Energy Tidbits

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Netanyahu: "*Israel Will Not Agree to Hamas's Demand*" and "*Hamas Remains Entrenched in its Positions*"

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. Earlier this morning, Netanyahu "*Israel will not agree to Hamas's demands, which mean surrender, and will continue the fighting until all its goals are achieved*". And Hamas "*remains entrenched in its positions*." [LINK]

2. Shell CEO Sawan's LNG growth focus description seemed as if he was describing LNG Canada incl Phase 2. [LINK]

3. Yesterday, Warren Buffett said he is looking at a Canadian investment opportunity right now. [LINK]

4. Vortexa crude oil floating storage to 57.78 mmb, lowest since Covid. Crude on water may be big with avoiding Red Sea but floating storage is very low. [LINK]

5. TC Energy reminds "*"Reliability requirements associated with data centers are also driving increased appreciation for the role that natural gas is going to play in supporting those loads as well."* [LINK]

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

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

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Natural Gas: Warning for risk US natural gas storage gets filled early

US natural gas storage to be filled early?

We repeat and update our warning from last week's (Apr 28, 2024) Energy Tidbits memo. US natural gas storage season has just started but we warn it is pointing to full storage being hit early unless there are some big changes to the storage outlook. The latest EIA Form 914 is for February data and it shows Feb 2024 +4.6 bcf/d YoY. Europe gas storage is looking to be full early so may have some push back on US LNG cargoes in the fall. And Jul/Aug/Sept was the 3rd hottest summer in the last 129 years. There may very well be items such as hurricane interruptions, a big spike up in natural gas for data centers, etc. that will change this patch but when we see natural gas storage this much higher YoY, we think it is at least time to get people focused on the risk for an early fill to US natural gas storage. And if this path continues over the next couple months, we should see analysts reflecting in their natural gas price forecasts, more producers shutting-in supply and low Q3 prices. As noted below, US natural gas storage is now +436 bcf YoY.

Natural Gas: +59 bcf build in US gas storage; now +436 bcf YoY

+59 bcf build in US gas storage

For the week ending April 26, the EIA reported a +59 bcf build. Total storage is now 2.484 tcf, representing a surplus of +439 bcf YoY compared to a surplus of +424 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 +642 bcf above the 5-year average, slightly lower than last week's 655 bcf surplus. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

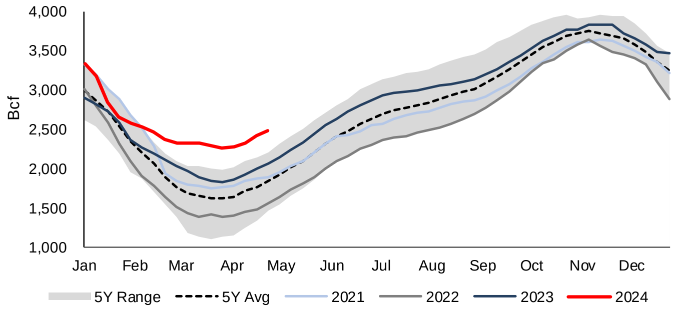
Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (04/26/23)		Historical Comparisons: 5-year average (2019-23)	
Region	04/26/24	04/19/24	net change	implied flow	Bcf	% change	Bcf	% change
East	425	408	17	17	404	5.2	333	27.6
Midwest	564	551	13	13	477	18.2	406	38.9
Mountain	182	173	9	9	94	93.6	97	87.6
Pacific	240	235	5	5	97	147.4	173	38.7
South Central	1,073	1,057	16	16	975	10.1	832	29.0
Salt	314	309	5	5	277	13.4	261	20.3
Nonsalt	759	749	10	10	698	8.7	571	32.9
Total	2,484	2,425	59	59	2,048	21.3	1,842	34.9

Totals may not equal sum of components because of independent rounding.

Source: EIA

Figure 2: US Natural Gas Storage



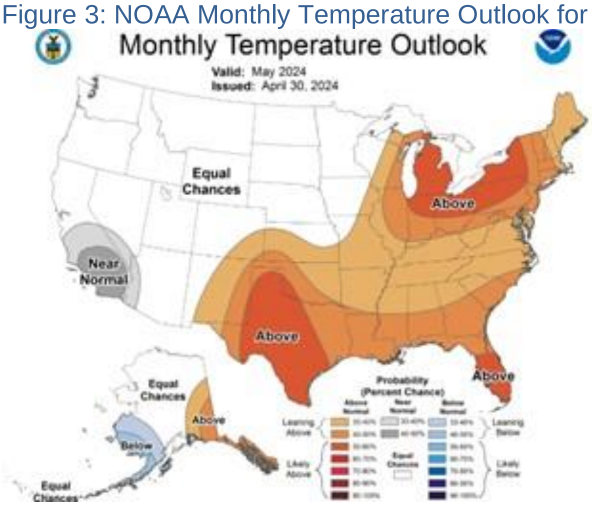
Source: EIA

Natural Gas: NOAA forecasts warmer than normal temps in May for Eastern US, TX

NOAA monthly temp outlook

May is still the shoulder season for natural gas where there really isn't any strong weather related demand for natural gas. There are always exceptions but, as a norm, May is generally for most of the US what we call "leave the windows open" weather for the northern half of the US. However, it can get hot in the south and southwest to start the drive for air conditioning, which has already started in some areas with the hot weather this week. On Thursday, we tweeted [LINK] "*30-day @NOAA temp outlook calls for above normal temps for May in East half & South incl Texas ie. more populous areas. Hope some support for #NatGas demand. May 2023 was 11th hottest in last 129 yrs, very hot in West but was below normal in more populous east coast. #OOTT".* NOAA's temperature forecast for May is warmer than normal for the eastern states and for Texas. Hopefully the warmth in southern states is enough to begin an early A/C demand season. Below is NOAA's temperature forecast for May.

Figure 3: NOAA Monthly Temperature Outlook for May



Source: NOAA

Natural Gas: US Feb gas production up +2.3 bcf/d MoM in February after extreme cold

US gas production 105.7 bcf/d in Feb

One of the big US news stories in Jan was the extreme cold in mid-Jan in a wide range of the US. The big weather hits were in Texas -1.6 bcf/d MoM and North Dakota -0.5 bcf/d MoM. This caused MoM declines in Texas -1.5 bcf/d Mom and shut-in natural gas in Jan. On Tuesday, the EIA released its Natural Gas Monthly [LINK], which includes its estimated "actuals" for February dry gas production, which showed a recovery to the most part of the January weather impact. Key items to note are as follows: (i) There were no material revisions to prior monthly production estimates. (ii) US dry natural gas production exceeded 106 bf/d for the first time in December at 106.5 bcf/d. (iii) February's production of 105.7 bcf/d was +2.3 bcf/d MoM and +3.7 bcf/d YoY from February 2023 of 102.0 bcf/d. Our Supplemental Documents package includes the EIA Natural Gas Monthly.

Figure 4: US dry natural gas production

bcf/d	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Jan	65.3	66.8	73.4	73.6	70.6	78.7	89.3	97.4	92.6	96.2	101.9	103.4
Feb	65.4	68.4	73.8	74.6	71.5	80.4	89.9	95.5	85.8	96.0	102.0	105.7
March	65.3	68.9	74.1	73.8	73.2	81.3	90.3	95.3	93.6	97.6	102.9	
Apr	66.1	70.5	75.2	73.7	73.3	81.2	90.7	95.0	94.3	98.3	102.6	
May	65.9	70.2	74.1	72.9	73.3	82.1	91.4	87.9	94.2	99.1	103.6	
June	65.8	70.5	74.0	72.2	74.0	82.5	91.7	90.4	93.9	99.3	103.3	
July	67.1	72.0	74.2	72.8	74.7	84.2	92.2	90.3	94.8	100.4	103.4	
Aug	66.9	72.4	74.3	72.2	74.7	85.9	94.4	90.4	95.0	100.9	104.5	
Sept	66.8	72.4	74.7	71.7	76.0	87.3	94.8	91.3	95.7	102.4	104.5	
Oct	67.0	73.1	74.2	71.4	77.3	88.4	95.6	89.7	97.2	102.2	104.3	
Nov	67.7	72.6	73.9	72.0	79.8	89.9	97.2	92.5	98.3	102.2	105.9	
Dec	66.5	73.2	73.9	71.2	80.4	89.5	97.1	93.1	99.1	100.2	106.5	
Average	66.3	70.9	74.2	72.7	74.9	84.3	92.9	92.4	94.5	99.6	103.8	104.5

Source: EIA

Natural Gas: US pipeline exports to Mexico at 5.8 bcf/d in February, up YoY

US pipeline exports to Mexico down MoM, up YoY

As a reminder, the new monthly DOE Natural Gas Imports and Exports provides the US natural gas pipeline export data to Mexico about a day or two before the monthly EIA Natural gas Monthly report. The EIA is part of the DOE so the data is the same source. The only difference is that the EIA Natural Gas Imports and Exports data is for both US pipeline natural gas exports to Mexico and LNG exports to Mexico. On Wednesday, the EIA released its Natural Gas Monthly, which also provides its "actuals" for gas pipeline exports to Mexico [LINK], which were 5.8 bcf/d in February, down -0.2 bcf/d MoM from 6.0 bcf/d in January but is up +0.3 bcf/d YoY from 5.5 bcf/d in February 2023. The EIA doesn't provide explanations for the numbers. Mexico's relatively unchanged domestic production over the past seven years has created the need for increased US pipeline exports as Mexico builds out its domestic natural gas infrastructure. Below is our table of the EIA's monthly gas exports to Mexico.

Figure 5: US Pipeline Exports to Mexico

bcf/d	2017	2018	2019	2020	2021	2022	2023	2024
Jan	3.9	4.4	4.9	5.2	5.6	5.7	5.4	6.0
Feb	4.0	4.5	4.8	5.2	4.9	5.5	5.5	5.8
March	4.2	4.3	4.8	5.4	5.9	5.5	5.7	
Apr	3.7	4.4	4.7	4.6	6.1	5.9	5.6	
May	4.0	4.4	5.0	4.7	6.2	6.0	6.2	
June	4.5	4.6	5.2	5.4	6.6	6.1	6.8	
July	4.4	4.9	5.4	5.8	6.4	6.1	6.7	
Aug	4.4	5.0	5.4	6.0	6.2	5.8	6.9	
Sept	4.2	5.0	5.4	6.1	6.0	5.6	6.7	
Oct	4.2	4.9	5.5	6.0	6.0	5.5	6.5	
Nov	4.5	4.7	5.3	5.5	5.5	5.4	6.0	
Dec	4.4	4.5	4.9	5.3	5.4	5.1	5.6	
Average	4.2	4.6	5.1	5.4	5.9	5.7	6.1	5.9

Source: EIA

US February LNG exports

Natural Gas: US LNG exports down -0.4 bcf/d MoM to in Feb; up +0.7 bcf/d YoY

As a reminder, the US LNG export data is available about a week earlier in the DOE's Natural Gas Import and Export report. The EIA is part of the DOE so the numbers are the same or, if anything, a rounding. On Wednesday, the EIA's Natural Gas Monthly reported the same data, US LNG exports for February were 12.4 bcf/d, down -0.4 bcf/d MoM from 12.8 bcf/d in January but up +0.7 bcf/d from 11.7 bcf/d in February 2023. The DOE doesn't provide explanations but the declines are due trains being down at Freeport LNG. Below is a table of the EIA reported US monthly LNG exports. Our Supplemental Documents package includes excerpts from the EIA' Natural Gas Monthly.

Figure 6: US Monthly LNG Exports

(bcf/d)	2019	2020	2021	2022	2023	2024
Jan	4.1	8.1	9.8	11.4	10.9	12.8
Feb	3.7	7.8	7.4	11.3	11.7	12.4
March	4.2	7.9	10.4	11.7	11.8	
Apr	4.2	7.0	10.2	11.0	12.5	
May	4.7	5.9	10.2	11.3	11.8	
June	4.7	3.6	9.0	10.0	10.9	
July	5.1	3.1	9.7	9.7	11.3	
Aug	4.5	3.6	9.6	9.7	11.4	
Sept	5.3	5.0	9.5	9.8	11.7	
Oct	5.7	7.2	9.6	10.0	12.4	
Nov	6.4	9.4	10.2	10.1	12.9	
Dec	7.1	9.8	11.1	11.0	13.6	
Average	5.0	6.5	9.7	10.6	11.9	12.6

Source: EIA

LNG macro 101

Natural Gas: LNG macro 101 reminders from Cheniere's Q1

One of the big advantages of no longer being a stock analyst is that we can look at quarterly reporting to get insights on the macro energy and market outlook and not focus on updating models and financial numbers. (i) Cheniere released Q1 early Friday morning, we didn't look at the numbers but immediately saw some excellent LNG macro slides and tweeted [LINK] *"LNG Macro 101 from @Cheniere. Huge emissions cuts when #NatGas replaces coal. Low LNG prices brings out price sensitive buyers, not just India. EU gas demand down. 2nd warmest JFM ever. "More flexible global LNG marketplace to absorb new capacity additions efficiently". #OOTT,"* (ii) Massive emission reductions switching from coal to natural gas This is a theme we have highlighted for years in particular how UK have had big drops in emissions, they switched from coal and replaced with natural gas. Cheniere reminded that switching to LNG means there is a "*80-99% less air pollutant emissions vs coal".* (ii) Price sensitive buyers stepping in. We have been highlighting how India, China and others (ie Pakistan) have been taking advantage of the low LNG prices to end 2023 and start 2023 to step up LNG buying. Cheniere's graph highlighted "LNG trade highlights emergence of price sensitive buyers". (iii) Europe gas demand down in Q1. Cheniere didn't give reasons but the obvious one we have highlighted is that it was very hot in JFM in Europe with the 2nd hottest JFM on record. (iv) Cheniere sees strong growth in demand to absorb new capacity additions and expect a supply gap in 2028. Cheniere said "*we expect today's larger more flexible global LNG marketplace to absorb new capacity additions efficiently*." The supply/demand outlook looks reasonable balanced for the next few years, which, we believe sets up periods within a year for price spikes up and down, but also where, as we have seen in the last two years, winter weather can cause an extended period of lower prices. Our Supplemental Documents package includes the four Cheniere LNG macro slides attached to our tweet.

Figure 7: Market Outlook for the Third LNG Supply Cycle

Source: Cheniere

Natural Gas: TC Energy expects AI/data centers to add 6-8 bcf/d to demand by 2030

AI/data center natural gas demand

TC Energy held its Q1 call on Friday morning and they were another to hammer home the emergence of AI/data centers as a significant and fast growing natural gas demand area. . We tweeted [LINK] " *AI/Data Centers = More #NatGas. TC Energy,think 6 to 8 bcf/d of added gas demand to 2030 from data centers. Reliability requirements drive increased appreciation for #NatGas in data centers. Direction of travel for #NatGas looking good for next decade or more! #OOTT."* There was nothing specific In the prepared remarks or slide deck but, in the Q&A, mgmt said "*Somebody's probably going to ask you about data centers in particular, so it's probably a good time to bring that up right now. We do see a meaningful load in growth opportunity and increased demand in coming years due to data centers. When we look and do the math, we think somewhere between 6 Bcf to 8 Bcf of increased gas demand between now and 2030 is more than reasonable. But there are also higher forecasts out there that exceed 10 Bcf a day. Reliability requirements associated with data centers are also driving increased appreciation for the role that natural gas is going to play in supporting those loads as well*."

TC also reminded that AI/data centers need reliability ie. good for natural gas

We expect to see more start to specifically say the obvious – data centers need 24/7 power at reasonable prices and they will need natural gas as that baseload power and not renewable. They will keep emphasizing their data centers prioritize renewable, which is valid. But that priority is for a small portion of the data center power and natural gas will be needed to make sure there is availability and reliability. In the TC Energy Q1, mgmt reminded data centers need reliable power so natural gas is in demand. In the Q&A, mgmt said "*Reliability requirements associated with data centers are also driving increased appreciation for the role that natural gas is going to play in supporting those loads as well*."

Natural Gas: AI/data centers bring baseload demand not affected by weather

AI/data center run 24/7 365 days a year

If we use TC Energy's view, AI/data centers will bring 6 to 8 bcf/d of added natural gas demand by 2030. What is great about AI/data center demand is that it won't be impacted by the biggest swing factor to natural gas – is it a hot or cold winter. That is, unless weather knocks out a data center. So in addition to the trend of increasing demand for natural gas, there is another big benefit by layering in AI/data center natural gas demand – its natural gas consumption that doesnt' go up and down with the temperatures or season. So it will help to smooth out seasonal volatility or at least give a higher floor for the seasonal downside case.

Natural Gas: Shell CEO seems to describe LNG Canada 1.8 bcf/d Phase 2

LNG Canada

On Thursday, Shell held its Q1 call. (i) On Thursday, we tweeted [LINK] "*Seems like Shell CEO Sawan was describing LNG Canada 1.8 bcf/d Phase 2. Q1 Q&A today, Sawan's LNG growth focus on organic, low carbon intensity, attractive, grow its #LNG portfolio, etc. Sounds like Sawan's 👇07/28/23 Q2/23 Q&A description of LNG Canada incl Phase 2. #OOTT.*" (ii) In the Q1 call, Shell CEO Sawan did not specifically mention LNG Canada 1.8 bcf/d Phase 2 as a likely FID, but it certainly seemed like Sawan was alluding to it as he talked about potential organic opportunities to grow LNG, especially as he highlithged low carbon intensity LNG projects. And also since Sawan confirmed his positive view for LNG in Shell and that he wasn't looking at LNG M&A, rather was looking at organic growth. Here is what Sawan said in the Q&A "*I'd sort of be -- I'd separate them. I think one for example been talked about Ruwais LNG in Abu Dhabi. That's one which Abu Dhabi is developing on a on a greenfield basis. I won't give any specific comments other than to say organic opportunities to continue to grow our LNG portfolio opportunities that potentially can add more supply points to the portfolio in attractive locations where the carbon intensity is low and the value potential is high are very much down the lane that we want to continue to grow. We have a fundamental conviction that this is not an LNG sprint of a few years but that LNG will be required for decades to come. And this is why continuing to find those differentiated opportunities is something we will look at. We are indeed not looking at big M&A in that space. Whenever we're looking at LNG opportunities we're looking at bolt-ons to our existing port for you where we feel that the capabilities we have the portfolio, we have the positions that we have built up over the years would allow us to be able to unlock more value than maybe a seller would be. And so we would be looking at any of these opportunities of course being creative to our overall delivery as as an energy business for, for sure*." (iii) We have been closely following Sawan's comments on LNG Canada since before he took over as CEO a year ago. But in the Q2/23 call, Sawan had the below comments on LNG Canada that highlighted items like

LNG Canada is the "*cleanest, lowest carbon intensity LNG* "in the world. Our Supplemental Documents package includes Sawan's comments from the Q1/24 and Q2/23 calls on LNG Canada.

07/27/23: Shell CEO Sawan's Q2/23 call comments on LNG Canada

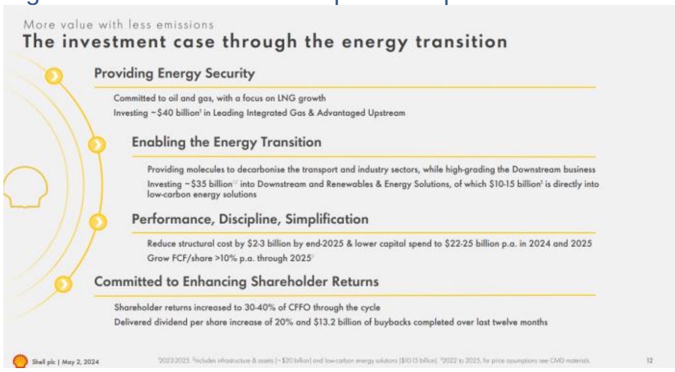
Here is what we wrote in our July 30, 2023 Energy Tidbits memo on CEO Sawan's comments on the Q2/23 call. "*Natural Gas: Surely Shell is going to FID "very attractive" LNG Canada Phase 2. Shell CEO Wael Sawan had the perfect opportunity in the Q&A of the Q2 call on Thursday to throw some caution or doubt on the potential to FID the brownfield LNG Canada 1.8 bcf/d Phase 2 but didn't say do so. Rather he continued to speak glowingly about the under-construction 1.8 bcf/d LNG Canada Phase 1 and also about LNG Canada Phase 2. We believe he is setting the stage to FID Phase 2 in the coming months. (i) On Friday, we tweeted [LINK] "Feels like FID is when, not if. #Shell CEO Sawan on #LNGCanada 1.8 bcfd Phase 2. "while the asset itself is very attractive for us, a big part of the attraction is also the optimization opportunities that full flex #LNG cargos offer us in a portfolio like ours". LNG Canada 1.8 bcfd Phase 1 will be "the cleanest, the lowest carbon intensity LNG out there in the market". Post 2025 should be very good for AB, BC #NatGas! #OOTT." (ii) There was no comments in the Q2 report or Q2 call mgmt. prepared remarks on Phase 2. (iii) But Sawan had the perfect opportunity to play down Phase 2. Shell took an impairment charge on LNG Canada Phase 1, which analysts described as "sizeable". We couldn't find the specific amount. In the Q&A, Shell CFO Sinead Gorman said "This one was an accounting mechanics one, pure and simple discount rates. So as you saw risk free rates changing of course, that played into the whack and that's where we went up 1%. That's where it played in on this asset." Even though it was an accounting mechanics impairment, Sawan could have used this as an opportunity to put some caution on Phase 2. (iv) In the Q&A, Sawan was asked "One on LNG Canada, again, posted this, the impairment. Does that have any implications for a second phase of that project or not really, either from a returns perspective or anything else." Sawan went thru how LNG Canada Phase 1 is a "really advantaged asset with the "cleanest, lowest carbon intensity LNG" in the world, and then how Phase 2 is "very attractive" to Shell. Sawan full reply was "LNG Canada, I'll use the same frame. LNG Canada continues to be an advantaged asset, a really advantaged asset. You have, in essence, a captive export scheme for Western Canadian gas. You have a demand, a market, the Asian market that is within proximity. And you have, in essence, the cleanest, the lowest carbon intensity LNG out there in the market, all coming together at a good point in time for those volumes to, all of which will be full flexibility portfolio volumes for us, something which we, of course, like a lot. All that coming together around middle of this year. That's a project that now is over 75% complete on the midstream, over 90% complete on the pipeline. So it's coming along nicely. All the major units are either at the plant or are enroute to the plant. So knock on wood, all seems to be going well. Phase 2 is going to -- the impairment itself does not impact at all our view on Phase 2. In fact, all the reasons that Sinead, explained around this being more driven by accounting and of course, while the asset itself is very attractive for us, a big part of the attraction is also the optimization opportunities that full flex LNG cargos offers us in a portfolio like ours. And that doesn't change, of course. And so what we will do is we will wait for* *the joint venture to have put their best proposal forward, and with the other joint venture partners, we will assess it and make a decision at the time."*

Natural Gas: Shell CEO continues to be convinced of their LNG strategy

Shell CEO on LNG strategy

Shell CEO Sawan made a point of reiterating his own conviction in their LNG strategy. In their Q1 call slides, their below slide "The investment case through the energy transition",, it includes "*committed to oil and gas with a focus on LNG*". Then in the Q1 call Q&A, Sawan noted his conviction to this LNG strategy. Sawan replied ""*I think the world around us, of course, has continued to be uncertain and volatile. And what you have seen is ta number of things. I'd say one, the amount of geopolitical risk that has played up, the accentuation of the Russia-Ukraine issue, what we are seeing, of course, in the Middle East at the moment and the challenging relationship across the US.-China axis, all of it, of course, has just meant that that volatility, that uncertainty that we had expected has been magnified and we need to be able to adapt to that. And this is where I think it's reinforced my own conviction in the strategy that we have in something like LNG, where our ability to be able to have multiple supply points, our ability to have multiple demand points, our cross-commodity exposures afford us quite some resilience when you have such volatility*".

