Energy Tidbits

March 31, 2024

Produced by: Dan Tsubouchi

Helima Croft "*closely watching whether Ukraine moves at some stage to target actual [Russian] export facilities*"

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. Great comments by RBC's Helima Croft on potential geopolitical oil risk premium events over the coming weeks including the risk that Ukraine moves at some stage to target Russia oil/LNG export facilities. [click here]

2. Croft's comments seem even more timely given the escalation in Russian/Ukrainian drone attacks and Ukraine's reported ignoring of US preference to not hit Russian refineries. [click here]

3. We highlight reasons to support Vitol's "*seeing jet fuel now back to averaging around 6.9 mmb/d over the last 4-weeks, which is back to 2019 levels.*" [click here]

4. 321 crack spreads at $29.73 still provide big margins for refineries and big incentives for refineries to maximize runs and buying crude and support for WTI. [click here]

5. Ford CFO "*we're going to have some large EVs as well, but they're going to be very limited in the scope and the number*." [click here]

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

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

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Natural Gas: -36 bcf draw in US gas storage; now +430 bcf YoY surplus

-36 bcf draw in US gas storage

US natural gas storage continues to be well above the 5-yr range. There was a draw from gas storage in the US this week. For the week of March 15, the EIA reported a +7 bcf build. Total storage is now 2.296 tcf, representing a surplus of +430 bcf YoY compared to a surplus of +441 bcf last week. For this week, and the past few, total storage is above the top end of the 5-y range. Total storage is +669 bcf above the 5-year average, down from the +678 bcf surplus last week. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

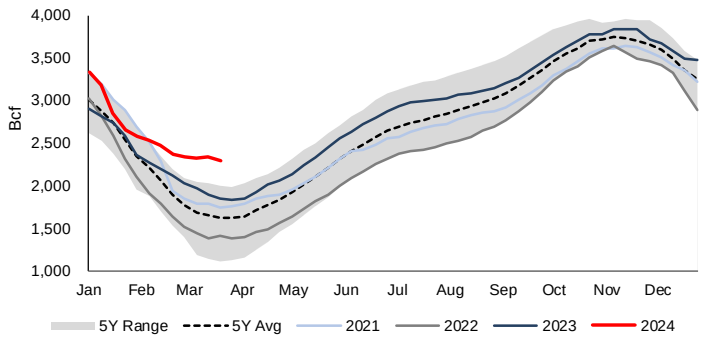
Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (03/22/23)		5-year average (2019-23)	
Region	03/22/24	03/15/24	net change	implied flow	Bcf	% change	Bcf	% change
East	387	406	-19	-19	346	11.8	308	25.6
Midwest	528	551	-23	-23	444	18.9	380	38.9
Mountain	166	166	0	0	83	100.0	87	90.8
Pacific	223	216	7	7	73	205.5	145	53.8
South Central	991	993	-2	-2	920	7.7	706	40.4
Salt	294	300	-6	-6	262	12.2	208	41.3
Nonsalt	698	694	4	4	658	6.1	498	40.2
Total	2,296	2,332	-36	-36	1,866	23.0	1,627	41.1

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

Source: EIA

Figure 2: US Natural Gas Storage



Source: EIA

Natural Gas: US Jan gas production was -3.3 bcf/d MoM due to extreme cold

US gas production 103.3 bcf/d in Jan

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. his caused MoM declines in Texas -1.5 bcf/d Mom an shut-in natural gas. On Friday, the EIA released its Natural Gas Monthly [LINK], which includes its estimated "actuals" for January dry gas production. 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 106.6 bcf/d. It was revised slightly from 106.5 bcf/d last month. (iii) January's production of 103.3 bcf/d was -3.3 bcf/d MoM and +1.4 bcf/d YoY from January

2023 of 101.9 bcf/d. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

Figure 3: 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	103.3
Feb	65.4	68.4	73.8	77.3	71.5	80.4	89.9	98.9	85.8	96.0	102.0	
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	106.6	
Average	66.3	70.9	74.2	72.9	74.9	84.3	92.9	92.7	94.5	99.6	103.8	103.3

Source: EIA

Natural Gas: US LNG exports up -6.3% MoM to 12.8 bcf/d in Jan; up +17.5% YoY

US January LNG exports

On Wednesday, the Department of Energy (DOE) posted its US LNG exports estimates for January 2024 [LINK]. Note, the DOE has changed the name from the LNG Monthly to the U.S. Natural Gas Imports and Exports Monthly. This is a reminder that the US LNG export data is available a day or two prior to the more commonly referenced US LNG exports from the EIA's Natural Gas Monthly. The EIA is a group under the Department of Energy. The data for LNG exports is either identical or just a rounding issue. US LNG exports were down MoM to 12.8 bcf/d in January from 13.6 bcf/d in December, but up +1.9 bcf/d YoY from January 2023. US LNG exports averaged 11.9 bcf/d per month over 2023, which is +1.3 bcf/d compared to 2022. The DOE did not comment on the MoM or YoY changes. Our Supplemental Documents package includes excerpts from the U.S. Natural Gas Imports and Exports Monthly.

Figure 4: US Monthly LNG Exports

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

Source: EIA, DOE

Natural Gas: US natural gas pipeline exports to Mexico down -5.6% MoM, +9.6% YoY

US to Mexico Dec natural gas exports

Also included in the DOE's U.S. Natural Gas Imports and Exports Monthly was a breakout of exports by destination. Natural gas and LNG exports to Mexico were up +6.0% MoM to 6.0 bcf/d in January from 5.6 bcf/d in December and is up +11.5% YoY from 5.6 bcf/d in January 2023. The DOE doesn't provide a split but based on its prior disclosures, it looks like essentially 100% of the exports are via pipeline, without any CNG/LNG in the mix, although once in a while there might be something. Please note that we will note if there are any CNG/LNG exports to Mexico more than a rounding. Below is a summary of natural gas via pipeine exports to Mexico from the US.

Figure 5: US Natural Gas Pipeline Exports to Mexico

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.7	5.4	6.0
Feb	1.8	2.3	3.5	4.0	4.5	4.8	5.4	4.9	5.5	5.5	
March	1.9	2.4	3.3	4.2	4.3	4.8	5.4	5.9	5.5	5.7	
Apr	1.9	2.6	3.5	3.7	4.4	4.7	4.6	6.1	5.9	5.6	
May	2.0	2.8	3.7	4.0	4.4	5.0	4.7	6.2	6.0	6.2	
June	2.2	3.0	3.9	4.5	4.6	5.2	5.4	6.6	6.1	6.8	
July	2.2	3.3	4.0	4.4	4.9	5.4	5.8	6.4	6.1	6.7	
Aug	2.1	3.3	4.3	4.4	5.0	5.4	6.0	6.2	5.8	6.9	
Sept	2.2	3.3	4.1	4.2	5.0	5.4	6.1	6.0	5.6	6.7	
Oct	1.9	3.2	4.2	4.2	4.9	5.5	6.0	6.0	5.5	6.5	
Nov	1.9	3.0	4.0	4.5	4.7	5.3	5.5	5.5	5.4	6.0	
Dec	2.1	3.2	3.6	4.4	4.5	4.9	5.3	5.4	5.1	5.6	
Average	2.0	2.9	3.8	4.2	4.6	5.1	5.5	5.9	5.7	6.1	6.0

Source: DOE, SAF

Natural Gas: Mexico's natural gas production still below 5 bcf/d, flat MoM, down YoY

Mexico natural gas still below 5 bcf/d

On Monday, Pemex posted its natural gas production data for February. [LINK] Pemex does not provide any commentary on the data but reported February 2024 natural gas production of 4.777 bcf/d, which was -4.1% YoY and basically flat MoM. The big picture story for Mexico natural gas is, at least for now, still unchanged – for the past six years, Mexico natural gas production has been stuck right around 5 bcf/d, and that means any increased domestic natural gas consumption has been met by US natural gas imports. Below is our ongoing table of Pemex reported monthly natural gas production.

Figure 6: Mexico Natural Gas Production

Natural Gas Production bcf/d	2017	2018	2019	2020	2021	2022	22/21	2023	2024	24/23
Jan	5.326	4.910	4.648	5.005	4.848	4.713	-2.8%	4.955	4.780	-3.5%
Feb	5.299	4.853	4.869	4.942	4.854	4.646	-4.3%	4.979	4.777	-4.1%
Mar	5.383	4.646	4.857	4.946	4.839	4.766	-1.5%	5.035		
Apr	5.334	4.869	4.816	4.827	4.671	4.740	1.5%	5.095		
May	5.299	4.827	4.841	4.460	4.730	4.702	-0.6%	5.034		
June	5.253	4.840	4.843	4.754	4.727	4.744	0.4%	5.035		
July	5.216	4.856	4.892	4.902	4.725	4.815	1.9%	4.936		
Aug	5.035	4.898	4.939	4.920	4.656	4.796	3.0%	4.947		
Sept	4.302	4.913	5.017	4.926	4.746	4.798	1.1%	4.969		
Oct	4.759	4.895	4.971	4.928	4.718	4.795	1.6%	4.950		
Nov	4.803	4.776	5.015	4.769	4.751	4.845	2.0%	4.888		
Dec	4.811	4.881	5.024	4.846	4.697	4.845	3.2%	4.786		

Source: Pemex, SAF

Natural Gas: Japan to cut natural gas/electricity subsidies at end of May

Japan cutting subsidies

We have to believe we will be seeing requests/warning from Tokyo to conserve electricity this summer. The latest Japan Meteorological Agency forecasts calls for a warm start to summer and now it looks like Japan is ending its electricity and natural gas subsidies at the end of

May. So calls to conserve electricity and natural gas will be a logical way to keep energy costs down this summer. On Thursday, Nikkei reported [LINK] "*Measures to reduce the burden of electricity and gas charges to be temporarily terminated for use in May Government. It is understood that the government has entered into final adjustments to the measures to reduce the burden of electricity and gas charges, which have been carried out as a measure against soaring prices, with the aim of ending them by the end of May usage. On the other hand, the government plans to extend subsidies to control gasoline prices for the time being. In order to reduce the burden on households and businesses, the government subsidizes electricity bills by 3.5 yen per kilowatt-hour for households and 1.8 yen for businesses, and for city gas, 15 yen per cubic meter for households and companies with low annual contracts*." Our Supplemental Documents package includes the Nikkei report.

05/08/22; Tokyo won't be the last to focus on energy/natural gas conservation

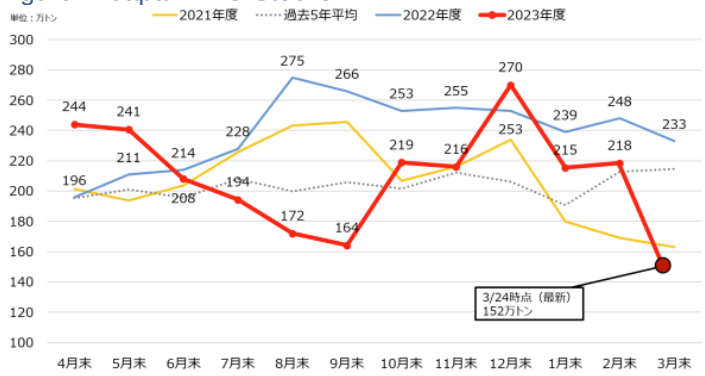
Here is what we wrote in our May 15, 2022 Energy Tidbits memo on Tokyo's summer 2022 push for energy conservation. "*It was interesting to see Tokyo make a big push on energy conservation, which is a focus we expect other countries/regions to follow. The Tokyo Metropolitan Government announced it "will strengthen and accelerate its efforts not only from the perspective of the climate crisis, but also from the perspective of ensuring stable energy over the medium to long term. The point is to reduce power consumption, create it, and store it. The keyword is HTT. From these three perspectives, we need to work together with the citizens of Tokyo and businesses in a total war." We tweeted [LINK] "Tokyo's energy conservation push 👇 will be followed by EU. Also reminds of business trips to Japan post Arab Oil Embargo with office temps set to >80F except it was suits & ties, no suggestion of wearng cool (temp not fashion) short sleeve shirts to work. Thx @shoko_oda #OOTT." A few of their energy saving guidelines were put air conditioning room temperature to 28℃ during cooling times, don't overload the refrigerator, set refrigerator setting to a warmer temp, and the one that got the most headlines was turn off toilet seat heating off. Tied to the warmer room setting, Tokyo also suggested "Cool Biz fashion" showing a picture of short sleeves shirts. There were many other energy saving ideas. Our tweet noted that the higher temperature under air conditioning is much what Japan did post the Arab Oil Embargo.*"

Natural Gas: Japan LNG stocks down big WoW, YoY, lowest in past three years

Japan LNG stocks down -5.0% WoW

Japan's LNG stocks are below 2023 levels and well below the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on March 22 were 73.0 bcf, down -5.0% WoW from Mar 17 of 76.8 bcf, and are down -34.8% YoY from 111.9 bcf a year earlier. Stocks are well below the 5-year average for the end of March of 102.8 bcf, and is now the lowest it has been over past 3 years. We now know part of the reason why stocks have fallen so much recently: Japan LNG/natural gas consumption for electricity has been helped for the past month by unplanned coal plant outages. METI did not comment on the WoW decrease. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 7: Japan LNG Stocks



Source: METI

Japan moves to save natural gas

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

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

China natural gas production

Natural Gas: China natural gas production +4.5% YoY in Jan-Feb to 24.5 bcf/d

Well before Covid, our concern in 2019 was that China's LNG imports were going to change from strong YoY growth in LNG imports to a period of zero to very low growth in LNG imports. The reason was primarily the startup of the big Power of Siberia natural gas pipeline from Russia and a return in the 2000's to modest growth in China domestic natural gas production. And since LNG is the most expensive natural gas, it would be and is the marginal natural gas/LNG supply. That concern has played out over the past few years and increasing domestic natural gas production and increasing cheaper natural gas pipeline imports from Russia squeezed out LNG imports in 2022 and 2023. Last Sunday, Bloomberg reported that China natural gas production was +2.9% YoY over Jan-Feb to 24.5 bcf/d, up +4.5% YoY from 23.5 bcf/d in Jan-Feb 2023. December was 23.8 bcf/d. The Chinese government website [LINK] also noted that over 2023, China's natural gas production was 22.3 bcf/d, up +1.0 bcf/d from 2022, which is the 7th annual YoY increase.

China natural gas and LNG imports

Natural Gas: China LNG imports flat YoY at 9.85 bcf/d, natural gas up YoY to 7.72 bcf/d

Here's what we wrote in our Mar 10, 2024 Energy Tidbits memo: "*On Thursday, China's General Administration of Customs (GACC) reported combined natural gas import data for Jan-Feb [LINK]. China's natural gas imports (LNG and pipeline gas) were +23.6% YoY to 22.1 million tons over Jan-Feb 2024, vs 17.87 million tons over Jan -Feb 2023. This is approx. 17.7 bcf/d in Jan-Feb 2024 vs ~14.5 bcf/d in Jan-Feb 2023. Note Jan-Feb 2024 had 60 days due to the leap year. As of our 7am MT news cut off, China has not posted the split*

of natural gas imports into impacts via pipeline vs LNG imports. That split typically comes out a week or so later". Recall that those YoY growth figures were based on absolute tonnage and would be skewed due to the extra day in February 2024 being a leap year. On Monday, China's General Administration of Customs (GACC) provided that LNG split and reported natural gas and LNG import data for February [LINK]. i) LNG imports. GACC reported that over February, China imported 9.85 bcf/d of LNG, down -12.3% MoM from 11.23 bcf/d in Jan and -0.2% YoY from 9.87 bcf/d in Feb 2023. ii) Natural Gas imports. GACC reported that over February, China imported 5.67 bcf/d of natural gas via pipeline, which is +17.2% MoM from 4.84 bcf/d in Jan and +3.4% YoY from 5.49 bcf/d in Feb 2023. China has been benefitting from cheap natural gas exports from Russia but have also been opportunistic in their buying of LNG given weak spot prices in recent months.

Russia targeted Ukraine gas storage

Natural Gas: Russia tries to bomb Ukraine underground natural gas storage

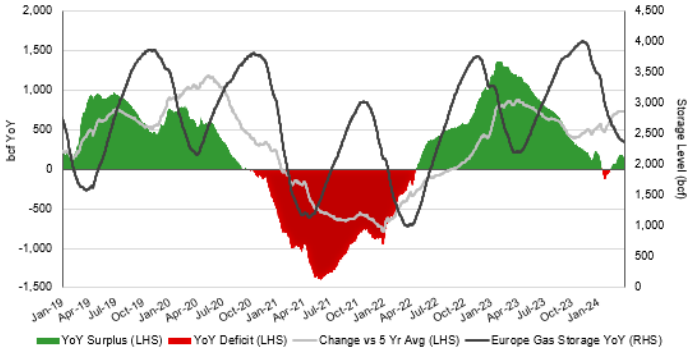
We were a little surprised that it didn't' get much attention but it must because it didn't cause any significant damage. But Last Sunday afternoon, Bloomberg reported "*Russia struck an underground gas storage facility in western Ukraine during Sunday missile and drone attack, underlining threats to the country's energy system posed by war. The barrage damaged equipment on the ground, Oleksiy Chernyshov, chief executive officer of state-run Naftogaz Ukrainy, said on Facebook. The underground storage itself wasn't damaged as it's significantly below the earth's surface, he said".* It's a good thing Ukraine natural gs sotragte is underground reservoirs much like the US and not like above ground LNG storage in countries like Spain or Japan. Our Supplemental Documents package includes the Bloomberg report.

Europe gas storage

Natural Gas: Europe storage decreases WoW to 58.81%, YoY surplus narrows

Europe is seeing some draws on gas storage but shook off its YoY deficit last month. This week, Europe storage decreased by -0.47% WoW to 58.81% on March 27 vs 59.28% on March 20. Storage is now +2.91% higher than last year's levels of 55.90% on March 27, 2023. Even though the YoY surplus is modest, there are no gas supply/demand fears for natural gas and LNG supply and the expectations seem mostly for storage to be full once again going into the winter. However with the caveat in the prior item on Russia reportedly trying to bomb Ukraine underground natural gas storage. Below is our graph of Europe Gas Storage Level.

Figure 8: European Gas Storage Level



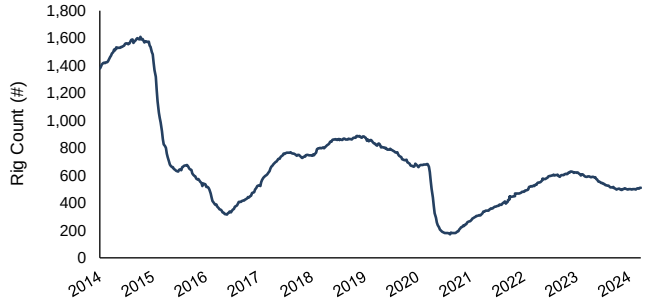
Source: Bloomberg, SAF

Oil: US oil rigs down -3 rigs WoW to 506 rigs, US gas rigs flat WoW at 112 rigs

US oil rigs down WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note, Baker Hughes has restored their old reporting format so we can break out the state data. (ii) Total US oil rigs were down -3 rigs WoW to 506 oil rigs as of March 28. US oil rigs went below 520 rigs on Aug 25 and stayed there for 4 weeks and has been around 490-510 rigs for the past few months. (iii) DJ Niobrara was down -1 rig, the Permian added back 1 rig, but we think the other losses from the "Other Categories", down -3 rigs WoW were in Texas based on the state-level change provided by Baker-Hughes. (iv) US gas rigs were flat this week at 112 gas rigs. Note that most of the losses recently have come from the Haynesville basin and this is expected based on the comments from natural gas producers a month ago as they announced they were cutting back programs and shutting in natural gas in response to low prices.

Figure 9: Baker Hughes Total US Oil Rigs



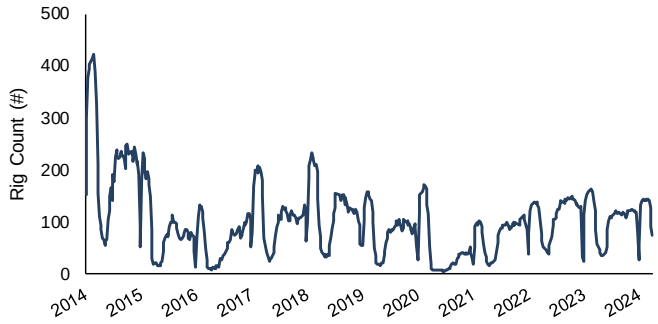
Source: Baker Hughes, SAF

Oil: Total Cdn rigs down -18 rigs WoW

Cdn total rigs down WoW

The last few weeks have seen total Cdn rigs decline drop from 231 to 151 in March as winter drilling season came to an end. And we still expect to see continued declines for at least the next month. Last week, we saw the first significant week of declining Cdn rigs marking the start of the end of winter drilling season. There was another big drop this week and we expect another drop next week. For the week of March 28, as expected, total Cdn rigs were down big at -18 rigs WoW to 151 rigs. Cdn oil rigs were down -16 rigs WoW to 91 oil rigs and are up +17 rigs YoY. Cdn gas rigs were down -2 rig WoW to 76 rigs, which is -5 rigs YoY. By province, Alberta lost 13 rigs, Saskatchewan was down -6 rigs, and BC was up +1 rig.

