

# Energy Tidbits

December 24, 2023

Produced by: Dan Tsubouchi

## Strait of Hormuz Risk as US says Iran Drone Hit a Tanker in the Arabian Sea, Reportedly After Loading/Stopping in Saudi Arabia

**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. The US has said it was an Iran drone that hit a tanker offshore India in the Arabian Sea, which brings Strait of Hormuz risk given the reports the tanker had loaded/stopped in Saudi Arabia. [\[click here\]](#)
2. Houthis warn it "*will turn the Red Sea into a graveyard of the US-led coalition*" if the US or its coalition strike the Houthis in Yemen. [\[click here\]](#)
3. China's CNPC keeps increasing its forecast for peak oil demand. [\[click here\]](#)
4. Finally, NOAA's near-term temperature outlooks forecast normal to colder than normal weather moving into eastern US in Jan. [\[click here\]](#)
5. The massive net redemptions continues in Cdn mutal funds balanced funds and equity funds. [\[click here\]](#)
6. Wishing everyone a Merry Christmas!
7. Please follow us on Twitter at [\[LINK\]](#) for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT. [\[click here\]](#)
8. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [\[LINK\]](#).

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**Natural Gas: -87 bcf draw from US gas storage; now +240 bcf YoY surplus**

After last week’s gas injection, this week storage saw a draw. For the week of Dec 15, the EIA reported a -87 bcf draw (vs expectations of -82 bcf draw) which is the same as the -87 bcf draw reported for the week of Dec 16, 2022. Recall that it started to turn to warmer than normal temperatures in Dec 2022. Total storage is now 3.577 tcf, representing a surplus of +240 bcf YoY compared to a surplus of +245 bcf last week. Total storage is +280 bcf above the 5-year average, up from the +260 bcf surplus last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage report [\[LINK\]](#).

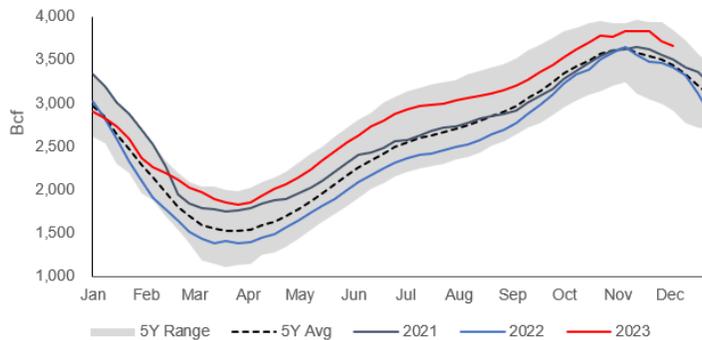
**US gas storage +240 bcf YoY surplus**

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	12/15/23	12/08/23	net change	implied flow	Year ago (12/15/22)		5-year average (2018-22)	
East	834	857	-23	-23	794	5.0	796	4.8
Midwest	1,021	1,055	-34	-34	978	4.4	955	6.9
Mountain	236	243	-7	-7	179	31.8	185	27.6
Pacific	283	289	-6	-6	188	50.5	247	14.6
South Central	1,203	1,219	-16	-16	1,199	0.3	1,114	8.0
Salt	331	336	-5	-5	340	-2.6	319	3.8
Nonsalt	872	883	-11	-11	859	1.5	795	9.7
<b>Total</b>	<b>3,577</b>	<b>3,664</b>	<b>-87</b>	<b>-87</b>	<b>3,337</b>	<b>7.2</b>	<b>3,297</b>	<b>8.5</b>

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



Source: EIA, SAF

**Natural Gas: NOAA sees moving towards more normal temps in early Jan**

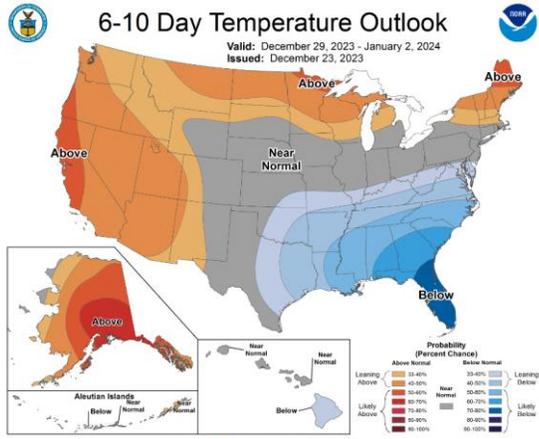
Yesterday, we tweeted [\[LINK\]](#) “Finally, a near-term @NOAA temp outlook showing normal to colder than normal temps are moving into eastern half of US in Jan. Today’s NOAA temp outlook is for Dec 29-Jan 6. But need a cold Jan after a warm Nov/Dec start to winter. #OOTT.” It’s been a warm start to winter in Nov and Dec. But finally, NOAA’s latest 6-10 and 8-14 day temperature outlook is showing normal to colder than normal temperatures are forecast to move into the eastern half of the US. Prior to this week, the NOAA forecasts have been consistently calling for warmer than normal temperatures for pretty well all of the US in their 6-10 and 8-14 day temperature outlooks. Our concern is unchanged – it’s really tough but not impossible to catch up from a warmer than normal Nov and Dec. But it needs a cold

**Turning to more normal temps in Jan**

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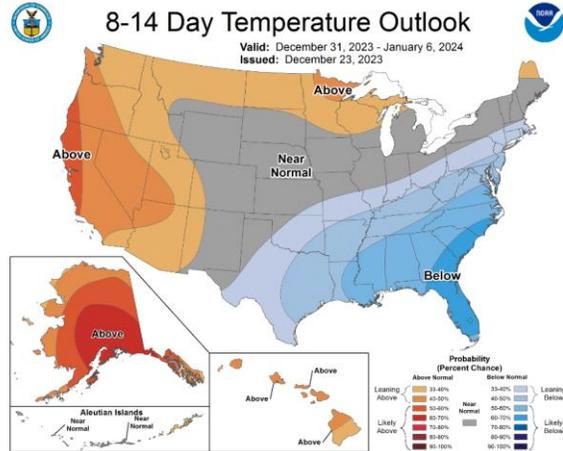
Jan and Feb. Below are the NOAA 6-10 day and 8-14 day temperature outlooks posted yesterday, Dec 23.

Figure 3: NOAA 6-10 day temperature outlook as of Dec 23



Source: NOAA

Figure 4: NOAA 8-14 day temperature outlook as of Dec 23



Source: NOAA

**Natural Gas: NOAA forecasts warmer than normal Jan/Feb/Mar**

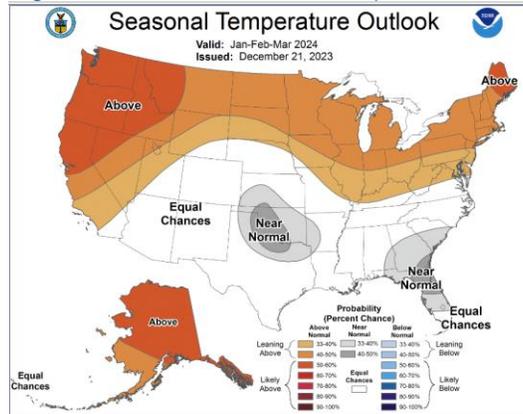
On Thursday, we tweeted [LINK](#) “#Natgas investors can probably stay on sidelines until there is any sustained cold in northern half of US. Warmer than normal Nov/Dec & to start Jan. Now @NOAA’s updated seasonal Jan/Feb/Mar temp outlook is for warmer than normal. #OOTT.” Last week’s (Dec 17, 2023) Energy Tidbits memo highlighted that Nov 2023 was the 19<sup>th</sup> hottest on record in the past 129 years. And anyone who watches NFL football knows it’s been warmer than normal in Dec. On Thursday, NOAA posted its updated seasonal outlook including its Jan/Feb/Mar temperature outlook that calls for warmer than normal temperatures across the northern half of the US, normal for most of the rest except for

**Warmer than normal JFM**

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lower than normal temperatures in SE US and in Oklahoma. So it doesn't look as warm as seen in Nov and Dec but still on the bearish side. And our concern is always that it's hard to catch up from a warm start to winter and this temperature outlook doesn't look like it will do so. But the caveat is that weather forecasts are far from 100%.

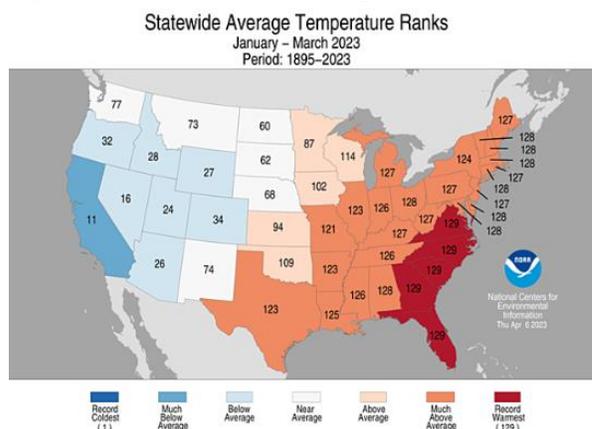
Figure 5: NOAA Seasonal Temperature Outlook Dec/Jan/Feb



Source: NOAA

**As a result, Jan/Feb/Mar 2023 was the 20<sup>th</sup> hottest in the last 129 years**  
 Here is what we wrote in our April 16, 2023 Energy Tidbits memo. *“The fact that it was cold in the west brought Jan/Feb/Mar down to the 20<sup>th</sup> hottest in the last 129 years. Whereas the Dec/Jan/Feb was the 17<sup>th</sup> hottest in the last 129 years. But as seen in the NOAA by state temperature rankings, almost every state in the populous eastern half of the US was within the top 3 hottest Jan/Feb/Mar in the last 129 years. No wonder HH gas prices crashed to \$2 after being over \$7 just before Xmas. Below is a graphic depicting the state average temperature ranks for Jan/Feb/Mar.”*

Figure 6: US Statewide Average Temperature Ranks (Jan/Feb/Mar 2023)



Source: NOAA

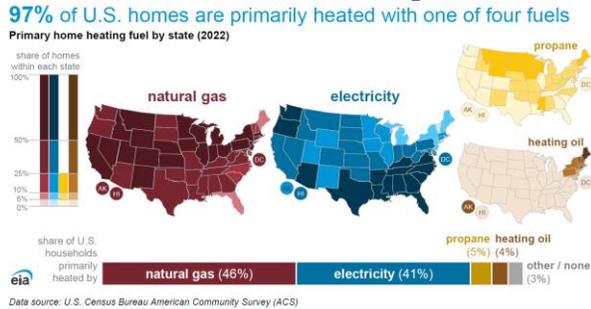
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Natural gas home heating

**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 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.” iv) Adding the indirect and direct, natural gas provides the fuel for 62% of US homes.”