Figure 8: US Natural Gas Pipeline Exports to Mexico



Source: Shell

Natural Gas: Kogas and BP sign LT LNG agreement for 0.12 bcf/d

Another long-term LNG deal

The big rush in long-term LNG deals was from July 1, 2021 through June 30, 2022 that locked up almost all the available LNG supply that was available prior to 2026. There was a slow down but there was a pickup again over the last year and a half or so as buyers moved to lock up very long term LNG supply for the late 2020s and some continuing even out past 2050. Plus, there was a push from global LNG suppliers to lock up other long-term LNG supply to add to their supply portfolio to be able to use to supply to their customers. This week, there was one new long-term LNG deal. On Monday, LNG Prime reported [LINK] BPsigned an 11-year LNG Sales and Purchase (SPA) agreement with Kogas whereby Kogas will purchase 0.12 bcf/d from BP Singapore beginning in 2026 to supply gas to Korea. This SPA is in addition to a preceding SPA signed by BP and Kogas in 2022, which was for 0.20 bcf/d beginning in 2025. We checked again yesterday and could not see any press releases on the BP or Kogas websites.

SAF GROUP

There have been 22.05 bcf/d of long-term LNG supply deals since July 1, 2021
The big wave in buyers locking up long term supply started in July 2021. We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 22.05 bcf/d of long-term LNG deals since July 1, 2021. 63% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 52% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long-term supply deals since July 1, 2021.

Figure 9: Long-Term LNG Buyer Deals Since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country Buyer / Seller	Volume (bcf/d)	Duration Years	Start	End
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan / Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan / US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea / US	0.05	19.0	2027	2046
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh / Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	Bangledesh / Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China / Qatar	0.53	27.0	2027	2054
Jun 26, 2023	ENN LNG	Cheniere	Singapore / US	0.24	20.0	2026	2046
Jul 5, 2023	Zhejiang Energy	Mexico Pacific Ltd	China / Mexico	0.13	20.0	2027	2047
Aug 8, 2023	LNG Japan	Woodside	Japan / Australia	0.12	10.0	2026	2036
Sep 7, 2023	Petrochina	ADNOC	China / UAE	n.a.	n.a.	n.a.	n.a.
Nov 2, 2023	Foran	Cheniere	China / US	0.12	20.0	n.a.	n.a.
Nov 4, 2023	Sinopec	QatarEnergy	China/Qatar	0.39	27.0	2026	2053
Nov 27, 2023	Gunvor Singapore Pte	Delfin Midstream	Singapore / US	0.10	15.0	n.a.	n.a.
Dec 20, 2023	ENN	ADNOC	Singapore / UAE	0.13	15.0	2028	2043
Jan 5, 2024	GAIL	Vitol	India / Singapore	0.13	10.0	2026	2036
Jan 8, 2024	Shell	Ksi Lisims LNG	Singapore / Canada	0.26	20.0	2027	2047
Jan 16, 2024	ExxonMobil	Mexico Pacific Ltd	Singapore / Mexico	0.16	20.0	2024	2044
Jan 29, 2024	Excelerate	QatarEnergy	Bangladesh / Qatar	0.13	15.0	2026	2041
Jan 30, 2024	ADNOC	GAIL India	UAE / India	0.07	10.0	2024	2034
Feb 6, 2024	Petronet LNG	QatarEnergy	India / Qatar	0.99	20.0	2028	2048
Feb 19,2024	Deepak Fertilisers	Equinor	India / Norway	0.09	15.0	2026	2041
Feb 28, 2024	Kogas	Woodside	Korea / Australia	0.07	10.5	2026	2037
Feb 29, 2024	Sembcorp	TotalEnergies	Singapore / France	0.11	16.0	2027	2043
Apr 29, 2024	Kogas	BP	Korea / Singapore	0.12	11.0	2026	2037
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**13.87**			

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country Buyer / Seller	Volume (bcf/d)	Duration Years	Start	End
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	PKN ORLEN	Sempra Infrastructure	EU//US	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	2026	2046
Apr 24, 2023	Hartree Partners LP	Delfin Midstream	US / US	0.08	20.0	n.a.	n.a.
Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	15.0	2027	2042
Jun 22, 2023	SEFE	Venture Global LNG	EU//US	0.30	20.0	2026	2046
Jul 14, 2023	ONEE (Morocco)	Shell	Africa/US	0.05	12.0	2024	2036
Jul 18, 2023	IOCL	Adnoc	India/UAE	0.16	14.0	2026	2040
Jul 28, 2023	OMV	BP	Austira/UK	0.13	10.0	2026	2036
Aug 4, 2023	ConocoPhillips	Mexico Pacific Ltd	US/Mexico	0.29	20.0	2025	2045
Aug 22, 2023	BASF	Cheniere	Germany / US	0.10	17.0	2026	2043
Aug 30, 2023	Shell	Oman LNG	US / Oman	0.11	10.0	2025	2035
Oct 11, 2023	TotalEnergies	QatarEnergy	France / Qatar	0.46	27.0	2026	2053
Oct 18, 2023	Shell	QatarEnergy	Netherlands / Qata	0.46	27.0	2026	2053
Oct 23, 2023	ENI	QatarEnergy	Italy / Qatar	0.13	27.0	2026	2053
Oct 31, 2023	Vitol	Chesapeake Energy	Sweden / US	0.13	15.0	2028	2043
Nov 29, 2023	OMV	Cheniere	Netherlands / US	0.11	15.0	2029	2044
Dec 5, 2023	Woodside Energy	Mexico Pacific Ltd	Australia / Mexico	0.17	20.0	2024	2044
Mar 18, 2024	SEFE	ADNOC	Germany / UAE	0.13	20.0	2024	2044
Apr 17, 2024	Shell	Oman LNG	US / Oman	0.21	10.0	2025	2035
Apr 22, 2024	TotalEnergies	Oman LNG	France / Oman	0.11	10.0	2025	2035
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**8.18**			

Total New Long Term LNG Contracts since Jul/21	**22.05**

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

Source: SAF

Natural Gas: Chevron Gorgon LNG train off line for a number of weeks

Gorgon LNG train down

Early Friday morning, we tweeted [LINK] “"*Chevron says Gorgon LNG production train offline after fault", repairs "expected to take a number of weeks" , remaining 2 trains producing at full rates reports @SStapczynski. See 👇Gorgon LNG is 3-trains, each ~0.7 bcf/d for total ~2.1 bcf/d capacity. #OOTT #LNG.”* It looks like one of the 0.7 bcf/d LNG trains is down for an unknown period but it is not expected to impact the other trains. Gorgon LNG is three trains, each with ~0.7 bcf/d capacity for total capacity of ~2.1 bcf/d. Bloomberg wrote “C*hevron is working to resume full production at the Gorgon Gas Facility in Australia after a mechanical fault, co. said in an emailed statement. * Fault is affecting output at one production train, and occurred on Tuesday in a turbine * Repair activities have begun and are expected to take a number of weeks * Domestic gas and the remaining two LNG production trains at Gorgon are unaffected and are producing at full rates.”*

Figure 10: The Gorgon Project

The Gorgon Project is located on Barrow Island, around 60 kilometres off the northwest coast of Western Australia.

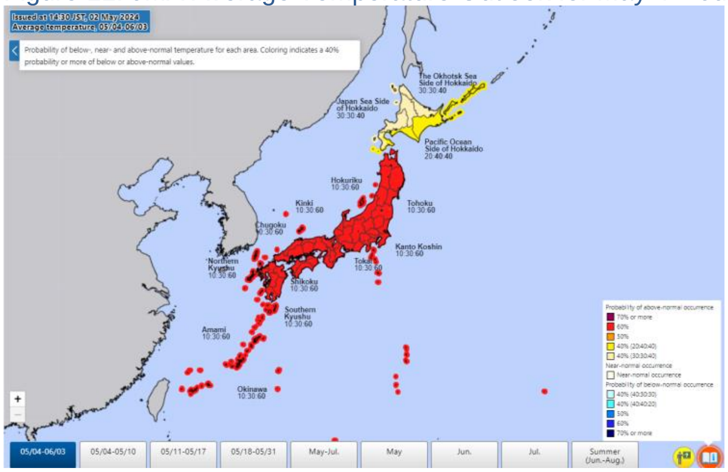
Source: Chevron

Natural Gas: Japan expects warm May, ties to call for hot summer

JMA temperature forecast for May

On Thursday, the Japan Meteorological Agency updated its 4-week forecast for Japan [LINK], which is May 4 - June 3, so essentially for the month of May. There is no JMA commentary on the forecast but it looks as though the southern prefectures are going to me much warmer than normal and, as noted in last week’s memo, the seasonal outlook for May/June/July is calling for well above average temperatures to start the summer. It looks to be in line or slightly hotter than May/Jun/Jul 2023 that was above average temps. A warm start to summer may not move natural gas/LNG prices up too much but it’s better than seeing a cool start to summer to hit prices. Below is the JMA temperature forecast for May.

Figure 11: JMA Average Temperature Outlook for May 4 – June 3



Source: Japan Meteorological Agency

Natural Gas: Naftogaz says repaired gas infrastructure where Russia attacked

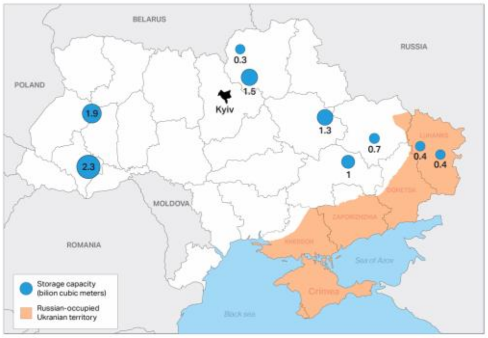
Russia hits Ukraine gas infrastructure

There was no detailed disclosure from Naftogaz this week on last weekend's reports that Naftogaz there were multiple hits from Russian on its natural gas infrastructure. There were only limited comments from Naftogaz. Bloomberg reported "*Gas storage sites in western Ukraine have faced multiple attacks in recent months, with only above-ground facilities sustaining damage, Naftogaz said. However, the underground storage tanks, some as deep as three kilometers beneath the surface, have remained unaffected. "Technologically, we're all fit, and we have managed to repair the [damaged surface] equipment and we fulfill our obligations [to our customers]" after the attacks, Chernyshov said*." So no details on the damage or what was repaired. But Chernyshov also asked for help. Bloomberg wrote '*The CEO of Ukraine's national energy company has urged EU nations to assist in safeguarding its natural gas storage facilities against recent Russian attacks so they can keep contributing to lower prices across the continent. "It is of interest of the EU to protect storage, transportation and production [facilities], given that Ukraine's gas infrastructure is 'well integrated' into Europe's energy system," Naftogaz Group CEO Oleksii Chernyshov said, according to Financial Times."* Here is what we wrote in last week's (Apr 28, 2024) Energy Tidbits memo. ' *As of our 7am MT news cut off, we could not find recognized reports of exactly where and how many gas infrastructure areas were hit in west or central Ukraine. However, there were confirmed multiple hits and no disclosure of damages. Earlier this morning, we tweeted [LINK] "ICYMI. Naftogaz confirms multiple Russia "hits" on Ukraine #NatGas infrastructure at undisclosed locations with undisclosed damage. However, Naftogaz says no one injured and "attack will not affect the provision of services to Ukrainian consumers and the Group's customers". "Our employees and involved services are dealing with the aftermath of the hits." #OOTT." Our tweet included Naftogaz's Saturday Telegram post that said "This morning, the enemy once again attacked the gas infrastructure facilities of the Naftogaz Group. Fortunately, no one was injured. The attack will not affect the provision of services to Ukrainian consumes and the Group's customers. Our employees and involved services are dealing with the aftermath of the hits." As of our 7am MT news cut off, we have not been able to find out any specifics."*

Ukraine storage is currently ~6% of total Europe 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 May 2nd natural gas in Ukraine storage was at 12.78% of its total capacity, up from 12.28% on April 25th and started the winter on Nov 1, 2023 at 39.38%. Right now, Ukraine makes up ~6% 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.

Figure 12: Ukraine Gas Storage Facilities as of July 2023



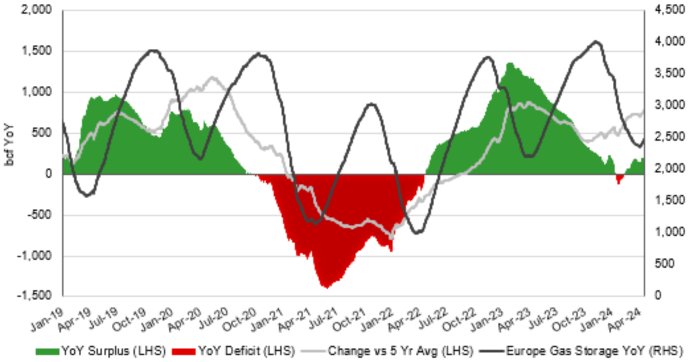
Source: Bruegel

Natural Gas: Europe storage builds WoW to 62.86%, YoY surplus narrows

Europe gas storage

This week, Europe storage increased by 124 bps WoW to 62.86% on May 2 vs 61.62% on April 25. Storage is now +244 bps higher than last year's levels of 60.42% on May 2, 2023, and up huge vs the 5-year average of 47.74%. Even though the YoY surplus is modest, up until the recent Russia bombing of Ukraine natural gas storage facility, there weren't fears for natural gas and LNG supply over the summer months. The big wildcard 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 13: European Gas Storage Level



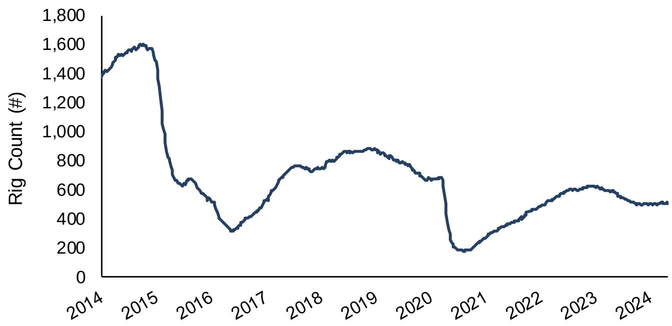
Source: Bloomberg, SAF

Oil: US oil rigs down -7 WoW to 499 rigs, US gas rigs down -3 WoW to 102 rigs

US oil rigs down WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note, after we sent them an email, Baker Hughes confirmed they wouldn't be returning to the old format which previously allowed us to break out the basin changes by rig type. (ii) Total US oil rigs were down -7 rigs WoW to 499 oil rigs as of May 2. 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 +2 rigs WoW to 3 total rigs, Cana Woodford -1 WoW to 21 total rigs, Granite Wash +1 WoW to 6 total rigs, Eagle Ford -3 WoW to 52 total rigs, and Permian -1 rig WoW to 316 total rigs. We also noticed Alaska lost 5 rigs this week. (iv) US gas rigs were down -3 rigs this week to 102 gas rigs.

Figure 14: Baker Hughes Total US Oil Rigs



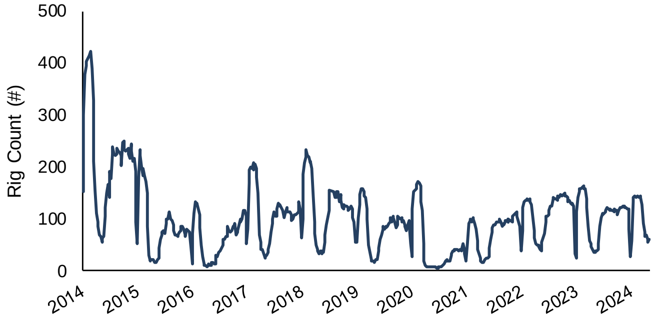
Source: Baker Hughes, SAF

Oil: Total Cdn rigs up +2 WoW, seasonal trough likely reached last week

Cdn total rigs up WoW

As happens every year in Canada, the rig count drops dramatically from early March thru normally the end of April/beginning of May as winter drilling season ends and the industry moves into spring break up. Spring break up is the period when it warms up and road access becomes limited/restricted in many parts of Western Canada. The last several weeks have seen total Cdn rigs decline drop from 231 at the beginning of March to 118 last week. It appears as though the trough was reached last week as this week we saw an uptick of rigs. Note the earliest trough in the past 7 years was April 30th, as usually it bottoms out in the 1st or 2nd week of May. Cdn oil rigs were up +4 rigs WoW to 56 oil rigs and are up +26 rigs YoY. Gas rigs are down -2 rigs WoW and +1 YoY. Baker Hughes did not update their old format report, so we weren't able to see the provincial breakouts.

Figure 15: 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

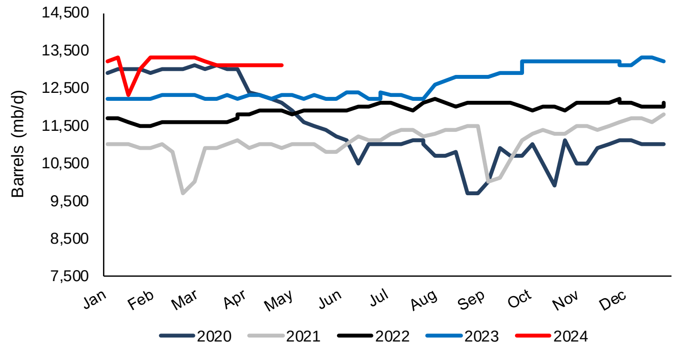
It's worth noting that the EIA has benchmarking has led to a revision downward in weekly oil estimates instead of what have been upward revisions. Here's what the EIA wrote on their website earlier this month: "*When we release the Short-Term Energy Outlook (STEO) each month, the weekly estimates of 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".* Earlier this month, 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 February actuals) was -0.146 mmb/d lower than the weekly estimates of 13.300 mmb/d. This week, the EIA's production estimates were flat WoW at 13.100 mmb/d for the week ended Apr 26. Alaska was down -0.007 mmb/d WoW to 0.430 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 16: EIA's Estimated Weekly US Field Oil Production (mb/d)

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

Source: EIA

Figure 17: EIA's Estimated Weekly US Oil Production



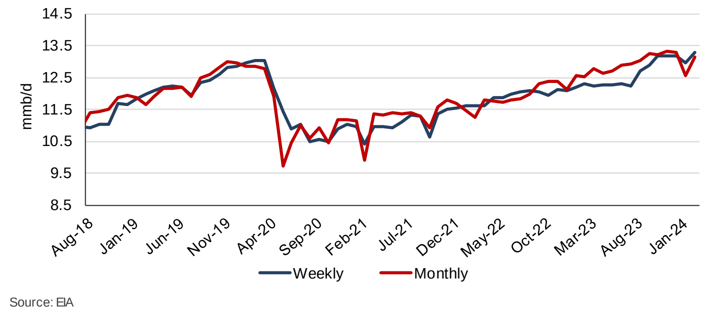
Source: EIA, SAF

Oil: EIA Form 914 – US Feb oil production actuals +4.6% MoM after Jan shut-in

EIA Form 914 February

On Friday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for February US oil and natural gas production. As noted above and previously, over the past four months the EIA has had to make big upward adjustments to their weekly oil supply estimates to bring them more in line with the Form 914 actuals. The major upward adjustments to the EIA weekly oil estimates were +0.400 mmb/d in Aug, another +0.400 mmb/d in Oct and then November's +0.200 mmb/d. (i) Revisions. There were no material revisions to the monthly data for the past few months. (ii) February actuals. February's "actuals" came in at 13.154 mmb/d according to the EIA's form 914. (iii) Weekly EIA estimates for February were at 13.300 mmb/d, up +4.6% MoM from January and +5.0% YoY from 12,532 mmb/d in February 2023. The Form 914 actuals are therefore -0.146 mmb/d under the weekly estimates. We aren't surprised in the drop-off in production in January because we recall the shut-in due to extreme cold, such as the 700,000 b/d from North Dakota alone at one point. Here's what we wrote in our Jan 21, 2024 Energy Tidbits memo: "*On Friday, North Dakota held its monthly Directors Cut webcast to review November oil and gas production data. One of the first comments by North Dakota's Lynn Helms was the* *status of shut-in North Dakota oil production from the deep freeze. Helms did not comment on shut-in associated natural gas, only oil. But since the natural gas in North Dakota is almost all from associated natural gas from oil wells, there would still be a big shut-in impact of natural gas. Helms said that the peak oil shut-in was 700,000 b/d on Jan 17, but was down to 400,000 b/d on Friday. Helms also warned that recovery of all the oil doesn't happen overnight and warned some can take some time to recovery. We made the below transcript of his comments*". Below is a chart of monthly actuals vs. weekly estimates. Our Supplemental Documents package includes an excerpt from the Form 914 figures.

