Energy Tidbits

March 10, 2024

Produced by: Dan Tsubouchi

Will OPEC Lower Its +2.2 mmb/d YoY Oil Demand Growth in 2024 Given Saudi Aramco is Lower at +1.5 mmb/d YoY?

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

This week's memo highlights:

1. Earlier this morning, Saudi Aramco CEO sees oil demand growth at +1.5 mmb/d YoY, which is lower than OPEC's +2.2 mmb/d but higher than IEA's +1.2 mmb/d. [LINK]

2. China's CNPC sees China in a low-growth rate for oil consumption over the long run. [LINK]

3. Maduro puts Biden on the spot for oil sanctions with its call for a July 28 election and leading opposition candidate Machado banned from running.[LINK]

4. Did private co's crank up in drilling & completions ahead of $51b of private sales to publics lead to a one-time burst in US oil production? [LINK]

5. EQT's voluntary shut-in of ~1 bcf/d helped support HH prices this week. [LINK]

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

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

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Natural Gas: -40 bcf draw from US gas storage; now +280 bcf YoY surplus

-40 draw in US gas storage

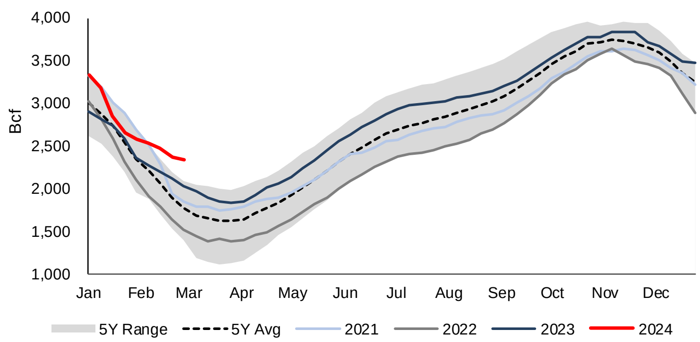
There was a small draw from gas storage in the US this week. For the week of March 1, the EIA reported a -40 bcf draw. Total storage is now 2.334 tcf, representing a surplus of +280 bcf YoY compared to a surplus of +248 bcf last week. For this specific week, total storage is the highest it's been in the past 5 years. Total storage is +551 bcf above the 5-year average, up from the +498 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 (03/01/23)		Historical Comparisons: 5-year average (2019-23)	
Region	03/01/24	02/23/24	net change	implied flow	Bcf	% change	Bcf	% change
East	422	453	-31	-31	426	-0.9	377	11.9
Midwest	575	600	-25	-25	523	9.9	449	28.1
Mountain	169	169	0	0	94	79.8	95	77.9
Pacific	219	217	2	2	86	154.7	153	43.1
South Central	949	935	14	14	924	2.7	708	34.0
Salt	285	275	10	10	261	9.2	199	43.2
Nonsalt	664	660	4	4	663	0.2	510	30.2
Total	**2,334**	**2,374**	**-40**	**-40**	**2,054**	**13.6**	**1,783**	**30.9**

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



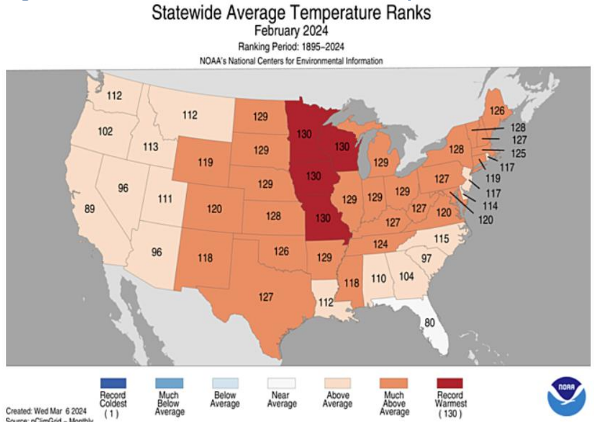
Source: EIA, SAF

Natural Gas: NOAA, 3rd warmest Feb on record, warmest winter on record for US

3rd warmest Feb on record

We started warning on the hot winter in Q4/23 with the reminder that it is always tough for natural gas markets to catch up from a warm start to winter. And that the only way that happens is if there is sustained cold weather in Jan and Feb. Unfortunately, the hot weather played out all winter. On Friday, the NOAA released their February recap for statewide average temperatures, which revealed February 2024 was the 3rd warmest the US has seen in the past 130 years. 4 other states saw their hottest February in recorded history as well. This comes after last February (2023) was labelled the 28th hottest since 1895. In a news release [LINK], the NOAA wrote "*The average temperature of the contiguous U.S. in February was 41.1°F, 7.2°F above average, ranking third warmest in the 130-year record. February temperatures were above average across most of the contiguous U.S., while* *record-warm temperatures were observed across much of the Mississippi Valley and in parts of the Great Lakes and southern Plains. Minnesota, Wisconsin, Iowa and Missouri each had their warmest February on record…The meteorological winter (December–February) average temperature for the Lower 48 was 37.6°F, 5.4°F above average, ranking as the warmest winter on record. Temperatures were above average across a vast majority of the contiguous U.S. and near average along parts of the Gulf of Mexico. North Dakota, Minnesota, Iowa, Wisconsin, Michigan, New York, Vermont and New Hampshire each had their warmest winter on record."* Note that NOAA's definition of winter is Dec-Feb. Below is a picture of statewide average temperature ranks in February.

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

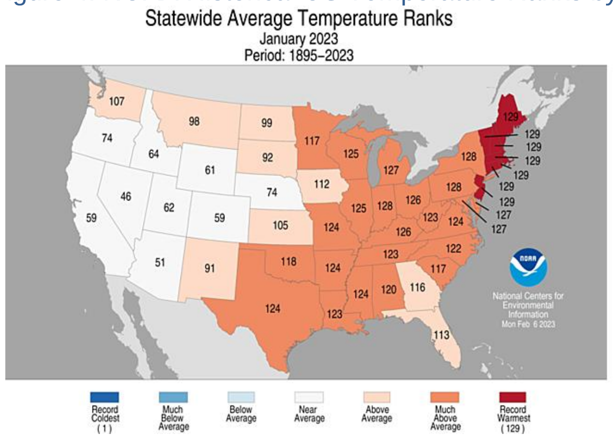


Source: NOAA

NOAA Feb 2023 temperature in US was the 28th hottest in last 129 years

Here is what we wrote in our March 12, 2023 Energy Tidbits memo. "*On Thursday, we tweeted [LINK] "Never good for #NatGas prices when its HOT in winter. Key reason why HH #NatGas fell from >$7 pre Xmas to <$3 in Jan and stayed there. Feb was 28th hottest followed Jan was 8th hottest in last 129 yrs. Dec/Jan/Feb was 17th hottest in last 128 yrs.Thx @NOAA. #OOTT." All of the populous eastern half of US was well above normal temps in Feb with the Virginia experiencing some of the hottest temps on record. Feb's hotter than normal weather followed Jan being the 8th hottest month in 129 years. No surprise, natural gas prices remained lower thru Feb with HH prices falling from $7 just before Xmas to an average of $2.56 in Feb, a ~60% decline in just two months. Our tweet Thursday included NOAA's below Jan aveage tempurature ranks."*

Figure 4: NOAA Historical US Temperature Ranks by State – February 2023



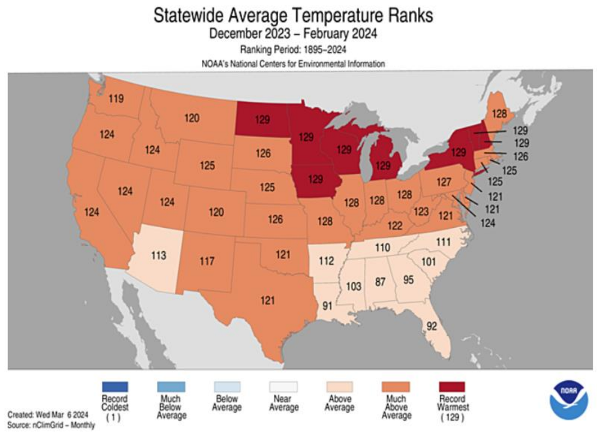
Source: NOAA

Natural Gas: NOAA, winter 2023/24 was the hottest on record

Warmest winter on record

On Friday, we tweeted [LINK] "*No surprise HH #NatGas prices are $1.80 given @NOAA reminds it was the warmest winter on record. Would be <$1.50 if EQT, CHK & others weren't shutting in supply. Challenge for #NatGas is that shoulder season is starting ie. leave the windows open temperatures. #OOTT.*" On Friday, NOAA also posted its recap of US weather for Dec/Jan/Feb ie. Winter 2023/24. NOAA wrote "*The 2023–24 winter season ranked warmest on record for the contiguous U.S. with eight states across the Upper Midwest, Great Lakes and Northeast each observing their warmest winter on record.*"

Figure 5: NOAA Historical US Temperature Ranks by State – Dec/Jan/Feb 2023/24



Source: NOAA

Natural Gas: EQT curtailing ~1 bcf/d in response to low natural gas prices

EQT curtails ~1 bcf/d

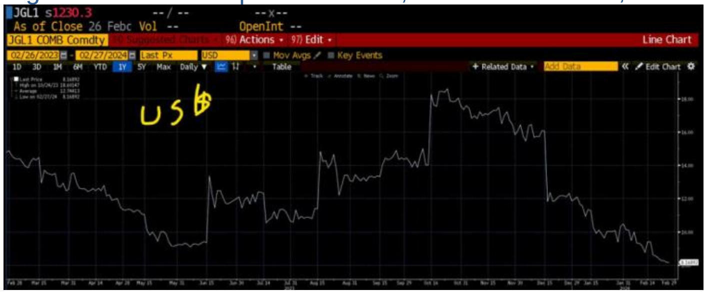
Early Tuesday morning, we tweeted [LINK] "*Here's why HH #NatGas is +$0.10 to $1.93 this morning. EQT to curtail ~1 bcf/d thru March in response to low price "and will reassess market conditions thereafter" #OOTT.*" EQT issued a short press release [LINK] that it "*made* *the strategic decision to curtail approximately 1 Bcf per day of gross production beginning in late February in response to the current low natural gas price environment resulting from warm winter weather and consequent elevated storage inventories. The Company expects to maintain this curtailment through the month of March and will reassess market conditions thereafter. Curtailments are expected to total approximately 30 to 40 Bcf of net production during the first quarter."* This was the second major announcement of cutting back 2024 because of low natural gas prices. The first was Chesapeake on Feb 20, who announced they wre dropping some rigs and frack spreads through year-end, which led to 2024 guidance of 2.65 to 2.75 bcf/d, which is down vs 3.470 bcf/d in 2023. There is chatter about other natural gas producers shutting in and/or cutting back on capex but there haven't been any other major announcements.

Natural Gas: Fears on weak LNG & natural gas prices for months is playing out

Record low JKM LNG futures

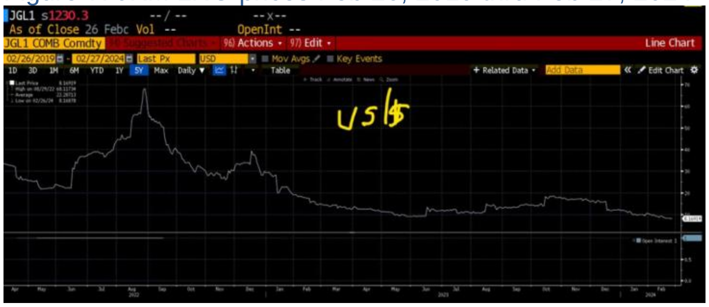
Here is what we wrote in last week's (March 3, 2024) Energy Tidbits memo on the concern for weak LNG and natural gas prices to continue through shoulder season. "*There are certain key fundamentals for natural gas but the #1 fundamental is that a very hot winter impacts natural gas prices thru shoulder season. Unfortunately, our fears of two months are playing out in that the very warm Dec that ran into Jan was setting up, unless there was sustained cold to end Jan and for Feb, the risk that weak global LNG and European natural gas prices would continue well thru shoulder season. And with the US increasing linked to LNG markets, it would be a push back on HH natural gas prices thru shoulder season. This very negative scenario is playing out. On Monday, we tweeted [LINK] "Record low JKM #LNG futures will keep pressure on US HH #NatGas prices. Prior to Feb, JKM low was $9, approaching $8 vs >$14 yr ago. Reminds a hot winter will keep pressuring LNG #NasGas prices at least thru shoulder season. Thx @SStapczynski daily LNG Wrap. #OOTT." The chart hasn't changed much to close the week. But the point to note is that JKM near term futures are in the $8. Plus we didn't put in our tweet, it's happening way earlier than normal – in Feb! That is showing the weakness is happening earlier. Our tweet included the JKM futures for April delivery was $8.125 and May delivery was $8.050 to close on Feb 23. Below are the two JKM graphs we included in our tweet that show JKM for the last year and the last 5 years*."

Figure 6: JKM LNG prices Feb 26, 2023 thru Feb 27, 2024



Source: Bloomberg

Figure 7: JKM LNG prices Feb 26, 2019 thru Feb 27, 2024



Source: Bloomberg

TotalEnergies on Mozambique LNG

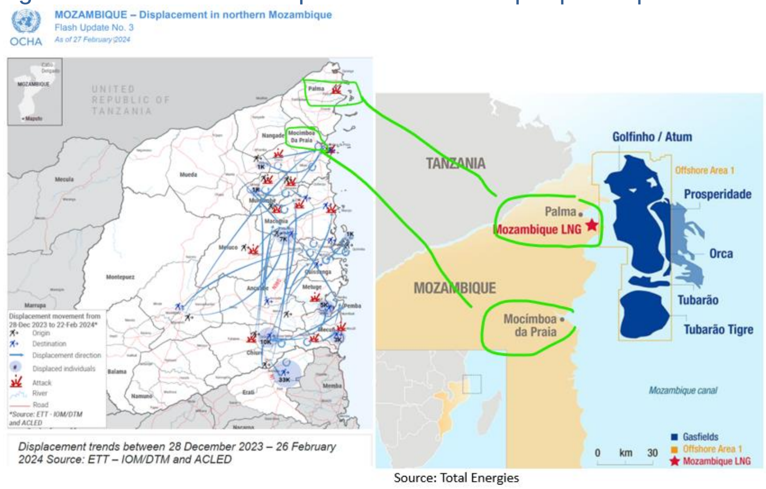
Natural Gas: TotalEnergies response to Le Monde on restarting Mozambique LNG

We did not see the TotalEnergies March 1 press release prior to last week's (March 3, 2024) Energy Tidbits memo. Even if we had, it would not have changed anything we wrote on its Mozambique LNG project restart. TotalEnergies release said "*Mozambique : TotalEnergies publishes its response to Le Monde French Newspaper"* [LINK]. *"On 1st March 2024, the French daily newspaper Le Monde published an article on the Mozambique LNG project. The questions posed by the journalists were answered in detail. However, given the limited use of our responses in the article and in the interest of transparency, the Company has decided to publish its exhaustive answers."* The Le Monde report is under subscription but the limited excerpt wrote "*In northern Mozambique, TotalEnergies wants to resume its activities despite the jihadist insurgency. In March 2021, following a large-scale jihadist attack, the group had to suspend its activities on the site of its gas megaproject in Cabo Delgado. Nearly three years later, contractors have revived their activities while armed Islamists continue to operate.".* TotalEnergies included the transcript of CEO Pouyanne's Feb 7 Q4 call comments on the restart and that they did not say the restart of construction would start in mid-2024 but that they hoped it would restart around mid-2024. ". Pouyanne said *I hope that the construction works will be able to kick off again some time half-way through the year. We are keeping a close eye on the situation. Again, what I want to avoid at all costs is to decide to bring people back on-site and then have to get them all out again. That would a very complex situation to handle."* Our Supplemental Documents package includes the TotalEnergies release.

Risk to further delay to restart TotalEnergies Mozambique LNG?

