9am MT

Date	Last Px
Fr 04/12/2024	75026
Fr 04/05/2024	69302
Fr 03/29/2024	79457
Fr 03/22/2024	69596
Fr 03/15/2024	74838
Fr 03/08/2024	76090
Fr 03/01/2024	70442
Fr 02/23/2024	62771
Fr 02/16/2024	65808
Fr 02/09/2024	82112
Fr 02/02/2024	71897

Apr 6, 9am MT

Date	Last Px
Fr 04/05/2024	67191
Fr 03/29/2024	80112
Fr 03/22/2024	71769
Fr 03/15/2024	75740
Fr 03/08/2024	74242
Fr 03/01/2024	69932
Fr 02/23/2024	62655
Fr 02/16/2024	67326
Fr 02/09/2024	82188
Fr 02/02/2024	72050
Fr 01/26/2024	70976

Mar 30, 9am M

Date	Last Px
Fr 03/29/2024	65555
Fr 03/22/2024	80020
Fr 03/15/2024	80224
Fr 03/08/2024	79497
Fr 03/01/2024	70261
Fr 02/23/2024	62552
Fr 02/16/2024	66636
Fr 02/09/2024	81819
Fr 02/02/2024	71738
Fr 01/26/2024	70623
Fr 01/19/2024	80077

Source: Bloomberg, Vortexa

Vortexa floating storage by region

Oil: Vortexa crude oil floating storage WoW changes by regions

Bloomberg also posts the Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. (i) As noted above, last week's Apr 5, in total, was revised +2.11 mmb. There were no major revisions by region. (ii) As noted above, Apr 12 of 75.03 mmb was +5.73 mmb WoW vs upwardly revised Apr 5 of 69.30 mmb. The major WoW changes by region were Other +5.20 mmb WoW, Europe -4.43 mmb WoW and Asia +2.94 mmb WoW. (iii) Apr 12 of 75.03 mmb is -53.86 mmb vs the summer June 23, 2023 peak of 128.89 mmb. Recall Saudi Arabia started its voluntary 1 mmb/d production cuts on July 1, 2023. The major changes by region vs the summer June 23 peak are Asia -38.72 mmb and Other -18.75 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 Apr 5 that was posted on Bloomberg at 9am MT on Apr 6.

Figure 50: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Apr 12/24	Apr 5/24	WoW	Apr 5/24	Jun 23/23	Apr 12 vs Jun 23
Asia	34.29	31.35	2.94	30.07	73.01	-38.72
Europe	7.53	11.96	-4.43	12.33	6.21	1.32
Middle East	8.49	7.68	0.81	7.48	6.76	1.73
West Africa	6.84	7.33	-0.49	7.33	7.62	-0.78
US Gulf Coast	2.34	0.64	1.70	0.92	1.00	1.34
Other	15.54	10.34	5.20	9.06	34.29	-18.75
Global Total	75.03	69.30	5.73	67.19	128.89	-53.86
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Apr 6						
Source: Vortexa, Bloomberg						

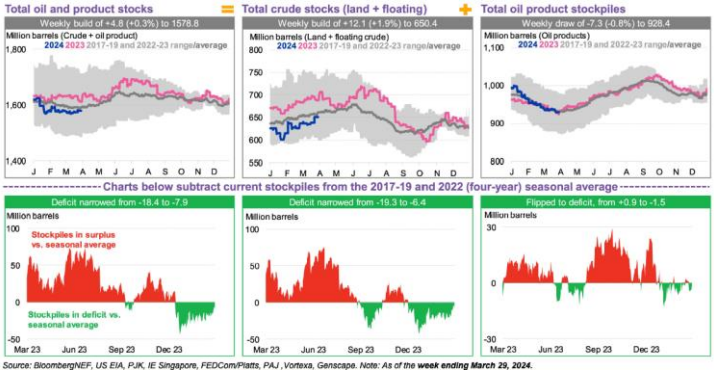
Source: Bloomberg, Vortexa

Oil: BNEF – global oil and product stocks deficit narrows to -7.9 mmb

Global oil and products stocks

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending March 29, which is a week earlier than the normal EIA US oil inventory data that is for the week ending Apr 5 which was a build of +5.84 mmb. On Tuesday, BloombergNEF posted its "*Oil Price Indicators*" weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022-2023, and other times using a five-year average 2017-2019 + 2022-2023. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products deficit narrowed from -18.4 mmb to -7.9 mmb deficit for the week ending Mar 29. (iii) Total crude inventories (incl. floating) increased +1.9% WoW to 650.4 mmb, while the stockpile deficit narrowed from -19.3 mmb to -6.4 mmb. (iv) Land crude oil inventories increased +0.9% WoW to 571.3 mmb, narrowing the deficit to -16.5 mmb against the five-year average (2017-2019 + 2022-23). (v) The gas, oil, and middle distillate stocks decreased -0.5% WoW to 153.9 mmb, with the deficit against the four-year average narrowing from -13.6 mmb to -12.9 mmb. Jet fuel consumption by international departures for the week of Apr 15 is set to decrease by -52,200 b/d WoW, while consumption by domestic passenger departures is forecast to fall by -13,000 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 51: Aggregate Global Oil and Product Stockpiles