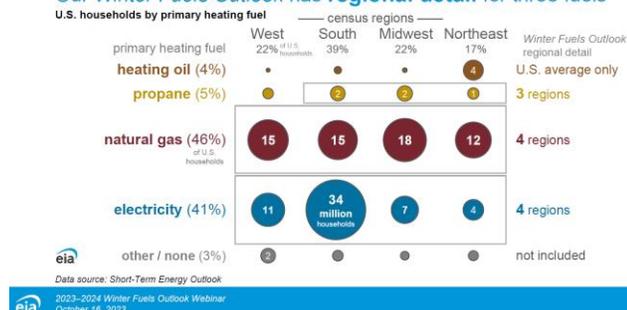
Figure 7: Fuels for winter home heating of US homes



Source: EIA

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Figure 8: Fuels for winter home heating by region  
 Our Winter Fuels Outlook has regional detail for three fuels



Source: EIA

**Natural Gas: EIA, US shale/tight natural gas to stay above 99 bcf/d in Jan 2024**

US natural gas production is still up strong YoY with the US shale/tight natural gas plays up 3.9 bcf/d YoY. After an upwards revision in last month's DPR that brought gas production as far back as May back above 99 bcf/d all the way through December, the EIA revised historical months back down, largely due to a change in data methodology. Here's what the EIA wrote on their website: "Our data vendor for oil and gas production data, Enverus, reported a change in the Texas Railroad Commission's (TX RRC) methodology for reporting natural gas production that discontinued applying a "well separation extraction loss factor" to condensate production reported by operators. For example, the impact of the methodology change lowers TX RRC reported natural gas gross production by 914 million cubic feet per day, nearly 3% in the month of January 2022. The December Drilling Productivity Report released on December 18, 2023, reflects this revision". (i) On Monday, the EIA released its monthly Drilling Productivity Report for December 2023 [\[LINK\]](#), which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case December) and next month (in this case January). (ii) The EIA forecasts US shale/tight natural gas for December at 99.226 bcf/d, which is down slightly from last month's December estimate of 99.638 bcf/d, after the downward revision to this month. January natural gas production is estimated to be 99.026 bcf/d. (iii) The Permian used to be above 24 bcf/d for 4 months prior to the downward revision; now it's only above 24 bcf/d for 3 months: November at 24.112 bcf/d, December at 24.233 bcf/d and now January at 24.363 bcf/d. (iv) Haynesville has been falling gradually for the past 5 consecutive months; from 16.825 bcf/d in September, 16.740 bcf/d in October, 16.630 bcf/d in Nov, 16.507 bcf/d in December to now 16.385 bcf/d in January. (vii) Remember US shale/tight gas is ~90% of total US natural gas production. So, whatever the trends are for shale/tight gas are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

**Shale/tight gas production**

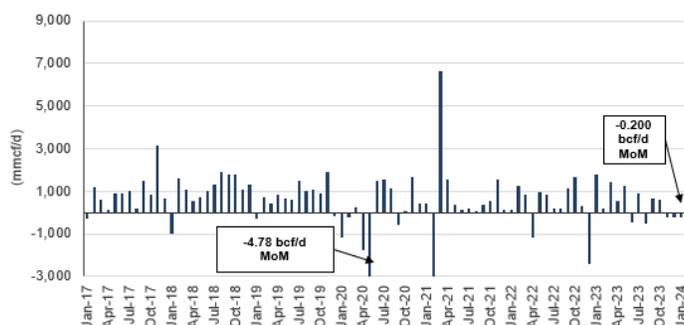
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Figure 9: EIA Major Shale/Tight Natural Gas Production

mmcf/d	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Jan YoY	Jan YoY%	Jan MoM	Jan MoM%	Dec	Dec	Change
Anadarko	6,796	6,644	6,533	6,628	6,774	6,872	6,799	6,751	6,924	6,866	6,803	6,749	6,704	-92	-1%	-45	-1%	6,535	6,749	214
Appalachia	35,174	34,864	35,110	35,362	35,676	35,741	35,830	36,241	35,430	36,075	35,931	35,765	35,630	457	1%	-135	0%	35,505	35,765	259
Bakken	2,896	3,092	3,104	3,169	3,205	3,297	3,336	3,349	3,433	3,446	3,454	3,466	3,479	583	20%	13	0%	3,411	3,466	55
Eagle Ford	6,995	7,097	7,490	7,407	7,488	7,343	7,404	7,252	7,339	7,278	7,213	7,167	7,126	131	2%	-41	-1%	7,520	7,167	-353
Haynesville	16,432	16,894	16,649	16,685	17,229	16,988	16,834	16,135	16,825	16,740	16,630	16,507	16,385	-47	0%	-122	-1%	16,562	16,507	-54
Niobrara	4,991	4,902	4,978	5,032	5,208	5,270	5,255	5,228	5,305	5,319	5,332	5,338	5,338	347	7%	0	0%	5,173	5,338	165
Permian	21,858	21,842	22,885	23,021	22,981	22,602	23,545	23,506	23,847	23,983	24,112	24,233	24,363	2,505	11%	130	1%	24,102	24,233	131
Total	95,141	95,335	96,748	97,303	98,561	98,114	99,003	98,461	99,103	99,707	99,475	99,226	99,026	3,885	4%	-200	0%	98,808	99,937	1,129

Source: EIA, SAF

Figure 10: MoM Change – Major Shale/Tight Natural Gas Production



Source: EIA, SAF

**Natural Gas: US LNG exports up +7.33% MoM to 12.4 bcf/d in October; up +24.22% YoY**

Last Friday, the Department of Energy (DOE) posted its US LNG exports estimates for October 2023 [\[LINK\]](#). Note, the DOE has changed the name from the LNG Monthly to the U.S. Natural Gas Imports and Exports Monthly. This is a reminder that the US LNG export data is available about two weeks prior to the more commonly referenced US LNG exports from the EIA's Natural Gas Monthly. The EIA is a group under the Department of Energy. The data for LNG exports is either identical or just a rounding issue. US LNG exports were up MoM to 12.4 bcf/d in October from 11.6 bcf/d in September. US LNG exports are now averaging 11.6 bcf/d per month YTD for 2023, which is +1.0 bcf/d compared to the same period in 2022. The DOE did not comment on the MoM or YoY increases. Our Supplemental Documents package includes excerpts from the U.S. Natural Gas Imports and Exports Monthly.

**US October LNG exports**

Figure 11: US Monthly LNG Exports

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023
January	0.0	1.7	2.3	4.1	8.1	9.8	11.4	10.9
February	0.1	0.9	2.6	3.7	8.1	7.4	11.3	11.7
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7	11.8
April	0.3	1.7	2.9	4.2	7.0	10.2	11.0	12.5
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3	11.8
June	0.5	1.7	2.5	4.7	3.6	9.0	10.0	10.9
July	0.5	1.7	3.2	5.1	3.1	9.7	9.7	11.3
August	0.9	1.5	3.0	4.5	3.6	9.6	9.7	11.4
September	0.6	1.8	2.7	5.3	5.0	9.5	9.8	11.6
October	0.1	2.6	2.9	5.7	7.2	9.7	10.0	12.4
November	1.1	2.7	3.6	6.4	9.4	10.2	10.1	
December	1.3	2.7	4.0	7.1	9.8	11.1	11.0	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	10.6	11.6

Source: EIA, DOE

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Figure 12: US LNG and Natural Gas Exports Oct 2023 vs Oct 2022 and Sep 2023

Volume (Bcf) Mode of Transport	Monthly			Percentage Change	
	Oct 2023	Sep 2023	Oct 2022	Oct 2023 vs. Sep 2023	Oct 2023 vs. Oct 2022
<b>Exports</b>					
LNG by Vessel	384.3	346.5	309.4	11%	24%
Pipeline	266.9	279.0	244.5	-4%	9%
Truck	<0.1	<0.1	0.2	-47%	-86%
LNG by ISO Container	<0.1	<0.1	0.2	-30%	-73%
<b>Total</b>	<b>651.3</b>	<b>625.6</b>	<b>554.3</b>	<b>4%</b>	<b>17%</b>

Source: DOE

**Natural Gas: US natural gas + LNG exports to Mexico down -3.56% MoM, +17.33% YoY**

Also included in the DOE's U.S. Natural Gas Imports and Exports Monthly was a breakout of exports by destination. Natural gas and LNG exports to Mexico were down -3.56% MoM to 6.5 bcf/d in October from 6.7 bcf/d in September, but is up +17.33% YoY from 5.5 bcf/d in October 2022. The DOE doesn't provide a split but based on its prior disclosures, it looks like essentially 100% of the exports are via pipeline. Below is a summary of natural gas and LNG exports to Mexico from the US.

**US to Mexico Oct nat gas exports**

Figure 13: US Natural Gas Pipeline + LNG Exports to Mexico

Natural Gas + LNG Exports to Mexico (bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023
January	0.9	4.3	4.7	5.3	5.4	5.6	5.7	5.5
February	3.4	4.6	5.0	5.1	5.3	5.4	5.5	5.5
March	3.4	4.5	5.2	5.1	5.6	5.9	5.5	5.8
April	3.5	4.2	4.7	5.0	4.6	6.1	5.9	5.6
May	3.7	4.3	4.9	5.6	4.7	6.2	6.0	6.2
June	3.8	5.3	5.5	5.8	5.4	6.6	6.2	6.8
July	4.0	4.8	5.6	6.2	5.8	6.4	6.1	6.8
August	4.4	4.6	5.6	5.9	6.1	6.3	5.9	6.9
September	4.2	4.5	5.4	5.8	6.2	6.0	5.6	6.7
October	4.2	4.5	5.1	5.7	6.2	6.0	5.5	6.5
November	4.4	4.8	4.9	5.4	5.6	5.5	5.4	
December	3.8	4.5	4.9	5.2	5.3	5.4	5.1	
Full Year	3.6	4.6	5.1	5.5	5.5	5.9	5.7	6.2

Source: DOE, SAF

**Natural Gas: Bakken/Cdn natural gas-on-gas competition next summer**

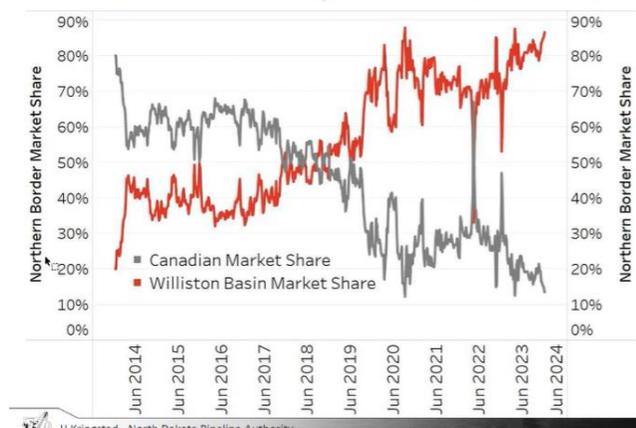
On Friday, North Dakota held its monthly press conference on the October production numbers. One of the insights from the press conference was the North Dakota warning on Bakken vs Cdn gas-on-gas competition around Q2. We created a transcript of the North Dakota comments. At 23:40 min mark, North Dakota's Justin Kringstad "slide 19, now well over 80% market share on Northern Border for those volumes coming out of North Dakota and just over the lower teens for those Canadian market share. Again, we're watching this, very likely over the next six months or so but at least by next summer, going to be a very interesting situation with that gas on gas competition to remain viable, continue to move that gas onto the Northern Border system. Canadian producers maintain about 10% of the market share on that system, the remainder is held by marketing firms as wells as Bakken producers. So as you near or try to exceed that 90%, that's when I expect the competition

**Gas-on-gas competition**

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between Bakken production and Canadian production to really intensify. And it appears we're trending that direction relatively quickly".

Figure 14: Northern Border Pipeline Market Share  
Northern Border Pipeline Market Share



Source: North Dakota Pipeline Authority

**Natural Gas: Mexico’s natural gas production just below 5 bcf/d**

On Friday, Pemex posted its natural gas production data for November. [LINK](#) Pemex does not provide any commentary on the data but reported November 2023 natural gas production of 4.888 bcf/d, which was +0.9% YoY and -1.3% MoM. The big picture story for Mexico natural gas is, at least for now, still unchanged – for the past six years, Mexico natural gas production has been stuck right around 5 bcf/d, and that means any increased domestic natural gas consumption has been met by US natural gas imports. Below is our ongoing table of Pemex reported monthly natural gas production.