Here is what we wrote in last week's (March 3, 2024) Energy Tidbits memo. "*On Tuesday, we tweeted [LINK] "Risk to further delay at $TTE Mozambique LNG restart? Still ~60 km south of TTE's Palma, but 👇@UNOCHA 02/27, "confrontations between non-State armed groups (NSAGs) & the Security Defence Forces scaled-up, violent attacks against civilians occurred", 72k people displaced. #OOTT." Our tweet highlighted that the ramp up in violence and displacement of people is still ~60 km of TotalEnergies and ExxonMobil's onshore liquefaction. But, in reading the UNOCHA Feb 27 update, we have to wonder if there is a risk to the revised expected timing for a restart to TotalEnergies Mozambique in the summer. Recall that October, TotalEnergies CEO Pouyanne expected the restart would be for the end of 2023. TotalEnergies has to be watching and hoping that the Increasing violence and* *people displacement in Cabo Delgado province, not get closer to its Mozambique LNG onshore/loading facilities location. OCHA (United Nations Office for the Coordination of Humanitarian Affairs) Feb 27 Flash Update No. 3 Displacement in northern Mozambique wrote "A total of 71,681 people have been displaced since 22 December due to attacks or fear of attacks by non-State armed groups (NSAGs), the majority (69 per cent) are women (14K) and children (35K)." The update and map note that the impact is up to Mocimboa da Praia so south of Palma, which is where the TotalEnergies Mozambique LNG and Exxon's Rozuma LNG will have their onshore liquefaction facilities and loading terminals. Palma is approx. 60 km north of Mocimboa da Praia. So still ~60 km south of Palma but we have to believe any shift in violence north to close to Palma has the risk to cause further delays to the restart of TotalEnergies Mozambique LNG. Our Supplemental Documents package includes the OCHA Feb 27 update."*

Figure 8: OCHA Feb 27 update on violence/people displacement



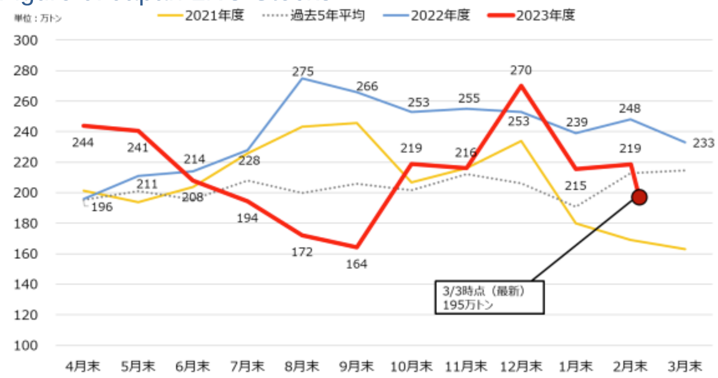
Source: UNOCHA, TotalEnergies

Natural Gas: Japan LNG stocks down WoW, down YoY, below 5-year average

Japan LNG stocks down -9.7% WoW

Japan LNG stocks are below 2023 levels and below the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on March 3 were 93.7 bcf, down -9.7% WoW from Feb 25 of 103.7 bcf, and are down -20.7% YoY from 118.1 bcf a year earlier. Stocks are back below the 5-year average for the end of February of 102.3 bcf. We are a little surprised to see the big draw in inventory as this last week JMA forecasted warm weather across all of Japan. METI did not comment on the WoW increase. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 9: Japan LNG Stocks



Source: METI

China natural gas imports

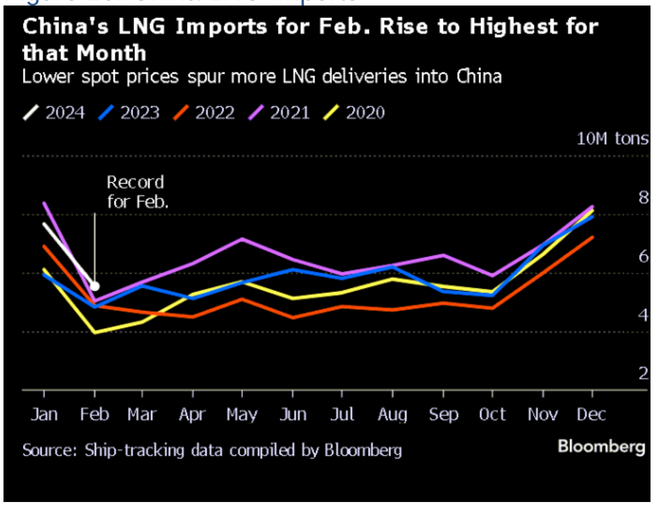
Natural Gas: China natural gas imports +20% YoY, ~17.7 bcf/d during Jan-Feb period

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 ain 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.

China's LNG imports reach record high in February, 9.1 bcf/d

Last week's (March 3, 2024) Energy Tidbits memo reported on Bloomberg LNG tanker tracker data for China for Feb. Here is what we wrote "*The very weak LNG spot prices in late Jan and in Feb led to buyers stepping up to take advantage of the very low prices and that includes China. We look at China's record, for a Feb, LNG imports being driven primarily by price and less by any shift in energy mix to reduce emissions. On Friday, Bloomberg reported that China's LNG imports reach a record high, taking in 9.1 bcf/d over February. Bloomberg wrote "China's liquefied natural gas imports for February jumped to the highest ever level for that month, as a drop in spot prices spurred additional purchases of the fuel. Deliveries rose to more than 5.5 million tons, a 15% increase from a year earlier, according to ship-tracking data compiled by Bloomberg. That's the first time China's monthly imports have broken a record since 2021, before the global energy crisis sent prices surging and as virus lockdowns dashed demand". We This is an encouraging sign for the Chinese appetite for energy, but also indicative of the shift in the energy mix they are relying on. Less on coal, more on LNG. Below is a chart of China's LNG imports. Our Supplemental Documents package includes the Bloomberg report.*

Figure 10: China LNG Imports



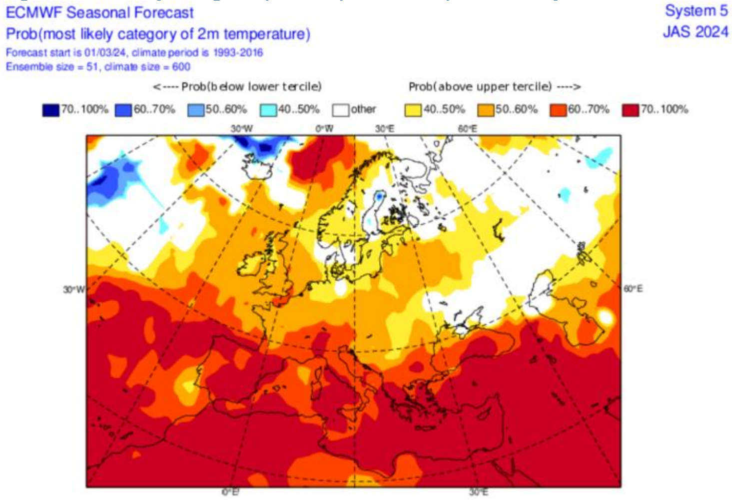
Source: Bloomberg

Natural Gas: ECMWF forecasts a warmer than normal summer in Europe

Forecast warm summer in Europe

The European Centre for Medium-Range Weather Forecasts updated its monthly look ahead at summer 2024. There is no real change and the ECMWF still forecasts a warmer than normal summer for Europe. Summer is not as significant a variable for natural gas than the winter temperatures. Plus the other normal negative for natural gas is that wind generation is normally better in warmer temperatures. Below is the updated ECMWF March temperature probability for Jul/Aug/Sept.

Figure 11: July/Aug/Sept temperature probability forecast



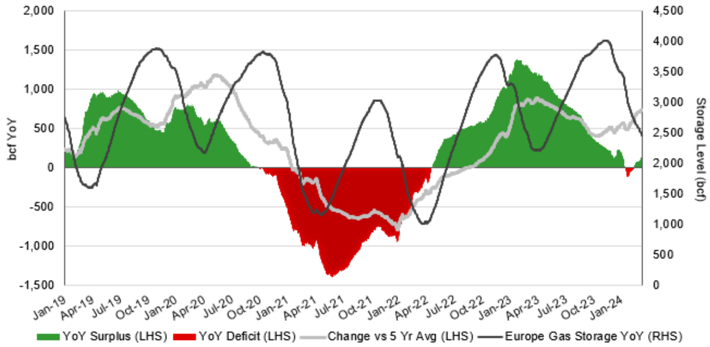
Source: ECMWF

Natural Gas: Europe storage drops again WoW to 61.02%, YoY surplus widens

Europe gas storage

Europe is seeing some draws on gas storage but shook off its YoY deficit last month. This week, Europe storage decreased by -1.51% WoW to 61.02% on March 7 vs 62.53% on February 29. Storage is now +2.99% higher than last year's levels of 58.03% on March 7, 2023. Even though the YoY surplus is modest, there are no fears for natural gas and LNG supply and the expectations seem mostly for storage to be full once again going into the winter. Below is our graph of Europe Gas Storage Level.

Figure 12: European Gas Storage Level



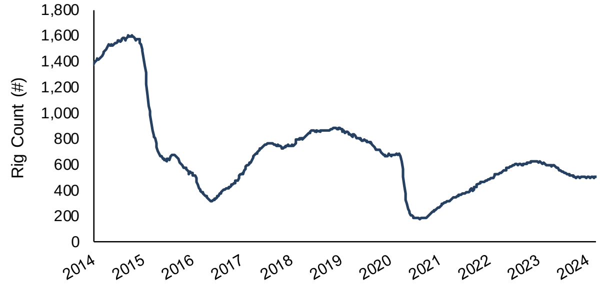
Source: Bloomberg, SAF

Oil: US oil rigs down -2 rigs WoW to 504 rigs, US gas rigs down -4 WoW at 115 rigs

US oil rigs down WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note, Baker Hughes has changed their data output format, so we are in the process of finding a way to get basin splits between gas/oil more easily. (ii) Total US oil rigs were down -2 rigs WoW to 504 oil rigs as of March 8. US oil rigs went below 520 rigs on Aug 25 and stayed there for 4 weeks and for the last 15 weeks have been between 494 and 507 oil rigs. (iii) The major basin changes for rigs were Permian -2 rigs WoW to 313 rigs, Cana Woodford -1 rig WoW to 21 rigs, and Haynesville -3 rigs WoW to 38 rigs. Note that while the Permian is only down -2 rigs, Baker Hughes reported Texas as whole was down -8 rigs WoW and they didn't note any WoW changes in any other Texas basins. So we don't know where in Texas were the remain -6 rigs WoW/ The only possibility is Other but that was only -1 WoW. (iiv) US gas rigs were down -4 rigs WoW to 115 gas rigs. We expect to see some continued small declines in gas rigs given how weak HH prices are.

Figure 13: Baker Hughes Total US Oil Rigs



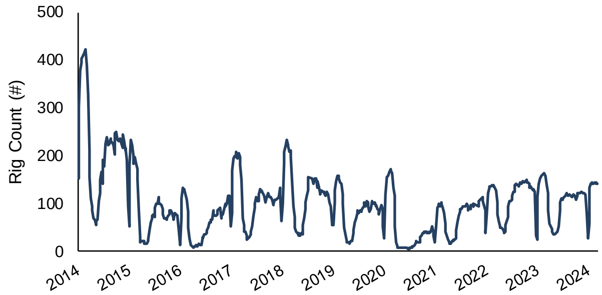
Source: Baker Hughes, SAF

Oil: Total Cdn rigs down -6 rigs WoW, starting end of winter drilling season

Cdn total rigs down WoW

Note, Baker Hughes has changed their data output format, so we are in the process of finding a way to get historical provincial splits more easily. With this drop in oil and gas rigs, we are calling the beginning of the wind down of Winter drilling, especially as we see some warmer weather coming up in Alberta next week. We expect to see a big drop-off in rig count next week. For the week of March 1, total Cdn rigs were down -6 rigs WoW to 225 rigs. Cdn oil rigs were down -3 rigs WoW to 141 oil rigs and are up +2 rigs YoY. Cdn gas rigs were down -3 rigs WoW to 84 rigs, which is flat YoY.

Figure 14: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates down -0.100 mmb/d WoW to 13.200 mmb/d

US oil production down WoW

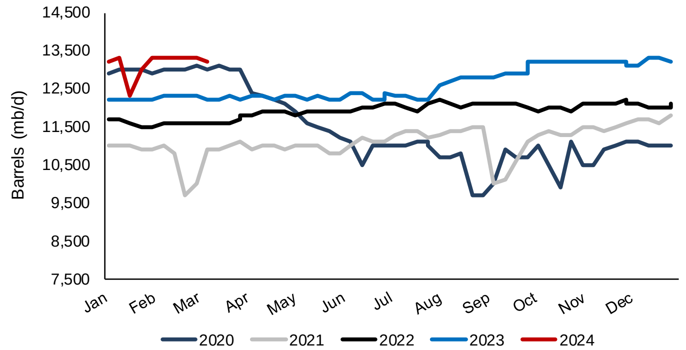
After the EIA slashed production estimates by -1.000 mmb/d in January in response to cold temperatures and production shut-ins, the EIA's estimates showed production quickly returned to where they were before January. On Jan 24, the EIA wrote "*This week's domestic crude oil production estimate incorporates a decrease of 1 million barrels per day, representing an estimate of the impact of winter storms and extreme cold temperatures. We will report survey-based domestic production for January in the Petroleum Supply Monthly (PSM) at the end of March*". We will see how accurate they were when we see the actuals. 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 down -0.100 mmb/d WoW to 13.200 mmb/d for the week ended March 1. Alaska was up +0.003 mmb/d WoW to 0.436 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 15: EIA's Estimated Weekly US Field Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	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								

Source: EIA

Figure 16: EIA's Estimated Weekly US Oil Production



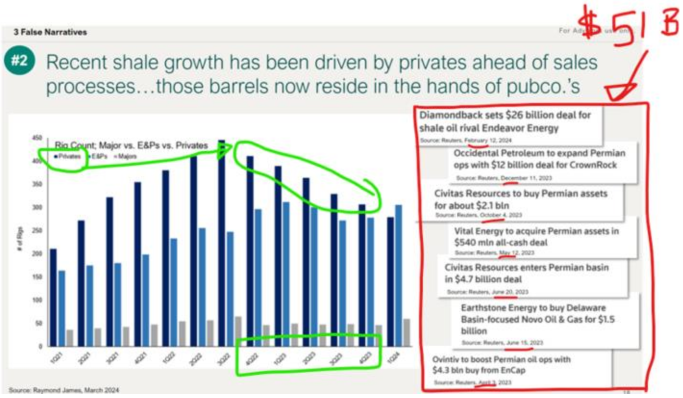
Source: EIA, SAF

Oil: One-time US oil production adds in 2023 ahead of $51b privates sales to publics

$51b private sales to publics

It seems like the consensus is in the camp of lower YoY growth in US oil production in 2024 but also a growing group reminding that US oil growth, in most years, tends to be stronger than expectations. On Thursday, we reminded that there is an overlooked one-time production win for US oil growth in 2023. On Thursday, we tweeted [LINK] "*Why lower US oil growth in 2024. Yes, US #Oil supply exceeded expectations in 2023. BUT a good chunk was one-time production adds by privates to be bigger ahead of $51b in sales to publics. Great analysis/message @ericnuttall. Thx @RaymondJames Oil team for rig splits. #OOTT.*" Our tweet included the below slide from Eric Nuttall's Ninepoint Energy Strategy Update on Thursday. Nuttall used the Raymond James US rig splits that show how private E&P companies really cranked up their rigs in 2022 and 2023. And then Nuttall added the reminder that there were $51 billion in large private sales to publics with the comment "*Recent shale growth has been driven by privates ahead of sales processes …. Those barrels now reside in the hands of pubco's.*" No surprise, the privates wanted to look the biggest and best they could ahead of a sale process and more production leads to higher sale price. We just added the commentary calling looking the biggest and best they can as a "one-time" production addition in 2023. In addition, the publics are now all committed to the return cash to shareholders model so are looking at flat to modest growth models. But the one-time burst to be bigger and better ahead of a sale process is the key reason why we would expect to see lower YoY growth in 2024.

Figure 17: $51b of private shale sales to publics



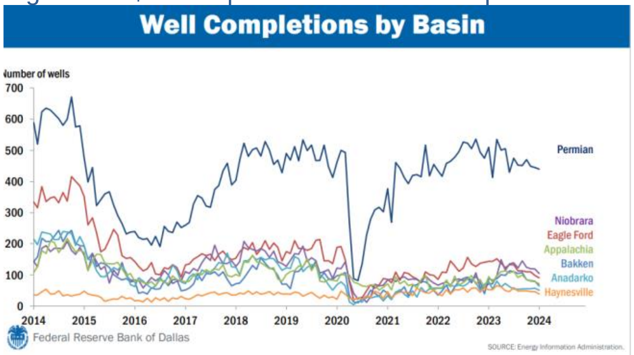
Source: NInepoint, Raymond James

Oil: US well completions are increased in 2023but have declined the past few months

US well completions

On Thursday, the Dallas Fed posted its Energy Slideshow updated March 7, 2024. [LINK] and one of their slides fit the above thesis of the one-time US production adds in 2023 as privates made themselves look bigger and better ahead of sale processes. US oil production directly depends on how many wells get completed and the quality of those wells. We don't have the data to the graphs but the below Dallas Fed graph reminds how completions ramped up in 2023 and have been declining over the past few months. We will likely create our own version of this graph from EIA data.

Figure 18: $51b of private shale sales to publics



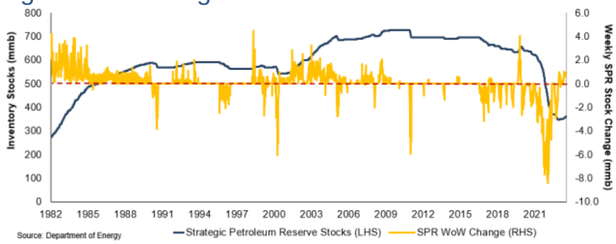
Source: Dallas Fed

Oil: US SPR less -commercial reserve deficit now -87.570 mmb

US SPR reserves

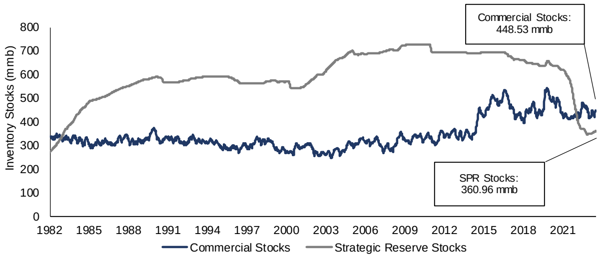
The US elections are now eight moths away on Nov 5, 2024 and the Biden Administration has added 14.2 million barrels back to the SPR since Aug 4, 2023. And it's too early to know if there will be the political need for any releases prior to the election. Even with the 14.2 million barrels added since Aug 4, oil in 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 bigger build on the commercial side. The EIA's weekly oil data for March 1 [LINK] saw the SPR reserves increase +0.706 mmb WoW to 360.960 mmb, while commercial crude oil reserves increased +1.367 mmb to 448.530 mmb. There is now a -87.570 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles, along with the weekly changes to SPR stockpiles.

