Energy Tidbits

December 17, 2023

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Is US Building the Case for Potential Strike On Houthis by Admitting Its Drones Have "Directly" Targeted US Navy Ships?

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. Our 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 our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. Our target is to write on 48 to 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. We have to wonder if the US is setting the stage for a potential strike on the Houthis as it's 1st time we can recall the US has acknowledged that a Houthi drone was "directly" targeting a US Navy ship. [click here]
2. Looks like natural gas/LNG is the unspoken winner from COP28 agreement. [click here]
3. Continued negative to natural gas/LNG with warmer than normal start to winter in all major natural gas consumption regions. [click here]
4. Trans Mountain warns that the start up of the TMX expansion could be delayed by approx. 2 years. [click here]
5. Bank of America estimates US consumer bank balances are still 40% above pre-Covid levels. [click here]
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT. [click here]
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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Table of Contents

Natural Gas: -55 bcf draw from US gas storage; now +245 bcf YoY surplus

US gas storage +245 bcf YoY surplus

After last week's gas injection, this week storage saw a draw. For the week of Dec 8, the EIA reported a -55 bcf draw (vs expectations of -56 bcf draw) and a YoY decrease compared to the -21 bcf draw reported for the week of Dec 2, 2022. Recall that it started to turn to warmer than normal temperatures in Dec 2022. Total storage is now 3.664 tcf, representing a surplus of +245 bcf YoY compared to a surplus of +254 bcf last week. Total storage is +260 bcf above the 5-year average, up from the +234 bcf surplus last week. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

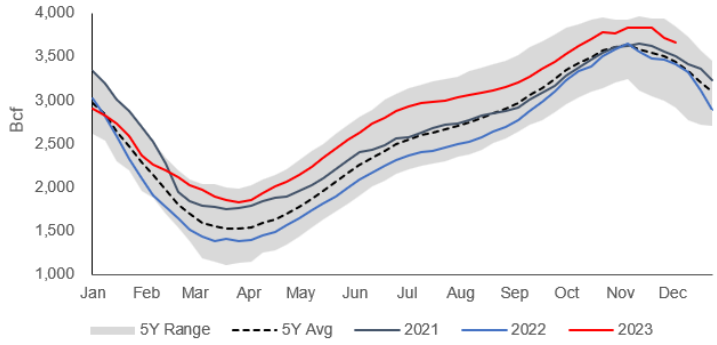
Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (12/08/22)		5-year average (2018-22)	
Region	12/08/23	12/01/23	net change	implied flow	Bcf	% change	Bcf	% change
East	857	876	-19	-19	824	4.0	826	3.8
Midwest	1,055	1,082	-27	-27	1,006	4.9	991	6.5
Mountain	243	245	-2	-2	187	29.9	193	25.9
Pacific	289	289	0	0	205	41.0	258	12.0
South Central	1,219	1,228	-9	-9	1,198	1.8	1,137	7.2
Salt	336	334	2	2	336	0.0	321	4.7
Nonsalt	883	894	-11	-11	862	2.4	815	8.3
Total	3,664	3,719	-55	-55	3,419	7.2	3,404	7.6

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

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



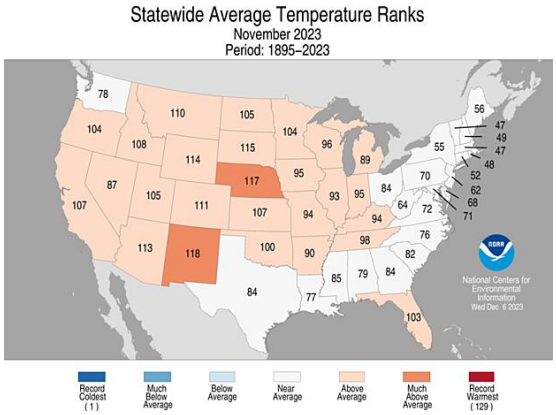
Source: EIA, SAF

Natural Gas: November was the 19th warmest for US in 129 years

Nov was 19th warmest for US in 129 years

We have been highlighting the warmer than normal US temperatures so far this winter that has led to lower natural gas demand. On Wednesday, the NOAA posted its national climate recap for Nov and Nov 2023 was the 19th hottest on record in the past 129 years. No wonder then when we see the slow start to the draw season! NOAA also sees El Nino conditions thru the winter, with 100% probability for Dec/Jan/Feb and Jan/Feb/Mar. Again, we note it's not impossible for natural gas demand to catch up after a warm Nov/Dec, but it really needs to get really cold in January and February to make up for it. Below is the NOAA graphic showing indexed average statewide temperatures since 1895.

Figure 3: NOAA Average Temperatures for Nov since 1895

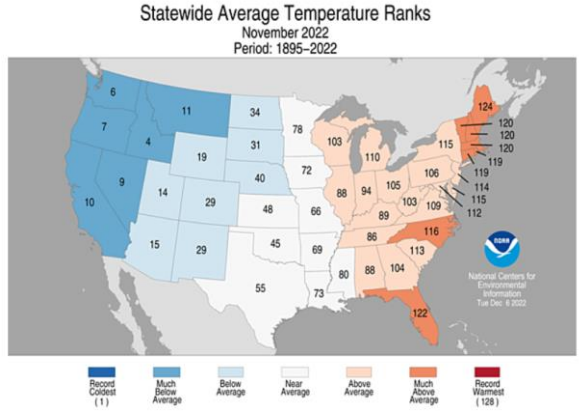


Source: NOAA

NOAA: Nov 2022 was the 44th coldest November on record

Here is wshat we wrote in our Dec 18, 2023 Energy Tidbits memo. "*On Wed, NOAA released National Climate recap for Nov 2022, which NOAA ranks as the 44th coldest Nov in the last 128 years. The weather turned a little colder in later Nov ie. starting to see weather related natural gas demand for heating. At its press conference, NOAA said "the contiguous U.S. average maximum (daytime) temperature during November was 51.9°F, 0.8°F below the 20th century average, ranking in the coldest third of the record." Below is NOAA's Statewide Average Temperature Rankings for November [LINK].*"

Figure 4: US Statewide Average Temperature Ranks Nov 2022



Source: NOAA

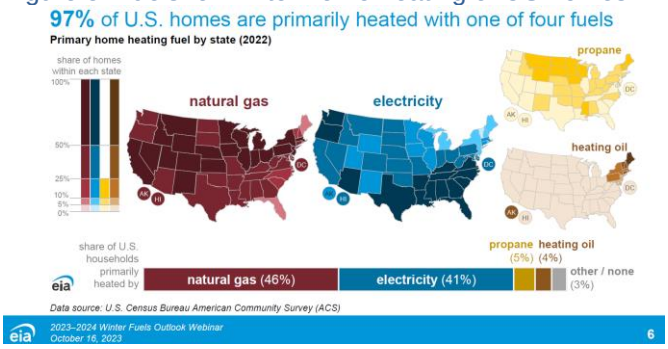
Natural Gas: 62% of US homes have winter home heating fueled by natural gas

Here is what we wrote in our Nov 19, 2023 Energy Tidbits memo on overview of US home heating by fuel. "*Our primary focus for winter weather tends to be in the US NE and around*

Natural gas home heating

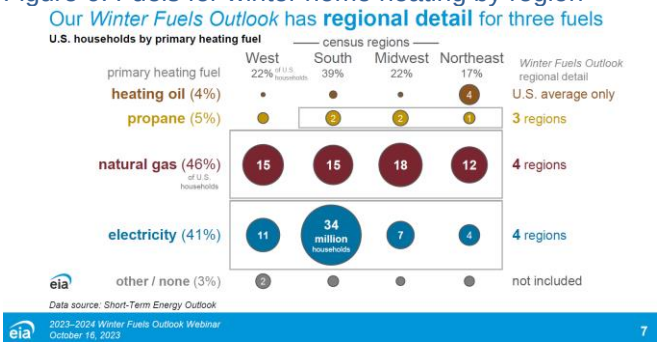
the Great Lakes for the combination of population density, areas that have colder winters, and a higher percentage of the US homes in these regions that primarily use natural gas for heating. Below is the EIA's map from Oct showing the primary fuel source for heating homes. (i) On Thursday, we tweeted [LINK] "62% of US homes winter heated directly (46%) and indirectly (16%) by #natgas. All direct fuel % splits unchanged YoY ie. #natgas 46%, electricity 41%, etc. @EIAgov #natgas fuels 40% of electricity for home heating ie. indirect 16% #OOTT." (ii) Natural gas continues to be the major fuel for "direct" fuel for home heating with 46% of US homes followed by electricity 41%, propane 5%, heating oil 4% and other/none at 3%. Note these % shares are unchanged vs last year. (ii) much of the electricity is provided by natural gas. (iii) Natural also is the major fuel to generate electricity. On a direct basis, electricity is the primary source for heating 41% of US homes. The EIA notes that natural gas provides the fuel for 40% of electricity. The EIA wrote "Last winter, electricity generation fueled by natural gas reached a new record of 619 billion kilowatthours (kWh), accounting for nearly 40% of all generation in the U.S. electric power sector. We forecast a similar level and share of natural gas generation for winter 2023–24. The addition of new natural gas-fired generating capacity has been one factor keeping natural gas the largest source of power generation. By October 31, we expect U.S. natural gas generating capacity to have grown by 4.7 gigawatts (GW) from the previous October." ivi) Adding the indirect and direct, natural gas provides the fuel for 62% of US homes."

Figure 5: Fuels for winter home heating of US homes



Source: EIA

Figure 6: Fuels for winter home heating by region



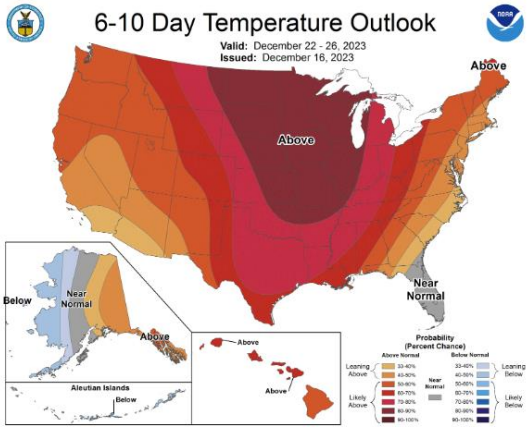
Source: EIA

Natural Gas: NOAA calls for much warmer than normal temps thru end of Dec

Warmer than normal in the US

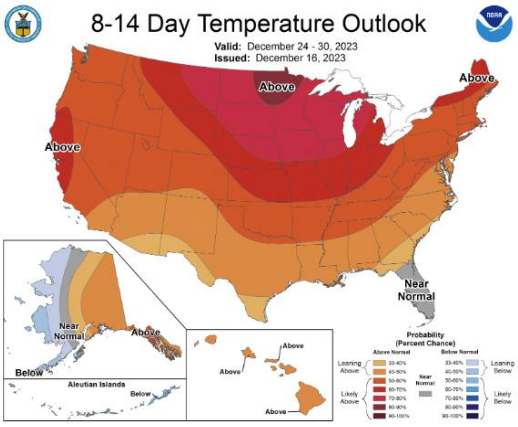
Yesterday, we tweeted [LINK] *"#Natgas investors can stay on sidelines until after Xmas to see if will turn cold. Today's @NOAA temp outlook is for much warmer than normal temps across US for Dec 22-30. A warm Nov/Dec start is difficult, but not impossible to catch up, BUT needs a very cold Jan/Feb. #OOTT."* Our tweet included NOAA's updated Dec 16 6-10 day and 8-14 day temperature outlook that covers Dec 22-30. Their forecasts have been unchanged throughout the week with NOAA looking for warmer than normal temperatures for the last half of Dec. Dec is the first crucial month for weather driven natural gas demand and it continues to look like a warmer than normal start to winter. Our concern is always that a warmer than normal start to winter makes it really tough, but not impossible to catch up up. And a warmer than normal winter can effective cap natural gas prices for mosf of the year, as seen in 2023. Below are the NOAA 6-10 day and 8-14 day termperature outlooks posted yesterday, Dec 16.

Figure 7: NOAA 6-10 day temperature outlook as of Dec 16



Source: NOAA

Figure 8: NOAA 8-14 day temperature outlook as of Dec 16



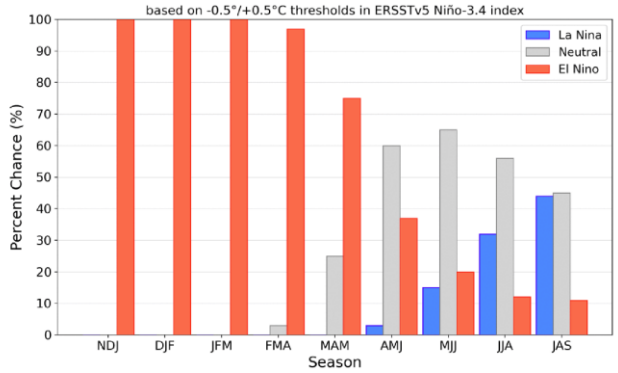
Source: NOAA

Natural Gas: NOAA sees El Nino conditions for Dec/Jan/Feb

El Nino forecast for Dec/Jan/Feb

The focus for El Nino conditions is for the winter. On Thursday, NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. NOAA continues to forecast El Nino conditions in the Northern Hemisphere Winter and Spring 2023-24. NOAA provided a probabilistic forecast for meeting El Nino thresholds for Dec/Jan/Feb at 100%, as well as for Jan/Feb/Mar.

Figure 9: El Nino Probability Dec 2023



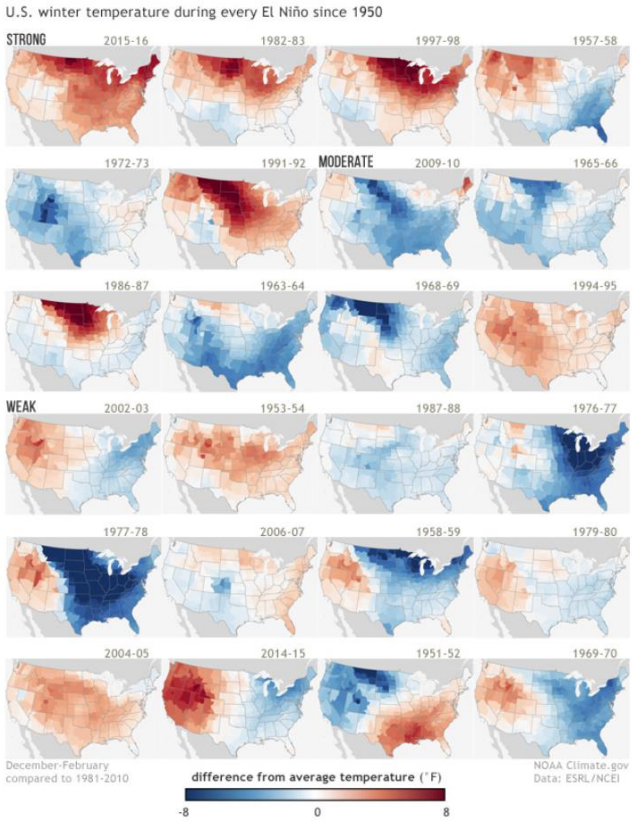
Source: NOAA

Natural Gas: El Nino correlations to warm winters aren't perfect

El Nino can bring cold winters

So far, this El Nino winter is looking to be another warm winter. El Nino winters are typically warmer than normal in the northern US. But we remind of a Oct 24, 2018 NOAA brief "*U.S. winter temperatures for every El Niño since 1950"* where NOAA looked at all El Ninos since 1950, classified them as strong, moderate or weak El Ninos and then showed the average winter (Dec thru Feb) temperature map. We checked this weekand the link still works [LINK]. NOAA wrote *"The tropical Pacific climate pattern known as "ENSO," which is short for El Niño-Southern Oscillation, has its strongest influence on the U.S. climate during winter (December-February). El Niño in general acts to tilt the odds toward wetter- and cooler-than-average conditions across much of the South, and toward drier and warmer conditions in many of the northern regions. El Niño's influence on temperature is less reliable than its influence on precipitation. The collection of maps at right show the difference from average (1981-2010) winter temperature (December-February) in each U.S. climate division during all El Niño events since 1950. Years are ranked from strongest El Niño (top left) to weakest (bottom right), based on the December–February Oceanic Niño Index value. There is no universal way to define the strength of El Niño events, but for this graphic, events with ONI values above 1.5 are ranked as strong, events with ONI values between 1 and 1.5 are ranked as moderate, and events with ONI values between 0.5 and 1 are ranked as weak." "Four of the six strong events have a warm signal that is nearly nationwide, but even among them, the geographic details—the location of the biggest anomalies, where the few cool spots are—vary from one event to another. Looking at both strong and moderate events, the patterns become even less consistent. Eight of the twelve events have a warm signal in the Northern Plains (a much smaller area than is affected in the strong events), but 4 are colder than normal."* Below are the Nino maps from the NOAA brief.

Figure 10: Winter (Dec-Feb) Temp In Strong, Moderate And Weak El Ninos Since 1950



Source: NOAA

Natural Gas: EIA leaves US gas production forecast for 2023 unchanged, lowers 2024

EIA US natural gas production forecast

The EIA left unchanged its forecast of US natural gas production for 2023 but lowered it for 2024 likely with the EIA lowering their HH gas price forecast. In October, the EIA made the expected catch-up adjustment in its natural gas production forecast after weekly oil estimates were well below actuals (associated gas production would have gone up as well). In October's STEO the EIA made a +1.0 bcf/d adjustment to 2023 and a +0.2 bcf/d adjustment to 2024, but last month's and this month's STEO kept 2023 production forecasts flat. As a reminder the key oil plays produce associated natural gas and NGLs, any increase in US oil production lead to increases in associated natural gas production from these oil plays. (i) On Tuesday, the EIA released its monthly Short Term Energy Outlook for December 2023 [LINK]. The EIA left unchanged its 2023 US natural gas production forecast at 103.7 bcf/d, which, on a full year average basis, gives solid YoY growth of +4.1 bcf/d from 2022. The EIA's overall unchanged 2023 forecast still had one quarterly change to estimates, which was Q3/23 -0.1 bcf/d to 104.0 bcf/d. (ii) The EIA revised its 2024 forecast downwards -0.2 bcf/d at 104.8 bcf/d, which, on a full year average basis, is up vs 2023 forecast of 103.7 bcf/d. The biggest quarterly change in 2024 is Q4/24 which was revised down -0.6 bcf/d to 105.3 bcf/d

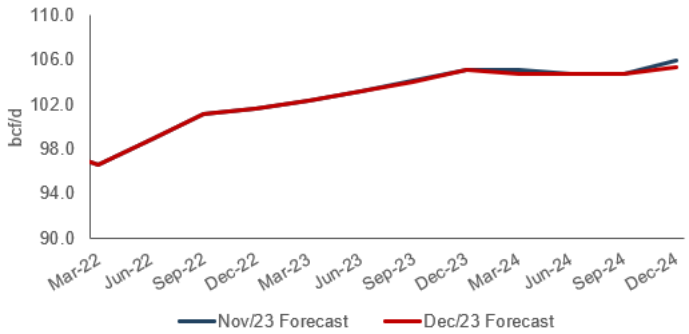
compared to November's STEO. The EIA did not comment on the changes in their natural gas consumption forecast. (iii) The EIA lowered its HH natural gas price expectations to $2.77/mcf in 2023 (was $2.78/mcf) and as well as the 2024 expectation to $2.90/mcf (was $3.38/mcf). The EIA did not comment on the change in HH gas prices. (iv) Our Supplemental Documents package includes excerpts from the STEO.