Figure 10: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

US oil production flat WoW

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

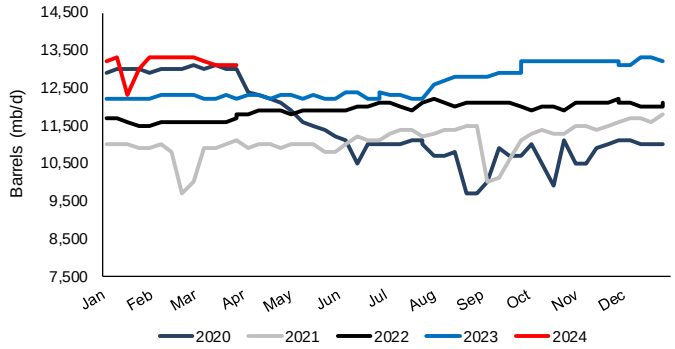
It's worth noting that the EIA has benchmarking has led to a revision downward in weekly oil estimates instead of what have been upward revisions. Here's what the EIA wrote on their website earlier this month: "*When we release the Short-Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude oil production are reviewed to identify any differences between recent trends in survey-based domestic production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that decreased estimated volumes by 177,000 barrels per day, which is about 1.3% of this week's estimated production total".* On Mar 5, the EIA released its Mar STEO and they'd revised down Q1/24 production estimates to 12.91 mmb/d from 13.03 mmb/d in Feb's STEO, so this message is consistent. The latest Form 914 (with December actuals) was +0.115 mmb/d higher than the weekly estimates of 13.200 mmb/d. This week, the EIA's production estimates were flat WoW at 13.100 mmb/d for the week ended March 22. Alaska was down -0.009 mmb/d WoW to 0.432 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 11: EIA's Estimated Weekly US Field Oil Production

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

Source: EIA

Figure 12: EIA's Estimated Weekly US Oil Production



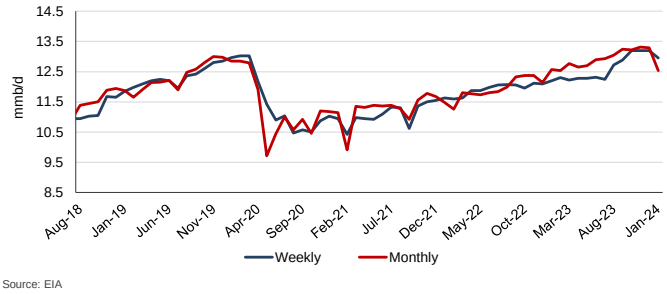
Source: EIA, SAF

EIA Form 914 January

Oil: EIA Form 914 – US January oil production actuals -5.7% MoM due to shut-in effect

On Friday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for January 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 upward adjustments to the EIA weekly oil estimates were +0.400 mmb/d in Aug, then 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, although December was revised down -95,000 b/d to 13,295 mmb/d from 13,315 b/d. (iii) Weekly EIA estimates for January were at 12.533 mmb/d, down -5.7% MoM from December and -0.3% YoY from 12,568 mmb/d in January 2023. The Form 914 actuals are -0.417 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.

Figure 13: EIA Form 914 US Oil Production vs Weekly Estimates



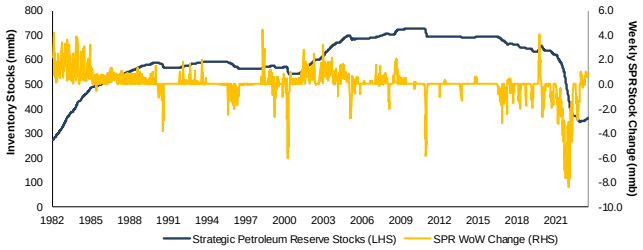
Source: EIA, SAF

US SPR reserves

Oil: US SPR less commercial reserve deficit widens, now -85.157 mmb

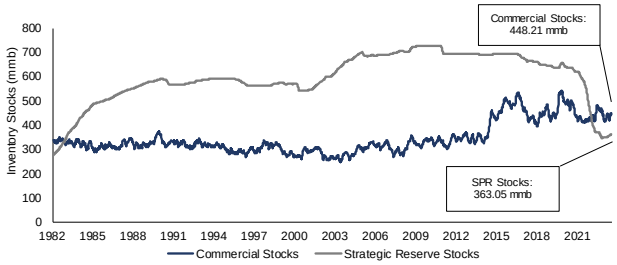
We were surprised by the Granholm comments last week on the Biden Administration plans to add back big amount of oil to SPR. Although, it seems like she was leaving a big out to them in that they would only do so at much lower oil prices. However, at a minimum, she seemed to try to signal the markets they aren't planning to sell any SPR in 2024 or at least that is what she wants the market to think. Reserves are still down -275 mmb since Biden came into office. The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022 week. This week, there was a build on the SPR side, and the but the commercial build was bigger. The EIA's weekly oil data for March 22 [LINK] saw the SPR reserves increase +0.744 mmb WoW to 363.050 mmb, while commercial crude oil reserves increased +3.165 mmb to 448.207 mmb. There is now a -85.157 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 14: Strategic Petroleum Reserve Stocks and SPR WoW Change



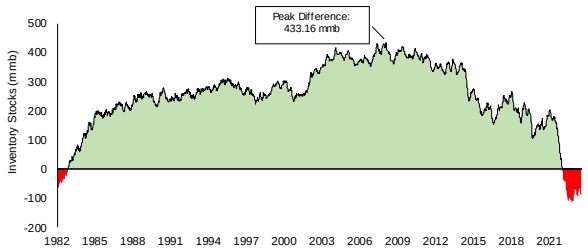
Source: EIA

Figure 15: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 16: US Oil Inventories: SPR Less Commercial



Source: EIA

US gasoline prices

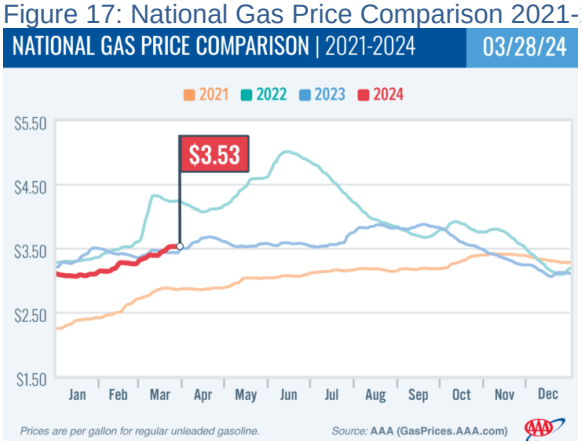
Oil: US national average gasolines prices +$0.01 this week to $3.54

Yesterday, we tweeted [LINK] "*California #Gasoline prices hit $5 this week. US gasoline prices only +$0.01 this week to $3.54 but are +$0.22 MoM and in normal seasonal period to keep going higher. Last thing Biden wants is $4 gas in election run up. Newsom re-election not until 2026. Thx @AAAnews #OOTT."* Yesterday, AAA reported that US national average prices were $3.54, which was +$0.01 WoW, up $0.22 MoM and up $0.05 YoY. As of yesterday, the California average gasoline prices were +$0.10 WoW to $5.08, which is a $1.54 premium to the national average gasoline price of $3.54.

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

On Thursday, AAA reminded that US gasoline prices are currently moving up and down but that they are expected to go higher. They posted a blog "*Don't get April fooled by wobbling gas prices."* [LINK]. AAA wrote "*After an early spring surge, the national average for a gallon of gas spent the past week drifting up and down by a fraction of a cent before settling a penny higher at $3.53. But the break may be temporary, as gas pump prices will likely resume a spring increase*." Our Supplemental Documents package includes the AAA blog.

Figure 17: National Gas Price Comparison 2021-2024 (as of 03/28/24)



Source: AAA

Seasonal increase in US gasoline prices

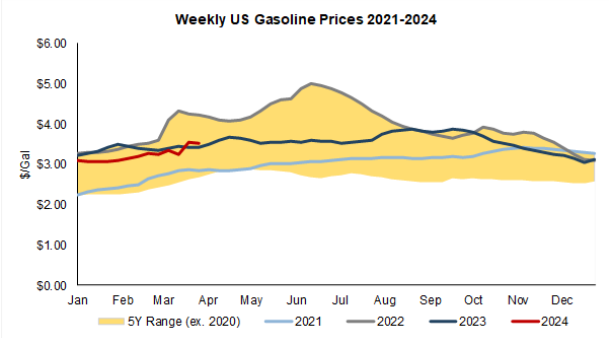
Oil: US gasoline prices normally start seasonal ramp up in March

Rising US gasoline prices were in the general news this week with everyone wondering why. Oil prices are a starting point but we always remind that this is the normal seasonal time for increasing gasoline prices. On Thursday, we tweeted [LINK] "*Gasoline 101. See 👇Mar 9 tweets. ~Mar 1 is when US gas prices start normal seasonal ramp up in driving post winter into the summer. Plus @NACSonline reminds switch to more summer blend fuels costs as much as $0.15 more to produce. Gas +$0.15 since Mar 9.* #OOTT."

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

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

Figure 18: 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 narrowed $2.47 WoW to $29.73

Crack spreads closed at $29.73

Yesterday, we tweeted [LINK] *"321 crack spreads still high. WTI +$2.54 WoW to close $83.17. Yes 321 crack spreads were -$2.47 WoW to $29.73, BUT crack spreads near $30 still provide big margins for refineries ie, big incentive to maximize runs & buying crude & support for WTI. #OOTT Thx @business."* 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 $29.73 on Mar 29, which was a narrowing of $2.47 WoW from $32.20 on Mar 22. Crack spreads around $30 are still big and a huge incentive for refiners to maximize crude runs. We remind that oil demand is driven by refiners and their ability to make money by processing oil and selling petroleum products. So crack spreads are a good indicator if refiners will be looking to buy more or less oil. And when crack spreads are at or over $30, it's a very big incentive to refiners to want more crude and produce more product. This week,

crack spreads narrowed $2.47 WoW to $29.73 on Mar 29, which followed $32.20 on Mar 22, $33.00 on Mar 15, $29.61 on Mar 8, $31.11 on Mar 1, $30.61 on Feb 23, $25.23 on Feb 16, $30.03 on Feb 9, and $25.07 on Feb 2. Crack spreads at $29.73 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

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 $29;73 as of the Friday March 29, 2024 close.

Figure 19: Cushing Oil 321 Crack Spread & WTI Mar 22, 2014 to Mar 29, 2024

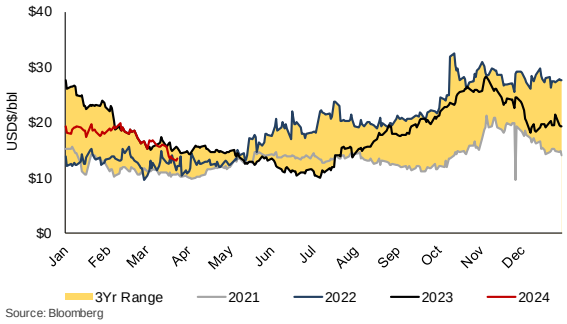
Source: Bloomberg

Oil: Cdn heavy oil differentials continue to narrow, now down to $13.29

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. Refineries have, for the most part, finished planned winter turnarounds and are moving to maximize production of summer grade fuels as well as asphalt ahead of the annual summer driving and paving season. As is said in Canada, there are two seasons in Canada – winter and paving season. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials from Feb thru May. The seasonal narrowing is in motion. The WCS less WTI differential closed on March 28 at $13.29, which was -$0.39 WoW vs $13.64 on March 22. These are both well below the Feb peak of $19.75. The other upcoming factor is the startup of the 590,000 b/d TMX expansion, which is expected to provide additional support for narrowing WCS less WTI differentials.

Figure 20: WCS less WTI oil differentials to March 28 close



Source: Bloomberg

Oil: Mgmt "*feeling better & better everyday about the [TMX] startup*" in Q2

TMX 590,000 b/d expansion

The big watch on Cdn oil will be on Q2 with the expected startup of the Trans Mountain 590,000 b/d TMX expansion. It is expected to be a boost to Cdn oil prices by narrowing the discount of Cdn oil prices to WTI. NO one knows specifically how much the discount will narrow but the view still seems to be around $7. Here is what we wrote in last week's (Mar 24, 2024) Energy Tidbits memo. "*Absent some negative surprise, it keeps looking like Trans Mountain's 590,000 b/d TMX expansion should start commercial shipments in Q2, likely June. (i) On Wednesday, we tweeted [LINK] "Big positive to Cdn #Oil about to kick-in with 590,000 b/d TMX expected start by end of Q2. China's Sinochem takes 1st cargo from Suncor in May/June reports @business. Recall 👇@JavierBlas 02/14 column, expected to give $7/b lift to Cdn crude. #OOTT." (ii) Sinochem has purchased TMX cargos for May/June loading. Our tweet included Bloomberg's Wed report "China's Sinochem Group has purchased one of the first crude cargoes shipped through a new pipeline in Canada, which is designed to move oil from landlocked Alberta to the Pacific Coast for export. Sinochem bought a 550,000-barrel cargo from Suncor Energy Inc., which will load from the Trans Mountain Expansion pipeline in May-June, said traders who asked not to be identified. The oil is a heavy crude quality, they added." (iii) Trans Mountain mgmt feeling better every day about Q2 TMX startup. On Thursday, we tweeted [LINK] "We are feeling better and better every day about the startup" Trans Mountain's Mark Maki about 590,000 b/d TMX entering service in Q2 Report @lkassai @Devikakrishnak. Big positive for Cdn #Oil with expected narrowing of differentials ie. less of a discount to Cdn oil. #OOTT." Bloomberg reported on comments by Trans Mountain mgmt on the expected Q2 startup. "The startup date for Canada's mega oil pipeline should be known within weeks as Trans Mountain drills through hard rock in British Columbia's rugged Fraser Valley for the final stretch of the 715-mile conduit."The next few weeks will be very important in terms of being able to enter service in the second quarter," Trans Mountain's Chief Financial and Strategy Officer Mark Maki said in a interview during the CERAWeek by S&P Global conference on Wednesday. "We are feeling better and better every day about the startup." The startup date for Canada's mega oil pipeline should be known within weeks as Trans Mountain drills through hard rock in British Columbia's rugged Fraser Valley for the final stretch of the 715-mile conduit. "The next few weeks will be very important in terms of being able to enter service in the second quarter," Trans Mountain's Chief Financial and Strategy Officer Mark Maki said in a interview during*

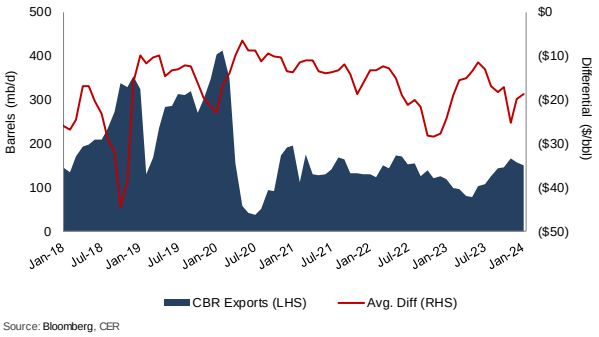
the CERAWeek by S&P Global conference on Wednesday. "We are feeling better and better every day about the startup." Our Supplemental Documents package includes the Bloomberg Trans Mountain mgmt comments."

Oil: Cdn crude by rail exports at 150,292 b/d in January, up +25.2% YoY

Cdn crude by rail up YoY in Jan

We have reached out a couple times to the EIA (but never get a response) as to why their crude by rail imports from Canada data are so much lower than the CER data for Cdn crude by rail exports to the US. Our assumption is that the major reason for the difference is likely that Cdn crude by rail that goes directly to the Gulf Coast and then onto tankers for export will show up in Cdn crude by rail exports but not in US crude by rail imports from Canada ie. the oil never stay in the US. On March 20, the CER released their Canadian crude exports by rail figures for January. January crude exports by rail were 150,292 b/d, down -4.4% MoM from 157,142 b/d in December but up +25.2% YoY from 120,075 b/d in January 2023. As noted below, the EIA estimates crude by rail imports from Canada were only 93,419 b/d in January. The CER doesn't provide any explanation for the MoM changes. Below is our graph of Cdn crude by rail exports compared to the WCS–WTI differential.

Figure 21: Cdn Crude By Rail Exports vs WCS Differential



Source: Canadian Energy Regulator, Bloomberg

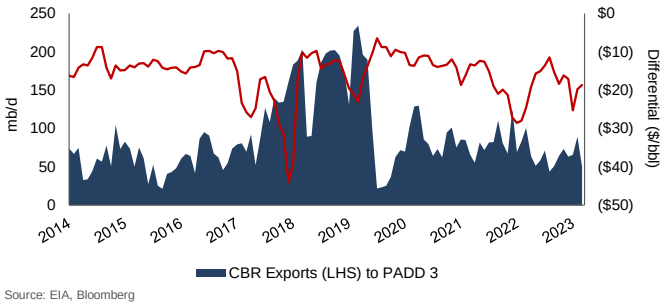
Oil: EIA estimates total Cdn crude by rail imports -19,774 b/d MoM in Jan

EIA Cdn crude by rail imports

On Friday, 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 93,419 b/d in January, which was -19,774 b/d MoM from 113,194 b/d (revised) in December. The EIA estimates Cdn crude by rail into PADD 3 (Gulf Coast) was 50,161b/d in January, which was -39,226 b/d MoM from 89,387 b/d in December (revised). Note there were some big revisions again on the November data. Two months ago in November'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 last month'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). Now, 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. This month, as noted above in the Cdn crude by rail item, 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 93,419 b/d the EIA says they got – there are over 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 22: US Imports of Canada CBR to US Gulf Coast vs WCS Differential



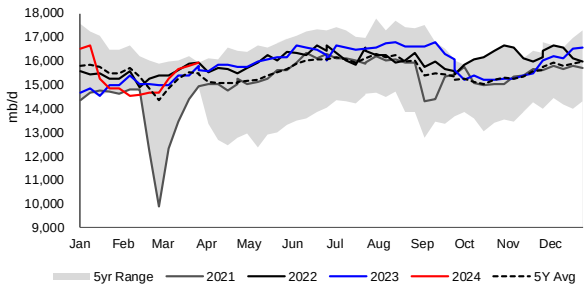
Source: EIA, Bloomberg

Oil: Refinery Inputs up +0.148 mmb/d WoW to 15.932 mmb/d, Joliet refinery to go down

Refinery inputs +0.148 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 ie. below we note Exxon's 250,000 b/d Joliet refinery going down for ~50 days turnaround. But, as a general rule, this is the normal seasonal ramp up in refinery runs following winter maintenance. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended March 22 [LINK]. The EIA reported crude inputs to refineries were up +0.148 mmb/d this week to 15.932 mmb/d and are up +0.119 mmb/d YoY. Refinery utilization was up +90 bps WoW to 88.7%, which is -160 bps YoY.

Figure 23: US Refinery Crude Oil Inputs



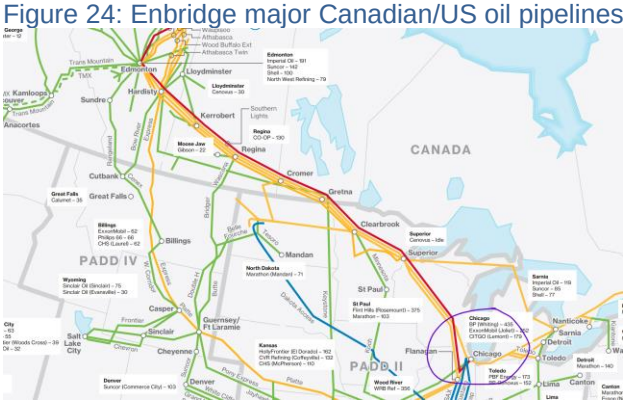
Source: EIA, SAF

Oil: Exxon's 250,000 b/d Joliet (Illinois) refinery going thru lengthy turnaround

Exxon 250,000 b/d Joliet refinery

On Wednesday, we tweeted [LINK] "*Negative to Cdn #Oil. @GasBuddyGuy reports Exxon Joliet refinery beginning ~50 day turnaround. See 👇 Exxon says Joliet processes 250,000 b/d of Cdn crude. Plus Enbridge pipeline map shows mainline for Cdn oil then feeds connected pipelines to Joliet. #OOTT."* The well-known Patrick De Haan (GasBuddy) had tweeted "*A source tells me a full turnaround (shutdown) at ExconMobil's Joliet, IL refinery will begin imminently and is planned to last ~50 days.*". Our tweet was a reminder that Joliet is another US Midwest refinery running on Cdn oil that gets transported thru Enbridge's mainline oil pipeline and then other pipelines in the Enbridge system to get the oil the last leg to Joliet. This is why the Joliet turnaround is a negative to Cdn oil – it means there will be 250,000 b/d less demand for Cdn oil. Exxon writes "*"The Joliet Refinery is located 40 miles southwest of Chicago, Ill. Built in 1972, the Joliet facility is one of the newest refineries in the United States and is ideally located to receive and process Canadian crude oil delivered by pipeline. About us. The Joliet Refinery is located 40 miles southwest of Chicago, Ill. Built in 1972, the Joliet facility is one of the newest refineries in the United States and is ideally located to receive and process Canadian crude oil delivered by pipeline. The characteristics of Canadian crude require specialized refinery equipment and processes and the Joliet Refinery was designed with this purpose in mind. Today the refinery is equipped to handle 250,000 barrels of crude per day, producing about 9 million gallons of gasoline and diesel fuel every day. That daily production is enough to drive an average car around the world more than 7,000 times."* Our Supplemental documents package includes the Exxon overview of the Joliet refinery and the Enbridge oil pipelines map that was attached to our tweet.

Figure 24: Enbridge major Canadian/US oil pipelines



Source: Enbridge

Oil: US net oil imports +1.124 mmb/d WoW as oil exports down -0.700 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up +1.124 mmb/d to 2.521 mmb/d for the March 22 week. US imports were up +0.424 mmb/d to 6.702 mmb/d against exports which were down -0.700 mmb/d WoW to 4.181 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 that Chevron continues to import >100,000 b/d from Venezuela into the Gulf Coast. 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 +0.243 mmb/d. Some items to note on the country data: (i) Canada was down -0.083 mmb/d to 3.652 mmb/d. (ii) Saudi Arabia was up +0.084 mmb/d to 0.338 mmb/d. (iii) Mexico was up +0.172 mmb/d to 0.525 mmb/d. (iv) Colombia was down -0.146 mmb/d to 0.143 mmb/d. (v) Iraq was down -0.008 mmb/d to 0.244 mmb/d. (vi) Ecuador was down -0.138 mmb/d to 0.009 mmb/d. (vii) Nigeria was up +0.158 mmb/d to 0.215 mmb/d.