Figure 19: Strategic Petroleum Reserve Stocks and SPR WoW Change



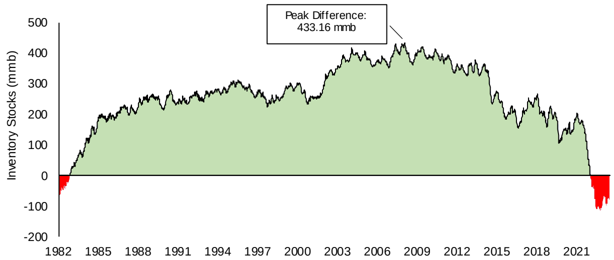
Source: EIA

Figure 20: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 21: US Oil Inventories: SPR Less Commercial



Source: EIA,

Oil: US national average gasoline prices +$0.06 this week to $3.40

US gasoline prices

Yesterday, AAA reported that US national average prices were $3.40, which was +$0.06 WoW, up $0.23 MoM and -$0.07 YoY. It was the first week since Jan when there weren't big WoW increases in local gasoline prices that have been impacted by BP Whiting (Indiana) unplanned shutdown. As of yesterday, the California average gasoline prices were +$0.08

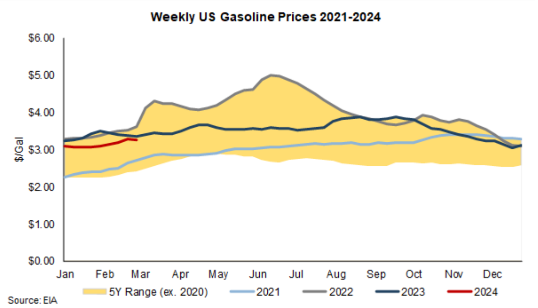
WoW to $4.88, which is a +$0.16 WoW to $4.80, which is a $1.48 premium to the national average gasoline price of $3.40.

Seasonal increase in US gasoline prices

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

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 refiners switch to summer blend after the current turnarounds. Recall that last September, California Gov Newsom allowed an early switch to winter blend to lower the price of gasoline and it worked. NACS (see following item) estimates summer blend gasoline can cost up to 15 cents per gallon to produce.

Figure 22: US weekly gasoline prices



Source: EIA

Summer blend gasoline is more costly

Oil: Switch to summer blend gasoline can add 15₵/gallon to cost

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 $1.50 WoW to $29.61

Crack spreads closed at $29.61

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 29.61 on Mar 8, which was a narrowing of $1.50 WoW. $29.61 is a high enough crack spread to incentivize refiners to run as much crude as possible. 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, its' a very big incentive to refiners to want more crude and produce more product. This week, crack spreads narrowed $1.50 WoW to $29.61 on Mar 8, which followed $31.11 on Mar 1, $30.61 on Feb 23, $25.23 on Feb 16, $30.03 on Feb 9, $25.07 on Feb 2, $26.65 on Jan 26, and $24.47 on Jan 19. Crack spreads at $29.61 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.

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 $29.61 as of the Friday March 8, 2024 close.

Figure 23: Cushing Oil 321 Crack Spread & WTI Mar 8, 2014 to Mar 8, 2024

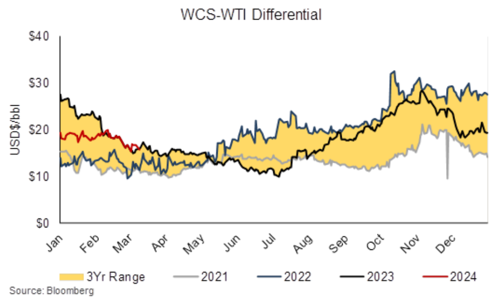
Source: Bloomberg

Oil – Cdn heavy oil differentials continue to seasonally narrow ahead of TMX start

WCS differentials normally narrow in spring

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. The narrowing happens every year. So this is the time of the year, for the next few months, that normally sees Cdn heavy oil differentials narrow. Refineries have, t the most part, finished winter turnarounds and will be moving to maximize production of summer grade fuels as well as asphalt ahead of the annual summer 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. We have seen Cdn heavy oil differentials narrowing already and a key factor for that is the OPEC+ cuts, which tend to first be on heavy/medium sour barrels that would tend to compete with Cdn heavy/medium barrels. WCS less WTI differential closed on March 8 at $16.00, which was -$0.40 WoW vs $16.40 on March 1. These are both well below the Feb peak of $19.75 We note that this is before the start up of Trans Mountain 590,000 b/d TMX expansion, which is expected to have a major reduction of WCS less WTI differentials.

Figure 24: WCS less WTI oil differentials to March 8 close



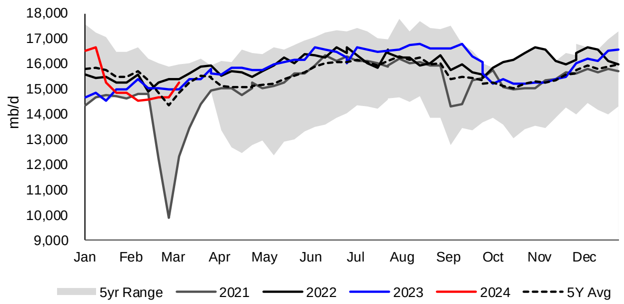
Source: Bloomberg

Oil: Refinery Inputs up +0.595 mmb/d WoW to 15.268 mmb/d, refineries coming online

Refinery inputs +0.595 mmb/d WoW

There are other refinery items impacting crude oil inputs into refineries. There are always unplanned shutdowns such as the 435,000 b/d BP Whiting (Indiana), which was still shut down for the March 1 week. It is reportedly starting up this weekend so may not be impacting the March 8 data. But for the most part, this is the normal seasonal ramp up in refinery runs following winter maintenance. And, there were also some refineries coming off maintenance in Louisiana last week that contributed to the increase, including the 283,000 b/d crude unit at Marathon Garyville and a 116,000 b/d unit at Exxon's Baton Rouge refinery. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended March 1 [LINK]. The EIA reported crude inputs to refineries were up +0.595 mmb/d this week to 15.268 mmb/d and are up +0.301 mmb/d YoY. Refinery utilization was up +340 bps WoW at 84.9%, which is -110 bps YoY.

Figure 25: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: 1 mmb/d of new Pemex & Nigeria refinery capacity is ramping up in Q2 and Q3

1 mmb/d of new refinery capacity ramping up

Global refining seasonally ramps up as refineries come off winter maintenance so they can provide products like summer grade gasoline for the peak products demand in the summer. So there is increasing QoQ oil demand. That is from existing refineries. In addition, there is the ramp up of oil demand from new refineries. On Tuesday, we tweeted [LINK] "*1 mmb/d of new refining capacity started up in Jan . Both should impact Q2/24 to take #Oil off export markets, & should ramp up to full capacity over 2024 👇Jan 9. Nigeria started 650,000 b/d Dangote refinery. Pemex started up 340,000 b/d Olmeca (Dos Bocas) refinery. #OOTT."* Our memos have been highlighting the startup of these two new refineries. (i) Nigeria's 650,000 b/d Dangote refinery. On Jan 8, 2024, we tweeted [LINK] "I*CYMI. Nigeria expected to cut #Oil exports by 350,000 b/d in early 2024, then ultimately up to 650,000 b/d in later 2024 with the just starting up 650,000 b/d Dangote refinery. Thx @MDzirutwe #OOTT."* (ii) Pemex's 340,000 b/d Olmeca refinery. Pemex has not been disclosing on the ramp up of Olmeca. Last yr, Mexico noted it had started operations in Sept. Pemex did say it was to reach full capacity by March 31. 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."*

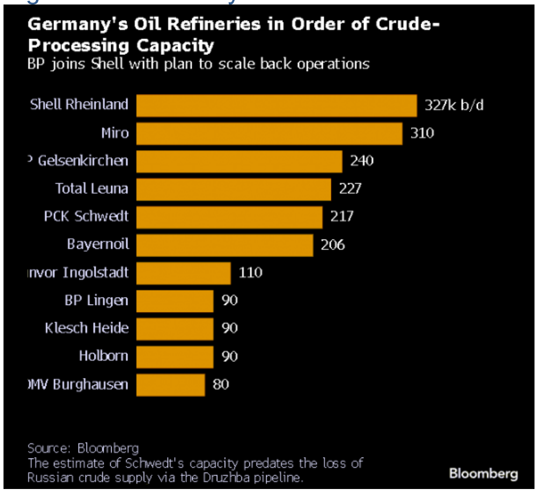
Oil: bp shutting down 240,000 b/d Its Gelsenkirchen in Germany

Bp shutting 240,000 b/d Germany refinery

No one should be surprised to see another western European refinery being shut down due to structurally high costs such as carbon levies to operate in western Europe and high energy costs. And the issue for oil and gas in western Europe and in countries like Canada and The US is that the lookahead will inevitably include the assumption of increasing carbon and other environmental costs on refineries or oil and gas in general. On Wednesday, Bloomberg reported "*BP to Scale Back German Refining Operations on High Costs".* BP management said it clearly "*"Our refinery in Gelsenkirchen is currently uncompetitive," said Arno Appel, head of the plant. It is "burdened with structural costs that are too high."* Bloomberg wrote "*"Its Gelsenkirchen oil-processing complex will become the second German plant to reduce crude consumption from 2025, with Shell Plc working on a similar move at a nearby plant.*

The companies' plans could reduce the nation's refining capacity by more than 10%, according to Bloomberg calculations. European refiners face increasing competition from fuel imports originating in the Middle East and Asia, where capacity is being increased. Operators often complain about an unfair playing field, with European plants subject to carbon levies that don't apply elsewhere. The price of natural gas used in refining and chemicals is also a headwind in Europe." Our Supplemental Documents package includes the Bloomberg report.

Figure 26: Germany's Oil Refineries



Source: Bloomberg

Oil: US net oil imports +0.928 mmb/d WoW as oil imports up +0.837 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up +0.928 mmb/d to 2.585 mmb/d for the March 1 week. US imports were up +0.837 mmb/d to 7.222 mmb/d against exports which were -0.091 mmb/d WoW to 4.637 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 +2.434 mmb/d. Some items to note on the country data: (iii) Canada was down -0.134 mmb/d to 3.632 mmb/d. US oil imports from Canada have been well of the recent 4.188 mmb/d for the Jan 12 week as BP Whiting (Indiana) 435,000 b/d refinery has been down. It is reportedly restarting this weekend but we suspect it won't impact the March 8 import data. (vi) Saudi Arabia was up +0.227 mmb/d to 0.366 mmb/d. (v) Mexico was up +0.071 mmb/d to 0.640 mmb/d. (vi) Colombia was up +0.280 mmb/d to 0.351 mmb/d. (vii) Iraq was down -0.064 mmb/d to 0.176 mmb/d. (viii) Ecuador was up +2.118 mmb/d to 2.118 mmb/d. (ix) Nigeria was up +0.057 mmb/d to 0.222 mmb/d.

Figure 27: US Weekly Preliminary Imports by Major Country

	Dec 1/23	Dec 8/23	Dec 15/23	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	WoW
Canada	3,972	3,572	3,686	3,428	3,796	3,557	4,188	3,270	3,573	3,539	3,999	3,669	3,766	3,632	-134
Saudi Arabia	400	316	406	75	139	474	413	81	150	353	390	224	139	366	227
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	876	633	851	380	952	522	756	356	427	661	294	784	569	640	71
Colombia	289	214	215	157	129	220	212	72	79	415	150	286	71	351	280
Iraq	166	85	22	380	239	192	64	206	205	0	43	226	240	176	-64
Ecuador	252	233	49	142	83	30	150	3	103	72	201	158	0	2,118	2,118
Nigeria	226	111	162	80	95	165	147	199	190	81	137	159	165	222	57
Brazil	274	255	197	238	305	249	264	266	213	338	148	44	234	178	-56
Libya	87	87	86	0	171	0	7	37	0	0	63	92	65	0	-65
Top 10	6,542	5,506	5,674	4,880	5,909	5,409	6,201	4,490	4,940	5,459	5,425	5,642	5,249	7,683	2,434
Others	966	1,011	1,076	1,396	986	832	1,219	1,090	665	1,448	1,045	1,012	1,136	-1,298	4,788
Total US	**7,508**	**6,517**	**6,750**	**6,276**	**6,895**	**6,241**	**7,420**	**5,580**	**5,605**	**6,907**	**6,470**	**6,654**	**6,385**	**6,385**	**7,222**

Source: EIA, SAF

Oil: Maduro puts Biden on the spot, sets July 28 for election, Machado not eligible

Venezuela election July 28

It seems that Venezuela didn't get any headlines this week with the ongoing Hamas/Israel, Ukraine/Russia, Houthis, Super Tuesday, Biden's State of the Union and the effective start of the countdown to Biden vs Trump election. On Monday, we tweeted [LINK] "*Maduro puts Biden on the spot! Sets July 28 for VEN election. Can Biden extend VEN Oil #NatGas licenses given opposition candidate Machado still not eligible. Biden wants low #Oil #Gasoline prices for his election & now has ~175,000 b/d VEN imports to Gulf Coast. Bad timing for Biden as will already be less oil this summer to Gulf Coast refineries w/ Pemex 340,000 b/d Olmeca refinery ramping up & TMX 590,000 b/d start. #OOTT.*" Maduro surprised calling an early July 28 election. But he didn't surprise by Venezuela not changing their banning of the leading opposition candidate, María Corina Machado, from running against Maduro. We have to believe Maduro is taking advantage of oil dynamics impacting the Gulf Coast, in particular, how the startup of Pemex's 340,000 b/d Olmeca refinery and the 590,000 b/d Trans Mountain TMX expansion will mean less crude to the Gulf Coast. Venezuela oil exports have reached ~175,000 b/d to the Gulf Coast. And Maduro must know that Biden doesn't want to lose another 175,000 b/d to the Gulf Coast in an election year where the #1 consumer risk for Biden is always gasoline prices. We believe oil markets are a key reason why Maduro feels he put Biden on the spot. Our Supplemental Documents package includes the WSJ reporting on the election call. [LINK]

US vows Venezuela oil sanctions to return if Machado isn't allowed to run

The only Biden Administration response was on the reporting by Reuters and others on comments by Brian Nichols (US Assistant secretary of state for Western Hemisphere Affairs) speaking to a Washington think-tank on Thursday. Rueters reported "*The United States on Thursday accused the Venezuelan government of failing to deliver on some of its key commitments that resulted in U.S. sanctions relief last year, despite this week's announcement of a July 28 date for a presidential election. Speaking to a think tank in Washington, Brian Nichols, U.S. assistant secretary of state for Western Hemisphere Affairs, said Venezuelan President Nicolas Maduro had taken a number of steps in the "wrong direction." These measures, he said, include maintaining an election ban on Maria Corina Machado, the leading opposition candidate, and arresting dozens of opposition activists. Washington has vowed to reimpose sanctions on the OPEC member-state's vital energy sector by mid-April unless Machado is allowed to run and Maduro follows through on other promises made in a deal with the opposition in Barbados in October.*" Our Supplemental Documents package includes the Reuters report.

Oil: Exxon CEO "extremely confident" on Hess's Guyana assets in Chevron deal

Exxon CEO on Hess's Guyana assets

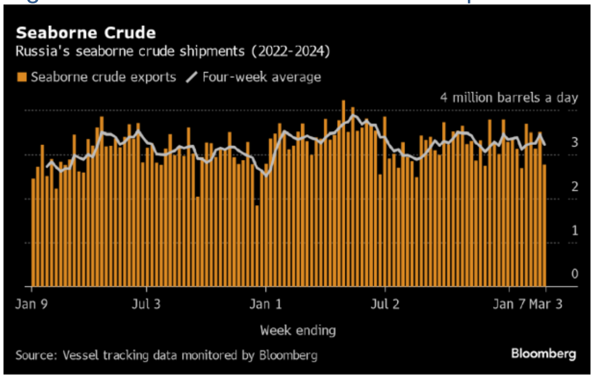
The big surprise to markets in the last couple weeks was how the Chevron/Hess deal could fall apart if Exxon wins its right to Hess's Guyana assets instead of the Guyana assets automatically going to Chevron in its deal to buy Hess. Chevron says clearly on pg 31 of its S-4 "W*ith respect to the Stabroek ROFR (as defined in the section entitled "The Merger—Stabroek JOA"), if the discussions with Exxon Mobil Corporation (Exxon) and China National Offshore Oil Corporation (CNOOC) do not result in an acceptable resolution and arbitration (if pursued) does not result in a confirmation that the Stabroek ROFR is inapplicable to the merger, then there would be a failure of a closing condition under the merger agreement, in which case the merger would not close."* Exxon CEO Darren Woods was very clear in his confidence on Exxon's position. Exxon spoke at a US sell-side conference on Wednesday. It's worth reading Woods comments. Here are his key comments "*Yeah, well, first, let's just let's put a perspective on this thing. The joint operating agreement actually is a confidential contract. It's a confidential contract between the participants in the block, which in this case is ExxonMobil, CNOOC and Hess. So, Devin, what that really means is I can't get into the specific contract language .contract language, because I would have to have agreement from the other partners to be able to do that. However, there are a few points I can make and make very, very clearly. First of all, we wrote this joint operating agreement. ExxonMobil authored the agreement, and we actually co-authored it with Shell prior to entering the stable block. That joint operating agreement was based on an industry standard joint operating agreement. I can't get into the specifics of this JOA, but it was based on an industry standard JOA, which provides rights, preemption rights, for the other partners, if any parties want to sell, either through an asset transaction, and what that means, in this case, Hess would just want to sell their participation in the stable block, and also it also comprehends if there's a parental transaction where part of that transaction is the stable block. That's what a model JOA does. The JOA contract in this case was developed based on that model JOA We understand the detailed language. We wrote it. We understand the intent of this language of the whole contract because we wrote it. I think most observers in this industry would understand our reputation for rigor, attention to detail in contract language. I mean, it's a brand we have as a company. And what that means is we're extremely confident in our position that pre-emption rights exist in this contract. And we fully intend on ensuring that we preserve those preemption rights. And actually as of this morning, we filed for arbitration. We file for arbitration to protect those preemption rights, and we think that's very important for the company. We think it's very important for the industry. We think it's precedent-setting, and sanctity of contracts in this industry is a really, really important component, and we take that responsibility very seriously."* Note the transcript says "stable block", which is meant to be Stabroek block. There were other Exxon comments. Our Supplemental Documents package includes an excerpt from the Chevron S-4 and the transcript from Exxon's comments this week on the ROFR.