Figure 11: EIA STEO Natural Gas Production Forecasts

bcf/d	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Dec-2023	94.6	96.6	98.9	101.2	101.6	99.6	102.3	103.2	104.0	105.1	103.7	104.8	104.8	104.7	105.3	104.9
Nov-2023	94.6	96.6	98.9	101.2	101.6	99.6	102.3	103.2	104.1	105.1	103.7	105.1	104.8	104.7	105.9	105.1
Oct-2023	94.6	96.6	98.9	101.2	101.6	99.6	102.4	103.2	104.4	104.9	103.7	104.7	104.8	104.8	106.1	105.1
Sep-2023	94.6	95.1	97.6	99.5	100.3	98.1	102.1	102.8	102.7	103.1	102.7	104.3	104.7	104.9	105.9	104.9
Aug-2023	94.6	95.1	97.6	99.5	100.3	98.1	102.1	102.8	103.4	103.6	103.0	104.0	103.9	104.0	104.6	104.1
July-2023	94.6	95.1	97.6	99.5	100.3	98.1	102.0	102.2	103.0	102.2	102.4	101.8	101.5	102.5	103.7	102.4
June-2023	94.6	95.1	97.6	99.5	100.3	98.1	102.0	103.7	103.4	101.9	102.7	102.8	102.8	103.0	103.6	103.0
May-2023	94.5	95.1	97.6	99.5	100.3	98.1	102.1	101.9	99.9	100.4	101.1	100.7	101.1	101.4	101.8	101.2
Apr-2023	94.5	95.1	97.6	99.5	100.2	98.1	101.6	100.5	100.5	100.9	100.9	101.2	101.5	101.8	101.8	101.6
Mar-2023	94.5	95.1	97.6	99.5	100.2	98.1	101.0	100.2	100.6	101.0	100.7	101.4	101.4	102.0	102.0	101.7
Feb-2023	94.6	95.1	97.6	99.5	100.1	98.1	99.9	100.0	100.3	100.9	100.3	101.2	101.6	102.0	101.9	101.7
Jan-2023	94.6	95.1	97.6	99.4	99.9	98.0	100.8	99.9	100.1	100.6	100.3	101.1	101.8	102.7	103.6	102.3
Dec-2022	93.6	95.1	97.6	99.2	100.5	98.1	99.9	99.5	100.5	101.6	100.4					

Source: EIA, STEO

Figure 12: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

Natural Gas: EIA STEO forecasts Apr 1/24 storage 2.023 tcf, +0.029 tcf vs Nov STEO

EIA December STEO storage forecast

Given the continued strong YoY increase in forecast US gas production and the mild start to winter, the EIA Dec STEO increased its forecast for storage to end winter 2023/24. (i) The EIA STEO also forecasts US gas storage. Gas storage started the summer 2023 refill season at 1.850 tcf on April 1, 2023, which was +0.448 tcf YoY. For the winter 2023 draw season, the EIA forecasts storage on Nov 1, 2023 at 3.810 tcf, which is +0.241 tcf YoY but down vs Nov STEO of 3.835 tcf. (ii) The increasing US natural gas production has a bigger impact on storage to end winter 2023/24. The EIA forecasts gas storage to end the winter at 2.023 bcf, which would be +0.173 tcf YoY and up vs Nov STEO of 1.993 tcf. Below is a table tracking the working gas inventory forecasts and actuals since 2016.

Figure 13: EIA STEO US Natural Gas in Storage (2016-2024)

	Storage	2016-2024				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,021.3	785.0	3,628.8	10.6%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,021.3	785.0	3,628.8	5.2%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,021.3	785.0	3,628.8	-10.8%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,021.3	785.0	3,628.8	3.7%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,021.3	785.0	3,628.8	8.3%
Mar 2021	1,801.2	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,236.3	4,021.3	785.0	3,628.8	1.0%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,569.4	3,236.3	4,021.3	785.0	3,628.8	-1.6%
Mar 2023	1,849.6	1,184.9	2,486.3	1,301.4	1,835.6	0.8%
Oct 2023	3,810.2	3,236.3	4,021.3	785.0	3,628.8	5.0%
Mar 2024	2,022.8	1,184.9	2,486.3	1,301.4	1,835.6	10.2%
Oct 2024	4,021.3	3,236.3	4,021.3	785.0	3,628.8	10.8%

Source: EIA, STEO

LNG Canada 1.8 bcf/d Phase 2

Natural Gas: Will Canada GHC cap pause a Shell FID on LNG Canda 1.8 bcf/d Phase 2

We were a little surprised that last week's Liberals proposed cap on GHG emissions for the oil and gas sector didn't seem to get many concerned on what it could mean to LNG Canada's potential 1.8 bcf/d Phase 2. Our concern is that it seems hard (impossible?) to see how Shell FIDs LNG Canada Phase 2 until there a clarity on the final GHG cap limits and timing. Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo. "*Earlier this morning, we tweeted [LINK] "Many big questions to be answered. 2030 is only 6 year away! Liberals "proposes to cap [GHG] 2030 emissions at 35 to 38 percent below 2019 levels" on Cdn #Oil #NatGas. If production gets effectively capped, how can this not impact future #LNG #Oil export growth? #OOTT." Later in the memo, we discuss the Liberals new proposed GHG cap on the oil and gas sector at 35-38% below 2019 levels by 2030. This is a proposal which is means an opening negotiation point. But assuming it doesn't get changed, it will work to be an effective cap on Cdn oil and gas production. There are cap and trade options but that just adds to the cost and there are always limits to cap and trade volumes. One of the obvious questions is what does this mean to any Shell FID of LNG Canada's 1.8 bcf/ Phase 2. We have to believe it would be impossible for this FID to happen until there is some better understanding of what will be the final GHG cap limits and timing, and how that will be determined back to projects.* "

Canada, oil & gas GHG cap 35-38% less than 2019 BY 2030

Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo on the GHG cap on Cdn oil and gas. "*Earlier this morning, we tweeted [LINK] "Many big questions to be answered. 2030 is only 6 year away! Liberals "proposes to cap [GHG] 2030 emissions at 35 to 38 percent below 2019 levels" on Cdn #Oil #NatGas. If production gets effectively capped, how can this not impact future #LNG #Oil export growth? #OOTT." This was a huge announcement this week and one that is leading to a number of big questions. We think it is fair to say the Liberal's Thursday*

introduction of their framework to cap GHG from the oil and gas sector is a major competitive blow vs oil and gas everywhere in the world. It's not just that there is an GHG cap, it is to be done by 2030. That is very little time. And that the Liberals are doing all they can to reduce oil and gas production in Canada. It is far too early to tell the exact ramifications of this framework but, investors and capital allocators, don't like uncertainty and the most immediate impact of this framework will be capital staying or moving to the sidelines especially for any capital that is long term directed. Especially with having to reduce GHG by 35-38% by 2030. That is a huge task. 2030 is very little time. Like him or not, it's looks like a good strategy for Liberal environment minister, "propose" something impossible and back off to something that will still be a huge win for him. On Thursday, Canada released its "The proposed Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap was developed following extensive engagement with industry, Indigenous groups, provinces and territories, and stakeholders. It proposes to cap 2030 emissions at 35 to 38 percent below 2019 levels, while providing compliance flexibilities to emit up to a level about 20 to 23 percent below 2019 levels. The greenhouse gas pollution cap puts a limit on the amount that the sector can pollute and will be key to making sure we reduce our emissions as a country, on the road to reaching net zero by 2050. The greenhouse gas pollution cap will spur reductions over time at a pace and scale needed to ensure the sector achieves net-zero emissions by 2050, which aligns with provincial and industry commitments. This framework comes at a critical time for Canada, with many Canadians having seen firsthand the impacts of the climate crisis—from floods, heatwaves, and wildfires to economic loss and health impacts." This is their proposal so the question is what will be ultimately resolved as to amount and timing and application. There is cap and trade potential that will add to cost but the reality is that there are always limits to how much real cap and trade opportunities there are. But assuming no changes to the proposal, this will be THE question to be resolved for the Cdn oil and gas sector. How will they comply with this and what will it mean to their future production and value of oil and gas in the ground? This is an effective cap on production and has to bring question on the value of future reserves. We have to believe companies will have to try to figure out what this means before they commit long term capital. Earlier in the memo, we noted one specific question will be what impact will this have on Shell's upcoming FID decision on LNG Canada 1.8 bcf/d Phase 2? But there are many more questions on how this framework gets implemented on a company basis. And most of all, the one immediate reaction will be capital allocators inevitably sitting on the sidelines or pulling back any long term capital to Canada's oil and gas sector until it is understood how much this will impact oil and gas. This will be THE issue for the Cdn oil and gas sector. Our Supplemental Documents package includes the Canada announcement."

CAPP says proposed GHG emissions cap is an effective cap on production

Here is another item from last week's (Dec 10, 2023) Energy Tidbits memo. *On Thursday, the Canadian Association of Petroleum Producers (CAPP) posted their response. Their key points were "Despite the federal government's stated objective that the emission cap should not put a limit on Canadian oil and natural gas production, the unintended consequences of the draft framework announced today of a cap-and-trade system with an interim target of a 35% to 38% emissions reductions*

below 2019 by 2030 could result in significant curtailments – making this draft framework effectively a cap on production. At a time when the country's citizens are experiencing a substantial affordability crisis, coincident with record budget deficits, the federal government risks curtailing the energy Canadians rely on, along with jobs and government revenues the energy sector contributes to Canada. An emissions cap on the upstream oil and natural gas industry is unnecessary, given the longstanding carbon policies which already have Canada well on its way to meet or exceed emission targets. The added complexity of yet another layer of carbon policy is potentially detrimental to established carbon markets that fund clean energy projects. Canada is a major exporter of hydrocarbons to its western allies who value our commitment to energy security while operating under one of the most stringent environmental regulatory regimes in the world."

'

Good thing Canada is an exporter of oil, natural gas and soon to be LNG

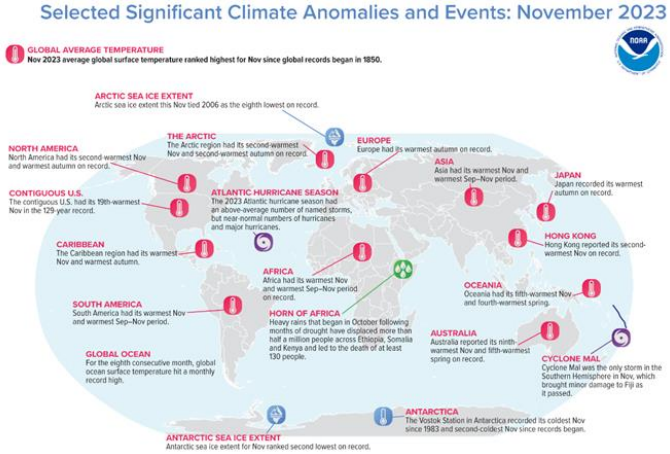
Here is another item from last week's (Dec 10, 2023) Energy Tidbits memo. "*The Liberals are fortunate that Canada is an exporter of oil and natural gas, and soon to be LNG. It gives them the flexibility to put an effective cap on oil and gas without having to be like an oil and gas importing country and see the impact of increasing cost of imports ie. like seen in Europe even before Russia/Ukraine. Recall the massive hit to Europe industry in the summer before Russia invaded Ukraine as natural gas prices hit record highs. So for Canada, if the GHG emissions cap to 35-38% of 2019 levels is an effective cut on production, we would assume that the it will be to Canada's exports."*

Natural Gas: Warmest Nov on record for the world

Warmest Nov on record globally

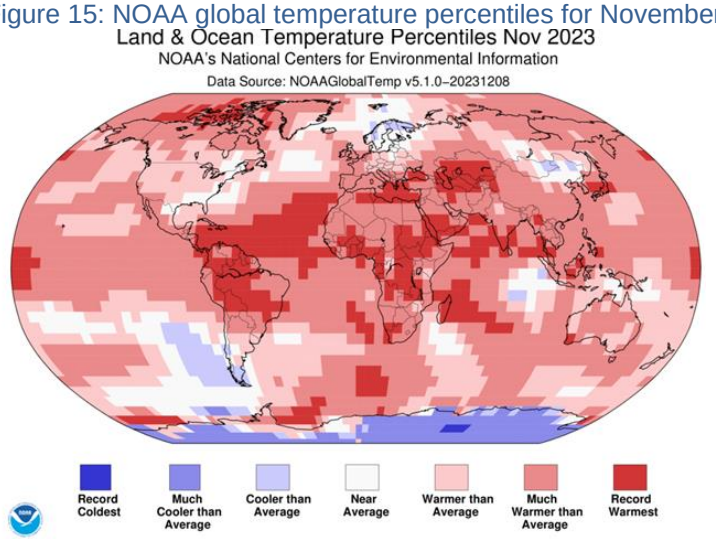
On Thursday, we tweeted [LINK]: "*No wonder global #LNG #NatGas prices are weak. - Global warmest Nov on record. - US 19th warmest on record - EU 15th warmest on record - Asia warmest on record. Need sustained cold temps ASAP broadly in world or risk repeat of winter 22/23 hit on 2023 prices. Thx @NOAA #OOTT*". The NOAA's Global Climate Report for the month of November [LINK] showed that globally, the average surface temperature was +1.44C above the 20th century average of 12.9C, which made it the warmest November for the planet on record. This makes sense as Asia just had their warmest November on record, Europe tied it's 15th warmest on record, and as we mentioned earlier in this memo, the US saw the 19th warmest Nov in the past 129 years. Given these record temperatures, we aren't surprised to see the slow start to winter natural gas demand. Below are clips from the NOAA Global Climate Report, with climate anomalies and land and ocean surface temperatures during November.

Figure 14: Major climate anomalies across world for November



Source: NOAA

Figure 15: NOAA global temperature percentiles for November



Source: NOAA

Natural Gas: LNG on water (>20 days) at highest level since at least 2017

On Thursday, we tweeted [LINK] "*Need sustained cold weather ASAP broadly in EU & Asia or else risk repeat of winter 22/23 for #LNG & EU #NatGas prices. LNG on water >20 days worldwide jumped to highest seasonal level since at least 2017, 70% higher than an average over the last six yrs. @MaznevaElena #OOTT."* No question that a key factor is the weather, it was hot in Nov in all the key natural gas consuming regions and that has led to muted winter weather natural gas demand. Bloomberg wrote "*Liquefied natural gas cargoes are piling up at sea as demand stalls in key importer Europe, given milder weather and the upcoming holiday season. Volumes of the fuel on the water for more than 20 days worldwide*

LNG on water is highest since 2017

jumped this week to the highest seasonal level since at least 2017, data compiled by Bloomberg show. It's now roughly 70% higher than an average over the last six years." Our Supplemental Documents package includes the Bloomberg report.

Figure 16: LNG on water (>20 days)

Source: Bloomberg

Warmest Nov on record globally

Natural Gas: India November natural gas production bascically flat MoM to 3.58 bcf/d

India domestic natural gas production peaked in 2010 at 4.6 bcf/d, and then ultimately declined to average 2.8 bcf/d in 2020-2021. India returned to modest growth in 2021/2022. There was a several months of basically flat production but production growth has returned in 2023. On Friday, India's Petroleum Planning and Analysis Cell released their monthly report for November's natural gas and oil statistics [LINK]. India's domestic natural gas production for November was 3.58 bcf/d, which was basically MoM from 3.60 bcf/d in October. On a YoY basis, natural gas production was up +7.08% from 3.34 bcf/d in November 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

India LNG imports up YoY

Natural Gas: India LNG imports down MoM at 2.75 bcf/d in November

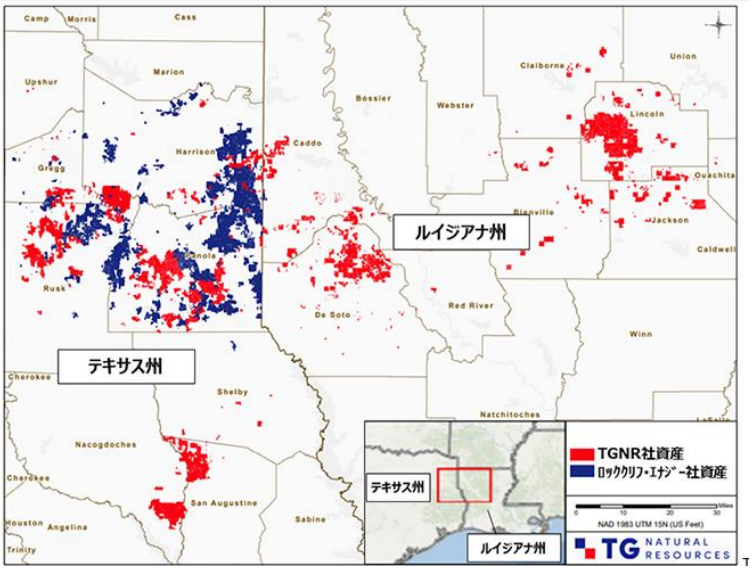
For the past several years, India has increased LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 was the high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we have been seeing some India LNG imports move up or down in line with domestic production moving down or up. But there is also some opportunistic buying when LNG prices are this weak. On Friday, India's Petroleum Planning and Analysis Cell released their monthly report for November's natural gas and oil statistics [LINK]. Over the past 3 years, India's LNG imports declined from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. Additionally, November's LNG imports were 2.75 bcf/d, which is up MoM from 2.66 bcf/d in October. LNG imports are now up +5.32% YoY from 2.61 bcf/d in November 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas: Japan's Tokyo Gas buys US shale gas producer Rockcliff Energy

Tokyo Gas buys US shale gas producer

On Tuesday, Tokyo Gas announced [LINK] it was spending $2.7b to acquire Rockcliff Energy, a US shale gas producer in East Texas Haynesville shale gas producer. Rockcliff production is approx. 0.95 bcf/d (1.3 bcf/d gross operated production). Tokyo Gas wrote "*As demand for natural gas is expected to increase in the future, such as the construction of new LNG export terminals in the U.S., the Tokyo Gas Group has set out to expand its shale gas business in North America in its medium-term management plan "Compass Transformation 23-25," and expects to build a earnings base overseas through this acquisition*." Note the Google Translate of the Tokyo Gas release says "Rockcliffe" but the company name is "Rockcliff"

Figure 17: Rockcliff Energy Texas lands in blue, Tokyo Gas existing lands in red



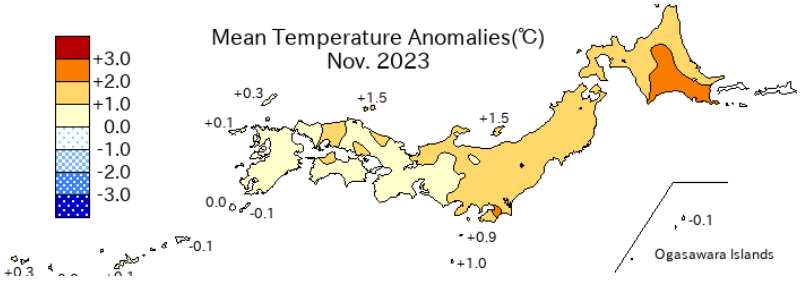
Source: Tokyo Gas

Natural Gas: Above normal temperatures in Japan in Nov

Above normal temps in Japan

No one should have been surprised by the Japan Meteorological Agency's recap of Nov 2023 temperatures that it was above normal temperatures, which meant that any electricity demand, including for natural gas, would be less than normal. On Friday, the Japan Meteorological Agency posted its climate recap for Nov. [LINK]. It included the below mean temperature anomalies map. The JMA wrote "*Monthly mean temperatures were significantly above normal in northern Japan and above normal eastern/western Japan due to warm air advection and weak cold air inflow from the Eurasian continent*."