**Mexico natural gas just below 5 bcf/d**

Figure 15: Mexico Natural Gas Production

Natural Gas Production bcf/d	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	5.326	4.910	4.648	5.005	4.848	4.713	-2.8%	4.955	5.1%
Feb	5.299	4.853	4.869	4.942	4.854	4.646	-4.3%	4.979	7.2%
Mar	5.383	4.646	4.857	4.946	4.839	4.766	-1.5%	5.035	5.6%
Apr	5.334	4.869	4.816	4.827	4.671	4.740	1.5%	5.095	7.5%
May	5.299	4.827	4.841	4.460	4.730	4.702	-0.6%	5.034	7.1%
June	5.253	4.840	4.843	4.754	4.727	4.744	0.4%	5.035	6.1%
July	5.216	4.856	4.892	4.902	4.725	4.815	1.9%	4.936	2.5%
Aug	5.035	4.898	4.939	4.920	4.656	4.796	3.0%	4.947	3.1%
Sept	4.302	4.913	5.017	4.926	4.746	4.798	1.1%	4.969	3.6%
Oct	4.759	4.895	4.971	4.928	4.718	4.795	1.6%	4.950	3.2%
Nov	4.803	4.776	5.015	4.769	4.751	4.845	2.0%	4.888	0.9%
Dec	4.811	4.881	5.024	4.846	4.697	4.845	3.2%		

Source: Pemex, SAF

**US pipeline exports to Mexico +5 bcf/d since Mexico production flatlined**

Since Jan 1, 2017, Mexico natural gas production is down 0.4 bcf/d and has basically been more or less flat for the past six years. And this has created the opportunity for US natural gas pipeline exports to Mexico as Mexico builds out its domestic natural gas infrastructure. Since Jan 1, 2017, US natural gas exports via pipeline to Mexico

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are +4.6 bcf/d and most recent data being 6.7 bcf/d in Sept 2023. Below is our table of the EIA's monthly gas exports to Mexico.

Figure 16: US Pipeline Exports to Mexico

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

Source: EIA, SAF

### Natural Gas: ENN LNG and ADNOC sign 15-yr long term LNG deal

### Long-term LNG deal

There was a significant slowdown in long-term LNG deals in since the end of H1/22 compared to the activity seen from July 1, 2021 through June 30, 2022. That's because most, if not all the available long term LNG supply available before 2026 was locked up in the July 1, 2021 through June 30, 2022 rush. Since that first rush, there have been a few new developments. The long-term deals now being done are generally for long-term supply starting in 2026 or later. There have been some very long-term LNG deals even out past 2050. And the big LNG suppliers have been stepping in more to lock up other long-term LNG supply to add to their supply portfolio to be able to use to supply to their customers. (i) On Wednesday, ADNOC (UAE) announced they signed a long-term Heads of Agreement 15-year LNG supply deal with ENN LNG (Singapore) [\[LINK\]](#), whereby ENN will purchase at least 0.13 bcf/d for 20 years expected to begin in 2028 once ADNOC's Ruwais LNG project is commercially operable. Rashid Khalfan Al Mazrouei, ADNOC Senior VP, Marketing, said: *"This landmark LNG agreement from our ongoing Ruwais LNG project enhances ADNOC's position as a reliable and responsible global energy provider and creates new opportunities for value-creation across our gas value chain as natural gas demand continues to increase. We are making excellent progress in delivering this strategic project as we grow our portfolio of lower-carbon energy solutions to enable the energy transition and we will continue to support our customers and partners on this journey"*. ENN is a major global LNG supplier who is adding the UAE supply to its portfolio so it can supply its customers. This deal specifically is with ENN's Singapore-based subsidiary. This gives them the flexibility to have other LNG supply in the event of outages in their own LNG supply projects. Our supplemental documents package contains the news release.

### There have been 19.49 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs". We included a table of the deals done in that short two week period. We continue to update that table, which now shows 19.49 bcf/d of long-term LNG deals since July 1, 2021. 60% of the deals have been by Asian LNG buyers, but we are now seeing rest of world

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locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 64% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long-term supply deals since July 1, 2021. Our Supplemental Documents package includes our July 14, 2021 blog.

Figure 17: Long-Term LNG Buyer Deals Since July 1, 2021

Long Term LNG Buyer Deals Since July 1, 2021										Long Term LNG Buyer Deals Since July 1, 2021									
Date	Buyer	Seller	Country	Volume	Duration	Start	End	Date	Buyer	Seller	Country	Volume	Duration	Start	End				
			Buyer / Seller	Pct/D	Years						Buyer / Seller	Pct/D	Years						
<b>Asian LNG Deals</b>																			
Jul 7, 2021	CHOCOC	Petrobras	China / Canada	0.30	10.0	2022	2032	Jul 28, 2021	POFAG	Ventura Global LNG	Poland / US	0.26	20.0	2023	2043				
Jul 9, 2021	QFC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037	Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2023	2043				
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034	Mar 7, 2022	Shell	Ventura Global LNG	US / US	0.26	20.0	2024	2044				
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045	Mar 16, 2022	NPE	Ventura Global LNG	US / US	0.13	20.0	2023	2043				
Sep 29, 2021	CHOCOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037	Mar 16, 2022	NPE	Ventura Global LNG	US / US	0.13	20.0	2023	2043				
Oct 7, 2021	Shanghai	BP	China / US	0.04	10.0	2022	2032	May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041				
Oct 11, 2021	ERH	Cheniere	China / US	0.12	13.0	2022	2035	May 17, 2022	POFAG	Serpa Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.				
Nov 4, 2021	Unigas	Ventura Global LNG	China / US	0.46	20.0	2022	2043	May 26, 2022	ROWE Supply & Trading	Serpa Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.				
Nov 4, 2021	Sinopac	Ventura Global LNG	China / US	0.53	20.0	2022	2043	Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	10.0	2026	2041				
Nov 5, 2021	Sinohydro	Cheniere	China / US	0.12	17.5	2022	2040	Jun 21, 2022	EnBW	Ventura Global LNG	Germany / US	0.20	20.0	2026	2046				
Nov 22, 2021	Fran	Cheniere	China / US	0.04	20.0	2023	2043	Jun 22, 2022	NEOS Energy	Serpa Infrastructure	UK / US	0.21	20.0	2027	2047				
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034	Jun 22, 2022	Cheniere	Ventura Global LNG	US / US	0.26	20.0	n.a.	n.a.				
Dec 6, 2021	S&I International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037	Jun 22, 2022	Cheniere	Cheniere	US / US	0.26	15.0	2027	2042				
Dec 16, 2021	Sunken Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037	Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046				
Dec 16, 2021	3PFC Guangfeng	BP	China / US	0.03	10.0	2023	2033	Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	10.0	n.a.	n.a.				
Dec 20, 2021	CHOCOC Gas & Power	Ventura Global LNG	China / US	0.25	20.0	2022	2043	Aug 3, 2022	Centrica	Delfin Midstream	UK / US	0.13	10.0	2026	2041				
Dec 29, 2021	Fran	BP	China / US	0.01	10.0	2023	2032	Aug 24, 2022	Shell	Energy Transfer	US / US	0.20	20.0	2026	2046				
Jan 11, 2022	ERH	NextDecade	China / Russia	0.08	11.0	2024	2035	Oct 6, 2022	EnBW	Ventura Global LNG	Germany / US	0.26	20.0	2022	2042				
Jan 11, 2022	Zhejiang Energy	NextDecade	China / Russia	0.13	15.0	2024	2035	Dec 5, 2022	ENGIE	Serpa Infrastructure	France / US	0.12	10.0	n.a.	n.a.				
Feb 4, 2022	QFC	Cheniere	China / Russia	0.00	20.0	2023	2033	Dec 29, 2022	Galp	NextDecade	Norway / US	0.13	20.0	n.a.	n.a.				
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046	Dec 30, 2022	Shell	OMG LNG	UK/Great	0.11	10.0	2029	2036				
Mar 29, 2022	ERH	Energy Transfer	China / US	0.36	20.0	2026	2046	Jan 25, 2023	PNB ORLEN	Serpa Infrastructure	ELABUS	0.13	20.0	2027	2047				
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.	Jan 26, 2023	SO2AB	Cheniere	Turkey / Oman	0.13	10.0	2026	2036				
Apr 8, 2022	ERH	NextDecade	China / US	0.26	20.0	2026	2026	Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.35	20.0	2026	2046				
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043	Apr 24, 2023	Halvex Patterns LP	Delfin Midstream	US / US	0.08	20.0	n.a.	n.a.				
May 2, 2022	Gazprom Singapore Pte	Energy Transfer Ltd	Singapore / US	0.26	20.0	2026	2046	Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	10.0	2027	2042				
May 3, 2022	S&I Gas Trading LLC	Energy Transfer Ltd	Korea / US	0.05	18.0	2026	2042	Jun 22, 2023	SEFE	Ventura Global LNG	ELABUS	0.30	20.0	2026	2046				
May 10, 2022	Exxon Asia Pacific	Ventura Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.	Jul 14, 2023	ONEE (Mexico)	Shell	AlaskaUS	0.05	12.0	2024	2036				
May 11, 2022	Petrobras LNG	Ventura Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.	Jul 18, 2023	IOCL	Adnoc	India/UAE	0.36	14.0	2026	2046				
May 24, 2022	Hanjin Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039	Jul 28, 2023	OMV	BP	Australia	0.13	10.0	2026	2036				
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036	Aug 4, 2023	ConocoPhillips	Mexico Pacific Ltd	US/Mexico	0.29	20.0	2025	2045				
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2025	2051	Aug 22, 2023	BASF	Cheniere	Germany / US	0.10	17.0	2026	2043				
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047	Aug 30, 2023	Shell	Oman LNG	US / Oman	0.11	10.0	2025	2035				
Jul 26, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2046	Oct 11, 2023	TotalEnergies	QatarEnergy	France / Qatar	0.40	27.0	2026	2053				
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046	Oct 18, 2023	Shell	QatarEnergy	Netherlands / Qatar	0.40	27.0	2026	2053				
Jul 27, 2022	Exxon Asia Pacific	NextDecade	China / US	0.13	20.0	2026	2046	Oct 23, 2023	ENI	QatarEnergy	Italy / Qatar	0.13	27.0	2026	2053				
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046	Oct 31, 2023	Vitol	Cheniere Energy	Sweden / US	0.13	10.0	2023	2043				
Nov 21, 2022	Sinopac	QatarEnergy	China / Qatar	0.53	27.0	2026	2053	Nov 29, 2023	OMV	Cheniere	Netherlands / US	0.11	15.0	2029	2044				
Dec 27, 2022	JERA	Oman LNG	Japan / Oman	0.11	10.0	2025	2035	Dec 5, 2023	Woodside Energy	Mexico Pacific Ltd	Australia / Mexico	0.17	20.0	2024	2044				
Jan 10, 2023	IPDCHJ	NextDecade	Japan / US	0.13	10.0	n.a.	n.a.	<b>Total Non-Asian LNG Buyers New Long Term Contracts Since Jul21</b>											
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.	7.73											
Feb 23, 2023	China Gas Holdings	Ventura Global LNG	China / US	0.26	20.0	n.a.	n.a.	<b>Total New Long Term LNG Contracts since Jul21</b>											
Mar 8, 2023	Gazprom Singapore Pte	Cheniere Energy	Singapore / US	0.26	15.0	2027	2042	13.40											
Apr 28, 2023	JERA	Ventura Global LNG	Japan / US	0.13	20.0	n.a.	n.a.	*Excludes Asian short term/spot deals											
May 16, 2023	KOSPO	Cheniere	Korea / US	0.05	19.0	2027	2046	**On Dec 20, 2021 CHOCOC agreed to buy an additional 0.13 bcf/d from Ventura Global for an undisclosed shorter period											
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh / Qatar	0.24	15.0	2026	2031	Source: Bloomberg, Company Reports											
Jun 21, 2023	Petro Jiang	Cheniere	Bangladesh / Oman	0.20	10.0	2026	2036	Prepared by SAF Group. <a href="mailto:stan.us@saferesearch.com">stan.us@saferesearch.com</a>											
Jun 21, 2023	CHFC	QatarEnergy	China / Qatar	0.53	27.0	2027	2054												
Jun 26, 2023	ERH LNG	Cheniere	Singapore / US	0.24	20.0	2026	2046												
Jul 5, 2023	Zhejiang Energy	Mexico Pacific Ltd	China / Mexico	0.13	20.0	2027	2047												
Nov 2, 2023	USG Japan	Woodside	Japan / Australia	0.12	10.0	2026	2036												
Nov 4, 2023	Petrochina	ADAC	China / UAE	n.a.	n.a.	n.a.	n.a.												
Nov 2, 2023	Fran	Cheniere	China / US	0.12	20.0	n.a.	n.a.												
Nov 4, 2023	Sinopac	QatarEnergy	China / Qatar	0.39	27.0	2026	2053												
Nov 27, 2023	Gazprom Singapore Pte	Delfin Midstream	Singapore / US	0.10	15.0	n.a.	n.a.												
Dec 26, 2023	ERH	ADAC	Singapore / UAE	0.13	10.0	2028	2043												
<b>Total Asian LNG Buyers New Long Term Contracts Since Jul21</b>																			
13.36																			

Source: SAF

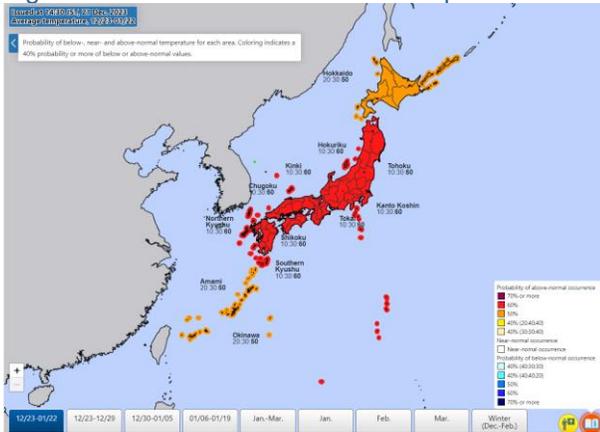
**Natural Gas: Japan forecasts warm end to December, start to January**

Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The Dec 21 update calls for normal temperatures for this week, then much warmer than normal temperatures to end December, cooling slightly but still warmer than usual to begin the new year. The warm weather is expected to affect the entire country. Below is the JMA's 30-day temperature probability forecast for Dec 23 - Jan 22.