Oil: Russia's crude oil shipments for Mar 3 plummets WoW, well below Q1/24 target

Weather hit Russia oil shipments

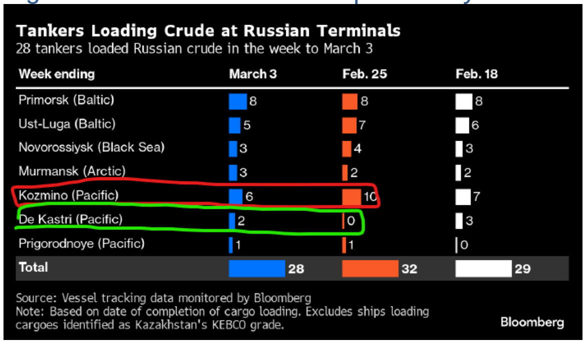
Russia's crude exports by sea fell sharply this week as high winds at their Kozmino terminal prevented the mooring of tankers. Bloomberg had reported "*Russia's seaborne crude flows in the week to March 3 at 2.78 million barrels a day were the lowest in five weeks. The less volatile four-week average also dropped, down by about 230,000 barrels a day to 3.22 million barrels a day".* The March 3 figures are down -720,000 b/d WoW, and 510,000 below Russia's renewed Q1/24 export cap. As expected, there were a couple of tankers that returned to the De Kastri terminal to haul more Sokol crude, but they seem to be destined for China instead of their usual Indian market. Tracking data reveals a Sokol tanker anchored outside of Karachi, so it is possible the Pakistanis could help Russia with their placement issues. Below are Russia's seaborne crude shipments since 2022 and tanker loading data. Recall Russia just announced a 500,000 b/d production cut as well as a renewed export limit, so their shipments going forward should be dampened. Our Supplemental Documents package includes the Bloomberg report.

Figure 28: Russia's seaborne crude shipments thru Mar 3 week



Source: Bloomberg

Figure 29: Russian Crude Shipments by Terminal



Tankers Loading Crude at Russian Terminals
28 tankers loaded Russian crude in the week to March 3

Week ending	March 3	Feb. 25	Feb. 18
Primorsk (Baltic)	8	8	8
Ust-Luga (Baltic)	5	7	6
Novorossiysk (Black Sea)	3	4	3
Murmansk (Arctic)	3	2	2
Kozmino (Pacific)	6	10	7
De Kastri (Pacific)	2	0	3
Prigorodnoye (Pacific)	1	1	0
Total	28	32	29

Source: Vessel tracking data monitored by Bloomberg
Note: Based on date of completion of cargo loading. Excludes ships loading cargoes identified as Kazakhstan's KEBCO grade.
Bloomberg

Source: Bloomberg

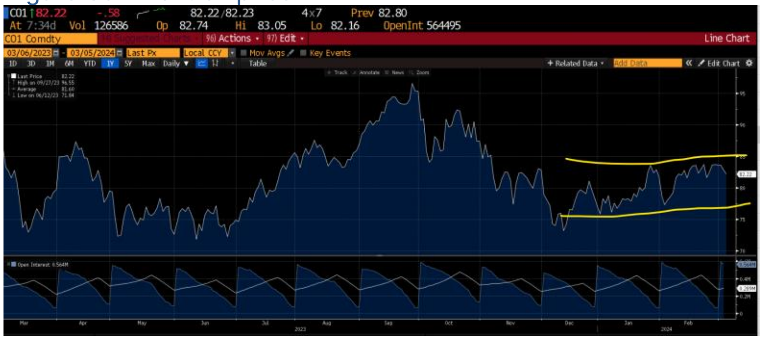
SAF GROUP

Oil: OPEC has managed oil markets to stable Brent +/-80

Stable Brent +/- $80

It is often overlooked that Brent has been pretty stable for the past few months, which provides support that Saudi Energy Minister Abdulaziz made the right call on the market six months ago. The stable oil price is impressive considering Q1 is the seasonally lower QoQ demand period for oil. On Tuesday, we tweeted [LINK] "*Saudi Energy Minister Abdulaziz OPEC cuts are working, Brent is stable in tight range +/-$80 in seasonally lower QoQ oil demand. "These [#Oil] markets have become relatively boring" "lowest trading range for Brent since Sept 2020" highlights @Ole_S_Hansen on @gulf_intel ."#OOTT."* Our tweet referenced comments by Ole S Hansen (Head of Commodity Strategy @SaxoBank) on the Gulf Intelligence daily energy podcast. Hansen comments on how oil markets have become relatively boring and that Brent has been in its lowest trading range since Sept 2020. We believe this is exactly what Abdulaziz hoped/expected when he got OPEC+ cuts.

Figure 30: Brent oil price



Source: Bloomberg

Oil: OPEC to extend and apply additional voluntary cuts of 2.2 mmb/d through Q2/24

OPEC extends 2.2 mmb/d thru June 30

On March 3rd, we tweeted [LINK] "Breaking! #Oil story for Monday morning. "*OPEC+ Extends Oil Supply Cuts Until Mid-Year to Avert a Surplus" reports @FionamMacDonald @S_Elwardany Grant Smith. #OOTT*". What happened post the Bloomberg report was that we started seeing the individual countries issues releases on their extending the voluntary cuts thru June 30. And then after that, OPEC posted their press release [LINK] that they would extend voluntary output cuts thru June 30. These are the same 2.2 mmb/d of voluntary production and export cuts. These are what we call in the below item as Tranche 3 of OPEC+ cuts. They were in place for Q1/24 and are being extended thru Q2/24. The unchanged voluntary cuts are Saudi at -1.000 mmb/d, Iraq at -0.220 mmb/d, UAE -0.163 mmb/d, Kuwait -0.135 mmb/d, Kazakhstan -82,000 b/d, Algeria -51,000, and Oman -42,000 b/d. Russia continue to support cuts of some sort but there was a change in the nature of their commitments. OPEC wrote "*The above will be in addition to the announced voluntary cut by the Russian Federation of 471 thousand barrels per day for the same period (second quarter of 2024), which will be from crude oil production and exports as follows: • In April 350 thousand barrels per day from production and 121 thousand barrels per day from exports. • In May 400 thousand barrels per day from production and 71 thousand barrels per day from exports. • In June 471 thousand barrels per day totally from production.*" Our Supplemental Documents Package includes the OPEC release.

Oil: OPEC's big challenge is upcoming – how to unwind cuts incl 2.2 mmb/d in Q3/24

OPEC's challenge to unwind cuts

There is no question that Saudi Energy Minister Abdulaziz has been right in how he has led the OPEC+ group to manage oil markets. He has the track record. And his lead in extending the voluntary cuts thru Q2 has been right on, once again. But the challenge is upcoming. On Wednesday, we tweeted [LINK] ""*I think the increasing [OPEC] challenge is how to unwind these cuts" @Amena__Bakr 👇reminds T1 2.2 mmbd expects to come back gradually . T2 & T3 in place thru yr-end. Based on track record, have to expect Saudi's Abdulaziz won't let the market slip away. #OOTT @gulf_intel @DyalaSabbagh_GI."* Bakr is the plugged in OPEC following for Energy Intelligence. She reminded there is 5.8 mmb/d of OPEC+ cuts that will be unwound, including the 2.2 mmb/d that is currently scheduled to end at the end of Q2/24. This the upcoming challenge for Abdulaziz is how and when to get the OPEC+ groups unwound and back on the market while maintaining market stability. Her current understanding is that the first tranche of 2.2 mmb/d will be unwound gradually and on a pro rata basis ie. no priority to Saudi Arabia to preferentially unwind their cuts. Our tweet included the below transcript we made of Bakr's comments. SAF Group created transcript of comments by Amena Bakr (Senior Research Analyst, Energy Intelligence) with Gulf Intelligence's Dyala Sabbagh on Gulf Intelligence Daily Energy Markets podcast March 6, 2024 [LINK] Items in "*italics*" are SAF Group created transcript. At 11:00 min mark, Bakr "*I think the increasing challenge is how to unwind these cuts, Dyala. That's where they're going to face the most in terms of their challenges ……. But for the time being, they're favoring the policy kind of keeping a tight grip on the market in terms of management knowing that the price is going to be within a certain range. Making sure these stock levels remain under the 5-year average. But when it comes to the unwinding of the cuts, our understanding so far is the way they are going to happen is you have various tranches of this agreement. You have the voluntary cuts by the eight members, which is the 2.2 [million b/d]. You have the group cuts, which is the 2 million which is placed until the end of this year. And then you have another voluntary cut that's 1.6 million by some members that, again, is until the end of this year. So the first tranche that is going to be unwound is the first 2.2 million b/d by the eight members and that most likely is going to come gradually into the market on a pro rata basis. That doesn't mean Saudi Arabia gets you know to put all of its 1 million b/d into the market, even though they have been consistent and they're the biggest producer, they're the one with the biggest cut in terms of allocation. But doesn't mean they're bringing it back first or all at once. So again, gradual process."*

Oil: Will OPEC reduce its 2024 oil demand +2.2 mmb/d YoY in Tuesday's MOMR?

Will OPEC reduce its demand forecast

Earlier this morning, we tweeted [LINK] "*Looks like OPEC to reduce its 2024 #Oil demand growth in MOMR on Tues. "We expect it to be fairly robust, we are looking at growth of about 1.5 million barrels," Aramco CEO. Closer to IEA +1.2 mmbd than OPEC +2.2 mmbd. Thx @mahaeldahan @YousefSaba #OOTT."* Saudi Aramco released its Q4 and held its media call. It's public investor analyst call isn't until tomorrow. Fortunately, Reuters reported on the media call as there were key insights not in the short release including on the key oil macro question for 2024 – oil demand growth. Reuters reported " *So far we are in the early part of 2024, demand is healthy and growing in China," Nasser said on a media call following the release of results that showed net profit falling 24.7% to $121.3 billion on lower oil prices. Nasser said the country's refineries were some of the most fully integrated and had the highest conversion rates and Aramco was currently looking at further opportunities for investment. Nasser expected the global oil market to remain healthy throughout 2024.*

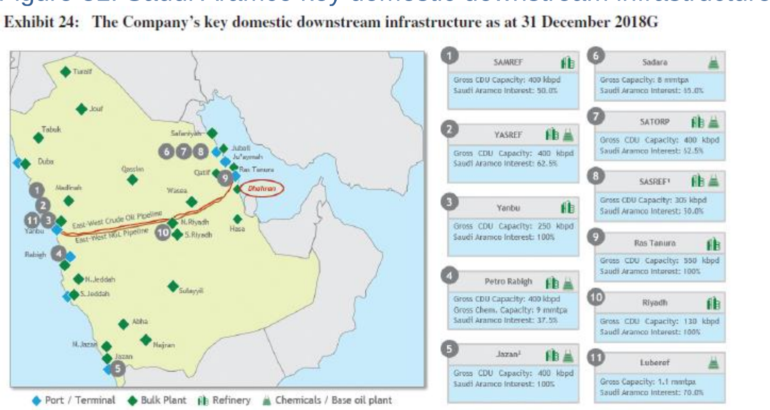
"We expect it to be fairly robust, we are looking at growth of about 1.5 million barrels," Nasser said. Nasser put demand for 2024 at 104 million barrels a day as opposed to an average of 102.4 million barrels in 2023." The +1.5 mmb/d YoY growth in demand is well below OPEC's latest Monthly Oil Market Report's forecasts for oil demand to growth +2.2 mmb/d YoY in 2024, but a little above IEA's latest Oil Market Report forecast for oil demand growth of +1.2 mmb/d YoY in 2024. OPEC doesn't have to have the same forecast as Saudi Arabia but we find it hard to believe they will be much different. Especially as Saudi Arabia Energy Minister Abdulaziz tries to keep a hold on oil markets knowing the 2.2 mmb/d voluntary cuts are currently scheduled to end on June 30. OPEC is scheduled to release its MOMR on Tuesday, normally around 5:45am MT. Our Supplemental Documents package includes the Reuters report.

Oil: Saudi Arabia moving 3.1 mmb/d in East-West pipeline

Aramco moving 3.1 mmb/d in East-West pipeine

We will get more insights on Saudi Aramco's oil views tomorrow when it holds its public analyst call. One other insight from the Aramco media call was from Amena Bakr (Energy Intelligence), who tweeted "*The East/ West pipeline is currently being used at a capacity of 3.1 million bpd - Aramco's ceo #OOTT #Aramco*". The East-West pipeline can move oil to Yanbu on the Red Sea to avoid tanker transit thru the Bab el Mandeb. Yanbu is north of where all the Houthi missile/drone attacks are happening so eliminates that risk as long as the Houthis don't decide to send drones/missiles north up to near Yanbu. Recall the Houthis have had missile/drone attacks at Saudi Aramco oil facilities at Yanbu in prior years. Note the 3.1 mmb/d is not the maximum capacity of the East-West pipeline. Recall Saudi Aramco's original international offering circular wrote "*In particular, the Company's East-West pipeline is critical in linking oil production facilities in the Eastern Province with Yanbu' on the west coast, and providing flexibility to export from the east and west coast of the Kingdom. In 2018G, the East-West pipeline transported an average of 2.1 million barrels per day of crude oil. By the end of 2019G, the capacity of the East-West pipeline is expected to increase from 5.0 million barrels per day to 6.2 million barrels per day of sustainable flow for six months using drag reducing additives and has the ability to temporarily increase to as much as 7.0 million barrels per day*." It's a reminder that Saudi Aramco has a huge alternative route if the Strait of Hormuz is ever blocked.

Figure 31: Saudi Aramco key domestic downstream infrastructure



Source: Saudi Aramco

Oil: Saudi not adding 1 mmb/d to MSC saves $40 billion between 2024 and 2028

Saudi cost to add 1 mmb/d

There was a sentence in the Saudi Aramco Q4 that caught our attention "*Aramco expects 2024 capital investments to be approximately $48 to $58 billion, growing until around the middle of the decade. The directive to maintain Maximum Sustainable Capacity at 12 million barrels per day, mainly from deferral of projects not yet commissioned and reductions in infill drilling, is expected to reduce capital investment by approximately $40 billion between 2024 and 2028.*" It's a reminder that adding oil capacity is not cheap even in Saudi Arabia. I saying they will reduce capex by $40 billion by not moving their MSC from 12 to 13 mmb/d. This doesn't include any capital already spent on these added MSC projects. But it says that, from here on, it would cost Aramco $40 billion to add 1 mmb/d. Our Supplemental Documents package includes the Saudi Aramco press release.

Oil: Ramadan expected to start tomorrow

Ramadan starts March 11

Ramadan is expected to begin on March 11, and the Eid al Fitr celebrated on Apr 10. We checked and didn't see a normal specific security warning from the US Overseas Security Advisory Council [LINK] for Security Alerts that typically refer to Ramadan. In prior years, their warnings have noted that "*martyrdom during the month may hold a special allure to some*". It's normally a reminder they make just like we see reminders of terrorist risk on certain anniversaries. We are surprised given the increased fighting in Gaza, Yemen, Iraq and Lebanon. Ramadan is described by the LiveScience [LINK] "*Ramadan is the most sacred month of the year in Islamic culture. Muslims observe the month of Ramadan, to mark that Allah, or God, gave the first chapters of the Quran to the Prophet Muhammad in 610, according to the Times of India. During Ramadan, Muslims fast, abstain from pleasures and pray to become closer to God. It is also a time for families to gather and celebrate".*

Oil: Houthis say attacked with 37 drones on Fri, US says shot down at least 28 drones

Big Houthis drone attack

As of our 7am MT news cut off, we haven't seen any updated US reporting on the big Houthi drone attack on Friday. (i) What is clear is that it was one of the biggest Houthi drone attacks and the Houthis still aren't going away. The Houthis said they launched 37 drones. CENTCOM said they shot down "*at least 28*" drones. (ii) Our second tweet yesterday was [LINK] "*Update from @CENTCOM. US shot down "at least 28" drones. Also no US/coalition ships damaged & no reports of damage to commercial ships. Houthis claimed launched 37 drone attack. Good to see unaccounted # of drones isn't as 1st reported and no damage! #OOTT.*" We were glad to see this second CENTCOM update as its first update on the attack left big unanswered questions. (iii) Our first tweet yesterday was [LINK] "*Let's hope it's Houthis exaggeration. Houthis claim launched 37 drones vs US navy. US says shot down 15 drones. Is this large attack what Houthis leader warned 👇 on Mar 7? Reminds Houthis are still not going away. #OOTT.*" That first CENTCOM update only addressed 15 of the Houthi drones and did not say if there was any damage to the navy or commercial ships. Our Supplemental Documents package includes the Houthis recap of the attack and the two CENTCOM tweets.

Oil: Was the big drone attack the Houthis leader warning on Thursday?