Figure 18: EIA Form 914 US Oil Production vs Weekly Estimates



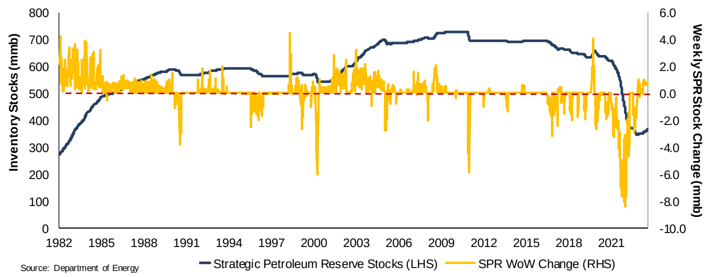
Source: EIA, SAF

US SPR reserves

Oil: US SPR less commercial reserve deficit narrows, now -94.619 mmb

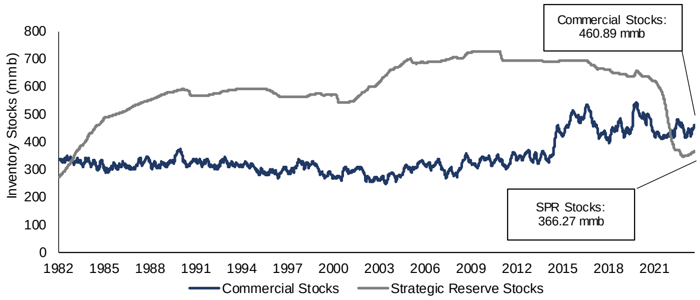
The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022 week. Again this week, we saw a build on the SPR side, but the commercial side saw a huge build. The EIA's weekly oil data for Apr 26 [LINK] saw the SPR reserves increase +0.594 mmb WoW to 366.271 mmb, while commercial crude oil reserves increased +7.265 mmb to 460.890 mmb. There is now a -94.619 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 19: Strategic Petroleum Reserve Stocks and SPR WoW Change



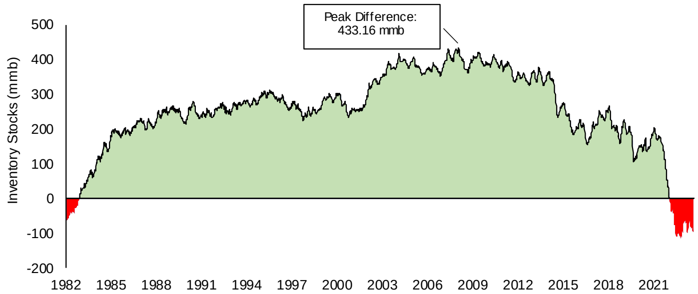
Source: EIA

Figure 20: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 21: US Oil Inventories: SPR Less Commercial



Source: EIA

US gasoline prices

Oil: US national average gasolines prices flat WoW at $3.66
Yesterday, we tweeted [LINK] "*US gasoline prices flat WoW at $3.66. Now +$0.09 MoM and $0.09 YoY. California -$0.05 WoW, +$0.16MoM to $5.36. Reminder US gas 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 $3.66, which was - flat WoW, up $0.09 MoM and up $0.09 YoY. As of yesterday, the California average gasoline prices were down $0.04 WoW to $5.36, which is a $1.70 premium to the national average gasoline price of $3.66. California gas prices are +$0.16 MoM and +$0.51 YoY.

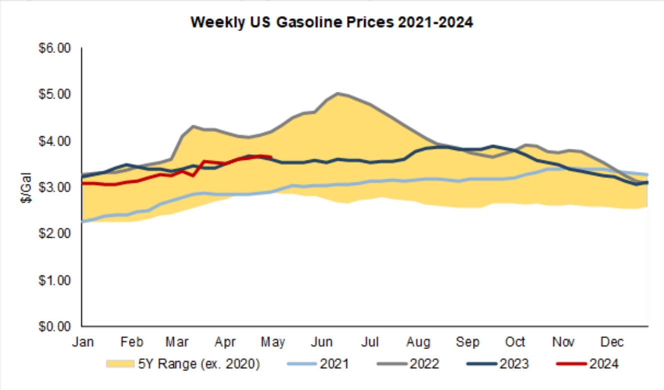
Seasonal increase in US gasoline prices

Oil: US gasoline prices normally seasonally increase thru Memorial Day
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 so California 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 as of the Friday close.

Figure 22: 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 decreased $1.39 WoW to $27.59

Crack spreads closed at $28.96

On Friday, we tweeted [LINK] "*May not drive up #Oil prices but 321 crack spreads still positive support for WTI. 321 crack spreads widened $0.66 WoW to $28.96. Crack spread $28.96 still provides big margin for refiners and incentive to buying crude to maximize runs. #OOTT #Oil Thx @business."* The message for the past few 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 $28.96 on Apr 26, which was a widening of $0.66 WoW from $28.30 on Apr 19. We always say crack spreads around $30 are still a big incentive for refiners to maximize runs. Apr 26 crack spreads of $28.96 are still a big incentive for refineries to maximize run and make big margins. So crack spreads are a good indicator if refiners will be looking to buy more or less oil. And $28.96 crack spreads are still strong and close to $30 so a big incentive to refiners to want more crude and produce more product. This week, crack spreads widened $0.66 WoW to $28.96 on Apr 26, which followed $28.30 on Apr 19, $30.39 on Apr 12, $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, and $25.23 on Feb 16. Crack spreads at $28.96 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 $27.59 as of the Friday May 3, 2024 close.

Figure 23: Cushing Oil 321 Crack Spread & WTI May 3, 2014 to May 3, 2024

Source: Bloomberg

Oil: Trans Mountain apportioned by 0% for May due to starting of expanded line

Trans Mountain apportionment

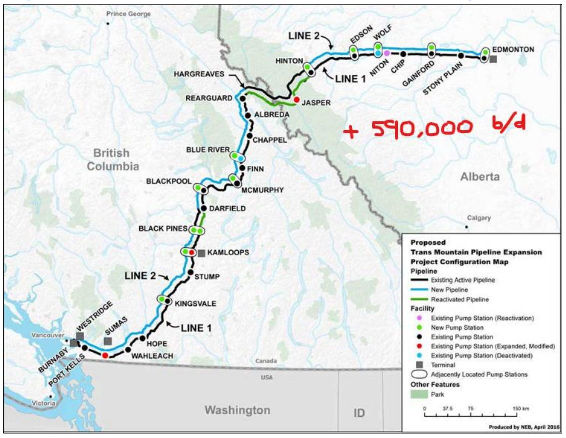
On Monday, Trans Mountain released an update [LINK] on its capacity for the month of May. Total system nominations are apportioned by 0% for May (April was 24%), meaning 0% of demand for the pipeline exceeds its capacity. This now includes the increased capacity of the Trans Mountain pipeline, which is why the apportionment went down (the capacity now exists to service the demand). Trans Mountain has been running at full capacity and has seen regular monthly apportionment for over a decade. Last month's increased apportionment was expected as oil producers have been ramping up capacity ahead of the start of the 590,000 b/d TMX expansion. Our Supplemental Documents package includes the Trans Mountain release.

Oil: Trans Mountain's 590,000 b/d TMX expansion began commercial operations May 1

TMX 590,000 b/d expansion

On Tuesday, Trans Mountain announced that the 590,000 b/d expansion to the TMX pipeline began commercial operations, and is now pumping crude to the west coast. This is the expected big good news for the Cdn oil industry – now, more Canadian crude than ever can be piped to the west coast for loadings on tankers to global markets including the US west coast. It is expected to be a boost to Cdn oil prices by narrowing the discount of Cdn oil prices to WTI mostly during periods that discount widens due to lower seasonal demand in the US. TMX will allow Cdn barrels to flow to international markets in these wider differential periods. No-one knows specifically how much the discount will narrow but the view still seems to be around $7, which we see as on an average basis with more or less a saving during different seasons. Trans Mountain's press release [LINK] said "*May 1, 2024, signifies the commercial commencement date for the Expanded System. As of today, all deliveries for shippers will be subject to the Expanded System tariff and tolls, and tankers will be able to receive oil from Line 2 by mid-May. Line fill on the Expanded System continues, and is expected to be completed within the next few weeks. Both the existing and expanded pipelines are now able to transport crude oil and Trans Mountain has the ability to load cargoes from all three berths. As of April 30, 2024, the expanded pipeline is 70 per cent full by volume, and 69 per cent complete by distance.*" Our Supplemental Documents package includes the Trans Mountain release.

Figure 24: Trans Mountain and TMX Expansion Pipeline Map



Source: CER (NEB)

Cenovus sees TMX means light/heavy diffs will remain narrow for years

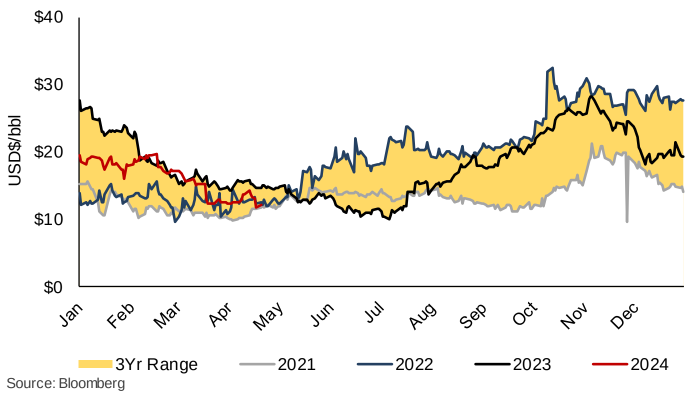
Cenovus reported Q1 on Wednesday and, in his prepared remarks, CEO McKenzie gave his view for a positive long term impact of TMX. We tweeted [LINK] "*TMX a big positive for Cdn #Oil for years! Cenovus CEO McKenzie "... TMX pipeline. This critical pieces of --- with this critical piece of infrastructure now complete, we anticipate light-heavy differentials will remain narrow for years while excess egress capacity exists" #OOTT.'*" McKenzie's full quote was "*We're also looking forward to the important milestone for our industry with the imminent start-up of the TMX pipeline. This critical piece of -- with this critical piece of infrastructure now complete, we anticipate light-heavy differentials will remain narrow for years while excess egress capacity exists.*"

Oil: Cdn heavy oil differentials narrows $0.75 WoW to close at $11.75 on May 3

WCS differentials narrows

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 and 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 May 3 at $11.75, which was a narrowing of $0.75/bbl WoW vs $12.50/b on Apr 26. 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 now that Trans Mountain's TMX is operational.

Figure 25: WCS less WTI oil differentials to May 3 close



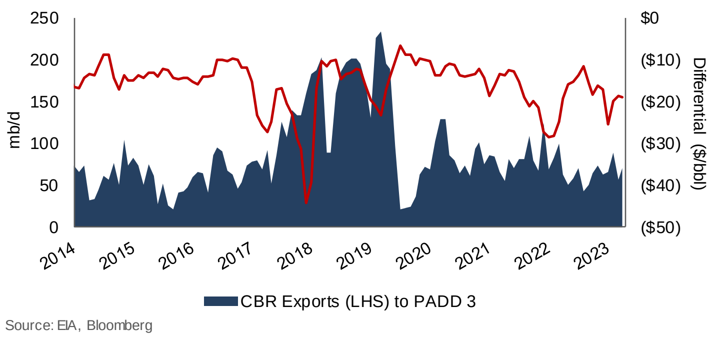
Source: Bloomberg

EIA Cdn crude by rail imports

Oil: EIA estimates total Cdn crude by rail imports -11,151 b/d MoM in Feb, PADD 3 up

On Tuesday, the EIA posted its "*U.S. Movements of Crude Oil by Rail*" [LINK], which includes the EIA data on US imports of Cdn crude by rail. EIA estimates total US imports of Cdn crude by rail were 94,655 b/d in February, which was -11,151 b/d MoM from 105,806 b/d (revised) in January. The EIA estimates Cdn crude by rail into PADD 3 (Gulf Coast) was 71,655 b/d in February, which was +15,010 b/d MoM from 56,645 b/d (revised) in January. Note, there were some revisions again on the January data: Total imports from Canada were revised upward from 93,419 b/d to 105,806 b/d. And remember in November data's original release, the EIA reported total imports from Canada were 61,267 b/d, with the PADD 3 numbers at 53,100 b/d. Then in January's update, November revision went up over 20,000 b/d to 85,167 b/d (Total imports) and over 10,000 b/d at 65,600 (PADD 3). As of last month, it's up even higher to 89,167 b/d (total) with PADD 3 imports held the same. The EIA did not comment on the MoM changes or revisions. We have been highlighting some very large discrepancies in what the EIA reports as crude-by-rail imports from Canada versus what the Canadian Energy Regulator (CER) reports as crude-by-rail exports from Canada. Recall last month the CER reported that 150,292 b/d of crude was exported by rail out of Canada during January. This is way off the total Canadian imports by rail of 105,806 b/d (even after the upwards revision) the EIA says they got – there are ~50,000 b/d of unexplained items. The only explanation is that the difference is Cdn crude-by-rail that goes directly to Gulf Coast for exports to international markets. Here is what we wrote in our Nov 5 memo: "*Last month, we reached out to the EIA to ask if they could shed some light on why there might be such a large difference to the CER numbers but they did not respond to our question. Last month, there was a 75,000 b/d difference in what the CER estimated as Cdn crude by rail exports to US in July vs what the EIA estimates as Cdn crude by rail imports from Canada. This month, there is 92,000 b/d difference in what the CER estimates as Cdn crude by rail exports to US in Aug vs what the EIA estimate for crude by rail imports from Canada. We have checked to see if somehow the crude by rail went into the US and was turned around and sent back to Canada via truck, rail or pipeline. But the EIA shows zero crude by rail exports Plus we checked the North Dakota Pipeline Authority monthly report as North Dakota will truck oil into Canada and the NDPA showed zero such volumes in July and small amounts in Aug. Our only explanation was that* *the higher amount of Cdn crude by rail exports to the US is railed to the GoM and directly put on tankers for export from the GoM. That way they wouldn't be included in the EIA's ~30,000 b/d of crude oil by rail imports into PADD 3 in July or the ~47,000 b/d into PADD 3 in Aug*". Below is our graph of Cdn CBR exports to the Gulf Coast and WCS differential over time.

Figure 26: US Imports of Canada CBR to US Gulf Coast vs WCS Differential



Source: EIA, Bloomberg

Oil: Did Gulf Coast refineries load up on Cdn crude ahead of TMX

Gulf Coast oil stocks +6.8 mmb WoW

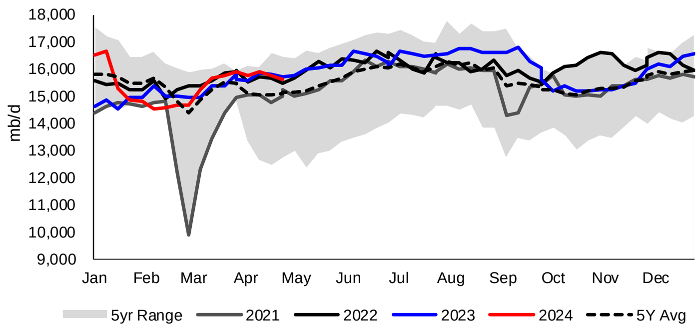
One of the negatives to oil on Wednesday was the EIA oil inventory data for Apr 26, which saw crude oil inventory +7.27 mmb WoW vs expectations of a -2.50 mmb draw. Note that the expectations are the Bloomberg expectations and there were only four analysts is the survey. Including in the +7.27 mmb WoW increase in oil inventory was that PADD 3 Gulf Coast oil inventory was +6.8 mmb WoW to 261.6 mmb. When we saw this Gulf Coast build, we tweeted [LINK] "*Gulf Coast #Oil stocks were +6.8 mmb WoW. One factor, earlier @lkassai on @business* TOPLive warned "*crude inventories on the Gulf Coast may build as fuelmakers hoarded a bit more Cdn oil than usual ahead of the start of the expanded TMX*". #OOTT." The Bloomberg warning makes sense but can't be confirmed.

Oil: Refinery Inputs down -0.230 mmb/d WoW to 15.641 mmb/d

Refinery inputs -0.230 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. There were some smaller outages that led to the WoW decrease. 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 26 [LINK]. The EIA reported crude inputs to refineries were down -0.230 mmb/d this week to 15.641 mmb/d and are down -0.094 mmb/d YoY. Refinery utilization was down -120 bps WoW to 87.5%, which is -320 bps YoY.

Figure 27: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports +1.535 mmb/d WoW as oil exports down -1.261 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up +1.535 mmb/d to 2.854 mmb/d for the April 26 week. US imports were up +0.274 mmb/d to 6.772 mmb/d against exports which were down -1.261 mmb/d WoW to 3.918 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 >100,000 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 up +0.509 mmb/d. Some items to note on the country data: (i) Canada was up +0.424 mmb/d to 3.847 mmb/d, which may be linked refiners loading up on Cdn crude before TMX startup.. (ii) Saudi Arabia was up +0.004 mmb/d to 0.402 mmb/d. (iii) Mexico was up +0.108 mmb/d to 0.459 mmb/d after six low weeks. (iv) Colombia was up +0.148 mmb/d to 0.363 mmb/d. (v) Iraq was down -0.002 mmb/d to 0.307 mmb/d. (vi) Ecuador was down -0.124 mmb/d to 0.000 mmb/d. (vii) Nigeria was down -0.047 mmb/d to 0.089 mmb/d.

Figure 28: US Weekly Preliminary Imports by Major Country

	Mar 1/24	Mar 8/24	Mar 15/24	Mar 22/24	Mar 29/24	Apr 5/24	Apr 12/24	Apr 19/24	Apr 26/24	WoW
Canada	3,632	3,458	3,735	3,652	3,874	3,546	3,458	3,423	3,847	424
Saudi Arabia	366	265	254	338	321	531	229	398	402	4
Venezuela	0	0	0	0	0	0	0	0	0	0
Mexico	640	303	353	525	263	209	208	351	459	108
Colombia	351	0	289	143	316	114	246	215	363	148
Iraq	176	93	252	244	91	142	308	309	307	-2
Ecuador	218	102	147	9	146	231	0	124	0	-124
Nigeria	222	132	57	215	136	43	173	136	89	-47
Brazil	178	272	114	230	147	257	189	492	492	0
Libya	0	66	0	88	117	24	21	100	98	-2
Top 10	5,783	4,691	5,201	5,444	5,411	5,097	4,832	5,548	6,057	509
Others	1,439	800	1,077	1,258	1,207	1,337	1,629	949	715	-234
Total US	**7,222**	**5,491**	**6,278**	**6,702**	**6,618**	**6,434**	**6,461**	**6,497**	**6,772**	**275**

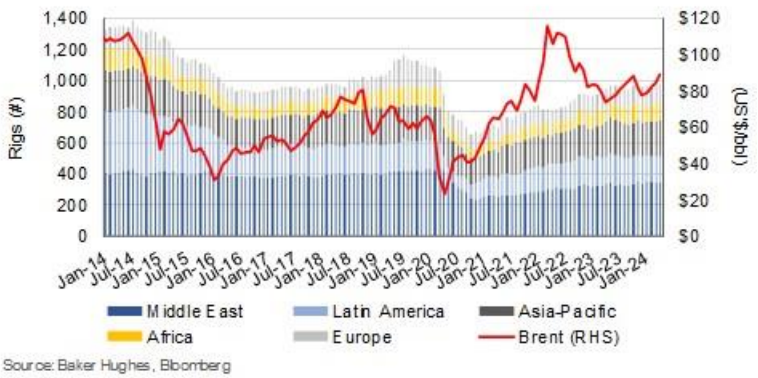
Source: EIA, SAF

Oil: Baker Hughes International rigs +7 MoM to 978 rigs in April

International rigs +7 MoM in April

For the most part, international drilling doesn't react quickly to moves in oil prices as most drilling isn't like US and Canada where there is also the largest drilling rig fleets to support any quick increases in rigs. On Friday, Baker Hughes posted its monthly update to international rigs, in total, that show rigs in April increased MoM. (i) Note that Baker Hughes has changed its report format which doesn't allow us to break out country-by-country information. (ii) Total international rigs increased by +7 rigs MoM to 978 rigs in April, and total rigs are now up +172 rigs from the recent low of 806 in April 2022. The MoM rig count is as follows: Africa -3 rigs, Asia-Pacific +8 rigs, Europe +2 rigs, Latin America +1 rig, and the Middle East -1 rig. The YoY rig count is Africa +19 rigs, Asia-Pacific +18 rigs, Europe flat, Latin America -12 rigs, and the Middle East +6 rigs. (iii) We weren't able to summarize the MoM data by country due to Baker-Hughes' new format. (iv) April's count of 978 rigs was +3% YoY from 947 in April 2023, and down -10% vs pre-Covid February 2020 of 1,085 rigs (March 2020 is when the pandemic kicked off). Below is our graph of international rigs by region and avg monthly Brent price.

Figure 29: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg, SAF

Oil: Pemex refineries process most Mexico crude since 2016

Pemex refineries crude processed

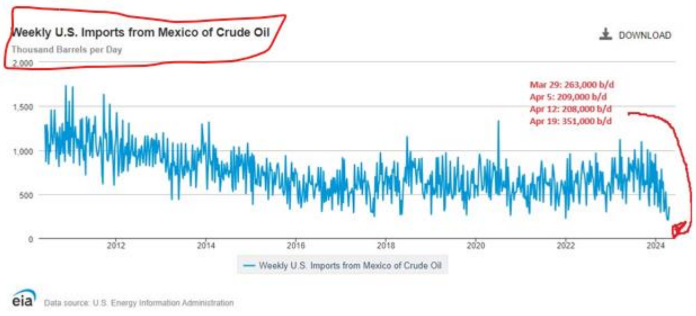
More Mexico crude refined in Mexico = Less Mexico crude available for export. We are seeing what we have said for months – the startup, albeit slow of the new 340,000 b/d Olmeca (also known as Dos Bocas) and improvements in existing refinery processing would lead to Pemex refineries processing more Mexico crude and therefore there would be less for export. In March the six refineries (excl Olmeca) processed 1,062 mmb/d of oil, which is 65.3% of 1.627 mmb/d capacity. On Monday, Bloomberg posted a report "*Pemex Oil Refining Jumps to Highest Since 2016"* and we then tweeted [LINK] "*Here's why US #Oil imports from Mexico are at all time lows. Pemex finally ramping up refinery crude runs = less oil for export. Also why Biden needs to keep Chevron Venezuela oil flowing to Gulf Coast. Thx @lkassai. #OOTT."* Bloomberg posted the below table and wrote *"* Pemex's 6 refineries in Mexico operated at 65.3% of capacity in March, highest since June 2016; rates remained above 50% of capacity for the fourth straight month ** The six refineries have capacity to process 1.627m b/d of c crude, according to Pemex; company didn't disclose data for its new Olmeca* *refinery, also known as Dos Bocas, which started operations in September."* Below is the Bloomberg table and the EIA oil imports from Mexico graph that we included with our tweet. Our Supplemental Documents package includes the Bloomberg report.