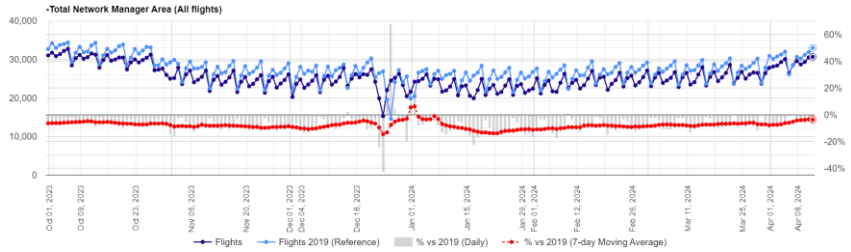
Source: BloombergNEF

Europe airports daily traffic

Oil: Europe airports daily traffic 7-day average is -3.7% below pre-Covid levels

Yesterday, we tweeted [LINK] "*Daily Europe air traffic creeping back closer to pre-Covid. Now only 3.7% below pre-Covid as of Apr 11, vs 6.2% below as of Apr 4, and 7.0% below as of Mar 28. Thx @eurocontrol #OOTT."* Other than over Christmas, European daily traffic at airports continues to be stuck below pre-Covid levels. However, it has been inching closer over the past three weeks. As of our 7am MT news cut off, the latest Eurocontrol daily traffic at Europe airports shows the 7-day rolling average to the end of Apr 11 was up WoW to -3.7% below pre-Covid levels, which an improvement from -6.2% to end of Apr 4, and -7.0% to end of March 28. Eurocontrol updates this data daily and it is found at [LINK]

Figure 52: Europe Air Traffic: Daily Traffic Variation to end of Apr 11



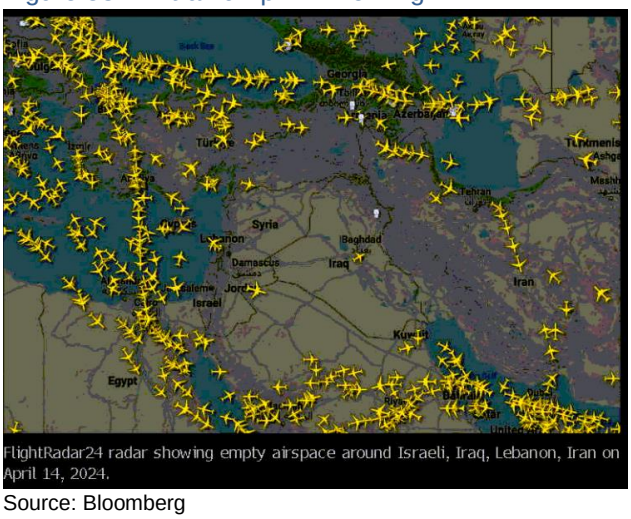
Source: Eurocontrol

Europe airports daily traffic

Oil: Not clear how long and how much air travel will be impacted by Iran/Israel

As of our 5am MT news cut off, it's only been 15 hours since the Iran attack. So it is far from clear how Israel will respond and the fallout on global economy. One item that isn't clear is how air traffic will be impacted. There will be cancelled flights in and around the region ie. less jet fuel. And there will be a rerouting of some flights to avoid the region ie. using more jet fuel. It's too early to tell the net impact on jet fuel but we have to believe the likely impact negative.

Figure 53: Air traffic Apr 14 morning



Source: Bloomberg

Oil: Look for more to follow Vitol and say jet fuel consumption back to 2019 levels

More to call higher jet fuel consumption

Last week's memo highlighted the IATA monthly data for Feb that noted that both international and domestic air travel was back to above pre-Covid levels. Here is what we wrote in last week's (Apr 7, 2024) Energy Tidbits memo. "*After seeing the above IATA monthly data for Feb that showed both international and domestic air passenger travel was above pre-Covid, we tweeted [LINK] "Positive for #Oil. Look for more to follow @vitolnews Gallagher's 👇 03/21 call that jet fuel consumption back to 2019. @IATA Feb passenger data, both international & domestic are above 2019. Plus greater share of less fuel efficient domestic volume. #OOTT," As noted below, on March 21, Vitol came out two weeks ago with their view that jet fuel consumption had returned to 2019 levels. But we should start to see more follow that call post the IATA's release this morning of Feb 2019 air passenger data. Everyone will rightly focus on the below table that shows total market RPK is +5.7% vs Feb 2019 with both international +0.9% and domestic +13.7% being above Feb 2019. Total air passenger being +5.7% vs 2019 gives room to account for some replacement of older planes with newer more fuel-efficient planes. The caveat to that being is that the older planes from the big companies tend to get sold to smaller companies and not necessarily junked. But there is also one overlooked reason for higher jet fuel consumption, all things being equal, is that shorter flights are less fuel efficient due to take-offs and landings allocated over shorter distances. And what people are not likely do is look at the share. In Feb 2024, it was 60.1% international vs 39.9% domestic. We went back to the Feb 2019 data and the splits were 63.9% international vs 36.1% domestic. So shows the increasing share of less fuel-efficient shorter haul trips. A greater proportion of less fuel-efficient shorter haul trips is a positive for jet fuel demand.*"

Figure 54: Air passenger market in detail – February 2024

Air passenger market in detail - February 2024

	World share[1]	February 2024 (% year-on-year)			February 2024 (% ch vs the same month in 2019)			
		RPK	ASK	PLF (%-pt)	RPK	ASK	PLF (%-pt)	PLF
TOTAL MARKET	***100.0%***	**21.5%**	**18.7%**	**1.9%**	**5.7%**	**5.8%**	**-0.1%**	**80.6%**
International	*60.1%*	26.3%	25.5%	0.5%	0.9%	1.2%	-0.3%	79.3%
Domestic	*39.9%*	15.0%	9.4%	4.0%	13.7%	13.7%	0.0%	82.6%