Big Houthis drone attack

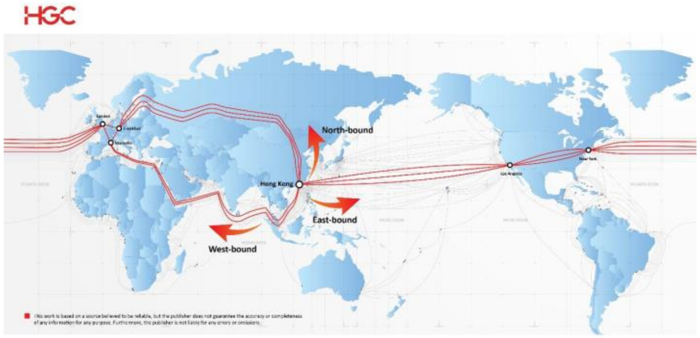
The Houthis leader made his normal Thursday night speech and he continued his warning for something greater is coming against the US. Early Friday morning, we tweeted [LINK] "*Houthis are still not going away. Leader last night "What is coming is greater and there are great signs. We suit the action to the word. The enemy, the friend, and our dear people will see the level of achievements of strategic importance ...." #OOTT.*" Note the Houthis leader made no mention of the first deaths from a Houthi hit on the commercial ship this week. Last Sunday, the Houthis leader also warned that there were surprises coming against the US. On Monday, we tweeted [LINK] "*ICYMI. Yesterday Houthis leader "options are being studied and surprises are coming". This is his new "surprises" are coming message that he started on Feb 29 👇 It's a reminder that Houthis don't go away quickly. The Saudis/Houthis conflict started almost 9 years ago! #OOTT.*" Our Supplemental Documents package includes the Saba reporting of the Houthis leader speech on Thursday.

Oil: HGC confirms 4 of 15+ Red Sea submarine cables were cut

4 Red Sea communication cables cut

Even though the Houthis have said they aren't going to go after submarine cables, the now confirmed cut on 4 submarine cables in the Red Sea is a reminder that there is real risk towards a major interruption in Europe to Asia communications cables. On Tuesday, there was official confirmation of the submarine cables being cut in the Red Sea. We tweeted [LINK] "*Who cut the Red Sea cables ? HGC confirms 4 of 15 Red Sea submarine cables were cut last week. impacted 25% of traffic. "Around 15% of Asia traffic goes west-bound, while 80% of those traffic" will pass thru these cables/ Rerouting via China, US & 11 remaining cables. #OOTT.*" Last week's (Mar 3, 2024) Energy Tidbits memo noted the WSJ Mar 2 report confirming that three submarine communication cables were cut in the Red Sea. Our tweet included the media statement from HGC Global Communications, the owner of 15 submarine cables in the Red Sea. HGC confirmed "• *Among 15+ submarine cables in the Red Sea, 4 of them (Seacom, TGN, AAE-1, EIG) are cut which we estimated impact 25% of traffic • Around 15% of Asia traffic goes west-bound, while 80% of those traffic will pass through these submarine cables in the Red Sea*". Fortunately, HGC has re-routing options. HGC also wrote "*In light of this situation, HGC has already taken necessary measures to mitigate for our clients. We have successfully devised a comprehensive diversity plan to reroute affected traffic: • North-bound: departing from Hong Kong and routing through mainland China to Europe; • East-bound: departing from Hong Kong and routing through the United States to Europe; • West-bound: diversifying traffic within the rest of 11 submarine cables system in the Red Sea.*" Our Supplemental Documents package includes the HGC release.

Figure 32: HGC re-routing

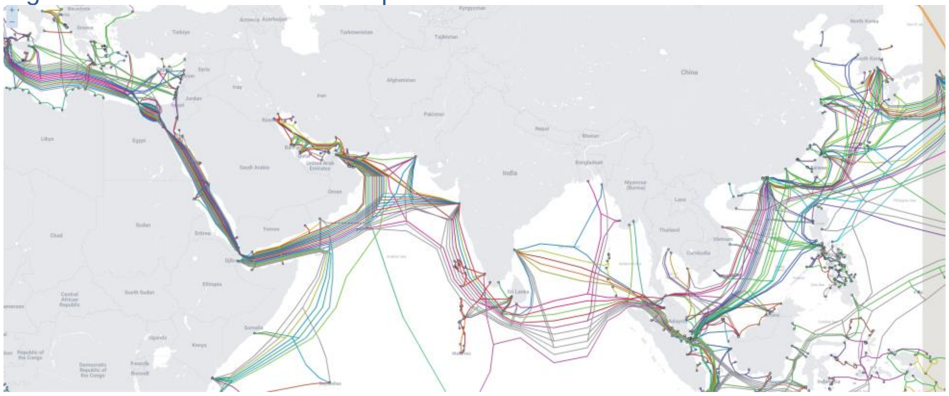


Source: HGC Communications

02/13/24: Houthis Leader says have no intention of targeting submarine cables
Here is what we wrote in our Feb 18, 2024 Energy Tidbits memo. "*On Tuesday, we tweeted [LINK] "Houthis leader "we have no intention of targeting submarine cables connecting to countries in region". Lets hope his intention is more indicative than when politicians say no intention. #OOTT." The Houthis leader was responding to the media reports last week about the risk to underwater communications cables from Europe to Asia that all run thru the Red Sea and Bab el Mandeb. Our tweet included the Al Masirah (Yemen news) web page that showed the headlines of the Houthis leader comments "Sayyed Abdulmalik. We have no intention of targeting submarine cables connecting to countries in region" "Sayyed Abdulmalik. Rumors circulating in some media about our intention to target submarine cables, internet cables are aimed at distorting, mispresenting Yemen's position."*

EU to Asia underwater communications cables run thru Houthis Bab el Mandeb
Here is what we wrote in our Feb 11, 2024 Energy Tidbits memo. "*There was a good reminder that the Bab el Mandeb is more than a critical shipping chokepoint, it is also a critical choke point for global communications. On Monday, we tweeted [LINK] "Overlooked Houthis global risk. "we also have to make sure they never build the capacity to touch the underground sea cables that handle most of the internet traffic between EU and Asia that go thru the Bab el Mandeb" warns @Norman_Roule to @FerroTV @lisaabramowicz1 @annmarie See 👇@TeleGeography map. #OOTT." This was a reminder from Norman Roule(Senior Advisor, Transnational Threats Project for CSIS Center for Strategic & International Studies on Bloooomberg Surveillance. HE remidned that all of the major underwater cables for communications from Europe to Asia went thru thej Bab el Mandeb. And that the Houthis could cause major global economic hit if they damaged this underwater cables. Our prior writings on these underwater cables was on the risk in the South China Sea and not the Bab el Mandeb but the concept is the same. These underwater communications cables are at risk. Our tweet included the Submarine Cable Maps from TeleGeography that shows the major global underwater communications cables. Our Supplemental Documents package includes the Submarine Cable Maps.*

Figure 33: Submarine Cable Map



Source: GeoTrelegraphy

Oil: Added oil tanker days from avoiding Suez Canal and Panama Canal

Add tanker days to avoid Red Sea

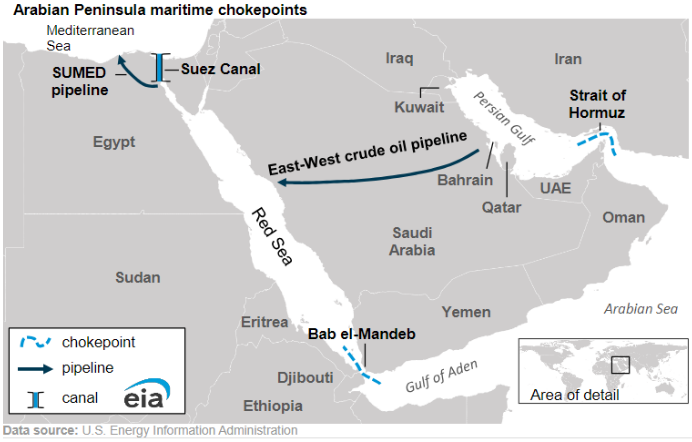
No one knows how long the re-routing from the Red Sea via the Cape of Good Hope will last, but we don't see anyone calling for that to end in the next few months. Here is what we wrote in our Feb 4, 2024 Energy Tidbits memo. "*We always love a good map. On Friday, we tweeted [LINK] "Great map courtesy 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 34: 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 35: Bab el-Mandeb Strait, a world oil chokepoint



Source: EIA

Figure 36: 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: Still no visibility to deal with Iraq to see Kurdistan oil exports resume via Turkey

Kurdistan oil co's look to US for help

It's almost one year since Kurdistan oil exports via Turkey stopped on March 23, 2023. As of our 7am MT news cut off, we have seen no reports on Rudaw (Kurdistan news), Iraqi News Agency (state media) and AKIPUR for any update on a potential deal to restart Kurdistan oil exports via Turkey. (i) Recall on Feb 19, Iraq's oil minister said he expected a deal in the next week or two. Here is what we wrote in last week's (Feb 25, 2024) Energy Tidbits memo. *"The Bloomberg Feb 19 report on Iraq Oil Minister also included a surprise statement that he expects a deal in the next one or two weeks with Kurdistan to resume oil exports via Turkey. Bloomberg also wrote "Separately, he said he expects an agreement with Kurdistan on resuming oil production from the semi-autonomous region in one or two weeks, and eventually the restart of exports through a pipeline to Turkey." The Kurdistan oil exports via Turkey have been stopped since March 23. This is a surprise given that we have only seen negatives coming from Kurdistan on no progress on a deal with Iraq to resume oil exports via Turkey. However, Kurdistan looks to be getting a break with the restart of the Al-Shamal Refinery."* (ii) Kurdistan oil companies don't expect any restart for probably at least two months. Here is what we wrote in last week's (March 3, 2024) Energy Tidbits memo. *"Earlier this morning, we tweeted [LINK] "Kurdistan #Oil exports shut at least 2 more months? AKIPUR hopes US can pressure Iraq PM Sudani to resume exports at his late Apr White House visit. AKIPUR reminds Iraq budget depends on US funding! Great interview @diyarkurda! [LINK]." Our tweet included Rudaw's (Kurdistan news) Saturday interview with a representative of AKIPUR (industry association for Kurdistan oil companies). In reading the interview, it's hard to see how AKIPUR expects any restart of Kurdistan oil exports until at least late Apr, when they hope the US can pressure Iraq Prime Minister Sudani when he meets Biden at the White House in late Apr. AKIPUR also reminds of an overlooked fundamental for why the US can pressure Sudani – Iraq gets US funding for its budget! Rudaw writes "The White House has issued an invitation to Iraqi Prime Minister Mohammed Shia' al-Sudani, and an association of oil producers working in the Kurdistan Region is hoping Americans can use that visit to pressure Baghdad into resuming oil exports. "We know that Prime Minister Mohammed Shia' al-Sudani has been invited to visit the White House and we think that visit will happen after Ramadan, sometime in late April." There is more in the interview. Our Supplemental Documents package includes the Rudaw interview."*

Oil: Libya NOC confirms oil production at 1.220 mmb/d

Libya producing 1.220 mmb/d

On Friday, the Libya National Oil Corporation tweeted [LINK] *"Crude oil production reached 1,220,000 barrels per day, and condensate production reached 53,000 barrels per day during the past 24 hours."* The ~1.2 mmb/d is the stable level of production seen over the past several months other than when there were supply interruptions. This is the first update in over two weeks. It was good to see that the NOC confirm production was ~1.2 mmb/d. We were waiting for the update, wondering if there was any lingering impact or other protest shutdowns. On Wednesday, Bloomberg reported that it had seen the Libya March loading schedule and it was down 114,000 b/d MoM. Normally, loadings would only be down 114,000 b/d if there were weather issues or if there production issues. But, the NOC update at 1.220 mmb/d suggests no current production interruptions. And the recent protests only shut down the ~40,000 b/d Wafa oilfield for one day. So it isn't clear why loadings are expected down 114,000 b/d MoM.

Oil: China state media set stage for doubt on what was to come from 2 sessions

China state media economy warnings

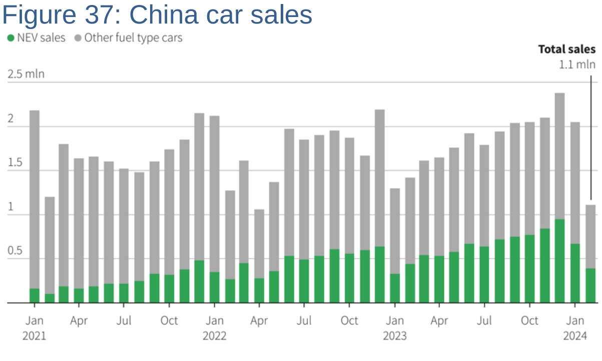
We were surprised to see last Sunday night (North America time) Global Times (Chinese state media) report *"China's two sessions to flesh out economic roadmap"* [LINK] as it seemed to set the stage for doubt for what was to come out of the two sessions economic plans/targets. Last Sunday night, we tweeted [LINK] "*State media warns China "still faces a bunch of downward pressures ranging from insufficient demand, weakening social expectation and property downturn that could weigh on economic development prospect this year" Market will need to see something from Two Sessions! #OOTT."* Global Times put the spotlight clearly on what comes out of the two sessions. The full quote from Global Times was "*One of the most widely watched economic goals for the upcoming two sessions is the GDP target, as China, while sustaining a good economic recovery momentum, still faces a bunch of downward pressures ranging from insufficient demand, weakening social expectation and property downturn that could weigh on economic development prospect this year. Deputies and economists said the GDP narrative will set a beacon for this year's economic work and accompanying measures. It also sheds light on how the Chinese government makes a comprehensive calculus on balancing off a number of goals including stabilizing employment, preventing risk, improving people's livelihoods, lifting social expectation, while coordinating with targets outlined in the 14th Five-year Plan (2021-25)."* Our Supplemental Documents package includes the Global Times report.

Oil: Brutal China car sales, incl EVs, in Feb must be more than just Lunar New Year

China Feb car sales -21% YoY

Early Friday morning, we tweeted]LINK] "*China car sales, EV & ICE, down huge YoY. Yes, Feb was Lunar New Year holiday BUT Chinese consumers are staying on the sidelines. See 👇01/28 tweet, Chinese are adding to savings and not plowing into consumption. Thx @Reuters @Zoeyzhangyan @sarah_wu_ Qiaoyi Li. #OOTT."* No question Lunar New Year holiday in Feb would have been a big hit to February car sales. However, the drop has een huge in the last two months and so we have to believe there is more than Lunar New Year that has hammered China new car sales, including for EVs. Total China car sales were 1.095 million in Feb, which was down 21% YoY and down 46% MoM. We didn't put this item in Energy Transition as we normally do with EV reports because we have to believe the big dro in Jan & Feb of both ICE and EVs has to be more than Lunar New Year holidays. Rather, we believe it is also a sign of he big picture – Chinese are not consuming!. Below is the Reuters [LINK] graph of China Passenger Car Association monthly car sales.

Figure 37: China car sales



Source: Reuters, China Passenger Car Association

Bad start to China declaring 2024 as the "*year of promoting consumption*"
How China car sales tweet forwarded commentary that we wrote in our Jan 28, 2024 Energy Tidbits, when we wrote "*The Chinese consumer continues to sit on the sidelines. This is the lunar "Year of the Dragon" but, two weeks ago, China's commerce ministry tried to rally Chinese to spend more in 2024. Our Energy Tidbits memos regularly highlight how Chinese households continue to increase savings as opposed to starting to accelerate spending. On Monday, we tweeted [LINK] "Will Chinese get back to spending instead of just saving? 01/26/24, China commerce ministry "declared 2024 the "year of promoting consumption" as it stressed the need to revitalize demand .. report @JDMayger @yujingliu_ @EngleTV. If so, should add support to #Oil in 2024. #OOTT." Bloomberg wrote "China's Ministry of Commerce declared 2024 the "year of promoting consumption" as it stressed the need to revitalize demand and attract more investment in the world's second-largest economy.' Our tweet included the below Bloomberg chart from Jan 29 night on China increasing household savings."*

Figure 38: China Households add $1.7 trillion 2023

Source: Bloomberg

China 2 sessions highlighted need to improve consumption
Another of the first headlines being reported by Xinhua (China state media) on the start of the 2 sessions was on need to improve consumption. That should not have surprised anyone considering, as noted above, China's commerce department had declared 2024 as the "*year of promoting consumption*". On Monday night, we tweeted [LINK] "*When will Chinese start to start spending their 👇 big savings? Today "to improve the consumption environment, China will launch a year-long program to stimulate consumption" Xinhua 01/26: Commerce ministry declared 2024 "year of promoting consumption". #OOTT.*" Xinhua's report "*China to expand domestic demand*" [LINK] wrote "*China will promote steady growth in consumption spending, and launch policies to promote digital, environmentally-friendly, and health-related consumption. The country will also boost spending on intelligent connected new-energy vehicles, electronic products, and other big-ticket items, it said. To improve the consumption environment, China will launch a year-long program to stimulate consumption, it said.*"

Oil: Chinese moving from country to city down ~10 million per year

10 million per years less Chinese moving to cities

Last Sunday night, we were watching Bloomberg The China Show and we heard a great demographic that we hadn't heard before and one that explains a lot of the reason for real estate and other consumer spending – there has been a massive decline in people from Chinese countryside to cities. It is a huge factor for real estate but also speaks to other consumer items. Last Sunday night, we tweeted [LINK] "*No wonder empty China apartments everywhere. See 👇structural reduction in 3 buyer types of apartments in China. Marriage rate 1/2 of 10 yrs ago. Birth rate 9 mm vs 16 mm in 2000-2020. Last 2 yrs, only 12/yr mm moved from rural to cities, used to be 22 mm/yr. Big job creation needed to get people back to cities. Thx @BNPParibas George Sun @DavidInglesTV @YvonneManTV #OOTT.*" BNP's George Sun was talking about the structural changes that have led to the massive amount of vacant apartments. We hadn't heard the number that the number of Chinese moving from countryside to cities was about 12 million/yr the last two years, which is down 10 million/yr from 22 million/yr. Sun was talking about the structural reduction in three key home buyer groups – people getting married, married couples having children and, most of all, people moving from countryside to cities. Sun noted how the key will be jobs so companies can attract people to the cities. Our tweet included a video clip of the George Sun comments.