Figure 30: Pemex refinery crude oil processed in March

Refinery	March (b/d)	m/m	y/y	Capacity use	NOTE
Cadereyta	159,502	-3.5%	18%	58.0%	
Madero	130,615	14%	63%	68.7%	highest since Feb. 2016
Tula	246,571	-1.9%	3.8%	78.3%	
Salamanca	137,293	3.5%	12%	62.4%	highest since Jan. 2023
Minatitlan	150,862	7.9%	83%	52.9%	
Salina Cruz	237,076	80%	16%	71.8%	highest since April 2018
Dos Bocas	not available				
Total	1,061,918	14%	23%	65.3%	

Source: Bloomberg

Figure 31: US oil imports from Mexico incl Apr 19 data



Source: EIA

Reality setting in, Pemex (Mexico) to cut exports by >330,000 b/d in May
Here is what we wrote in our Apr 21, 2024 Energy Tidbits memo on Mexico's declining oil exports. *"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*

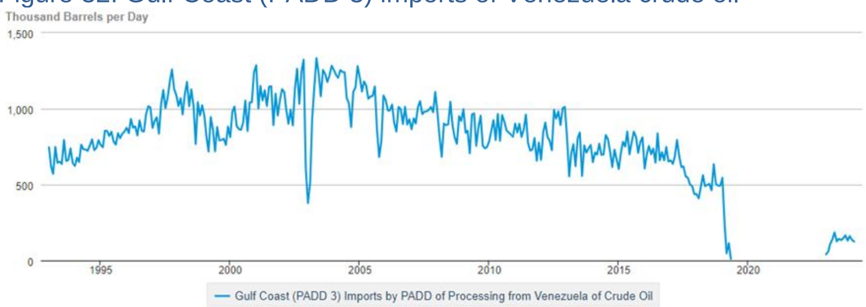
from exports. On Monday, Reuters reported [LINK] "Mexico's state energy company, Pemex, is planning to cut at least 330,000 barrels per day (bpd) of crude exports in May, leaving customers in the United States, Europe and Asia with a third less supply, two sources said. The plan follows the withdrawal 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."

Oil: US PADD 3 imports of Venezuela oil over 125,000 b/d for last 11 months

Venezuela imports to USGC

US Gulf Coast PADD 3 oil imports from Venezuela continue to be 125,000 b/d or more for the past 11 months. We don't expect this number to significantly drop given Biden is allowing Chevron to continue to import Venezuela oil. And we could see this go higher depending on Chevron's near-term activities as there is an increasing need for medium sour barrels into the Gulf Coast with Mexico medium sour exports declining and the startup of the TMX expansion should pull Cdn oil barrels to the west coast and not the Gulf Coast. February's imports were 125,000 b/d, down from 136,000 b/d in January and well below Jan 2019 of 545,000 b/d, but we will see how this figure changes when the May actuals roll around. Below is a chart of PADD 3 imports of Venezuelan crude.

Figure 32: Gulf Coast (PADD 3) imports of Venezuela crude oil



Source: EIA

Oil: Colombia oil production still below pre-Covid, February was 0.764 mmb/d

Colombia oil production down MoM

It's hard to see how Colombia oil production ever sustainably rallies anywhere back to 1 mmb/d or even 900,000 b/d given Colombia President Petro's goal to reduce oil and natural gas. Despite stronger oil prices post Covid, Colombia oil production has been stuck below 800,000 b/d. The National Hydrocarbons Agency (ANH) reported [LINK] February's oil production was down -1.7% MoM to 0.764 mmb/d. This puts February's production up +0.7%

YoY vs 0.759 mmb/d in February 2023, so essentially flat. Production is now -13.8% below pre-Covid levels of 0.886 mmb/d in 2019.

Figure 33: Colombia Oil Production

mmb/d	2016	2017	2018	2019	2020	2021	2022	2023	2024	23/22
Jan	0.986	0.860	0.860	0.899	0.884	0.745	0.740	0.774	0.777	0.4%
Feb	0.955	0.864	0.823	0.893	0.878	0.746	0.740	0.759	0.764	0.7%
Mar	0.917	0.804	0.856	0.885	0.857	0.745	0.751	0.771		
Apr	0.915	0.857	0.865	0.891	0.796	0.745	0.751	0.782		
May	0.904	0.851	0.866	0.895	0.732	0.703	0.746	0.774		
June	0.888	0.857	0.864	0.892	0.730	0.694	0.752	0.778		
July	0.843	0.856	0.860	0.869	0.735	0.731	0.748	0.782		
Aug	0.827	0.858	0.866	0.883	0.742	0.748	0.749	0.782		
Sept	0.859	0.851	0.869	0.879	0.749	0.744	0.754	0.771		
Oct	0.846	0.864	0.879	0.883	0.751	0.740	0.757	0.778		
Nov	0.855	0.851	0.883	0.880	0.761	0.747	0.771	0.783		
Dec	0.837	0.870	0.889	0.882	0.759	0.745	0.784	0.787		

Source: Bloomberg, Hydrocarbons Colombia, SAF Group

Oil: RBN – Nigeria's Dangote Refinery Likely Facing A Long, Slow Ramp-Up

Dangote Refinery Ramp-up

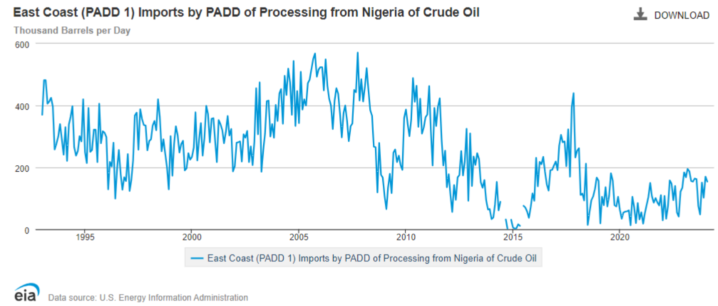
We started highlighting the start up of Nigeria's big 650,000 b/d Dangote Refinery in our Jan 14, 2024 Energy Tidbits memo as a key event that will dramatically reduce Nigeria's oil exports as it ramps up to full capacity. It sounds like the startup is taking longer but the key is that it will be a big hit to global oil and products trade. This is the 7th-largest refinery in the world and is meant to wean the country off of refined fuel imports, and consequently more Nigerian crude will be diverted from export markets to feed it. On Thursday, RBN released an article [LINK] titled "Almost There – Nigeria's Dangote Refinery Likely Facing A Long, Slow Ramp-Up". RBN is skeptical of Dangote's ability to live up to its expectations, citing cost overruns, delays, and a spotty record from the operator, the Nigerian National Petroleum Corporation (NNPC). RBN wrote "*Nigeria's total nameplate refining capacity, not including Dangote, is about 445 Mb/d, which could meet most domestic demand if the four refineries operated by the Nigerian National Petroleum Corporation (NNPC), Nigeria's state-owned oil company, ran reliably. They don't. Those plants have largely been shut for years, and a string of oil ministers' predictions of resuming stable operations for a decade or more haven't come to fruition. We are skeptical of Dangote's prospects for reaching full capacity this year. RFA expects the plant to ramp up to only an effective 20% of its nameplate capacity on average in 2024, 50% next year and the remaining 30% in 2026 given Dangote's scale, unusual operations makeup, the country's iffy track record when it comes to reliable refinery performance, and the operators' lack of experience*". 20% of nameplate capacity works out to around ~130,000 b/d in 2024, so nothing noticeable for the near future. The IMF is even more pessimistic, forecasting 100,000 b/d in 2024, 200,000 b/d in 2025 and only 300,000 in 2026-27. RBN elaborated on the specific challenges the NNPC might face by writing "*At full capacity, Dangote would produce about 240 Mb/d of gasoline and 190 Mb/d of middle distillates. But Dangote's sheer scale and single-train design (including by far the largest atmospheric crude unit in the world) is a concern. A single-train design means the refinery has one crude distillation unit (CDU) to receive incoming crude oil and distill it into hydrocarbons that will be processed further in other units, like a fluid catalytic cracking unit that "cracks" those liquids into smaller hydrocarbons and processes them into gasoline, or a hydrocracker that does the same for processing liquids into primarily diesel and jet fuels. In addition to the technology risk implicit in such a large and unproven unit, if that single CDU shuts down, there's no backup".* So a lot of concentrated risk in one the refineries processing units. We will keep an eye on the progress of Dangote's ramp-ups and if it is translating into a downward trend in US imports. Our Supplemental Documents Package includes the RBN article.

Figure 34: Dangote Refinery Location

Source: RBN

Jones Act likely to keep US importing oil from Nigeria as it's all to PADD 1
In theory, the ramp up of Dangote to full capacity should wipe out any Nigeria oil to the US especially as Nigeria oil is mostly light oil that isn't much different than Permian oil. The US imports ~150,000 b/d of Nigerian oil that should be eliminated by Nigeria's increasing use in Dangote. However, there is the case for US to keep importing Nigeria oil due to price. US oil imports from Nigeria are essentially all to the East Coat PADD 1. The reason why PADD 1 refineries use Nigeria oil instead of Permian is the Jones Act, which forces any US oil to domestic users to US owned, flagged and staffed tankers ie. higher cost. So PADD 1 imports oil such as Nigerian oil for its refineries. We could very well see the economic case for PADD 1 to pay the premium to get the Nigerian oil away from Dangote. So its' too early to tell but PADD 1 refineries will need to either pay a premium for Nigerian crude or get crude from some other countries.

Figure 35: East Coast PADD 1 oil imports from Nigeria



Source: EIA

Oil: Ukraine hits another major Russian refinery

Ukraine/hits another refinery

Another Russian refinery hit this week. No question the US aid deal signed into law by Biden on Wednesday was critically needed by Ukraine, the question is where will take Ukraine as they escalate attacks on Russia. One thing is clear is that Ukraine is not going along with the US preference to not hit Russian oil infrastructure. On Wednesday, Ukraine hit a big Russian refinery – the Ryazan oil refinery located ~200 km SE of Moscow. Rosneft writes [LINK] "*Ryazan Oil Refining Company Joint Stock Company (JSC RORC) ensures the Company's presence in the Central Federal District and is the largest oil refinery in the region. The design capacity of the company is 17.1 million tons of oil per year. Ryazan Oil Refinery's production facilities include 4 crude oil processing units, a vacuum gasoil hydrotreatment unit, a hydrogen production unit, a sulphuric acid alkylation unit, a catalytic cracking unit, a tar visbreaking unit and a catalytic reforming unit, aromatic reforming unit, diesel fuel hydrotreating unit, aviation kerosene hydrotreating unit, low-temperature isomerization unit, gas fractionation unit, bitumen production unit, sulphuric acid production unit, etc.*" We do not know the recent throughput but 17.1 mmt/yr is ~340, 000 b/d. Yesterday, Bloomberg wrote "* *The fire happened at the Russian facility's smaller primary-processing unit, with a capacity of 8.2k tons/day, or about 60k b/d, according to the note ** Two more operating units at Ryazan have a combined processing capacity of 33.3k tons/day.*"

Will Ukraine escalate its drones to target after Russia oil/LNG export terminals

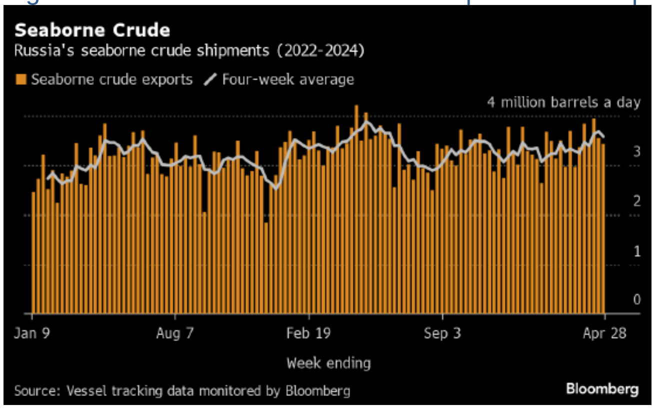
The escalation has to raise the risk as to what will Ukraine do next in their escalation. As noted previously, Ukraine keeps going after Russian refineries despite US preferences to not do so. So it is far from clear how or where Ukraine escalates, which is why we keep in mind RBC Helima Croft's recent comment on the increased geopolitical risks including the risk that Ukraine moves at some stage to target Russian oil/LNG export facilities. Our 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 our March 31, 2024 Energy Tidbits memo. " *We couldn't help think of the above RBC Helima Croft comment this morning when start looking at overnight news and seeing more Russian escalating drone attacks on Ukraine energy/power infrastructure. Earlier this morning, we tweeted [LINK] "This 👇Must Read from @CroftHelima looks even more relevant with the last 4 days, incl last night, of escalating Russia drone attacks on Ukraine energy/power infra. Will Ukraine expand its drone attacks to target RUS oil export facilities? has to be at least a risk? #OOTT." The news of the last four days, including last night, was on escalating Russian drone attacks on Ukraine energy and power infrastructure. Bloomberg reported "Russia continues almost daily strikes at Ukraine's critical infrastructure, and hit energy facilities in the country's south and in the far western region of Lviv on Sunday, local authorities said. Kremlin forces targeted high-voltage electricity substations in the Odesa region, damaging equipment, which caused power to be cut off to more than 170,000 households in Ukraine's third largest city, according to electricity provider DTEK." Ukraine hasn't gone along with the reported US request to not go after Russian refineries and so we have to believe there is at least a risk they expand their drone attacks to go after Russian oil and LNG export facilities."* Our Supplemental Documents package includes the cover page of the Helima Croft note.

Oil: Russian crude exports down as China reduces imports, sanctioned vessels sail

Russia crude oil shipments

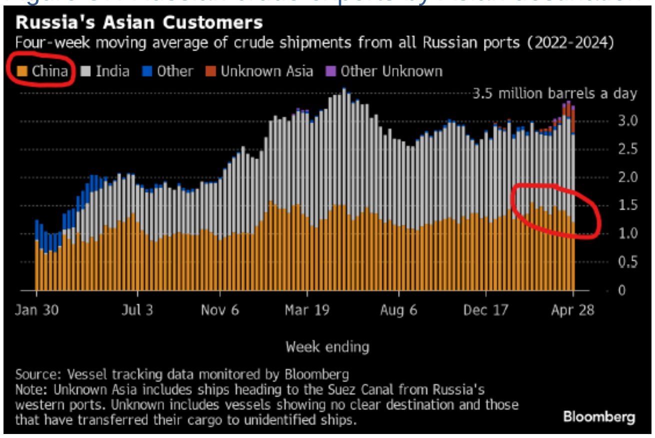
Information on the impacts on Russian oil infrastructure and its impact on moving crude is still a black hole. So its far from clear how drone strikes reducing refinery capacity in Russia would free up crude for export assuming the crude oil volumes can be moved to export terminals. And as noted previously, there are reports of Russia moving more crude and products via rail. Bloomberg reported "*Russia's crude flows fell for a second week in the seven days to April 28, with fewer vessels leaving the key ports of Primorsk on the Baltic and Kozmino on the Pacific. The four-week average was also down. Despite the declines, crude shipments remain above their average for the year so far, with domestic oil processing still under pressure as refineries that have barely recovered from Ukrainian drone attacks enter seasonal maintenance. Russia is stepping up efforts to undermine US-led sanctions on its tanker fleet. India looks like it may again accept cargoes delivered on vessels belonging to state-controlled shipper Sovcomflot PJSC, which the Asian nation's refiners had shunned previously. The first Sovcomflot tanker of Urals crude in several months is headed to the Indian port of Paradip, following a fuel oil cargo delivered to the port of Sikka last week*". In the week to April 28, Russia exported 3.43 mmb/d of crude via tankers, down -120,000 b/d WoW and -30,000 b/d below the April target. Remember that Russia will be shifting towards a production-based cut rather than export control for their OPEC+ commitments this quarter. Note that this week, 1.2 mmb/d bound for China was loaded, down ~-150,000 b/d WoW compared to the Apr 21 week which was 1.35 mmb/d. Recall the comments we heard on Gulf Intelligence's podcast [LINK] made by Victor Yang (JLC Network Technology Snr Analyst) which noted the discount on Russian oil to Brent has evaporated recently, which removes the incentive for Chinese refiners to keep up the pace of imports. The second chart below shows Russia's Asian customers. Our Supplemental Documents package includes the Bloomberg report.

Figure 36: Russia's seaborne crude shipments thru Apr 28 week



Source: Bloomberg

Figure 37: Russian crude exports by Asian destination



Source: Bloomberg

Oil: Bloomberg OPEC production -50,000 b/d MoM to 26.810 mmb/d in April

OPEC+ April production - 50,000 b/d

On Wednesday, Bloomberg posted its monthly survey of OPEC production. (i) The Bloomberg survey estimates OPEC production was -50,000 b/d MoM to 26.810 mmb. (ii) There were no revisions to March's estimates. (iii) The largest MoM changes in Apr vs Mar were: Libya was +60,000 b/d MoM to 1.190 mmb/d and Iraq +50,000 b/d which to 4.220 mmb/d. Nigeria's recovery saw another -50,000 b/d setback and is now down to 1.420 mmb/d, and Iran was also down -50,000 b/d to 3.130 mmb/d. Venezuela was -30,000 b/d MoM to 0.840 mmb/d. Below is the Bloomberg survey table.

Figure 38: Bloomberg Survey OPEC production in April (mb/d)

Production ('000 b/d)		Apr	Mar	Chg	Capacity
Total OPEC		26,810	26,860	-50	33,460
Algeria		910	910	0	1,060
Congo, Republic		250	240	+10	300
Equatorial Guinea		50	60	-10	120
Gabon		210	230	-20	220
Iran		3,130	3,180	-50	3,830
Iraq		4,220	4,170	+50	4,800
Kuwait	i	2,430	2,430	0	2,820
Libya		1,190	1,130	+60	1,200
Nigeria		1,420	1,470	-50	1,600
Saudi Arabia	i	9,040	9,040	0	12,000
U.A.E.		3,120	3,130	-10	4,650
Venezuela		840	870	-30	860

Source: Bloomberg

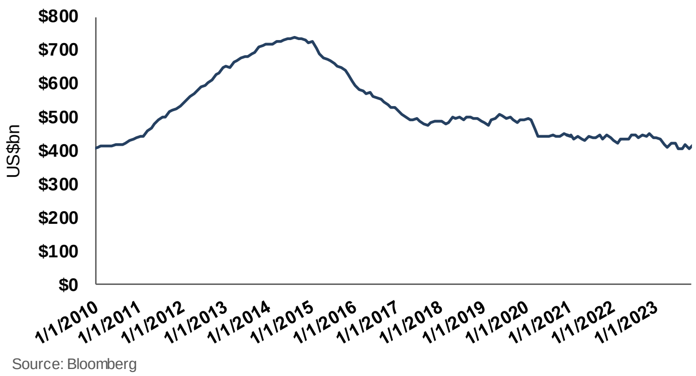
Oil: Saudi nest egg, its net foreign assets were up +$22.1b MoM in March

Saudi net foreign assets

On Tuesday, the Saudi Central Bank (SAMA) released its Monthly Statistical Bulletin for the month of March [LINK]. We continue to believe the #1 financial theme for Saudi Arabia in the 2020s will be their continued, and increasing, use of Other People's Money as they try to transition their country to MBS's Vision 2030. We believe this has been obvious with how

Saudi Arabia's net foreign assets dropped by ~37% or $256.2b over the last nine years (since March 2015). We are surprised that markets and oil watchers didn't seem to pay attention to the Saudi net foreign assets data i.e., what we call their nest egg to help them their push to MBS's Vision 2030. There was a +$22.1b MoM increase to Saudi Arabia's net foreign assets which are now $434.2b in March vs $412.1b in February. Recall that in November, there was a +$11.7b increase after a -$13.9b MoM decrease to $406.3b in October vs $420.2b in September. We have to believe this was due to some timing issues or other external fund injections. But the thesis and big picture remains, Saudi net foreign assets as of March 31 of $434.2b is a decline of ~41% or $302.8b over the last 9 years from its peak of $737.0b on Aug 31, 2014. That is an average of $2.7b per month for the last 114 months since the peak. One factor over the last several years is that Saudi Arabia has been moving more capital to its PIF (Public Investment Fund) but those would generally be into less liquid assets. Saudi Arabia is far from going broke but there has been a huge decline in the last 9 years. This net foreign asset depletion is why we have been highlighting that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money (OPM) to fund as much of their Vision 2030 as possible. And no question, accessing OPM has helped to slow down and temporarily pause the decline in net foreign assets. Our supplemental documents package includes an excerpt from the SAMA monthly bulletin. Below is our graph of Saudi Arabia net foreign assets updated for the March data.

Figure 39: Saudi Arabia Net Foreign Assets



Source: Bloomberg

Saudi Arabia GDP

Oil: Saudi GDP needs both 10 mmb/d production and Brent over $80

Saudi Arabia has done a great job of managing oil markets to keep an $80 oil price but it's been at the cost of a voluntary extra 1 mmb/d cut. Their challenge is how to keep oil prices strong (say over $80) while bringing back the 1 mmb/d of voluntary cuts. Because if they can't bring that 1 mmb/d back on, even under $80 or $90 oil, Saud GDP will likely be in contraction. We were reminded of this math on Thursday when Bloomberg TV had a graph titled "*Saudi GDP Contacts: Non-oil sector continue to grow*". The beauty of Bloomberg terminals is that we can then add or take out data so we took out the non-oil growth and added Brent oil price and Saudi oil production. Early Thursday morning, we tweeted [LINK] "*Saudi GDP challenge. Needs to to keep #Oil prices solid AND add back its 1 mmb/d voluntary cut. 9 mmb/d and $80/90 oil isn't enough for GDP growth. Needs China recovery to* *pick up. Thx @business for base graph. #OOTT."* Our modified graph is below and it shows how Saudi needs to get that 1 mmb/d back on to get GDP back to positive. So that is the challenge how to bring back the 1 mmb/d and keep oil prices high.