Japan's 30-day temperature forecast

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Figure 18: JMA Dec 23 – Jan 22 Temperature Probability Forecast



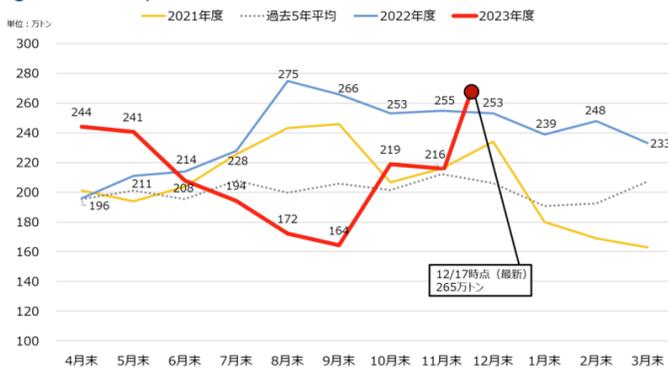
Source: Japan Meteorological Agency

**Natural Gas: Japan LNG stocks up WoW and YoY, above 5-yr average**

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 17 were 127.3 bcf, up +4.7% WoW from Dec 10 of 122.0 bcf, up the same amount, +4.7% YoY from 122.0 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.

**Japan LNG stocks up +4.7% WoW**

Figure 19: Japan LNG Stocks



Source: METI

**Natural Gas: Japan LNG imports up MoM, but down YoY to 8.53 bcf/d in November**

Japan LNG imports were up small MoM in November but were down YoY. On Thursday, Japan’s Ministry of Finance posted its import data for November [LINK](#) and pointed to a YoY increase in LNG imports. The MOF reported Japan’s October LNG imports were 8.53 bcf/d, which is up +1.7% MoM from 8.38 bcf/d in October, but down -3.9% YoY from 8.88 bcf/d in November 2022. November’s imports of 8.53 bcf/d show some recovery from the recent low

**Japan LNG imports up MoM**

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in May of 7.14 bcf/d. Japan's thermal coal imports in November were down -7.6% YoY, compared to -5.9% YoY in October. Petroleum products imports were down -8.1% YoY. Below is our table that tracks Japan LNG import data.

Figure 20: Japan Monthly LNG Imports

bcfd	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	12.66	13.06	11.22	12.85	12.79	11.69	11.63	12.48	10.51	-15.8%	10.56	0.5%
Feb	12.88	13.26	12.30	13.36	14.23	12.61	10.99	13.84	12.19	-11.9%	10.98	-9.9%
Mar	12.46	12.60	12.62	12.61	12.28	11.30	11.16	11.04	10.07	-8.7%	8.86	-12.0%
Apr	11.54	10.56	10.21	10.52	8.97	9.00	8.31	7.96	8.92	12.0%	7.25	-18.7%
May	10.06	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.92	16.3%	7.14	-19.9%
June	10.91	10.61	10.02	9.90	8.88	8.32	8.42	9.13	9.29	1.7%	7.25	-22.0%
July	12.14	10.77	10.19	10.19	10.55	10.56	9.35	9.58	9.54	-0.4%	7.88	-17.4%
Aug	10.92	10.93	11.96	11.24	11.73	9.45	9.04	9.75	9.71	-0.4%	8.78	-9.6%
Sept	11.64	11.06	10.67	9.31	10.04	10.30	10.41	8.66	8.52	-1.6%	8.84	3.8%
Oct	10.75	9.38	9.73	9.50	10.12	9.75	9.20	7.17	7.88	9.9%	8.38	6.4%
Nov	11.00	10.71	12.07	10.26	10.15	10.03	9.63	9.38	8.88	-5.4%	8.53	-3.9%
Dec	12.79	12.51	11.69	12.31	11.23	10.54	11.96	10.89	9.39	-13.8%		

Source: Japan Ministry of Finance, SAF

### Natural Gas: China LNG imports in November up +36.0% MoM, +1.0% YoY

On Monday, China reported its November 2023 LNG import data [\[LINK\]](#). We have been highlighting a big change in China's natural gas and LNG dynamics over the past two years. China has been increasing its domestic natural gas production, which means less need for LNG imports. That has been compounded by China's increasing natural gas pipeline imports of cheaper Russian natural gas. This reduces the need for LNG imports. (i) China's General Administration of Customs released the finalized natural gas import data for November, which provided the split of natural gas imports between pipeline imports and LNG imports. (ii) Natural gas pipeline (gaseous) imports for November were up +18.4% MoM to 6.64 bcf/d and are +1.5% YoY from 6.54 bcf/d in November 2022. We believe the higher MoM was due to pipeline maintenance finishing up. (iii) There was a big MoM increase for November LNG imports at +36.0% MoM to 10.89 bcf/d, which is +1.00% from November 2022 of 10.78 bcf/d. LNG imports were consistently above 9.00 bcf/d for a consecutive 4 months before October's lower figures and are now back up.

China LNG imports

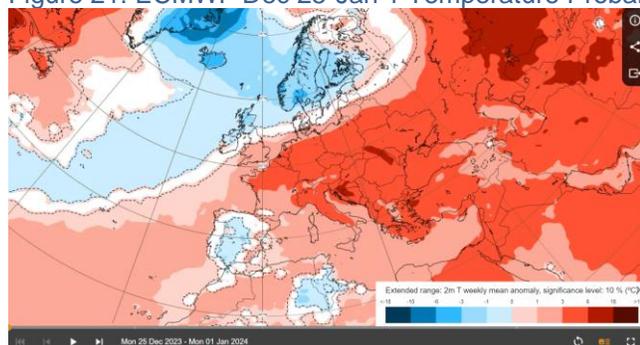
### Natural Gas: Warmer than normal temperatures forecast for Europe for next two weeks

The short-term weather forecasts for Europe have been pretty accurate so far this winter. And as expected, the ECMWF (European Centre for Medium-Range Weather Forecasts) temperature probability forecasts call for warmer than normal temperatures to end Dec and to start Jan. 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.

Europe temperature forecast

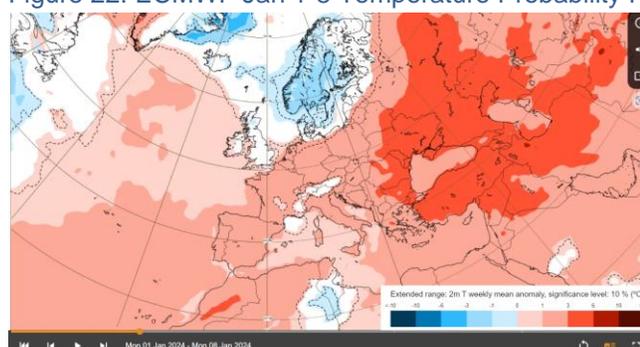
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Figure 21: ECMWF Dec 25-Jan 1 Temperature Probability Forecast



Source: ECMWF

Figure 22: ECMWF Jan 1-8 Temperature Probability Forecast



Source: ECMWF

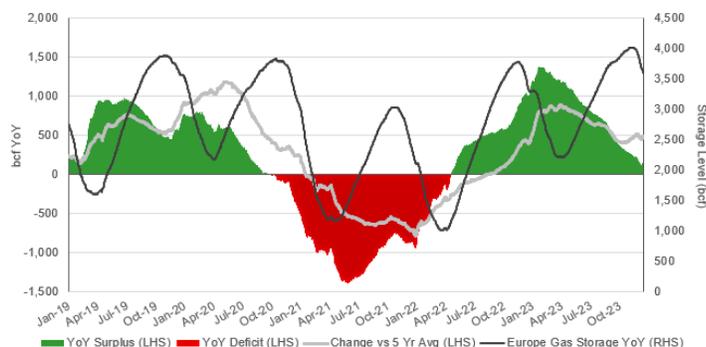
### Natural Gas: Europe storage drops to 87.63%

The cooler temperatures were more typical of winter in Europe over the past couple weeks has finally led to consistent 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 -2.11% WoW to 87.63% on Dec 20 vs 89.74% on Dec 13. Storage is now +4.45% greater than last year's levels of 83.18% on Dec 20, 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.

### Europe gas storage

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Figure 23: European Gas Storage Level



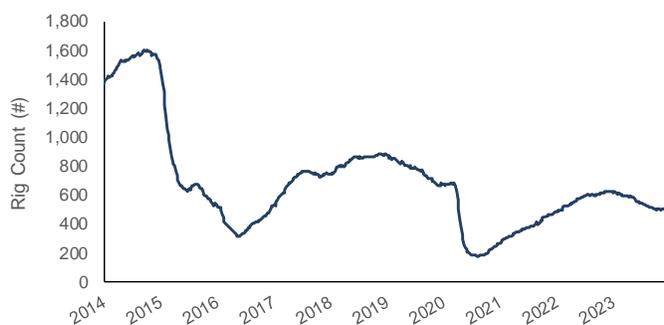
Source: Bloomberg, SAF

**Oil: US oil rigs -3 WoW to 498 rigs, US gas rigs up +1 WoW at 120 rigs**

Rigs in the US are showing only a small decline in this week leading up to Christmas, but we expect another decrease next week. On Thursday, Baker Hughes released its weekly North American drilling rig data. (i) Total US oil rigs were -3 rigs WoW to 498 rigs at Dec 21. 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 Ardmore Woodford +1 rig, Cana Woodford +1 rig and Permian -3 rigs. Others were down -2 rigs WoW. (iii) We expect another slight decline over the Xmas week. (iv) Gas rigs were up +1 rig WoW at 120 gas rigs. Below is our graph of total US oil rigs.

**US oil rigs down WoW**

Figure 24: Baker Hughes Total US Oil Rigs



Source: Baker Hughes, SAF

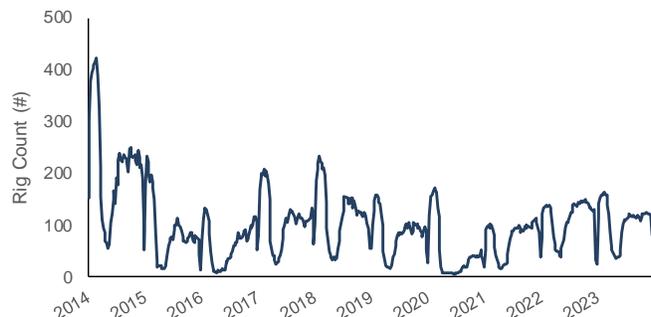
**Oil: Total Cdn rigs down -39 rigs to 146 total rigs**

For the week of Dec 21, total Cdn rigs were down -39 WoW to 146 total rigs. On a per province basis, Alberta was down -18 rigs WoW to 113 rigs, BC was flat WoW at 19 rigs, and Saskatchewan was down -19 rigs WoW to 11 rigs. It looks like the normal seasonal decline going into Christmas is well underway and we expect to see rigs down again this week. Cdn oil rigs were down -37 rigs WoW to 81 oil rigs and are up +49 oil rigs YoY. Cdn gas rigs were down -2 rigs WoW to 65 gas rigs, which is +1 rig YoY.