Figure 18: JMA Mean Temperature Anomalies Nov 2023

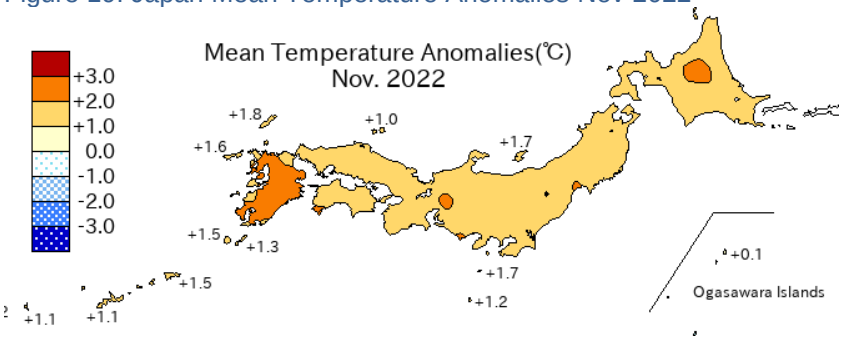


Source: Japan Meteorological Agency

Year ago, Nov 2022 was very hot across all of Japan

It was warn in Nov 2023, but nowhere near as hot as it was in Nov 2022. The JMA's climate recap for Nov 2022 [LINK] included the below mean temperature anomalies map. The JMA wrote *"Monthly mean temperatures were significantly above normal nationwide, due to remarkably weak cold air inflow from the continent and warm air advection in front of low-pressure systems. Regional average temperatures for the eastern Japan were the highest for November since records began in 1946*."

Figure 19: Japan Mean Temperature Anomalies Nov 2022



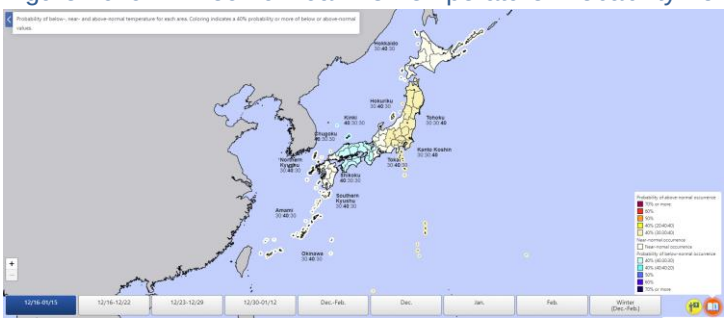
Source: Japan Meteorological Agency

Natural Gas: Japan forecasts cold end to Dec, but above-normal temps for 1st half Jan

Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The Dec 14 update calls for colder than normal temperatures for the next two weeks, then warmer than normal temps for the first half of January. It will be especially cold over the next two weeks in the southern prefectures. Below is the JMA's 30-day temperature probability forecast for Dec 16 - Jan 15.

Japan's 30-day temperature forecast

Figure 20: JMA Dec 16 – Jan 15 Temperature Probability Forecast



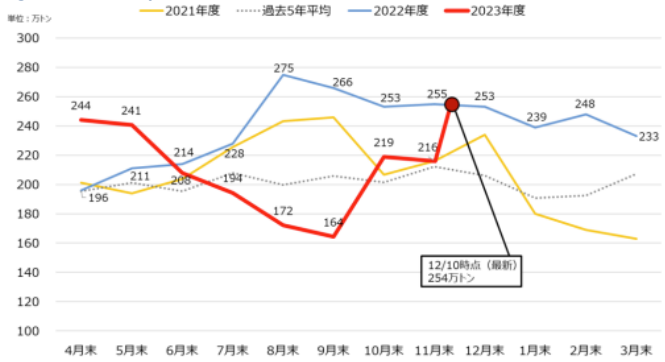
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks up big WoW, flat YoY, above 5-yr average

Japan LNG stocks up +16.0% WoW

After draws over the past few weeks, this week there was a big build in LNG storage for Japan. Stocks are now essentially in-line with 2022 levels and above the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on Dec 10 were 122.0 bcf, up +16.0% WoW from Dec 3 of 105.2 bcf, down -0.04% YoY from 122.5 bcf a year earlier, and above the 5-year average for the end of December of 98.9 bcf. METI did not comment on the WoW increase. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 21: Japan LNG Stocks



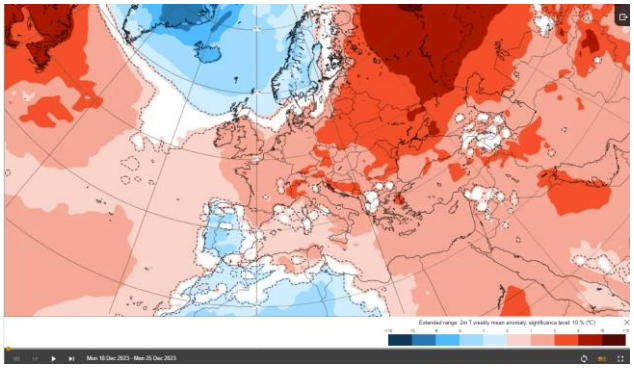
Source: METI

Natural Gas: Warmer than normal temperatures forecast for Europe thru year end

Europe Dec forecast

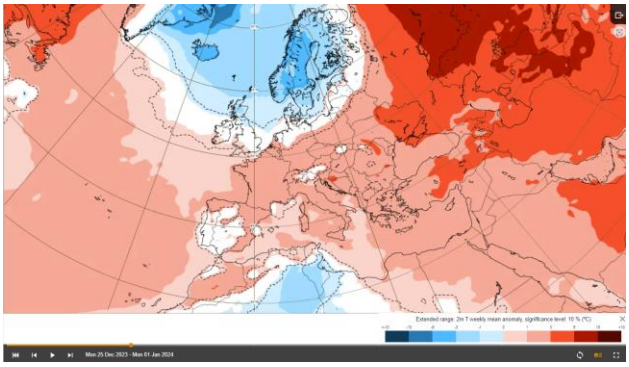
The short-term weather forecasts for Europe were pretty accurate as they called for colder than normal temp to end Nov/start Dec for much of Europe, and then to flip back to warmer than normal temperatures. That is unchanged. Yesterday's ECMWF (European Centre for Medium-Range Weather Forecasts) temperature probability forecasts call for warmer than normal temperatures to end Dec. Our concern is always a warm start to winter needs to get offset sometime and a warmer than normal winter can be a hold back on natural gas/LNG prices for several months. Last winter 2022/23 was a hot winter and it held back prices all of 2023.

Figure 22: ECMWF Dec 18-25 Temperature Probability Forecast



Source: ECMWF

Figure 23: ECMWF Dec 25-Jan 1Temperature Probability Forecast



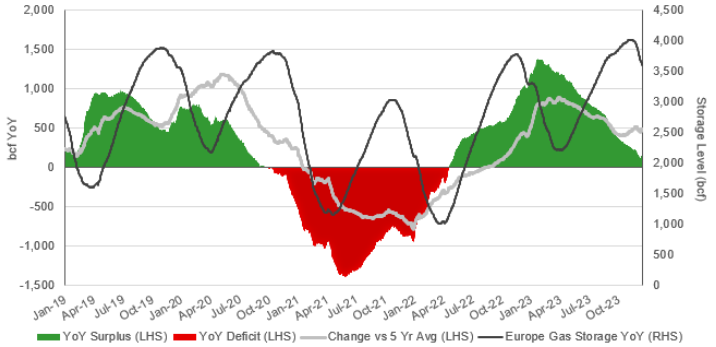
Source: ECMWF

Natural Gas: Europe storage drops to 89.37% after cold end to Nov/start to Dec

Europe gas storage

The colder than normal temperatures in most of Europe over the past couple weeks has finally led to some draws in EU gas storage. Please note that Europe generally refers to the start of winter natural gas withdraw season as starting Oct 1, whereas North America refers to the start of winter natural gas season as starting Nov 1. After entering winter essentially full at over 99%, it looks like Europe has begun to draw on its gas storage. This week, Europe storage decreased by -2.26% WoW to 89.37% on Dec 14 vs 91.63% on Dec 7. Storage is now +3.52% greater than last year's levels of 85.85% on Dec 14, 2022. But remember the panic of late 2021 on natural gas, it was because Europe gas storage was only 67.21% full on Dec 1, 2021. Below is our graph of Europe Gas Storage Level.

Figure 24: European Gas Storage Level



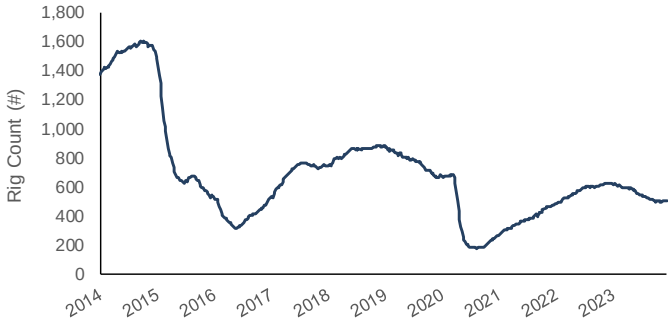
Source: Bloomberg, SAF

Oil: US oil rigs -2 WoW to 501 rigs, US gas rigs flat WoW at 119 rigs

US oil rigs down WoW

Yesterday, we tweeted [LINK] "*See 👇 Baker Hughes posts revised North American rig count as of Dec 15 to correct for WoW changes in the big basins. #OOTT."* When we saw the originally posted rig count just after 11am MT on Friday, it was clear that there were mistakes in the WoW changes in the major basins. There just couldn't be WoW changes of that magnitude. For example, the original Baker Hughes rigs showed a -35 WoW in the Permian and -22 WoW in the Eagle Ford. And then how Others were +77 oil rigs WoW to 147 oil rigs. We also thought the total US oil and gas rigs looked reasonable but given that there were going to be huge basin changes, we wanted to wait until the revised to see if there going to be revisions to the total. Sometime later Friday night or early Saturday morning, Baker Hughes posted a revised weekly North American drilling rig data for Dec 15. (i) Total US oil rigs were -2 rigs WoW to 501 rigs at Dec 15. US oil rigs went below 520 rigs on Aug 25 and stayed there for 4 weeks and for the last 13 weeks have been between 494 and 507 oil rigs. (ii) The major basin WoW changes were Granite Wash -5 rigs, Permian -3 rigs and Cana Woodford + 3 rigs. (iii) We expect to see another WoW decline this week in the run up to Xmas. (iv) Gas rigs were flat WoW at 119 gas rigs. Below is our graph of total US oil rigs.

Figure 25: Baker Hughes Total US Oil Rigs



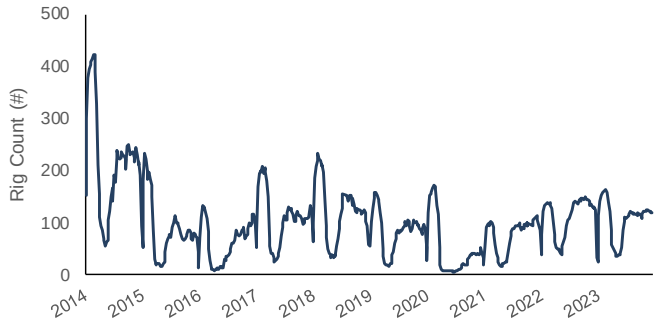
Source: Baker Hughes, SAF

Oil: Total Cdn rigs down -9 rigs to 185 total rigs

Cdn total rigs down WoW

For the week of Dec 15, total Cdn rigs were down -9 WoW to 185 total rigs. On a per province basis, Alberta was down -5 rig WoW to 131 rigs, BC was down -2 rigs WoW to 19 rigs, and Saskatchewan was flat WoW at 32 rigs. It looks like the normal seasonal decline going into Christmas has begun. Cdn oil rigs were down -2 rigs WoW to 118 oil rigs and are down -6 oil rigs YoY. Cdn gas rigs were down -7 rigs WoW to 67 gas rigs, which is -8 YoY.

Figure 26: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

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

US oil production flat WoW

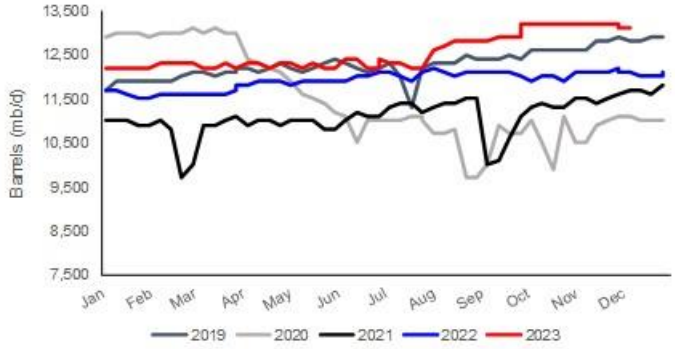
In mid-Oct, there was a second big adjustment to the EIA's weekly oil production estimates. The first was in August, when our Aug 13, 2023 Energy Tidbits memo highlighted the EIA increased their weekly US oil production estimates by +0.4 mmb/d. Our Oct 15th Energy Tidbits memo highlighted the EIA's second big, another +0.4 mmb/d, adjustment to the weekly production estimates. Last month, the EIA wrote *"Crude Oil Production Re-benchmarking Notice: When we release the Short Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that increased estimated volumes by 370,000 barrels per day, which is about 2.8% of this week's estimated production total*." This 2nd EIA adjustment was needed to bring the weekly production estimates in line with the EIA's actuals. And as noted in the Form 914 item from this month, the EIA's Oct adjustment basically makes up for the weekly estimates being below the EIA's actuals for Aug. This week, the EIA's production estimates were flat WoW at 13.100 mmb/d for the week ended December 8. Alaska was up +0.004 mmb/d WoW to 0.435 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 27: 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
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200	08/12	12,100	08/19	12,000	08/26	12,100		
2022-Sep	09/02	12,100	09/09	12,100	09/16	12,100	09/23	12,000	09/30	12,000
2022-Oct	10/07	11,900	10/14	12,000	10/21	12,000	10/28	11,900		
2022-Nov	11/04	12,100	11/11	12,100	11/18	12,100	11/25	12,100		
2022-Dec	12/02	12,200	12/09	12,100	12/16	12,100	12/23	12,000	12/30	12,100
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						

Source: EIA

Figure 28: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

Oil: EIA Dec STEO small increase to 2023, small decrease to 2024 US oil production

EIA STEO US oil production

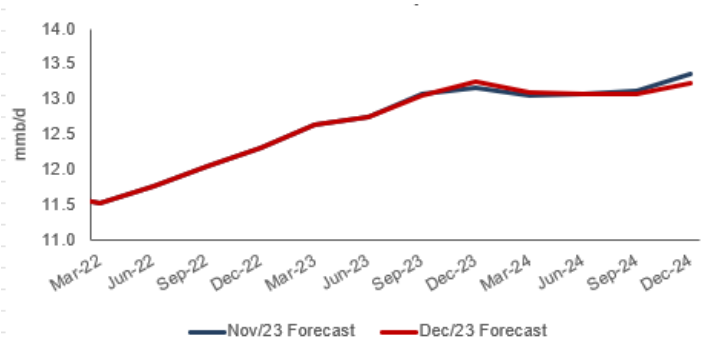
On Tuesday, the EIA released its Short-Term Energy Outlook for December 2023 [LINK] and increased its oil production forecasts for 2023 but decreased its 2024 forecast. (i) The Dec STEO forecasts for 2023 US oil production estimates have increased vs the last STEO in November. The December STEO forecast for 2023 is up +30,000 b/d to 12.93 mmb/d from the November STEO of 12.90 mmb/d. Recall the big +140,000 b/d revision in October's STEO from the September STEO's forecast of 12.78 mmb/d, as the EIA had to play catch-up with higher oil production actuals being reported over weekly estimates. The revisions by quarter were Q3/23 -0.01 mmb/d to 13.06 mmb/d and Q4/23 exit +0.09 mmb/d to 13.26 mmb/d. (ii) The EIA decreased its 2024 oil production forecast by -40,000 b/d to 13.11 mmb/d compared to 13.15 mmb/d in the November STEO, which is still a YoY increase of +0.18 mmb/d. The revisions by quarter were Q1/24 +0.03 mmb/d, Q2/24 -0.01 mmb/d, Q3/24 -0.04 mmb/d and Q4/24 exit at -0.12 mmb/d from the November forecast to 13.23 mmb/d (was 13.35 mmb/d). Below is our EIA STEO forecast comparison by month.

Figure 29: EIA STEO Oil Production Forecasts by Month

(million b/d)	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Dec-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.75	13.06	13.26	12.93	13.09	13.07	13.07	13.23	13.11
Nov-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.75	13.07	13.17	12.90	13.06	13.08	13.11	13.35	13.15
Oct-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.75	13.13	13.16	12.92	13.07	13.02	13.07	13.31	13.12
Sep-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.71	12.86	12.94	12.78	13.03	13.09	13.15	13.36	13.16
Aug-23	11.27	11.52	11.77	12.05	12.30	11.91	12.63	12.67	12.81	12.93	12.76	12.98	13.01	13.08	13.27	13.09
Jul-23	11.25	11.47	11.70	12.06	12.31	11.89	12.61	12.55	12.48	12.63	12.56	12.67	12.71	12.88	13.13	12.85
Jun-23	11.25	11.47	11.70	12.06	12.31	11.89	12.60	12.56	12.57	12.70	12.61	12.69	12.63	12.76	13.00	12.77
May-23	11.25	11.47	11.70	12.06	12.31	11.89	12.54	12.51	12.46	12.61	12.53	12.63	12.58	12.68	12.85	12.69
Apr-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.54	12.50	12.50	12.61	12.54	12.69	12.71	12.77	12.83	12.75
Mar-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.71	12.63
Feb-2023	11.25	11.47	11.70	12.06	12.36	11.90	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65
Jan-2023	11.25	11.47	11.70	12.05	12.23	11.86	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81
Dec-2022	11.25	11.46	11.70	12.03	12.29	11.87	12.24	12.24	12.34	12.51	12.33					

Source: EIA STEO

Figure 30: Estimated US Crude Oil Productions by Forecast Month



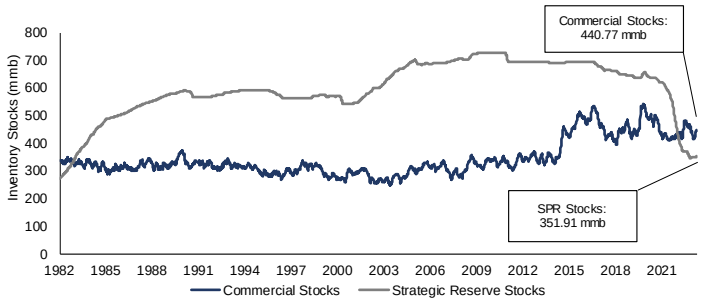
Source: EIA, STEO

US SPR reserves

Oil: US SPR reserves now -88.862 mmb lower than commercial crude oil reserves

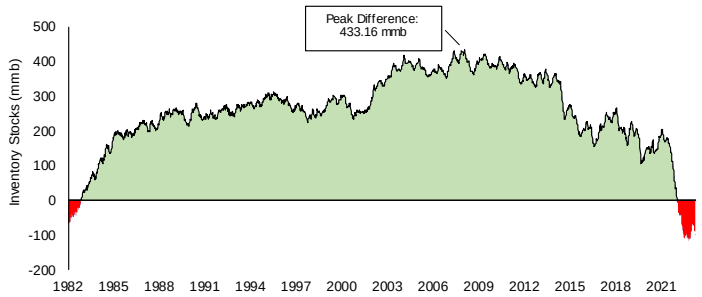
Oil in the US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit widened this week after a draw in commercial oil stocks of -4.630 mmb. The EIA's weekly oil data for December 8 [LINK] saw the SPR reserves decrease -0.06 mmb WoW to 351.911 mmb, while commercial crude oil reserves decreased -4.258 mmb to 445.773 mmb. There is now a -88.862 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 31: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 32: US Oil Inventories: SPR Less Commercial



Source: EIA, SAF

Oil: US gasoline prices down $0.09 this week to $3.08

US gasoline prices

US gasoline prices were down $0.09 this week to $3.17 as of yesterdayt. Yesterday, AAA reported that US national average prices were down $0.09 this week to $3.08 on Dec 16, which is down $0.26 MoM from $3.34, and down $0.10 YoY from $3.18. Remember US gasoline prices started to ease below $4 in August 2022 and were helped in Q4/22 by the SPR releases. The big reason for the drop in US gasoline prices over the past three months was the expected big drop in California gasoline prices following the surprise late Sept Gov Newsom move to then immediately switch to cheaper winter blend gasoline. That plus lower oil prices has meant a big cut in California gas prices. Yesterday, AAA reported California average gasoline prices were down $0.10 WoW to $4.62, and are now down $0.41 MoM and up $0.20 YoY.