Figure 40: Saudi Arabia GDP, oil production and Brent oil price

Source: Bloomberg

Oil: Netanyahu, Hamas is entrenched in its positions, Israel will not agree to Hamas

Netanyahu says no to Hamas demands

Please note that we have a 7am MT news cut off so we will not be able to see what the Biden Administration says and what followup up there is from Hamas and others in Israel say to the breaking news around 5am MT of Netanyahu's clear response to any Hamas position. We tweeted [LINK] "*Breaking! Still critical differences between Israel & Hamas. Netanyahu "Israel will not agree to Hamas's demands, which mean surrender, and will continue the fighting until all its goals are achieved". And Hamas "remains entrenched in its positions." Thx @Lazar_Berman #OOTT."* Our tweet included the Times of Israel report [LINK] this morning. "*Netanyahu: Israel will not agree to a deal with Hamas that demands end to the war*". Netanyahu had a simple and clear message and one that is saying there is no deal unless Hamas moves off its positions. Here is the short and sweet Times of Israel report. "*Amid swirling rumors over the weekend of international pressure on Israel to agree to an effective end to the war in Gaza as part of a hostage release deal, Prime Minister Benjamin Netanyahu releases a video statement emphasizing in no uncertain terms that Israel will not accept an end to the campaign and the withdrawal of IDF troops from the Strip. "Israel cannot accept this," he says. "We are not ready to accept a situation in which the Hamas battalions come out of their bunkers, take control of Gaza again, rebuild their military infrastructure, and return to threatening the citizens of Israel in the surrounding communities, in the cities of the south, in all parts of the country." "Israel will not agree to Hamas's demands, which mean surrender, and will continue the fighting until all its goals are achieved,' says Netanyahu, repeating a message he has expressed throughout the war. Netanyahu says accepting Hamas's demands would only bring the next conflict closer, and would allow Hamas to carry out another massacre in the future. The prime minister stresses that Israel is still open to a deal, but Hamas "remains entrenched in its positions." Senior officials from the US, Qatar, and Egypt are in Cairo, as are Hamas officials. Netanyahu decided not to send a delegation at this stage."*

How much of the ~$7 Brent decline was due to the prospects of a Hamas deal?
One of the problems with a 7am MT news cut off is that we are writing this as of that time and so don't have the luxury of writing on Sunday night after oil has started trading and Biden Admin, Hamas and everyone else has weighed in on the Netanyahu statement. Our second tweet earlier this morning was [LINK] "*Will any Biden Admin appear on cable news today? If so, what will they say? Netanyahu seems clear. IF so, we will get a chance to see how much of the ~$7 drop in Brent is really due to a Hamas/Israel deal being close. #OOTT.*" Oil prices have declined over the past week or two with the increasing chatter/opinion that a Hamas/Israel deal of some sort was going to happen. So unless Netanyahu backs off today or Hamas indicates they will move, we will get a chance to see tonight how much of $7 decline in oil prices is linked to a Hamas deal being likely.

Figure 41: Brent oil down ~$7 in last week

Source: EIA

Oil: Houthis say expanding attacks into Mediterranean Sea

Houthis leader speech

We suspect that most don't believe Houthis can do this so it will be a bit of a Show Me situation but, on Friday, the Houthis armed forces warned the Mediterranean Sea is now in their target area. So even though people will be in a Show Me, if they can launch a missile or drone and hit a target in the Mediterranean Sea, it will mean they can also reach all of Israel and not just the very south of Israel. On Friday night, we tweeted [LINK] "*Houthis expanding target range to incl all ships linked to Israel "heading to the ports of occupied Palestine from the Mediterranean Sea in any reachable area within our ample zone." ie. relief ships. So far Houthis have been delivering on target threat areas. #OOTT.*" We don't know if the Houthis can reach the Mediterranean but we note that, at least so far, the Houthis have been able to hit targets where they said they can. Saba (Yemen Houthis side news) reported [LINK] "*The Yemeni Armed Forces observe the developments of the battle in the Gaza Strip, of the ongoing Israeli-American aggression and serious preparations to carry out an aggressive military operation against the Rafah area, as well as the deal presented to the resistance in which the enemy wants to extract the captives card without a permanent ceasefire. Accordingly; In implementation of the instructions of Commander Sayyed Abdul-Malik Badr al-Din al-Houthi, may Allah protect him, and in triumphing for the oppression of the Palestinian people, and in response to the calls of the Palestinian people, and with the intransigence of the Israeli and American enemy, the Yemeni armed forces announce the beginning of the implementation of the fourth stage of escalation, as follows: First, the targeting of all ships that violate the ban decision of Israeli navigation and that heading to the ports of occupied Palestine from the Mediterranean Sea in any reachable area within our ample zone.*"

Oil: UKMTO confirms Houthis hit container ships 300-400 miles south of Yemen

Houthis hit way south of Yemen

On Tuesday, the UKMTO confirmed that the Houthis hit the container ship MSC Orion 300-400 nautical miles south of Yemen in the Arabian Sea. The attack surprised as it was the farthest south Houthis attack on a ship. The significance of this attack is that it is another example of the Houthis leader warning on something that most questioned was possible and then the Houthis doing it. The Houthis leader warned on April 25 that they were expanding their attacks into the Indian Ocean and this attack was four days later.

Figure 42: Gulf of Aden, Arabian Sea and Indian Ocean

Source: Google Maps

Oil: Houthi, Indian Ocean is a vast area for the US/UK to protect

Houthis leader speech

The Houthis Leader big speech on Thursday included a couple of good reminders relevant to oil and global economy. (i) On Friday morning, we tweeted [LINK] "*Houthis don't plan to go away. Even if Hamas ceasefire, "conflict with the enemy will not end unless it is removed from all of the land of Palestine" Reminds of increasing challenge for US/UK "Red Sea a small pond in view of the vastness of the India Ocean" #OOTT."* (ii) Need ore than a Hamas ceasefire for the Houthis to stop their fight, need Israel out of Palestine. Houthis leader said "*If the round of negotiations in Gaza succeeds, and the situation calms down, that does not mean the end of the battle and conflict with the enemy, but rather it means the completion of a round of escalation, and when we reach the end of this round with the Israeli enemy, the conflict with the Israeli enemy will continue." He pointed out that the conflict with the Zionist enemy is inevitable, because it is in a state of occupation, usurpation, aggression, crime and injustice, and the conflict with the enemy will not end unless it is removed from all of the land of Palestine and cleansing it... Pointing out that the completion of rounds or the obtaining of certain truces does not mean the end of the conflict with the Zionist enemy."* (iii) Increasing challenge for US/UK now that the Houthis have expanded its attacks to Arabian Sea/Indian Ocean. The Houthis Leader made a good point on the challenge for US and UK when the Houthis expanded their attacks to Arabian Sea and Indian Ocean – that is a huge area for the US and UK to protect and will bring risk to some of the travel around the Cape of Good Hope as it nears Arabian Sea and Indian Ocean. Saba wrote "*Sayyed, Abdul-Malik Badr Al-Din Al-Houthi addressed the enemies' deep annoyance and anxiety over the Yemeni operations that extended to the Indian Ocean, stressing that the Americans, British, or Israelis may not have expected these operations with their long reach to the Indian Ocean, and with moving targets. He stated that the American was astonished by the level of Yemeni technology, and also by the level of tactics in carrying out the Yemeni military operations to target Zionist, American and British ships... stressing that the American failed miserably even to prevent military operations from hitting the targets, despite his efforts to prevent the launching of missiles and drones and his extensive monitoring. He said: "Experts realize that our naval operations are complex and important, and are based on advanced capabilities, and American-British newspapers quoted experts, officers, and leaders who feared the Yemeni capabilities, their extent, and their accuracy in attacking." He considered the Red Sea a small pond in view of the vastness of the Indian Ocean."* Our Supplemental Documents package includes the Saba report.

04/25/24: Houthis leader expanding attack in India Ocean opposite Gulf of Aden
Here is what we wrote in last week's (Apr 28, 2024) Energy Tidbits memo. The Houthis seemed to take a pause in their missile/drone attacks for a week or two but resumed this week. On Thursday, the Houthis Leader speech included what he said was the reason for lesser attacks – there were less US ships. Saba (Houthi news) wrote "*He pointed out that the American naval presence had shrank, and many of its warships had disappeared and were scattered on the outskirts of the Red Sea. Sayyed Abdul-Malik stated that the movement of American ships that were passing through the Red Sea decreased by 80 percent.*" The highlight of his Thursday speech was on the Indian Ocean. On Thursday, we tweeted [LINK] "*Houthis leader "There is a continuous effort to expand and strengthen Yemeni military operations in its new theater, which it extended to in the Indian Ocean, opposite the Gulf of Aden" #OOTT.*" Saba wrote "*The revolution leader , Sayyed Abdul-Malik Badr al-Din al-Houthi, affirmed the endeavor to expand and strengthen Yemeni military operations in the Indian Ocean in a way that was not in the minds and calculations of the Americans, the British, the Israelis, and perhaps all countries of the world. Sayyed Abdulmalik Badr al-Din al-Houthi said in his speech today, Thursday, about the latest developments in Palestine and regional developments, "There is a continuous effort to expand and strengthen Yemeni military operations in its new theater, which it extended to in the Indian Ocean, opposite the Gulf of Aden, in a way that was never in the minds and calculations of the Americans, the British, and the Israelis and perhaps all countries of the world."* Our Supplemental Documents package includes the Saba report on the Houthis speech.

Figure 43: Gulf of Aden, Arabian Sea and Indian Ocean

Source: Google Maps

03/15/24: Houthis leader warned on Indian Ocean & to Cape of Good Hope
The Houthis Leader first warned on their expanding attacks in the Indian Ocean on Mar 13. Here is what we wrote in our Mar 15, 2024 Energy Tidbits memo. *"If there is one thing that is clear from the US/UK attacks on the Houthis, it's that the Houthis aren't going away. Rather, they keep warning the US that they are expanding their attack areas. On Friday morning, we tweeted [LINK] "Houthis leader expanding missile/drone attack region from Red & Arabian Seas to "even across the Indian Ocean and from South Africa towards the Good Hope Road". Also stepping up criticism of Arab regimes not stepping up to help Gaza. #OOTT." The Houthis leaders made his normal Thursday night speech and the new disclosure this week was how he said the Houthis were expanding their targets t the Indian Ocaean and down to the Cape of Good Hope. Saba reported on the Houthis leader's speech and wrote "He revealed the serious intention to continue expanding the scope of military operations to areas and locations that the enemy never expected. Al-Sayeed added, "We are moving, with Allah grace to prevent the crossing of ships linked to the Israeli enemy, even across the Indian Ocean and from South Africa towards the Good Hope Road."*

Oil: Maersk sees Red Sea workaround from Houthis until "well into the second half"
Maersk reported its Q1 on Thursday and expects the no return to Red Sea shipping for most of this year. We tweeted [LINK] "*No visible near-term end to #Houthis disrupting Red Sea shipping. "... conditions in the Red Sea remain entrenched ..... we now expect these conditions to stay with us for most of the year" Maersk CEO Clerc. #OOTT."* CEO Clerc's main message upfront in the Q1/24 release started off ""*We had a positive start to the year with a first quarter developing precisely as we expected. Demand is trending towards the higher end of our market growth guidance and conditions in the Red Sea remain entrenched. This not only supported a recovery in the first quarter compared to the previous quarter, but also provide an improved outlook for the coming quarters, as we now expect these conditions to stay with us for most of the year."* Maersk subsequently posted its Q1 investor presentation that said it slightly differently "*Current situation will be with us well into the second half".*

No visibility to return to Red Sea shipping

Oil: Will oil companies take a lesser deal to get Kurdistan oil flowing?
At least it looks like it is clear what the issue is that is holding up the restart of Kurdistan oil via the pipeline in Turkey – it looks like it is up to the international oil companies to accept the tougher terms in moving from production sharing contracts with Kurdistan to the form of oil agreements and royalties consistent with Iraq oil deals. Yesterday, Rudaw (Kurdistan news) reported that Erbil and Baghdad agreed to the formation of two joint committees to resolve the contract situation. Rudaw reported "*Iraqi Oil Minister Hayyan Abdul Ghani told reporters on Thursday that two joint Baghdad-Erbil committees have been formed to resolve the contract situation between Erbil and the international oil companies (IOCs) as they are production-sharing contracts - agreements he said are incompatible with the Iraqi constitution*." And ""*There has not yet been an agreement with the Kurdistan Regional Government on handing over the oil produced in the Region to the federal oil ministry," the Iraqi oil minister said on Thursday, adding that there are "differences regarding contracts signed with the international companies*." Our Supplemental Documents package includes the Rudaw report.

No visibility to restart Kurdistan oil

Oil: No production update from Libya NOC since Mar 21

No Libya oil production update

As of our 7am MT news cut off, we still 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. Our Apr 14, 2024 Energy Tidbits memo highlighted the appointment a new Libyan oil minister Khalifa Abdul Sadiq, who was previously Deputy Oil Minister. But we still haven't seen any production update.

Oil: China's Politburo signals near-term support for economy

China Politburo on near-term support

China recognizes that there has been a solid start to 2024 for the economy but there are still challenges so the government signaled it will continue near-term support for the economy. Early Tuesday morning, we tweeted [LINK] "*China Politburo signals near-term support for economy. Recognizes still challenges. "country should front-load efforts ..." "necessary to flexibly employ policy tools such as interest rates & reserve requirement ratios ..""" " introduce more consumption scenarios ..." #OOTT.*" Our tweet included the Xinhua (statement media) reporting of the Politburo meeting in Beijing on what they will report to the Central Committee in July. The Politburo recognizes there are still challenges for the economy but the reporting was they play to provide near term support for the economy. Xinhua wrote "*The country should front-load efforts to effectively put the established macro policies in place, and well implement a proactive fiscal policy and a prudent monetary policy. Ultra-long special treasury bonds should be issued at an early stage and put in good use, while the issuance and utilization of special-purpose bonds should be expedited. It is necessary to flexibly employ policy tools such as interest rates and reserve requirement ratios to increase support for the real economy and reduce the overall financing cost of the society, the meeting noted. The meeting stressed the need to assess the consistency of macro policy orientation, advance large-scale equipment renewals and trade-ins of consumer goods, introduce more consumption scenarios, promote people-centered new urbanization, and implement a new mechanism for cooperation between the government and private capital, while fully stimulating private investment.*" Our Supplemental Documents package includes the Xinhua report.

Oil: China offers trade-in incentives on used cars so more new cars can be sold

China incentives to trade-in used cars

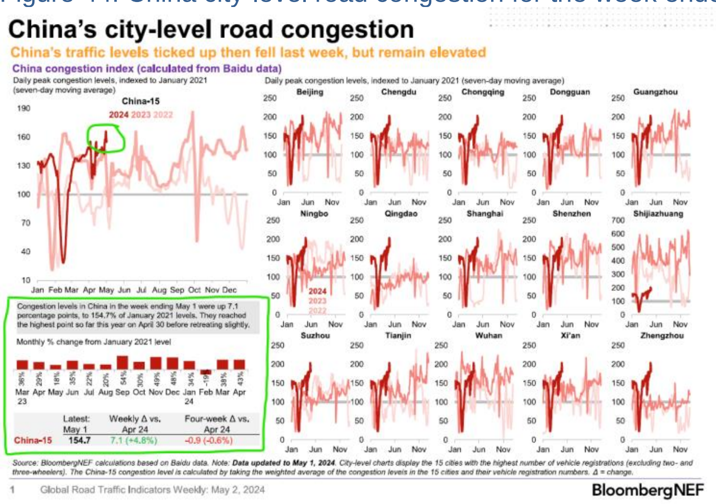
The above item on the Politburo signaling near-term support for consumers including to support "*trade-ins of consumer goods*". And they have just done so on a key consumer good – getting the trade-in of used cars for new cars. Xinhua wrote "*The [Politburo] meeting stressed the need to assess the consistency of macro policy orientation, advance large-scale equipment renewals and trade-ins of consumer goods, introduce more consumption scenarios, promote people-centered new urbanization*". China introduced incentives to trade-in cars. Last Sunday night, we tweeted [LINK] "*ICYMI. China auto stocks up today. China to give one-time subsidy of as much as 10,000 yuan ($1,380) to consumers who trade in their old vehicles and buy a newer model, and a 7,000 yuan who trade in new vehicles. See 👇@Lindadalew report. #OOTT.*" The interesting part of this trade-in incentive is that it also includes EVs and Hybrids sold before 2018 so these aren't really old cars. The incentive lasts thru 2024. Bloomberg wrote "*Drivers who trade in electric vehicles or hybrids registered before 2018, or gasoline cars that don't comply with China's 2007 emissions standards, and purchase a new qualifying vehicle will get 10,000 yuan, the Ministry of Commerce said in a statement Friday. Customers who trade in newer vehicles will receive 7,000 yuan, it said. The program, which runs until the end of 2024, is part of Beijing's latest effort to boost consumption to accelerate economic growth that's been hurt by a property crisis and weak consumer sentiment.*".

Oil: Baidu China city-level road congestion reaches new YTD high

China city-level traffic congestion

On Thursday, we tweeted [LINK] "*Positive indicator for China recovery is more traffic in China cities. China Baidu city-level road congestion tor Top 15 cities Apr 2024 was 110% of Apr 2023. Mar 2024 was 100% of Mar 2023. Note May Day 1-5 holiday will see plunge in city traffic. Thx @BloombergNEF #OOTT".* It's only one indicator but it is positive to see the Baidu city-level road congestion continue to increases. More driving activity in cities is a good indicator. On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly May 2 report, which includes the Baidu city-level road congestion for the week ended May 1. This week saw traffic levels continue on their upward trend even prior to the Tomb-Sweeping holiday drop. Baidu city-level road congestion was +710bps WoW to 154.7% of Jan 2021 levels. This is the highest point so far in the year and the Top 15 cities in April 2024 are 110% of April 2023. Below is the BloombergNEF key graph.

Figure 44: China city-level road congestion for the week ended May 1



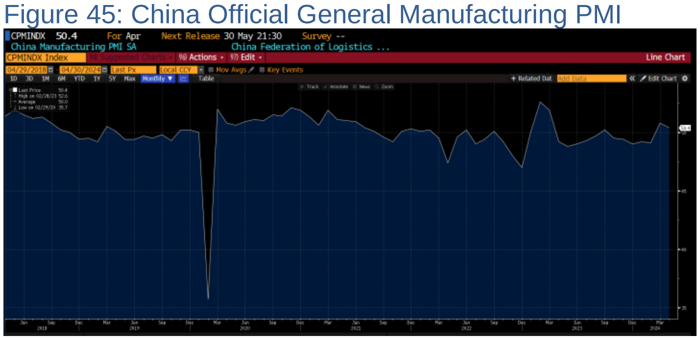
Source: BloombergNEF

Oil: China official Manufacturing PMI at 50.4 in April, 2nd consecutive expansion

China official Manufacturing in expansion

As a reminder, there are two China manufacturing PMI data from S&P Global that come out each month. The Official Manufacturing PMI that normally comes out earlier the same day or the day before the Caixin Manufacturing PMI data that we track. We have focused on the Caixin Manufacturing PMI as it is viewed as more of a leading indicator for how the China recovery is doing as it is a more of a smaller Chinese company who are export-oriented PMI and exports have been the big driver of China for the past 20 years. On Monday, we tweeted [LINK] "*China recovering. 2nd mth of expansion in Official China Manufacturing PMI after 5 negative mths. Apr 50.4 (est 50.3) Mar 50.8 Feb 49.1 Jan 49.2 Dec 49.0 Nov 49.4 Oct 49.5 More smaller export oriented firm Caixin Manufacturing PMI out in 15 mins. Thx @business #OOTT".* Note that while this is only the second consecutive month of expansion in the official PMI measure after five months of contraction, the Caixin PMI had been in expansion since Nov. It means that the manufacturing PMIs for larger domestic firms and smaller export-oriented firms are both in expansion. Since both are pointing in the right direction, it seems to be at least an indicator that the economy is stabilizing.

Figure 45: China Official General Manufacturing PMI



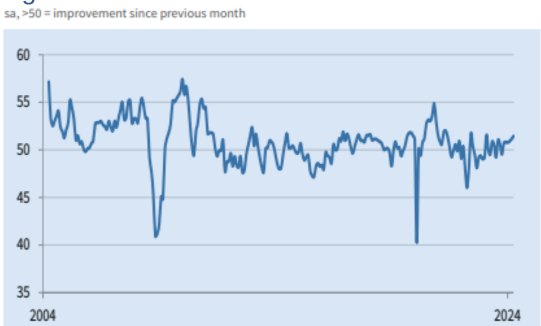
Source: Bloomberg

Oil: Caixin Manufacturing PMI at 51.4 in April, 6th straight expansion

Caixin Manufacturing Apr PMI 51.4

As a reminder, there are two China manufacturing PMI data from S&P Global that come out each month. The Official Manufacturing PMI that normally comes out earlier the same day or the day before the Caixin Manufacturing PMI data that we track. We have focused on the Caixin Manufacturing PMI as it is viewed as more of a leading indicator for how the China recovery is doing as it is a more of a smaller Chinese company who are export-oriented PMI and exports have been the big driver of China for the past 20 years. The Caixin Manufacturing PMI for April was released at 6:45pm MT Monday night [LINK]. The seasonally adjusted headline Caixin PMI was 51.4 in April, up from March's 51.1. This is the 16th month in a row of increased services activity. Commenting on the official manufacturing PMI on Saturday, we tweeted [LINK] "*6th straight month of expansion for China smaller & export oriented firms. China Caixin Manufacturing PMI Apr 51.4 (est 51.0) Mar 51.1, Feb 50.9, Jan 50.8, Dec 50.8, Nov 50.7, Oct 49.5. "manufacturers' output and total new orders continued to grow…" Thx @SPGlobalPMI. #OOTT".* Our Supplemental Documents package includes Caixin Manufacturing PMI report.