[1]% of industry RPKs in 2023

Air Passenger Monthly Analysis – February 2024 1

Source: IATA

Figure 55: Air passenger market overview – February 2019

Air passenger market overview - February 2019

	World share[1]	February 2019 (% year-on-year)				% year-to-date			
		RPK	ASK	PLF (%-pt)[2]	PLF (level)[3]	RPK	ASK	PLF (%-pt)[2]	PLF (level)[3]
TOTAL MARKET	***100.0%***	**5.3%**	**5.4%**	**-0.1%**	**80.6%**	**5.9%**	**5.9%**	**0.0%**	**80.1%**
International	*63.9%*	4.6%	5.1%	-0.4%	79.5%	5.3%	5.5%	-0.1%	79.7%
Domestic	*36.1%*	6.4%	5.8%	0.5%	82.4%	6.9%	6.8%	0.1%	80.8%

[1]% of industry RPKs in 2018 [2]Year-on-year change in load factor [3]Load factor level

Source: IATA

Here's why Vitol's jet fuel consumption back to 2019 call looks right

Here is what we wrote in our March 31, 2024 Energy Tidbits memo as to why Vito's jet fuel consumption back to 2019 levels looks right. "*We had a number of readers*

note our item last week on Vitol's saying they are seeing jet fuel now back at 2019 levels. One of our readers is a former commercial/private pilot and reminded us of some jet fuel basics as to why the Vitol can make sense given international air travel still hasn't come back. It's why on Thursday we tweeted [LINK] "Here's why #JetFuel can be back to 2019 level per @vitolnews 👇03/21. @IATA cargo +2.8% vs 2019. @IATA passenger "ASKs" only -0.5% vs 2019 despite slow long-haul recovery. So more shorter flights with higher relative fuel consumption ie. takeoffs/landings over shorter distance & fly at lower altitudes. #OOTT." Our March 10, 2024 Energy Tidbits memo noted the IATA March report with air passenger and air cargo data for Jan. The air cargo component is straight forward – air cargo FTK (freight tonne kilometers) in Jan were +2.8% vs Jan 2019. Passenger ASKs in Jan were -0.5% vs Jan 2019. But our pilot friend explained that there was probably more jet fuel for passengers even with long-haul international air travel still not back. He had two reminders. Short-haul flights are less fuel efficient than a longer haul flight because the heavy fuel usage part of takeoff and landings are spread over a shorter distance. His other reminder is that domestic short-haul flights normally fly at lower altitudes so less fuel efficiency. So this is why there can be less ASKs but the lesser percentage of long-haul international flights is why jet fuel consumption can be more. Our Supplemental Documents package includes the IATA air passenger and air cargo data March release including the data for Jan."

Vitol, global jet fuel consumption reached pre-Covid level, going higher in Q2

Here is what we wrote in our March 24, 2024 Energy Tidbits memo. "On Thursday, we tweeted "*Bullish for near term #Oil. "we're seeing jet fuel now back to averaging around 6.9 million barrels per day over the last 4-weeks, which is back to 2019 levels" "we see growth in Q2, which brings it up to record highs" @vitolnews Kieran Gallagher to @sean_evers* #OOTT." Gallagher is Managing Director for Vitol Bahrain E.C. and was speaking on the Gulf Intelligence Daily Energy Markets podcast on Thurs [LINK] hosted . His comments on jet fuel were straightforward – global jet fuel consumption is back to pre-Covid levels and will be hitting new record levels in Q2. Our tweet included a transcript we made of his comments. Items in "*italics*" are SAF Group created transcript. At 17:00 min mark, Gallagher "*We're seeing jet fuel now back to, averaging around 6.9 million barrels per day over the last 4-weeks, which is back at 2019 levels*". Evers "*which of course is a global number*". Gallagher "*It's a global number. And at 6.9, you know we see growth in Q2 which brings it up to sort of record highs."*

Energy Transition: Trafigura reminds More Renewables = More Natural Gas

More renewables = more natural gas

We still think that many or most on the climate side just focus on capacity of solar/wind capacity additions and keep forgetting that something has to fil in for when the wind doesn't blow or the sun doesn't shine. And there the more wind and solar capacity, the more there is the need for some other source of power that can be geared up or down. And that is natural gas. Trafigura tried to remind of this Energy Transition 101. On Tuesday, we tweeted [LINK] "*Energy Transition 101: More Renewables = More #NatGas. "if you believe in the Energy Transition, you believe in [Natural] gas. Because the more renewables you add to the grid, the more gas you're going to need to provide that baseload power. @trafigura Richard Holtum. Thx @FT @gulf_intel #OOTT."* Our tweet included the transcript we made of