Oil: Crack spreads up $2.23 WoW to $24.79

Crack spreads basically flat this week

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. This week, crack spreads were up $2.23 WoW to $24.79, which followed $22.56 on Dec 8, $22.50 on Dec 1, $23.36 on Nov 24, $23.95 on Nov 17, $22.39 on Nov 10, $21.65 on Nov 3, and $20.47 on Oct 27. Crack spreads at $24.79 are now almost $5 above the high end of the more normal pre-Covid that was more like $15-$20, which should support the continued seasonal ram up in refinery runs.

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, which was $24.79 as of the Friday Dec 15, 2023 close.

Figure 33: Cushing Crude Oil 321 Crack Spread Dec 15, 2013 to Dec 15, 2023

Source: Bloomberg

Oil: Trans Mountain warns TMX expansion delay could be 2 years

Potential 2-year delay to TMX startup

There was a big shock from Trans Mountain on Thursday. We tweeted [LINK] "*WOW! #TransMountain warns #TMX could be delayed by ~2 yrs & suffer $billions in losses unless get relief. See 👇CER filing. Thx @RodNickel_Rtrs for flagging. [LINK] #OOTT."* Our tweet included the excerpt from Trans Mountain's Thursday filing with the Canada Energy Regulator wherein they warned that, unless it can move on the rejected move for a pipeline variance, "*If Trans Mountain proceeds with the current plan to install NPS 36 pipe, there is a significant risk that the borehole will become compromised, or the HDD will fail altogether. If the HDD fails and Trans Mountain is required to implement an alternative installation plan, the TMEP schedule will likely be delayed by approximately two years, and Trans Mountain will suffer billions of dollars in losses. These outcomes would not be in the public interest*." The potential 2-year delay was a surprise to everyone who would have assuming a potential delay of a few months, perhaps six months.

10/03/23: Trans Mountain CEO says $200 mm for every month of delay

The Trans Mountain CER filing said the delay could end up in billions of dollars in losses. Here is what we wrote in our Oct 8, 2023 Energy Tidbits memo. "The Calgary Herald interview with Trans Mountain CEO Farrell did not specifically address the B.C. First Nation saying it was entitled to an appeal of the CER approved minor route change. But CEO Farrell's timing for line-fill to start end of Jan and commercial operations at the loading terminal by the end of March, which suggests she doesn't see any risk to her timeline for TMX startup. On Tuesday, we tweeted

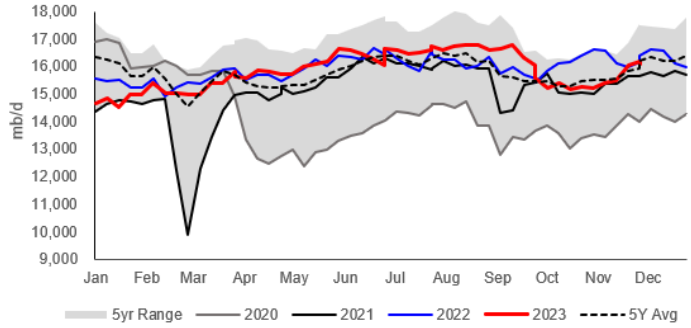
[LINK] "*Risk to timing, hopefully only small, for 1st #Oil at TMX expansion? Seems hard for CER to not hear A.B.C First Nation appeal on the route change. CER Mission statement 👇incl "recognizing and respecting the rights of the Indigenous peoples of Canada"? Thx @AmandaMsteph. #OOTT."* The Canadian Press had reported [LINK] "*In a letter to the regulator dated Wednesday, a lawyer representing the Stk'emlupsemc te Secwepemc Nation (SSN) said the decision to grant the route deviation Monday without providing its reasons has left the First Nation without the ability to decide its next steps. Article content. The letter said the First Nation has the right to request a reconsideration of the decision, or to appeal it through the Federal Court of Appeal."* We have to believe the key reason that Trans Mountain isn't seeing any impact to its timing is that money talks and the owner of the pipeline is the Cdn government and not private sector. And CEO Farrell indicates that every month of delay is $200 million. The Calgary Herald wrote "*I think we're close (on the latest price tag). For sure, there's pressure on it because every time there's a bit of a delay or you have to do a regulatory hearing, or you have to find a new methodology, that puts pressure on the contingency and on the reserve. But we are close, in that range," she added, noting rising interest rates are another factor. "The biggest pressure on this project right now is the timing, for sure. So every month of delay is $200 million that accrues to the project."*

Oil: Refinery inputs down -0.104 mmb/d WoW to 16.097 mmb/d

Refinery inputs -0.104 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. There was the normal summer ramp up that lasted a little longer than normal given the big crack spreads. We saw the decline in crude oil inputs for the fall turnarounds, but it looks like US refineries have come out of turnarounds so we have been seeing a steady increase in crude inputs, apart from this week's -0.104 mmb/d decrease. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended December 8 [LINK]. The EIA reported crude inputs to refineries were down -0.104 mmb/d this week to 16.097 mmb/d and are down -0.029 mmb/d YoY. Refinery utilization was down -0.3% WoW to 90.2%, which is -2.0% YoY. We likely hit the seasonal peak in refining in September.

Figure 34: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports -0.423 mmb/d WoW as oil imports down -0.991 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were down -0.991 mmb/d to 2.746 mmb/d for the December 8 week. US imports were down -0.991 mmb/d to 6.517 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) The WoW increase in US imports was driven mostly by "Top 10". The Top 10 was down -1.036 mmb/d. Some items to note on the country data: (i) Canada was down -0.400 mmb/d to 3.572 mmb/d. (ii) Saudi Arabia was down -0.084 mmb/d to 0.316 mmb/d. (iii) Mexico was down -0.243 mmb/d to 0.633 mmb/d. (iv) Colombia was down -0.075 mmb/d to 0.214 mmb/d. (v) Iraq was down -0.081 mmb/d to 0.085 mmb/d. (vi) Ecuador was down -0.019 mmb/d to 0.233 mmb/d. (vii) Nigeria was down -0.115 mmb/d to 0.111 mmb/d.

Figure 35: US Weekly Preliminary Imports by Major Country

(thousand b/d)	Sep 8/23	Sep 15/23	Sep 22/23	Sep 29/23	Oct 6/23	Oct 13/23	Oct 20/23	Oct 27/23	Nov 3/23	Nov 10/23	Nov 17/23	Nov 24/23	Dec 1/23	Dec 8/23	WoW
Canada	3,645	3,287	3,880	3,291	3,544	3,723	3,387	3,485	3,873	3,835	3,846	3,243	3,972	3,572	-400
Saudi Arabia	383	383	383	291	67	208	436	294	192	242	224	141	400	316	-84
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	1,095	603	844	524	656	609	614	1,004	465	366	971	571	876	633	-243
Colombia	211	287	286	143	289	150	146	74	364	316	217	143	289	214	-75
Iraq	248	233	280	306	247	127	182	351	187	283	36	178	166	85	-81
Ecuador	0	134	167	125	0	0	92	133	61	36	126	112	252	233	-19
Nigeria	219	0	3	0	46	48	89	30	39	70	79	174	226	111	-115
Brazil	545	209	240	209	362	63	221	168	234	135	257	148	274	255	-19
Libya	0	0	0	89	88	47	86	106	0	86	86	0	87	87	0
Top 10	6,346	5,136	6,083	4,978	5,299	4,975	5,253	5,645	5,415	5,369	5,842	4,710	6,542	5,506	-1,036
Others	1,236	1,381	1,146	1,237	1,030	967	760	780	979	1,004	687	1,123	966	1,011	45
Total US	7,582	6,517	7,229	6,215	6,329	5,942	6,013	6,425	6,394	6,373	6,529	5,833	7,508	6,517	-991

Source: EIA, SAF

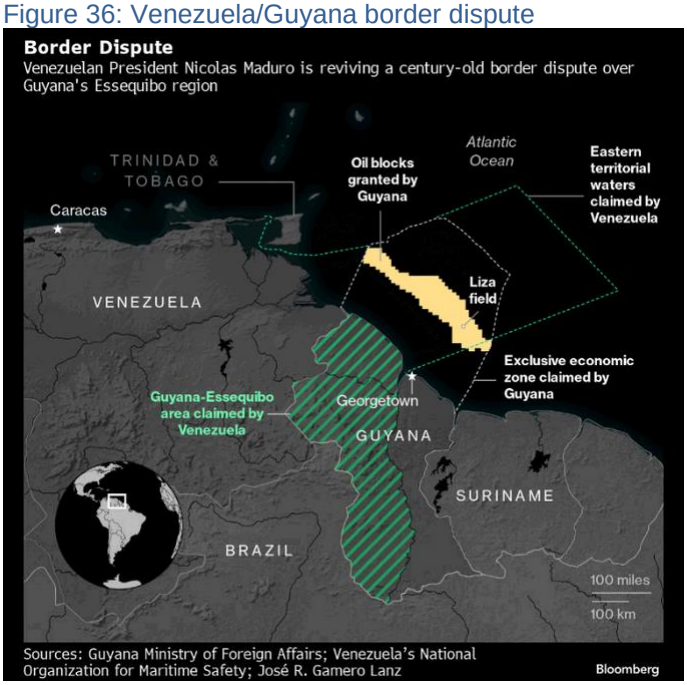
Oil: Venezuela agrees it will not threaten or use force against Guyana

Venezuela Guyana 11 point statement

Yesterday, we tweeted [LINK] "*VEN/GUY 11-pt statement. Headline is VEN will not threaten or use force vs Guyana re the "border controversy". But no resolve yet as VEN doesn't recognize International Court jurisdiction. VEN/GUY to meet again within 3 mths on "territory in dispute". #Maduro #OOTT* " Maduro and Guyana President Irlaan Ali met in St. Vincent on Thursday. On Friday, the Guyana govt released the 11-point joint statement agreed to by Guyana and Venezuela. The headline was all about "*Agreed that Guyana and Venezuela, directly or indirectly, will not threaten or use force against one another in any circumstances, including those consequential to any existing controversies between the two States*." Ie. that Venezuela agreed to not threaten or use force against Guyana. But the statement also notes the continued disagreement on the territory in dispute. It said "*Noted Guyana's assertion that it is committed to the process and procedures of the International Court of Justice for the resolution of the border controversy. Noted Venezuela's assertion of its lack of consent and lack of recognition of the International Court of Justice and its jurisdiction in the border controversy*." And despite Ali's position that nothing to discuss, the joint statement also notes they are meeting again on this dispute. "*Both States agreed to meet again in Brazil, within the next three months, or at another agreed time, to consider any matter with implications for the territory in dispute, including the above-mentioned update of the joint commission*." The consensus view was that no one can trust Maduro even with the agreed statement. No one

knows Maduro would do in this but our expected case is that Maduro is leaving this dispute so he can leverage the potential risk into something more from the US. Our Supplemental Documents package includes the 11-point joint Guyana/Venezuela statement. [LINK]

Figure 36: Venezuela/Guyana border dispute



Source: Bloomberg

Venezuela Guyana 11 point statement

Oil: Is Maduro just trying to have a chip to use with Biden with this Guyana dispute?

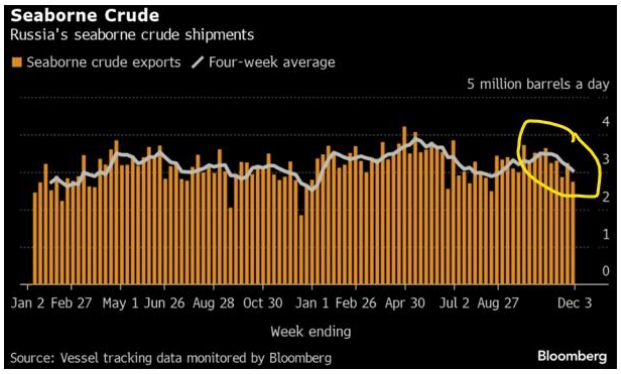
One of the common views seems to be that Maduro has elevated the territory dispute with Guyana to get Venezuelans to broadly support something of Maduro's in the run up to the 2024 election. No one knows what Maduro will do as he is unpredictable. But we are in the camp that doesn't expect him to take any type of military action to capture the Guyana lands and cause interruptions to the Exxon et al offshore Guyana production and development. Maduro also knows that all of his neighbours are against any such action and we don't see him wanting to risk any neighbour support for him. So we have to believe there is a reason and the question is what does Maduro expect to get. In the 11-point joint statement with Guyana, he has clearly stated he still sees the disputed lands are Venezuela's and that still leaves the risk out there even if he has agreed to not threaten or use force to take over the lands. Again, no one knows. However, we believe he is leaving the potential threat or uncertainty on what he could do against Guyana for potential chip to use against the US on their sanctions relief. It is a reminder to the US that there is the risk to Guyana oil, which means that there is risk to the US supermajors, Exxon and Chevron and also to Biden with oil supply to the global market in an election year. If Biden tries to put back on sanctions, it would have a bigger impact on global oil prices if Maduro were to somehow cause any interruption to Guyana oil production. We have to wonder if this play is really about trying to have a chip to use against Biden.

Oil: Russia crude oil shipments +910,000 b/d WoW post Black Sea storms disruption

Russia oil shipments less than commitment

One of the three negative oil stories on Tuesday was the big WoW jump in Russia oil shipments. On Tuesday, we tweeted [LINK] "*Big +0.91 mmbd WoW increase in Russia #Oil shipments to 3.76 mmbd for Dec 10 wk. Increase was expected as prior weeks were down due to Black Sea storms. 4-wk ave to Dec 10 now 3.2 mmbd, just below 3.28 mmbd commitment. Thx @JLeeEnergy #OOTT."* It was expected to see a big WoW increase as prior week's loadings were impacted by storms in the Black Sea. But the +0.91 mmb.d WoW to 3.76 mmb/d increase was a big sticker shock number and well above Russia's commitment to keep exports to ~3.28 mmb/d. So the sticker shock hit even though the 4-week average was still 3.2 mmb/d or less than the 3.28 mmb/d commitment. The other facto that likely helped increase the Rusia oil shipments was the lower Russian refinery runs for the week ended Dec 6 that would free up more crude for export. Bloomberg wrote "*Russia's seaborne crude exports climbed on a four-week average basis, driven by a big jump in weekly flows after storms that disrupted Black Sea shipments finally abated. Loadings soared at the port of Novorossiysk, with a full week of uninterrupted activity. About 3.2 million barrels a day of crude were shipped from Russian ports in the four weeks to Dec. 10, tanker-tracking data monitored by Bloomberg show. That was up by 114,000 barrels a day from the revised figure for the period to Dec. 3. The more volatile weekly average leaped to the highest since early July." "The figure for weekly flows rose sharply. Using this measure, shipments soared to 3.76 million barrels a day, up by about 910,000 barrels a day from the revised figure for the period to Dec. 3. Weekly shipments were the highest in more than five months."* Our Supplemental Documents package includes the Bloomberg report.

Figure 37: Russia's seaborne crude shipments thru Dec 10 week



Source: Bloomberg

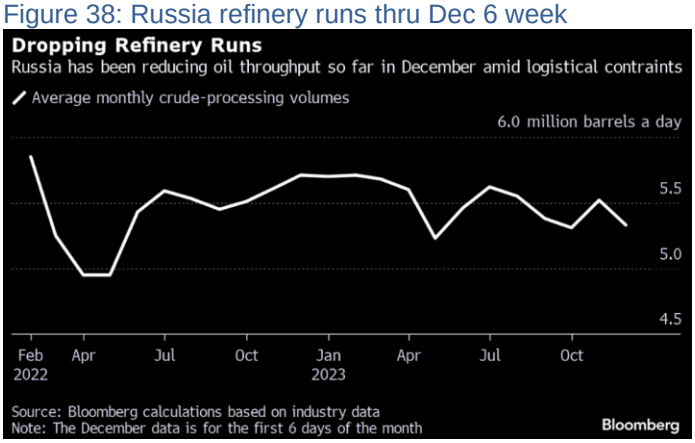
Oil: Russian refineries processed less oil with refinery downtime

Russia oil refinery runs down

It was the same story as last week for Russian oil refineries for the week ended Dec 6 – they processed less oil due to refinery downtime. This also means that more Russian crude oil would be freed up for exports. On Monday, Bloomberg reported "*Russia's oil processing in early December fell to a seven-week low as logistical constraints weighed on refineries. The nation's plants processed 5.33 million barrels of crude a day in the first six days of the month, down about 81,000 barrels a day from the prior week's average, according to a person with knowledge of industry data. That's a second week of decline and the lowest rate since the second half of October, Bloomberg calculations show. Several major refineries in three areas*

— southern and central Russia and the Volga region — led the downturn, the person said, asking not to be identified as the information isn't public. Declines were noted at Rosneft PJSC's Tuapse, Ryazan and Saratov plants, at Lukoil PJSC's Volgograd, Nizhny Novgorod and Perm facilities and at Surgutneftegas PJSC's Kirishi site, the person said. Cuts were mainly due to logistical constraints that were aggravated by a recent storm in the Black Sea, a key route for fuel exports, the person said." Our Supplemental Documents package includes the Bloomberg report.

Figure 38: Russia refinery runs thru Dec 6 week



Source: Bloomberg

Oil: OPEC MOMR: no material changes to forecasts, upward revision to Sept oil stocks

OPEC Monthly Oil Market Report

On Wednesday at 5:30am MT, OPEC released its Monthly Oil Market Report Dec. (i) We thought the takeaway was slightly negative compared to the November MOMR. There were immaterial changes to OPEC's non-OPEC supply forecast and no change to demand projections. The negative aspect of this month's release was the upward revision to OPEC's estimate of global oil + products stocks at Sept 30 by ~48.00 mmb. (ii) There were no revisions to 2023 demand, staying flat at +2.46 mmb/d YoY growth to 102.11 mmb/d. (iii) Quarterly demand changes for 2023. Q1/23 decreased slightly to 101.57 mmb/d (was 101.58). Q3/23 increased slightly to 102.12 mmb/d (was 102.11 mmb/d). (iv) No change to 2024 demand growth either. (v) OPEC still forecasts increasing oil demand for OECD countries at +0.26 mmb/d YoY to 46.08 mmb/d ie not reaching peak oil demand. (vi) Non-OECD is forecast +1.99 mmb/d YoY to 58.28 mmb/d (was 58.27 mmb/d) in 2024 with the largest growth being China +0.58 mmb/d YoY to 16.68 mmb/d and the Middle East +0.38 mmb/d YoY to 9.01 mmb/d. Other Asia non-OECD +0.31 mmb/d YoY to 9.59 mmb/d (was 9.57 mmb/d). India +0.22 mmb/d YoY to 5.59 mmb/d. (vii) Non-OPEC supply was held flat for 2023 at +1.78 mmb/d YoY and full year average of 67.59 mmb/d. For 2024, OPEC forecasts non-OPEC supply at +1.37 mmb/d YoY to 68.96 mmb/d (from 68.97 mmb/d). Key YoY non-OPEC growth areas for 2024 are US +0.61 mmb/d (unchanged), Canada +0.24 mmb/d (unchanged), Guyana at +0.16 mmb/d (unchanged), Brazil at +0.12 mmb/d (unchanged), Norway +0.12 mmb/d (unchanged) and Kazakhstan +0.06 mmb/d (was +0.08). (viii) OPEC Secondary Sources for November were -57,000 b/d MoM to 27.837 mmb/d. There were no major changes on a country basis, but some revisions were Angola down -37,000 b/d MoM to 1.130 mmb/d, and Iraq down -77,000 b/d MoM to 4.278 mmb/d. (ix) Direct

Communications (what the OPEC countries report). There were a few items to note vs what countries directly reported vs Secondary Sources estimates: Angola says it produced less at 1.084 mmb/d in Nov vs secondary sources of 1.130 mmb/d. Iran does not provide production numbers. Iraq does its norm and says it produced less at 4.093 mmb/d in Nov vs. Secondary Sources of 4.278 mmb/d, Saudi Arabia says it produced 8.818 mmb/d in Nov vs Secondary Sources of 8.998 mmb/d (it's not normal for the Saudis to have such a big variance), and Venezuela does its norm and says it produced more at 801,000 b/d vs. Secondary Sources of 780,000 b/d. (x) Our Supplemental Documents package includes excerpts from the December OPEC MOMR.