Also why China's 2 sessions highlighted adding 12 million urban jobs

On Thursday, one of the first Global Times (China state media) headlines Xinhua News [LINK] on the NPC & CPPCC Annual Sessions was "China aims to create over 12 mln urban jobs in 2024". We tweeted [LINK] "*No surprise. "China aims to create over 12 mln urban jobs in 2024" Xinhua. Fits last night 👇tweet & video , rural to urban down to 12 mm/yr vs norm of 22 mm/yr. so need urban jobs to get them back into cities. #OOTT.*" It fit right into the comments by BNP Paribas George Sun noted above. On Thursday, we tweeted [LINK] "*ICYMI. #1 reason why China is focusing on trying to add high paying urban jobs. See 👇video. Chinese moving from countryside to cities down ~10 million per year!! It has a huge impact beyond why there are empty apartments. #OOTT.*"

Oil: Chinese wealthy feel 20-30% hit to net worth, most Chinese trading down

Chinese wealthy feel 20-30% hit to net worth

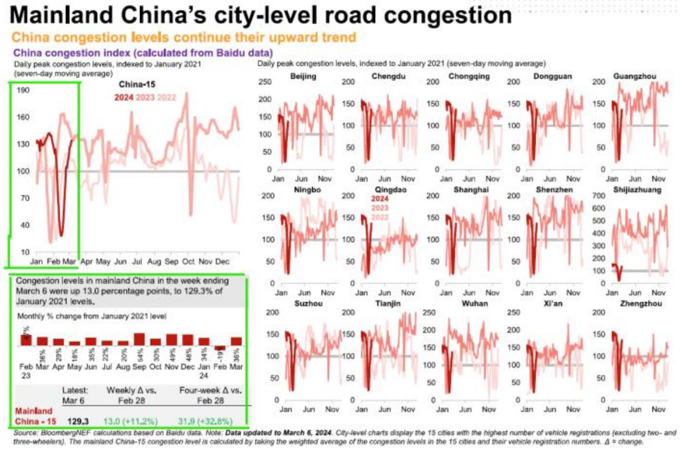
We always like hearing on-the-ground in China feedback and we have previously referenced such comments from Shaun Rein (China Market Research Group).and noted a few of his comments from his CNBC Street Signs interview on March 6 (i) Normal Chinese consumers are trading down on personal consumption. This is as seen in other parts of the world including the US. This should not surprise as the Chinese haven't yet jumped in to start spending their big-accumulated savings. Rein highlighted the trading down with a simple example. On Wed, we tweeted [LINK] "*Chinese trading down on personal consumption. Chinese are traveling BUT are "spending down about 20% per capita during Chinese New Year when we interview hotels ....restaurants within China ..." "instead of buying say 3 meat dishes and 1 vegetable dish, they started buying 2 meat dishes and 2 vegetable dishes" Thx @shaunrein for on the ground channel checks. #OOTT @tanvirgill2 @WillKoulouris.*" Note our tweet included a video clip of Rein's longer comments on this. (ii) Wealthy are feeling hit hard. This is different than in the US. Our Energy Tidbits memos have been highlighting the two big negatives to the wealthy & higher income – the material loss in value from real estate and Chinese stocks. On Wed, we tweeted [LINK] "*Reminder Chinese wealthy/high income* *optimism has dropped with real estate/Chinese stocks drops. Middle class is feeling optimistic with modest ~5% wage growth, but not wealthy consumer who drive high end consumption. Thx @shaunrein #OOTT @tanvirgill2 @WillKoulouris."* Rein said "*if you are somebody that owns 3, 4, 5 homes. Who has a lot of money invested in A shares. Your net worth, you feel like you've dropped 20 to 30% in net worth in the last year."* Our tweet included a video of his longer comments.

Oil: Baidu China city-level road congestion essentially recovered after Lunar New Year

China city-level traffic congestion

On Friday, BloombergNEF posted its Global Road Traffic Indicators Weekly March 8 report, which includes the Baidu city-level road congestion for the week ended March 6. As expected, China city-level road congestion is pretty much back to normal after Lunar New Year on Feb 10. Baidu city-level road congestion was +13.0% WoW to 129.3% of Jan 2021 levels. Below is the BLoomergNEF key graph.

Figure 39: China city-level road congestion for the week ended Mar 6



Source: BloombergNEF

Oil: CNPC, China in long-run low-growth rate for oil demand because EVs hit gasoline

CNPC sees low growth rate for China oil demand

On Thursday night, we tweeted [LINK] "*CNPC sees low oil demand growth rate for China; "in the long run, of course, we are, we have entered the era of low growth rate of the crude oil and especially the gasoline because of the transportation volumes should be replaced by the electrical vehicles & other areas" CNPC Lu Ruquan to @EngleTV #OOTT."* Bloomberg interviewed Lu Ruquan (President of China National Petroleum Corp's Economics & Technology Research Institute) so we assume these are the views of CNPC. There were two key points: EVs are impacting gasoline demand already and increasingly so in the future. Ie. Lu sees China gasoline demand only +1% this year because of EVs. And then linked to the lesser gasoline demand due to EVs, Lu sees China in a low-growth rate for oil demand in the long run. Lu did not say what % is low-growth rate although Bloomberg's Stephen Engle did try to get him to say low single-digit growth. Lu also did not say what period he was referring to when he said in the "long-run". Our tweet included the transcript we made of the exchange. SAF Group created transcript of comments by Lu Ruquan (President of China National Petroleum Corp's Economics & Technology Research Institute) with Bloomberg's Stephen Engle on March 7, 2024 (North America time) [LINK]. Items in "*italics*" are SAF

Group created transcript. At 0:22 min mark, Lu "… *However, oil and gas sector, from perspective of oil consumption. You know last year, our country's oil consumption increased by 11%. That is very high. So that is of course, the recovery from Covid 19. And this year, because of energy transition, the bombing[?] up of electric vehicles, especially for the gasoline transportation. According to our research and study, our prediction is about 1% increase of the gasoline increase because of the EV and because of the economy*." Engle "*so transition yes, but that number, 1% growth, basically when I look at your research that would be the lowest increase from your research in at least a decade. Is that a concern or is that just a reflection of that energy transition. Does it represent that the economy does not have end demand or is it more because there is a energy transition, at least in the new energy vehicles?*" Lu "*I think because of more of the energy transition from traditions of fossil fuel to EV. That will reduce at least 20 million tons of crude oil at least every year, year by year. So that is a huge number*." Engle "*so through this energy transition is this going to be the long term trend of very low single digit oil demand growth?*" Lu "*Iin the long run, of course, we are, we have entered the era of low growth rate of the crude oil and especially the gasoline because of the transportation volumes should be replaced by the electrical vehicles and other areas*."

Gasoline is ~20% of China's oil consumption

As noted above, CNPC's Lu did not specify what % he meant by saying China will have a low-growth rate in oil demand in the long-run, nor did he specify what period he was referring to when he said in the "long-run". And above we highlighted that Lu was specific in saying he saw gasoline consumption down to 1%. Gasoline is one of the petroleum products consumed that make up oil demand. Lu says gasoline growth is only 1% this year due to EVs and the economy. Then he says entering not low growth rate era for oil overall, including gasoline. For perspective, gasoline is approx 20% of China's total consumption of petroleum products. Below is the table from OPEC's current Monthly Oil Market Report, February 2024.

Figure 40: China's oil demand by product

Table 4 - 4: China's oil demand*, mb/d

China's oil demand By product	Dec 22	Dec 23	Change Dec 23/Dec 22 Growth	%
LPG	2.67	2.95	0.28	10.5
Naphtha	2.00	2.07	0.08	3.8
Gasoline	3.27	3.55	0.28	8.5
Jet/kerosene	0.98	1.28	0.30	30.1
Diesel	3.65	3.85	0.21	5.6
Fuel oil	0.50	0.63	0.13	26.7
Other products	2.55	2.57	0.02	0.9
Total	15.61	16.90	1.29	8.3

Note: * Apparent oil demand. Totals may not add up due to independent rounding.
Sources: Argus Global Markets, China OGP (Xinhua News Agency), Facts Global Energy, JODI, National Bureau of Statistics China and OPEC.

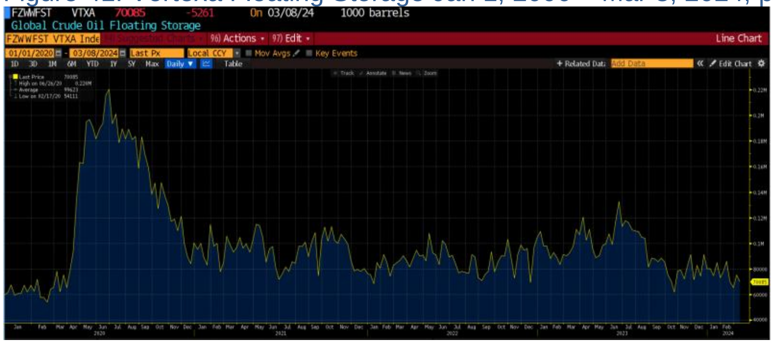
Source: OPEC

Oil: Vortexa crude oil floating storage est 70.09 at Mar 8, -5.26 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 2 at 9am MT. (i) Yesterday, we tweeted [LINK] "*#Oil floating* *storage 70.09 mmb Mar 8. Last 7 wks ave 74 mmb. Seems floating normalizing at lower (<80 mmb) level as refiners/tankers had ~6 wks to work in longer tanker trips. Longer tanker 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 8 at 70.09 mmb, which is -5.26 mmb WoW vs revised up Mar 1 of 75.35 mmb. Note Mar 1 was revised +7.92 mmb vs 67.43 mmb originally posted at 9am on Mar 2. (iii) It seems like oil floating storage/longer tanker travel has mostly sorted out to a new normal. The last two weeks were mostly downward revisions after three weeks of upward revisions. It feels like refineries and shippers have now had well almost two months 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. Other than the +7.92 mmb revision to Mar 1, all other revisions for the past several weeks were downward revisions including a couple large downward revisions. There were three weeks of upward revisions before the last two weeks of primarily downward revisions. We have to believe this is likely due to likely due to the normalization of the forced longer than originally expected tanker travel voyages. Prior to the normalization, floating storage was needed to fill the gap for the longer tanker voyages. Now, it looks like we are seeing the longer tanker travel times increasingly worked into refinery delivery planning and schedules. Here are the revisions compared to the estimates originally posted on Bloomberg at 9am MT on Mar 2. Mar 1 revised +7.92 mmb. Feb 23 revised -6.41 mmb. Feb 16 revised -0.60 mmb. Feb 9 revised -4.98 mmb. Feb 2 revised -11.78 mmb. Jan 26 revised -3.33 mmb. Jan 19 revised -1.98 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 74.07 mmb vs last week’s then seven-week average of 79.21 mmb. The big decrease is due to dropping a higher week but mostly due to the downward 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 8 estimate of 70.09 mmb is -62.50 mmb vs the recent June 23, 2023 high of 132.59 mmb. Recall Saudi Arabia stepped in on July 1, 2023 for additional cuts. (ix) Mar 8 estimate of 70.09 mmb is -23.09 mmb YoY vs Mar 10, 2023 of 93.18 mmb. (x) Mar 8 estimate of 70.09 mmb is s -150.22 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (xi) Mar 8 estimate of 70.09 mmb is +4.48 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (xii) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Mar 9, 9am MT Mar 2, and 9am MT Feb 24.

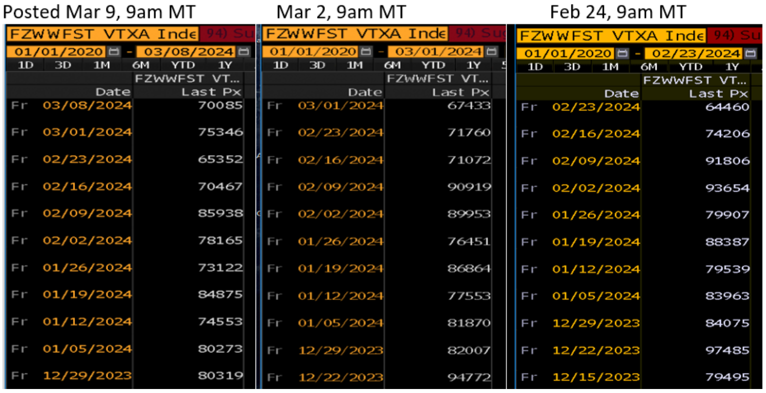
Figure 41: Vortexa Floating Storage Jan 1, 2000 – Mar 8, 2024, posted Mar 9 at 9am MT



Source: Bloomberg, Vortexa

Figure 42: Vortexa Estimates Posted 9am MT on Mar 9, Mar 2, and Feb 24

Posted Mar 9, 9am MT　　Mar 2, 9am MT　　Feb 24, 9am MT



Posted Mar 9, 9am MT (FZWWFST VTXA Index, 01/01/2020 - 03/08/2024)

Date	Last Px
Fr 03/08/2024	70085
Fr 03/01/2024	75346
Fr 02/23/2024	65352
Fr 02/16/2024	70467
Fr 02/09/2024	85938
Fr 02/02/2024	78165
Fr 01/26/2024	73122
Fr 01/19/2024	84875
Fr 01/12/2024	74553
Fr 01/05/2024	80273
Fr 12/29/2023	80319

Mar 2, 9am MT (FZWWFST VTXA Index, 01/01/2020 - 03/01/2024)

Date	Last Px
Fr 03/01/2024	67433
Fr 02/23/2024	71760
Fr 02/16/2024	71072
Fr 02/09/2024	90919
Fr 02/02/2024	89953
Fr 01/26/2024	76451
Fr 01/19/2024	86864
Fr 01/12/2024	77553
Fr 01/05/2024	81870
Fr 12/29/2023	82007
Fr 12/22/2023	94772

Feb 24, 9am MT (FZWWFST VTXA Index, 01/01/2020 - 02/23/2024)

Date	Last Px
Fr 02/23/2024	64460
Fr 02/16/2024	74206
Fr 02/09/2024	91806
Fr 02/02/2024	93654
Fr 01/26/2024	79907
Fr 01/19/2024	88387
Fr 01/12/2024	79539
Fr 01/05/2024	83963
Fr 12/29/2023	84075
Fr 12/22/2023	97485
Fr 12/15/2023	79495

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, Mar 1, in total, was revised +7.92 mmb. Asia was revised +4.95 mmb and Middle East was revised +1.76 mmb vs the estimates posted as of 9am Mar 2 for Mar 1. (ii) As noted above, Mar 8 of 70.09 mmb was -5.26 mmb WoW vs revised up Mar 1 of 75.35 mmb. The major WoW changes by region were Asia -5.09 mmb WoW. (iii) Mar 8 at 70.09 mmb is -62.50 mmb vs the summer June 23, 2023 peak of 132.59 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 -41.17 mmb and Other -21.10 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 1 that was posted on Bloomberg at 9am MT on Mar 2.

Figure 43: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Mar 8/24	Mar 1/24	WoW	Mar 1/24	Jun 23/23	Mar 8 vs Jun 23
Asia	32.39	37.48	-5.09	32.53	73.56	-41.17
Europe	4.82	6.66	-1.84	6.83	6.22	-1.40
Middle East	9.19	9.45	-0.26	7.69	6.76	2.43
West Africa	5.39	5.10	0.29	5.10	7.62	-2.23
US Gulf Coast	1.97	0.13	1.84	0.13	1.00	0.97
Other	16.33	16.53	-0.20	15.15	37.43	-21.10
Global Total	70.09	75.35	-5.26	67.43	132.59	-62.50
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Mar 8						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil: IATA air passenger data for January was up +16.6% YoY, or 99.6% of January 2019

Air travel up in January

On Tuesday, the International Air Transport Association (IATA) released air passenger data for January 2024 [LINK] and the January data showed the continued recovery from Covid-19 in air passenger trends. Domestic air travel was up 10.4% YoY against January 2023, when most COVID restrictions were lifted, and is up +6.7% from January 2019 levels. International air travel keeps recovering, and is up +45.4% YoY but -4.3% against January 2019. Overall, globally air travel was -0.4% from January 2019, i.e. 99.6% of pre-covid levels. (i) Total traffic in January, measured in revenue passenger kilometers (RPK), rose +16.6% YoY. Please note the IATA splits out total market air travel into international travel vs domestic travel. (ii) For January 2024, total global RPKs were +16.6% vs January 2023 levels, but that was split between International RPKs +20.8% vs January 2023 and Domestic RPKs +10.4% vs January 2023. (iii) Willie Walsh, IATA's Director General, commented "*2024 is off to a strong start despite economic and geopolitical uncertainties. As governments look to build prosperity in their economies in the busiest election-year ever, it is critical that they see aviation as a catalyst for growth. Increased taxes and onerous regulation are a counterweight to prosperity. We will be looking to governments for policies that help aviation to reduce costs, improve efficiency and make progress towards net zero CO2 emissions by 2050".* Our Supplemental Documents package includes the IATA release.