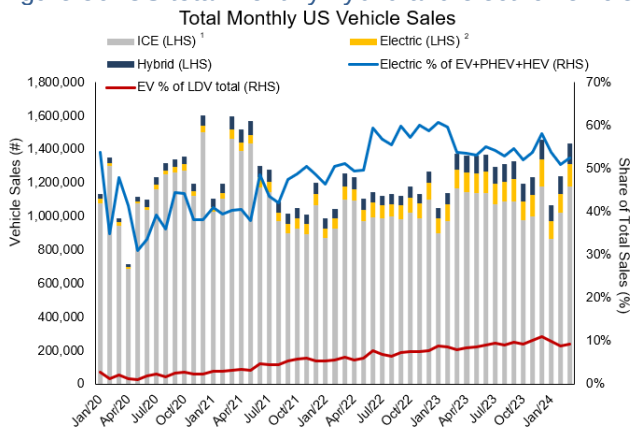
Trafigura Global Head of Gas, Power and Renewables comments. SAF Group created transcript of comments by Richard Holtum (Global Head of Gas, Power and Renewables, Trafigura) at FT Commodity Summit posted courtesy of Gulf Intelligence on April 9, 2024 [LINK] Items in *"italics*" are SAF Group created transcript. Holtum "*As we go through the Energy Transition, let's not forget that the fossil fuels have a very, very large role to play. Fundamentally to me, if you believe in the Energy Transition, you believe in gas [Natural Gas]. Because the more renewables you add to the grid, the more gas you're going to need to provide that baseload power. And the best way you decarbonize that baseload power is to make sure it's gas, not coal. So, I think you have a very large scope of opportunity within the developed world." "But then as you add more renewables into the US and into Europe, you will see significantly more gas demand in those areas."*

Energy Transition: US EVs bump in sales and market share, but not taking ICE off road

US EV sales +23% YoY in Mar

Argonne National Laboratory posted its monthly US sales data for Light Duty Vehicles (LDVs) broken out into Battery Electric Vehicles (BEVs), Plug-in Electric Hybrids (PHEVs) and Hybrid Electric Vehicles (HEVs) for March. We are focusing on two major trends: one, the falling share of EVs among EV plus Hybrid sales, and two, the trend that EVs aren't replacing ICE cars (people are just buying an extra Tesla). March 2024 EV sales are up +23% YoY at 135,035 in Mar 2024 vs 110,188 in Feb 23. Hybrid sales continue to grow at strong rates and gain market share vs EVs for both PHEV (plug-in hybrid) and HEV (hybrid), although EVs sales as a % of EV + Hybrids were up to 52.5% in March (from 51.0% in Feb). March 2024 PHEVs were +62% YoY to 33,315 in Mar 2024 vs 20,540 in Mar 2023. Mar 2024 HEVs were +30% YoY to 122,332 in Mar 2024 vs 94,289 in Mar 2023. Despite this growth in EV and HEV sales, ICE cars are still growing in sales as well, up+1.0% YoY. Keep in mind that a +1.0% YoY growth in ICE sales means +9,928 vehicles that aren't electric in any way. So not exactly being taken off the road yet. The sales just make it feel more like what has been seen in Norway – the EVs are to the most part 2nd or 3rd vehicles and not the primary vehicle. Below is our updated graph on the Argonne data. Note that in the below table we included PHEV with EVs as their fuel efficiency is much closer to EVs than to hybrid. Our Supplemental Documents package includes the data from Argonne.

Figure 56: US total monthly hybrid and electric vehicle sales vs LDV total



[1]ICE is total LDV - (BEV+PHEV+HEV) [2]Electric includes BEV+PHEV
Source: Argonne National Laboratory

Source: Argonne National Laboratory

03/25/23: Equinor chief economist Norwegians bought EVs as 2nd or 3rd cars

The Argonne data above for US EV, hybrid and ICE sales and the overall tone of what is happening in EV sales reinforces what has been seen in Norway – EVs are selling big but to the most part are 2nd or 3rd cars and not the principal car. The reason why we highlight this Norway feedback is that we continue to believe the one of the biggest flaws in the IEA and other EV forecasts is that they assume an EV being sold displaces the mileage driven of an ICE, which inherently assumes the EV is the principal and perhaps only car. Norway has been the EV leader in Europe for the last decade and that isn't the case in Norway. Here is what we wrote over a year ago in our March 26, 2023 Energy Tidbits memo. "*The Equinor Chief Economist Wareness comment to the FT also supported the above item on how Norwegians aren't using their EVs as much as would be expected given the massive penetration of new car sales over the past several years. Yesterday, we tweeted [LINK] "Here's why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness. many other reality check energy transition views in his @FT interview [LINK] #OOTT." Waerness says that Norwegians really have bought EVs as their 2nd or 3rd cars and not the principal car. Whereas historically car buyers buy new cars as a principal car other than the wealthy who have more than a couple cars. The FT wrote "Norway's experience with electric vehicles provides an example, Wærness suggested. Subsidies to buy battery-powered cars had rapidly increased their number, and Norway has been repeatedly cited as an example of how quickly customers could switch to EVs. But the overall car fleet had swollen too, Wærness said. "We've kept a lot of the diesel cars and gasoline cars, and we've added EVs, and it took 10 years before gasoline demand went down," he said. "We've bought an EV instead of taking the bus, or it becomes the second or the third car."*