OPEC Dec MOMR sees big draw on global oil stocks in Q4/23

The item that caught our eye on the OPEC MOMR forecasts is their forecast for big oil stock draws in Q4/23. We tweeted [LINK] *"#OPEC's big #Oil call in its monthly Dec MOMR. Call on OPEC est +2.73 mmb/d QoQ to 31.12 mmb/d in Q4/23. Vs Secondary Sources OPEC Oct 27.895 mmb/d & Nov 27.837 mmb/d. Could be almost 3 mmb/d deficit in Q4/23! #OOTT."* This is the big call in OPEC's MOMR Dec -their forecast for a big increase deficit of demand vs non-OPEC supply in Q4/23. This is the argument that bulls have had is that that the physical markets is much tighter than expected. Dec MOMR forecasts a deficit of 31.12 mmb/d in Q4/23, which means if OPEC stays disciplined, it's a big hit to oi inventories in Q4/23.

Figure 39: OPEC forecasts big draw on global oil stocks in Q4/23

Table 10 - 1: Supply/demand balance for 2023*, mb/d

	2022	1Q23	2Q23	3Q23	4Q23	2023	Change 2023/22
(a) World oil demand	99.66	101.57	101.47	102.12	103.28	102.11	2.46
Non-OPEC liquids production	65.81	67.72	67.62	68.29	66.73	67.59	1.78
OPEC NGL and non-conventionals	5.39	5.44	5.47	5.43	5.43	5.44	0.05
(b) Total non-OPEC liquids production and OPEC NGLs	71.21	73.15	73.10	73.72	72.16	73.03	1.82
Difference (a-b)	28.45	28.42	28.37	28.40	31.12	29.08	0.63
OPEC crude oil production	28.86	28.82	28.28	27.56			
Balance	0.41	0.40	-0.10	-0.84			

*Note: * 2023 = Forecast. Totals may not add up due to independent rounding.*
Source: OPEC.

Source: OPEC MOMR Dec

IEA Oil Market Report

Oil: IEA lowers 2024 demand by -0.1 mmb/d to 102.8 mmb/d due to -0.2 revision to 2022

On Thursday, the IEA released its monthly Oil Market Report for December at 2am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. (i) Hmmm! The headlines coming out of the reporting on the Dec OMR were on lowering of oil demand forecast. The reality is the reduction to demand for 2023 and 2024 is basically due to the IEA revising downward its lookback at 2022 demand. (ii) 2023 demand. Dec OMR says +2.3 mmb/d to 101.7 mmb/d vs Nov OMR +2.4 mmb/d to 102.0 mmb/d. So YoY growth revised down by 0.1 mmb/d but apparent 0.2 mmb/d downward revision to 2022 means 2023 demand is down to 101.7 mmb/d vs Nov OMR of 102.0 mmb/d. (iii) 2024 demand. Dec OMR 2024 demand forecast growth is unchanged increased to +1.1 mmb/d but demand reduced to 102.8 mmb/d. Nov OMR was +0.9 mmb/d YoY to 102.9 mmb/d. the key reason is the downward -0.2 mmb/d revision to 2022. So Dec OMR is 102.8 mmb/d vs Nov OMR 102.9 mmb/d. (iv) Despite the downward growth revision to 2022, 2023 demand is still a record high, well above the pre-covid record of 100.5 mmb/d, and 2024 is

another new record for oil demand. Don't forget all the IEA comments years ago about pre-Covid could be peak demand. (v) Dec OMR keeps what we saw in the last few OMRs in that the IEA has now fully walked back what stood out to us as an unusual assumption for their Q1/24 oil demand. In their June OMR, the IEA had a massive -2.0 mmb/d QoQ drop in Q1/24 vs Q4/23. The normal seasonal pattern is for Q1 to be down sequentially QoQ vs the prior year Q4. But the 2.0 mmb/d QoQ drop was way higher than normal. They walked that QoQ decline to -1.9 mmb/d in July OMR, then -1.6 mmb/d QoQ in Aug OMR, then -1.4 mmb/d QoQ in the Sept OMR, then -1.3 mmb/d QoQ in the Oct OMR, -1.3 mmb/d QoQ in the Nov OMR, and now a -0.8 mmb/d QoQ decline in the Dec OMR. Six months ago, we looked at some of the older pre-Covid OMR reports and didn't see any QoQ forecasts this big, rather it was more like 1.0 mmb/d QoQ. (vi) IEA slightly increased non-OPEC supply. For 2023, Dec OMR is now +2.2 mmb/d YoY to 67.8 mmb/d, higher growth due to a -0.4 mmb/d downward revision to 2022 non-OPEC supply (would now be 65.6 mmb/d vs last month's 66.0 mmb/d). For 2024, non-OPEC supply, is up +1.2 mmb/d YoY to 69.0 mmb/d (was +1.2 mmb/d YoY to 68.9 mmb/d). The only change that was more than 0.1 mmb/d was from the Americas (including US) with 27.9 mmb/d vs Nov OMR at 27.7 mmb/d. (vii) Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 40: IEA Global Demand Forecast by OMR Report

mmb/d	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	23-22	Q1/24	Q2/24	Q3/24	Q4/24	2024	24-23
Dec 23	99.6	100.2	101.7	102.8	102.2	101.7	2.1	101.4	102.4	103.4	103.9	102.8	1.1
Nov 23	99.6	100.3	101.7	103.0	102.8	102.0	2.4	101.5	102.4	103.5	104.1	102.9	0.9
Oct 23	99.6	100.4	101.8	102.7	102.6	101.9	2.3	101.3	102.2	103.5	103.9	102.7	0.8
Sep 23	99.6	100.4	101.7	102.6	102.5	101.8	2.2	101.1	102.6	104.0	103.5	102.8	1.0
Aug 23	100.0	100.6	102.0	102.9	103.1	102.2	2.2	101.5	102.6	104.2	104.3	103.2	1.0
July 23	99.9	100.5	101.4	103.1	103.3	102.1	2.2	101.4	102.6	104.3	104.5	103.2	1.1
June 23	99.9	100.5	101.6	103.4	103.5	102.3	2.4	101.5	102.5	104.1	104.4	103.1	0.8
May 23	99.9	100.5	101.3	103.0	103.1	102.0	2.1						
Apr 23	99.9	100.4	101.2	103.1	103.0	101.9	2.0						
Mar 23	99.9	100.7	101.3	101.9	101.9	101.5	1.6						
Feb 23	100.0	100.1	101.1	102.9	103.5	101.9	1.9						
Jan 23	99.9	99.6	100.8	102.9	103.5	101.7	1.8						
Dec 22	99.9	99.7	100.6	102.7	103.4	101.6	1.7						
Nov 22	99.8	99.6	100.5	102.3	103.0	101.4	1.6						

Source: IEA, Bloomberg, SAF

Additional OPEC+ cuts should offset IEA's Q1 demand forecast

One item that didn't get much attention on the IEA Dec OMR was how the additional OPEC+ cuts should more than offset the IEA's lower call on OPEC in Q1/24 vs Q4/23. The IEA Dec OMR forecasts a call on OPEC of 28.3 mmb/d in Q4/23 and that is decreased by -0.6 mmb/d QoQ to 27.7 mmb/d in Q1/24. A QoQ decreasing call on OPEC+ in Q1 was exactly what Saudi Arabia's assumed in the recent additional OPEC+ cuts. It looks like the Dec OMR is accounting for the additional non-OPEC members of OPEC+ in the voluntary cuts. But it doesn't look like the Dec OMR assumes the additional 200,000 b/d voluntary cuts to Russia exports because that doesn't seem to work into its call on OPEC calculations that show FSU production unchanged QoQ. Even still, assuming Dec OMR did somehow work in the additional Russia oil exports into its Q1/24 call on OPEC, the announced voluntary cuts by OPEC members is 0.6 mmb/d, which would offset the Dec OMR 0.6 mmb/d lesser call on OPEC in Q1/24 vs Q4/23.

Figure 41: OPEC+ Voluntary Cuts from Nov 30, 2023 Meeting

OPEC+ cuts to production and exports post 11/30 meeting			
Updated 11:30am MT post OPEC Secretariat release			
Production Cuts	Before 11/30 meetiung	Added at 11/30 meeting	increased cut thru q1/24
	b/d	b/d	b/d
Algeria	0	51,000	51,000
Iraq	0	223,000	223,000
Kazakhstan	0	82,000	82,000
Kuwait	0	135,000	135,000
Oman	0	42,000	42,000
Saudi Arabia	1,000,000	1,000,000	0
UAE	0	163,000	163,000
	1,000,000	1,696,000	696,000
Cuts to exports		b/d	b/d
Russia - oil	300,000	300,000	0
Russia - fuel oil	0	200,000	200,000
	300,000	500,000	200,000
Total cuts	1,300,000	2,196,000	896,000
Source: OPEC, Energy Intelligence, Platts, UBS			
Preppared by SAF Group https://safgroup.ca/news-insights/			

Source: OPEC, Energy Intelligence, Platts, UBS, SAF Group

Oil: Houthis hitting container ships force major container shippers to avoid Suez Canal

Houthi targeting any ship heading to Israel

The big news this week were the confirmation that the Houthis have hit some container ships with what the US Central Command called UAV and two ballistic missiles. As a result, the largest container shipping companies, including the wo largest MSC and Maersk, will no longer send their ships thru the Suez Canal and will instead reroute via the Cape of Good Hope. (i) MSC. Yesterday we tweeted [LINK] *"#Houthis major disruption to global trade. MSC, largest container shipper, is latest to says its ships will not transit thru Suez Canal, be rerouted via Cape of Good Hope. Follows Maersk 2nd largest. Reminder 8.8 mmbd and 4.2 bcfd also goes thru Bab el Mandeb. #OOTT."* Yesterday, MSC announced [LINK] "*MSC PALATIUM III Incident in Red Sea - Rerouting Suez Traffic to Cape. On 15 December 2023 the container ship MSC PALATIUM III was attacked at approximately 09.37 UTC while transiting the Red Sea under sub charter to Messina Line. All crew are safe with no reported injuries, meanwhile the vessel suffered limited fire damage and has been taken out of service. Due to this incident and to protect the lives and safety of our seafarers, until the Red Sea passage is safe, MSC ships will not transit the Suez Canal Eastbound and Westbound. Already now, some services will be rerouted to go via the Cape of Good Hope instead. This disruption will impact the sailing schedules by several days of vessels booked for Suez transit. We ask for your understanding under these serious circumstances."* (ii) Maersk. On Friday, we tweeted [LINK] ""*we have instructed all Maersk vessels in the area bound to pass through the Bab al-Mandab Strait to pause their journey until further notice," the Danish company said a statement to AFP" [LINK] See 👇 @eiagov 8.8 mmbd & 4.2 bcf LNG thru Bab el Mandeb. #OOTT."* We couldn't find the Maersk advisory but the Times of Israel reported "*Top shipping company Maersk suspends Red Sea route after two more Houthi strikes. German company Hapag-Lloyd also suspends shipping through Bab al-Mandab Strait after one of its vessels was targeted by Yemeni rebels; ballistic missile slams into container ship. One of the world's largest shipping companies, Maersk, said Friday it was suspending its vessels' passage through a key Red Sea strait following attacks by Yemeni Houthi rebels on merchant ships. "Following the near-miss incident involving Maersk Gibraltar yesterday and yet another attack on a container vessel today, we have instructed all Maersk*

vessels in the area bound to pass through the Bab al-Mandab Strait to pause their journey until further notice," the Danish company said a statement to AFP. German shipping company Hapag-Lloyd announced it too was suspending Red Sea container ship traffic until December 18, after one of its vessels was attacked by the Houthis." Below is the Marine Insight Top 10 Largest Container Shipping Companies. Our Supplemental Documents package incudes the US Central Command Friday post and the Times of Israel report.

Figure 42: Top 10 largest container shipping companies

Source: Marine Insight

Houthis warned targeting any ship of any nationality heading to Israel

The multiple Houthi drones/ballistic missile attacks on ships in the Red Sea is consistent with their warning last Saturday. Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo. "*The big Houthis news was yesterday with the Houthis saying they will now target any ship of any nationality that is heading to Israel. We tweeted [LINK] "#Houthis expand target list. warn it will target any ship of any nationality in Red Sea/Bab el Mandeb IF it is heading to Israel. Suez Canal 101: Every ship thru the Suez has to go thru Red Sea & Bab El Mandeb. @EIAgov: 8.8 mmbd #Oil #Products & 4.1 bcfd #LNG thru Bab el Mandeb." Our tweet attached the Saba (Yemen, Houthi news) report [LINK] that "The Yemeni Armed Forces explained in a statement issued today that, after its success in imposing its decision to prevent Israeli ships from navigating in the Red and Arab Seas, and as a result of the Zionist enemy's continued commitment of horrific massacres, genocidal war, and siege against the brothers in Gaza, they announce a ban on the passage of ships heading to the Zionist entity of any nationality, it will become a legitimate ta rget for it if the food and medicine it needs does not enter the Gaza Strip. It warned all ships and companies against dealing with Israeli ports in order to ensure the safety of*

maritime navigation, stressing its full concern for the continuation of global trade movement through the Red and Arab seas for all ships and countries except for ships linked to Israel or that will transport goods to Israeli ports. The Yemeni Armed Forces also confirmed that they will implement this decision from the moment this statement is announced."

Oil: US says Houthis directly targeted US Navy ships, setting the stage for retaliation?

US admits Houthis directly target US Navy

We have to believe the US is setting the stage to justify any military action (we assume some sort of missile strike) on the Houthis. Up until Thursday, we have not seen the US admit that the Houthis drones/missiles were directly targeting US Navy ships. That seemed like a big disclosure change. Early Thursday morning we forwarded a US Central Command Wed night tweet and we tweeted [LINK] "*is this 1st time US admits Houthi drone was heading "directly" towards a US Navy ship? How much longer can US keep amazing restraint to NOT expand into regional conflict. Kudos to US Navy in shooting down drones! #OOTT."* This was the first time we recall the US acknowledging a Houthi drone was shot directly at the US Navy. The US has been criticized by some for not admitting that the Houthis were directly attacking the US Navy. Our view has been that the US has been doing all they can to try to not make this a regional battleground, which we believe the Saudi's also want to have happen. So acknowledging the direct attack on the US Navy is why we believe the US is setting the stage to justify any potential US action against the Houthis.

Did yesterday's 14 Houthis drones directly target the US Navy?

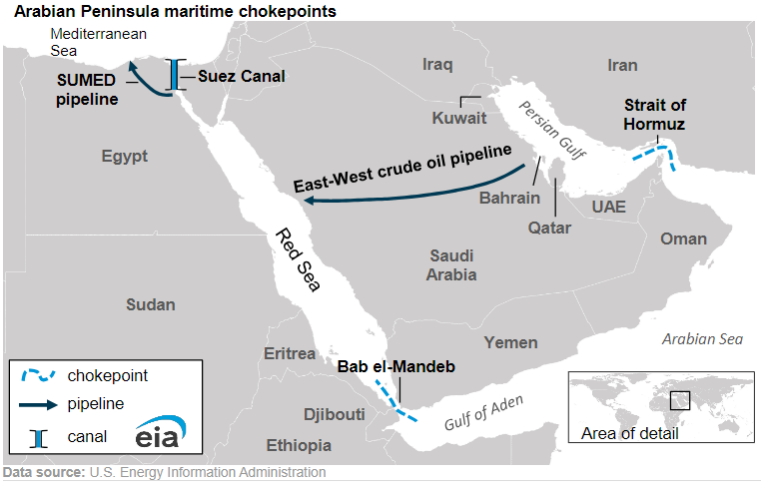
Earlier this morning, we tweeted [LINK] "*Increasing potential for US to retaliate? Certainly justified. Can't help wonder if Sat Houthis 14 drones was another one directed at US Navy? Normally, CENTCOM names specific nearby ships under attack when US steps in to defend and not just "ships in the area" #OOTT."* We wonder if yesterday's US Central Command tweet was really saying, but not saying, the Houthis 14 drones yesterday were targeting the US Navy. Normally the US Central Command tweets would reference specific shipping vessels that are under attack when the US Navy steps in to defend by shooting down missiles/drones but yesterday, they used a general "*ships in the area*". Yesterday, the US Central Command tweeted [LINK] "*In the early morning hours of December 16 (Sanna time) the US Arliegh Burke-class guided missile destroyer USS CARNEY (DDG 64), operating in the Red Sea, successfully engaged 14 unmanned aerial systems launched as a drone wave from Houthi-controlled areas of Yemen. The UAS were assessed to be one-way attack drones and were shot down with no damage to ships in the area or reported injuries. Regional Red Sea partners were alerted to the threat."* The question is if the US admitted the Thursday direct targeting of the US Navy, why not admit it yesterday? We have to believe saying a 14 drone wave directly targeting the US Navy would force an earlier decision to take action and we suspect the US is in the process of speaking with regional partners before making any final decision to take action against the Houthis. Our view continues to believe the regional partner to convince is Saudi Arabia, who we believe is doing all they can to avoid escalating any action against the Houthis into a war with the Houthis.

Bab el Mandeb chokepoint.