Figure 46: China Caixin General Manufacturing PMI



Source: Caixin, S&P Global

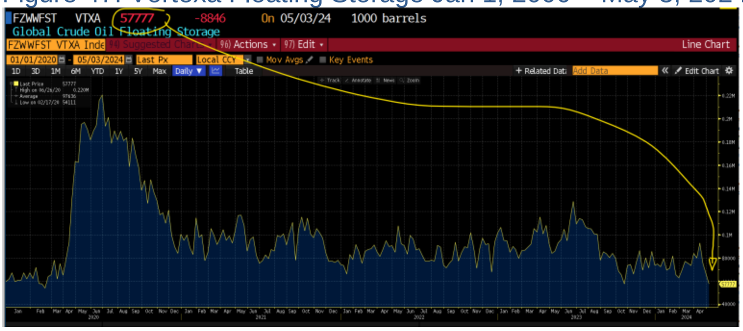
Vortexa floating storage

Oil: Vortexa crude oil floating storage est 57.78 mmb at May 3, -8.45 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 27 at 9am MT. (i) Yesterday, we tweeted [LINK] *"#Oil floating storage -35 in last 3 wks to 57.78 mmb May 3. Lowest since Covid. Incl Asia -25 mmb, was this Iran slashing prices to clear floating storage? Crude on water may be big w/ avoiding Red Sea BUT floating storage is low. Thx @vortexa @business #OOTT."* (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for May 3 at 57.78 mmb, which is -8.45 mmb WoW vs upwardly revised Apr 26 of 66.23 mmb. Note Apr 26 was revised +5.59 mmb vs 60.64 mm originally posted at 9am MT on Apr 27. (iii) Floating storage is down -34.99 mmb over the past three weeks, which included Asia being down ~25 mmb in that period. Our tweet noted our wondering if this was Iran slashing prices to clear up floating storage buildup in March. The other highlighted item is that there have only been 13 weeks in the 60s/50s since Covid and 57.78 mmb on May 3, unless revised, would be the lowest since Covid. (v) Revisions. Other than the +5.59 mmb revision to Apr 26, all other revisions for the past seven weeks were small. Here are the revisions for the past seven weeks compared to the estimates originally posted on Bloomberg at 9am MT on Apr 27. Apr 26 revised +5.59 mmb. Apr 19 revised -0.78 mmb. Apr 12 revised -0.54 mmb. Apr 5 revised -0.99 mmb. Mar 29 revised +2.46 mmb. Mar 22 revised -0.05 mmb. Mar 15 revised +0.16 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 75.69 mmb vs last week's then seven-week average of 77.32 mmb. (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) May 3 estimate of 57.78 mmb is -70.87 mmb vs the recent June 23, 2023 high of 128.65 mmb. Recall Saudi Arabia stepped in on July 1, 2023 for additional cuts. (ix) May 3 estimate of 57.78 mmb is -26.06

mmb YoY vs May 5, 2023 of 83.84 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT May 4, 9am MT Apr 27, and 9am MT Apr 20.

Figure 47: Vortexa Floating Storage Jan 1, 2000 – May 3, 2024, posted May 4 at 9am MT



Source: Bloomberg, Vortexa

Figure 48: Vortexa Estimates Posted 9am MT on May 4, Apr 27, and Apr 20

Posted May 4, 9am MT		Apr 27, 9am MT		Apr 20,9am MT	
Date	Last Px	Date	Last Px	Date	Last Px
Fr 05/03/2024	57777	Fr 04/26/2024	60640	Fr 04/19/2024	74136
Fr 04/26/2024	66623	Fr 04/19/2024	76105	Fr 04/12/2024	92054
Fr 04/19/2024	75328	Fr 04/12/2024	93310	Fr 04/05/2024	79659
Fr 04/12/2024	92765	Fr 04/05/2024	80901	Fr 03/29/2024	81018
Fr 04/05/2024	79913	Fr 03/29/2024	81486	Fr 03/22/2024	72932
Fr 03/29/2024	83948	Fr 03/22/2024	73494	Fr 03/15/2024	75322
Fr 03/22/2024	73442	Fr 03/15/2024	75298	Fr 03/08/2024	76387
Fr 03/15/2024	75464	Fr 03/08/2024	76132	Fr 03/01/2024	69260
Fr 03/08/2024	76969	Fr 03/01/2024	69176	Fr 02/23/2024	62745
Fr 03/01/2024	69521	Fr 02/23/2024	62727	Fr 02/16/2024	65579
Fr 02/23/2024	62997	Fr 02/16/2024	65563	Fr 02/09/2024	81703
Fr 02/16/2024	65681	Fr 02/09/2024	81627	Fr 02/02/2024	71281

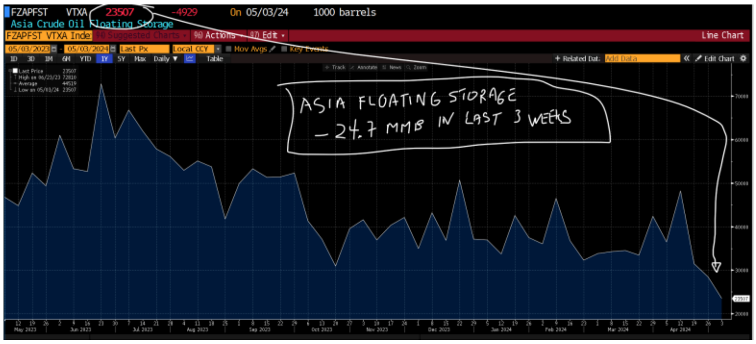
Source: Bloomberg, Vortexa

Oil: Did Iran cut prices to find customers in China or India for its floating oil storage?

Asia floating storage -24.73 mmb in last 3 weeks

Asia crude oil floating storage is -24.73 mmb drop from 48.23 mmb on Apr 12 to 23.50 mmb on May 3 and, as we wrote in last week's (Apr 28, 2024) Energy Tidbits memo, we have to wonder is this is due Iran slashing prices so they could clear up floating storage in Asia. Iran had trouble moving its oil in March so there would have been a build up in floating storage. So the question is if Iran discounted prices enough to find China or India customers. Our Apr 21, 2024 Energy Tidbits memo was titled '*Vortexa: Iran Floating Oil Storage Up 10 mmb in March, Struggling to Find China Buyers Despite Deeper Discounts*". Last week's memo wrote "*There was negative oil market views on Iran and China from Vortexa on Wednesday that didn't any market attention. On Thursday, we tweeted [LINK] "Vortexa seeing "little bit of weakness" on China buying. Iranian crude oil floating storage +10 mmb in Mar. Iran offering wider discounts than normal but "struggling to find buyers in China". See 👇SAF Group transcript. Thx @Vortexa Jay Maroo, @gulf_intel #OOTT." Vortexa's Jay Maroo highlighted Iran floating storage was up 10 million barrels in March, and that it was struggling to find buyers in China for its crude even though it was offering wider discounts than normal. Maroo* *was on the Gulf Intelligence Apr 17 podcast and or tweet was a day later. Maroo is Head of Market Intelligence and Analytics MENA, Vortexa. He also highlighted Iran was exporting 1.4 mmb/d in March and that was very high vs year ago levels. Maroo also said the increasing Ian n floating storage of 10 million barrels "What that suggests and I think we will probably come to this later on is a little bit of weakness coming in from China on the buying side of things. And I guess that probably feeds into the wider comment about bearishness on oil prices because of demand issues." Maroo also highlighted that ""And actually looking ahead to the second half of the year, we think, at best, it will be similar to year ago levels. So when it comes to China importing much more crude, we're not very bullish on that. The only thing that could change that is if there is a significant decrease in the price and obviously Chinese being very opportunistic buyers, they'd be quick to pick that up. But that hasn't really happened yet. Speaking to some of our wider network, we're hearing that some of the Iranian crude that is being offered, is being offered at deeper discounts than usual to some new buyers. And what that suggests to me is that, even with Iranian crude being priced so cheap, they're struggling to find buyers in China that are willing to pay even below market rates. So they are going to have dig deeper to get those barrels into China.".*

Figure 49: Vortexa crude oil floating for Asia region Jan 1, 2020 to May 3, 2024



Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Bloomberg also posts the Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, 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 26, in total, was revised +5.59 mmb with the key revisions West Africa revised +2.24 mmb and Asia revised +2.14 mmb. (ii) As noted above, May 3 of 57.78 mmb was -8.45 mmb WoW vs the upwardly revised Apr 26 of 66.23 mmb. The major WoW changes by region was Asia -4.93 mmb. (iii) May 3 of 57.78 mmb is -70.87 mmb vs the summer June 23, 2023 peak of 128.65 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 -49.30 mmb and Other -22.96. (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 26 that was posted on Bloomberg at 9am MT on Apr 27.

Figure 50: Vortexa crude oil floating by region

				Original Posted	Recent Peak	
Region	May 3/24	Apr 26/24	WoW	Apr 26/24	Jun 23/23	May 3 vs Jun 23
Asia	23.51	28.44	-4.93	26.30	72.81	-49.30
Europe	5.87	5.77	0.10	6.73	6.16	-0.29
Middle East	8.86	8.77	0.09	8.75	6.76	2.10
West Africa	6.64	7.52	-0.88	5.28	7.62	-0.98
US Gulf Coast	1.56	2.91	-1.35	1.29	1.00	0.56
Other	11.34	12.82	-1.48	12.29	34.30	-22.96
Global Total	57.78	66.23	-8.45	60.64	128.65	-70.87
Vortexa crude oil floating storage posted on Bloomberg 9am MT on May 4						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil: Asia/Pacific international Mar passenger air travel up +38.6% but -13.2% vs 2019

Asian Pacific air traffic in Mar

On Tuesday, the Association of Asia Pacific Airlines released its March traffic results [LINK] which is comprised of aggregate data across a total of 40 Asia Pacific airline carriers. (i) Air travel. International passenger air travel on the 40 airlines is up big YoY, but still well below 2019 levels. The AAPA reports preliminary March 2024 travel figures were up +38.6% from March 2023. The AAPA wrote "*Preliminary March 2024 traffic figures released today by the Association of Asia Pacific Airlines (AAPA) showed the continuation of robust growth in both international air passenger and air cargo demand, which is in line with a steady expansion in global economic activity. Reflecting positive business and consumer sentiment, the region's carriers carried a combined total of 28.2 million international passengers in March, a 37.5% increase from the 20.5 million recorded in the same month last year. Traffic averaged 86.8% of 2019 volumes. As measured in revenue passenger kilometres (RPK), demand rose by 38.6% year-on-year, with available seat capacity increasing in equal measure. As a result, the international passenger load factor at 82.0%, remained unchanged from the previous corresponding month".* (ii) Air cargo was up +15.3% YoY, measured in Freight Tonne Kilometres (FTK), but the load factor fell 50 bps. Meanwhile, headline capacity measured in Available Seak Kilometres (ASK) expanded +38.6%, which was why the freight load factor fell (more belly space relative to freight). iii) Subhas Menon, Director General of the AAPA, said "*March saw another healthy expansion in both passenger and cargo markets, culminating in a strong first quarter performance for 2024. For the three-month period, Asian airlines registered a 47% year-on-year increase in the number of passengers carried, fuelled by a surge in demand for both leisure and business travel. Additionally, international air cargo traffic witnessed a solid 16% year-on-year increase during the same period, signaling that the full recovery of the Asia Pacific airline industry is well within sight*". Below is a snapshot of the APAA's traffic update.

Figure 51: APAA Preliminary International Air Traffic Data

International	Mar-24	Mar-23	% Change
Passengers (Thousand)	28,168	20,493	+ 37.5%
RPK (Million)	101,585	73,283	+ 38.6%
ASK (Million)	123,858	89,378	+ 38.6%
Passenger Load Factor	82.0%	82.0%	+ 0.0 pp
FTK (Million)	6,278	5,445	+ 15.3%
FATK (Million)	10,007	8,614	+ 16.2%
Freight Load Factor	62.7%	63.2%	- 0.5 pp

Source: AAPA

Oil: Europe airports daily traffic 7-day average is -2.9% below pre-Covid levels

Europe airports daily traffic

Yesterday, we tweeted [LINK] "*Daily Europe air traffic still below Covid. 7-day average got to 1.5% below Covid on Apr 22, but is back to 2.9% below as of May 2. Vs 3.2% below as of Apr 25. 3.2% below Apr 18, 3.7% below Apr 11, 6.2% below Apr 4 and 7.0% below as of Mar 28. Thx @eurocontrol #OOTT*" Other than over Christmas, European daily traffic at airports has been below pre-Covid. However, it has been staying just a little below over the past five weeks and even got to only 1.5% below Covid as of Apr 22 before falling back. 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 May 2 was a little better WoW to 2.9% below pre-Covid levels vs 3.2% below at Apr 25, -3.2% for Apr 18, -3.7% to end of Apr 11, -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 May 2

Source: Eurocontrol

Oil: Germany air increases passenger tax by 19%

Europe airports daily traffic

German air passengers weren't too happy this week when the government raised its air passenger tax by 19%, which the IATA says will increase the tax by "*between EUR 15.53 and EUR 70.83 per passenger, depending on the route".* One EUR is currently US$1.08. The IATA reminds that this will hurt Germany's air travel recovery. The IATA wrote *"The tax will make Germany less competitive in key economic areas such as exports, tourism, and jobs. It will further affect Germany's air transport recovery from the pandemic, which is one of the slowest in the EU. Germany's international passenger numbers, for example, are still 20% below pre-pandemic levels*." The IATA also reminds that Germany is not committed to use the air passenger tax to directly fund production of Sustainable Aviation Fuel, rather this ends up being a general tax grab. The IATA wrote "*ATA also warned that the tax increase will hamper the industry's efforts to decarbonize. Aviation has a goal of reaching net-zero CO2 emissions by 2050 and sustainable aviation fuels (SAF) are vital to this effort. The German government coalition agreement originally stated that revenues from aviation taxes would directly fund production of SAF, but this commitment has been broken. In addition, weakening the German air transport industry with this tax makes it harder for airlines to invest in SAF, in a more fuel-efficient fleet and other decarbonization efforts."* Our Supplemental Documents package includes the IATA comment.

Oil & Natural Gas: sector/play/market/global insights from Q1 calls

Sector insights from Q1 calls

Please note that this is under Oil & Natural Gas but we include other sectors in our recap of earnings calls. This was a big week of Q1 reporting with in Canada, the US and around the world. One of our focus areas for reporting are the non oil and gas producers as we typically get some of the best macro insights from the services, pipelines, refineries, commodities traders, and utilities. We find we get the best insights into a range of oil and gas themes/trends, sectors and plays form the conference calls. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts, or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks.

Amazon: "service interruptions" could materially harm data center business

Amazon held its Q1 call on Tuesday. (i) On Wednesday, we tweeted [LINK] "*More Power Please! "the more demand AWS has, the more we have to procure new data centers, power and hardware." Amazon CEO Jassy on Q1 call .Need #NatGas for baseload or else risk service interruptions when wind doesn't blow or sun doesn't shine. #OOTT".* (ii) Amazon wasn't specific, and we couldn't see in their Q1 any detail on the fuel powering their existing data centers. Their comments were general but Amazon CEO Jassy highlighted that demand means they need more data centers and power. Jassy said "*We expect the combination of AWS's reaccelerating growth and high demand for GenAI to meaningfully increase year-over-year capital expenditures in 2024, which given the way the AWS business model works, is a positive sign of the future growth. The more demand AWS has, the more we have to procure new data centers, power and hardware*." (iii) Apple didn't specify natural gas or cast a stone against solar and wind for powering data centers, but Jassy stressed they can't have service interruptions or else there is a risk to materially harm the data center business. If Apple can't have service interruptions, then there is no way

Amazon can rely on solar and wind for its data centers as the primary and essential fuel. Our tweet included an excerpt from the 10Q risk factors where Amazon wrote in a section "We Face Risks Related to Successfully Optimizing and Operating Our Fulfillment Network and Data Centers. *Failures to adequately predict customer demand and consumer spending patterns or otherwise optimize and operate our fulfillment network and data centers successfully from time to time result in excess or insufficient fulfillment or data center capacity, service interruptions, increased costs, and impairment charges, any of which could materially harm our business."*

Baker Hughes: data centers need off-grid & distributed power

We are repeating an item from last week's (Apr 28, 2024) Energy Tidbits memo on Baker Hughes insights on data centers because we just aren't hearing people talking about how electricity will be provided for the massive growth in data centers. Here is what we wrote in last week's memo. "*Baker Hughes had a different perspective on the rapidly emerging problem/opportunity on how to power the escalating growth in power required by data centers/AI. Everyone talks about the hugely increasing power demand but Baker Hughes took it a little deeper and said this means a growing need for "off-grid solutions as well as distributed power generation", . Most talk about the need for more power but don't say anything more specific. In the Q&A, mgmt said "Yes, I'd agree with you that there is a growing realization that there is a growing demand for energy and that's being driven by some of the datacenters. And look, AI provides huge benefits both internally and also from an external perspective to us internally to drive optimization for our customers, but also externally to drive growth for our equipment and the services that we provide.And that's why we like the ready gas turbines that go on natural gas today, but then can switch to hydrogen. That's also why we like the solutions that we're offering with regards to other clean power solutions. And as we talk to our customers, that's what they're looking for. And when you look at the datacenter developers, they're all coming to a realization that there is going to be a growing need for off-grid solutions as well as distributed power generation with a view to continuing the aspect of reducing emissions. So there's also opportunities for geothermal and others where we play and we look at it as being a growing element of our equipment portfolio and a nice segment that again diversifies us versus others because of the portfolio that we have."*

Cameco: Data centers/crypto energy usage could double by 2026

Cameco held its Q1 call on Tuesday. (i) Don't see a US ban on Russia uranium imports is priced in. On Wednesday, we tweeted [LINK] ""*The market is not priced in that risk" of US cutting off Russian uranium supply said Cameco CFO Isaac on yesterday's Q1 call. Lot more in the Cameco Q1 call on the #EnergyTransition."* Cameco doesn't believe the market has priced in the risk of Russian uranium supply being stopped from coming to the US. (ii) AI/data centers power usage could double in 2-3 years. Cameco's Q1 slide deck wrote "*Traditional and AI data centers, cryptocurrencies have the potential to double their energy usage by 2026, increasing demand for reliable, low emissions electricity and bringing significant opportunities for nuclear growth*". WE agree 100% with Cameco but don't highlight nuclear in our near-term comments as it isn't possible for anew nuclear plant to be onstream for several years or longer at the earliest.

Domino's: Can't feed a family for less than pizza

Domino's reported Q1 on Monday. After seeing the BofA analyst on Squawk Box on the Q1 reporting for the various food companies, we tweeted [LINK] "*No shrinkflation for Pizza! "In a time where people are pinching pennies, pizza is a great way to feed a family. You really can't do it for less than that" BofA Sara Senatore to @JoeSquawk. Domino's CEO Q1 call "We saw the largest growth in our lower income cohorts..."* Domino's shares are +56% in the last year to $514.33. The CEO says the largest growth area is lower income customers. But the BoA analyst said it best, where else can you feed a family as cheaply as pizza especially when you see the regular Domino's specials and the discount for picking up your own pizza.

Loblaw: Shift to discount to continue over the next many years

Loblaw held its Q1 call on Wednesday. (i) Later in the memo, we highlight Loblaw's internal inflation continuing to be less than food CPI. (ii) Consumers keep trading down. There were multiple comments on the Q1 call on the consumer trading down or looking to save money. "*As expected, the consumer shift to discount continued, with our hard discount banners outperforming our conventional stores." "Canadians remain very focused on value and our Maxi and No Frills banners continue to outperform."* (iii) Mgmt expects the shift to discount to continue for many years. In the Q&A, mgmt replied "*Yes, let's see, it's difficult to predict the future, but actually I would probably see that it's going to continue, but continue with a slower pace than before, but I think the shift to discount will continue over the next many years, like it has done in probably any other country where discount is a dominant factor."*

Maersk: Positive read thru for global economy but risk skewed to downside

Maersk reported its Q1 on Thursday. (i) Earlier in the memo, we highlighted Maersk's expectation for the Red Sea workaround to continue until well into the second half. (ii) Positive read thru for global economy. The key reason why we like to follow Maersk is that, as the largest global shipping company, they should have a great pulse on economies around the world. After reading their Market Environment in the Q1 report, we tweeted [LINK] "*Positive economic outlook read thru but risks more to downside. "Global container demand growth is expected to remain positive in coming quarters, but likely at a slower rate" Maersk market environment. "growth outlook in China has slightly improved driven by .. exports" #OOTT."* Maersk seemed on balance to the positive but qualified by saying there is downside risk. On the major global economic question mark China, Maersk wrote "*The growth outlook in China has slightly improved, driven by stronger-than-expected industrial production and exports, the latter supported by improved cost competitiveness. However, consumer demand remains subdued as households face the property market deleveraging."* And "*Global container demand growth is expected to remain positive in coming quarters, but likely at a slower pace.On the export side, Chinese exports stand out with y/y growth around 16%."* The Market Environment is only one-page so worth a read. Our Supplemental Documents package includes the Maersk Market Environment from the Q1 report.

Shell: Relisting in the US is "*not a live discussion at the moment for us*"

Shell held its Q1 call on Thursday. (i) Earlier in the memo, we highlighted how CEO Sawan's description of LNG growth organic projects seemed to be what he said about LNG Canada in the Q2/23 call. (ii) Earlier in the memo, we also noted Sawan's conviction to its LNG strategy. (iii) One of the big discussion points of late has been the potential for European supermajors to relist in the US. Sawan shut that down for Shell at least for now by his reply in the Q&A that it was "*not a live discussion at the moment for us*". (iv) Namibia is the hot new global oil play but Sawan says Shell still has some way to go yet de-risk the play. In the Q&A, CEO Sawan highlighted this is a complex reservoir. Sawan replied "*Your first question on Namibia, Alejandro, what I would say is, we continue our de-risking program there. We continue to drill expiration and appraisal wells and study the results of it. And importantly, we continue to study the results from many of our neighboring blocks to be able to better inform our own choices. We're not in a race here to be able to put a facility in place. What we have been very clear with the team on is, this is a new basin. This is a complex reservoir. Significant volume is clear, but complex in terms of the porosities and the permeabilities. And so it is important that we continue to ensure that if we are to invest significant capital here, we want to be able to have sufficiently de-risked it and made sure that we can deliver the sort of returns that our shareholders expect of us."* (v) M&A isn't as attractive as buying back stock. In the Q&A, CEO Sawan said "*So that's our base case. The consolidation question, I think, is a good one, and we continue to look for opportunities to be able to, of course, bulk up, as any good company should be doing. We have a couple of challenges here. One is, of course, our share price, we don't think, is reflective of an opportunity to be buying somebody else and creating accretive returns for our shareholders. That in my mind is a must-do, right? If we start to sort of run on the back of value destructive deals, then we've lost the plot. So we want to continue to be doing the right thing by our shareholders in that context. The second point, of course, is that all the deals we're seeing out there at the moment pale in comparison to actually buying back our shares against a double-digit free cash flow yield with a suite of portfolios, whether it's in deepwater, LNG, our trading business, our marketing business, which we know very well, which is much more de-risked, which doesn't require as much of an integration effort and as much of a premium to be able to adjust. We can buy those at a discount today*."

Starbucks: Can they reconfigures logistics to handle more takeaway?