Figure 25: US Weekly Preliminary Imports by Major Country

	Dec 22/23	Dec 29/23	Jan 5/24	Jan 12/24	Jan 19/24	Jan 26/24	Feb 2/24	Feb 9/24	Feb 16/24	Feb 23/24	Mar 1/24	Mar 8/24	Mar 15/24	Mar 22/24	WoW
Canada	3,428	3,796	3,557	4,188	3,270	3,573	3,539	3,999	3,669	3,766	3,632	3,458	3,735	3,652	-83
Saudi Arabia	75	139	474	413	81	150	353	390	224	139	366	265	254	338	84
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	380	952	522	756	356	427	661	294	784	569	640	303	353	525	172
Colombia	157	129	220	212	72	79	415	150	286	71	351	0	289	143	-146
Iraq	380	239	192	64	206	205	0	43	226	240	176	93	252	244	-8
Ecuador	142	83	30	150	3	103	72	201	158	0	218	102	147	9	-138
Nigeria	80	95	165	147	199	190	81	137	159	165	222	132	57	215	158
Brazil	238	305	249	264	266	213	338	148	44	234	178	272	114	230	116
Libya	0	171	0	7	37	0	0	63	92	65	0	66	0	88	88
Top 10	4,880	5,909	5,409	6,201	4,490	4,940	5,459	5,425	5,642	5,249	5,783	4,691	5,201	5,444	243
Others	1,396	986	832	1,219	1,090	665	1,448	1,045	1,012	1,136	1,439	800	1,077	1,258	181
Total US	**6,276**	**6,895**	**6,241**	**7,420**	**5,580**	**5,605**	**6,907**	**6,470**	**6,654**	**6,385**	**7,222**	**5,491**	**6,278**	**6,702**	**424**

Source: EIA, SAF

Oil: Mexico oil production including partner volumes hits new low 1.544 mmb/d

Pemex February oil production

Mexico started its decline in oil production in 2015 when its super giant Cantarell oil field showed the first signs of being on the back side of its peak oil supply. And as Cantarell declined, Mexico oil production went on a steep decline right away from 2.5 mmb/d down to 1.7 mmb/d by the end of 2018. It has been on a smaller decline since then but started to be consistently below 1.6 mmb/d at the end of 2022. Feb was a new low at 1.544 mmb/d. On

Monday, Pemex posted its February 2024 oil production data. [LINK] Pemex does not provide any commentary on the data, but reported January oil production, including partners, was 1.544 mmb/d, which was -2.4% YoY and basically flat MoM from 1.549 mmb/d in January. The big picture story remains the same - Mexico (Pemex) oil production is stuck around 1.6 mmb/d for the last three years. Pemex has been unable to grow Mexico oil production, which means that any increase in Pemex Mexico refineries crude oil input will result in less Mexico oil for export including to the US Gulf Coast. And it also means that if Mexico has refinery issues in a month, there will be more Mexico oil for export in a month. Below is our table tracking Pemex oil production.

Figure 26: Pemex (Incl Partners) Mexico Oil Production

Oil Production (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	2024	24/23
Jan	2,259	2,020	1,909	1,623	1,724	1,651	1,705	1,584	1,549	-2.2%
Feb	2,214	2,016	1,876	1,701	1,729	1,669	1,684	1,582	1,544	-2.4%
Mar	2,217	2,018	1,846	1,691	1,745	1,697	1,696	1,597		
Apr	2,177	2,012	1,868	1,675	1,703	1,693	1,686	1,608		
May	2,174	2,020	1,850	1,663	1,633	1,688	1,690	1,611		
June	2,178	2,008	1,828	1,671	1,605	1,698	1,702	1,609		
July	2,157	1,986	1,823	1,671	1,595	1,701	1,707	1,573		
Aug	2,144	1,930	1,798	1,683	1,632	1,657	1,691	1,602		
Sept	2,113	1,730	1,808	1,705	1,643	1,709	1,685	1,593		
Oct	2,103	1,902	1,747	1,655	1,627	1,692	1,698	1,574		
Nov	2,072	1,867	1,697	1,696	1,633	1,691	1,706	1,567		
Dec	2,035	1,873	1,710	1,706	1,650	1,694	1,576	1,560		

Source: Pemex, SAF

Oil: Mexico exports 0.940 mmb/d of oil in February, -1.16% MoM

Pemex February oil exports

On Monday, Pemex posted its oil exports for February [LINK]. Pemex does not provide any commentary on the data but reported February oil exports were 0.940 mmb/d, which is -1.16% MoM and -0.9% YoY vs 0.949 mmb/d in February 2023. Exports to the US were up +21.9% MoM but down -5.8% YoY. Pemex's new 340,000 b/d Olmeca (Dos Bocas) refinery continues to push back when they will get thru their ramp up but it is reportedly about to get there in Q2/24 so this should start to lead to big reductions in Mexico oil exports. The simple reminder is more oil processed at refineries = less oil available for export. Below is our table of the Pemex oil export data.

Figure 27: Pemex Mexico Oil Exports

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	2024	24/23
Jan	1,119	1,085	1,107	1,071	1,260	979	832	980	951	-3.0%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	925	949	940	-0.9%
Mar	1,062	1,001	1,176	1,150	1,144	925	905	971		
Apr	1,081	1,017	1,266	1,023	1,179	923	1,024	989		
May	1,204	958	1,222	1,205	1,062	1,031	965	1,087		
June	1,098	1,157	1,110	995	1,114	1,106	1,029	1,203		
July	1,146	1,255	1,156	1,079	1,051	1,173	1,062	1,052		
Aug	1,261	1,114	1,181	1,082	1,190	1,099	915	1,076		
Sept	1,425	1,159	1,206	995	1,023	983	1,022	1,119		
Oct	1,312	1,342	1,027	963	908	935	971	1,053		
Nov	1,273	1,388	1,135	1,114	1,171	1,025	893	883		
Dec	1,115	1,401	1,198	1,115	1,243	1,037	900	1,027		

Source: Pemex, SAF

Oil: looks like more delay for Pemex's 340,000 b/d Dos Bocas/Olmeca refinery

More Pemex refinery delays

No one is surprised to see another report that the new Pemex 340,000 b/d Dos Bocas or Olmeca refinery start up is delayed once again. The start is only reportedly a month later in April but reaching full volumes is now back to September. We checked haven't seen any Pemex reports for the delay but, on Monday, Mexico Business reported [LINK] "*Dos Bocas*

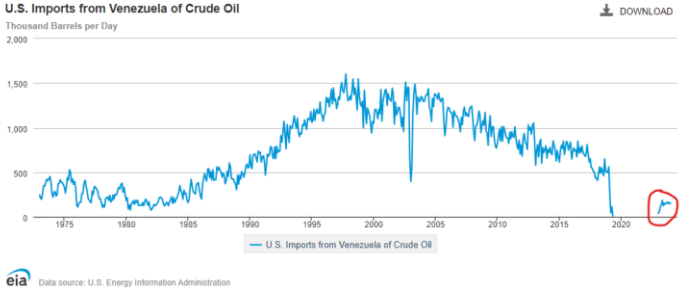
Delayed Again. PEMEX has once again adjusted the timeline for the start of commercial production at the Olmeca refinery in Dos Bocas, Tabasco. Originally slated to begin diesel production in early March, the refinery's operations will now commence in April, aiming for maximum fuel output by September. Reinaldo Wences, Deputy Director of Evaluation and Regulatory Compliance, PEMEX Transformación Industrial, announced during a conference with financial analysts that crude processing would commence upon the arrival of necessary materials, starting with diesel production and followed by gasoline. Prior to this announcement, the NOC had indicated that the Olmeca refinery would reach its maximum gasoline and diesel production capacity by late March. However, President Andrés Manuel López Obrador provided a new deadline, ensuring that operations at Dos Bocas would commence no later than early April. This delay aims to finalize preparations for the refinery to produce around 164Mb/d of gasoline and 130Mb/d of diesel by September, when it is expected to reach its peak production."

> **01/20/24: Pemex Olmeca refinery to be at max production capacity by Mar 31**
> The Mexico Business report that the refinery isn't expected to hit full volumes until September is much later than what Pemex forecast in January. Here is what we wrote in our Jan 21, 2024 Energy Tidbits memo. "*Yesterday, Pemex CEO Oropeza said its new 340,000 b/d Olmeca refinery will be running at full capacity by the end of March. Pemex posted a video on Twitter/X in Oropeza in Spanish but it had English translation running on the bottom. [LINK]. Oropeza said "we are very excited because in a matter of weeks, this refinery, this great project, is going to enter commercial production. First we will start producing diesel, then regular gasoline and, by the end of March, all three will be at their maximum production capacity."*

US oil imports from Venezuela

Oil: US oil imports from Venezuela were 152,000 b/d in Jan, steady for last 7 months
As we highlight every week, the EIA weekly oil import data continues to show zero oil imports from Venezuela, whereas we know Chevron has been importing oil from Venezuela and that is being reflected in the EIA's monthly oil import data. On Friday, the EIA posted its monthly oil import data for Jan, which showed US oil imports from Venezuela were 152,000 b/d ion Jan, That is relatively stable for the past seven months: Dec was 161,000 b/d, Nov was 147,000 b/d, Oct 166,000 b/d, Sept was 163,000 b/d, Aug was 145,000 b/d, and July was 153,000 b/d.

Figure 28: US Weekly Preliminary Imports by Major Country



Source: EIA

US oil sanctions on Venezuela

Oil: No surprise, Biden unlikely to reimpose oil sanctions on Venezuela

The US elections are now just over six months away on Nov 5, 2024. We have been highlighted gasoline and grocery prices as the key priorities for Biden. But gasoline prices may be #1 because Biden can indirectly influence gasoline prices by ensuring maximum oil on the market. And one of his direct levers on oil supply is oil sanctions on Venezuela. Our view is unchanged – Biden isn't going to reimpose oil sanctions even if he stopips the leading opposition candidate, Machado, from running. Yesterday, we tweeted [LINK] "*Gasoline prices is Biden focus for Nov 5 election. "Biden Is Unlikely to Reimpose Oil Sanctions on Venezuela" "US officials are concerned that reverting to Trump-era sanctions that accelerated the decline of Venezuela's #oil production would raise the price of gas at US pumps" report @WSJForero @kejalvyas #OOTT."* The WSj wrote [LINK] "*Biden Is Unlikely to Reimpose Oil Sanctions on Venezuela. Nicolás Maduro of Venezuela has barred presidential candidates, but U.S. officials worry that new penalties would raise gas prices in a U.S. election year. The Biden administration is leaning away from reimposing sanctions on Venezuela's oil industry despite President Nicolás Maduro's moves to bar leading opposition candidates from the country's July elections, said people familiar with the matter. U.S. officials are concerned that reverting to Trump-era sanctions that accelerated the decline of Venezuela's oil production would raise the price of gas at U.S. pumps and prompt more migration from Venezuela as President Biden campaigns for re-election in November."* The unnamed US officials said it clearly, they worry reimposing oil sanctions would raise US gasoline prices. Our Supplemental Documents package includes the WSJ report.

Oil: Colombia oil production still below pre-Covid, January was 0.777 mmb/d

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] January's oil production was down -1.3% MoM to 0.787 mmb/d. This puts January's production up +0.4% YoY vs 0.774 mmb/d in January 2023, so essentially flat. Production remains -12.3% below pre-Covid levels of 0.886 mmb/d in 2019.

Figure 29: 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		
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

Helima Croft comment

Oil: Helima Croft notes multiple geopolitical risk premium items in coming weeks/mths

We recommend reading a great food for thought oil comment from well regarded RBC Helima Croft on Wed, who identified a number of major potential geopolitical risk premium events for oil over the coming weeks and next few months. On Wed, we tweeted [LINK] "*Must read from*

well plugged-in, not subject to hyperbole @CroftHelima. Multiple geopolitical risk premium events over the coming weeks/months, NOT years. #OOTT." (i) One of the key pluses to oil in the last few weeks has been Ukraine drone success hitting Russian refineries. Croft noted that this has Russian refineries down 650,000 b/d YoY n March. And it is important to note that this Ukraine focus on refineries is against the reported Biden request to Ukraine to not go after refineries. It raises the risk if Ukraine is going ahead against the US wishes.. Croft wrote "• *There have been reports that the White House has tried to dissuade Kyiv from this strategy, fearing the energy price impact – we find this entirely credible based on our conversations. As we have repeatedly noted, the White House has sought to avert a Russian supply disruption and has shaped policy towards this end; including price caps designed as a release valve to ensure Russian barrels locked out of Europe would flow to Asia, or directly telling Ukraine to not target Black Sea oil tankers. However, with US assistance being held up in Congress, and Russia making battlefield gains, Ukraine and key regional allies appear to be questioning the utility of this energy bargain with Washington*." (ii) Croft raises the risk that Ukraine will go after Russia oil export terminals. Croft wrote "*Hence, we will be closely watching whether Ukraine moves at some stage to target actual export facilities to strike a deeper blow on the Russian balance sheet. We continue to contend that Ukraine seemingly has the capability to target the majority of export facilities in western Russia, which would put ~60% of Russia's crude exports at risk".* (iii) Croft doesn't see OPEC ramping up production to help ease prices. Crost wrote "*While OPEC is sitting on over 2 mb/d of spare capacity, we do not think the producer group would rush in to cool the rally and ramp up output given what transpired in the months immediately following the Russian invasion of Ukraine. Washington made unprecedented interventions in the market by releasing 180 mb from the SPR after the IEA and other market participants warned of a multimillion b/d Russian disruption that never materialized."* (iv) There was more in the comment. Our Supplemental Documents package includes the Croft comment.

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

Will Ukraine go after Russian oil export

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.

Oil: Russia selling oil and gas to China mainly for ruble & yuan ie. not US$ deals

Russia/China deals in Ruble & Yuan

It didn't get much attention, but Russia and China are doing almost all their oil and gas trades in the ruble and yuan and not the US dollar. 2 mmb/d of oil trade would be over $50 billion

per year. Last Thursday, TASS reported [LINK] "*Russia selling oil and gas mainly for ruble, yuan — Deputy Prime Minister. De-dollarization is a global trend because many countries are starting to switch to doing business in national currencies, Alexander Novak said. The Russian oil and gas industry does about 80% of its business in rubles and yuan, Deputy Prime Minister Alexander Novak said in the documentary "Oil" on the Premier online platform. "More than 90% of our settlements with China were made in national currencies as of the end of 2023. These are the ruble and the Chinese yuan. Speaking about our oil and gas sector in general, we sell about 40% of our products for export for rubles and about 40% - for the Chinese yuan. 20% is left for other currencies," Novak said. "This means the share of the dollar and the euro is actually minimized. I believe this trend will continue," the official noted*."

Oil: Reuters "*Russia orders companies to cut oil output to meet OPEC+ target*"

Russia to cut oil output

Markets have been viewing Russia as a positive for oil prices with the success of Ukraine drones hitting Russian refineries. In theory, Russia would have more oil for export if it refines less but that assumes the oil supplying any hit refineries via pipeline can have that oil moved to export terminals. And we suspect that can't be done for all the hit refineries. And that would mean there would be less oil for export. Whether Russia is cutting p;roduction or can't get the oil to export terminals, it's a positive for oil prices. It's why, on Monday, we tweeted [LINK] "*Whatever the reason, less RUS oil in market = support for prices. RUS to cut #Oil output to "facilitate a seasonal peak in maintenance at refineries...." OR is it the oil supplying refineries hit by drones can't be physically moved to export terminals? #OOTT Thx @Reuters."* We have been checking TASS this week but aren't surprised that we haven't seen them report on this issue. Reuters reported [LINK] "E*xclusive: Russia orders companies to cut oil output to meet OPEC+ target. Russia's government has ordered companies to reduce oil output in the second quarter to ensure they meet a production target of 9 million barrels per day (bpd) by the end of June in line with its pledges to OPEC+, three industry sources said on Monday."* And "*Russia plans to gradually ease the export cuts and focus on only reducing output. Novak has not provided the targeted level for output, but production would drop to almost 9 million bpd in June if the reduction is implemented as planned. The sources, who declined to be named because they were not authorised to speak publicly, said the government had given specific targets to each company, indicating its intention to meet its OPEC+ pledge to cut output to support international oil prices. Russia's Energy ministry declined to comment. Alexander Novak's press office did not reply to Reuters' request for comment. Reuters sources said the production cuts would facilitate a seasonal peak in maintenance at refineries, many of which had already reduced fuel production as a result of outages and Ukrainian drone attacks."* The last Reuters sentence that the production cuts would facilitate a seasonal peak in maintenance is valid but we still believe that not all the oil can be rerouted to export terminals. Our Supplemental Documents package includes the Reuters report.

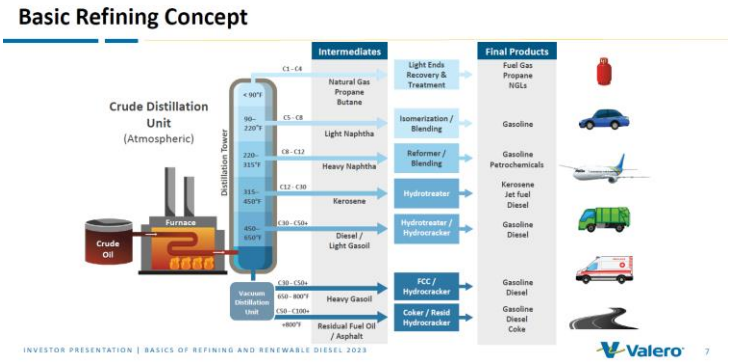
Oil: Ukrainian drones are hitting critical parts of Russian refineries

Russian refineries hit by drones

We continue to see the escalation of the Russia/Ukraine war as a major wildcard to the world and markets. It's hard to get specific damage information on the refinery hits, but the latest last week, Kuibyshev, was reported by Reuters to have had Rosneft stopping its second primary refining unit for an indefinite period. But one thing that seems clear is that Ukrainian drones have been hitting critical parts of Russian oil refineries. Whether its by precise guided drones or luck, it seems the Ukrainians are being increasingly able to hit critical parts of the

refinery and not just oil/products tank. On Mar 12, we tweeted [LINK] "*Refining 101. Lukoil drone reportedly hitting a distillation unit. it's a critical part of refining process. See 👇 @ValeroEnergy refining basics. So it's hit by a drone, it means can't distill oil to send intermediate products to crackers to make finished product. #OOTT.*" Our tweet included some refinery basic charts from Valero's 2022 presentation *"Basics of Refining and Renewable Diesel"* that reminded of the critical nature of distillation units and crackers in the refining process. The distillation tower is the first major step in the process to distill the oil into intermediate products that can be sent to crackers to produce the finished petroleum products. So not distillation unit means no intermediate products to produce final products. It is the critical first process in refining oil into petroleum products. Below is one of the Valero graphics included with our tweet.

Figure 30: Valero's Basic Refining Concept

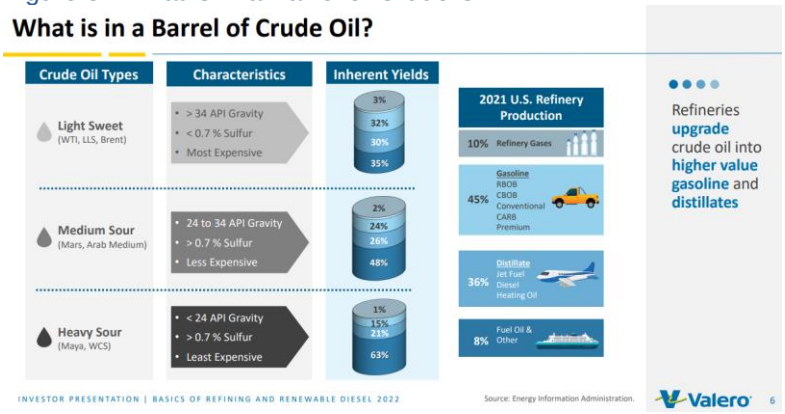


Source: Valero

10/30/22: Valero Basics of Refinery & Renewable Diesel is must add to libraries

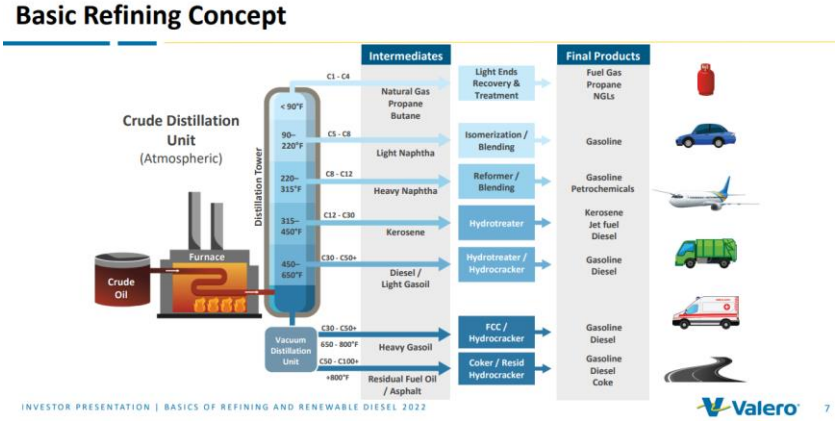
Here is what we wrote in our Oct 30, 2022 Energy Tidbits memo. "*We always like having good reference material that provide the answers to basic questions on oil and gas. One such report is Valero's "Basics of Refinery and Renewable Diesel" [LINK], which we recommend adding to reference libraries. It is as the title suggests, a step through the basics of refineries from crude oil quality, light sweet vs medium sour vs heavy sour, basics refinery concept, coking, etc. and then a step thru renewable diesel refining. It is an excellent reference report. Below are a couple of the slides. We recommend adding the entire 30+ slide presentation to reference libraries. Our Supplemental Documents includes a small portion of the slide deck*." We checked the link for this memo and it still works.