**Cdn total rigs down WoW**

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Figure 25: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

### Oil: US weekly oil production estimates up +0.200 mmb/d WoW at 13.300 mmb/d

This week, there was a third upward adjustment to the EIA weekly estimates in H2/23, this time a +0.2 mmb/d adjustment. 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. Then, our Oct 15<sup>th</sup> Energy Tidbits memo highlighted the EIA's second big, another +0.4 mmb/d, adjustment to the weekly production estimates. This time, on Wednesday, the EIA wrote "*When we release the Short-Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude oil production are reviewed to identify any differences between recent trends in survey-based domestic production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that increased estimated volumes by 189,000 barrels per day, which is about 1.4% of this week's estimated production total*". This 3<sup>rd</sup> EIA adjustment was needed to bring the weekly production estimates in line with the EIA's actuals. We saw the 2<sup>nd</sup> adjustment pretty much make up for the October estimates being off in the Nov 30 Form 914, so we'll see how much this fills the gap in upcoming Form 914s. This week, the EIA's production estimates were up +0.200 mmb/d WoW to 13.300 mmb/d for the week ended December 15. Alaska was down - 0.004 mmb/d WoW to 0.430 mmb/d. Below is a table of the EIA's weekly oil production estimates.

US oil production  
up WoW

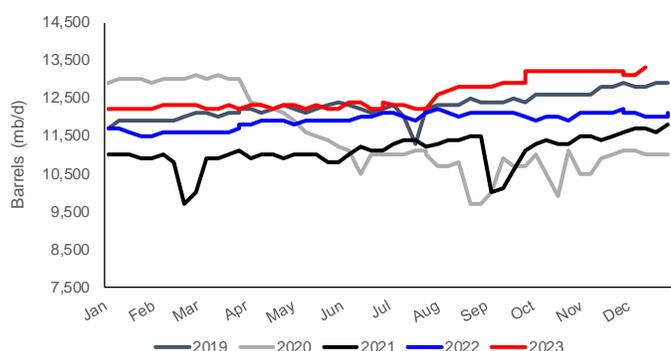
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Figure 26: EIA's Estimated Weekly US Field Oil Production

Year/Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	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	12-15	13,300				

Source: EIA

Figure 27: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

**Oil: North Dakota Oct oil production decreases -0.035 mmb/d MoM to 1.245 mmb/d**

No one should have been surprised to see North Dakota oil production was down MoM in October, at least if they bothered to listen to the monthly press conference on oil production. On the November 14 press conference, North Dakota Industrial Commission Director Lynn Helms warned October snow storms would hit oil production. On Thursday, the North Dakota Industrial Commission posted its Director's Cut, which includes October's oil and natural gas production data [\[LINK\]](#). North Dakota oil production in October was down -0.035 mmb/d MoM to 1.244 mmb/d, which is up +11.0% YoY from 1.122 mmb/d in October 2022. (i) North Dakota hitting 1.2 mmb/d is what North Dakota expected give the increasing frac spreads. In our Sept 20, 2023 Energy Tidbits, we wrote "North Dakota 1.2 mmb/d in sight thanks to completions of DUCs. Our Supplemental Documents package includes the NDIC Director's Cut.

**North Dakota oil production**

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Figure 28: North Dakota Oil Production by Month

(b/d)	2017	2018	2019	2020	2021	2022	2022/21	2023	2023/22
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	1,088,613	-5.1%	1,060,708	-2.6%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	1,089,091	0.5%	1,158,837	6.4%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	1,122,640	1.2%	1,122,693	0.0%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	900,597	-19.8%	1,133,435	25.9%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	1,059,060	-6.1%	1,135,009	7.2%
June	1,032,873	1,227,320	1,425,230	893,591	1,133,498	1,096,783	-3.2%	1,166,604	6.4%
July	1,048,099	1,269,290	1,445,934	1,042,081	1,076,594	1,072,632	-0.4%	1,180,611	10.1%
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	1,075,307	-2.9%	1,223,617	13.8%
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	1,121,063	0.6%	1,280,052	14.2%
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	1,121,754	0.9%	1,244,857	11.0%
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	1,098,389	-5.2%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	957,864	-16.3%		

Source: NDIC, NDPA

### 11/14/23: North Dakota cautioned snow storms to hit Oct production

Here is what we wrote in our November 19, 2023 Energy Tidbits memo. *“It is important to remember that North Dakota holds a monthly press conference on the monthly oil and gas data. It seems like analysts and investors don’t listen to the press conference, but we always get additional insights. That was the case with Tuesday’s press conference [\[LINK\]](#). North Dakota director Lynn Helms cautioned that snow storms in Oct will impact production. We made a transcript of Helms comments. At 1:50 min mark. On the impact of Oct snow storms, Helms “Little bit of a cautionary statement about October. You know what happened. We had a major storm and we saw what we think looked like a 50 to 90,000 b/d hit on production that lasted for 3 or 4 days and still maybe 20-25% of that is lingering as we work through the first week or 10 days of November. Those things hit hard. Usually what happens is oil tanks on the wellsite fill up and trucks aren’t able to get there or pumpers or people that sell the oil aren’t able to get there. So as oil backs up, the wells get shut in and you can see that reflected in water transfer and natural gas transfers. October, we’re hoping it will be flat, could be down just slightly from September but should still be above that 1.2 mmb/d mark, that’s our year end target and we should be really solid on that. We got to almost 1.3 before the October weather.”*

### North Dakota expects oil production up in Nov and Dec

As usual, there were many good insights from the monthly North Dakota press conference on Dec 21. Just like last month, North Dakota’s Lynn Helms gives good guidance on where North Dakota oil production is going in the near term – It’s going higher in Nov and again in Dec. Nov is going higher to a great part from the catch up from the snow storm that hit Oct oil production. And a key reason for Dec going higher is the mild weather that is allowing good frack conditions. On Friday, we tweeted [\[LINK\]](#) *“North Dakota “we should see better numbers in Nov [#Oil production] and, with the weather we’ve been having in Dec, we should see great numbers”. Oct production was down MoM to 1.245 mmb/d due to impact of snow storms. #OOTT.”*

### Almost depleted Bakken DUCs drove almost 50% of oil growth in 2023

Another of the insights from the Dec 21 press conference was on Bakken DUCs. On Friday, we tweeted [\[LINK\]](#) *““The [Bakken] DUC well inventory should be almost entirely depleted at this point.” “pretty close to 50% of the [Bakken #Oil] production*

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increase is driven by completion of DUC wells.” #OOTT.” There were two key points on DUCs. There was a big completion of DUCs in 2023 that North Dakota says means the Bakken DUCs inventory “should be almost entirely depleted at this point.” There have been 1,000 completions already and expect to get to 1,200 and close to 50% of the production increase has been driven by the completion of DUCs. Our Supplemental Documents package includes the transcript we made of the press conference key comments.

**Oil: North Dakota crude by rail down MoM to 89,962 b/d in October**

On Wednesday, the North Dakota Pipeline Authority posted its monthly update “December 2023 Production & Transportation” [\[LINK\]](#). Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority that provide low and high estimates for Williston crude by rail exports. The NDPA Monthly Update (graph below) report has a thick line that represents the low and high range. In the backup excel, the NDPA estimates crude by rail in October from a low of 74,962 b/d and a high of 104,962 b/d for an average of 89,962 b/d. We noticed there was a big, +26,107 b/d revision for September, that initially was reported to have an average of 95,650 b/d, but is now 121,757 b/d. Because of this, the MoM drop is a lot bigger. The NDPA did not comment on the MoM changes. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

**North Dakota CBR down MoM in October**

Figure 29: Estimated North Dakota Rail Export Volumes



Source: NDPA

**Oil: US shale/tight oil production in Jan 2024 in past 5-mth range of 9.6 to 9.7 mmb/d**

On Monday, the EIA released its monthly Drilling Productivity Report for December 2023 [\[LINK\]](#), which is the EIA’s forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case December) and the next month (in this case January). (ii) US shale/tight oil in Jan continues the now 5-month trend of being flat at just below 9.7 mmb/d. The EIA is forecasting immaterial MoM production decreases in December of -2,000 b/d MoM to 9.693 mmb/d and -1,000 b/d to 9.692 mmb/d in

**Shale/tight oil production**

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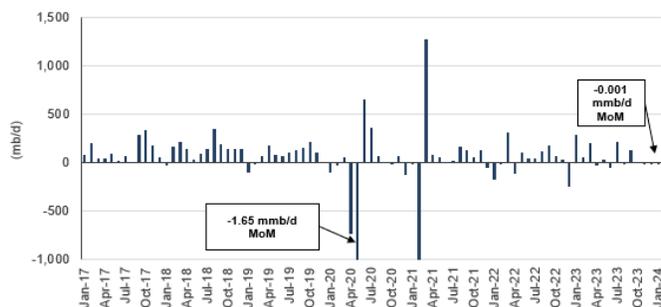
January. So basically flat production going into 2024. (iii) December is forecast to be just below 9.7 mmb/d, due to revised estimates, after being forecast slightly lower in the previous DPR. Oil production will have been sustained over 9.6 mmb/d for five months now with September at 9.697 mmb/d, October at 9.603 mmb/d, November at 9.695 mmb/d, December at 9.693 mmb/d and now January at 9,692 mmb/d. (iv) Permian shale/tight oil production was retroactively revised downwards in this DPR, especially earlier in the year, and now have been above 5.9 mmb/d for only 5 months if we include January's forecast (was 8 months straight in November's DPR). mmb/d, September at 5.953 mmb/d, October at 5.966 mmb/d, November at 5.976 mmb/d, December at 5.981 mmb/d and now January at 5.981 mmb/d. (v) US shale/tight oil production is +813,000 b/d YoY to 9.692 mmb/d in January 2023. The major change areas are Permian +219,000 b/d YoY, Bakken at +215,000 b/d YoY, and Niobara at +65,000. (vi) Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 30: US Major Shale/Tight Oil Production

Thousand b/d	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Jan YoY	Jan YoY%	Jan MoM	Jan MoM%	Dec	Dec Change	
Anadarko	393	394	406	410	426	422	421	410	407	402	396	392	389	-4	-1%	-3	-1%	392	392	0
Appalachia	144	152	152	153	155	148	137	139	144	143	142	140	138	-6	-4%	-2	-1%	133	140	7
Bakken	1,093	1,191	1,158	1,165	1,163	1,195	1,200	1,241	1,306	1,307	1,305	1,306	1,308	215	20%	2	0%	1,272	1,306	34
Eagle Ford	1,111	1,130	1,176	1,152	1,190	1,193	1,202	1,178	1,172	1,163	1,154	1,151	1,149	38	3%	-2	0%	1,151	1,151	0
Haynesville	36	36	35	35	35	31	32	32	32	32	32	32	32	-4	-10%	0	0%	32	32	0
Niobrara	625	613	645	649	659	671	673	691	683	687	690	691	690	65	10%	-1	0%	692	691	-1
Permian	5,767	5,705	5,850	5,829	5,796	5,711	5,920	5,875	5,953	5,966	5,976	5,981	5,986	219	4%	5	0%	5,981	5,981	0
Total	9,169	9,221	9,421	9,383	9,424	9,371	9,584	9,567	9,697	9,603	9,695	9,693	9,692	523	6%	-1	0%	9,653	9,693	40

Source: EIA, SAF

Figure 31: MoM Changes in US Major Shale/Tight Oil Production



Source: EIA, SAF

**Oil: EIA DUCs down MoM in November, 10<sup>th</sup> straight monthly decrease in DUCs**

We have been warning that we see a key risk to how much US oil production can sustainably grow in 2024 is the need to increase rig counts (not have less frac spreads) to replenish the inventory of Drilled Uncompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. The biggest problem in the past with the EIA's Drilling Productivity Report [\[LINK\]](#) estimate of Drilled Uncompleted wells was that the data had been constantly revised and sometimes significantly. (i) The EIA estimates DUCs were down -83 MoM (-545 YoY) in November to 4,415 DUCs. Note that October's data had a net downwards revision of -26 DUCs to 4,498 DUCs. (ii) To put in perspective, there were 8,883 DUCs in the height of the Covid slowdown in June 2020, 5,323 DUCs in

**DUCs down in November**

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November 2021, 5,198 DUCs in November 2022 and now 4,415 DUCs in September 2023. (iii) It looks like DUCs have steadily decreased over the past 10 months with 5,399 DUCs in February, 5,273 DUCs in March, 5,151 DUCs in April, 5,058 DUCs in May, 4,968 DUCs in June, 4,816 DUCs in July, 4,730 DUCs in August, 4,591 in September, 4,498 DUCs in October, and now 4,415 DUCs in November. (iv) We still believe there is still the need for drilling rigs to pick up to replenish the DUC inventory if the US is to have sustained strong oil growth in 2024 and beyond. (v) The largest YoY DUCs declines are the Eagle Ford (-316 YoY), Bakken (-233 YoY), and Permian (-155 YoY). (vi) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production.