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

Here is what we wrote in last week's (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 43: Bab el-Mandeb Strait, a world oil chokepoint



Source: EIA

Figure 44: 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)

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**

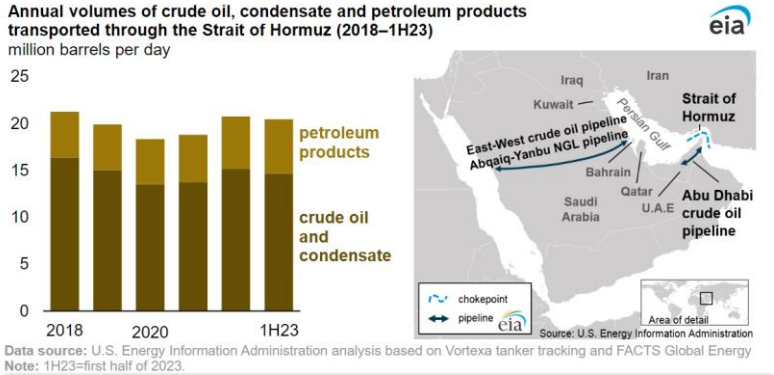
Data source: U.S. Energy Information Administration analysis based on Vortexa tanker tracking
Note: LNG=liquefied natural gas, 1H23=first half of 2023

Source: EIA

Bab el Mandeb can be worked around whereas the Strait of Hormiz can't

As we are seeing with the MSC and Maersk announcing their ships are now avoiding the Suez Canal and will take the long route via the Cape of Good Hope, there is a workaround for shipping by avoiding the Bab el Mandeb. Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo. "*The reason why the Strait of Hormuz is considered the most important chokepoint for oil and LNG is that there isn't a workaround, to the most part, if the Strait of Hormuz becomes closed. The Bab el Mandeb can be worked around, it just means a much longer voyage. Here is what we wrote in our Nov 26, 2023 Energy Tidbits memo. "To dated, the market has been focused on the Strati of Hormuz risk as it is the most important world oil chokepoint. We have been more worried to date on interruptions via the Red Sea and Bab el Mandeb but have also been noting how the Strait of Hormuz is more significant to supply if any interruption. And we have been included the EIA's latest Strait of Hormuz blog, which is four years old. But on Tuesday, the EIA updated its Strait of Hormuz blog "The Strait of Hormuz is the world's most important oil transit chokepoint" [LINK]. "The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because large volumes of oil flow through the strait. In 2022, its oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. In the first half of 2023, total oil flows through the Strait of Hormuz remained relatively flat compared with 2022 because increased flows of oil products partially offset declines in crude oil and condensate." "Between 2020 and 2022, volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz rose by 2.4 million b/d as oil demand recovered after the economic downturn from the COVID-19 pandemic. In the first half of 2023, shipments of crude oil and condensates dropped because OPEC+ members implemented crude oil production cuts starting in November 2022. Flows through the Strait of Hormuz in 2022 and the first half of 2023 made up more than one-quarter of total global seaborne traded oil. In addition, around one-fifth of global liquefied natural gas trade also transited the Strait of Hormuz in 2022." Our Supplemental Documents package includes the EIA blog. "*

Figure 45: Crude oil, Condensate & Petroleum Products Flows Thru Strait of Hormuz



Source: EIA

Figure 46: Volumes thru the Strait of Hormuz 2018-1H23

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

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

Source: EIA

Oil: Libya oil production at 1.2 mmb/d, to hit 1.4 mmb/d in 2024

Libya oil production

Libya oil production has been stable for the last several months at ~1.2 mmb/d. On Monday, the Libya National Oil Corporation (NOC) tweeted [LINK] "*Crude oil production reached 1,214,000 barrels per day, and condensate production reached 54,000 barrels per day during the past 24 hours."* The NOC has been consistent on splitting crude oil vs condensate.

12/07/23: NOC Chair Libya oil production at 1.3 mmb/d, to hit 1.4 mmb/d in 2024

We noted above how the NOC has been consistent in splitting out crude oil vs condensate. So we were a little surprised that the NOC Dec 11 tweet said Libya oil production was 1.214 b/d. We had expected to see a higher number give the Libya NOC Chair comments on Dec 7 who said Libya was producing 1.3 mmb/d of "oil". Perhaps he meant oil + condensate or maybe he was just stretching the numbers. Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo. "*Libya oil production has been stable for the last several months at ~1.2 mmb/d and been moving up closer to 1.25 mmb/d but, on Tuesday, Libya said oil production was now at 1.3 mmb/d. On Tuesday, Bloomberg reported on its interview with Libya National Oil Corporation Chairman Bengdara. Blomberg wrote "Libya is currently producing 1.3m b/d of oil, and is targeting at least 1.4m a day by the end of next year, Farhat Bengdara, chairman of the National Oil Corporation, said in an interview. * Oil exports are likely to rise to 1.1m b/d by end-2024 from 1m b/d." Libya at 1.3 mmb/d is exactly what Bengdara targeted in May*."

05/19/23: Libya NOC Chair forecast production about 1.3 mmb/d by yr-end

Here is what we wrote in our May 21, 2023 Energy Tidbits memo. *"For the past few months, we have been expecting to see some indication from the Libya National Oil Corporation of where they see oil production growth in 2023, especially since we are almost at the end of May. Libya oil production has been steady right around 1.2 mmb/d. On Friday, Bloomberg reported that Libya NOC Chair Farhat Bengdara expects production to reach ~1.3 mmb/d by yr-end 2023 and, with $17b, could reach 2 mmb/d within five years. We have been expecting a higher 2023 exit production rate given the Feb comments from one of the Libya NOC operating companies (see following item) that production to reach 1.5 mmb/d by yr-end 2023. Bloomberg wrote*

"Libya is aiming to boost oil production by about 8% by December, a level that would catapult it to the highest in a over a decade. North Africa's biggest producer should be able to pump about 1.3 million barrels a day by the end of the year, Farhat Bengdara, chairman of the National Oil Company, said in an interview. Avoiding field closures and steps like improving oil workers' pay already helped boost output by nearly a quarter since January 2022 to 1.2 million barrels a day now, he said. Libya has been dogged by political turmoil ever since the overthrow and killing of leader Moammar Al Qaddafi in 2011, with a political stalemate pitting rival governments and factions against each other." And "Bengdara said that $17 billion of investment across 45 projects would allow the National Oil Corp. to raise production to 2 million barrels a day within five years. If sustained, that would far exceed anything achieved during Qaddafi's rule."

Oil: China scheduled domestic flights stuck back at March 21-27 levels

China scheduled domestic flights

On Monday, we tweeted [LINK] "*Weak Chinese consumer, increasing respiratory cases or most likely both. China scheduled domestic flights for 5h consecutive week are ~90,000 flights and stuck back at Mar 21-27 levels. Thx @BloombergNEF Claudio Lubis #OOTT."* (i) BloombergNEF posted its Aviation Indicators Weekly Dec 13 on Monday morning. Note the report is dated Dec 13 but was released on Dec 11. Please also note BNEF is not posting any more Aviation Indicators Weekly until mid Jan. (ii) Negative. Unchanged takeaway as the last five weeks. We think the takeaway continues to be negative for China's scheduled domestic flights. The message from the "actuals" for China domestic scheduled flights is that the number of domestic flights for the last five weeks remains stuck back to Mar 21-27 levels. This is even less than the pre-summer early June levels when China was then calling for a peak in Covid wave at the end of June, before the wave of China stimulus and before international flights began to ramp up. Plus we worry about the new factor – increasing respiratory cases and I still believe this has to impact Chinese views on travel until there is clarity on what is going on. China scheduled domestic flights for the Dec 5-11 week were +0.2% WoW to 90,012 flights. This follows four weeks just above 89,500 flights, which means they are stuck at March 21-27 levels. The next 4-week lookahead is to grow 8.8% over next four weeks to 97,847, which is driven by the increasing international flights that lead to more domestic feeder flights. Recall China was still under Covid restrictions a year ago. (ii) China scheduled domestic flights were +0.2% WoW to 90,012 flights for the Dc 5-11 week, - basically flat as the prior four weeks that ranged from 89,562 to 89,810 flights. The first week below 90,000 flights was 89,776 flights for the Nov 6-13 week. Prior to that, flights were stuck for three weeks just over 92,000 flights after falling post the big Golden Week travel that saw flights at 99,490 flights for the Oct 10-16 week, 101,120 flights for the Oct 3-9 week, 97,009 flights for Sept 26-Oct 2 week and start of Golden Week travel. And below 90,000 flights is well below month ago 4-week scheduled flights where the Nov 6 report said ""*The number of scheduled domestic flights is set to grow by 4.7% over the next four weeks to 96,51*0." And that report was well below the Oct 23 report that said "*the number of scheduled domestic flights is set to grow by 39.3% over the next four weeks to 129,038*". Instead, domestic flights for the at basically at 90,000 or marginally below, or just back to March 21-27 levels. (iii) The look ahead to the next four weeks is up vs last week. Today's report says "*The number of scheduled domestic flights is set to grow 8.8% over the next four weeks to 97,957*." This is up vs last week's Dec 6 report that said "*the number of scheduled domestic flights is set to grow 7.2% over the next four weeks to 96,267*." But these are all

hugely below the Oct 23 report that said "*the number of scheduled domestic flights is set to grow by 39.3% over the next four weeks to 129,038*". The increasing domestic flights in the look ahead is likely mostly due to the increasing international flights as more international flights means more need for domestic feeder flights. Today's report says the combined number of international flights out of China for the seven major airlines "*will rise by more than 340 a week to around 3,475 by the last week of the month*". This is up vs the few weeks that were seeing the ramp up in international flights below 3,400 flights. The Dec 6 report called for "*will rise by more than 325 a week to around 3,340 by the third week of December*".. the Nov 27 report was "will rise by more than 355 a week to around 3,370 by the third week of December." And the Nov 20 report ""*will rise by more than 370 a week to around 3,315 by the second week of December*." The increasing international flights is the key factor for increasing domestic flights. Below is our running WoW changes from the prior BloombergNEF reports and the BloombergNEF charts from the Dec 6 report.

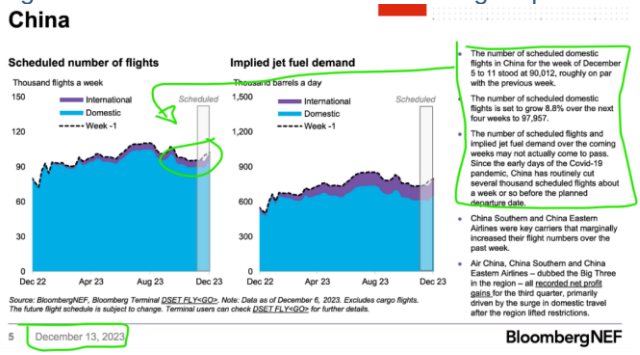
Figure 47: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

Dec 5-11: +0.2% WoW to 90,012 flights
Nov 28-Dec 4: -0.1% WoW to 89,810
Nov 21-27: +0.4% WoW to 89,916
Nov 14-20: -0-.2% WoW to 89,562
Nov 7-13: -2.6% WoW to 89,776
Oct 31-Nov 6: -0.2% WoW to 92,146
Oct 24-30: -0.3% WoW to 92,361
Oct 17-23: -6.9% WoW to 92,638
Oct 10-16: -1.6% WoW to 99,490
Oct 3-9: +4.2% WoW to 101,120
Sept 26-Oct 2: +1.3% WoW to 97,009
Sept 19-25: essentially flat WoW to 95,742
Sept 12-18: -2.7% WoW to 95,853
Sept 5-11: -5.0% WoW to 98,469
Aug 29-Sep 4: -1.2% WoW to 103,637
Aug 22-28: +0.2% WoW to 104,932
Aug 15-21: -0.1% WoW to 104,716
Aug 8-14: +0.8% WoW to 104,823
Aug 1-7: -0.4% WoW to 104,000
July 25-31: +0.4% WoW to 104,436
July 18-24: +1.3% WoW to 104,011
July 11-17: +2.8% WoW to 102,709
Jul 4-10: +2.4% WoW to 99,904
Jun 27-Jul 3: +1.9% WoW to 97,572
Jun 20-26: +3.4% WoW to 95,724
Jun 13-19: -0.9% WoW to 92,568
June 6-12: -1.2% WoW to 93,328

May 30-Jun 5: +0.2% WoW to 94,486
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW to 94,138
Apr 11-17: +0.7% WoW to 92,231
Apr 3-10: -4.2% WoW to 91,567
Mar 28-apr 3: +6.8% WoW to 95,624
Mar 21-27: +1.5% WoW to 89,513
Mar 14-20: -0.6% WoW to 88,166
Mar 7-13 week: -0.8% WoW to 88,675
Feb 27-Mar 3 week: -2.6% WoW to 89,430
Feb 21-27 week: +0.0% WoW to 91,828
Feb 14-20 week -0.5% WoW to 91,561
Feb 7-13 week -0.7% WoW to 92,007
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW to 83,500
Jan 17-23 week +7% WoW to 91,959
Jan 10-16 week +20% WoW to 85,910
Jan 3-9 week: -5.3% WoW to 71,642
Dec 27-Jan 2 week: -5.6% WoW to 75,652

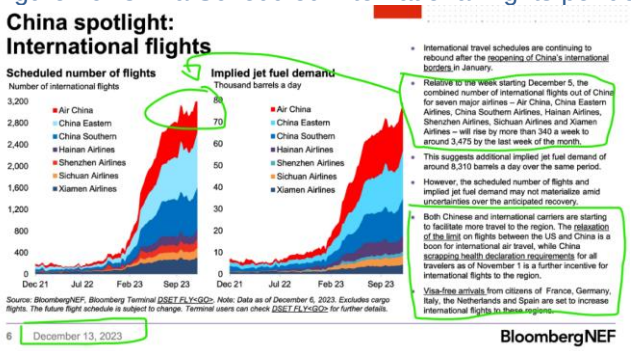
Source: BloombergNEF

Figure 48: China Scheduled Domestic flights per Dec 13 report



Source: BloombergNEF

Figure 49: China Scheduled International flights per dec 6 report



Source: BloombergNEF

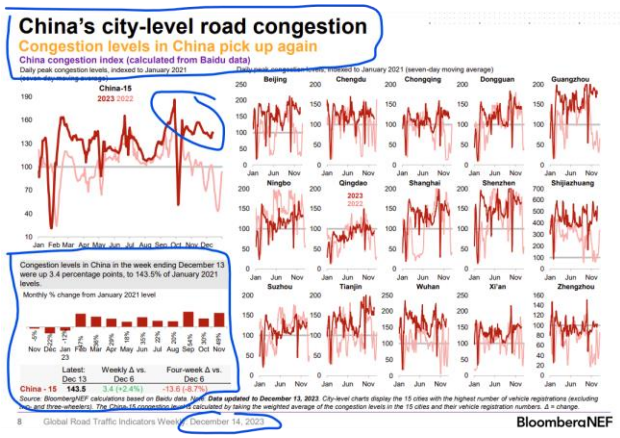
Oil: Baidu China city-level road congestion inched up after 3 down weeks

China city-level traffic congestion

On Thursday, we tweeted [LINK] "*China stalled economy, increasing respiratory cases & snow in Beijing/northern China are all likely holding back any big recovery in Baidu road congestion levels. Dec is big MoM decline in city-level road congestion with 12 of 15 top cities down MoM. Thx @BloombergNEF. #OOTT."* (i) BloombergNEF posted its Global Road Traffic Indicators Dec 14, which includes the China Baidu city-level road congestion data for week ended Dec 13. (ii) BNEF's report was titled "*China inches up after prolonged downward trend*" and the later headlines were, "*Congestion levels in China pick up again*" and "*Late 2023 traffic levels remain elevated*". (iii) Note BNEF says this is the last edition of road traffic indicators for 2023, (iv) Negative. There was WoW increase in Baidu China city-level road congestion data for Dec 13 that followed three WoW decrease. Dec 2023 to date is 111 of Dec 2021,which is less than Nov 2023 was of Nov 2021 and Oct 2023 that was 116 pf Oct 2021 levels. So the increase in city level road congestion compared to the same months in 2021 has paused. Is it the stalled China economy or increasing respiratory cases, or I expect some of both. But the level of city road congestion vs same period in 2021 has stalled. Nov was the best month relative to 2021 this year other than Feb 2023 that was 240 of Feb 2021 as it was the first Chinese New Year without Covid restrictions. Less driving is a a good indicator that less people out and about and spending money. (v) For the week ended Dec 13, Baidu data for China city-level road congestion was +2.4% WoW to 143.5 of Jan 2021 levels. This is the first WoW increase after three consecutive WoW declines. Hence the reason why the report was titled "China inches up after prolonged downward trend". This follows -1.8% WoW for Dec 6 week, -3.5% WoW for Nov 29 week and -5.5% WoW for Nov 22 week. There was a notable drop off in Nov. Nov was the best road congestion month relative to 2021 other than Feb 2023 that was the first Chinese New Year without Covid restrictions. For the 1st 13 days of Dec, the top 15 cities, in aggregate, were 111% of Dec 2021 levels vs Dec 2022 that was only 60% of Dec 2021 levels. The big increase was expected as China was still in some sort of Covid restrictions prior to 2023. But Dec 2023 relative to Dec 2021 is well below Nov 2023 vs Nov 2021 where the top 15 cities, in aggregate, were 129% of Nov 2021 levels. (vi) As noted above, the Baidu data is only for 13 days of Dec. Remember China was still under Covid restrictions a year ago. For the Top 15 cities in aggregate, MTD to Dec 13 was 111% of Dec 2021 levels vs Dec 2022 that was only 60% of Dec 2021 levels. For Dec 2023, all of the top 15 cities are higher YoY vs Dec 2022 that had Covid restriction. There is a big MoM drop vs Nov 2023 and only 3 of 15 top cities

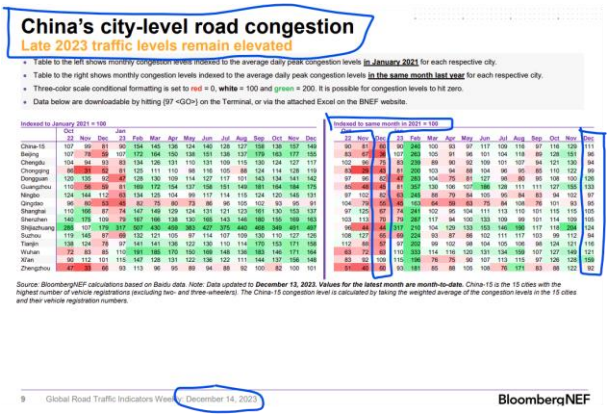
are up MoM vs Nov 2023. Vs Dec 2021, 8 of the top 15 cities are higher, whereas Nov 2023 had 14 of top 15 cities higher vs Nov 2021. Our tweet included the below two charts from the BloombergNEF Road Traffic Indicators Dec 14 weekly report.

Figure 50: China city-level road congestion for the week ended Dec 13



Source: BloombergNEF

Figure 51: China city-level road congestion for the week ended Dec 13



Source: BloombergNEF

Oil: China says Covid "mortality & severe illness rates likely to increase"

China Covid update

On Tuesday, we tweeted [LINK] "*Holdback to China mobility? "doctors told the media that they had witnessed an increase in COVID-19 infections recently & they predicted this wave of infections will last till late January 2024 with mortality & severe illness rates likely to increase" China state media. #OOTT."* Our tweet included the Global Times (Wed local time, Tues night MT) report [LINK]. Global Times is Chinese communist party media so we are always surprised when they include some quotes that seem like a warning on Covid. So when we see these types of quotes from communist party media it gets our attention. Global Times report "*The latest COVID-19 variant JN.1 is spreading around the world, leading to growing*

concerns in Chinese society, following a recent severe wave of respiratory infections. Chinese experts estimate that the variant will cause more infections in the near future, but it is not likely to seriously worsen the current situation." "Currently, the XBB variant of COVID-19 is still the main strain of the local infections in China. Many clinical doctors told the media that they had witnessed an increase in COVID-19 infections recently and they predicted this wave of infections will last till late January 2024 with mortality and severe illness rates likely to increase." "Therefore, we speculate that the future prevalence of JN.1 in our country may temporarily increase the number of COVID-19 patients and burden hospitals, but it will not significantly worsen the ongoing respiratory disease outbreaks," he said." Our Supplemental Documents package includes the Global Times report.