Figure 44: January 2024 Air Passenger Market

JANUARY 2024 (% YEAR-ON-YEAR)	WORLD SHARE[1]	RPK	ASK	PLF(%-PT)[2]	PLF(LEVEL)[3]
Total Market	**100%**	**16.6%**	**14.1%**	**1.7%**	**79.9%**
Africa	2.1%	18.1%	19.9%	-1.1%	73.1%
Asia Pacific	31.7%	31.8%	26.6%	3.2%	80.8%
Europe	27.1%	10.0%	9.6%	0.3%	78.2%
Latin America	5.5%	9.9%	5.5%	3.4%	85.0%
Middle East	9.4%	16.2%	15.3%	0.6%	79.9%
North America	24.2%	6.0%	4.1%	1.5%	79.9%

Source: IATA

Oil: IATA, global air cargo Jan up +18.4% YoY

Air cargo up YoY in Jan

We look at international air cargo as the data that affirms the level of export orders and trade. On Tuesday, the International Air Transport Association (IATA) announced cargo data for the month of January [LINK]. The January data shows that cargo-tonne kilometres (CTKs) were up 18.4% YoY. The IATA's Director General, Willie Walsh, noted that "*Air cargo demand was up 18.4% year-on-year in January. This is a strong start to the year. In particular, the* *booming e-commerce sector is continuing to help air cargo demand to trend above growth in both trade and production since the last quarter of 2023. The counterweight to this good news is uncertainty over how China's economic slowdown will unfold. This will be on the minds of air cargo executives meeting in Hong Kong next week for the IATA World Cargo Symposium with an agenda focused on digitalization, efficiency and sustainability".* Overall, mostly positive news, CTKs up big everywhere YoY (except Africa which is only up +2%) while cargo load factors (CLFs) are up or flat YoY. A drop in CLF just means the planes are going less full, but if flights are increasing in frequency it makes sense that CLFs would also fall in those markets, all else being equal. Our Supplemental Documents package includes the IATA release.

Figure 45: January 2024 Air Cargo Market

JANUARY 2024 (%YEAR-ON-YEAR)	WORLD SHARE *1	CTK	ACTK	CLF (%-PT) *2	CLF (LEVEL) *3
Total Market	**100%**	**18.4%**	**14.6%**	**1.4%**	**45.7%**
Africa	2.0%	17.0%	19.4%	-0.9%	43.1%
Asia Pacific	33.3%	24.6%	25.0%	-0.2%	44.6%
Europe	21.4%	16.4%	12.5%	1.9%	55.5%
Latin America	2.8%	13.4%	6.6%	2.1%	34.4%
Middle East	13.5%	25.9%	17.1%	3.1%	43.9%
North America	26.9%	9.3%	3.8%	2.2%	43.5%

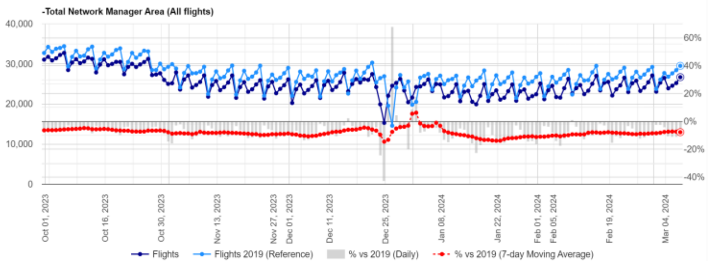
Source: IATA

Oil: Europe airports daily traffic 7-day average is -7.4% 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 7 is down small WoW at -7.4% (was -8.5%) below pre-Covid 2019 levels. Eurocontrol updates this data daily and it is found at [LINK]

Figure 46: Europe Air Traffic: Daily Traffic Variation to end of Mar 7



Source: Eurocontrol

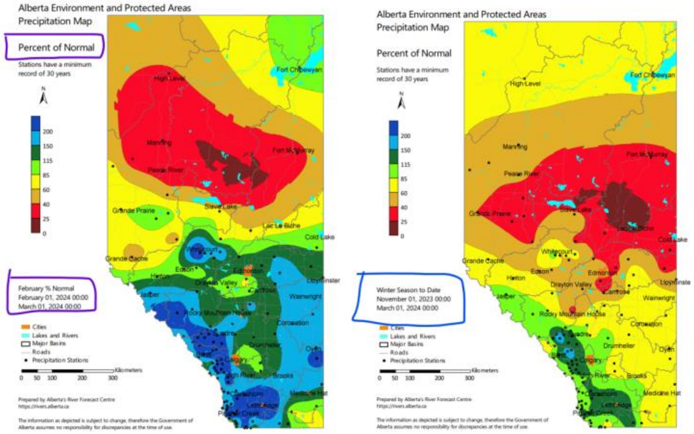
Oil & Natural Gas: Low snowfall should lead to increasing road bans in Alberta

Road bans in Alberta

It's been good sustained cold over the past two weeks in Alberta and it has allowed for winter drilling to continue for longer. But, as noted earlier, we are expected Cdn rig counts to decline this week. The key reason is that there was very little snowfall in NW Alberta this winter so there isn't a deep insulating blanket of snow to keep the ground frozen for longer.

It's not hot this week, but the really cold is ending. The problem this winter is that it was warmer than normal and way less snow than normal. And that means the snow melts quickly and the ground loses its freeze abruptly as it turns less cold. Alberta posted the % of normal accumulated snowfall for Feb and the updated Nov 1 thru Feb 29 winter maps. There was solid snowfall across southern Alberta in Feb but very snowfall across northern Alberta. However, the accumulated snowfall from Nov 1 thru Feb 29 is very low for all of Alberta except a strip along the Foothills. This is why we should see road bans coming fast in March. Below are the Alberta % of normal precipitation maps for the month of Feb and Nov 1 thru Feb 29.

Figure 47: Alberta % of Normal Precipitation For Feb 2024 and Nov 1/23 thru Feb 29/24



Source: Alberta River Forecast Centre

Oil & Natural Gas: Low water levels can also impact water usage by oil and gas

We remind that any water shortages will also impact oil and gas operations. We have seen this in NE BC when low water levels led to some restrictions on water usage by the oil and gas sector. It is still early but we won't be surprised if there are some water restrictions this summer if we keep seeing the low precipitation for the rest of the winter.

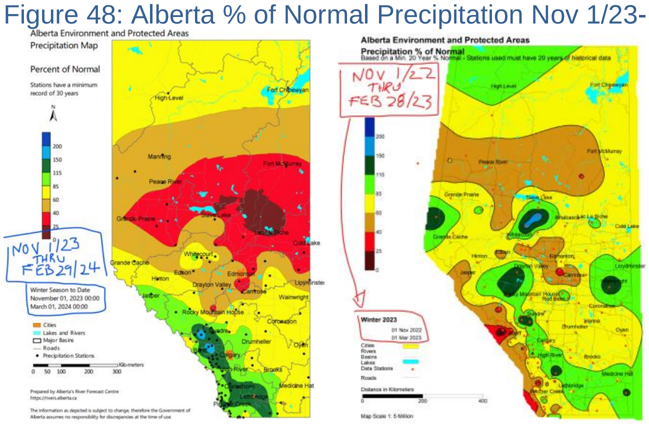
Low water levels can impact oil and gas

Oil & Natural Gas: Way less snowfall this winter than last winter in Alberta

Our big concern is that there has been significantly less snowfall this winter vs last winter. On Thursday, we tweeted [LINK] "*ICYMI. Good levels snow/precipitation in southern Alberta in Feb. But Nov 1-Feb 29 is stil well below normal for almost all of Alberta except for along the Foothills. So terrible set up for 2024 wildfire season and agriculture. Need more snow/rain in March! #OOTT.*" Then on Friday, we tweeted [LINK] "*Here's why there is increased risk to wildfire season & crops this summer vs last summer. % of normal precipitation is significantly lower this winter vs last winter. Huge amount of red (<40% of normal) and brown (60% of normal) this winter. #OOTT.*" Our big concern for the very low snowfall across Alberta this winter is that it is even worse than last year and that means an increased risk for wildfire season and also for this year's crops. Below is the comparison of snowfall % of normal this winter vs last winter.

Way less snowfall this winter

Figure 48: Alberta % of Normal Precipitation Nov 1/23-Feb 29/24 vs Nov 1/22-Feb 28/23



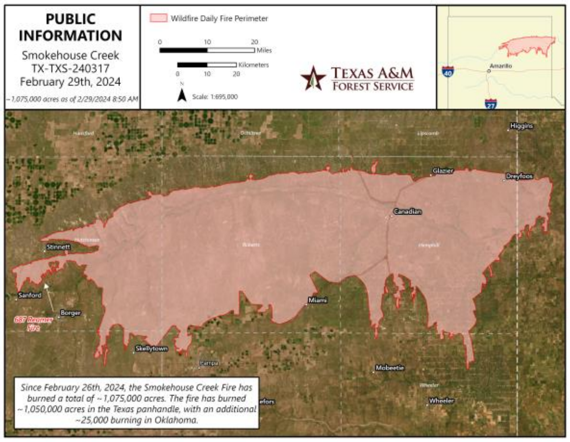
Source: Alberta River Forecast Centre

Xcel Energy fallen pole may have caused wildfire

Electricity: Did a fallen Xcel Energy power pole cause the big Texas wildfire?

A big wildfire in the Texas Panhandle erupted last week and the reporting of a lawsuit appear to link the cause from a fallen utility pole from part of Xcel Energy's infrastructure. Xcel's press release acknowledges its facilities "*appear to have been involved in an ignition of the Smokehouse Creek fire*". On Thursday, Xcel Energy released a statement [LINK] and said "*Xcel Energy has been cooperating with the investigations into the wildfires and has been conducting its own review. Based on currently available information, Xcel Energy acknowledges that its facilities appear to have been involved in an ignition of the Smokehouse Creek fire. Xcel Energy disputes claims that it acted negligently in maintaining and operating its infrastructure; however, we encourage people who had property destroyed by or livestock lost in the Smokehouse Creek fire to submit a claim to Xcel Energy through our claims process. We will review and respond to any such claims in an expeditious manner, with a priority on claims from any person that lost their home in the Smokehouse Creek fire. A claim form and instructions for submission can be found by visiting www.xcelenergy.com and scrolling to the bottom righthand side of that page, to the "Claims Process" link under Customer Support Claims Services | Customer Support | Xcel Energy. Xcel Energy notes that the Windy Deuce fire reportedly impacted many structures in and around Fritch, Texas. Xcel does not believe that its facilities caused the ignition of the Windy Deuce fire, and we are not aware of any allegation that Xcel Energy's facilities caused this fire.*" As of Feb 28, the Smokehouse Creek fire was 900,000 acres and only 3% contained, and as of March 5 it had destroyed over 60 homes. It is called the largest in Texas history. Our Supplemental Documents Package includes the Xcel energy press release. Below is a map of the Smokehouse creek fire.

Figure 49: Smokehouse Creek Fire Map



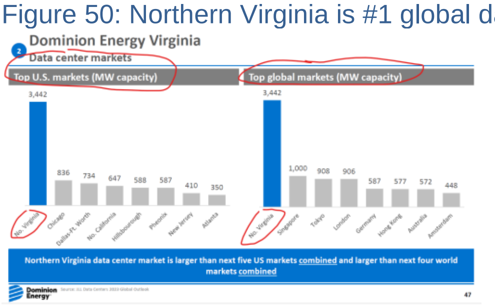
Source: Bovine Veterinarian

Energy Transition: Data centers/AI need 24/7, reliable, affordable power

Data centers need 24/7 power

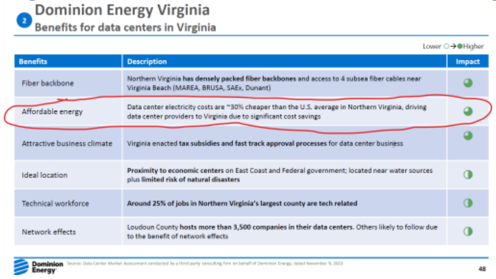
We were watching CNBC Squawk on the Street on Monday morning and the hosts opening banter highlighted how data centers were the hot discussion point among their contacts and how the huge ramp up in their electricity requirements wouild be driven by solar power. They highlighted how the data center owners were only going to go solar due to their environmental views. We were surprised that there was zero discussion on the fundamental need for 24/7 reliable, affordable power. We just don't see the solar power call. Yes solar will be used as much as possible but there is no solar power at night. So we tweeted [LINK] "*Data Centers 101; Need 24/7 available, affordable power, not intermittent solar/wind. $D: Northern Virginia is #1 for data centers in US & the world. Why? Affordable energy from #NatGas, #Nuclear & #Coal. Vs Clean energy is 14% of capacity but 5% of actual energy. #OOTT."* We have been highlighting the recent Dominion Energy investor day and how northern Virgina is the global leader in data centers. And how Dominion's Virgina power generation is basically driven by natural gas, nuclear and coal. Whereas renewable energy was 14% of capacity but only provided 5% of actual power. The Dominion Energy data on power for data centers is the Data Center 101 – they need 24/7 reliable affordable power. Below are the Dominion Energy slides/data from our tweet.

Figure 50: Northern Virginia is #1 global data center market



Source: Dominion Energy

Figure 51: Benefits for data centers in Virginia



Dominion Energy Virginia
Benefits for data centers in Virginia

Lower → Higher

Benefits	Description	Impact
Fiber backbone	Northern Virginia has **densely packed fiber backbones** and access to 4 subsea fiber cables near Virginia Beach (MAREA, BRUSA, SAEx, Dunant)	
Affordable energy	Data center electricity costs are ~30% cheaper than the U.S. average in Northern Virginia, driving data center providers to Virginia due to significant cost savings	
Attractive business climate	Virginia enacted **tax subsidies and fast track approval processes** for data center business	
Ideal location	**Proximity to economic centers** on East Coast and Federal government; located near water sources plus **limited risk of natural disasters**	
Technical workforce	**Around 25% of jobs in Northern Virginia's largest county are tech related**	
Network effects	Loudoun County **hosts more than 3,500 companies in their data centers.** Others likely to follow due to the benefit of network effects	

Dominion Energy

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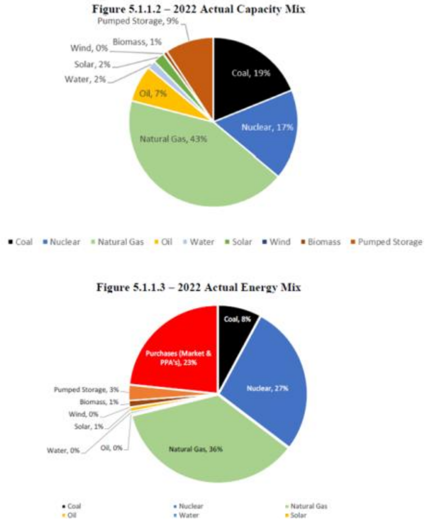
Source: Dominion Energy

Figure 52: Dominion's Virginia 2022 actual energy capacity mix and actual energy mix



Source: Dominion Energy

Energy Transition: EV "*market that's going from optimistic to realistic*" ex Ford CEO

EV market "*going from optimistic to realistic*"

We have used the term "reality check" so many times when tweeting or writing about how the Energy Transition is happening but it's going to take way longer, cost way more and be a bumpy/rocky road. But, on Friday morning, we saw a better term used by former Ford CEO Fields to describe the EV market as "*going from optimistic to realistic*", a term that can be used to offshore wind, hydrogen, sustainable aviation fuel, etc. On Friday morning, we tweeted [LINK] ""*this is a [EV] market that's going from optimistic to realistic. You're seeing waning demand ... It's growing but the bottom line is that it's not accelerating at pace all the automakers expected" Ex Ford CEO Fields to @BeckyQuick. #Oil will be needed for longer. #OOTT."* Fields noted how the consumer is holding back with issues of cost, range anxiety and insurance. And then highlighted loss of residual value. Here is the transcript we made of Fields comments. SAF Group created transcript of comments by Ford's Ex-CEO Mark Fields with CNBC's Becky Quick on Squawk Box on March 8, 2024. [LINK] Items in "*italics*" are SAF Group created transcript. Quick "I *mean there's still a lot of EV cars that are selling, but* *there's a lot of supply to meet that demand at the same time. Maybe Mark, kind of rethinking the supply/demand picture?"* Fields ""Y*eah I mean I would characterize - this is a market that's going from optimistic to realistic. And you're seeing kind of waning demand. Listen the growth is still there – right – we know that EV sales here in the US passed over a million last year, it was up almost, slightly less than 50%, so it's growing Becky, but it's not growing at the rate at which everybody was expecting.*" Quick "*so what's the national total sales, is it, I don't know, 12, 13, 14 million? Of Automobiles?"* Fields "*Yeah the national sales last year was a little over 15 million vehicles, and so you had EVs that represented I think it was about 1.1 million, so it was a little over 7% share, so it was up from the prior year which was about 5.5% share, so its growing but the bottom line is it's not accelerating at the pace all the automakers expected, and that's why you're seeing right now all the automakers make changes, delaying programs, shifting out the construction of plants, and things of that nature, because you know at the end of the day the consumer, you know, has the issues around the cost, they have issues around the charging anxiety, you got insurance. And the big issue for consumers which nobody really talks about, is with the reduction in prices you've seen here in the US and around the world - but let's stay here in the US – you know, a Model Y is about 20% less of cost or price this year than it was last year. And that has huge impacts on residual values. So if you're a consumer that owns an EV right now, your vehicle is probably worth a lot less. And I think that weighs on consumers as they think about EVs going forward."*

Capital Markets: Biden 25% min tax on income incl unrealized cap gains for wealthy

Biden minimum 25% income tax for wealthy

Early Thursday morning the White House posted its "*Fact Sheet: President Biden Is Fighting to Reduce the Deficit, Cut Taxes for Working Families, and Invest in America by Making Big Corporations and the Wealthy Pay Their Fair Share.*" [LINK]. This was setting the stage for th State of the Union on Thursday night. (i) Early Thursday morning, we tweeted [LINK] "*Biden kicks off election campaign with a bang! Plans multiple tax items on corps & wealthy. Plan to raise $trillions "by enacting a new billionaire minimum tax and ..." Note his billionaire minimum tax is minimum 25% income tax on those who have >$100 mm wealth. #OOTT."* (ii) "*Requiring billionaires to pay at least 25 percent of income in taxes*". It sounds simple but there was a twist in the Fact Sheet – this applied to those with wealth >$100 mmm. The Fact Sheet said "*Requiring billionaires to pay at least 25 percent of income in taxes. Billionaires make their money in ways that are often taxed at lower rates than ordinary wage income, or sometimes not taxed at all, thanks to giant loopholes and tax preferences that disproportionately benefit the wealthiest taxpayers. As a result, many of these wealthy Americans are able to pay an average income tax rate of just 8 percent on their full incomes—a lower rate than many firefighters or teachers. To finally address this glaring inequity, the President is proposing to levy a 25 percent minimum tax on the wealthiest 0.01 percent, those with wealth of more than $100 million."* Note this is not what people call a wealth tax or a tax on someone's wealth, rather the wealth test of >$100 mm is used to determine who will be hit by the minimum 25% tax on income including unrealized capital gains. (ii) A big detail missing from the Fact Sheet – the income for the minimum tax includes unrealized capital gains. On Thursday morning, we were watching CNBC Squawk Box interview NEC Director Brainard on the Biden plan. And she surprised with a big missing detail. We tweeted [LINK] "*NOT in 👇 press release. "have billionaires pay 25% of their income including unrealized capital gains ..... would be like prepaying those taxes ... it's very well crafted..." NEC Lael Brainard to @JoeSquawk. Note: release says >$100mm wealth, not* *just billionaires. #OOTT."* Our tweet included the video clip of Brainard saying the 25% would be on income including unrealized capital gains and the White House looked at being like prepaying taxes. Our Supplemental Documents package includes the Fact Sheet.