Figure 32: Estimated Drilled Uncomplete Wells in 2023

Drilled Uncompleted	June	July	Aug	Sept	Oct	Nov	Nov YoY	YoY %	Nov MoM	MoM %	Nov DPR	Dec DPR	Change
Anadarko	737	732	725	715	705	696	-59	-8%	-9	-1%	709	705	-4
Appalachia	814	797	787	774	764	761	-65	-8%	-3	0%	747	764	17
Bakken	484	443	406	362	344	329	-233	-41%	-15	-4%	350	344	-6
Eagle Ford	487	452	430	406	389	372	-316	-46%	-17	-4%	399	389	-10
Haynesville	737	729	734	735	735	736	85	13%	1	0%	751	735	-16
Niobrara	843	809	796	756	729	700	-40	-5%	-29	-4%	736	729	-7
Permian	866	854	852	843	832	821	-155	-16%	-11	-1%	832	832	0
Total	4,968	4,816	4,730	4,591	4,498	4,415	-783	-15%	-83	-2%	4,524	4,498	-26

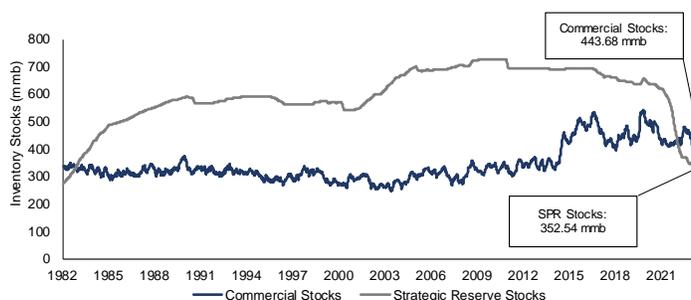
Source: EIA, SAF

**Oil: US SPR reserves now -91.142 mmb lower than commercial crude oil reserves**

**US SPR 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. The deficit widened this week after a build in commercial oil stocks of +2.909 mmb. The EIA's weekly oil data for December 15 [LINK](#) saw the SPR reserves increase +0.629 mmb WoW to 352.540 mmb, while commercial crude oil reserves increased +2.909 mmb to 443.682 mmb. There is now a -91.142 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

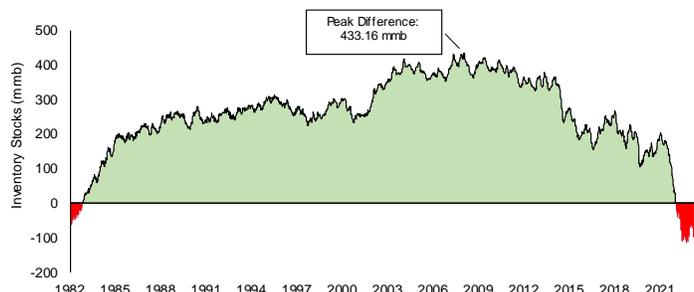
Figure 33: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

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Figure 34: US Oil Inventories: SPR Less Commercial



Source: EIA, SAF

**Oil: US gasoline prices +\$0.05 this week to \$3.13**

It was the first WoW increase in US national gas prices in some time. US gasoline prices were +\$0.05 this week to \$3.13 as of yesterday. Yesterday, AAA reported that US national average prices were up \$0.05 this week to \$3.13 on Dec 23, which is down \$0.10 MoM and up \$0.03 YoY from \$3.10. 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 \$0.03 WoW to \$4.59, and are now down \$0.33 MoM and up \$0.25 YoY.

**US gasoline prices****Oil: Crack spreads down \$1.92 WoW to \$22.87**

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 down \$2.13 WoW to \$22.87 as of Dec 22, which followed \$24.79 on Dec 15, \$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 \$22.87 are a little above the high end of the more normal pre-Covid that was more like \$15-\$20, which should support the continued normal seasonal ram up in refinery runs.

**Crack spreads basically flat this week****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 \$22.87 as of the Friday Dec 22, 2023 close.

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Figure 35: Cushing Crude Oil 321 Crack Spread Dec 22, 2013 to Dec 22, 2023



Source: Bloomberg

### Oil: Regulator still reviewing Trans Mountain 2<sup>nd</sup> request for TMX expansion variance

On Wednesday, Bloomberg reported “*Trans Mountain Corp. lost its bid to alter part of its long-delayed expansion of Canada’s only oil pipeline to the Pacific coast because regulators found the company’s plans were contrary to public interest and raised environmental issues. The Canada Energy Regulator denied a variance earlier this month that would have allowed Trans Mountain to use smaller pipe in an area where drilling challenges emerged because of concern about the pipeline’s integrity and its risks, the agency said Wednesday in a filing. The government-owned company reapplied for permission to use smaller pipe last week, warning that the project could face a two-year delay due to the variance denial, resulting in “billions of dollars in losses.” That second application is still pending.*” Note Bloomberg was reporting on the CER’s Wednesday posting of its Dec 5 rejection of the initial Trans Mountain request for a variance and NOT the second request a week ago.

Potential delay to  
TMX startup

### Trans Mountain warned TMX expansion delay could be 2 years

Here is what we wrote in last week’s (Dec 17, 2023) Energy Tidbits memo on Trans Mountain’s second application for a variance. “*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 said \$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

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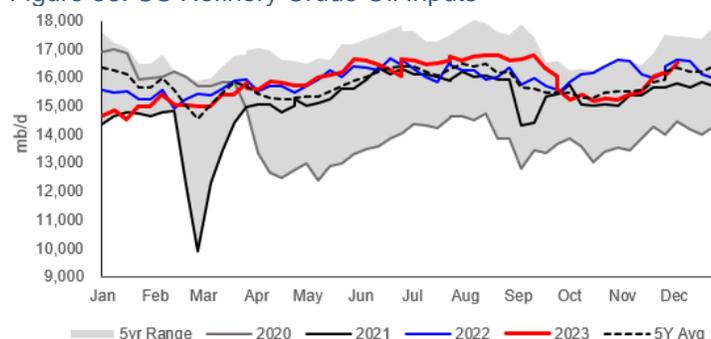
Calgary Herald interview with Trans Mountain CEO Farrell did not specifically address the B.C. First Nation saying it was entitled to an appeal of the CER approved minor route change. But CEO Farrell's timing for line-fill to start end of Jan and commercial operations at the loading terminal by the end 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 up +0.403 mmb/d WoW to 16.500 mmb/d**

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 are in their normal seasonal winter ramp up so we have been seeing a steady increase in crude inputs. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended December 15 [\[LINK\]](#). The EIA reported crude inputs to refineries were up +0.403 mmb/d this week to 16.500 mmb/d and are up +0.524 mmb/d YoY. Refinery utilization was up +2.2% WoW to 92.4%, which is +1.5% YoY. We likely hit the seasonal peak in refining in September.

**Refinery inputs  
+0.403 mmb/d  
WoW**

Figure 36: US Refinery Crude Oil Inputs



Source: EIA, SAF

**Oil: US net oil imports -0.117 mmb/d WoW as oil exports up +0.568 mmb/d WoW**

The EIA reported US “NET” imports were down -0.117 mmb/d to 2.629 mmb/d for the December 15 week. US imports were up +0.233 mmb/d to 6.750 mmb/d but were more than offset by exports which were +0.568 mmb/d WoW to 4.121 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 up +0.168 mmb/d. Some items to note on the country data: (i) Canada was up +0.114 mmb/d to 3.686 mmb/d. (ii) Saudi Arabia was up +0.090 mmb/d to 0.406 mmb/d. (iii) Mexico was up +0.218 mmb/d to 0.851 mmb/d. (iv) Colombia was up +0.001 mmb/d to 0.215 mmb/d. (v) Iraq was down -0.063 mmb/d to 0.022 mmb/d. (vi) Ecuador was down -0.184 mmb/d to 0.049 mmb/d. (vii) Nigeria was up +0.051 mmb/d to 0.162 mmb/d.

**US net oil imports**

Figure 37: US Weekly Preliminary Imports by Major Country

(thousand b/d)	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	Dec 15/23	WoW
Canada	3,287	3,890	3,291	3,544	3,723	3,387	3,485	3,873	3,835	3,846	3,243	3,972	3,572	3,686	114
Saudi Arabia	383	383	291	67	208	436	294	192	242	224	141	400	-318	406	90
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	803	844	524	656	809	614	1,004	465	366	971	571	876	633	851	218
Colombia	287	286	143	289	150	146	74	364	318	217	143	269	214	215	-1
Iraq	233	280	306	247	127	182	351	187	283	38	178	166	85	22	-63
Ecuador	134	167	125	0	0	92	133	61	36	128	112	252	233	49	-184
Nigeria	0	3	0	46	46	89	30	39	70	79	174	226	111	162	51
Brazil	209	240	209	362	63	221	168	234	135	257	148	274	255	197	-58
Libya	0	0	89	86	47	86	106	0	86	86	0	87	87	86	-1
Top 10	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	5,674	168
Others	1,381	1,146	1,237	1,030	967	760	780	979	1,004	867	1,123	966	1,011	1,076	65
Total US	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	6,750	233

Source: EIA, SAF

**Oil: Mexico oil production including partner volumes just below 1.6 mmb/d**

On Friday, Pemex posted its November 2023 oil production data. [LINK](#) Pemex does not provide any commentary on the data, but reported November oil production, including partners, was 1.567 mmb/d, which was -8.1% YoY and basically flat MoM to 1.574 mmb/d in

**Pemex November oil production**

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October 2023. The big picture story remains the same - Mexico (Pemex) oil production is stuck around 1.6 mmb/d for the last three years. Pemex has been unable to grow Mexico oil production, which means that any increase in Pemex Mexico refineries crude oil input will result in less Mexico oil for export including to the US Gulf Coast. And it also means that if Mexico has refinery issues in a month, there will be more Mexico oil for export in a month. Below is our table tracking Pemex oil production.

Figure 38: Pemex (Incl Partners) Mexico Oil Production

Oil Production (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	2,259	2,020	1,909	1,623	1,724	1,651	1,705	1,584	-7.1%
Feb	2,214	2,016	1,876	1,701	1,729	1,669	1,684	1,582	-6.1%
Mar	2,217	2,018	1,846	1,691	1,745	1,697	1,696	1,597	-5.8%
Apr	2,177	2,012	1,868	1,675	1,703	1,693	1,686	1,608	-4.6%
May	2,174	2,020	1,850	1,663	1,633	1,688	1,690	1,611	-4.7%
June	2,178	2,008	1,828	1,671	1,605	1,698	1,702	1,609	-5.5%
July	2,157	1,986	1,823	1,671	1,595	1,701	1,707	1,573	-7.9%
Aug	2,144	1,930	1,798	1,683	1,632	1,657	1,691	1,602	-5.3%
Sept	2,113	1,730	1,808	1,705	1,643	1,709	1,685	1,593	-5.5%
Oct	2,103	1,902	1,747	1,655	1,627	1,692	1,698	1,574	-7.3%
Nov	2,072	1,867	1,697	1,696	1,633	1,691	1,706	1,567	-8.1%
Dec	2,035	1,873	1,710	1,706	1,650	1,694	1,576		

Source: Pemex, SAF

### Oil: Mexico exports 0.883 mmb/d of oil in November, -16.1% MoM

On Friday, Pemex posted its oil exports for November [LINK](#) Pemex does not provide any commentary on the data but reported November oil exports were 0.883 mmb/d, which was -1.1% YoY and -16.1% MoM vs 1.053 mmb/d in October. Pemex oil exports were down 0.160 mmb/d MoM and its exports to the US were down 0.126 mmb/d MoM to 0.631 mmb/d vs 0.757 mmb/d in October 2023. The US tends to be a higher margin market so Pemex typically prioritizes oil exports to the US. Please note that Mexico oil exports were expected to decline in Q4/23 with the start up of their new 340,000 b/d Olmeca (formerly known as Dos Bocas) refinery. Pemex does not provide the refinery processing volumes for November, but does provide an indicator by noting its production of refined products in November was +0.161 mmb/d MoM and more refined oil means less oil for export. Below is our table of the Pemex oil export data.