Starbuck had a brutal week post its Q1 results, being down 17% to close at $73.11. There was plenty of blame to go around and lots of comments on what they should do. One of the many criticisms was that Starbucks hadn't had the same level of experiences as it was once known. Based on personal experiences of late, the challenge for people who want to go and sit to have a coffee at Starbucks is that most times there are tables or places to sit as people waiting for their pickup and takeaway coffee are taking most of the seats. So if they want ot have more experiences, they will have to reconfigure their stores for more takeaway or figure out the logistics of saving the seats for people who want o have coffee at Starbucks and not just for people waiting for their takeaway order.

Energy Transition: Berkshire will shut off power if wildfire is approaching

Berkshire's new approach to power

There was a stark warning from Berkshire Hathaway's Greg Abel (to be successor to Warren Buffett) at yesterday's shareholder meeting of a dramatic change in the way they will operate their power/electricity assets. (i) Yesterday, we tweeted [LINK] "*Time to buy a Generac in western US states. 👇warning from Berkshire Greg Abel on dramatic change in operating assets. Old: fundamental goal keep the power on. New: Situations where prioritize de-energizing the assets ie. if a wildfire encroaching, turn off systems. #OOTT.*" (ii) Recall in Warren Buffett's annual letter, he wrote "*At Berkshire, we have made a best estimate for the amount of losses that have occurred. These costs arose from forest fires, whose frequency and intensity have increased – and will likely continue to increase – if convective storms become more frequent. It will be many years until we know the final tally from BHE's forest-fire losses and can intelligently make decisions about the desirability of future investments in vulnerable western states. It remains to be seen whether the regulatory environment will change elsewhere.*" (iii) Yesterday Abel had a clear warning they are changing the way they operate especially moving away from the fundamental priority to keep the power on. Our tweet included a clip of Abel's comments. Here are some of his quotes. "*"how we think and operate those assets has to change" "we have worked with the states … with the fundamental goal to keep the power on" "the instincts were not to turn off the power, the instinct was to keep the power on. To keep hospitals, fire stations responding" "we've got to fundamentally change the culture, not just at PacificCorp but across all our utilities. The first thing we have to recognize is that there is now going to be situations where we prioritize de-energizing the assets. And that's completely different than how we have operated those assets…" "the second thing is we've now changed our operating systems so that we can turn off the power very quickly if there is a fire that is encroaching. We will turn off our systems now".* Our tweet included a good 1:52 min clip of Abel's comments.

Energy Transition: Mercedes, pace of EVs shift set by customers & market conditions

EVs pace is set by customers

Mercedes reported Q1 on Tuesday. There was no surprise that Mercedes sales are like others – hybrids are the growth area. But Mercedes reminded of the basic fundamental for the transition to EVs – the pace will be determined by customers and how fast they want to shift to EVs but also by how much the governments will incentivize customers. Mercedes wrote "*The pace of the transformation is set by customers and market conditions".* We look at the "market conditions" as also including how much governments incentivize customers. On the Q1 sales, EVs were down 8% YoY vs PHEVs that were +6% YoY. Mercedes wrote "*Unit sales of all-electric vehicles were down 8% on the same quarter of the previous year. The decline was mainly due to the end of the product life cycle of the smart EQ fortwo (previously produced in Europe) in the first quarter of 2024. In addition, demand for all-electric vehicles slowed following the discontinuation of the environmental bonus for electric vehicles in Germany in December 2023. Demand for plug-in hybrid vehicles led to a 6% increase in unit sales in the first quarter of 2024 compared to the same quarter of the previous year.*

Is Germany EVs push trying to teach a horse to fish?

Seeing the Mercedes simple reminder that the transition to EVs pace will be determined by customers reminded us of two classic truths on how western governments are trying to force thru the shift to EVs. The western governments have been working on the approach "*Give a man a fish, and you feed him for a day; teach* *a man to fish and you feed him for a lifetime*" with a view that they will teach the citizens on the benefits of EVs to the world and that they are lower all-in cost. But the Mercedes statement reminded us of the other truth "*you can lead a horse to water but you can't make it drink*". Both are classic truths and it seems like Mercedes is reminding you can lead a horse to water but can't make it drink.

Energy Transition: bp's "massive" new renewable natural gas is only 4.32 mmcf/d

bp's "massive" renewable natural gas

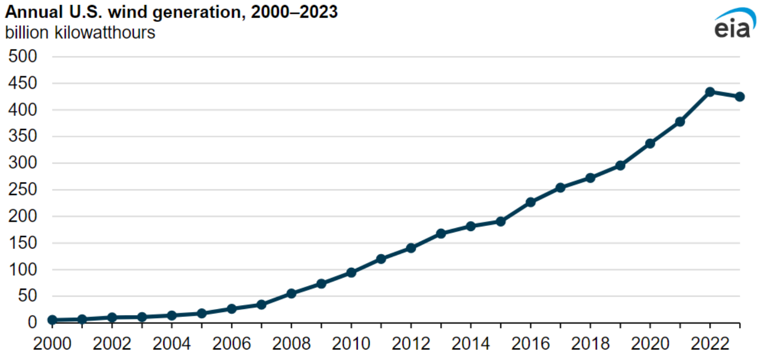
Our view is unchanged in that we believe renewable natural gas projects work economically due to the big incentives and that we believe the government incentives will continue because the size of RNG is so small that the incentives don't cost $billions. (i) We had to chuckle at some of the headlines on bp's new RNG plant such as "*BP Unit Starts Massive Kansas Renewable Natural Gas Plant*." It is bp's biggest RNG plant to date but the production of RNG will be a fraction of a shale gas well. (ii) On Tuesday, bp announced "*bp's Archaea Energy brings online its largest modular RNG plant to date in Kansas"* [LINK] . And "*bp's Archaea Energy (NYSE: BP) announced the official startup of its largest original Archaea Modular Design (AMD) renewable natural gas (RNG) plant to date in Shawnee, Kansas, just outside of Kansas City. The plant, which is fully-owned by Archaea, is located next to a large, privately-owned landfill. Landfill gas, a natural byproduct of the decomposition of waste in landfills, is a form of greenhouse gas. Using the AMD, the Shawnee plant captures the gas from the landfill and converts it to renewable natural gas. The Shawnee plant, which is three times the size of Archaea's first AMD plant in Medora, Indiana brought online in October 2023, can process 9,600 standard cubic feet of landfill gas per minute (scfm) into RNG – enough gas to heat around 38,000 homes annually, according to the EPA's Landfill Gas Energy Benefits Calculator*. *Starlee Sykes, CEO Archaea Energy: "This represents another significant milestone for Archaea. A plant of this size can have a positive impact in capturing emissions from a landfill and providing our customers with lower carbon fuel."* (iii) We didn't see any comments that put this project into perspective or comments on how much RNG would be produced by processing 9,600 cubic feet of landfill gas so, on Wednesday, we tweeted [LINK] "*Math for Renewable Natural Gas. New bp Archaea RNG is to process 9,600 landfill gas/min. Missing key data point 👇 @jendlouhyhc 10/04/23 on last bp module. processes 3,200 cf/min to get 1,000 cf/min RNG. Therefore 9,600/min = 4.32 mmcf/d RNG, fraction of a shale well. #NatGas wells are needed for longer! #OOTT."* This was the point that wasn't noted in the release or reporting – the output will be 4.32 mmcf/d of renewable natural gas or a fraction of a single Haynesville shale or Montney natural gas well. (iv) Our tweet noted Bloomberg's Oct 4, 2023 report on the first bp RNG module that included this missing data point – for every 3,200 cubic ft/min of landfill gas processed, there will be 1,000 cubic ft/min of RNG produced. Bloomberg then wrote "*BP is aiming to boost biogas supply volumes roughly sixfold by the end of the decade, to about 70,000 barrels of oil equivalent per day. And the modular system deployed in Medora is key to that trajectory. With each passing minute at the Medora plant, some 3,200 cubic feet of landfill gas will be processed, with nitrogen and carbon dioxide stripped out and burned off. Ultimately, some 1,000 cubic feet of renewable natural gas will be produced every 60 seconds and sent into pipelines. That's just a small sliver of BP's overall natural gas production, at roughly 6.8 billion cubic feet per day worldwide, according to Bloomberg data. BP's Archaea has another 80 projects waiting behind it."* (v) Our Supplemental Documentes package includes the bp release and the Bloomberg Oct 4, 2023 report on the prior bp RNG module.

Energy Transition: EIA - Wind Generation Declined in 2023, first time since '90s

Wind Generation fell in 2023

On Tuesday, the EIA posted an In-Brief Analysis on wind generation [LINK] and noted that in 2023 Wind Generation measured in billion KWh fell for the first time since the 1990s. The EIA wrote "*U.S. electricity generation from wind turbines decreased for the first time since the mid-1990s in 2023 despite the addition of 6.2 gigawatts (GW) of new wind capacity last year. Data from our Power Plant Operations Report show that U.S. wind generation in 2023 totaled 425,235 gigawatthours (GWh), 2.1% less than the 434,297 GWh generated in 2022. U.S. wind capacity increased steadily over the last several years, more than tripling from 47.0 GW in 2010 to 147.5 GW at the end of 2023. Electricity generation from wind turbines also grew steadily, at a similar rate to capacity, until 2023. Last year, the average utilization rate, or capacity factor, of the wind turbine fleet fell to an eight-year low of 33.5% (compared with 35.9% in 2022, the all-time high)*". The EIA pointed towards slower-than-normal wind speeds in 2023 as the main culprit for the fall in generation despite the increase in capacity. We want to highlight the low utilization rate for 2023 which was 33.5%, which isn't even that far below the all-time high of 35.9%. We think this report shows the unreliability of some renewable resources and makes an argument for natural gas being needed for longer as backups for power sources that depend on variable factors, such as weather and wind. Below is a chart of US wind generation from 2000-2023. Our Supplemental Documents Package includes the EIA In-Brief Analysis.

Figure 53: Annual Wind Generation in the US, Billion KWh



Source: EIA, Electric Power Monthly

Energy Transition: India ramps up solar generation, natural gas only 5.7% of total

India power generation mix

There was a great recap of India's installed power capacity by source for Q1/24 posted on Apr 30 post by Vibhuti Garg (Director, South Asia for Institute for Energy Economics and Financial Analysis). The focus of Garg's post was on the strong solar power capacity additions and how, at least on a capacity basis, coal is now down to 49.2% of total installed capacity. But one item that jumped out at us is a theme we have been highlighting that India has been talking about big ambition to crank up natural gas consumption but hasn't been doing much as natural gas is still only 5.7% of installed electricity capacity. On Friday, we tweeted [LINK] "*Great recap of India installed power capacity at 03/31/24. Thx @Vibhuti_D_Garg @ieefa_institute. Solar ramping up, coal still #1 by far, #NatGas stuck. Coal 49.2% of total capacity. Solar 18.5%. Hydro 11.7%. Wind 10.4%. Natural Gas 5.7%.*

Biomass 2.3%. Nuclear 1.9%. Oher 0.3%. #OOTT." Garg wrote "*2024 has certainly started with a bang. 📈 India witnessed record of 13.6 GW out of which solar power capacity installation of 8.4 GW in 1Q 2024 📈 Despite addition of 3.2 GW coal capacity, coal's share in total power generating capacity fell below 50% for the first time."* It's a good recap of India installed power capacity as of March 31, 2024 to be added to reference libraries. Our Supplemental Documents package includes the IEEFA report.

Figure 54: India installed power capacity by fuel as of Mar 31, 2024

Table 1: Installed power generation capacity, by source (MW), 1Q 2024

Energy Source	As on 31 December 2023	As on 31 March 2024	Change (MW)	% of New Capacity Added
Wind Power	44,736	45,887	1,150	8.4
Solar Power*	73,318	81,814	8,495	62.1
Small Hydro	4,987	5,003	17	0.1
Biomass	10,262	10,355	94	0.7
Waste-to Energy*	583	586	3	0.0
Large Hydro	46,910	46,928	18	0.1
Nuclear	7,480	8,180	700	5.1
Coal (+ Lignite)	214,396	217,589	3,193	23.4
Gas	25,038	25,038	0	0.0
Diesel	589	589	0	0.0
Total	**428,300**	**441,969**	**13,669**	**100.0**

Source: Central Electricity Authority, GoI; IEEFA
**Includes grid and off-grid capacities*

Source: IEEFA

Higher India incomes = more air conditioners = peak demand in afternoons

We heard some good on-the-ground electricity reminders from Vibhuti Garg (Director, South Asia for Institute for Energy Economics and Financial Analysis) on the Gulf Intelligence Dily Energy Markets podcast on May 3. She had a good reminder of what happens as incomes increase and people live in urban areas – they are spending more on energy, in this case more people are buying air conditioners. This is not a new theme, the theme of urban people having higher incomes and spending more on energy is a theme we have highlighted for 20 years. That isn't new but what is different is Garg saying this is leading to peak electricity demand not being in the morning or evening but in the afternoon. In Europe and North America and most other places, peak electricity demand normally happens around dinner time when people get back from work for the day and crank up electricity demand at home. Rather the implication from Garg is that there is big increasing daytime electricity demand. On Friday, we tweeted [LINK] "*India electricity/urbanization tidbit. Increasing income = more people buying air conditioning. "Peak demand which used to happen during morning or evening hours now is hitting right in the afternoon" @Vibhuti_D_Garg, Director - South Asia, @ieefa_institute to @sean_evers. #OOTT."*

Energy Transition: OXY's 500,000 CO2 Direct Air Capture = 110,000 cars off the road

Direct Air Capture

We believe most aren't aware that the Direct Air Capture projects don't really do much to offset CO2 from cars. And we have to believe the US could regulate to have a multiple larger impact on CO2 by simple items like increasing required mileage requirements per ICE vehicles. The reality of the Direct Air Capture of CO2 projects is that they don't really offset the CO2 emissions of many passenger cars. On Sunday evening (Riyadh time), Amena Bakr (Energy Intelligence) tweeted on comments from Occidental CEO Vicki Holub on OXY's planned DAC project that Holub said would remove 500,000 tons of CO2 per year. When we saw Bakr's reporting, we tweeted [LINK] "*C02 Math. See 👇09/21/21 tweet. EPA: 4.6 tonnes CO2/yr per passenger car. Today OXY CEO says Direct Air Capture project to remove 500,000 tonnes CO2/yr reports @Amena__Bakr. Equal to CO2 from ~110,000 cars. Vs 292.3 million registered cars in US. Hedges. #OOTT."* We used the EPA's estimate that a typical passenger car emits 4.6 tonnes of CO2 per year to estimate Occidental's DAC project would offset the CO2 of approx. 110,000 cars. And that compared to 292.3 million registered cars in the US.

Biggest direct air capture of carbon plant offsets <900 cars

Our tweet on Occidental's DAC referred to our Sept 21, 2021 tweet that noted the CO2 savings from the world's largest DAC project – the Orca project in Iceland. Here is what we wrote in our Sept 26, 2021 Energy Tidbits, when we first reported on Orca. "*We are well aware that governments and capital providers are going to make sure the world is put on a push to get to Net Zero, we just don't want to see that ambition result in an massive energy crisis for multiple years in the 2020s. But it gets increasingly harder to not believe a massive energy crisis is coming because we continue to see capital allocation go to energy transition technologies that are Not Ready for Prime Time. Yet, capital continues to pour into them. A good example is the push into direct capture of carbon from the air. On Tuesday, NowThis news tweeted a video [LINK] from Climeworks CEO (Jan Wurzbacher) on how they just turned into operation their Orca plant in Iceland, "which is the largest direct air capture plant currently operational in the world with a capacity of 4,000 tonnes of CO2 that are captured from the air every year. So that's phenomenal capacity." We hadn't realized that the capacity of the direct air capture plants was that low, which is why we tweeted [LINK] "World needs massive cuts to #CO2 emissions & need demonstration projects like this to show it can be done. But world's biggest project can remove 4,000 tonnes CO2/yr only offsets <900 cars, EPA est typcial car emits ~4.6 tonnes CO2/yr. #EnergyTransition will be hugely expensive." Our tweet included the main page from the EPA's Greenhouse Gas Emissions from a Typical Passenger Vehicle [LINK] "a typical passenger vehicle emits about 4.6 metric tons of carbon dioxide per year" . The math perspective is that the world's largest operating direct air capture of carbon plant will only offset the CO2 emissions of <900 cars. Climeworks did not disclose the capital or operating costs of the Orca plant. But this must be hugely expensive to take the equivalent of <900 cars off the road. Yet direct* *air capture of carbon is still able to attract massive capital. To illustrate the challenge, the number of cars in the US is approx. 290 million, or the equivalent of ~325,000 Orca direct air capture of carbon plants.*

Figure 55: Climeworks Direct Air Capture Plant

Source: Climeworks, NowThis

Exxon direct air capture is way too expensive even costs cut in half
Here is what we wrote in last week's (Apr 28, 2024) Energy Tidbits memo on Exxon's comments on direct air capture. *"Exxon held its Q1 call on Friday and repeated the reality check on Direct Air Capture – the costs are nowhere near low enough to be able to be broadly applicable at a reasonable cost. We tweeted [LINK] "Same Reality check on Direct Air Capture as 👇Mar 1 tweet! $XOM Q1, CEO Woods "our initial goal is to cut the cost in half, which will still be too expensive,.." Woods "focused on how we can make this [DAC] technology broadly applicable at a cost that society can afford" #OOTT." Exxon CEO Darren Woods made a point of repeating what he said two months ago – Direct Air Capture costs are nowhere near they need to be to be able to be commercially available to a large number of customers at a reasonable price. In his prepared remarks, Woods said "Today, many technologies are competing to crack the code and make DAC scalable and affordable. Our scientists and engineers are hard at work on this problem. We've launched a pilot project at Baytown that has demonstrated feasibility with the use of a proprietary capture process. Our initial goal is to cut the cost in half, which will still be too expensive, but will help move us down the cost curve. The current market for DAC is tiny at less than 10,000 tons per year of CO2 captured, but the long-term potential is huge." Our Supplemental Documents package includes excerpts from Exxon mgmt prepared remarks and the Q1 call Q&A*."

A huge amount of air has to be processed [by DAC] to remove a ton of CO2
Last week's (Apr 28, 2024) Energy Tidbits memo also wrote "*Exxon CEO Woods reminded of the huge challenge for Direct Air Capture to remove CO2 from the air. In*

his prepared remarks, Woods said "The last technology I'll touch on today is Direct Air Capture, or DAC. For the world to reach net zero, negative emissions technologies are going to be needed. None holds greater long-term promise than DAC. The challenges, however, are as big as the opportunity. Atmospheric CO2 is extremely dilute at about 425 parts per million. A massive amount of air has to be processed to remove a single ton of carbon dioxide."

Energy Transition; G7 commits to phase out existing unabated coal by 2035

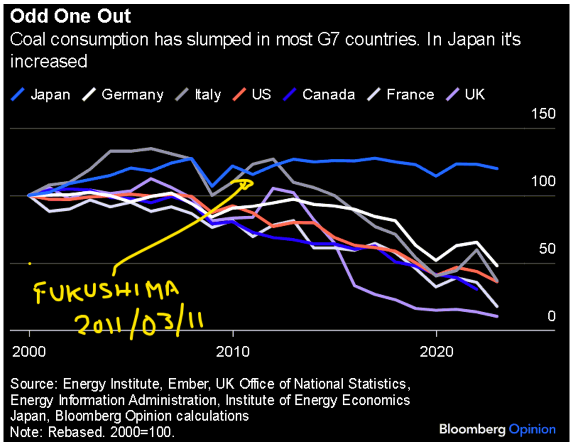
G7 phase out unabated coal

The G7 Climate, Energy and Environmental Ministers concluded their meetings and issued their communique on Tuesday. On Tuesday, we tweeted [LINK] "*Today #G7 commits to phase out existing unabated coal power generation during 1st half of 2030s. See yesterday's tweet on Alberta has already been phasing out coal generation from 38% of capacity in 2016 and down to 6% in 2023. #NatGas #OOTT #EnergyTransition."* The G7 setting by 2035 to phase out existing unabated coal generation really didn't surprise anyone so it wasn't a real topical discussion item this week. The G7 communique wrote "*We commit also to: 1. phase out existing unabated coal power generation in our energy systems during the first half of 2030s or in a timeline consistent with keeping a limit of 1.5°C temperature rise within reach, in line with countries' net-zero pathways; 2. reduce as much as possible, in the meanwhile, the utilization of unabated coal power generation plants in our energy systems to a level consistent with keeping the limit of 1.5°C temperature rise within reach."*

Japan's coal consumption has increased post Fukushima

All of the G7 except Japan have been on a steadily reducing coal consumption over the past decade or so. Germany and Italy had increases post the cut off of Russian pipeline natural gas but are back to declining coal in 2023. The exception is Japan. There was a good Bloomberg reminder report "*The Dog Ate Japan's Plan to Phase Out Coal Power: David Fickling*" that included the below graph comparing the G7 coal consumption since 2020. We added the reminder that the Fukushima March 11, 2011 disaster changed Japan's power mix including coal. It was the catalyst for increasing LNG imports but also for increasing coal consumption. Bloomberg notes that Japan has opened new coal generation in the last year. But to be fair, these projects would have been committed to years ago while it was still from certain that Japan would be bringing back any significant nuclear power. The other factor we have been highlighting is that Japan tends to increase thermal coal imports and generation in periods of high LNG prices. Japan is slowly getting more nuclear plants on line but the pace is far from certain. But the return of nuclear plants is the key for Japan to reduce coal consumption and also LNG imports. LNG imports have been down with warm winters but also the return of nuclear and, being way more expensive than thermal coal, is being cut faster than coal generation. Our Supplemental Documents package includes the Bloomberg report.

Figure 56: G7 consumption since 2000

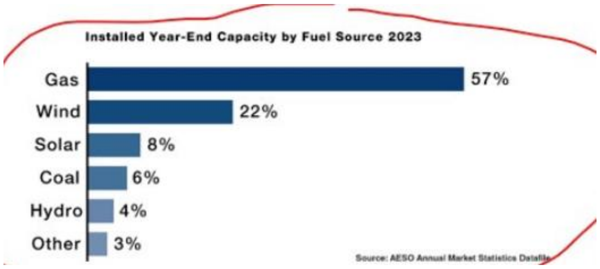


Source: Bloomberg

Coal is down to 6% of Alberta power generation capacity

There were reports that the G7 unabated coal decision on Monday so, on Monday, we tweeted [LINK] "*Topical tomorrow. Reports G7 communique is to incl shut down all #Coal plants by 2035. Alberta: coal was 38% of power generation capacity in 2016, but down to 6% in 2023. #OOTT #NatGas.*" We figured we would get the Alberta coal generation data out there as it would be topical when the G7 communique was issued. Most aren't aware that coal generation was 38% of the Alberta electricity capacity in 2016 but was down to 6% in 2023, and expected to keep going lower such that the new G7 phase out of existing unabated coal by 2035 would be any issue.