Biden's tax on wealthy is not Sen. Warren's two cent tax on wealth
As noted above, Biden's tax is not what most think call a wealth tax or a tax on someone's wealth, which is what Sen Warren has been pushing. Here is what we wrote in our Dec 10, 2023 Energy Tidbits memo about Sen Warren's wealth tax idea. "*We shouldn't be surprised that, with the US elections 11 months away, politicians are trying to get their preferred policy positions as par to the platform. In this case, it's Elizabeth Warren, known as a progressive, setting the stage for one of her favorite items to enact – a wealth tax. On Thursday, we tweeted [LINK] "Fan or not, got to appreciate how @ewarren messages. a 2 cent wealth tax, doesn't sound like big deal, but 2% on assets >$50mm is a huge pot of $$, listen 👇 to all the items it can fund. is wealth tax likely in Biden 2024 election? Trudeau 2025 election? @andrewrsorkin #OOTT." Elizabeth Warren was on CNBC Squawk Box on Thursday and mentioned her wealth tax idea from a few years ago. Our comment is much like we wrote on this in our Jan 31, 2021 wealth tax comments. Whether you are an Elizabeth Warren fan or not, you have to at least admire how she can frame her position to make the other side look unreasonable. Framing her wealth tax as a 2 cent tax makes it sound like a nothing. However, she is talking about a 2% tax per year on assets/wealth over $50 million. So it the wealth is $50mm, it's a tax of $1mm for that year, or $2mm for assets at $100mm and so forth. So it sounds like no big deal, but then when you listen to what she says it could fund, you realize it's a huge pot of money per year. Our tweet include the video clip of her comments ""If we just said if you've got more than $50 million in assets and we put in place a two cent tax on wealth. And by the way, people pay taxes, pay property taxes all the time on unrealized gains. You pay your property taxes on your home. But a two cent wealth tax, think what that would mean in this country right now. it would mean that we could provide universal child care for every one of our babies, we could put much more money into our public school system, we could provide free post high school technical school, 2-year college, 4-year college, we could cancel all student loan debt and we could still have a lot of money left over."*

Capital Markets: PBO est Canada deficit at $46.8b vs $40b fall economic statement

PBO estimates $46.8b Canada deficit

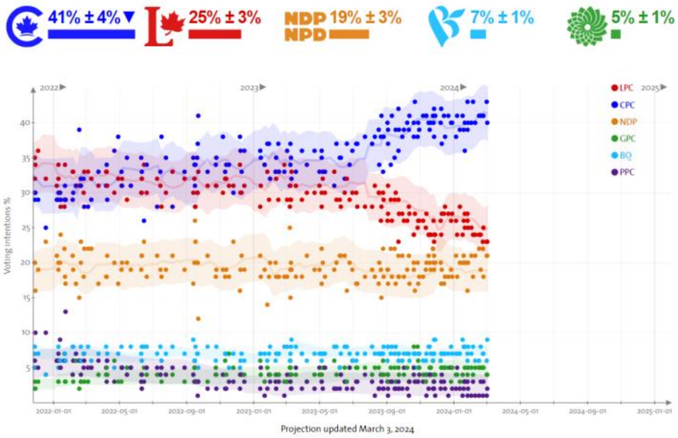
Canada's Deputy Prime Minister & Finance Minister Freeland announced she will be introducing the 2024 Federal Budget on April 16. We don't expect it will have any major impact on her budget plans but, on Thursday, the Parliamentary Budget Officer released "*The Government's Expenditure Plan and Main Estimates for 2024-25*" [LINK] The PBO analysis of government expenditures and estimate and the PBO estimates Canda deficit at $46.8b for current fiscal year vs $40b in Freeland's fall economic statement.. Our Supplemental Documents package includes excerpts.

Capital Markets: Will Liberals Apr 16 budget also be tax the rich and corporations?

Liberals budget is April 16

We say we don't expect it to impact Freeland's budget approach because we believe 2024 is a key year for Trudeau to try to change the big negative momentum again him so we expect the budget to be conceptually similar to what we saw from Biden's plan this week. Our position is unchanged, we believe Trudeau has no choice but to go big on tax and spend in 2024 to give himself any chance to see if he can turn the momentum. We do not believe Trudeau will run in 2025 if the polls continue show a wipe out in the 2025 election. So it's why we expect to see the same concepts emerge in the Liberals budget on April 16. In our Jan 14, 2024 Energy Tidbits memo, we wrote "*And if so, the logical targets will be the usual suspects like high income, wealthy, corporations, fossil fuels and likely items like 2nd homes*". We should note that the polls continue to get worse for Trudeau in 2024. Below is the latest 338Canada projection as of March 3, 2024.

Figure 53: 338Canada Federal polling



Source: 338Canada

Does Trudeau have to go big on tax and spend in 2024

Here is what we wrote in our Jan 14, 2024 Energy Tidbits memo. "*We were watching CTV News on Saturday morning when Nick Nanos came on to update his latest poll numbers on Canadians view of the federal government. The numbers are so bad for the Liberals that our first thought was Trudeau and the Liberals will have to take some big swings in 2024 to have any chance of turning the tide. We tweeted [LINK] "Brutal poll #s with <21 mths to Canada election. Does Trudeau have any choice but to go big on tax and spend if he wants to try to avoid what he did to Harper in 2015? Logical targets: high income, corporates, wealth tax, 2nd homes, fossil fuels, etc? Thx @niknanos #OOTT." Nanos was speaking on the results of their just released poll "Feelings of satisfaction toward the federal government hit all time low since tracking started in 2018". But what caught our attention was the graphics Nanos used on to note how Trudeaus was down to somewhat poor or very poor at 54% in Dec 2023 compared to 23% when he took over in 2015. Nanos also showed how former Conservative PM Harper had what was then considered a brutal somewhat poor or very poor of 45% before Trudeau's Liberals thumped the Conservatives in the 2015 election. The current polling shows strong negative views in all regions among all age groups and both genders. So when we see the brutal pool numbers, it makes us believe the Liberals will have no choice but to go big on tax and spend. And if so, the logical targets will be the usual suspects like high income, wealthy, corporations, fossil fuels and likely items like 2nd homes."*

Capital Markets: Liberals pull back some on beer, spirit and wine tax

Liberals pull back on beer, spirits, wine tax

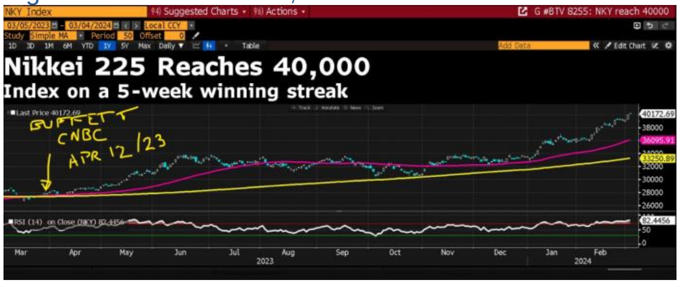
There was a good example yesterday that fits our view that 2024 is a make-it or break-it year for Trudeau to see if he can have any chance to win the next federal election. We continue to be in the camp that he won't run in 2025 unless he sees a turn in his chances in 2024. We believe this will shape what the Liberals do in 2024. Yesterday, we saw a good example when they announced [LINK] some relief to their planned April 1,2024 increase to taxes on beer, spirit and wines. There was too much negativity from restaurants, bars, patrons etc. that the Liberals have had to make this change. The tax was scheduled to increase by 4.7% on April 1, but the Liberals have now reduced that to 2% and that 2% is a cap for next year as well. They also announced "*For two years, cut by half the excise duty rate on the first 15,000 hectolitres of beer brewed in Canada, to provide the typical craft brewery with up to $86,952 in additional tax relief in 2024-25.*"

Capital Markets – Nikkei hit 40,000 before closing at 39,689 to end the week

Nikkei hit 40,000

It was another big week for Japanese stocks with the Nikkei hitting 40,000 this week for a couple of days before closing down at 39,689 to end the week. Last Sunday night, we tweeted [LINK] "*Thank you #WarrenBuffett say investors in Japanese stocks. Nikkei +40%, a great run so far post his positive comments on Japanese trading houses in his @SquawkCNBC @BeckyQuick Apr 12/23 interview #OOTT.*" Last week's (Mar 3, 2024) Energy Tidbits memo noted how Japanese stocks got back to 1989 highs after 35 years. This week, the Nikkei hit 40,000. We have been highlighting since last May on how Warren Buffett's April 12 CNBC Interview in Tokyo was the catalyst for foreign investors pouring into Japanese stocks and the clearly linked big run in Japanese stocks. Here is the Bloomberg chart from our tweet.

Figure 54: Nikkei hits 40,000



Source: Bloomberg

The Warren Buffett effect on Japanese stocks became evident in May

The Warren Buffett impact on Japanese stocks didn't come to our attention until we were watching Bloomberg TV Asia shows on May 18. Here is what we wrote in our May 21, 2023 Energy 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 55: Positive flows into Japanese equities for 7th straight week

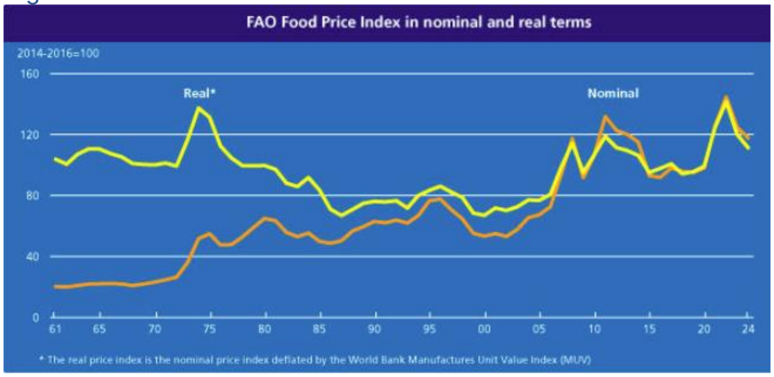
Source: Bloomberg

Capital Markets: UN FAO Food Price Index -0.7% MoM in February, -10.5% YoY

UN food price index down MoM

The UN Food Price Index is a monthly food commodities measure and not an index of food prices in grocery stores. However, increases or decreases in food commodity prices should eventually work their way into grocery prices. The UN Food Price index has been gradually decreasing since the middle of 2023 and it was down MoM again in February 2024. On Friday, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*FAO Food Price Index eases again in February, mostly driven by lower world cereal prices".* Note that the index is calculated on a Real Price basis. The FFPI averaged 117.3 points in February, down -0.7% MoM from 118.2 points in January, and down -10.5% YoY. The FFPI reported most categories increased in February, except the Cereal Price Index which was down big. The Vegetable Oil Index was down -1.3% MoM and -11.0% YoY. The Dairy Price Index was up +1.1% MoM but down -13.4% YoY. The Cereal Price Index was down -5.0% MoM which is -22.4% YoY. This was due to maize export prices cratering following good harvests in South America and cheap Ukrainian exports getting out of the Black Sea. The Meat Price Index was up +1.8% MoM and -0.8% YoY. The Sugar Price Index was up +3.2% MoM and still up +12.5% YoY. Sugar prices would have been worse if the Brazilian Real didn't depreciate as much as it did against the dollar. Overall, this month's decrease was driven by one or two categories, and after looking closer we can see the spots of resistance still residing in the index.

Figure 56:: UN FAO Food Price Index



Source: UN Food and Agricultural Organization

Loblaw Q4, says don't blame grocers for escalating grocery prices

Loblaw has been vocal on its earnings call saying the grocer, at least Loblaw, is not responsible for the inflation of grocery prices over and above inflation. It's others in the supply chain. Here is what we wrote in our Feb 25, 2024 Energy Tidbits memo on the Loblaw Q4 call. "*On Thursday, Loblaw held its Q4 call, which was the first earnings call led by recently new CEO Per Bank. Bank may have been less direct than prior CEO messaging but the point was the same – don't blame the grocers if grocery price escalation is much higher than inflation. Bank didn't specifically say who but he has to be referring to the food and product suppliers who are to blame. On Thursday, we tweeted [LINK] "Who's responsible for >inflation grocery store prices? Loblaw says not the grocer, rather look at others in grocery supply chain. "once again, our internal inflation was lower than grocery CPI, while our food gross margin is still below pre-Covid levels" Loblaw Q4 call." Bank reminded that their internal inflation was lower than grocery CPI ie. blame others in the supply chain to get groceries to consumers. Our tweet included the excerpt from the transcript where Bank said "Canadians continue to seek greater value as they face challenging and persistent inflationary pressures and we are committed to delivering that. Once again, our internal inflation was lower than grocery CPI, while our food gross margin is still below pre-COVID levels. Food price increases in our stores are as low as they have been over the past two years. We are pushing back whenever we can on suppliers cost increases, and we are finding more ways to be efficient to keep prices low for our customers. Our colleagues are doing a great job to reduce costs and be more efficient, allowing us to reinvest back into the business and help offset inflation."*

Demographics: Putin's approval ratings up over last 17 months

Putin approval ratings now 83%

Like everyone, we have to wonder who was in the polling group. Yesterday, TASS reported [LINK] "A*bout 83% of the polled Russians give a positive assessment of the work of Russian President Vladimir Putin, according to a survey conducted by the Public Opinion Foundation (FOM). According to the survey, 83% of the respondents said that they evaluate Putin's endeavors positively. The level of Russians' trust in Putin is about 82%."* Surprsingly, this is a higher approval rating than Nov 2022. Here is what we wrote inour Nov 27, 2022 Energy

Tidbits memo. "Russian poll says Putin has 78.7% level of trust among Russians. We were surprised that the number wasn't higher from a poll of 1,600 Russians conducted by All-Russian Center for the Study of Public Opinion (VTsIOM) on Russian's confidence in Putin. TASS wrote [LINK] "*The level of trust of Russians in Russian President Vladimir Putin over the past week increased by 0.7 percentage points and is 78.7%, according to the All-Russian Center for the Study of Public Opinion (VTsIOM), publishedon Friday. "The question of confidence in Putin was positively answered by 78.7% of the survey participants (plus 0.7 percentage points per week), the level of approval of the president's activities was 75% (plus 1.3 percentage points per week)," the center said in its materials."* We have to assume the poll is meant to give some reminder to the west that Putin has support within Russia, but suspect most will just ignore the poll or wonder what the real answer would be in a poll.

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

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.

@Energy_Tidbits on Twitter

LinkedIn: Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

Misc Facts and Figures.

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

LPGA rookie Cdn Savannah Grewal finished strong to be T4 in Blue Bay

Earlier this morning, we tweeted [LINK] *"Congrats CA @SavannahGrewal! Got to be a huge confidence booster for your rookie LPGA season. Playing in penultimate group but shoot 4 under 68 in closing round to end T4! Unfortunately with time zones, only caught a few holes so missed this chip-in."* Grewal is from Mississauga, just west of Toronto and is a rookie on the LPGA. Our tweet included her chip-in on 4 for a birdie. The Blue Bay LPGA was played in China so the Golf Channel coverage started last night. Unfortunately, with the time zones and losing an hour sleep with the clocks change, only saw a few of her shots and not this chip-in on 4. I had actually just turned the coverage off as I had seen her approach hit the green and run off the back edge of the green. Should have left the coverage on for another five minutes. For those who want to know more about Grewal, our Supplemental Documents package includes a SCOREGolf profile. [LINK]

Thurs Mar 14 is National Potato Chip Day

One of our favorite food holidays is Thurs March 14, National Potato Chip Day. Foodimentary writes "*The first potato "chips" appeared in 1853. Served at the Lodge at Saratoga Springs, New York. They were referred to for decades as "Saratoga Chips". Native American chef, George Crum is credited with creating & first serving the "Saratoga Chips".* One other interesting potato chip factoid is "*It takes 1,000 pounds of potatoes to make 350 pounds of potato chips."* Two personal potato chip memories. In the 80's, Ruffles potato chips weren't sold west of Ontario so my sister's birthday present was a big 3' x 4' box of Ruffles sent to my office. The other one is below. The 60s were the era where moms were stay at home and didn't have cars so there were home deliveries by the milkman and the bread truck twice a week. In Toronto, we also had a potato chip delivery guy who would come every couple week. The potato chip company would sell you the chips the first time in a big tin and then delivery guy would fill up the big tin when he stopped. Although I don't know how Musser's Charles Chips got to be delivered in Toronto. Below is Charles Chips 16 oz tin from the 60s.

Figure 57: Charles Chips potato chip tin from the 60s

Source: SAF Group

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