Energy Transition: Taking longer to sell EVs than ICE now in Canada

Taking long to sell an EV

We don't think any was surprised to see a few of the tidbits from the Financial Post Wed report "*Tall order to ask the average Canadian': EVs are twice as hard to sell today"* [LINK]. The report is mostly a general recap of the slowing pace of V adoptions and how the auto manufacturers are continuing to delay their EV plans. But the report also had some good EV tidbits such as the slowing pace of EV sales. They wrote '*However, the pace of sales has been cut in half, according to J.D. Power, a global data and analytics firm. In the first quarter of 2023, it took an average of 22 days to sell an EV in Canada compared to about 42 days for a gas-powered vehicle. Today, it takes about 55 days to sell an electric vehicle, compared to 51 days for a gasoline car. "The gap has narrowed dramatically," Robert Karwel, a senior manager at J.D. Power's Power Information Network, said. "While the total market in Canada has slowed down, it's EVs that have slowed down by more than double." The gap has narrowed dramatically. The EV market seems to be facing challenges moving from early adopters to the mass market. Karwel describes early adopters as consumers who were not necessarily concerned about the cost of an EV, but wanted to be associated with the "newest, coolest and latest technology." As such, the sale of luxury EVs has been doubling every year over the past five years, he said. These are bought by wealthier customers who tend to own a house and a garage, so they don't face any issues charging their vehicles. But the market now seems to be looking for more general buyers at a mass level, which has proven to be difficult for several reasons, including high prices and poor performance."* The other EV tidbit was "*EV owners reported 79 per cent more problems with their powertrains over the past three years than owners of gas-powered vehicles, according to Consumer Reports' latest annual car reliability survey."Most electric cars today are being manufactured by either legacy automakers that are new to EV technology, or by companies like Rivian that are new to making cars," Jake Fisher, senior director of auto testing at Consumer Reports, said in the report. "It's not surprising that they're having growing pains and need some time to work out the bugs.*"

Energy Transition: China March NEV sales split 40% Hybrid, 60% EV

China hybrid vs EV sales

China EV sales is not different than being seen in the US: EV growth is slowing and hybrids continue to take large market share from EVs. Last week's (Apr 7, 2024) Energy Tidbits memo highlighted the Xinhua reporting of China March auto sales that did not include the EV vs Hybrid split. As a reminder, China refers to NEV (new energy vehicles) as including EV + PHEV. The NEV splits were released on Tuesday by China Automobile Dealers Association's Analysis of the national passenger car market in March 2024. [LINK] On Tuesday, we tweeted [LINK] "*China, like US, is seeing Hybrids continuing to take market share from EVs. China Mar NEV sales 0.709 million. NEV splits were released today. EV: 0.428 million or 60%. Hybrid: 0.281 million or 40%. #OOTT."* In March, Hybrids were 40% of total EV + Hybrids.

Figure 57: China Monthly Car Registrations

Source: Bloomberg

China NEV sales increasing but still a lot less than ICE sales

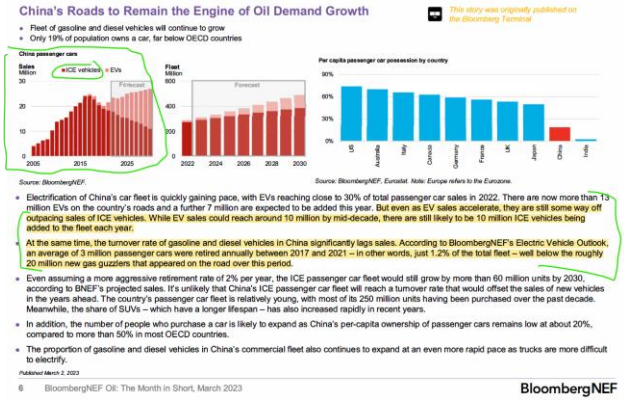
Here is what we wrote in last week's (Apr 7, 2024) Energy Tidbits memo when we saw the Xinhua report on the China March vehicle car sales. "*Earlier this morning, we tweeted [LINK] "Big China EV/Hybrid sales in Q1 but still a long way to go to catch up to ICE. NEV = EV + PHEV + HEV. Mar: Total 1.7 mm. NEV 0.70 mm. ICE 1.0 mm. Q1/24: Total 4.84 mm. NEV 1.76 mm. ICE 3.08mm. Fits 👇03/30 tweet thesis. #OOTT." There is no question that China is the global leader in EV sales. On Wednesday, Xinhua reported on China March car sales. They only reported NEV in total. New Energy Vehicles are the total of EVs + PHEVs+ HEVs. But as we have previously reported, hybrids are rowing at taking market share from EVs in China. The takeaway is that NEV sales continue to show strong YoY growth but are still way less than ICE vehicles. On Wednesday, Xinhua reported [LINK] " China's passenger vehicle sales stood at 1.7 million units in March, up 7 percent year on year, or 54 percent month on month, industry data showed. In the first three months of this year, passenger vehicle sales totaled 4.84 million units, surging 13 percent year on year, according to the latest data from the China Passenger Car Association. During the period, China's new energy vehicle (NEVs) sales rose 34 percent year on year to 1.76 million units. In March alone, the country's NEV sales reached 698,000 units, up 28 percent year on year, or 80 percent month on month, the association added."*