**Pemex  
November oil  
exports**

Figure 39: Pemex Mexico Oil Exports

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	1,119	1,085	1,107	1,071	1,260	979	832	980	17.8%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	925	949	2.6%
Mar	1,062	1,001	1,176	1,150	1,144	925	905	971	7.3%
Apr	1,081	1,017	1,266	1,023	1,179	923	1,024	989	-3.4%
May	1,204	958	1,222	1,205	1,062	1,031	965	1,087	12.6%
June	1,098	1,157	1,110	995	1,114	1,106	1,029	1,203	16.9%
July	1,146	1,255	1,156	1,079	1,051	1,173	1,062	1,052	-0.9%
Aug	1,261	1,114	1,181	1,082	1,190	1,099	915	1,076	17.6%
Sept	1,425	1,159	1,206	995	1,023	983	1,022	1,119	9.5%
Oct	1,312	1,342	1,027	963	908	935	971	1,053	8.4%
Nov	1,273	1,388	1,135	1,114	1,171	1,025	893	883	-1.1%
Dec	1,115	1,401	1,198	1,115	1,243	1,037	900		

Source: Pemex, SAF

### Oil: Norway November oil production of 1.779 mmb/d, essentially flat MoM

On Monday, the Norwegian Petroleum Directorate released its November production figures [LINK](#). It reported oil production of 1.779 mmb/d, basically unchanged from 1.772 mmb/d in October but +1.7% YoY from 1.749 mmb/d in November 2022. November's production

**Norway  
November oil  
production**

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actuals came in -3.1% (-0.057 mmb/d) under the forecast volumes of 1.836 mmb/d. The NPD does not provide any explanations for any MoM changes.

Figure 40: Norway November 2023 Production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm <sup>3</sup> /day	Total MSm <sup>3</sup> o.e./day
Production	November 2023	1.779	2.014	362.8	0.683
Forecast for	November 2023	1.836	2.064	356.1	0.684
Deviation from forecast		-0.057	-0.050	6.7	-0.001
Deviation from forecast in %		-3.1 %	-2.4 %	1.9 %	-0.1 %
Production	October 2023	1.772	1.986	328.8	0.645
Deviation from	October 2023	0.007	0.028	34	0.038
Deviation in % from	October 2023	0.4 %	1.4 %	10.3 %	5.9 %
Production	November 2022	1.749	1.971	345	0.658
Deviation from	November 2022	0.030	0.043	17.8	0.025
Deviation in % from	November 2022	1.7 %	2.2 %	5.2 %	3.8 %

Source: Norwegian Petroleum Directorate

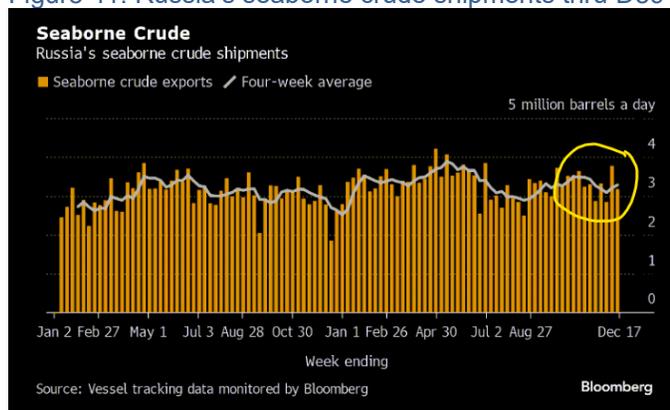
#### Oil: Russia crude oil shipments -600,000 b/d WoW, 4-wk average 3.28 mmb/d

On Tuesday, we tweeted [\[LINK\]](#) “Big -0.60 mmbd WoW decrease in Russia #Oil shipments to 3.18 mmbd for Dec 17 wk. Decrease was expected as Dec 10 wk was a catch up from Black Sea storms. 4-wk average to Dec 17 now 3.28 mmbd, in line with 3.28 mmbd commitment. Thx @JLeeEnergy #OOTT.” The big -0.60 mmb/d WoW decrease in Russia oil shipments was expected as last week was a bigcatch up week post the recent Black Sea storms. And with the big WoW, the 4-week average to Dec 17 is right in line with Russia’s commitment for oil exports of 3.28 mmb/d. Bloomberg wrote “About 3.28 million barrels a day of crude were shipped from Russian ports in the four weeks to Dec. 17, tanker-tracking data monitored by Bloomberg show. That was up by 80,000 barrels a day from the revised figure for the period to Dec. 10. The figure for weekly flows fell sharply, driven in part by the work at Primorsk. Using this measure, shipments fell to 3.18 million barrels a day, down by about 600,000 barrels a day from the revised figure for the period to Dec. 10.” Our Supplemental Documents package includes the Bloomberg report.

**Russia oil shipments less than commitment**

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Figure 41: Russia's seaborne crude shipments thru Dec 17 week

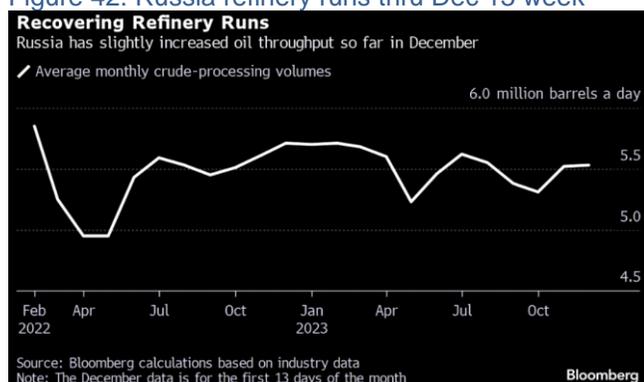


Source: Bloomberg

**Oil: Russian refineries processed more in recovery from Black Sea storms impact**  
 There was no surprise to see Bloomberg report that Russia's oil refineries processed the highest amount of crude since early April. Our last two Energy Tidbits memos have noted how Russia's oil refineries had lower processing due to Black Sea storms impact. So this week, things were back to normal. On Monday, Bloomberg wrote "Russia's oil processing climbed to the highest since early April, making up for a recent decline caused by logistical constraints. Refineries processed around 5.7 million barrels of crude a day from Dec. 7 to Dec. 13, up about 368,000 barrels a day from the first six days of the month, according to a person with knowledge of the matter. The weekly spike was mainly driven by higher runs at Rosneft PJSC's Tuapse refinery in southern Russia's Krasnodar region, the person said. The facility, which sends the bulk of its products abroad, previously curtailed operations as Black Sea storms aggravated logistical problems. Higher processing rates at the Afipsky and Ilsky plants, also in the Krasnodar region, as well as at Lukoil PJSC's Volgograd facility, contributed to the weekly growth in runs, the person said." Our Supplemental Documents package includes the Bloomberg report.

Russia oil refinery runs up

Figure 42: Russia refinery runs thru Dec 13 week



Source: Bloomberg

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### Oil: Angola leaves OPEC

On Thursday, ANGOP (Angola Press agency) reported [LINK](#) on Angola's decision to leave OPEC. ANGOP wrote "The Minister of Mineral Resources, Oil and Gas, Diamantino de Azevedo, announced on Thursday the withdrawal of Angola from OPEC. The decision, duly considered, was taken in a session of the Council of Ministers, chaired by the President of the Republic, João Lourenço. "We feel that at the moment Angola does not gain anything by remaining in the organization and, in defense of its interests, it has decided to leave," he said. He stressed that the country has always fulfilled its obligations and fought all the time to see OPEC modernize, help its members to gain advantages. Speaking to the press, the minister clarified that 'when we are in the organizations and our contributions, our ideas, do not produce any effect, the best thing is to exit'. Angola's decision to leave OPEC has already been transformed into a decree law, signed by the President of the Republic, João Lourenço. Angola voluntarily joined the Organization of the Petroleum Exporting Countries (OPEC) in 2006. OPEC is an intergovernmental organization of 13 nations, founded on September 15, 1960 in Baghdad by the five founding members (Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela). It has been headquartered since 1965 in Vienna, Austria, and as of September 2018, the 14 member countries accounted for 44% of global oil production and 81.5% of the world's proven reserves. OPEC enjoys a great deal of influence on global oil prices, previously determined by the so-called 'Seven Sisters' grouping of multinational oil companies."

### Angola leaves OPEC

#### Angola has been fighting to stop oil production decline

Angola leaving OPEC isn't expected to be a major oil negative in 2024. Angola's has been fighting to stop its production decline over the past couple years. That was the big issue for its OPEC partners that Angola's capacity isn't what they have been given and saying. And Angola has been producing below their target every month. Below is Bloomberg's graph of Angola oil production.

Figure 43: Angola's diminishing crude oil production



Source: Bloomberg

### Oil: "I am pleased to reaffirm Nigeria's unwavering commitment to OPEC"

No surprise, post Angola's leaving OPEC, to see the other African OPEC members come out with statements on their commitment to OPEC. On Friday, Nigeria's minister of state petroleum, Heineken Lokpobiri, tweeted [LINK](#) "I am pleased to reaffirm Nigeria's unwavering commitment to OPEC as we navigate the dynamic landscape of the global energy sector."

### Nigeria committed to OPEC

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*Our collaboration within the organization remains pivotal in fostering stability and sustainability in the oil market. We are resolute in our dedication to OPEC's objectives while actively engaging with the organization to address concerns that resonate not only within our nation's borders but across the entire continent. Nigeria stands ready to contribute constructively to the ongoing dialogue, ensuring that the unique challenges and opportunities of our region are duly recognized and addressed". As the Minister of State for Petroleum Resources, I am committed to fostering a collaborative spirit within OPEC that goes beyond our national interests, recognizing the collective responsibility to nurture a resilient energy landscape for the benefit of all member nations and the world at large".*

#### **Oil: "Republic of Congo reaffirms its steadfast commitment to ... OPEC"**

And then yesterday, Congo came out with their commitment to OPEC. Congo's Deputy Minister of Hydrocarbons, Bruno Jan Richard Itoua, posted on LinkedIn [\[LINK\]](#) *"The Republic of Congo reaffirms its steadfast commitment to the strategic policy defined by the Secretary-General of OPEC and OPEC+. We strongly support the efforts to stabilize and promote sustainable development of the oil markets, a crucial approach for the future of our sector and the global economy. Furthermore, the Republic of Congo highlights the remarkable harmony prevailing among the members of the OPEC and OPEC+ Ministerial Conference. This harmony reflects our common commitment and shared willingness to work together for mutually beneficial goals. The Republic of Congo is committed to continuing close and constructive collaboration with all member countries. We are determined to foster initiatives that serve the collective interest of the oil industry, while positively contributing to overall economic well-being. We reiterate our firm support for unity and cohesion at the heart of OPEC and OPEC+, where each member, whether African or not, plays an indispensable role in achieving our shared objectives and in maintaining the balance of the global oil market. Our collaboration transcends borders and continents, reflecting our common commitment to a more stable and prosperous energy future. With respect and determination, the Republic of Congo continues to actively engage in this global partnership, thereby helping to shape a sustainable energy future for all."*