Figure 31 What is in a Barrel of Crude Oil?



Source: Valero

Figure 32: Basic Refining Concept



Source: Valero

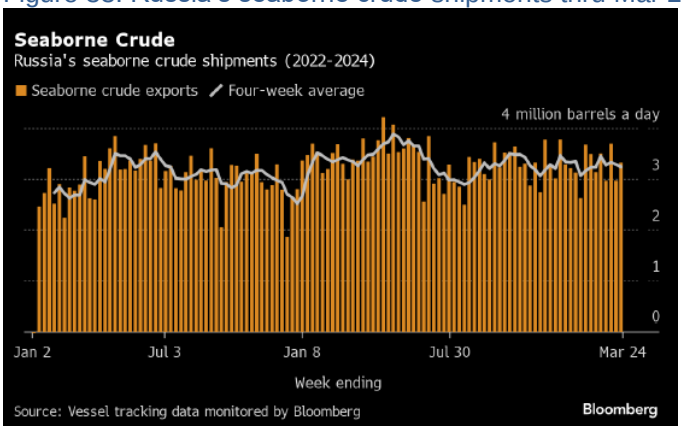
Oil: Russia oil shipments, India avoiding sanctioned cargoes, but exports rise WoW

Russia oil shipments over commitment

Storms from last week have abated, and maintenance at Primorsk is finished, so crude shipments were up WoW but they arguably could have been higher if India wasn't turning away sanctioned oil tankers. Bloomberg reported "*Indian oil refiners — Moscow's second-biggest customers after China since the 2022 invasion of Ukraine — will no longer accept tankers owned by state-run Sovcomflot PJSC because of the risks posed by recently intensified sanctions. That appears to have led to several vessels hauling Russian crude getting held up off the Asian nation's coast, with others diverting to China. None of the ships designated by the US Treasury as carrying oil in breach of a Group of Seven price cap has loaded a cargo since it was added to a list of sanctioned vessels. Many have diverted to the Black Sea, where they have disappeared from tracking screens. Others are anchored near ports on Russia's Baltic and Pacific coasts".* Shipments for the week ended Mar 24 are up +360,000 b/d WoW to 3.32 mmb/d from 2.97 mmb/d last week, and 40,000 b/d above Russia's Q1/24 export cap. After wrapping up maintenance work, the Primorks port saw 10

ships get loaded this week, up from 5 last week. Linked to Indian refiners' reluctance to accept Russian cargoes, all Sokol shipments so far this month ended up going to China, which took 1.21 mmb/d of crude in the Mar 24 week. Our Supplemental Documents package includes the Bloomberg report.

Figure 33: Russia's seaborne crude shipments thru Mar 24 week



Source: Bloomberg

Figure 34: Russian Crude Shipments by Terminal

Source: Bloomberg

Oil: OPEC+ JMMC meets on Wed Apr 3

OPEC+ JMMC on Apr 3

The next OPEC and non-OPEC Joint Ministerial Monitoring Committee (JMMC) will be held virtually on Wednesday Apr 3. As of our 7am MT news cut off, the only commentary we have seen from OPEC watchers is for no JMMC recommendations for any changes and any focus will be on member compliance. As a reminder, the OPEC members agreed to carry on voluntary cuts thru Q2/24.

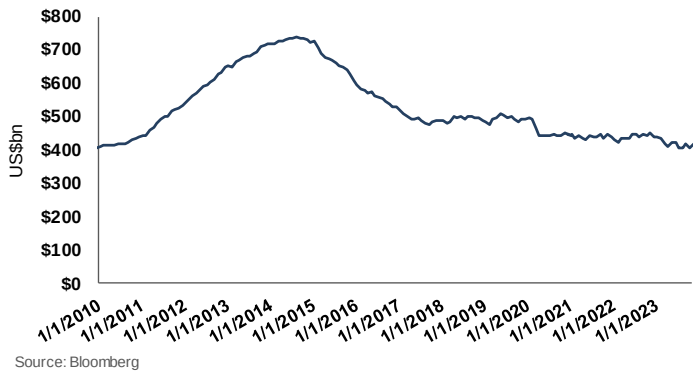
Oil: Saudi nest egg, its net foreign assets were down -$7.2b MoM in February

Saudi net foreign assets

On Wednesday, the Saudi Central Bank (SAMA) released its Monthly Statistical Bulletin for the month of February [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 ~44% or $294.5b over the last nine years (since February 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 -$7.2b MoM decrease to Saudi Arabia's net foreign assets which are now $412.1b in February vs $419.3b in January. 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 February 29 of $412.1b is a decline of ~44% or $324.9b over the last 9 years from its peak of $737.0b on Aug 31, 2014. That is an average of $2.9b per month for the last 113 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, but it is still a big nest egg. 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 February data.

Figure 35: Saudi Arabia Net Foreign Assets



Source: Bloomberg

Oil: Houthis Leader warns Saudi don't let US use their bases/air space to help Israel

Houthis warn Saudi

The Saudi/Houthi war just passed its 9th anniversary and the Houthis leader took the occasion to highlight the Saudi/US attacks over the year, but also to warn the Saudis on a number of fronts. On Monday, we tweeted [LINK] "*Houthis Leader warns Saudi. Houthis/KSA in a de-escalation not a truce. Don't let US use KSA bases/air space to transport weapons to Israel. Don't attack Houthis. Houthi missiles can reach KSA. Arab regimes should cut "fuel" exports to EU/US by 50%. #OOTT."* Our tweet included the Al Masirah reporting of the Houthis Leader speech. Some of their key reporting is as follows: "*Al-Houthi clarified that the current situation between Yemen and Saudi Arabia constitutes de-escalation, not a truce*." "*He also demanded not to allow aircraft to take off from military bases in the Arab world or to transport weapons to Israel." "He cautioned against the use of force on Yemen, stating that the Yemeni army is adapting to field developments and undergoing practical training. He emphasized that the US will not remain the dominant global power and highlighted Yemen's possession of weapons capable of reaching it." "Al-Houthi called on Arab regimes to reduce the export of fuel to Europe and America by 50%, noting that this would have repercussions."* Our Supplemental Documents package includes the Al Masirah report.

Oil: No end in sight for Houthis attacking ships and US/UK hitting the Houthis

No end in sight for Houthis

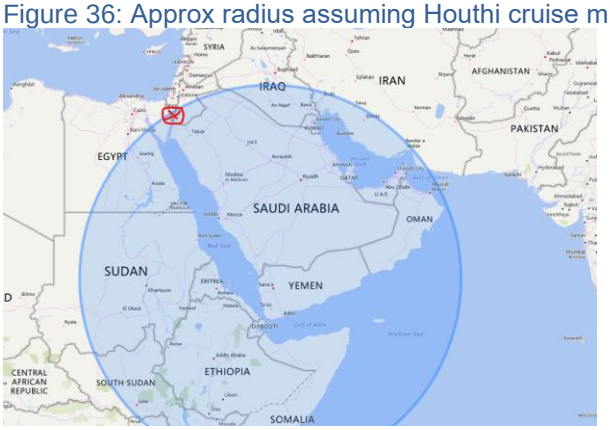
There is no change to our overall takeaway that there doesn't seem to be any end or de-escalation to the Houthis attacking ships and US/UK hitting the Houthis. Again, this week, we saw the Houthis go after US navy ships and the US hit back at the Houthis. So the actions by both the Houthis and US in the Red Sea is the same as there is no indication for any change in the Houthis attacking and hitting some ships and US navy, and the US (and sometimes the UK) missile attacks at Houthi sites on land. We are surprised that despite all the US missile attacks on the Houthis that the Houthis still seem to have reasonable capabilities. Rather the Houthis keep escalating and threatening more escalation and broadening of their attacks. And the US is not giving any indication they will stop their return attacks.

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

Houthi missile hits Israel

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

Figure 36: Approx radius assuming Houthi cruise missile was a little north of Sana'a



Source: Calcmaps

Houthis leader expands target to Indian Ocean & towards Cape of Good Hope

Here is what we wrote in last week's (Mar 17, 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." Our Supplemental Documents package includes the Saba report*."

01/28/24: Houthis reminded can hit Red, Arabian & Mediterranean Seas

When we think about the Houthis leader warning on a surprise for the last couple weeks, we couldn't help remember the Houthis warning from 7 weeks ago that they can hit the Red, Arabian and Mediterranean Seas. Here is what we wrote in our Jan 28, 2024 Energy Tidbits memo. "*As of our 7am MT news cut off, we look back at the week in the ongoing Red Sea crisis and highlight three of the weekly events in the back and forth US/UK missile attacks and Houthis drone/missile attacks. (i) Houthis hit a UK products tanker. On Friday, the Houthis hit a UK registered products tanker, Marlin Luanda, with a missile offshore southern Yemen. The tanker was reportedly carrying products for Trafigura. The tanker caught fire and it took about a day to get the fire out. This was the first successful missile attack and fire on an oil or petroleum products tanker. (ii) Maersk tried again but this time specifically in a fleet of 20 US-flagged ships accompanied by USS Gravely. But the Houthis launched >3 missiles at two of the Maersk container ships around the Bab el Mandeb. And it forced the*

Houthis to stop the transit. (iii) Houthis say they "are still keen on peace". No one knows exactly why now but one of the big unknowns has been how much the Houthis attack and defense capability has been hit by the US/UK missile attacks. But it jumped out at us that this was what we have seen is the first mention of the Houthis saying they are keen for peace. Rather, the Houthis have been saying that the Israel has to stop the attacks on Gaza for them to consider stopping their attacks on Israel linked ships. It just seemed like a different offer from the Houthis. And any time we see something different, it catches our eye. We don't' know if anyone knows the Houthi mindset but we highlight this because a patch to peace would reverse avoiding Red Sea and risk to another oil tanker being hit. Earlier this morning, we tweeted [LINK] ""We are still keen on peace with the least amount of escalation possible" Houthis FM after reminding "we can sink ships & battleships [from any point on the Yemeni mainland to any point in the Red, Arabian, & Mediterranean Seas]," Houthis haven't gone away but being hurt by US. #OOTT." Yemen media reported [LINK] "Yemen: Deputy Foreign Minister, Hussein Al-Ezzi, affirmed that Sana'a is capable of sinking enemy ships at any point across the Red, Arabian, and Mediterranean Seas. "By the power of God, we can sink ships and battleships [from any point on the Yemeni mainland to any point in the Red, Arabian, and Mediterranean Seas]," Al-Ezzi wrote in a post on X on Saturday. "But we leave that for another time," he, however, added, noting, "We are still keen on peace with the least amount of escalation possible."

Added oil tanker days from avoiding Suez Canal and Panama Canal

Our Maersk tweet highlighted Maersk's warning that "*network changes are complex and take time to implement and we believe we should only implement such changes when they can be sustained over a longer period of time."* No one knows how much longer shipping will avoid the Red Sea but it is hard to see logistics allowing a return for at least a few months. Here is what we wrote in our Feb 4, 2024 Energy Tidbits memo. "*We always love a good map. On Friday, we tweeted [LINK] "Great map courtesy of @EIAgov Josh Eiermann. Shows relative tanker travel times from US Gulf Coast to China. Via Panama Canal (27 days) Suez Canal (44 days) Cape of Good Hope (48 days) #OOTT." We included the below EIA map, which shows a lot more than just tanker times from US Gulf Coast to China. It also shows the comparative times Rotterdam, Gulf Coast, Arabian Sea and China. For example, it notes the time from the Arabian Sea to Rotterdam is 19 days via the Suez Canal but 34 days via the Cape of Good Hope. On Wednesday, the EIA posted its blog "Red Sea attacks increase shipping times and freight rates" [LINK]. Our tweet included the below EIA map. Note the EIA "voyage time is calculated for laden Suezmax tankers traveling at 14 knows without extended chokepoint delays". Our Supplemental Documents package includes the EIA blog*."

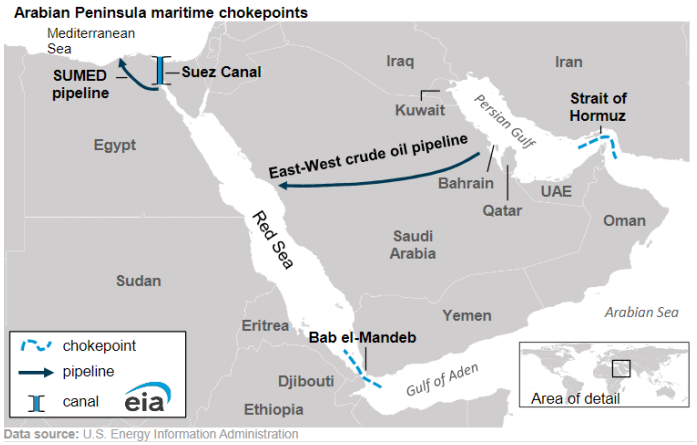
Figure 37 Selected commercial shipping routes, as of January 2024

Source: EIA

EIA estimates 8.8 mmb/d & 4.1 bcf/d thru Bab el Mandeb/Red Sea chokepoint

Here is what we wrote in our Dec 10, 2023 Energy Tidbits memo. "*For the past few years and over the past couple months in particular, we have referenced the EIA's Aug 27, 2019 brief "The Bab el-Mandeb Strait is a strategic route for oil and natural gas shipments", which highlighted the volume of oil, petroleum products and LNG that goes thru the Red Sea and Bab el Mandeb every day. The EIA then wrote "In 2018, an estimated 6.2 million barrels per day (b/d) of crude oil, condensate, and refined petroleum products flowed through the Bab el-Mandeb Strait toward Europe, the United States, and Asia, an increase from 5.1 million b/d in 2014." On Monday, the EIA updated the same data in a blog titled "Red Sea chokepoints are critical for international oil and natural gas flows" [LINK]. The volumes thru the Bab el Mandeb and Red Sea are a lot higher. The EIA's updated data for H1/23 estimates the volume was now up to 8.8 mmb/d and 4.1 bcf/d of LNG. Our Supplemental Documents package includes the EIA blog*."

Figure 38: Bab el-Mandeb Strait, a world oil chokepoint



Source: EIA

Figure 39: Bab el-Mandeb Strait, a world oil chokepoint

Volume of crude oil, condensate, and petroleum products transported through the Suez Canal, SUMED pipeline, and Bab el-Mandeb Strait (2018–1H23)

eia

million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Suez Canal and SUMED pipeline	**6.4**	**6.2**	**5.3**	**5.1**	**7.2**	**9.2**
crude oil and condensate	3.4	3.1	2.6	2.2	3.6	4.9
petroleum products	3.0	3.1	2.6	2.9	3.6	4.3
LNG flows through Suez Canal (billion cubic feet per day)	**3.3**	**4.1**	**3.7**	**4.5**	**4.5**	**4.1**
Total oil flows through Bab el-Mandeb Strait	**6.1**	**5.9**	**5.0**	**4.9**	**7.1**	**8.8**
crude oil and condensate	**3.0**	**2.7**	**2.2**	**1.9**	**3.3**	**4.5**
petroleum products	**3.1**	**3.2**	**2.8**	**3.1**	**3.8**	**4.4**
LNG flows through Bab el-Mandeb Strait (billion cubic feet per day)	**3.1**	**3.9**	**3.7**	**4.5**	**4.5**	**4.1**

Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking

Note: LNG=liquefied natural gas, 1H23=first half of 2023

Source: EIA

Oil: How will political infighting impact Libya's short and mid term oil production

Libya oil political infighting

Other than the short protest that shut in Sharara oil field, Libya's oil production has been stable at ~1.2 mmb/d for the past several months. But we can't help wonder what will happen given this week's political infighting. Political infighting can't be a positive, but the real question is what will be resolved and if it will impact oil production and development. On Monday, Libya oil minister Aoun was suspended for undisclosed reasons "*based on a memorandum from the director of the General Investigation Department regarding legal violations in case No. 178*." The immediate comments seemed to be that this would be a positive for the Libya National Oil Corporation as Aoun as been in conflict with the NOC. But then on Thursday, the Libya Observer reported [LINK] "*The National Accord Bloc of the High Council of State announced on Wednesday that it had submitted a report to the Attorney General against the Chairman of the Board of Directors of the National Oil Corporation (NOC), Farhat Bengdara, accusing him of holding the citizenship of another country, which "makes him lose the Libyan citizenship," demanding an investigation into "conflict of interest" and suspicions of corruption related to oil contracts that were signed in the past years*."

Libya NOC sees 1.5 mmb/d by end of 2025, 2 mmb/d in 3 years

Here is what we wrote in last week's (Mar 24, 2024) Energy Tidbits memo. "*We were surprised to see the bullish oil production growth forecasts by the Libya National Oil Corporation Chair Farhat Bengdara, especially his forecast for Libya to reach 2 mmb/d in three years. This seems optimistic especially considerin the NOC's track record of forecasts. We didn't see any disclosure on the Libya National Oil Corporation website, Twitter/X, or Facebook on the NOC's forecast for oi production in 2025 or 2027 so only have the brief Libya Observer report "PM urges transparency, vigilance over oil production increase plan" [LINK]. TH brief comment in the Libya Observer was "Prime Minister Abdul Hamid Dbeibah has emphasized the importance of monitoring the plan to increase oil production to achieve the target of two million barrels within the established timelines." AndFor his part, the Chairman of the National Oil Corporation, Farhat Bengdara, confirmed that the production will exceed 1.5 million barrels by the end of 2025 and reach two million within three years. However, he highlighted that ongoing projects require continuous financial*

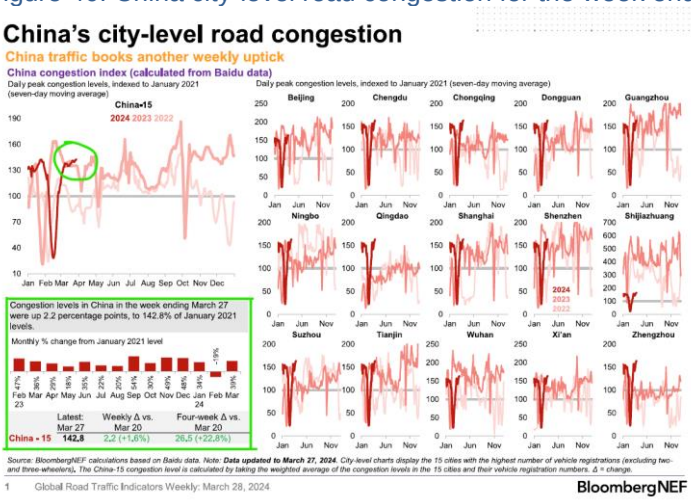
flows to achieve the necessary productivity." Our Supplemental Documents package includes the Libya Observer report. [LINK]"."

Oil: Baidu China city-level road congestion up WoW, strong past few weeks

China city-level traffic congestion

It's only one indicator but it is positive to see the Baidu city-level road congestion continue to increase. More driving activity in cities is a good indicator. On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly March 28 report, which includes the Baidu city-level road congestion for the week ended March 27. We have been seeing an uptick in Chinese road congestion over the past month, and this week there was a +1.6% WoW increase in congestion levels across select Chinese cities. Baidu city-level road congestion was +220bps WoW to 142.8% of Jan 2021 levels. Overall, so far, March is 39% higher than Jan 2021 levels. Below is the BloombergNEF key graph.

Figure 40: China city-level road congestion for the week ended Mar 27



Source: BloombergNEF

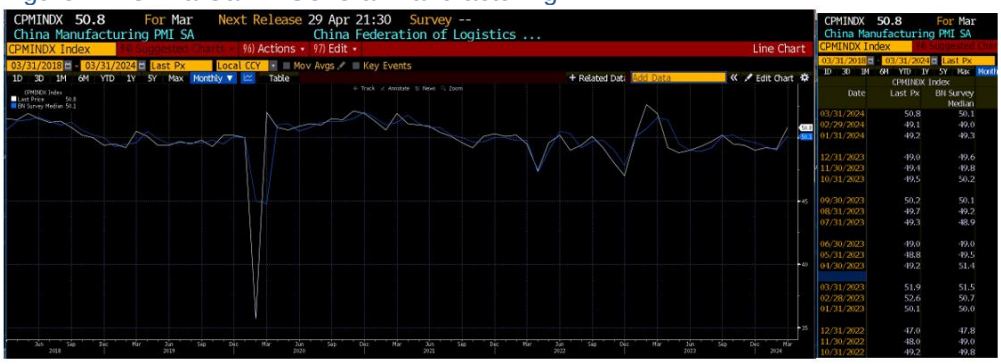
Oil: China official Manufacturing PMI at 50.8 in Mar, 1st expansion since Sept

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. However, early this morning, we tweeted [LINK] "*Positive for #Oil. 1st expansion in official China Manufacturing PMI since Sept. Mar 50.8 (survey 50.1). Feb 49.1. Jan 49.2. Dec 49.0. Nov 49.4. Oct 49.5. Sep 50.2. More smaller export oriented firm Caixin Manufacturing PMI is tonight. Thx @business. #OOTT #Oil."* It caught our eye that it was the first expansion since Sept for the official PMI, whereas the Caixin PMI had been in expansion since Nov. The Caixin PMI comes out tonight but assuming it is still in expansion, it would mean that the manufacturing PMIs for larger domestic firms and smaller export-oriented firms are both in expansion. The qualifiers is that Sept at 50.2 was the only expansion month n the official PMI since last Mar

so one month is not a trend. But it would seem to be at least an indicator that the economy is stabilizing.