China & EU reasons why EVs don't displace as fast as aspirations

Our tweet last Sunday morning said the March China car sales fit our 03/30 tweet thesis. Here is what we wrote in our Mar 31, 2024 Energy Tidbits memo. "*Yesterday, we tweeted [LINK] "it's a yr ago, but @BloombergNEF reminds in 👇04/26/23 tweet why EVs don't displace #OIl as fast as aspirations. China has big EV adds BUT also has big NET ICE adds. China ICE retirements are low as its ICE fleet is young. Only a dent in EU road fuel demand by 2030. #OOTT." This was a tweet from a year ago, but they are two EVs themes from BloombergNEF that don't get any attention. (i) No question China is leading the way in terms of number of EV sales. But a year ago, BloombergNEF reminded that China has a relatively young ICE vehicle fleet so retirements aren't large. Plus China may have big EV sales but it also has big ICE sales such that net ICE adds (sales less retirements) are still adding more net ICE*

than EV adds. BloombergNEF wrote "But even as EV sales accelerate, they are still some way of outpacing sales of ICE vehicles. While EV sales could reach around 10 million by mid-decade, there are still likely to be 10 million ICE vehicles being added to the fleet each year." (ii) Earlier we included the reminder from Norway, the EV leader in Europe for the last decade, that Norwegians buy EVs as a 2nd or 3rd vehicle. Last year, BloombergNEF posted the below charts under the header "EVs and Energy Cuts will only dent Europe's Oil Demand by 2030. Europe's policies to cut fuel use and the rapid uptake of electric vehicles might suggest an imminent and weighty decline in oil demand, but the downward trajectory remains sluggish. Oil demand in the region is likely to fall by only 10% to 15% up to 2030, according to BloombergNEF analysis". And "European road fuel demand to only fall by 300,000 b/d by 2030."

Figure 58: China's Roads to Remain the Engine of Oil Demand Growth



Source: BloombergNEF March 2023

Figure 59 EVs and Energy Cuts will only dent Europe's oil demand by 2030

Source: BloombergNEF March 2023

Energy Transition: Trafigura sees sustained & increasing India demand for fossil fuels

Trafigura on India

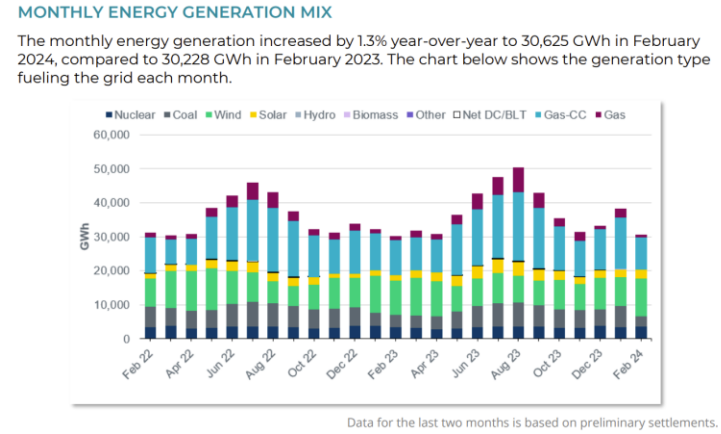
Trafigura is bullish on India's future demand for oil and, on Tuesday, Trafigura's Richard Holtum (Global Head of Gas, Power and Renewables) used Teslas to make his point that India should see sustained and increasing demand for fossil fuels. He also reminded that developing countries they go thru the phase of driving ICE, they just don't jump up to EVs. On Tuesday, we tweeted [LINK] "I*ndia reality check! "I was in Mumbai last week and anyone that thinks they're all going to be driving Tesla's in a few years time, hasn't seen the reality on the ground… be sustained & increasing demand for fossil fuels for the next 5, 10 yrs or so" @trafigura Richard Holtum. Thx @FT @gulf_intel #OOTT."* Our tweet included the transcript we made of Holtum's comments. SAF Group created transcript of comments by Richard Holtum (Global Head of Gas, Power and Renewables, Trafigura) at FT Commodity Summit posted courtesy of Gulf Intelligence on April 9, 2024 [LINK] Items in "*italics"* are SAF Group created transcript. Holtum "*Then looking at the rest of the world, I was in Mumbai last week and anyone that thinks they're all going to be driving Tesla's in a few years time, hasn't seen the reality on the ground. There is going to be sustained and increasing demand for fossil fuels for the next five, ten years or so. Because as the developing world develops, they will go through the phase of using fossil fuel driven cars. So, I think what we will see over the next few years is perhaps the emphasis move away from Europe and to a lesser extent the US, and move more towards the developing countries from a fossil fuel perspective for road transportation. But then as you add more renewables into the US and into Europe, you will see significantly more gas demand in those areas*."

Energy Transition – Texas wind generation typically declines in May/Jun/Jul

Texas wind power risk

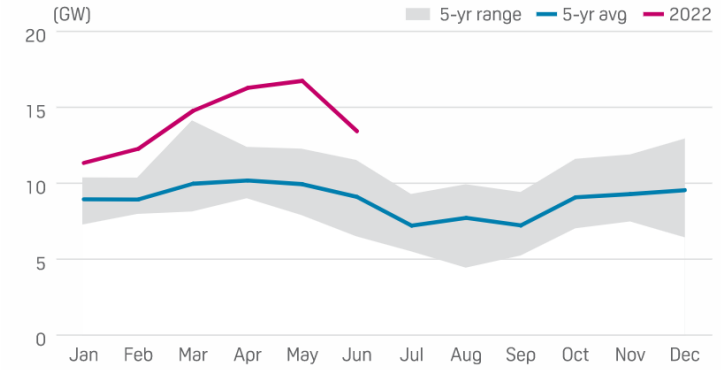
We remind that Texas is moving into its seasonally low period for wind generation, which happens every summer. One key Texas electricity to remember for May is that normally Texas wind generations starts to seasonally decline in May June and July. This is the key reason why the worries in Texas about electricity reliability are in the summer more than the winter. Fortunately for Texas when the wind doesn't blow in the summer and wind generation is at its low, Texas has natural gas to step and fill the void. Below is ERCOT's current Monthly Energy Generation Mix [LINK], which shows how wind generation seasonally declines around now and natural gas generation seasonally increases. Below that is a graph we used in our July 31, 2022 Energy Tidbits memo from Platts that shows the average hourly wind output in 2022 compared to the 5-year historical output.