Global Times "hospitals across China grapple with respiratory illnesses surge"

Here is an item from our Dec 3, 2023 Energy Tidbits memo. "*On Wednesday, Global Times report "Hospitals across China grapple with respiratory illnesses surge" [LINK] noted "hospitals across China grapple with respiratory illnesses surge" Note this is for respiratory illnesses, not just the spike in mycoplasma pneumonia. "Zhou's hospital has opened pediatric wards previously used for treating COVID-19 patients to accommodate the surge in cases". Re-opening wards not used since Covid. "with a decrease in the number of children seeking treatment for mycoplasma pneumonia infection and an increase in cases of influenza, an expert from Shanghai Children's Medical Center" ie. flu cases increasing. Also note that it's not just Beijing that is advising students/teachers to stay home if sick. It's also "East China's Shandong Province", which is the 2nd most populous province in China with over 100 million people. "Both educational and health authorities in provinces including East China's Shandong Province as well as Beijing have also advised students not to take classes or do their homework when they are sick. Personal health always comes first." But China reassures world, its fine to travel to China. "Hypes are biased. Amid a surge in respiratory illnesses in China, which the country's health authorities have already attributed to known pathogens, certain overseas media reports have been sensationalizing the severity of the diseases and even raising doubts about China's transparency in dealing with respiratory illnesses. These reports have hyped concerns about whether travel restrictions should be imposed on China." "On Tuesday, when a reporter from Antara asked the spokesperson of China's Foreign Ministry about rising concerns among the international public about the safety of traveling to China as well as people who travel from China, Wang Wenbin, the spokesperson, said, "Let me assure you that it is safe to travel and do business here in China and there's no need to worry." Our Supplemental Documents package includes the Global Times report.*"

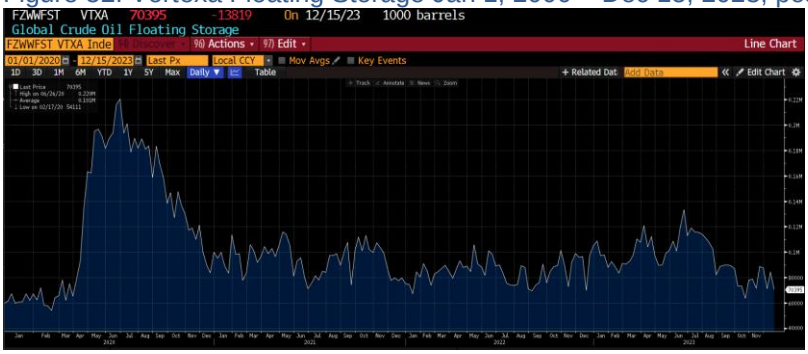
Oil: Vortexa crude oil floating storage est 70.40 at Dec 15, -13.81 mmb WoW

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 Dec 9 at 9am MT. (i) Yesterday, we tweeted [LINK] "*Floating #Oil storage 12/15 is 70.40 mmb, -13.81 WoW vs revised up 12/08 of 84.21 mmb. If not revised this wk, 12/15 of 70.40 would be 3rd lowest in last 12-mths following 10/20 of 63.49 and*

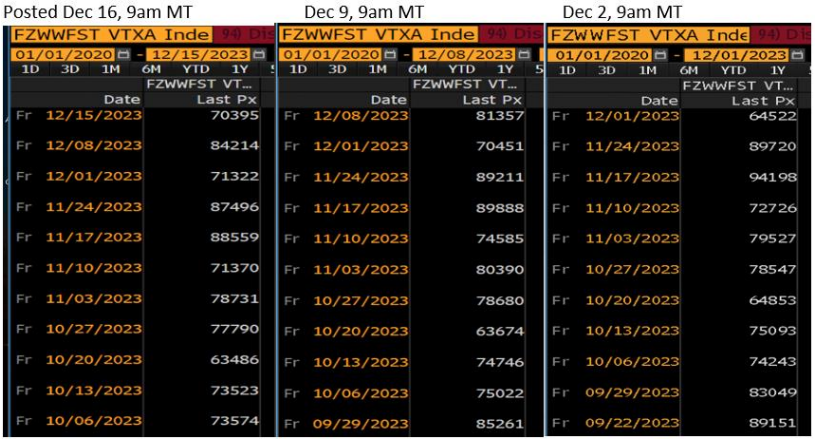
12/16/22 of 69.89. Thx @Vortexa @business #OOTT." (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Dec 15 at 70.40 mmb, which is -13.81 mmb WoW vs revised up Dec 8 of 84.21 mmb. Note dec 8 was revised +2.85 mmb vs 81.36 mmb originally posted at 9am on Dec 9. (iii) Revisions. The revisions for the prior seven weeks from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on Dec 9 are as follows: Dec 8 revised +2.85 mmb. Dec 1 revised +0.87 mmb. Nov 24 revised -1.71 mmb. Nov 17 revised -1.33 mmb. Nov 10 revised -3.22 mmb. Nov 3 revised -1.66 mmb. Oct 27 revised -0.89 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 78.87 mmb vs last week's then seven-week average of 80.65. The increase is primarily due to the negative revisions to 4 of the prior last 6 weeks. (v) 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. (vi) Note the below graph now goes back to Jan 1, 2020 and not just three years as floating storage in Apr 2020 had started to reflect the Covid impact. (vii) Dec 15 estimate of 70.40 mmb 8 estimate is +0.50 mmb YoY vs Dec 16, 2022 of 69.90 mmb. (viii) Dec 15 estimate of 70.40 mmb is -149.91 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (ix) Dec 15 estimate of 70.40 mmb is +4,79 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Dec 16, 9am MT Dec 9, and 9am MT Dec 2.

Figure 52: Vortexa Floating Storage Jan 1, 2000 – Dec 15, 2023, posted Dec 16 at 9am MT



Source: Bloomberg, Vortexa

Figure 53: Vortexa Estimates Posted 9am MT on Dec 16, Dec 9, and Dec 2



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, Dec 8, in total, was revised up 2.85 mmb. The main revisions in a region vs the originally posted (as of 9am Dec 9) floating oil storage for Dec 8 were Other revised +4.32 mmb, Asia revised +1.22 mmb, and then urope revised -1.02 mmb. (iii) The major WoW changes by region were Asia -6.46 mmb WoW and Europe -4.08 mmb WoW. (iv) Dec 15 of 70.40 mmb is down a huge 62.92 mmb vs the summer June 23, 2023 peak of 133.32 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 -37.37 mmb and Other -23.01 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 Dec 8 that was posted on Bloomberg at 9am MT on Dec 9.

Figure 54: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Dec 15/23	Dec 8/23	WoW	Dec 8/23	Jun 23/23	Dec 15 vs Jun 23
Asia	36.20	42.66	-6.46	41.44	73.57	-37.37
Europe	5.54	9.62	-4.08	10.64	6.44	-0.90
Middle East	6.98	8.14	-1.16	9.04	7.17	-0.19
West Africa	4.68	6.28	-1.60	6.54	7.62	-2.94
US Gulf Coast	2.46	2.33	0.13	2.84	0.97	1.49
Other	14.54	15.18	-0.64	10.86	37.55	-23.01
Global Total	70.40	84.21	-13.81	81.36	133.32	-62.92
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Dec 16						

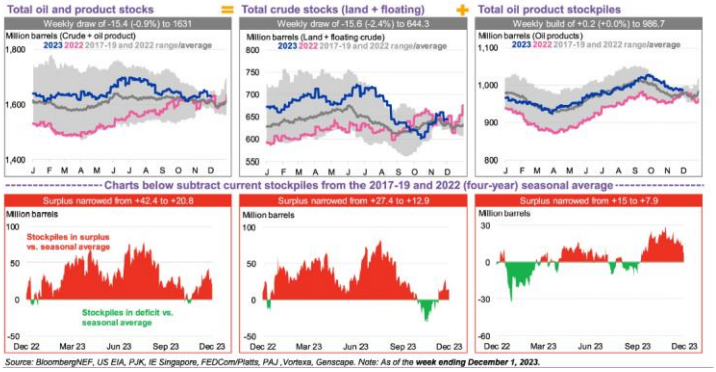
Source: Bloomberg, Vortexa

Oil: BNEF – global oil and product stocks surplus narrows WoW to 20.8 mmb

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending Dec 1, which is a week earlier than the normal EIA US oil inventory data that is for the week ending Dec 8 which was a draw of -4.3 mmb/d. On Tuesday, BloombergNEF posted its

"Oil Price Indicators" weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022, and other times using a five-year average 2016-2019 + 2022. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products surplus narrowed from 42.4 mmb to 20.8 mmb for the week ending Dec 1. (iii) Total crude inventories (incl. floating) decreased by -2.4% WoW to 644.3 mmb, while the stockpile surplus narrowed from +27.4 mmb to +12.9 mmb. (iv) Land crude oil inventories increased by +0.1 % WoW to 572.6 mmb, narrowing the deficit to -12.2 mmb against the five-year average (2016-2019 + 2022). (v) The gas, oil, and middle distillate stocks increased by +1.3% WoW to 145.7 mmb, with the deficit against the four-year average widening to -15.4 mmb. Jet fuel consumption by international departures for the week of December 18 is set to increase by +37,000 b/d WoW, while consumption by domestic passenger departures is forecast to stay flat WoW. Below is a snapshot of aggregate global stockpiles.

Figure 55: Aggregate Global Oil and Product Stockpiles



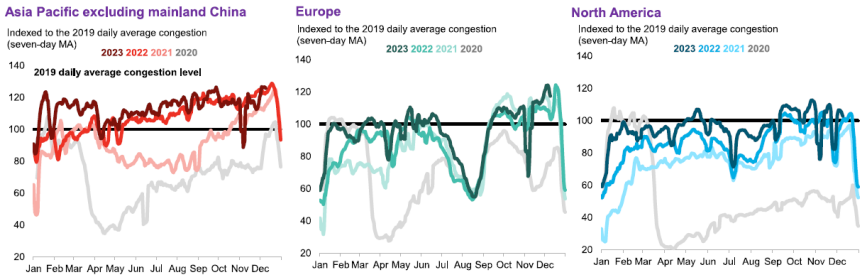
Source: BloombergNEF

Global road traffic indicators

Oil: TomTom mobility indicators: Asia-Pacific up, NA and Europe down WoW

On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly report, which recaps traffic indicators in all the major economic regions of the world i.e. mobility indicators like TomTom. For the week ending Dec 9, Asia Pacific (ex-China) increased +2.1% WoW, while Europe and North American traffic levels decreased by -3.6% and -2.0% WoW, respectively. Traffic levels in Asia Pacific (ex-China), Europe and North America are +25.8%, +17.4% and +2.8% compared to the 2019 average and are +2.1%, +13.5% and +2.7% YoY, respectively. All regions are above the 2019 daily average. It is worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 56: Mobility Indicators



	Week-on-week (2019 average = 100)				Year-on-year (same week last year = 100)			
	Latest week: Dec 9	Δ vs. Dec 2	4-week MA	Δ vs. Dec 2	Latest week: Dec 9	Δ vs. Dec 2	4-week MA	Δ vs. Dec 2
Asia Pacific ex-China	125.8	+2.6 (2.1%)	119.5	+2.8 (2.4%)	102.1	+2.5 (2.6%)	97.3	+1.6 (+1.7%)
Europe	117.4	-4.3 (-3.6%)	116.7	+5.0 (4.5%)	113.5	+1.8 (1.6%)	107.9	+5.9 (+5.8%)
North America	102.8	-2.1 (-2.0%)	99.9	+1.4 (1.4%)	102.7	-10.9 (-9.6%)	108.0	+2.0 (+1.9%)

*Source: BloombergNEF calculations based on TomTom data. Note: **Data updated to December 9, 2023**. Δ = change. MA = moving average.*

Source: BloombergNEF

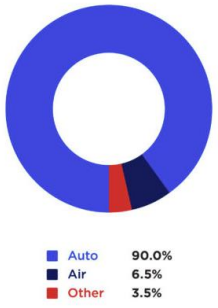
Oil: Year-end holiday travel expected to be up 2.2% YoY, 2nd highest since 2000

The AAA Travel released their 2023 Year-End Holiday Travel Forecast [LINK] on December 11. They expect 115.2mm Americans to travel this Christmas, which is a YoY increase of 2.2%, bringing volumes higher than pre-pandemic levels but lower than 2019 specifically as it was the biggest year on record for travel since 2000 with 119mm travelers. Share of car travel is up 1.8% from 2022 levels to 103.6mm people or 90.0% of total. Air travel volumes will hit the highest level since 2000 with an increase of 340,000 travelers expected to take to the skies Thanksgiving weekend, which is a 4.7% YoY increase, and 2.4% increase from 2019 levels. Our Supplemental Documents package includes the AAA release.

Figure 57: AAA Holiday Travel Mode Forecast

AAA 2023 Year-End Holiday Travel Forecast

Share of Travelers by Mode



Number of Travelers by Mode

	Auto	Air	Other	Total
2023 (forecast)	103.6M	7.51M	4.05M	115.2M
2022	101.8M	7.17M	3.66M	112.7M
2019	108.0M	7.33M	3.89M	119.3M
Growth* (2022 to 2023)	1.8%	4.7%	10.7%	2.2%
Growth* (2019 to 2023)	-4.1%	2.4%	4.1%	-3.4%

*Percentages may differ due to rounding. | Source: S&P Global Market Intelligence

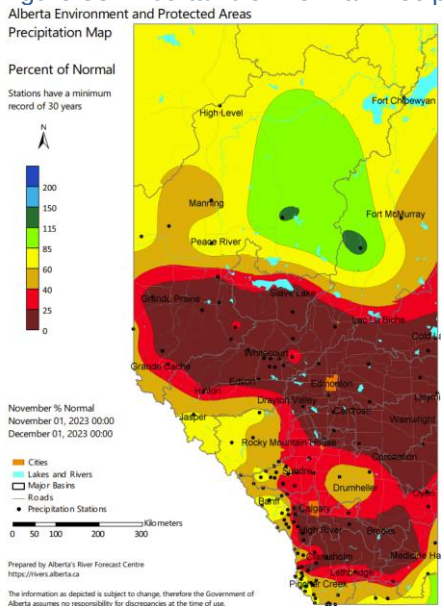
Source: AAA

Oil & Natural Gas: Already worries for 2024 that need more snowfall

Very little snowfall in Nov

It's more than halfway thru Dec and the worries are already emerging that Alberta needs more a lot more snow or else it could be a repeat of last winter when a low precipitation winter led to dry soil for farming and a very bad summer of wildfires. Last week, Alberta's River Forecast Centre posted its percent of normal precipitation for Nov and it shows how half the province had less than 40% of normal precipitation and almost all of the province had less than normal precipitation. Below is the River Forecast Centre's percent of normal precipitation map for Nov. [LINK]

Figure 58: Alberta % of Normal Precipitation For Nov 2023



Source: Alberta's River Forecast Centre

Energy Transition: Is the fear that oil consumption will keep growing unless squeezed

Guilbeault on reducing oil and gas spending

Notwithstanding what the IEA has said over the future peak in oil and gas consumption, there are no signs of peak oil consumption as they look to 2024 or in 2024 demand backing off continued growth, albeit modest. It's why the efforts of COP28 and western governments are focused on squeezing oil and natural gas supply. They may say it but aren't seeing near term signs that oil consumption has peaked. So as Canada environment Minister says, they want to reduce spending for oil and gas so they can reduce oil and gas supply to align with climate ambitions. Prior to seeing the final text of COP28, on Tuesday morning, we tweeted [LINK] "*Is the fear that #Oil consumption to keep going up unless supply is squeezed off by tax/regulations? Environment Min Guilbeault "Phasing out inefficient fossil fuel subsidies around the world ensures that spending is aligned with climate ambition." [LINK] #OOTT."*
The Guardian wrote "*The Canadian climate minister, Steven Guilbeault, urged countries to ditch subsidies sooner. "Phasing out inefficient fossil fuel subsidies around the world ensures that spending is aligned with climate ambition."* Guilbeault's saying "*ensures that spending is aligned with climate ambition*" is a key reminder that they want to squeeze capex on oil and

gas as the way to reduce oil and gas supply and less supply means less oil and gas in the global energy mix. When we read Canada Environment Minister Guilbeault's comments and think about their new methane and GHG emissions limits for the Cdn oil and gas sector, it looks like the way the Liberals will reduce Cdn oil and gas production and therefore Cdn oil and gas exports to the world will be by squeezing supply with higher costs and effective restrictions on production.

Energy Transition: Did anyone "win" at COP28?

Did anyone win at COP28?

It was interesting to see the reported reactions to the final COP28 agreement negotiated by UAE's COP President al Jaber. Saudi Arabia, the most outspoken on those who want to phase out fossil fuels were reportedly happy with the deal. But also the climate change side seemed happy as it marked the first time the world including the words transition away from fossil fuels. When we reviewed the key section on fossil fuels, we can see why both sides got something they can message on until the next COP. The lead in to the key fossil fuel section 28 is the is what will allow countries like India to determine what they can do and do their best to do what they think they can do. Countries are not committing to any specific action or target. Rather the COP28 agreement "calls on" companies to do the best they can. This is the key caveat. It calls on parties to do their best and doesn't obligate them to meet certain targets or actions. And what countries do is as they determine they can do given their own national circumstance. The point 28 lead in is "*28. Further recognizes the need for deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5 °C pathways and calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches*". So COP28 is calling on countries to do what they determine they can do on the below points. But, at the same time, it allows the western countries like Canada to drive hard saying this is the commitment they have made to the world and the world has made. Even if countries aren't committing to any specific target or actions. Rather they are all signing on to a call to do their best. It is not a commitment to do a certain amount. And it also allows more right wing governments in Europe to go at their best pace. And it allows other like India and China and African countries, etc to do what they think is right taking into account what they think is right and their different national circumstances. It's basically a do what you can approach. Here is the lead-in to point 28, on fossil fuels. "*28. Further recognizes the need for deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5 °C pathways and calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches*"

Here are what countries are being called on to do their best

We have written on many of these fossil fuel targets in point 28 and will write more of them in the coming weeks. Some are well overdue like energy efficiency improvements, which has been an item we have surprised Biden didn't prioritize from Day 1 given his experience with the success of Jimmy Carter's efficiency push post the Arab Oil Embargo in 1973/74. The subpoints under point 28 are:

"(*a) Tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements by 2030;*

(b) Accelerating efforts towards the phase-down of unabated coal power;

(c) Accelerating efforts globally towards net zero emission energy systems, utilizing zero- and low-carbon fuels well before or by around mid-century;
(d) Transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science;
(e) Accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors, and low-carbon hydrogen production;
(f) Accelerating and substantially reducing non-carbon-dioxide emissions globally, including in particular methane emissions by 2030;
(g) Accelerating the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero-and low-emission vehicles;
(h) Phasing out inefficient fossil fuel subsidies that do not address energy poverty or just transitions, as soon as possible"

The unsaid winner in COP28 is natural gas and LNG

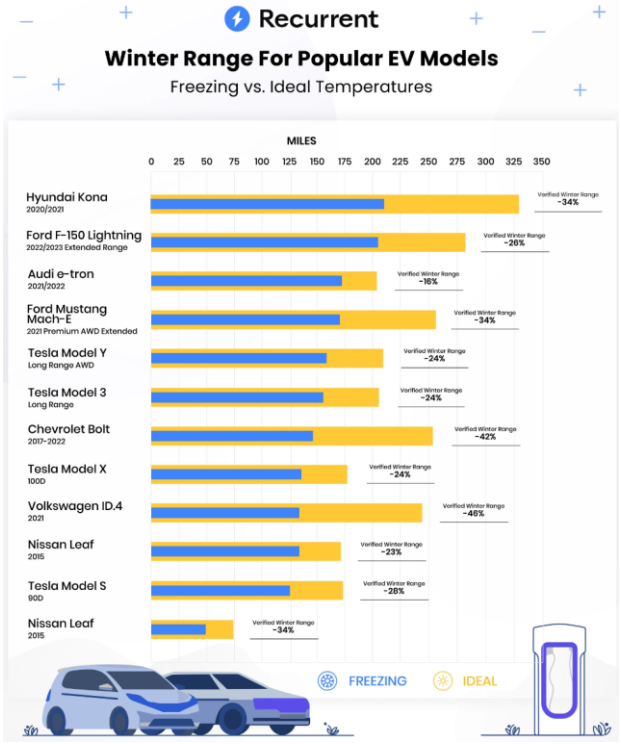
The western leaders didn't want to specifically say natural gas, a fossil fuel, is needed for longer, but that was the clear takeaway. Everyone assumed the reference to the transitional fuels is to natural gas and LNG. Pont 29 said "*Recognizes that transitional fuels can play a role in facilitating the energy transition while ensuring energy security*."