Figure 41: China Caixin General Manufacturing PMI



Source: Bloomberg

Caixin Manufacturing PMI at 50.9 in February, slightly up MoM

As noted above, the more export oriented firm Caixin Manufacturing PMI is being released tonight. Here is what we wrote in our Mar 4, 2024 Energy Tidbits memo. "*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 February was released at 6:45pm MT Thursday night [LINK] and we tweeted [LINK] "Continued positive view from China smaller & export oriented firms. China Caixin Manufacturing PMI Feb 50.9 (est 50.7) vs Jan 50.8, Dec 50.8, Nov 50.7, Oct 49.5. 4th straight month of growth." Our Supplemental Documents package includes Caixin Manufacturing PMI report."*

Figure 42: China Caixin General Manufacturing PMI

Source: Caixin, S&P Global

Oil: China oil production +1.4% YoY in Jan-Feb to 4.37 mmb/d

China Oil Production

A similar theme to natural gas is playing out for China oil imports in that increasing China domestic oil production reduces the amount of China oil imports. What is often overlooked is the fact that China is one of the world's top producers of crude oil, just behind Iraq in 2022, according to the EIA [LINK]. On Sunday, Bloomberg reported that China crude oil production was +1.4% YoY over Jan-Feb to 4.37 mmb/d, i.e. +0.06 mmb/d YoY from Jan-Feb 2023 which was 4.31 mmb/d. The government of China also noted [LINK] on January 9th that crude oil production over 2023 was overall 4.25 mmb/d, which was +0.06 mmb/d YoY from 2022.

Oil: China oil imports 11.16 mmb/d in February, up 6.8% MoM but down -3.3% YoY

China oil imports 11.16 mmb/d in Feb

On Monday, China's General Administration for Customs (GACC) reported on the summary data of China's oil and natural gas imports for February [LINK]. China's imports of crude oil in December were 4.414 ten thousand tons, or 11.16 mmb/d, a 6.8% increase from 10.44 mmb/d in January, and down -3.3% YoY from 11.54 mmb/d in February 2023. While on an absolute basis, the tonnage in Feb 2024 was higher than Feb 2023, recall this year had 29 days in Feb which means on a per day basis there was a YoY decrease. Overall, this was solid MoM growth but it isn't enough to convince oil markets that China oil domestic consumption is about to take off.

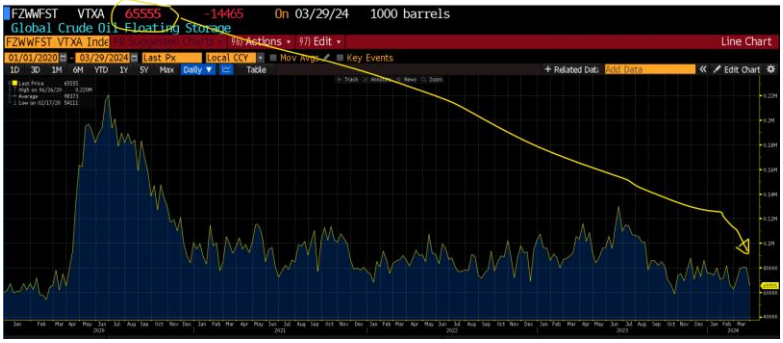
Oil: Vortexa crude oil floating storage est 65.56 mmb at Mar 29, -14.46 mmb WoW

Vortexa floating storage

We are referencing the Vortexa crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Mar 23 at 9am MT. (i) Yesterday, we tweeted [LINK] *"#Oil floating storage 65.56 mmb Mar 29. Big revisions up to Mar 15/22 (RUS cargos in limbo?), BUT last 7 wks ave 72.11 mmb ie. floating normalizing at lower levels. Refiners/tankers have worked in longer trips = lower floating storage as OPEC keeps cuts thru Q2. Thx @vortexa @business #OOTT."* (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Mar 29 at 65.56 mmb, which is -14.46 mmb WoW vs revised up Mar 22 of 80.02 mmb. Note Mar 22 was revised +13.78 mmb vs 66.24 mmb originally posted at 9am on Mar 23. (iii) It seems like oil floating storage/longer tanker travel has mostly sorted out to a new normal. It's been over two months for refineries and tankers to work thru the longer tanker trips into deliveries/schedules, which seemed to return oil to storage that was used to fill in as deliveries took longer. If the oil delivery system has now adapted to the longer tanker travel, it makes sense that a world of longer tanker travel is likely to have floating storage at lower (ie. <80 mmb) levels. (iv) Revisions. Big upward revisions to Mar 22 and 15, but all other revisions were small. There is no commentary provided, but we have to wonder if the big upward revisions were related to Russian crude tankers not being accepted. Here are the revisions compared to the estimates originally posted on Bloomberg at 9am MT on Mar 23. Mar 22 revised +13.78 mmb. Mar 15 revised +9.05 mmb. Mar 8 revised +1.57 mmb. Mar 1 revised -2.90 mmb. Feb 23 revised +0.90 mmb. Feb 16 revised +0.77 mmb. Feb 9 revised +0.53 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 72.11 mmb vs last week's then seven-week average of 71.04 mmb. The increase is due to the upward revisions. (vi) Also remember Vortexa revises these weekly storage estimates on a regular basis. For example, when most

report on the Vortexa data on Monday morning, they will be reporting on different estimates. We do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison. Normally we download the Vortexa data as of Saturday mornings around 9am MT. (vii) Note the below graph goes back to Jan 1, 2020 to show the run up to Covid and then how Covid started to impact Covid in March/April 2020. (viii) Mar 29 estimate of 65.56 mmb is -64.55 mmb vs the recent June 23, 2023 high of 130.11 mmb. Recall Saudi Arabia stepped in on July 1, 2023 for additional cuts. (ix) Mar 29 estimate of 65.56 mmb is -37.70 mmb YoY vs Mar 31, 2023 of 103.26 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Mar 30, 9am MT Mar 23, and 9am MT Mar 16.

Figure 43: Vortexa Floating Storage Jan 1, 2000 – Mar 29, 2024, posted Mar 30 at 9am MT



Source: Bloomberg, Vortexa

Figure 44: Vortexa Estimates Posted 9am MT on Mar 30, Mar 23, and Mar 16

Posted Mar 30, 9am MT

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

Mar 23, 9am MT

Date	Last Px
Fr 03/22/2024	66242
Fr 03/15/2024	71169
Fr 03/08/2024	77934
Fr 03/01/2024	73160
Fr 02/23/2024	61646
Fr 02/16/2024	65869
Fr 02/09/2024	81294
Fr 02/02/2024	72191
Fr 01/26/2024	70168
Fr 01/19/2024	80331
Fr 01/12/2024	74127

Mar 16, 9am MT

Date	Last Px
Fr 03/15/2024	69277
Fr 03/08/2024	75507
Fr 03/01/2024	75289
Fr 02/23/2024	65448
Fr 02/16/2024	68291
Fr 02/09/2024	83379
Fr 02/02/2024	75792
Fr 01/26/2024	70094
Fr 01/19/2024	80951
Fr 01/12/2024	72848
Fr 01/05/2024	76419

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 Mar 22 in total, was revised a big +13.78 mmb. Asia was revised +7.32 mmb and Other was revised +4.87 mmb vs the estimates posted as of 9am Mar 23 for Mar 22. (ii) As noted above, Mar

29 of 65.56 mmb was -14.46 mmb WoW vs revised up Mar 22 of 80.02 mmb. The major WoW changes by region were Other -7.92 mmb WoW, Asia -4.45 mmb WoW and Middle East -2.74 mmb WoW. (iii) Mar 29 at 65.56 mmb is -64.55 mmb vs the summer June 23, 2023 peak of 130.11 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 -41.47 mmb and Other -27.02 mmb. (iv) Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for Mar 22 that was posted on Bloomberg at 9am MT on Mar 23.

Figure 45: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Mar 29/24	Mar 22/24	WoW	Mar 22/24	Jun 23/23	Mar 29 vs Jun 23
Asia	31.54	35.99	-4.45	28.67	73.01	-41.47
Europe	9.68	7.54	2.14	6.47	6.21	3.47
Middle East	7.43	10.17	-2.74	10.08	6.76	0.67
West Africa	5.94	6.84	-0.90	7.41	7.62	-1.68
US Gulf Coast	2.48	3.07	-0.59	2.07	1.00	1.48
Other	8.49	16.41	-7.92	11.54	35.51	-27.02
Global Total	65.56	80.02	-14.46	66.24	130.11	-64.55
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Mar 30						
Source: Vortexa, Bloomberg						

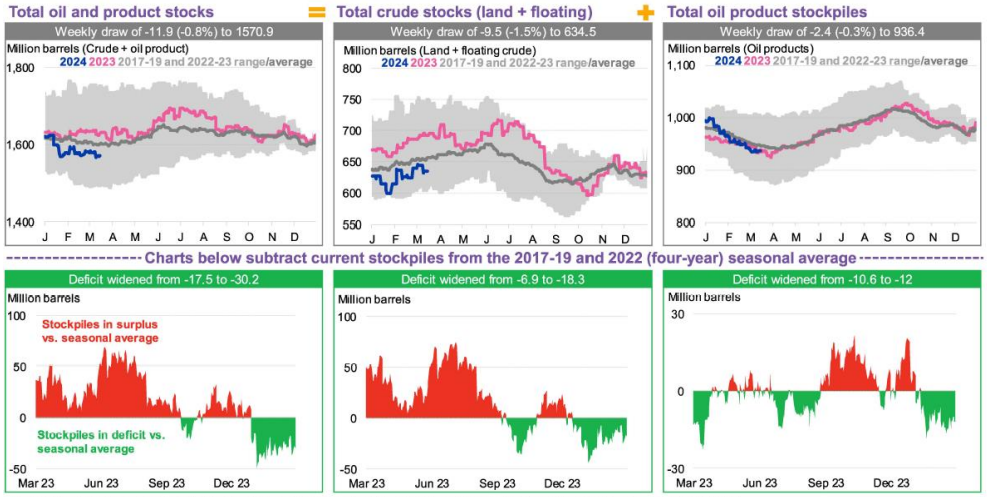
Source: Bloomberg, Vortexa

Oil: BNEF – global oil and product stocks deficit widens to -30.2 mmb

Global oil and products stocks

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending March 15, which is a week earlier than the normal EIA US oil inventory data that is for the week ending Mar 21 which was a build of +3.16 mmb. On Tuesday, BloombergNEF posted its "*Oil Price Indicators*" weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022-2023, and other times using a five-year average 2017-2019 + 2022-2023. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products deficit widened from -17.5 mmb to -30.2 mmb deficit for the week ending Mar 15. (iii) Total crude inventories (incl. floating) decreased by -1.5% WoW to 634.5 mmb, while the stockpile deficit widened from -17.5 mmb to -30.2 mmb. (iv) Land crude oil inventories decreased -0.5% WoW to 559.8 mmb, widening the deficit to -28.2 mmb against the five-year average (2017-2019 + 2022-23). (v) The gas, oil, and middle distillate stocks increased by +0.4% WoW to 155.7 mmb, with the deficit against the four-year average narrowing from -22.0 mmb to -20.7 mmb. Jet fuel consumption by international departures for the week of Apr 1 is set to increase by +105,300 b/d WoW, while consumption by domestic passenger departures is forecast to rise by +49,600 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 46: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF, US EIA, PJK, IE Singapore, FEDCom/Platts, PAJ, Vortexa, Genscape. Note: As of the ***week ending March 15, 2024.***

Source: BloombergNEF

Vitol, not building oil stocks in key pricing centers = more backwardation

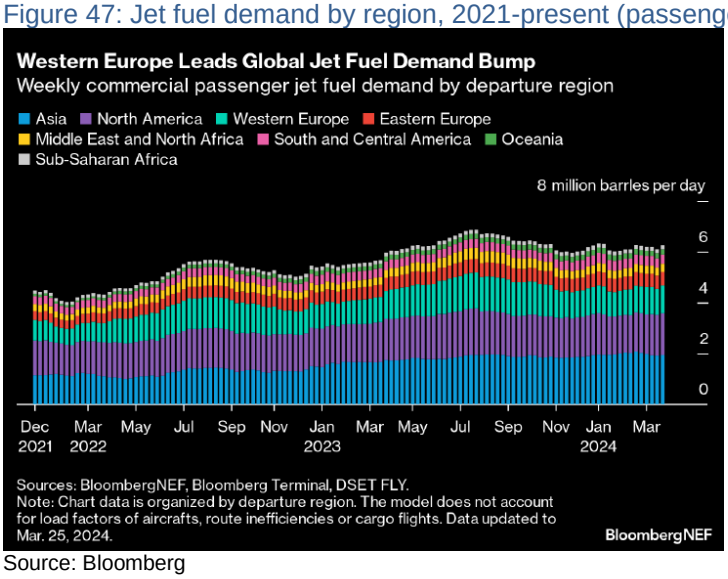
The key to oil markets in Q1 has been the OPEC+ cuts have worked and global oil stocks are not being built in what is the seasonally low oil consumption quarter. The above BloombergNEF global oil stocks numbers are in line with the views heard from Vitol a week ago. Here is what we wrote in last week's (March 24, 2024) Energy Tidbits memo. "*There was a straightforward comment from Vitol's Kieran Gallagher (Managing Director for Vitol Bahrain E.C.) on how global oil stocks in key pricing centers aren't really building and that means more backwardated oil prices. Gallagher was speaking on the tightening oil market and highlighted how onshore inventories aren't increasing in key oil pricing regions. Gallagher was speaking on the Gulf Intelligence Daily Energy Markets podcast on Thurs [LINK] hosted by Sean Evers (Founder and Managing Partner). On Thursday, we tweeted [LINK] "OPEC+ cuts are working. "means we're not really building [Oil stocks} in the pricing centers. And when we're not really building anything in the pricing centers, the market become more backwardated" @vitolnews Kieran Gallagher to @sean_evers #OOTT." Our tweet included a transcript we made of his comments. Items in "italics" are SAF Group created. At 5:10 min mark, Gallagher "What I would say is that the fundamentals have a got a touch tighter. We're seeing continuing attacks on Russian refineries. We're seeing the latest on the local refinery took out another 150 kbd. We're seeing supportive transport fuels market. We're seeing a lot more oil on water being rerouted around the Cape. All of these things taken together, along with the geopolitical risk, means we're not really building in the pricing centers. And when we're not really building anything in the pricing centers, the market becomes more backwardated". Evers "What does that mean for clarification, building in the pricing centers for the non-initiated". Gallagher "We're not building any stocks really. And that's being a factor. We are seeing a growth in oil on water but on land stocks, we're not really seeing that growth."*

Bloomberg oil demand monitor

Oil: Bloomberg Oil Demand Monitor "Gasoline Signals Strength; Robust Aviation"

The Bloomberg Terminal Oil Demand Monitor is a good recap of key oil demand indicators around the world. This week's issue continued the positive tone from the previous report, citing strong gasoline consumption and jet fuel demand. Bloomberg pointed out again that India is driving a lot of global oil demand growth, with gasoline sales up +3.5% YoY in the first half of March, while China's refineries just refined a record volume of crude to help support growing domestic and foreign demand for refined products. It's also worth noting that some regions in Europe are seeing double-digit growth in gasoline demand, namely France and Spain at +12% YoY during February and +8.6% in Italy. In North America, gasoline stockpiles fell for the 7th straight week, all in the face of a looming gas price increases now that refineries like Joliet (250,000 b/d) are performing turnarounds, and AAA predicting a return to 2022 prices over the summer. Air travel continues to ramp up, with a +19% increase to air passengers in the first half of March compared to pre-pandemic levels, and flight schedules for the April 1 week implying a +2.5% WoW increase to jet fuel demand globally, bringing total consumption to 6.25 mmb/d. Looking at consumption indicators, the demand monitor showed that global flights continued to track comfortably above both 2023 and 2022 levels during the week of March 25, up +7.3% and +9.9% respectively, but down -0.8% on a MoM basis. For the month of February, diesel and gasoline sales in India were up +6.2% and +8.9% YoY, respectively, while on a MoM basis diesel sales were up +0.1% MoM and Gasoline sales were down -2.5% MoM. Refinery utilization in the US for the week leading up to Mar 22 was at 88.7%, which is up +90 bps WoW but down -160 bps YoY. Recall the Whiting Refinery came back online earlier this month, boosting refinery runs. Below is a graph of jet fuel demand since 2021. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 47: Jet fuel demand by region, 2021-present (passenger flights)



Source: Bloomberg

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

Why jet fuel is up

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

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

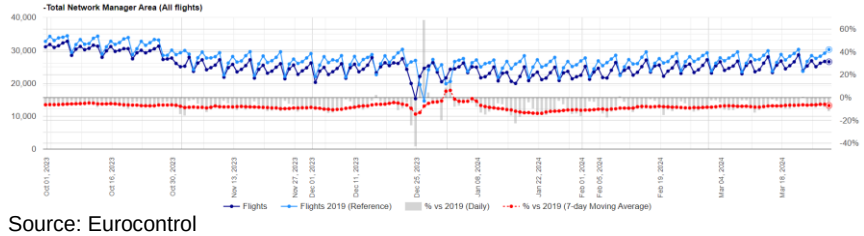
Here is what we wrote in last week's (March 24, 2024) Energy Tidbits memo. "On Thursday, we tweeted "*Bullish for near term #Oil. "we're seeing jet fuel now back to averaging around 6.9 million barrels per day over the last 4-weeks, which is back to 2019 levels" "we see growth in Q2, which brings it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

Oil: Europe airports daily traffic 7-day average is -7.0% below pre-Covid levels

Europe airports daily traffic

Other than over Christmas, European daily traffic at airports continues to be stuck below pre-Covid levels. 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 Mar 28 was down small WoW at -7.0% (was -6.7%) below pre-Covid 2019 levels. Eurocontrol updates this data daily and it is found at [LINK]

Figure 48: Europe Air Traffic: Daily Traffic Variation to end of Mar 21



Source: Eurocontrol

Oil & Natural Gas: Dallas Fed Survey, "*outlook improves… breakeven prices increase*"

Dallas Fed quarterly energy Survey

One of our favorite quarterly reports is the Dallas Fed quarterly energy survey posted this week [LINK]. The survey provides a good window into what the US oil and gas sector is thinking about prices, activities, and issues. (i) It is important to remember that the data for this survey was collected March 13-21 from a total of 147 firms; of which 97 were E&Ps and 50 were oilfield service companies. We suspect the views would be a little more positive for oil now vs. when the study was taken, based on decreasing storage around the world and reports on OPEC+ member cuts having a bigger impact than thought. During the Mar 13-21 survey, WTI averaged $82.52/bbl and Henry Hub was $1.45/mcf. (ii) The main headline was "*Outlook improves even as oil and gas activity little changed; Breakeven prices increase… .".* (iii) The rising costs theme continued, as the input cost index for oilfield service firms increased from 21.3 to 31.2, while lease operating expenses index jumped from 22.6 to 33.7 and the E&Ps' cost index stayed flat. (iv) Respondents said they expected WTI to be $79/bbl in 6 months and between $80-$85/bbl to end 2024. (v) For gas, respondents expected HH to be $2.23/mcf in 6 months and $2.08-$2.48/mcf to end 2024. (vi) E&P firm comments. E&P respondents are expressing frustration with labour issues and broader aversion of institutions with regards to engaging in oil and gas: "*The Great Turnover (wave of retirements backfilled by greenhorns) is continuing to result in elementary mistakes in land work, division orders, and, thus, revenue distributions from oil and gas purchasers. I am seeing increased joint interest billings errors. Collectively, this is causing a diversion of staff time. The greenhorns in the positions making these mistakes are defensive and insisting they are right even when confronted with the facts. Washington's war against domestic oil and gas is winning. Accounting firms don't want oil and gas firms as clients, preferring only clients in a so-called reputable industry. Bankers are stiff-arming discussions."* Natural gas prices are so low they are barely breaking even with cost of production. Companies express anxiety towards administrative uncertainty, in terms of further regulation and next election. (vii) O&G service firm comments. Respondents report that the consolidation of customers (as we've seen in the Permian) is affecting business. A challenge is that many OFS companies are still very small and undercapitalized, making it harder to meet needs of growing clients. Cost of labour continues to be an issue and margins are being compressed. Uncertainty around the 2024 election is causing capex decisions to be kicked down the road for now. Our Supplemental Documents package includes excerpts from the Dallas Fed survey.

Oil & Natural Gas: TIPRO Texas oil and natural gas jobs up +5.1% in 2023, US +2.8%

TIPRO 2023 jobs update

Last week the Texas Independent Producers and Royalty Owners Association (TIPRO) posted its annual recap, which included their updated their employment figures for the Texas upstream sector for FY 2023 [LINK]. By year-end 2023, there were 471,631 Oil & Gas

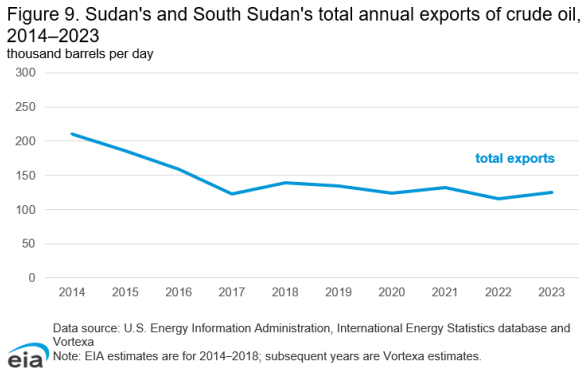
workers in Texas alone, which is up +5.1% YoY from 448,064 in 2022, and for the entire US there were 2,043,855 people employed in Oil & Gas, up +2.8% YoY from 1,987,482 in 2022. TIPRO wrote "*Despite facing a number of unique challenges, including geopolitical conflicts and an adversarial federal policy environment, the U.S. oil and gas industry continued to offer significant economic support in 2023, while providing reliable and affordable energy to meet growing domestic and global demand. According to TIPRO, the U.S. oil and gas industry supported a total of 2,043,855 direct jobs in 2023, which represented a net increase of 56,373 direct jobs compared to 2022. Total direct and indirect jobs for the U.S. oil and gas industry exceeded 24 million last year. In Texas, direct industry employment was 471,631 in 2023, compared to 448,064 jobs the previous year, a net gain of 23,567, subject to revisions. California was the second largest employer (148,729), followed by Louisiana (92,320), Pennsylvania (80,321) and Oklahoma (70,763). Together, direct and indirect oil and gas employment totaled 2.9 million in Texas last year. These jobs also pay extremely well, with an average annual wage of $124,453 in Texas, 74 percent higher than all average private sector wages in the state*". Our Supplemental Documents package includes excerpts from the TIPRO recap.