Figure 60: Monthly Energy Generation Mix



Source: ERCOT

Figure 61 ERCOT Average Hourly Wind Output From SAF Group 07/31/22 Energy Tidbits



Source: ERCOT

Capital Markets: Gasoline hit US CPI for March hammered equities, sent yields higher

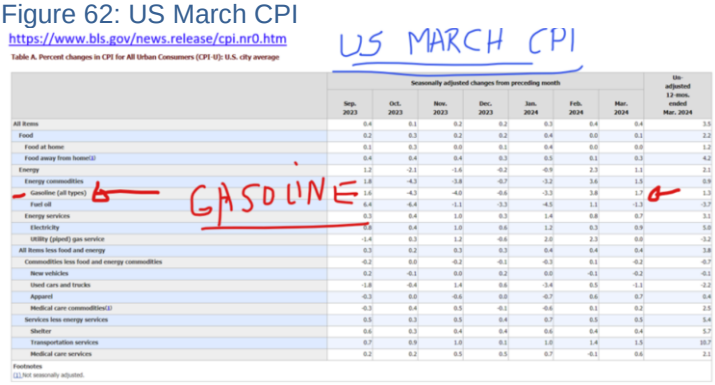
Gasoline was biggest driver to CPI

The big market news on Wednesday morning was the US CPI print for March, which exceeded expectations. It sent equities down and yields up. After listening to the commentators for an hour, we thought there wasn't any highlighting that the big MoM problem was gasoline. On Wednesday morning, we tweeted [LINK] "*[LINK]* "*Note 👇Gasoline impact in CPI. Hard for Biden to pull back on Venezuela licenses ie, stop >150 kbd of VEN oil into Gulf Coast. Saudi voluntary 1 mmb/d are the 1st OPEC+ cuts that could come back in July. MBS holds what Biden wants. Thx @Josh_A_Robinson #OOTT."* The biggest MoM CPI increase was energy and gasoline. And we linked the gasoline increase to the reality facing Biden – it's tough to see how he doesn't approve an extension of the Venezuela oil licenses as he needs all he can do to keep the price of oil and gasoline done in the election year. And the other reality is that the key potential help to Biden is what will Saudi do with its voluntary 1 mmb/d cuts, which will be the first OPEC+ cuts to come back. We have to believe the US will be pushing Saudi in the next month.

Biden's CPI inflation fighting agenda didn't mention gasoline prices

On Wednesday afternoon, the White House posted its "*Statement from President Joe Biden on the March Consumer Price Index*" [LINK], which was on Biden's agenda to fight inflation. His short statement went after grocery stores, housing sector, Pharma, corporations and billionaires but it jumped out at us that he didn't mention the biggest culprit in the CPI print – gasoline prices. On Thursday morning, we tweeted [LINK] *"What's missing? Biden CPI inflation fighting agenda incl housing, grocery retailers, Pharma, billionaires & corporations. Gasoline was #1 factor for the surprise higher MoM CPI. Question is why Biden omitted #Oil #NatGas? Not putting back VEN oil sanctions? What else? #OOTT."* It is puzzling why he didn't mention that he his agenda will be to lower or even keep gasoline prices from going higher. We have to wonder if he doesn't want to come out now with his inflation fight agenda against gasoline as he fears that gasoline prices are going up this summer. Below is the March CPI split that shows gasoline was the biggest MoM CPI increase at +1.7% MoM in March. Our Supplemental Documents package includes the White House statement.

Figure 62: US March CPI



Source: US BLS

Capital Markets: BlackRock on Indonesia, aging population on real estate/healthcare

BlackRock weekly commentary

The reality is that I can't see or get to a lot of great insights every week so I always appreciate when friends and contacts give some insight on items to check out. Some weeks, like this week, the news/market focus is on current events so I hadn't read BlackRock's Weekly Commentary April 8, 2024 "*Playing demographic divergence now."* It had some good food for thought about capital allocation over the coming decade. (i) Don't forget about Indonesia. I was reminded that Indonesia has 275 million people and is projected to keep having strong population growth. And that people who have lived in Indonesia believe the world inevitably will keep pushing to other SE Asian countries as the western world tries to move away from China. Vietnam has been the big winner but people also see Indonesia and Philippines are overlooked. The BlackRock commentary notes India and Indonesia as two countries that will have big buildout of energy infrastructure. (ii) Real estate and healthcare. The BlackRock weekly commentary also had good commentary on the demographic divide and also they don't see that priced in for real estate and healthcare. With good reminders such as that older people aren't really selling their homes as many expected and this has