Energy Transition: EVs lose an average 29.7% of range at freezing 32F or 0C

EV lose 29.7% of range at 32F

On Friday, Bloomberg posted its story "*Your Electric Car Battery Will Drain in Cold Weather, If You Let It. Freezing winter temperatures slow the chemical reactions in EV batteries, reducing the charge they can hold — and a vehicle's range. The good news is: It's temporary".* [LINK] The story was about how temperatures at freezing (32F or 0C) will reduce EV range and what to do to mitigate the loss ie. "*keeping the cabin temperature slightly below comfort levels*". Bloomberg referenced data from Recurrent "*The colder it is, the more a car's range will suffer. From there, the specifics vary, and different EVs react to the same temperature differently. In a report published last month by Recurrent, a Seattle-based firm that surveyed more than 10,000 electric cars across 12 models, Ford's F-150 Lightning was found to lose 26% of its normal range at 32F. The Volkswagen ID.4, meanwhile, lost 46% of its normal range."* We went to the Recurrent Nov 15 study and tweeted [LINK] "*Note @RecurrentAuto #EVs range loss at freezing 32F or 0C. SB no issue for CA within city drivers w/ home charging. Challenge for EVs penetration for rural, working fleets, longer commute, Sat skiers, pickups for work, etc is CA Dec/Jan/Feb is a lot colder than freezing. #OOTT."* We forwarded the Recurrent tweet that had the below graphic showing the estimated range loss by popular EV model. On an overall group average, Recurrent wrote "*Do electric cars have less range cold temperatures? Yes, the 18 popular EV models that we analyzed had an average of 70.3% of their range in freezing conditions, but each model performs differently as our chart illustrates."* Our Supplemental Documents package includes the Recurrent report. [LINK]

Figure 59: Recurrent Winter Range for Popular EV Models, Freezing vs Ideal Temperatures



Source: Recurrent

Canada is way colder than freezing in Dec/Jan/Feb

Our above tweet [LINK] referenced the problem for Cdn EV drivers with the Recurrent study – it shows range loss at freezing temperature of 32F or 0C. Whereas other than the BC West Coast, the rest of Canada is colder than that in Dec/Jan/Feb and therefore there will be even greater range loss below freezing. So we said shouldn't be an issue for Cdn EV owners who are basically within city drivers with home charging. But we also noted the "*challenge for EVs penetration for rural, working fleets, longer commute, Sat skiers, pickups for work, etc is CA Dec/Jan/Feb is a lot colder than freezing*." That is the challenge for EVs in Canada, can they provide the comfort to drivers other than within city commuters with home charging? Our tweet included the World Climate Guide average temperatures in Dec, Jan, and Feb for major cities in Canada. The average daily low in Dec was -17.2C and high was -8.8C. The average daily low in Jan was -20.8C and high was -11.9C. The average daily low in Feb was -20.1C and high was -10.3C. Our Supplemental Documents package includes the World Climate Guide daily high table for Dec/Jan/Feb.

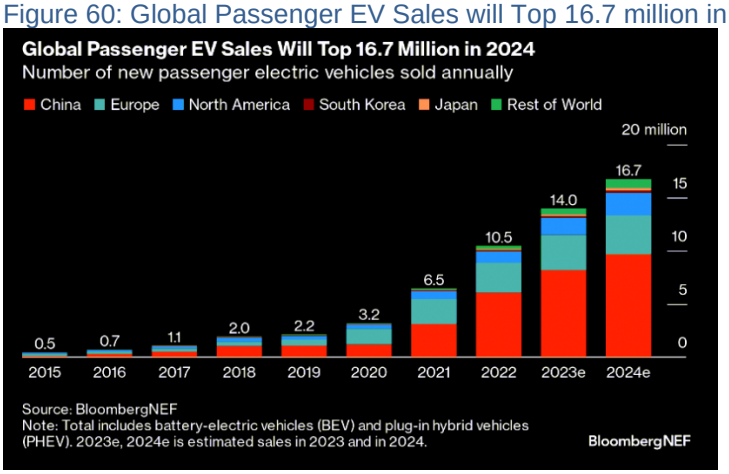
Energy Transition: BloombergNEF cuts global EV sales forecast by 4%

Global EV sales

We always highlight that no one can deny EV sales continue to show strong growth rates but also that EV sales rates are less than expected/planned. On Thursday, BloombergNEF posted its updated global EV sales forecast that calls for strong 20% YoY growth in 2024.

But their updated forecast was reduced by 4% from their prior forecast. BNEF wrote "*Global Electric Car Sales Seen Rising 20% in 2024: BNEF Chart. Global electric vehicle sales are set to reach 14 million this year from 10.5 million in 2022, according to BloombergNEF. The number of electric vehicles sold will jump to 16.7 million in 2024. The projection for next year is 4% lower than BNEF forecast previously, with the change driven mainly by lower sales in the US. The dilution of Ford and GM's EV ambitions, combined with Tesla's ageing model lineup and tougher economic conditions for US customers point to a tricky year for the country."* Below is BNEF's global passenger EV sales graph.

Figure 60: Global Passenger EV Sales will Top 16.7 million in 2024



Source: BloombergNEF

Energy Transition: Germany cuts EV subsidies as part of its budget cuts

Germany cuts EV subsidies a year early

No one should be surprised that Germany's need to slash its budget due to its debt has to involve key energy transition support items like its subsidies to buy EVs. Yesterday, Der Spiegel reported [LINK] "*From 4500 euros to zero E-car subsidy expires on Sunday*" on how Germany let the EV car subsidy expire today such that no new applications will be accepted after today. The subsidy was to expire at the end of 2024. Der Spiegel wrote "*With the funding, the German government wanted to achieve the goal of putting a total of 2030 million fully electric cars on the roads by 15. For this reason, buyers with a net list price of 40,000 euros received an environmental bonus of 4500 euros. For more expensive cars, the bonus was smaller. According to the Federal Ministry for Economic Affairs, a total of ten billion euros have been paid out since 2016 – for around 2.1 million vehicles. According to experts, the impact of the production freeze could be significant. Specifically, sales of purely battery-powered cars are likely to shrink in Germany for the first time in 2024 after almost a decade of steady growth: "We are calculating with 90,000 to 200,000 fewer vehicles," said car expert Ferdinand Dudenhöffer, the »Handelsblatt."* Our Supplemental Documents package includes the Der Spiegel report.

Energy Transition: Ford cutting F150 Lightning production by half due to demand

EV lose 29.7% of range at 32F

No one can deny that EVs sales continue to grow at strong rates but it is also turning out that the growth rates are less than expected/planned. A good example is Ford who is cutting their planned 2024 F150 Lightning by half to match demand. On Tuesday, Bloomberg reported

that Ford will cut its planned F-150 Lightning produciotn in 2024 by about half of its planned production levels due to reduced demand. Bloomberg noted the comments from Ford CFO Lawler in Nov that Ford would be adjusting capacity to match market demand. Bloomberg wrote "*Ford and other automakers have had to readjust their electric vehicle production plans because sales have been weaker than they had expected. Slower-than-expected growth in sales of electric vehicles has forced several automakers to scale back once-ambitious production plans. Ford Motor has become the latest company to join that pullback. In a memo sent to suppliers, the company said that it now expected to produce an average of 1,600 electric F-150 Lightning pickup trucks per week in 2024, about half of the level it had previously hoped to achieve. The reduced target reflects the substantial dimming of expectations for sales of battery-powered cars and trucks that automakers are now coming to grips with. Ford and its main rival, General Motors, had been racing to increase production of a variety of electric vehicles, but consumer enthusiasm has not kept pace with those plans over the last six months. Some would-be buyers have been put off by the high prices of many electric vehicles, including the F-150 Lightning, as well as the availability and reliability of charging stations. G.M. once expected to produce 400,000 electric vehicles by the middle of 2024, but withdrew that goal in November, and is delaying some new electric models. Rivian, a younger automaker, has said it aims to make 52,000 electric vehicles by the end of this year, a third of the 150,000 a year it is hoping its Illinois factory will eventually produce."* Our Supplemental Documents package includes the Bloomberg report.

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

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

as you might expect." Our Supplemental Documents package includes the Motor Trend report."

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

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

Capital Markets: Bank of America US consumer balances still 40% above pre-Covid

US consumer balances

One of the big surprises to markets in 2023 has been the strength of the US consumer. On Tuesday, we were watching CNBC Squawk Box when Bank of America's Liz Everett Krisberg was on speaking with CNBC's Becky Quick about the US consumer. We tweeted a clip of her comments [LINK] "*WOW" says @BeckyQuick @SquawkCNBC. US consumer deposit balances still 40% above pre-Covid. think the excess savings during Covid + wage growth savings boost doesn't run out until "well past 2024" says $BAC Liz Everett Krisberg .#OOTT"* We think most were surprised to hear that US consumer deposit balances were still 40% higher than pre-Covid levels. Here is the transcript we created of her comments. Everett Krisberg "*Deposit balances continue to come down BUT they're still 40% higher then they were pre-pandemic*." Quick "*That's kind of crazy because people were convinced that, okay, a year ago we would have spent down all of that excess savings, maybe by the summer this*

would have happened. When does this happen?" Everett Krisberg "*I remember the beginning of this year, you asked me and you said are we going to run out by the end of 2023. The answer is No. When we do some back of the envelope modeling, it's hard to actually know, we think it's well past 2024."* Quick "*WOW. And this is just all the excess savings from during the pandemic?"* Everett Krisberg "*Part of it's that but part of it's also the wage growth. Right. So the wages are continuing to be positive, they're continuing to grow and they're growing faster than goods and services are."*

12/05/23: Bank of America CEO, US consumer is still spending

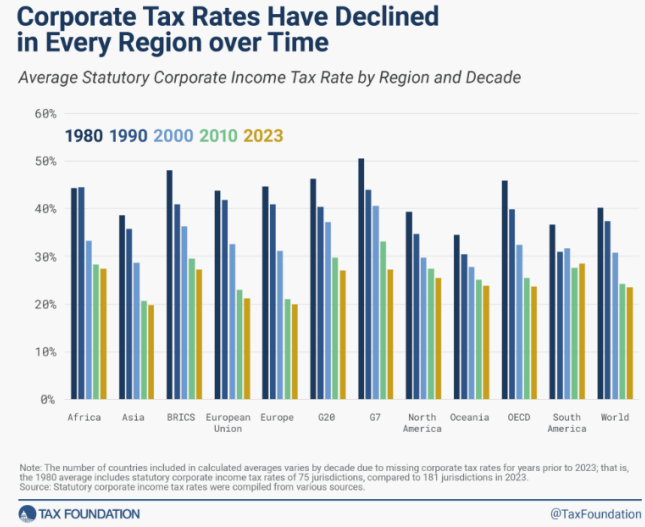
Here is what we wrote in last week's (Dec 10, 2023) Energy Tidbits memo on comments from Bank of America CEO Moynihan on the US consumer spending. "*All the surveys say how inflation and the cost of things is right up there as the #1 or #2 worry for Americans. And we see the earnings calls from the consumer companies talk about Americans trading down and starting to spend less. On Tuesday, Bank of America CEO Moynihan was interviewed on CNBC and he reminded that the American consumer may feel bad about inflation but is going out and spending. Ie. it's not the big post Covid rush, aren't spending goods as they did a lot of that in Covid but are out and about spending. We tweeted [LINK] "US consumer still spending! $BAC CEO "what you're seeing in the tension between how I feel versus what I do. And how I feel is I feel inflation, I'm reading about everything is more expensive. What I'm doing, I'm going to concerts, I'm spending money on entertainment" @LesliePicker #OOTT." We made a transcript of his answer "for the primed American consumer, they're employed, they're earning more money. Is inflation tough on certain segments of the economy? Absolutely. And that's what you're seeing in the tension between how I feel versus what I do. And how I feel is I feel inflation, I'm reading about everything is more expensive. What I'm doing, I'm going to concerts, I'm spending money on entertainment, 7% higher in November vs last November to give you a sense. I'm spending a little less money on goods because I bought all that stuff in the pandemic, I don't need to buy it again. But I am doing entertainment. I am travelling more. So the way consumers are spending money is leveling out but all and all, in pretty decent shape".*

Capital Markets: Tax Foundation "*Corporate Tax Rates around the World, 2023*"

Corporate tax rates around the world

On Tuesday, Tax Foundations posted its blog "*Corporate Tax Rates around the World, 2023*" [LINK]. It's another good blog by Tax Foundation that recaps what happened in 2023 to corporate tax rates around the world , a recap of highest and lowest corporate tax rates around the world, and listing of statutory top corporate tax rates for every country in the world. Tax Foundation warns "*Worldwide and regional average top statutory corporate tax rates have declined over the past four decades due to countries turning to more efficient tax types.[21] However, they have leveled off in recent years. Of the 225 jurisdictions around the world, only six have increased their top corporate income tax rate in 2023, a trend that might be reversed in the coming years as more countries agree to implement the global minimum tax."* Our Supplemental Documents package includes the Tax Foundation blog as well as its list of the corporate tax rates for every country in the world.

Figure 61: Corporate Tax Rates Have Declined in Every Region over time



Source: Tax Foundation

Demographics: Kim Jong Un wants mothers to have many children

North Korea's low birth rate

North Korea's Kim Jong Un doesn't come out and say North Korea has a major demographic issue with low birth rates like Putin does but did come out in his major Dec 5 speech "*Respected Comrade Kim Jong Un Makes Important Speech at 5th National Conference of Mothers*" [LINK] to highlight mothers should have many children. World Population Review writes "*North Korea's fertility rate has also declined significantly, dropping from 5.12 births per woman in 1960 to 1.91 births per woman in 2020*." That is well below the birth rates needed to not have a shrinking population. North Korea's state media, KCNA Korea Central News Agency, posted his speech. In his speech Un said "*In fact, the mothers should be praised by the times only for the painstaking efforts and merits they have made while giving birth to many children and bringing them up in the days of insufficiency and difficulties and doing all sorts of troublesome work to take care of their husbands and parents-in-law."* And "*Party organizations and women's union organizations should enlighten and sincerely help mothers to voluntarily get aware of their duties before families and society and give birth to many children and bring them up with devotion.*" Our Supplemental Documents package includes the Un speech.

Demographics: China's over 60 yrs would be 4th largest population in the world

China's 280 million are 60 yrs & older

The aging of the Chinese population is happening and happening quickly. And China's 60 yrs and older population is now 280 million, which would make it the 4th most populous country only behind China, India and the US. On Thursday, Global Times reported [LINK] "*China's elderly population aged 60 and above reached 280.04 million by the end of 2022, accounting for 19.8 percent of the total population, according to the latest report released by the Ministry of Civil Affairs. Demographers say China has paid great attention to addressing challenges brought by the aging population but more can be improved, such as further optimizing China's social security system. The country's elderly population aged 65 and over reached 209.78 million in 2022, accounting for 14.9 percent of the total population, while the*

national dependency ratio of the elderly population aged 65 and above hit 21.8 percent, the report titled Communique on the Development of the National Cause for Aging said. Since China became an aging society at the end of the 20th century, the number and proportion of the elderly population have continued to grow. From 2000 to 2018, the elderly population aged 60 and above increased from 126 million to 249 million, and in 2022, the number reached 280 million. The proportion of elderly population also increased from 10.2 percent in 2000 to 17.9 percent in 2018, and further to 19.8 percent in 2022." Our Supplemental Documents package includes the Global Times report.

China's aging workforce

Demographics: China's workforce average age is u to 39.4 yrs

The ageing Chinese population is also reflected in an aging workforce. On Wednesday, Yicai (Chinese state media) reported "*China's Labor Force Nears Average Age of 40 as Population Grows Old*" [LINK] "*As a result of China's rapidly ageing population, the average age of someone working in the country is pushing 40, according to a new report. The labor force's average age was 39.4 in 2021, up from 32.3 in 1985, the report published recently by the Central University of Finance and Economics showed. Rural male workers are the oldest group, at 40.4. By region, workers in northeastern provinces are the oldest, at 41.2 in Heilongjiang, 40.8 in Liaoning, and 40.6 in Jilin."* Our Supplemental Documents package includes the Yicai report.

@Energy_Tidbits on Twitter

Twitter: Look for our first comments on energy items on Twitter every day

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.

Look for energy items on LinkedIn

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].

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.

Shake Shack coming to Canada

In-N-Out Burger and Shake Shack are two examples of popular burger franchises that we don't have in Canada. We were watching CNBC on Monday morning and saw their interview with Shake Shack that discussed how CEO Randy Garutti is retiring in 2024 and will stay on as an advisor thru 2024. It's a pretty impressive story starting with a hot dog cart in New York's Madison Square Park, the cart reopened the following two summers and then created a permanent food kiosk. And at first, it

didn't have hamburgers. The story is quite a success story. But what we hadn't realized and missed the March 2023 announcement that Shake Shack is coming to Canada in 2024 with its first location to be in Toronto. Shake Shack didn't disclose exactly where in Toronto but the speculation is somewhere around Yonge and Dundas Square.

Ohtani's $700mm contract defers $680 until after 10 years

There is no question that the sports world was surprised by the the terms of his contract. The contract reportedly says he will be paid $2 mm annually by the LA Dodgers for 10 years and then the remaining $680 mm is to paid out over 10 years thereafter. There is not interest accrued on the $680 mm. Ohtani is fortunate that he doesn't need cash flow now, which allowed him to do this structure. His reported endorsement income is expected to be $50mm this year.

Ohtani's contract reminded everyone that July 1 is Bobby Bonilla Day

The Ohtani contract brought many references to Bobby Bonilla Day with one notable difference – Bonilla earned 8% interest on his future payments. Here is what we wrote in our July 2, 2023 Energy Tidbits memo on Bobby Bonilla day. "*Former baseball star, Bobby Bonilla, last played for the New York Mets in 1999 and retired after playing for the St. Louis Cardinals in 2001 but July 1 is known in MLB as Bobby Bonilla Day. It's because every July 1 thru 2035, Bonilla receives a check for $1.193 million as a result of the Mets negotiated buyout of the remaining $5.9 million on his contract in 2000. The Fed Funds rate reached 6.5% in May 2000. But the Mets negotiated buy-out was to pay Bonilla $1.193 million every July 1 starting on July 1, 2011 thru July 1, 2035. The buyout also included a negotiated 8% interest. One aside for the New York Mets is that the New York Mets ownership was reported invested in a Bernie Madoff that was promising double digit returns.*"

Vikings 3-0 win over Raiders was the 7th such game since NFL/AFL merger

We couldn't help flipping back and forth to the Vikings/'Raiders game last Sunday to see if it would end up being the only 0-0 NFL game since the NFL/AFL merger. But it wasn't to be with the Vikings kicking a field goal with 1:57 left to win the game. As a result, it became the 7th such 3-0 game since the NFL/AFL merger. The Vikings actually had the 1st such game with their Nov 14, 1971 win over the Packers. Prior to last Sunday's game the last 3-0 game was the Steelers beating the Dolphins on Nov 26, 2007 and then it was back to Dec 11,1993 with the Jets beating the Redskins.

Raiders led Chargers 42-0 at halftime, got to 49-0, before winning 63-21

What a comeback from their 3-0 loss to the Vikings, we watched all of the Thursday night Raiders/Chargers game. The Raiders came back from historic low to all-time record scoring 63 points to demolish the Chargers. We missed the start and turned the game on at the end of the 1st QT to see Raiders up 21-0. Everything that could go wrong for the Chargers, went wrong. You would never know it from the box score where Chargers QB Easton Stick made his 1st NFL start was 23/32 for 257 yards with 3 TDs and 1 INT. But the Chargers also lost four fumbles. And the Raiders scored four TDs on turnovers. And the embarrassing loss led to the Chargers firing head coach Brandon Stale and GM Tom Telesco on Friday.