Oil & Natural Gas: Sudan/South Sudan Country Brief

EIA's country brief on the Sudans

We continue to recommend adding the EIA's country analysis briefs to reference libraries as good quick references, in this case its new EIA country executive summary [LINK] on Sudan and South Sudan. South Sudan became its own country after a referendum in 2011 led to its secession from greater Sudan. This was a significant loss to Sudan as they essentially gave up 75% of their oil reserves to South Sudan, over which they still dispute certain fields. While collectively, the Sudans have one of the largest oil and gas reserves in Africa, underinvestment in upstream projects have led to the industry's atrophy and stagnation. Sudan has again been engulfed in a civil war, this time beginning in April 2023 in Khartoum as the Sudanese Armed Forces (SAF) clashed with the Rapid Support Forces (RSF). The RSF has gained control in the south of the country and has destabilized regions with major pipeline infrastructure, leading to signification problems with the export of their oil. Here's what we wrote in our March 24, 2024 Energy Tidbits memo: "*Sudan has been engulfed in civil war since April of last year, and the ability to conduct proper maintenance and deliver fuel to pump stations and generators have been difficult. The approximate location of the pipeline rupture is in an area controlled by the "Rapid Support Forces" (RSF). Sudan normally exports approximately 150,000 b/d and is home to Africa's third-largest oil reserves. The fuel is exported from the Sudanese coast on the Red Sea, which should be noted is very close to the Yemen (and Houthi militants)*". It's worth to note that as recent as 2014, the Sudans exported a combined 200,000 b/d of crude, but dropped below 150,000 b/d in 2016 and stuck there to this day. Sudan produced ~70,000 b/d of liquid fuels in 2023, while South Sudan produced ~149,000 b/d. Interestingly, a large portion of Sudan's electricity generation is from hydropower (the Nile runs through both countries), and they don't burn any coal, although South Sudan relies overwhelmingly on fossil fuels. Our Supplemental Documents Package includes the EIA brief.

Figure 49: Sudan and South Sudan's Crude Exports, 2014-2023



Source: EIA

Sudan pipeline rupture

Oil: Sudan declares Force Majeure on oil deliveries after pipeline rupture

Last Wednesday, Bloomberg reported that Sudan had declared a force majeure following a ruptured pipeline pumping crude from their oil fields straddling the border with South Sudan. Sudan has been engulfed in civil war since April of last year, and the ability to conduct proper maintenance and deliver fuel to pump stations and generators have been difficult. The approximate location of the pipeline rupture is in an area controlled by the "Rapid Support Forces" (RSF). Sudan normally exports approximately 150,000 b/d and is home to Africa's third-largest oil reserves. The fuel is exported from the Sudanese coast on the Red Sea, which should be noted is very close to the Yemen (and Houthi militants). Below is a map of the pipeline and the approximate break location.

Figure 50: Sudan oil infrastructure

Source: Drilling Info International, Bloomberg

Oil & Natural Gas: EIA Regional Analysis Brief on South China Sea

EIA's brief on the South China Sea

The EIA also posted its updated brief on the South China Sea [LINK] on Mar 21. The South China Sea and the Strait of Malacca is the 2nd largest by volume oil and LNG chokepoint after the Strait of Hormuz. And the Strait of Malacca has always been one of the active pirate areas. The South China Sea is also significant as the potential geopolitical powder keg with multiple countries having territorial disputes with China and, of course, it includes Taiwan, which may be the biggest potential powder keg .The EIA estimates 10 billion barrels and 6.7 tcf of LNG passed through those waters in 2023. Although largely unexplored, it is estimated that the South China Sea holds between 2.4 and 9.2 billion barrels between 13 distinct basins. There are currently ~3.6 billion barrels and 40.3 tcf of proved + probable oil and natural gas reserves, mostly in uncontested areas of the sea. Of the petroleum resources in the South China sea, Malaysia produces 41% and China 34%, while China produces 66% of its gas and Brunei 13%. As tensions rise in this region, and the easy reserves are depleted in uncontested areas, we think it will be worth keeping an eye on developments in the South China Sea. Our Supplemental Documents Package includes the EIA brief.

Figure 51: Volume of crude & products thru world chokepoints & Cape of Good Hope

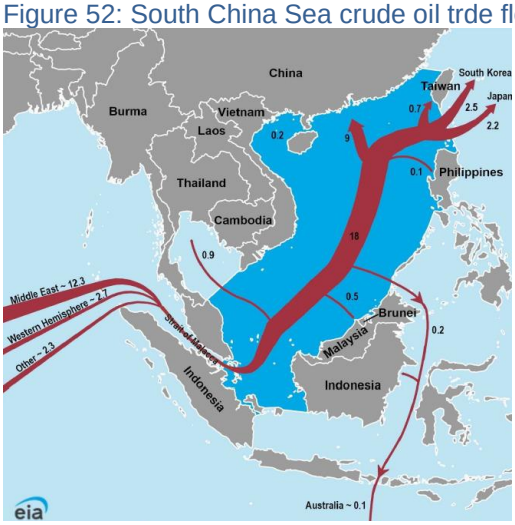
Table 1. Volume of crude oil and petroleum products transported through world chokepoints and the Cape of Good Hope, 2011-16 (million b/d)

Location	2011	2012	2013	2014	2015	2016
Strait of Hormuz	17.0	16.8	16.6	16.9	17.0	18.5
Strait of Malacca	14.5	15.1	15.4	15.5	15.5	16.0
Suez Canal and SUMED Pipeline	3.8	4.5	4.6	5.2	5.4	5.5
Bab el-Mandab	3.3	3.6	3.8	4.3	4.7	4.8
Danish Straits	3.0	3.3	3.1	3.0	3.2	3.2
Turkish Straits	2.9	2.7	2.6	2.6	2.4	2.4
Panama Canal	0.8	0.8	0.8	0.9	1.0	0.9
Cape of Good Hope	4.7	5.4	5.1	4.9	5.1	5.8
World maritime oil trade	**55.5**	**56.4**	**56.5**	**56.4**	**58.9**	**n/a**
World total petroleum and other liquids supply	**88.8**	**90.8**	**91.3**	**93.8**	**96.7**	**97.2**

Note: Data for Panama Canal are by fiscal year.
Sources: U.S. Energy Information Administration analysis based on Lloyd's List Intelligence, Panama Canal Authority, Argus FSU, Suez Canal Authority, GTT, BP Statistical Review of World Energy, IHS Waterborne, Oil and Gas Journal, and UNCTAD, using EIA conversion factors.[4]

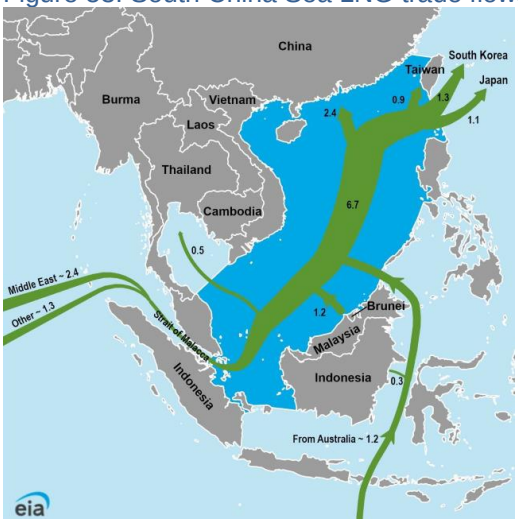
Source: EIA

Figure 52: South China Sea crude oil trde flows in million s of bpd in 2023



Source: EIA

Figure 53: South China Sea LNG trade flows in tcf in 2023]



Source: EIA

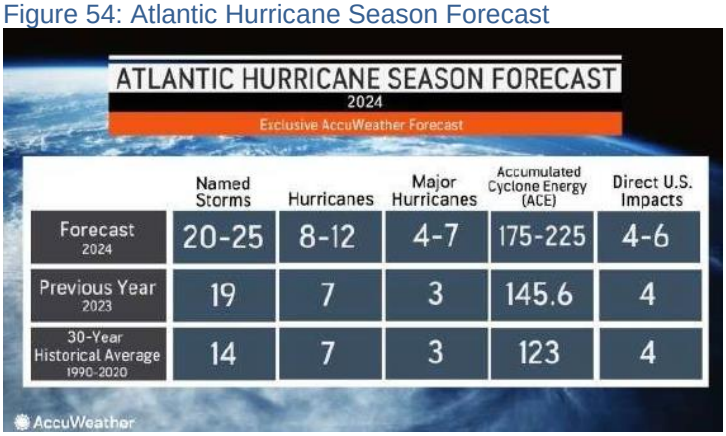
Oil & Natural Gas: AccuWeather "Explosive" Atlantic Hurricane Season in 2024

AccuWeather predicts massive hurricanes in 2024

It is important to remember the big change in Atlantic hurricane season impacts over the past several years. Prior to the big growth in US oil production that led to big growth in US oil and liquids exports and the rapid growth in US LNG exports, the major markets concern for Atlantic hurricanes was on US GoM natural gas production impacts. But now, hurricane season is as big or even bigger impact on oil. It's why we have moved our hurricane impact comments to the oil & natural gas section. This week, we saw the first of the major Atlantic hurricane season forecasts with others to follow in April. As a reminder, the Atlantic hurricane season is June 1 to November 30th, so roughly half the year. On Wednesday, AccuWeather

reported [LINK] "*A super-charged hurricane season could spawn a near-record number of storms in the Atlantic this year, and forecasters may even run out of names for storms amid a frenzy of tropical systems… "The 2024 Atlantic hurricane season is forecast to feature well above the historical average number of tropical storms, hurricanes, major hurricanes and direct U.S. impacts," AccuWeather Lead Hurricane Forecaster Alex DaSilva said. This echoes the early warning AccuWeather issued in late February, ringing the alarm bells about the potential for a surge in tropical activity"*. AccuWeather is forecasting between 8 and 12 storms to show up this season vs. 7 last year. They accredited this rise due to abnormally warm sea-surface temperatures, which leads to the creation of storms as well as their rapid development. Between 4 and 6 of these storms are expected to directly hit the United States, most likely on the gulf coast side as that's historically where the storms have originated. Note the impact this would have on PADD 3 tanker traffic and North American LNG exports. Our Supplemental Documents Package includes the AccuWeather report.

Figure 54: Atlantic Hurricane Season Forecast



Source: AccuWeather

Energy Transition: Ford cuts 2/3 of F-150 Lighting production due to less demand

Ford cuts F-150 Lightning production

It looks like Ford F-150 Lightning demand is even less than most expected when Ford made their Jan 19 announcement that they would be cutting F-150 Lightning production due to "*less than anticipated*" demand. Ford didn't say how much they would cut but most interpreted their comments of "*transitions to one shift effective April1*" to mean a 50% cut to workforce as they weren't reportedly working 24/7. On Wednesday, Detroit Free Press reported [LINK] "*Ford to dramatically cut hourly workforce at F-150 Lightning plant in Dearborn. Ford Motor Co. is dramatically cutting the hourly workforce at the factory that builds the Ford F-150 Lightning starting next week, as the automaker slashes product targets of its all-electric pickup. Of the 2,100 workers who make up three work crews at the Rouge Electric Vehicle Center in Dearborn, one third will remain on-site after April 1, Ford spokeswoman Jessica Enoch told the Detroit Free Press on Wednesday. A crew of 700 will be transferred to the Michigan Assembly Plant in Wayne to build the Bronco and Ranger while the remaining 700 or so will either take the $50,000 retirement package negotiated during the 2023 contract talks or accept reassignment in southeast Michigan. Ford is adding a third crew at Michigan Assembly. Staffing reductions at the Lightning plant, first announced in January, will not result in job losses, Enoch said.* She declined to confirm production

volume details on Wednesday." Our Supplemental Documents package includes the Detroit Free Press report.

01/19/24: Ford to cut F-150 Lighting production due to less demand

Ford making a big cut to its F-150 Lightning production workers was announced on Jan 19. Here is what we wrote in our Jan 21, 2024 Energy Tidbits. "*Ford is the latest to come out with changes to reflect significantly less customer EV buying. Early Friday morning, we tweeted [LINK] "Breaking. Ford cuts F-150 Lightning production to "achieve optimal balance of production, sales growth & profitability" Did customers speak or will Kerry 👇blame this on EV misinformation? #EnergyTransition will take longer and #Oil #Gasoline needed for much longer. OOTT." Ford didn't say how much lower Ford F-150 Lightning sales were projected. Rather they said on their overall EVs that they "expect continued growth in global EV sales in 2024, though less than anticipated". But it looks like they cut their Ford F-150 Lightning production capacity by ½ at their big Rouge Electric Vehicle Center that "transitions to one shift effective April 1". That sounds like a cut in half to Lightning production. Ford wrote that the reduction in production was to "achieve the optimal balance of production, sales growth and profitability."*

Ford F-150 Lightning really isn't a pickup for working pickup drivers

We have previously highlighted our belief that one of the big factors for the less than expected Ford F-150 Lightning sales is that the Lightning isn't going to work for working pickup drivers ie. contractors, drivers, ranchers, who tow, etc. Here is one reason from our Oct 8, 2023 Energy Tidbits memo. "*Recirculated Ford F-150 Lightning failed Motor Trend's towing test. We wouldn't have included this item on a recirculated Motor Trend report if the report wasn't getting renewed interest this week and if Ford CEO Jim Farley hadn't warned people on the shortfalls of the F-150 Lightning. The Ford F-150 Lightning had a lot of headlines in the last week with the reports from dealers in Canada and US on how they weren't getting planned deliveries of the Lightning. So, inevitably, a range of stories come out on the Lightning from both car and EV news sites. And in many cases, these are not new news such as one that got circulated this week – the Motor Trend July 31, 2022 report [LINK] "Tow No! The Ford F-150 Lightning Struggled in Our Towing Test". Motor Trend reported "We towed 3100-, 5300-, and 7200-pound travel trailers with Ford's electric truck and didn't get very far from home. Before you hitch an Airstream to your electric truck and set out to circumnavigate the country, you need to understand this: With the largest available battery pack, a fully charged 2022 Ford F-150 Lightning electric truck has less energy onboard than a regular F-150 with four gallons of gas in its tank. Consider how far a combustion-powered F-150 would tow at max capacity on four gallons of regular unleaded. Thirty five miles? Maybe 40 if you drive slowly? Now that you understand where we're starting from, you won't be as surprised to learn that the towing range of the electric F-150 is dismal. In Motor Trend testing, an F-150 Lightning Platinum saddled with a camper that nearly maxed out its 8,500-pound towing capacity couldn't even cover 100 miles. Range improved when we hooked up a significantly lighter trailer, but not by as much as you might expect."*

04/26/22: Ford CEO warned EV trucks aren't for working pickup truck drivers

Here is what we wrote in our May 1, 2022 Energy Tidbits memo on Ford CEO Jim Farley warning that the F-150 Lightning is really for normal pickup truck uses. "*We thought there was a throwing water on the fire reality check on EV trucks from Ford CEO Jim Farley on Tuesday. We had missed his comments but one of our Twitter followers flagged it for us after seeing our Wednesday morning tweet [LINK] "GM #SilveradoEV truck will have 400 miles of range & that is only a year away, @mtbarra just said to @tomkeene on @bsurveillance. #EV range is no longer a reason not to buy. Can they get the prices down?? #OOTT." We thought 400 miles of range was a pretty good number, even if it gets hammered down in cold Cdn winters. But then we went to search out the Ford CEO interview on the Ford F150 Lightning EV. As everyone knows, Ford dominates the pickup truck market with the F150. But clearly Farley threw some cold water on the fire. We were surprised at the bluntness of his warning on EV pickup truck uses. We tweeted [LINK] "#EV trucks #F150Lightning are not good for heavy users ie. ranchers, contactors. But perfect for urban cowboy & commuting to work, so will need mix of #ICE & #BEV says #Ford CEO to @sonalibasak..So why feature towing so prominently in commercials? Thx @kropija for flagging. #OOTT. Farley is basically saying the F150 Lightning is best suited for commuters and what Texans call "all hat, no cattle" pickup truck drivers. We created a transcript of Farley's comments [LINK]. Bloomberg's Sonali Basak. "Jim, look out into the future for a second here, can you see all the F150's going electric? And what would it take for that to happen?" Farley "No way. I don't see that happening. If you're towing a fifth wheel in Wyoming, or you know with a horse trailer, there is no way. An electric vehicle is not a good solution for super duty customers. We're 50% of all commercial light duty vehicles in the US so we know. And the technology is not right for that. For retail customer who is doing some light towing or commuting to work, it's perfect. But for heavy duty usage, it's not the right solution. So you're going to see a mix of ICE and BEV." After listening to Farley, we looked at the Ford F150 Lightning promotion video [LINK] and couldn't help notice how prominently Ford featured towing in its commercials."* [Note, we checked the link to the promotion video from 2022 and it is no longer available].

Energy Transition: Ford CFO, we wonder will large EVs fade away before they take off?

Ford's shifting EV strategy

It must be old news to the analysts and industry reports covering Ford but we were surprised Ford CFO John Lawler's comments t a US sellside conference on Tuesday didn't get more attention. There were some surprising "really?" moments in his comments but also what looked to be some significant changes to their EV strategy. (i) On Friday, we tweeted [LINK] "*Will large EVs fade away before they take off? No surprise, Ford CFO "Growth is much less than what we thought" "moving into the early majority. & the early majority is much less forgiving, & pricing is an issue" BUT "we're going to have some large EVs as well, but they're going to be very limited in the scope and the number. #OOTT."* (ii) There was a lot in the Lawler's comments included some expected but also some unexpected. (iv) Ford is now using what Lawler calls an "*early majority*", which we assume means there is a late majority. (v) Really? In the "really" category, we remain shocked how Ford has been surprised that pricing is an issue after moving from the early adopters. This is what has caused the huge mismatch in the reality of demand vs the demand expectations built into Ford's growth plans. This wasn't a new 2023 item, it was common feedback and survey responses. Lawler said

"*And I think we're in the transition between the early adopters that were much more willing to deal with some of the ancillary items that come with EVs, charging range, and things like that. We're moving into the early majority. And the early majority is much less forgiving, and pricing is an issue."* (vi) Lawler states the obvious on EV sales "*Growth is much less than what we thought*." (vii) Ford sees large EVs will be "*very limited in the scope and the number of top hats that we have".* This is the point that we didn't see highlighted post Lawler's comments. The reporting focused on Ford's concern that the "*real competition where we see it is the low-cost EVs from China as well as Tesla".* But if you read beyond the China headline, Ford sees a limited future for larger EVs and the future is is small low-cost EVs. This was not the original EV strategy. Lawler said "*Yeah, well, we definitely need to work to match capacity with demand. And demand is much lower than the industry expected when it comes to EVs. And when we look at that, prices came down dramatically. Growth is much less than what we thought. So we are right-sizing our capacity and the investments that we're putting into EVs. One of the first movers in the market is that we don't believe the game is going to be really fought in one with larger vehicles. We think it's going to be in the smaller, more affordable vehicles. And that's why we started the group out in California, which is a group of highly successful EV engineers, designing a new platform for us in a much different way. And it'll allow us to have that low-cost affordable EV platform where we can create multiple top hats off of that. And I think that's where we're really going to start to see the traction because the real competition where we see it is the low-cost EVs from China, as well as Tesla. And so, we're working towards that future. Now, of course, we're going to have some large EVs as well, but they're going to be very limited in the scope and the number of top hats that we have. So we're thinking about it in that way. And one of the things about the segmentation that's different, clearly, is everybody gets to see exactly where we are in EVs."* (viii) Pickups aren't made for working users. As noted earlier, Ford CEO Farley warned the F-150 Lightning really wasn't good for working pickup truck users. Lawler didn't specifically say that, but noted on two occasions that they can't put a big enough battery to allow for high duty towing. (ix) We couldn't help think of tiny homes when we saw Lawler talk about the their upcoming ability to have way more interior space in a small exterior. Tiny homes can pack a lot in them bit that doesn't mean the majority want to live in one. We have to wonder if Ford's upcoming small EVs with a lot packed in them will attract broad buying. this will attract broad buying. Lawler said "*So it's about that smaller platform. Now, the great thing about EVs is when you look at the design footprint, the way you can think about it is that the exterior size of an Escape could be the interior size of an Explorer because you don't have the package limitations of the front, right?* Our Supplemental Documents package includes excerpts from the transcript of the Ford CFO comments.