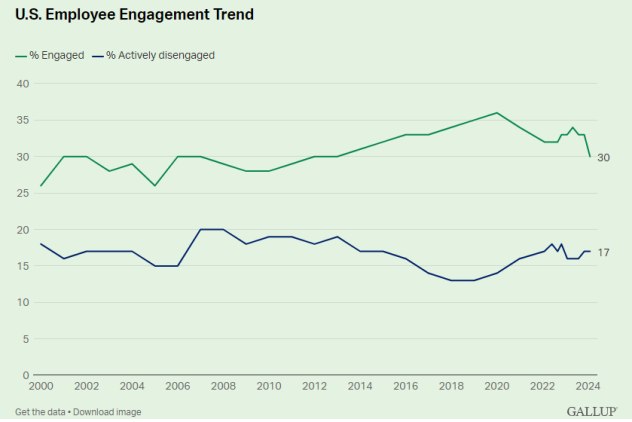
implications to the real estate market mid term. They also highlight the increasing capital required for healthcare on the aging boomers and this has huge implications for governments. BlackRock writes "*Plus, governments are likely to spend more on healthcare and pensions. The resulting inflationary pressure is one reason why we expect central bank policy rates to stay above pre pandemic levels. Aging related spending also threatens to push up government debt, with global public debt having already tripled since the mid 1970s to 92% of global GDP in 2022. And that debt is likely to be subject to higher interest costs*." There is more in the weekly commentary. Our Supplemental Documents package includes the BlackRock weekly commentary.

Demographics: Gallup, US employee engagement continues its downward trend

Employee disengagement

We in the financial services sector are fortunate that, as a general rule, there is a high degree of employee commitment in particular at firms that are at the top and want to stay there. Because it means that many of the major shifts in employee approaches to work don't seem to show up to the same degree as in other sectors. On Wednesday, Gallup posted its blog "*U.S. Engagement Hits 11-Year Low. 4.8 million fewer U.S. employees are engaged in early 2024"* [LINK]. The numbers of disengaged employees is getting large and it must be tough for company leadership to deal with this embedded trend. Gallup reported "*Continuing a downward trend, employee engagement in the U.S. has dropped to its lowest level in more than a decade. Last year, Gallup found U.S. employees were increasingly detached from their employers, with the workforce reporting less role clarity, lower satisfaction with their organizations and less connection to their companies' mission or purpose. Employees were also less likely to feel someone at work cares about them."* Gallup highlighted three groups for this trend. "t*he recent drops in employee engagement have been most pronounced in the following categories: younger employees under 35 (down five points), particularly Generation Z employees (down six points) who also feel less connected to their organization's culture, employees who could do their jobs remotely but work exclusively on-site (down six points), and employees who exclusively work from home (down five points)."*

Figure 63: U.S. Employment Engagement Trend



Source: Gallup

Twitter: Thank you for getting me to 10,000 followers

@Energy_Tidbits on Twitter

In January, I went over 10,000 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.

Apollo 13 was April 11-17, 1970

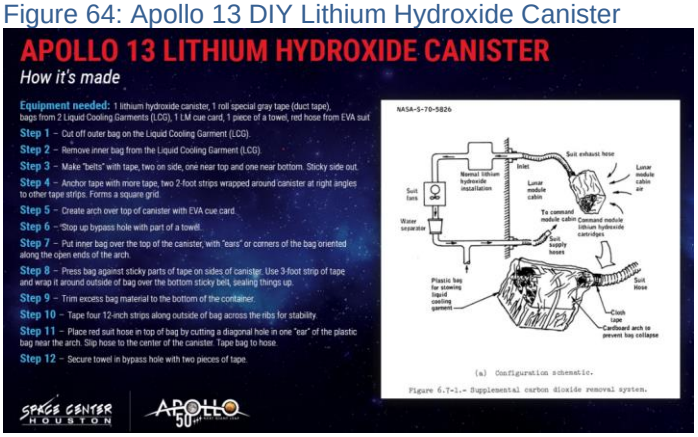
On Thursday lunchtime we tweeted [LINK] "*Human ingenuity and determination! If you haven't seen. Just had Apollo 13 on in background. Playing a lot as it was Apr 11-17, 1970. A great true story, viewed as the most accurate space movie. Couldn't help note the slide ruler, reminds of freshman year. Back to markets!"* We turned on the TV an hour before lunch and Apollo 13 movie (Tom Hanks) was on just after Apollo 13 had the explosion. And, of course, had to leave it on in the background as Apollo 13 was one of the all-time great stories of human ingenuity and determination to bring the three astronaut's home. At the time, it was world-stopping news. High schools even in Canada had a TV on in the gymnasium to follow wondering if NASA would be able to get them home safely. It was the 7th crewed mission in the Apollo space program and the US had never had an astronaut die on a mission. The part this is unbelievable is what they had to do save electricity, fix a CO2 problem just to have the chance to have the power to get them home. The movie is a classic because it considered the most accurate space movie of all time.

NASA's DIY fix to Apollo's rising CO2 problem was human ingenuity at its best

One of our followers replied to our Apollo tweet *"Love this scene. Ingenuity. A mission that ultimately turned into a rescue and saving the crew*." He included a video clip [LINK] "*Square Peg in a Round Hole Scene*", which is the scene where NASA has to come up solution that can be made from parts in the capsule to deal with the rising CO2 levels. Then there is the second short clip [LINK] "*Duct tape and cardboard*" that shows the detailed to DIY fix. It's basically take what is around and build a device. They did it and the CO2 levels decreased. And it's a true depiction of what happened. NASA came up with a solution and the astronaut's did it. It involved

using space suit hoses being cut, covers from a manual, tape, and a bunch of miscellaneous items. We replied back with a diagram of the Apollo 13 DIY fix.

Figure 64: Apollo 13 DIY Lithium Hydroxide Canister



Source: Space Center Houston