Figure 57: Alberta installed power capacity by fuel source year end 2023



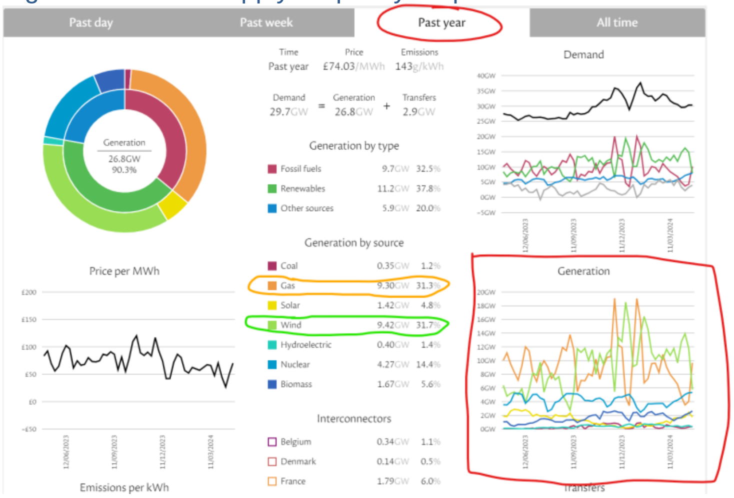
Source: Alberta

Energy Transition: Every added MW of wind needs an added MW of natural gas

Need natural gas to fill in for wind

On Wednesday, Bloomberg wrote on how natural gas pries were up as wind power was down. It reminded us of a basic fundamental for wind power – it needs something to fill in when the wind doesn't blow. We tweeted [LINK] "*Energy Transition 101. Every added MW of wind needs an added MW of #NatGas to fill in when the wind doesn't blow. @nationalgriduk Wind and NatGas almost identical for past yr. NatGas slightly less for past wk due to solar* *up vs past yr. #OOTT."* Our tweet included the National Grid graphs/charts that show how when wind generation goes down, natural gas generation goes up. And that the two had almost identical power supply for the last year with wind providing 31.7% of UK power and natural gas providing 31.3%.

Figure 58: Power supply for past year per National Grid: Live as of 4:30am MT on May 1



Source: National Grid

Capital Markets: Bank of Canada watching what US does on rates

Bank of Canada Governor Macklem

By way of background, following the Bank of Canada April 10 press conference, the general expectation was that the Bank of Canada was likely to start rate cutting in June. Bank of Canada Governor Tiff Maclem's answer to the first question pointed to the expectation for the BoC to lower interest rates in June. The first question was "*is the door open to a rate cut in June?"* In his reply, Maclem said "….*if things move broadly in line with the outlook that we published today, we will be becoming more confident that we're clearly on a path to 2% inflation and it will be appropriate to cut our interest rate."* On Thursday, Maclem was testifying before the House of Commons finance committee. BNNBloomberg wrote "*Our interest rates in Canada don't need to be the same as the U.S. rate or global rates. But there is a limit to how far they can diverge," Macklem said. "We're not close to that limit."* We didn't hear the testimony but it feels like he made his comments and then might have realized how that would be interpreted so added the "*we're not close to that limit*". Regardless, it sounds like the expectation for US to not start rate cuts for months will a part of the Bank of Canada deliberations in June.

Capital Markets: Buffett is looking at a Cdn deal right now, Berkshire's increasing cash

Warren Buffett

One of the advantages of having Saturday as a big work day was being able to catch the entire Berkshire Hathaway Q&A either live or by playing back the PVR. There were many many great comments from Warren Buffett and Greg Abel but here are a few we noted. (i) Looking at a specific Cdn opportunity right now. Yesterday we tweeted [LINK] "*Race will be on this weekend to figure out what* CA *stock and sector Warren Buffett is looking at right now.*" We forward the CNBC tweet that said *"Warren Buffett hinted that Berkshire Hathaway was* *evaluating a possible investment opportunity north of the border. "We do not feel uncomfortable in any way shape or form putting our money into Canada. In fact, we're actually looking at one thing now," Buffett said."* (ii) Buffett says attractive to have cash right now The Q1 included the disclosure Berkshire sold 115 mm Apple shares, which likely brought over $20 billion. No surprise the first question was on Apple and the cash. We tweeted [LINK] "*Buffett "But I don't mind at all, under current conditions, building the cash position. I think, when I look at the alternative of what's available n the equity markets and I look at the composition of what's going on in the world, we find it quite attractive" Canada? OOTT."* We have to wonder if it ties to what he is looking at in Canada. (iii) Aspire to be nice. We recognize this wasn't a Buffett business but it was good personal advice. Buffettt said "*I think the one thing that you can aspire to be and this can be done by anybody and it's amazing. It doesn't have anything to do with money. But you can be kind. Now you can be kind if you're and the world's better off*."

Capital Markets: How will anti-obesity & cancer vaccines impact pension liabilities?

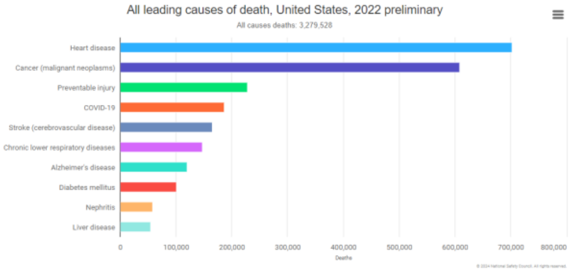
Obesity & cancer vaccines

We are surprised that we really haven't seen any discussion/reports on how the success of anti-obesity drugs are changing how pension plans assess their liability. It's still early so it isn't clear if there are significant negatives to these drugs but we have to believe they will at least look at potential impacts to liability if these drugs can be broadly used without significant adverse side effects. And if so then the pension plans will have to build in longer life expectancies. There is no official estimate we see estimates up to 20 years but it seems like more tend to use obestity can shorten life expectancy by 5-7 years. Whether the pension plans change life expectancies or layer it in, future pension liabilities should be going up. And if so, we would expect that it also could lead to the pension plans shifting or looking to allocate more to areas like alternatives. Then layer on top of that the question what if cancer deaths can be reduced. It may have not got much attention but Moderna CEO comments on Squawk Box caught our attention and we tweeted [LNK] " *Sounds promising! "... if you think about how the [Cancer vaccine] technology is working .....we believe now there is a lot of data demonstrating that the platform of our [Cancer] vaccine treatment is working across..." Moderna CEO. Thx @JoeSquawk for focusing on cancer!"* Our tweet included a video clip we made of the CEO's comments but it certainly sounds promising.

Heart disease and cancer continue to be the top 2 causes of deaths

It doesn't matter where you get the data, heart disease and cancer are always the top 2 leading causes of deaths in the US and Canada. They are basically neck and neck and far ahead of #3, preventative injury. Plus obesity is linked as a major cause for heart disease and also for cancer. Below is the US National Safety Council [LINK] listing.

Figure 59: All Leading Causes of Deaths in US, Preliminary 2022



Source: National Safety Council

Capital Markets: American consumer is pulling back except on experiences

American consumer

We missed the first hour of the CNBC coverage of the Berkshire Hathaway annual meeting and question period. During the short lunch break, CNBC showed a clip of Becky Quick's interviews with a number of the Berkshire owned company CEOs and the common view was on how the US consumer has pulled back especially the lower income consumer. There are always exceptions to the rule but the weaker consumer theme seemed to be the big theme in the Q1 reporting. On a generalized basis, the one area that seemed to go against that was Americans spending on experiences. On Wednesday, we were watching Squawk on the Street and tweeted [LINK] "*Americans still spending on experiences, but more CEOs seeing signs of US consumer is weakening. Weaker: McDonalds, Starbucks, Clorox, Amazon, Mondelez, YUM. Solid: Caesars, Marriott, Mastercard. Good 2 min CEO clip from @SaraEisen @davidfaber."* Our tweet included a 2 min clip we made of the CNBC soundbites of the CEO comments for the companies listed in the our tweet..

Capital Markets: Onlne returns to be bigger than cosmetics & alcohol combined

Online returns up to $1 trillion

We ere listening to Squawk Box on Wednesday, when Jean Paul Dejoria (Patron founder) was talking about his latest venture, Vendidit. We didn't realize how big a market online returns have become, expected to be $1 trillion this year. We tweeted [LINK] "*Online returns now $1T! "this next 12 mths, it [online returns] will be over $1 trillion. That is bigger than the cosmetics industry and the alcohol business put together" @johnpauldejoria on his latest, Vendidit, to @BeckyQuick @SquawkCNBC."* Dejoria says online returns four yeas ago was up to $300 billion/year, last year $800 billion/year and this next 12-months over a $1 trillion. He then said more than the cosmetics and alcohol business combined.

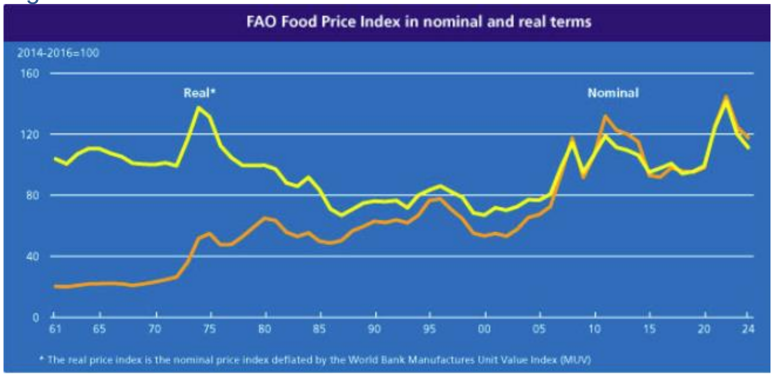
Capital Markets: UN FAO Food Price Index +0.3% MoM in April, -7.4% YoY

UN food price index flat MoM

The UN Food Price Index is a monthly food commodities measure and not an index of consumer food prices or food prices in grocery stores. However, increases or decreases in food commodity prices should eventually work their way into grocery prices. The UN Food Price index has been gradually decreasing since the middle of 2023 but was flat in April 2024. On Friday, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*FAO Food Price Index ticks up in March, mostly driven by higher world vegetable oil prices".* Note that the index is calculated on a Real Price basis. The FFPI averaged 119.1 points in April, up +0.3 points MoM from 118.8 points in March (revised), and is down -7.7% YoY. The FFPI reported categories were mixed in their index movements over April. The Vegetable Oil Index was up +0.3% MoM and is now at a 13-month high. The Dairy Price Index was down -

0.3% MoM and down -4.3% YoY. The Cereal Price Index was up +0.3% MoM which is -18.3% YoY. This is due in part to logistical difficulties of Ukrainian grain exports to markets and less than optimal crop yields in the EU and Russia. The Meat Price Index was up +1.6% MoM and -0.4% YoY. The Sugar Price Index was down -4.4% MoM and down -14.7% YoY. The Brazilian Real continued to depreciate against the dollar, which helped bring down the index.

Figure 60: UN FAO Food Price Index



Source: UN Food and Agricultural Organization

Loblaw's internal inflation rate was lower than food CPI

Loblaw held its Q1 call on Wednesday. Loblaw has a new CEO so this is his first way of saying the higher than expected grocery store prices aren't their fault. He isn't anywhere as direct as the prior CEO. New CEO Per Bank said "I*n food retail, we recorded strong top-line growth, with absolute sales up 4.4%, and same-store sales growth of 3.4%. Our internal inflation rate was lower than food CPI again this quarter. This helped bring CPI grocery inflation below the headline total inflation rate in Canada for the first time in over two years*."

Demographics: Moderna's cancer vaccine comments seemed promising

Moderna CEO on cancer vaccines

Imagine the implications if there were cancer vaccines that dramatically reduced the deaths from cancer. Cancer is the #2 cause of death, generally neck and neck but just behind heart. It's almost impossible to find any adults who haven't been touched by cancer hitting family and close friends. So the obvious is that it would be great news for fighting cancer if it can work. But it also has huge implications for economies because, it successful in dramatically reducing cancer deaths, it would lead to longer life spans, more elderly population, etc. Moderna released Q1 on Thursday and the market focus was on the expected significantly lower revenues post the Covid vaccine rush. But what we found interesting was how CNBC's Joe Kernen focus was on their longer-term cancer vaccine potential in their Squawk Box interview with CEO Stephane Bancel. One of the reasons we pay attention when Kernen is interviewing vaccine people like Bancel is that his graduate education was a Masters in molecular biology from MIT where he also reportedly worked on cancer research. And during Covid, we thought he was very good in the interviewing with Moderna, Pfizer, etc. We haven't been paying attention to what Moderna has been doing on cancer vaccines and had no idea these are apparently having good results and could be ramping up in late 2020s. That's only a few years away. Upon watching the Kernen/Bancel interview, we tweeted [LINK] "*Sounds promising! "... if you think about how the [Cancer vaccine] technology is working .....we believe now there is a lot of data demonstrating that the platform of our [Cancer] vaccine treatment is working across..." Moderna CEO. Thx @JoeSquawk for focusing on cancer!."* Our tweet included a clip of the Bancel comments. We also made the below transcript. Kernen *"… Do you view that as a bridge to when the cancer vaccines are finally developed assuming that you are successful that it's actually a viable way to treat such a horrific disease. When do you see that being the lion's share of revenue? Late 2020s?"* Bancel "…. *At the same time, we believe the duration data that we shared could allow us to file for accelerated approval so the oncology opportunity is really really large. And if you think about how the technology is working, we shared recently at the ACR, some new data for [inaudible] cancer. We shared before data on lung cancer. So we believe now there is a lot of data demonstrating that the platform of our vaccine treatment is working across many [inaudible]. And we think that we are going to go earlier in the disease, we're gong to get an even higher response rate because the technology works by leveraging the humane system of the patient to go and attack the cancer":*.

Demographics: CDC reports 1st bird flu in human case in US dairy worker

1st bird flu case in humans in US

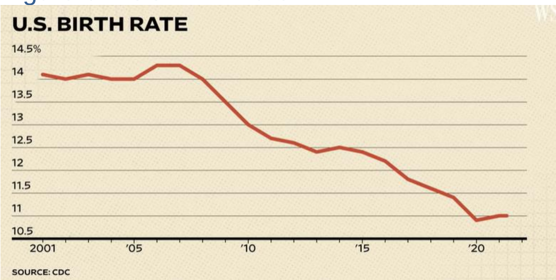
Bird flu has been in the news over the past couple months with increasing cases in chickens and cows. But, up until this week, there wasn't any coverage of bird flu in humans until the weekend news picked up the case of a person getting bird flu from exposure to dairy cattle in Texas. The other reason is that, despite low # of bird flu cases in humans, bird flu has a much higher death rate than a flu or Covid. On Friday, the CDC H5N1 Bird Flu: Current Situation Summary [LINK] wrote "*H5N1 bird flu is widespread in wild birds worldwide and is causing outbreaks in poultry and U.S. dairy cows with one recent human case in a U.S. dairy worker. While the current public health risk is low, CDC is watching the situation carefully and working with states to monitor people with animal exposures."* The CDC actually posted an Apr 1, 2024 on this case [LINK]. The CDC wrote "*Highly Pathogenic Avian Influenza A (H5N1) Virus Infection Reported in a Person in the U.S. CDC's Risk Assessment for the General Public Remains Low. A person in the United States has tested positive for highly pathogenic avian influenza (HPAI) A(H5N1) virus ("H5N1 bird flu"), as reported by Texas and confirmed by CDC. This person had exposure to dairy cattle in Texas presumed to be infected with HPAI A(H5N1) viruses. The patient reported eye redness (consistent with conjunctivitis), as their only symptom, and is recovering. The patient was told to isolate and is being treated with an antiviral drug for flu. This infection does not change the H5N1 bird flu human health risk assessment for the U.S. general public, which CDC considers to be low. However, people with close or prolonged, unprotected exposures to infected birds or other animals (including livestock), or to environments contaminated by infected birds or other animals, are at greater risk of infection. CDC has interim recommendations for prevention, monitoring, and public health investigations of HPAI A(H5N1) viruses*." Our Supplemental Documents package includes the CDC's *"Bird Flu Virus Infections in Humans*". [LINK]

Capital Markets: Declining birth rates now showing up in declining high school grads

Declining entrants to US work force

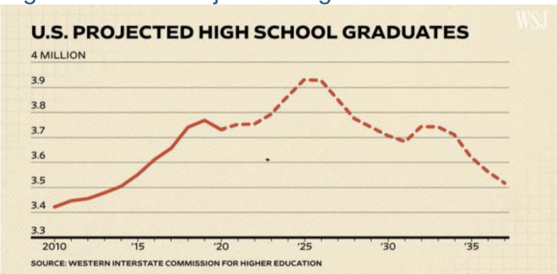
For the past decades, I have highlighted the theme that demographics are predictive as they are population trends that take a long time to dramatically change. A great example is the declining birth rate in the US from 2008 will be working it's way into less young people coming into the workforce. AI is expected to significantly increase worker productivity and the reality is that it better do so because there will be a labor crunch coming up in the US as the US work forces starts to see the impact of the lower birth rates post 2008. The declining birth rate is flowing thru into lower high school graduates now and therefore less young people coming into the workforce. The other factor is that the US continues to need immigration to feed the work force. Last Sunday, WSJ Video posted an 8:22 min clip "*How Universities Make Money Beyond the Big Donors*" [LINK] and what caught our eye are the below two graphs that show the declining US birth rates and how that will now be reflected in less high school graduates. This is the implication to the US workforce. And it links back to the need for AI to increase productivity and also where will the US get the workers for non-college educated jobs, especially manual labor jobs. Like it or not, the US needs illegal immigrants for the work force

Figure 61: US Birth Rate



Source: WSJ

Figure 62: US Projected High School Graduates



Source: WSJ

Demographics: California has first population increase since 2020

California's population grows YoY

On Tuesday, the California Department of Finance released a statement [LINK] announcing that for the first time since 2020, the state experienced an increase to its population. Please note that the US Census Bureau said California population dropped by 75,000 people in 2023 but they were using a July 1, 2023 date and not the Jan 1, 2024 date used by California. In 2023, California's population was 39.128mm people, which is up +67,000 people YoY. This works out to only +0.17% growth, but growth nonetheless. The release cited reduced mortality, increased immigration and fertility as the chief causes of the population growth. Legal immigration added 114,200 people YoY (compared to +90,300 in 2022). Natural increase (births minus deaths) was +118,400 YoY (compared to 106,700 in 2022). Over the past couple of years, there were net outflows of people in California as people left for more affordable (usually Republican) states in the US. A return to growth is a change in this trend. The Department of Finance wrote "*Greater domestic in-migration and slowed domestic out-migration. Net domestic migration no longer offsets the population gains from natural increase and international migration. Net migration from California in 2023 dropped in two years to roughly onefourth of its rate in 2021…With immigration processing backlogs largely eliminated and deaths returning to long-term trends, a stable foundation for continued growth has returned. As net domestic migration has receded to its lower rates of the 2010s, California is likely to experience slower but positive growth for the near future*". Our Supplemental Documents Package includes the DoF release.

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.

Kent State Shootings was May 4, 1970

We were a little surprised there wasn't much on the Kent State (Ohio) shootings from May 4, 1970. Times were different then as the protests in the late 60s and into 1970 were on the expanding US involvement in the Vietnam war into Cambodia. There was a protest at Kent State and the national guard was called in and fired 67 rounds over 13 seconds killing four students and wounding nine others. The shootings shocked Americans and was viewed as the turning point for US opinion against the Vietnam War.

Leafs/Bruins Game 6 was playoffs hockey at its best for old-time fans

Game 7 last night was exciting even if the Leafs lost in overtime to the Bruins. It was similar but not to the level of hitting in Game 6. It wasn't just that the Leafs won Game 6 against the Bruins 2-0 to force Game 7. Anyone who watched the game had to think it playoffs hockey at its most intense best. The first period was amazing. And we tweeted [LINK] "*Playoff hockey at its best tonight in @MapleLeafs @NHLBruins 0-0 score after 1st period in game 6. Here is an amazing stat tonight! Both teams have as many hits in 1st period (Leafs 25, Bruins 23) as normally have in* *a regular season game (Leafs 28, Bruins 28) "* It didn't matter which team got the puck or who got the puck, the other team hit him. The hitting had to slow down for the rest of the game but the Bruins had 55 hits, double their season average of 28 and the Leafs had 46 hits vs their season average of 28. The Bruins were behind so were hitting everything late in the game to try for a turnover.

Another good TV weekend for Cdn golf fans, Taylor Pendrith in the lead
We are hoping this weekend turns out as well as last weekend for Cdn golf fans when Stephen Ames successfully defended on the PGA Tour Champions with another victory at the Mitsubishi Electric Classic. Ames has been on a roll with his 2nd win this year and having six wins in his last 29 starts. Today, it will watching the PGA CJ Cup Byron Nelson, where Taylor Pendrith is in the lead by 1 at -19 after shooting a 63 on Saturday. He is seeking his first PGA win. Pendrith has a a runner-up and a 3rd place finish so far.

Classic UK bacon sandwich only has three ingredients
Anyone who been to the UK and gone early to the Portobello or Bermondsey Market and hit a small breakfast place and ordered a bacon sandwich knows the classic bacon sandwich is only three ingredients. On Tuesday, the Daily Mail report "*Breakfast experts reveal the surprisingly simple recipe for the perfect bacon sandwich (Spoiler...it needs to be toasted)* [LINK]. They wrote "*Guise Bule, chairman of the English Breakfast Society, said the 'British institution' should be made using just three ingredients after hearing about other spins on the breakfast butty. He added: '[Britons] know exactly what a bacon sandwich is. It's something that their mother used to make them with love and she used to make it the same way every time. 'Toasted white sliced bread, mildly salted English butter, and good old British back bacon. There is simply no substitute.'*

Figure 63: Classic UK bacon sandwich

Source: Daily Mail

Cinco de Mayo is today
Today would be a great day to be in Mexico to join the celebrations for Cinco de Mayo, which is a holiday to celebrate Mexico's military victory over the French forces of Napoleon III. I have only been in Los Cabos once during Cinco de Mayo and it reminded me of the first weekend of Calgary Stampede but with the drink of choice being tequila.