Energy Transition: Will govts/IEA admit the #1 factor for peak oil demand isn't working **Peak oil demand**

We believe April could be a key month for the mid to long term view of oil as we should see the IEA push back their timing for peak oil demand. ie. oil is needed for longer. The IEA normally releases its annual global EVBs outlook in April and we have been saying since the April 2023 report that the IEA has been using overly optimistic assumptions for their forecast that EVs will displace ~5.5 mmb/d of oil consumption by 2030. It is their key factor for why they forecast peak oil demand will be by 2030. (i) It is important to remember that our view was assuming the IEA's EV sales growth forecast was accurate. And, as highlighted again by Ford CFO on Tuesday, EV sales growth is less than expected. We have to believe the IEA has no choice but to significantly reduce its forecast for EV sales growth starting in 2024 and

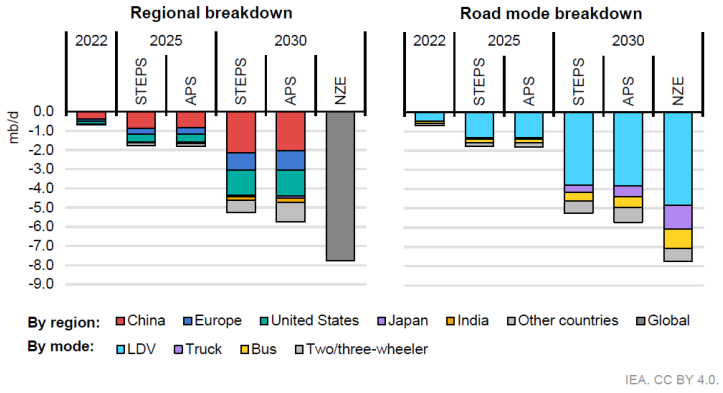
for all years. And lower EV sales has to lead to lower oil displaced by EVs in the IEA's peak oil demand forecast. (ii) In addition, we still believe the IEA should be changing their overly optimistic assumption on EVs displacing mileage driven by ICE. On Tuesday, we tweeted [LINK] "*IEA's peak oil demand by 2030 is more than how many & how quick EVs are sold. A huge overlooked ass. in IEA's peak oil demand before 2030 is 👇04/26/23 tweet. The IEA assumes every new EV displaces the distance driven by an ICE. ie. infers an ICE is effectively junked. #OOTT."* Our tweet included one of the 7-part tweets on April 26, 2023 on the IEA's then new global EVs outlook. This tweet (3/7) included this rationale. On Apr 26, 2023, we tweeted "3/7. *Oil bulls also note KEY assumption to @IEA #EVs replacing 6 mmbd is that distance travelled by EVs basically replaces the distance an ICE or hybrid would have driven. ie. infers a new EV is added to fleet, an ICE is effectively retired from fleet. #OOTT."* Our tweet included what we thought was overlooked – the assumptions to their forecast. The key assumption was "*Box 3.2 How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each). In the case of PHEVs, only the distance covered by electricity gets included. The stock average fuel consumption of gasoline and diesel vehicles determines the total liquid fuel displacement, where the biofuel portion is taken out of the estimate based on regional blending rates. As a result, it can be estimated that in 2022, the stock of EVs displaced 700 000 barrels of oil per day. This method of estimation assumes that EVs replace ICE or hybrid vehicles of the same segment, as opposed to some other means of transport, i.e. an electric car replaces an ICE car."*

04/30/23 memo: Will EVs displace ~6 mmb/d of oil as IEA forecast this week?

Here is what we wrote in our Apr 30, 2023 Energy Tidbits memo on the IEA's report. "*The most important assumption on when peak oil demand hits is how quickly the accelerating share that EVs have of all new car sales leads to a big decline in oil consumption. The IEA forecasts EVs will displace nearly 6 mmb/d of oil demand by 2030 if governments deliver on their stated policies. And says that EVs displaced 700,000 b/d of oil demand in 2022. We had a 7-tweet Twitter thread that reminded that the displacement is all about forecast assumptions. We agree that EVs have to displace some oil demand, but we question the primary assumption and therefore believe this nearly 6 mmb/d displacement is too optimistic. (i) On Wed, the IEA released its major report "Global EV Outlook 2023: Catching up with climate ambitions". [LINK]. There is no question it is an excellent report with a lot of data and global EV insights. We recommend adding to reference libraries. (ii) We tweeted [LINK] "1/7. @IEA Global EVs Outlook 2023. #Oil Bears and Bulls will both love it! Oil Bears and western leaders like headline, EVs to be 60% of total car sales in 2030, EVs to displace nearly 6 mmbd of oil by 2030, already displaced 0.7 mmbd in 2022. #OOTT." We expect western leaders will just run with the nearly 6 mmb/d displacement and not worry about the key assumption. (ii) Oil bears assume this nearly 6 mmb/d means the IEA expects oil demand to be down ~6 mmb/d by 2030. But we reminded in our tweet [LINK] "2/7. Oil bulls remember @IEA World Energy Outlook Oct/22 incl EVs to be 50% of total car sales in 2030, and IEA forecast #Oil demand to increase 0.8%/yr this decade to peak around 103 mmbd n mid 2030s."*

The IEA's flagship annual report World Energy Outlook in Oct 2022 assumed EVs would be 50% of total car sales in 2030, so less than its new forecast of 60% in 2030. But even including a 50% assumption, the IEA WEO forecast oil demand to keep increasing in the 2020s and not peak until the mid 2030s at ~103 mmb/d. (iii) Here is the key assumption to displacing ~6 mmb/d that most probably didn't read. We are big believers that it is important to look at the key forecast assumption on pg 132. We tweeted [LINK] "Oil bulls also note KEY assumption to @IEA #EVs replacing 6 mmbd is that distance travelled by EVs basically replaces the distance an ICE or hybrid would have driven. ie. infers a new EV is added to fleet, an ICE is effectively retired from fleet. #OOTT." The IEA wrote "How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each)." Basically, the IEA assumes the EV effectively replaces the distance driven by an ICE vehicle. (iv) We don't believe this effective one-for-one replacement in terms of distance driven has proved out so far. We tweeted [LINK] "4/7. But for many, an EV is a 2nd or 3rd car. Norway is recognized leader in terms of EVs penetration. 03/22 tweet. Yet #EVs distance driven 22.6% in 2022. EVs were >80% of new car sales in 2022, been 60% for ~4 years. [LINK] #OOTT". (v) On March 25, Equinor highlighted this EVs are 2nd or 3rd cars in Norway. We tweeted [LINK] "5/7. In Norway, EVs are 2nd or 3rd cars! 03/25 Equinor explains why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness [LINK] #OOTT." (vi) Absent governments mandating ICE vehicles get junked, the other key factor is that ICE vehicles are lasting longer. We tweeted [LINK] "6/7. A concept everyone has experienced - ICE vehicles are lasting longer. 03/31. @BloombergNEF. at least in China, ICE vehicles retirements are at a very low level even in the face of increasing EV and ICE sales. #OOTT." (vii) It is important to remember that the IEA forecasting a 60% EV share of total car sales means a displacement of nearly 6 mmb/d in 2030 is not an IEA forecast that says its oil demand forecast will be reduced by 6 mmb/d. It's WEO Oct 2022 assumed EVs were 50% of total car sales in 2030 and didn't see peak oil demand until the mid 2030s. So the incremental 10% EV sales penetration, by itself, isn't likely to move its peak oil demand closer by very much. Our last tweet [LINK] "7/7. #Oil Bears and western leaders will love @IEA EVs headlines on increasing EV sales and oil displacement. #Oil Bulls (Saudi Arabia) will love the IEA report and think this won't have much impact on @IEA forecast for peak oil demand around 103 mmbd in mid 2030s. #OOTT." (viii) EVs are having an impact on oil and energy, but it isn't a one-for-one replacement. Plus we wonder if it's just additive on an "energy" basis in what it does to the demand for natural gas and other forms of reliable electricity to power the new EV ecosystem. Our Supplemental Documents package includes excerpts from the IEA Global EVs Outlook report."

Figure 55: Oil displacement by region and mode, 2022-2030



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; LDV = light-duty vehicle. Oil displacement based on internal combustion engine (ICE) vehicle fuel consumption to cover the same mileage as the EV fleet.

Source: IEA

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

Here is what we wrote in our March 26, 2023 Energy Tidbits memo. "*The Equinor Chief Economist Wareness comment to the FT also supported the above item on how Norwegians aren't using their EVs as much as would be expected given the massive penetration of new car sales over the past several years. Yesterday, we tweeted [LINK] "Here's why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness. many other reality check energy transition views in his @FT interview [LINK] #OOTT." Waerness says that Norwegians really have bought EVs as their 2nd or 3rd cars and not the principal car. Whereas historically car buyers buy new cars as a principal car other than the wealthy who have more than a couple cars. The FT wrote "Norway's experience with electric vehicles provides an example, Wærness suggested. Subsidies to buy battery-powered cars had rapidly increased their number, and Norway has been repeatedly cited as an example of how quickly customers could switch to EVs. But the overall car fleet had swollen too, Wærness said. "We've kept a lot of the diesel cars and gasoline cars, and we've added EVs, and it took 10 years before gasoline demand went down," he said. "We've bought an EV instead of taking the bus, or it becomes the second or the third car."*

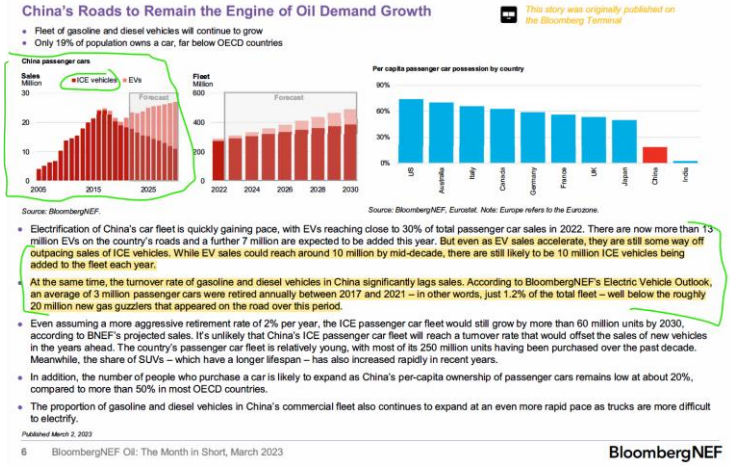
Energy Transition: China & EU reasons why EVs don't displace as fast as aspirations

BloombergNEF reminders on EVs displacing oil

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

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

Figure 56: China's Roads to Remain the Engine of Oil Demand Growth



Source: BloombergNEF March 2023

Figure 57: EVs and Energy Cuts will only dent Europe's oil demand by 2030

Source: BloombergNEF March 2023

Energy Transition: IEA *"journey to net zero emissions is likely to be a bumpy one"*

IEA Birol op-ed

It seems like many missed IEA Executive Director Fatih Birol's op-ed last Sunday. Here is what we wrote in last week's (Mar 24, 2024) Energy Tidbits memo. "*We believe the IEA started a backtrack or a reality check on their energy transition aspirations on Mar 11 and continued that this morning with the IEA Executive Director Fatih Birol posting an op-ed on his Linkedin and also on the FT. (i) Most will see it as a bit of an indirect rebuttal to the Republicans letter to him this week (see following item) BUT we think it is more of what appears to be an IEA backtracking on their bullish energy transition views like we saw in their blog last week. (ii) It is carefully or craftily drafted blog for what they say and also what they don't say. We thought the facts in his op-ed were real but they were only half truths. (iii) Early this morning, we tweeted [LINK] "Good read @fbirol op-ed today. Birol admits "ample evidence that the journey to net zero emissions is likely to be a bumpy one". Crafty drafting to only tell half the story. "cheaper to build onshore wind and solar power projects than new fossil fuel plants". Yes but that is capacity and not cost to replace 24/7 MW for MW #NatGas. "as electric cars and heat pumps, that reduce consumers' exposure to volatile fossil fuel prices" BUT isn't saying cheaper to own/drive. Also excl offshore wind as cheaper. More in op-ed. Note it's the 2nd backtrack on energy transition aspirations, follows 👇03/17 tweet admitting deep-rooted #Oil dependency. No one disagrees the fundamental direction of travel is energy transition. But will take way longer, cost way more and be a bumpy/rocky road. #Oil #NatGas will be needed for longer. #OOTT." (iv) Can't see anyone disagreeing with Birol's closing statement that govt changes may affect the pace of energy transitions, "they won't alter the fundamental direction of travel". We don't see how anyone can disagree with the concept of energy transition to move to cleaner energy and reduce emissions and that the world is moving that direction. (v) Birol is saying directly and also by omission what we have said for several years that the energy transition will take way longer, cost way more and be a bumpy/rocky road. He says specifically "We already have ample evidence that the journey to net zero emissions is likely to be a bumpy one. But the events of recent years — including the turmoil caused by the global energy crisis, the sharp spikes in fossil fuel prices and the impacts of extreme weather — are all reminders of why we need to press ahead. And while changes in governments may well affect the pace of energy transitions — accelerating them in some cases, slowing them in others — they won't alter the fundamental direction of travel." He didn't say cost more or take longer but a bumpy road would imply that ie another unsaid key point. (vi) "Nowhere is this clearer than in clean energy, where technologies like solar, wind and electric cars are increasingly replacing the need for fossil fuels and reining in emissions". Reigning in admissions from solar, wind and EVs suggests he realizes that they won't have the aspired impact. It's just not clear by how much. (vii) "It's now cheaper to build onshore wind and solar power projects than new fossil fuel plants almost everywhere worldwide." Note he specifically excludes offshore wind. And he doesn't say the concern of many that the solar farm or wind generators capacity are only part of the total cost of incorporating intermittent wind and solar and don't take into account that the full cycle economics of replacing 24/7 natural gas or coal power and include items like having battery storage, fill in power generation (natural gas) for when the sun doesn't shine or wind doesn't blow, transmission, grid upgrades, etc. (viii) "as electric cars and heat pumps, that reduce consumers' exposure to volatile fossil fuel prices." Obviously EVs reduce the EV owner exposure fossil fuel prices but he isn't saying EVs are cheaper to own and run. (ix) There are*

other items in the op-ed. Our Supplemental Documents package includes the Fatih Birol op-ed."

IEA Mar 11 blog on oil security started the backtrack on energy transition

As noted above, we see today's Birol op-ed as the second IEA backtrack on their energy transition aspirations. Our Mar 17, 2024 Energy Tidbits memo highlighted the IEA's Mar 11, 2024 blog, a blog that surprised us for its focus on oil security. This blog was overlooked by most people. Here is what we wrote on Mar 17. *"It feels like closing the barn door aft the horse bolted. The western governments rely upon the IEA analysis and views to set policies and the IEA's energy transition views were the key to western leaders putting the world on an irreversible course to Net Zero. We have to believe most people don't see anything wrong with being on a course to Net Zero. We don't. Rather our concern has been that the IEA's overly optimistic view on the energy transition led to unrealistic timing to get there and a set up for decade of energy risk. Back to the barn door, the IEA posted a blog this week that should have been posted seven years ago. And they are setting the stage for changing their view on peak oil demand, which we still believe one of the big oil calls this year as they and others push back their forecasts for how much oil and how quickly EVs will displace oil consumption. On Monday, the IEA posted a blog "A strong focus on oil security will be critical throughout the clean energy transition" [LINK]. The IEA has been at the lead on the lead to not worry about oil and natural gas. Rather their concern has been been that there were going to be stranded oil and gas assets because they weren't needed. So when we see the IEA write this type of blog, it is likely a set up trade for something that is to come in the near term. This is actually a decent blog and should have been written seven years ago before the IEA went all-in on the energy transition without really thinking thru the reality of whether the energy transition could actually work as per aspirations. Or even if it was as easy as everyone was led to believe for oil demand to be decline. Rather this blog at least raises some doubt on the speed of decline in oil consumption by the IEA writing "However, while the world's dependence on oil is lessening, it remains deep-rooted." Imagine if they started with this as an assumption that world dependence on il remains deep-rooted. So it's a decent blog, just about 7 years too late. Imagine if they had raised the issue of oil security and deep-rooted dependence on oil under the energy transition. Since last April, we have highlighted our view that the IEA's EV displacement of oil was way too optimistic and that was before what we have seen in the past few months on broader pull back in EV sales expectations. But we didn't look at this blog, in its entirety, as being the set up trade. Rather the blog is the carrier for a few words of warning or reminder of the caveats for their bearish call for peak oil demand to happen in the next five years. The key few words are at the end of these sentences "The shift to a clean energy economy is gathering pace, with electric vehicle sales soaring, energy efficiency improving, and other clean energy technologies advancing rapidly. Consequently, a peak in global oil demand is in sight before the end of this decade, based on today's policy settings." Based on today's policy settings will be a key reason why they can pull back on key assumptions such as the speed of EV adoption. Don't forget policy settings isn't just the official policy rules in place, it will also include declared policy intentions. This is a good blog to read even if it is seven years too late. And anyone who reads it will come away with*

the view that the IEA is worried about oil security. Why would they be worried about oil security based on their oil forecasts? It can only be because they are planning to change their oil forecasts in their upcoming June report Oil 2024 that is their look to oil supply and demand to 2029. It's too bad the IEA had to put in some CYA statements on how they have never lost focus on oil security. The IEA said "However, throughout its existence, the IEA has remained focused on oil security and emergency preparedness. And "The IEA will maintain an unwavering focus on oil security throughout the energy transition." When they have just said, here is the blog that we somehow missed posting seven years ago. Our Supplemental Documents package includes the IEA blog."

IEA is due to update its forecast that EVs to displace ~5.5 mmb/d of oil by 2030

Here is another item from last week's (Mar 24, 2024) Energy Tidbits memo. "*We don't believe the IEA's blogs have anything to do with political pressure. Rather we continue to believe the reason for items like the IEA's Mar 11 blog and the Fatih Birol op-ed today is that the IEA is due to revise its key assumption for peak oil demand – how quickly and how much oil demand is displaced by EVs. Here is what we wrote in our Feb 25, 2024 Energy Tidbits memo. "Macron's timing couldn't be worse for the IEA considering they are to update their amajor assumption for their peak oil demand by 2030 – their call for EVs to displace ~5.5 mmb/d of oil by 2030. On Tuesday, we tweeted [LINK] "Bad timing for Macro to say out loud IEA is "our armed wing of implementing the Paris Agreement". IEA's peak #Oil demand by 2030 depends on its annual Global EVs outlook 👇says EVs will displace ~5.5 mmb/d of oil by 2030. Will IEA double down or push peak demand back? IEA's global EVs outlook is in April #OOTT." The IEA normally updates its annual Global EVs outlook in April. Last year's outlook included the key conclusion that EVs are to displace approx. 5.5 mmb/d by 2030. We believe the IEA will have to make some bold new assumptions to not reduce the amount oif oil EVs are to displace by 2030. There is nowhere of significance that isn't pointing to a lesser EVs penetration than assumed a year ago. Plus we have highlighted several times our view of the unrealistic key assumption that every EV sold effectively displaces the miles driven by an ICE ie. it's like every time an EV is bought, it means an ICE doesn't get driven ever again. Absent some bold new assumptions, the IEA has to reduce its forecast for oil displaced by EVs and, if so, it should also push back when the IEA calls peak oil demand. When we say its bad timing for the IEA, it's because of the logical cut to its oil displacement call and Macron's call should see more scrutiny on the IEA's assumptions."*

Energy Transition: Larry Fink *"Time to rethink retirement'*

Larry Fink 2024 letter

We always like reading the annual letters from business leaders to see what they are saying about how the past is driving their views for the future. This week, BlackRock CEO Larry Fink posted his annual letter "*Time to rethink retirement*" [LINK]. This is worth a read on the challenge for retirement. And it's a letter that is relevant to all age groups and Fink presents a great explanation of the retirement challenge. It's a theme we have been highlighting for years on how to make sure people and governments have money for living longer lives. We say it differently. Because it is a tough call for politicians on how to take care of older and younger people. I say this from the perspective of a baby boomer, but I am surprised that young people haven't insisted to governments that they have to find a way to make sure

there is some semblance of money for them and that it isn't all given out to boomers. But Fink does a good job of laying out this tough retirement challenge. We also think there is a big miss from his retirement challenge – he doesn't mention that the wealth transfer from boomers down to their kids , other than wealthy people, will be less because longer living and it costs more to live. And also for some non-wealthy boomers, they aren't getting any inheritance from their parents who lived longer, spent all their savings and the boomers actually had to use some of their money to support their parents longer life. The Fink challenge is timely. Our concern is that the politicians don't solve it in the near term so the problem only gets bigger. Our Supplemental Documents package includes the Fink 2024 letter.

Fink's 2024 letter also had some crafty drafting on the energy transition.
We thought Fink's outline of the retirement challenge was very good. However, there was also a great example of his crafty drafting and no surprise it was on his comments on the energy transition. (i) In the 2024 letter, he writes "*As I wrote in 2020, the transition will only succeed if it's "fair." Nobody will support decarbonization if it means giving up heating their home in the winter or cooling it in the summer. Or if the cost of doing so is prohibitive*." Fink running two sentences together to infer that what he said in his 2020 letter about being fair had to do with the risk that people wouldn't have to give up heating their home in the winter. He makes his making sure there is a "fair" transition sound very personal to Americans on why he insisted on a fair transition. The personal messaging is crafty drafting. (ii) As a reminder his 2020 letter was focused on climate risk is investment risk. It was the letter was the catalyst for Fink being the lead financial person to push the climate risk is investment risk. The crafty drafting is that in the 2020 letter, Fink wrote "*We need to be mindful of the economic, scientific, social and political realities of the energy transition. Governments and the private sector must work together to pursue a transition that is both fair and just – we cannot leave behind parts of society, or entire countries in developing markets, as we pursue the path to a low-carbon world*". Fink does talk about not leaving parts of society behind. But was he then concerned about people not being able to heat their home in winter due to prohibitive cost? It's worth a read thru the 2020 letter. We can go back to what we have written for years and we didn't see the concern from financial and political leaders, four years ago, that they were worried that the energy transition was likely to or even at risk to take way longer, cost way more and be a bumpy/rocky road. Our Supplemental Documents package includes the Fink 2020 letter.

Energy Transition: DOE "Hydrogen-Ready" to make steel ie. means running on natural gas

Cleveland-Cliffs hydrogen-ready for making steel

No one denies a hydrogen-ready plant will be built to potentially switch to hydrogen at some point in the future. But for the next several years or more, any large hydrogen-ready plant means more demand for natural gas as natural gas will be fueling any big hydrogen-ready plant for the foreseeable future. (i). So it's disappointing, if not surprising, to see a big US Dept of Energy announcement of up to $0.5 bill for Cleveland Cliffs hydrogen-ready facility to power steel making not even mention that the plant will be running on natural gas until some indefinite time n the future. (iii) On Monday, we tweeted [LINK] "*Hydrogen = More #NatGas Demand. US forgot to note $0.5b for $CLF "hydrogen-ready flex-fuel" to replace coal for steel means NatGas driven until makes sense for hydrogen. Also is CLF's "clean Hydrogen"*

vague to incl NatGas? Most use "Green Hydrogen" to mean from wind/solar. #OOTT. ½." And [LINK] "*2/2 $CLF CEO gives clear credit to #NatGas as being the reason why US is technologically ahead of Japan. Also CEO says "No. We could not" in response to question could this be done without the $0.5b grant. Hydrogen = More NatGas demand. Thx @adsteel @RomaineBostick. #OOTT."* (iv) On Monday, the DOE announced "*Biden-Harris Administration Announces $6 Billion to Transform America's Industrial Sector, Strengthen Domestic Manufacturing, and Slash Planet-warming Emissions*" [LINK]. "*announced up to $6 billion for 33 projects across more than 20 states to decarbonize energy-intensive industries, reduce industrial greenhouse gas emissions, support good-paying union jobs, revitalize industrial communities, and strengthen the nation's manufacturing competitiveness*". (v) One of the big areas and big projects is "*Industrial Demonstrations Program Selections for Award Negotiations: Iron and Steel*" [LINK]. Making steel is always what people call one of the hardest sectors to get away from coal, natural gas power. One of the biggest projects of the total $6 billion is the up to $500 million Cleveland Cliffs "*Hydrogen-Ready Direct Reduced Iron Plant and Electric Melting Furnace Installation*." The DOE project release doesn't mention natural gas. And its graphic leads the ready to assume Cleveland Cliffs is replacing coal with hydrogen. The graphic is not specific to Cleveland Cliffs but infers it is relevant.(vi) Our tweet also included the Cleveland Cliffs release that says it is replacing its existing coking coal blast furnace with "*a 2.5mtpa Hydrogen-Ready Direct Reduced Iron (DRI) Plant and two 120 MW Electric Melting Furnaces (EMF) to feed molten iron to the existing infrastructure already on site, including the BOF, Caster, Hot Strip Mill…. The EMF technology is well established and, together with the injection of hydrogen in blast furnaces, is a preferred route for meaningful reduction in carbon emissions for integrated steelmakers worldwide*." (vii) The key buzz word is "*hydrogen-ready*" ie. it will be ready to be run to some degree on hydrogen, which we believe means it will run on natural gas until then. Cleveland Cliffs says it will be able to run on natural gas, a mix of natural gas & hydrogen, or hydrogen only. (viii) As a reminder, hydrogen is "an energy carrier that must be produced from another substance". (ix) And some crafty drafting from Cleveland Cliffs, who don't say what energy source will provide the hydrogen or us ethe commonly used terms "Blue Hydrogen" produced from natural gas or "Green Hydrogen" produced from solar or wind. Rather Cleveland Cliffs "*The facility will have the flexibility to be fueled by natural gas, which would reduce current ironmaking carbon intensity by over 50%; a mix of natural gas and clean Hydrogen; or clean Hydrogen, which would reduce current ironmaking carbon intensity by over 90%."* They use a different term "clean Hydrogen" which is a lower case for "clean", which looks like it is to infer something like "Green Hydrogen". Our Supplemental Documents package includes the DOE project announcement and the Cleveland-Cliffs release.

Cleveland-Cliffs CEO makes it clear it's all being driven by natural gas

There is no doubt the press releases aren't pounding the table that it's all about natural gas for this hydrogen-ready plant but that isn't the case for Cleveland-Cliffs CEO in his interview on Bloomberg to discuss the DOE grant. The CEO also notes that converting from coal to hydrogen wouldn't be economic without the grant. And also that the reason why US is at a technological advantage vs Japan is all because of natural gas. It's why we put his comments in a separate tweet [LINK] "*2/2 $CLF CEO gives clear credit to #NatGas as being the reason why US is technologically ahead of Japan. Also CEO says "No. We could not" in response to question could this be done without the $0.5b grant. Hydrogen = More NatGas demand. Thx*

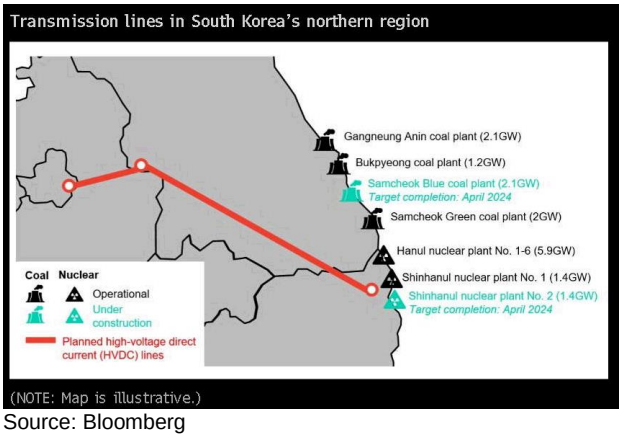
@adsteel @RomaineBostick. #OOTT." Our tweet included the transcript we made of his comments. SAF Group created transcript of comments by Cleveland-Cliffs CEO Lourenco Goncalves with Bloomberg's Alix Steel and Romaine Bostick on Bloomberg Markets The Close on March 25, 2024. [LINK] Items in "i*talics*" are SAF Group created transcript. At 0:45 min mark, Steel "*without the money from the Biden Administration could you make any of this possible? Sort of move from coal to natural gas to hydrogen*?" Goncalves "*No. We could not. These are real infrastructure type of projects. It takes policy. It takes resolve to make these investments. Because these are multi-year, multi-decade type of investments. So we cannot change the landscape, just the way the company changing the landscape. Because we need the infrastructure to feed the project. We can't generate the feed of hydrogen by ourselves. So these things need to come in a more co-ordinated way. And the Department of Energy Secretary Granholm, President Biden are doing the right thing*." Bostick "*So the money is there and it looks like you are onboard with this Lorenzo, I am curious about the competitive nature of this. Do you have worries here, that the net result of this, relative to your competitors outside the US, those not getting this money. Does that help you or hurt you*?" Goncalves "*Look, at the end of the day, we are a technologically ahead of our competitors outside of the United States. Let me give you an example. Japan talks a good game on technology. Japan doesn't have natural gas. We do. That gave us a head start on the ability to use hydrogen*. *I've already tried hydrogen in two blast furnaces. The one in Middletown, that's a small one. And the one in Indiana Harbor, that's the largest in the eastern, the western hemisphere. So we are technologically ahead. We supply steel for the same automakers they supply. And we can do anything we want with our workforce."*

Energy Transition: Korea can't get new transmission done

New transmission stalled in Korea

We continue to be surprised that most overlook the huge risk to getting major high voltage transmission done in any developed country. And this is especially so in countries like the US and Germany where new long distance high voltage transmission lines will be needed to bring renewable energy to demand centers. We were reminded of this risk to get transmission lines done with the Bloomberg Thursday report "*Korea's Newest Coal Plant Can't Send Its Power to Seoul*". In Korea's case, it's not to bring renewable power but coal and nuclear power to Seoul. Bloomberg wrote "*Years of delays and setbacks to building new transmission lines in South Korea's power grid is hampering efforts to bring more electricity to the capital area. New coal and nuclear power plants in the remote northeast region are losing out on this opportunity to generate more supply. Gas plants located near the capital and surrounding demand centers are poised to pick up the slack."* Bloomberg wrote "*15 years. Delay in plans to build new transmission lines between South Korea's northest region and the capital area*." And "*A plan to build two transmission lines to connect the regions is underway but continues to face challenges and local community opposition."* Our Supplemental Documents package includes the Bloomberg report.

Figure 58: Transmission lines in South Korea's northern region



Source: Bloomberg

Energy Transition: GM avoids question is making the Hummer good for environment

GM on The Hummer

We have to give experienced executives credit for making sure they don't answer questions they really don't want to answer. In this case, it was Duncan Aldred (Global VP Buick and GMC, General Motors) with Bloomberg's Jonathan Ferro on Bloomberg Surveillance on Monday. On Monday, we tweeted [LINK] "*Hummer EV. GM highlights zero tailpipe emissions. But evaded @FerroTV question if making the Hummer EV is good for the environment. GM "we're very responsible not only on the tailpipe but on the holistic nature of that battery development as well". See 👇transcript #OOTT."* Aldred was talking about GM's emission strategy and highlighted how the Hummer had zero tailpipe emissions. We expect Bloomberg's Ferro was trying to get at the full cycle impact including tire wear and emissions but Aldred wouldn't bite. Here is the transcript we made of the exchange. Items in *"italics*" are SAF Group created transcript. At 5:25 min mark, Aldred "*I think it's [hybrids] going to be part of the development. We still maintain an all EV future. We still maintain a zero emissions strategy or vision is what we want to achieve. But I think hybrids will part of that journey to get there."* Ferro "*I'm always interested by this zero emissions climate when I hear about the electric, the EV Hummer, I've got to ask you this question. I ask it out loud all the time. How on earth is that good for the environment? I've seen the size of these things, they are massive. How is that good for the environment? Help me understand that*" Aldred "*Well, they are nowhere as big as you think first of all. I actually bought one, it's not a company car. I bought one. It's the best vehicle ever you could buy. It's really easy to drive around town here, like somewhere in Manhattan. It's super easy. Four wheel steer make it turning circle the size of a small car*". Ferro " *creating potholes because it is so heavy*." Aldred "*No, no, no. It's got air suspension so it glides along the potholes this great city. The roof comes off making it a convertible vehicle. Zero to 60 in three seconds. Goes really anywhere off-road. It's got something we call extract mode. And of course, if you're on the highway, it drives hands-free with super cruise technology. So this really is the world's first super truck and an outstanding vehicle. And again, zero tailpipe emissions*." Ferro "*Okay. But to make the thing?*" Aldred "*To make the thing*?" Ferro "*That's what I'm getting at here. Zero tailpipe emissions, I understand that. But to make an electric Hummer an EV, are we saying that's good for the environment?*" Aldred "*well clearly, we are very responsible in the sourcing of materials that go into the batteries that then create the Altium battery technologies that go*

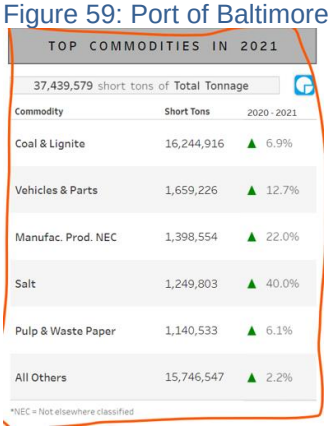
into the Hummer. So we're very responsible not only on the tailpipe but on the holistic nature of that battery development as well."

Capital Markets – Baltimore Francis Scott Key Bridge collapse

Baltimore bridge collapse

It's only been just over four days since the container ship hit and led to the collapse of the Francis Scott Key bridge in Baltimore. The NTSB investigation is ongoing but they ruled out terrorism as the cause for the container ship "DALI" that crashed into and caused the Francis Scott Key Bridge collapse. On Tuesday night. Maersk said "*We can confirm that the container vessel "DALI" is owned by Grace Ocean, and operated by Synergy Group. It is time chartered by Maersk and is carrying Maersk customers' cargo. No Maersk crew and personnel were onboard the vessel*." There are two key questions. First, how long to rebuild the bridge and the only real views are an unknown number of years. Second is also far form clear is how long and how much of an impact the collapse of the Baltimore bridge will have on the supply chain. Officials are avoiding getting into specific timing estimates as there are still too many unknowns. Bloomberg reported DHL thinks the port could reopen in May *"I don't think this closure is going to last that long, maybe six weeks or something like that is what I'm hearing," said Jim Monkmeyer, president of transportation at DHL Supply Chain, a Deutsche Post unit based near Columbus, Ohio. "I'm hearing May – nobody is saying when in May — that's why I'm saying six weeks."* Early Wednesday morning, we tweeted [LINK] out some facts on the Baltimore port *"Baltimore port profile from @USDOT. #Coal and cars are top two commodities. #OOTT."* Our tweet included the US Dept of Transportation Baltimore port profile. [LINK],which included the below table noting the primary commodities thru the port of Baltimore. The key commodities are Coal and cars. Our Supplemental Documents package includes the DOT Baltimore port profile.

Figure 59: Port of Baltimore – Top Commodities in 2021



TOP COMMODITIES IN 2021

37,439,579 short tons of Total Tonnage

Commodity	Short Tons	2020 - 2021
Coal & Lignite	16,244,916	▲ 6.9%
Vehicles & Parts	1,659,226	▲ 12.7%
Manufac. Prod. NEC	1,398,554	▲ 22.0%
Salt	1,249,803	▲ 40.0%
Pulp & Waste Paper	1,140,533	▲ 6.1%
All Others	15,746,547	▲ 2.2%

*NEC = Not elsewhere classified

Source: US Dept of Transportation

Capital Markets: Great Q1/24 & last 11 mths for Japan stocks since Buffett interview

Japanese stocks outperform

One of the big global capital markets stories since April 2023 has been the outperformance of Japanese stocks. On Wednesday night (MT), BloombergTV had the below graph titled "*Japan Beats Major Indexes in 1Q 2024: Nikkei outperforms global stocks by a big margin."* Since May, we have been highlighting the sea change in foreign investors moving into Japanese stocks and the resultant Japanese stocks outperformance. It's not a 1Q 2024

event, it's an event that started on April 12, 2023. On April 12, CNBC interviewed Warren Buffett in Japan and Buffett gave his positive view on the big Japanese trading houses and that was the catalyst for global investors to move into Japanese stocks. On Thursday, we tweeted [LINK] *"#WarrenBuffett was catalyst to Japanese stocks outperformance. Extended 👇 @business "Japan beats Major Indexes in 1Q 2024" back to show outperformance catalyst was Buffett 04/12/23 interview with @BeckyQuick. Vs Apr 11/23: Nikkei +44%. Nasdaq +36%. S&P +28%. Dow +19%. #OOTT."* We showed the original BloombergTV graph for Q1/24 and then extended the starting point back to Apr 11, 2023 to show the outperformance. And then also included a relative performance graph from Apr 11, 2023 for the Nikkei vs Dow vs S&P vs Nasdaq. It really is fair to say Warren Buffett was the catalyst to Japanese stocks outperformance since Apr 11, 2023.

Figure 60: Nikkei/Topix Performance and Foreign buying of Japanese stocks

Source: Bloomberg

Figure 61: Nikkei/Topix Performance and Foreign buying of Japanese stocks

Source: Bloomberg

Figure 62: Nikkei/Topix Performance and Foreign buying of Japanese stocks

Source: Bloomberg

05/18/23: It was clear that foreign investors were following Buffett into Japan

Here is what we wrote in our May 21, 2023 Enregy Tidbits memo. "*We aren't in the category of the Warren Buffett fanatics who think everything he says is gospel and he touches turns to gold. But we really respect what he has accomplished and continues to accomplish over the decades. It's amazing when someone can be considered to be on the top of his game over many decades. So we couldn't help tweet a Warren Buffett shout-out on Thursday, when we saw the below Bloomberg TV chart on how foreigners are loving Japanese stocks. We tweeted [LINK] "The #WarrenBuffett effect is still working. @business "foreigners loving Japanese stocks. positive flows into equities for 7th straight week". Last 5 weeks were since #WarrenBuffett made his positive comments on Japanese trading houses in his @BeckyQuick Apr 12 interview in Japan. #OOTT." Buffett was in Japan in early April and there was big investor attention to the CNBC Becky Quick interview with Buffett and Greg Abel on April 12, where he made positive comments about the Japanese trading houses. We have to believe this got a lot of attention from investors around the world. Was it coincidental or did people follow? Given his following, we suspect a good portion of this was people following Warren Buffett into Japanese stocks.*"

Figure 63: Positive flows into Japanese equities for 7th straight week

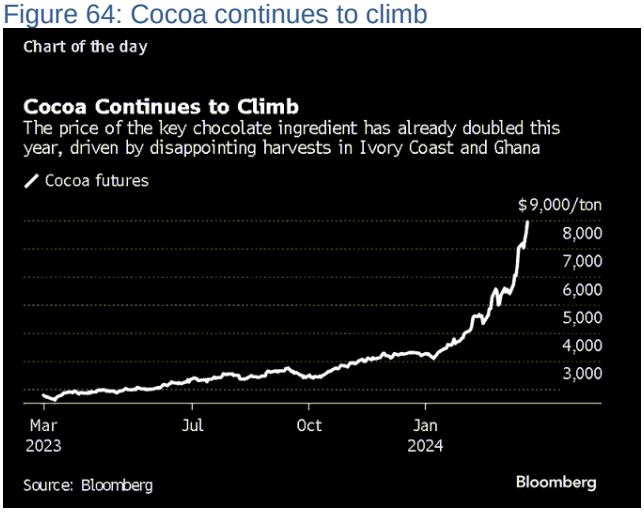
Source: Bloomberg

Capital Markets: Cocoa prices more than doubled in 2024

Cocoa prices more than doubled in 2024

It's Easter so it's the chocolate season time and we are sure everyone has seen the general news reports on cocoa prices and the shrinkflation on chocolate Easter eggs and bunnies. On Monday, we tweeted [LINK] "*Not a big chocolate eater so hadn't realized the huge Cocoa price escalation. #Cocoa prices already doubled this year. This is terrible for the kids with the annual Easter chocolate rush this week. Thx @business"* Cocoa prices have moved higher. Last Friday, the International Cocoa Organization posted its Cocoa Market Report for February 2024 [LINK], which highlighted "*High cocoa prices remain a significant concern due to a supply shortfall from key producers Côte d'Ivoire and Ghana, resulting in a 28% and 35% decrease in arrivals at Ivorian and Ghanaian ports, respectively compared to the previous season."*

Figure 64: Cocoa continues to climb



Source: Bloomberg

Demographics: Digitization & AI already hitting UK backoffice jobs

Digitization & AI in UK

We continue to get reminded that digitization and AI is already leading to white collar job losses. On Tuesday, we tweeted [LINK] "*Digitization/AI already wiping out back office, non-revenue generator jobs. 👇03/19 BofA CEO jobs down ~30%. @IPPR new analysis "up to 8 million UK jobs at risk from AI unless govt acts" 1st wave "already" here, 11% of tasks exposed. 2nd wave, 59% of tasks exposed. #OOTT."* The UK Institute for Public Policy Research had just posted its report "*Transformed by AI: How Generative artificial Intelligence could affect work in the UK – and how to manage it."* They highlighted "*Back Office Jobs, which are more likely to be occupied by women, are most exposed in the first phase of generative AI deployment".* They highlighted how AI was already forcing back office jobs.They wrote "*In a large scale assessment of 22,000 tasks in the UK economy, we find that about 11 per cent of tasks are exposed to generative AI right now, and this could increase fivefold if AI systems became more deeply integrated in organisational processes. We summarise our findings in figure S.1, showing a scenario for how this could play out over time, in four phases." "The second phase is one where generative AI becomes more deeply integrated with existing organisational processes. If organisations decide to integrate existing*

AI technology more deeply into their processes (which is not a given), we find that almost five times more tasks – about 59 per cent of tasks – are exposed." Our Supplemental Documents includes the UK release on the report.

03/19/24: Digitization & AI already hitting lower income white collar jobs

Our UK tweet included our Mar 19, 2024 tweet on BofA CEO Moynihan talking about how digitization and AI has already led to big job reductions. Here is what we wrote in last week's (Mar 24, 2024) Energy Tidbits memo. "*There was a good reminder from Bank of America CEO Moynihan that digitization and AI are already hitting non-producer, non-revenue generator white collar jobs. On Tuesday morning, Bloomberg Surveillance was broadcasting from BofA office and CEO Moynihan highlighted how BofA have been able to grow its business with significantly less people. On Tuesday, we tweeted [LINK] "Digitization/AI wiping out non-producer, non-revenue generator white collar jobs. "300,000 people, we have 212,000 today" "It's going to have less labor content. Are those people paid more, a lot more because the way the labor content shifts" "it will have less labor content because that is the expensive part but it will have more value added from labor because that's the way the mathematics will work" BofA CEO Moynihan to @FerroTV @lisaabramowicz1 #OOTT."*

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.

Terminator 1984 called it "a new order of intelligence"

Earlier this morning, we tweeted [LINK] "*Hmm! Imagine if @JimCameron had used the term artificial intelligence instead of "a new order of intelligence" in this great scene? Have one of the all-time classics "Terminator" from 40 yrs ago on in the background as i finish Energy Tidbits memo."* The Terminator was released in 1984 and was playing this morning as were finishing today's memo. Our tweet included a clip of the classic scene where Sarah Connor asks why me. Reese explains there

was a nuclear war and everything was gone, there were survivors and says "*it was the machines, Sarah.*". Connor "*I don't understand*". Reese "*Defense network computers. New. Powerful. Hooked into everything. Trusted to run it all. They say it got smart. A New Order of Intelligence."*

Something for almost every golf fan in today's Houston Open final round

We will be watching the final round of the Texas Children's Houston Open final round even though none of our Cdn PGA stars are in the hunt. Even still, it will be easy to root for all five tied for first going into the final round. The big favorite, world #1 Scottie Scheffler, is going for his 3rd straight PGA win, something that hasn't been done since Dustin Johnson in 2017. And then the other four tied for first are looking for their first win and it will be great to see if any or all of them can get over their nerves of having to do so against the world #1. For their careers, David Skinns only has one Top 5 finish, Stephan Jaeger has two 3rd place finishes, Alejandro Tosti has 1 Top 10 finish and Thomas Detry has 1 runner-up. Plus there are three others one shot off the lead and three more two shots off the lead. Too bad they didn't show the odds of Scheffler vs the others. There is something for everyone to root for today.

Figure 65: Texas Children's Houston Open leaderboard

All Players

													FEDEXCUP						
POS	↑↓	PLAYER		TOTAL	THRU	ROUND	R1	R2	R3	R4	STROKES	PROJ.	STARTING	↑↓	ODDS TO WIN
T1	↑9	David Skinns	Titleist	-9	F	-5	67	69	65	-	201	27	111	↑84	▲ +1600
T1	↑3	Stephan Jaeger	Titleist	-9	F	-4	69	66	66	-	201	11	47	↑36	▲ +650
T1	↑3	Scottie Scheffler		-9	F	-4	65	70	66	-	201	1	1	-	▲ +145
T1	↑1	Alejandro Tosti		-9	F	-2	66	67	68	-	201	37	181	↑144	▲ +1200
T1	↑2	Thomas Detry		-9	F	-3	70	64	67	-	201	8	40	↑32	▲ +750

Source: PGA Tour

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