**Congo  
committed to  
OPEC**

#### **Oil: US said Iran drone hit a tanker in the Arabian Sea ie. adds Strait of Hormuz risk**

There was big oil market news on Saturday with the reports that a US drone, not a Houthi drone, hit a tanker that was in the Arabian Sea (offshore India) and, significantly, this tanker reported loaded or stopped at Saudi Arabia before sailing thru the Strait of Hormuz to get to where it was hit by the drone in the Arabian Sea. There were two surprises yesterday. (i) First, early Saturday morning, a tanker was hit in the Arabian Sea approximately 200 km SW of Verava (India). The surprise was the location in the Arabian Sea on a tanker that had reportedly sailed from Saudi Arabia. Our immediate concern was that this drone attack was opening up another drone risk area leaving the Persian Gulf. When we saw the UKMTO tweet (United Kingdom Maritime Trade Operations), early Saturday morning, we tweeted [\[LINK\]](#) *"#Oil market story for Monday! Looks like a big expansion of shipping risk area for drone attacks to Arabian Sea! IF the Houthis, is this a reminder to Saudi to not help Israel/US as they can hit any tankers/ships coming out of Persian Gulf?. Thx @UK\_MTO #OOTT."* We put "IF the Houthis" as we did not know who it was and the target was still within the range of Houthi drones. (ii) The second big surprise was late Saturday, when the WSJ reported [\[LINK\]](#) that it was an Iran drone, not a Houthi drone. If true, this would be the first drone attack by Iran linked to the Israel/Hamas war. We tweeted [\[LINK\]](#) *"The #Oil story for Monday."*

**Drone hits tanker  
in Arabian Sea**

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US says it wasn't the Houthis, it was Iran. @WSJ reports the tanker hit by a drone 200 miles off coast of India was "a one-way attack drone fired from Iran," a Pentagon spokesperson said in a statement. #OOTT. The WSJ wrote "A chemical tanker in the Indian Ocean was struck by a drone launched directly from Iran early Saturday, the Pentagon said, signaling a widening risk to shipping after Yemeni rebels started attacking vessels in the Red Sea. "The motor vessel Chem Pluto, a Liberia-flagged, Japanese-owned, and Netherlands-operated chemical tanker was struck at approximately 10 a.m. local time today in the Indian Ocean, 200 nautical miles from the coast of India, by a one-way attack drone fired from Iran," a Pentagon spokesperson said in a statement. While Iran has struck tankers in the past, it is the first time the U.S. alleged Tehran had directly targeted ships since regional tensions flared up again after the Oct. 7 Hamas attacks on Israeli citizens. The vessel is owned by Japan's Rio Brillante and managed by the Netherlands' Ace-Quantum Chemical Tankers, which is connected to Israeli shipping tycoon Idan Ofer. Rio, Ace-Quantum and a spokesman for Ofer didn't respond to requests for comment." Our Supplemental Documents package includes the WSJ report.

#### **Hit tanker reportedly loaded in Saudi ie. must have sailed thru Strait of Hormuz**

The reports are that the tanker was loaded or stopped in Saudi Arabia, which means it then sailed thru the Strait of Hormuz before heading south in the Arabian Sea and being hit by the drone offshore India. We still find it surprising that Iran would get involved in this way. But, if so, this adds significant drone attack risk to tankers coming out of the Persian Gulf and thru the Strait of Hormuz, the #1 world's oil chokepoint.

Figure 44: Suez Canal vs Cape of Good Hope shipping routes



Source: Google Maps

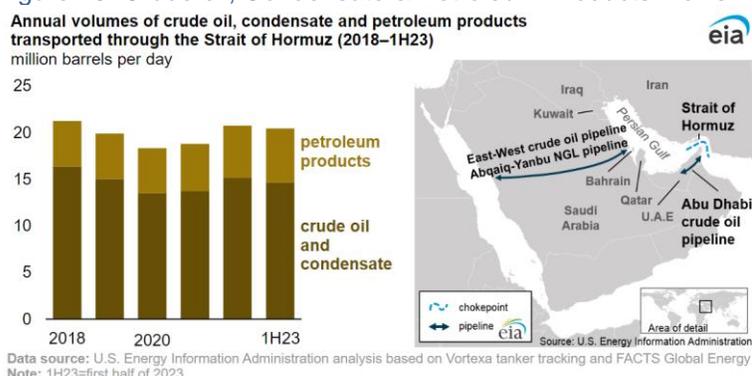
#### **Strait of Hormuz is the #1 world oil chokepoint, there is no real work around**

We have said this previously that the Bab el Mandeb can be worked around by having ships go around the Cape of Good Hope. But the reason why the Strait of Hormuz is the #1 world oil chokepoint is that there really isn't much of a work around. 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

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dated, the market has been focused on the Strait 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

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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
<b>Total oil flows through Strait of Hormuz</b>	<b>21.3</b>	<b>19.9</b>	<b>18.3</b>	<b>18.8</b>	<b>20.8</b>	<b>20.5</b>
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
<b>World maritime oil trade</b>	<b>77.4</b>	<b>77.1</b>	<b>71.9</b>	<b>73.2</b>	<b>75.2</b>	<b>76.3</b>
<b>World total petroleum and other liquids consumption</b>	<b>100.1</b>	<b>100.9</b>	<b>91.6</b>	<b>97.1</b>	<b>99.6</b>	<b>100.3</b>
<b>LNG flows through Strait of Hormuz (billion cubic feet per day)</b>	<b>10.3</b>	<b>10.6</b>	<b>10.4</b>	<b>10.6</b>	<b>10.9</b>	<b>10.8</b>

Source: EIA

### Oil: Houthis keep up attacks on US Navy and commercial ships in the Red Sea

There were multiple Houthi rocket/missile attacks this week on ships in the Red Sea/Bab el Mandeb. This includes multiple missile attacks yesterday including another missile attack at a US Navy ship. Yesterday's US Central Command tweeted [\[LINK\]](#) included (i) two Houthi missiles fired in the southern Red Sea and no ships reported being impacted. (ii) Houthis target US Navy again. CENTCOM wrote "*Between 3 and 8 p.m. (Sanaa time), the USS LABOON (DDG 58) was patrolling in the Southern Red Sea as part of Operation PROSPERITY GUARDIAN (OPG) and shot down four unmanned aerial drones originating from Houthi-controlled areas in Yemen that were inbound to the USS LABOON. There were no injuries or damage in this incident.*" (iii) One tanker hit and another had a near miss. CENTCOM wrote "*At approximately 8 p.m. (Sanaa time), U.S. Naval Forces Central Command received reports from two ships in the Southern Red Sea that they were under attack. The M/V BLAAMANEN, a Norwegian-flagged, owned, and operated chemical/oil tanker, reported a near miss of a Houthi one-way attack drone with no injuries or damage reported. A second vessel, the M/V SAIBABA, a Gabon-owned, Indian-flagged crude oil tanker, reported that it was hit by a one-way attack drone with no injuries reported. The USS LABOON (DDG 58) responded to the distress calls from these attacks. These attacks represent the 14th and 15th attacks on commercial shipping by Houthi militants since Oct. 17.*"

**Houthis keep up missile attacks in Red Sea**

### Oil: Avoiding the Red Sea adds 3,280 miles and 10-15 days via Cape of Good Hope

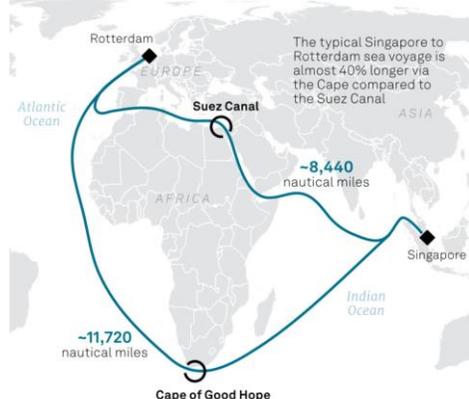
The Suez Canal couldn't happen at a worse time given the Panama Canal is still running at far less capacity than normal due to the droughts. So it really only leaves the shippers/tankers with the option of going around the Cape of Good Hope. On Monday, we tweeted [\[LINK\]](#) "*Avoiding Red Sea and going the long way around Cape of Good Hope for typical Singapore to Rotterdam for shipping adds ~3,280 miles and 10-15 days. Thx @jcgana @SPGCI #OOTT.*" Our tweet included the below map from Jennifer Gnana of Platts.

**3,280 miles and 10-15 days to avoid Suez Canal**

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Figure 47: Suez Canal vs Cape of Good Hope shipping routes

Suez Canal vs. Cape of Good Hope shipping routes



Source: Global Maritime Hub, S&amp;P Global Commodity Insights

Source: Platts

### Oil: Houthis warns it “will turn the Red Sea into a graveyard of the US-led coalition”

The Houthis gave a couple of very direct warnings to the US and its partners in protecting the Red Sea. The question is will it stop the US (i) We were surprised that the Houthis defense minister blunt warning to the US was overlooked. On Tuesday, we tweeted [LINK](#) ““The Yemeni Armed Forces will turn the Red Sea into a graveyard of the US-led coalition if the alliance decides to take any action against Yemen,” Houthis Defense Minister. Will this keep the US et al from retaliating against drones/missiles shot at their navy? #OOTT.” Iran’s PressTV reported “Yemen’s defense minister has denounced the formation of a US-led maritime task force in the Red Sea to protect the passage of merchant vessels bound for the Israeli-occupied territories, cautioning the Western alliance that any assault on Yemeni soil will have dire consequences. “We are in possession of munitions and military gear that can sink your warships, submarines and aircraft carriers,” Major General Mohammad al-Atifi said on Monday. “The Yemeni Armed Forces will turn the Red Sea into a graveyard of the US-led coalition if the alliance decides to take any action against Yemen,” he said.” (ii) Houthis leader repeated the warning on Wednesday that the Houthis will target US interests if the US attacks the Houthis. We tweeted [LINK](#) “Will Houthis leader speech keep US from attacking? Any US attack will be met w/ targeting US “battleships, interests, & navigation with missiles, drones, & military operations. Also warns UK, France, Italy & others. Regrets Arab countries shooting down Houthis missiles. #OOTT.” The Houthis leader made a major speech and he had a similar warning to the US and its allies but didn’t have the same colorful description as the Houthis defense minister. Our tweet included the full speech. He said “The Leader of the Revolution stressed that the Yemeni people will not stand idly by if the Americans have a tendency to escalate further and commit foolishness by targeting the country or launching a war against it, and that any “American targeting of Yemen will be met with targeting of American battleships, interests, and navigation with missiles, drones, and military operations.” He said: “We are not among those who stand idly by while the enemy targets them. We are a people who reject injustice, rely on God, and do not fear direct American threats and aggression.” He added, “As long as the American wants to enter into a direct war with us, he should know that we are not among those who fear him, and that he is facing an

**Houthi warns US  
against attacking**

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entire people and not a specific group. If he wants to prevent the Yemeni position towards Palestine, then he is in trouble with all the Yemeni people." He continued: "If the American sends his soldiers to Yemen, he should know that he will face something harsher than what he faced and suffered in Afghanistan and Vietnam. He should also not imagine that he can strike here or there and then send mediations to calm the situation." Our Supplemental Documents package includes the PressTV report and the Houthis leader speech.

#### **Did the Houthis leader also warn Saudi Arabia?**

Saudi Arabia has been doing all it can to avoid getting dragged into a direct conflict with anyone, especially the Houthis. The other part of the Houthis speech was that it looked like a warning to "Arab countries", but in reality, it seemed like a warning to Saudi Arabia. "The leader of the revolution asked the Arab countries to "leave Yemen in direct war with the Israeli and American enemies. If they want to dance, let them dance, but not participate militarily or financially with them." He said: "If the Arabs want to be an audience that applauds the Americans, let them applaud, and if they want to dance to let them dance with the remains of the victims, but do not join the Americans in their war against us." The other part that seemed to be a warning to Saudi Arabia was "He said: "Sometimes four countries, including Arab countries and military forces, in addition to the enemy entity, try to prevent our drones and missiles from reaching their targets. He expressed his regret over some Arab countries enlisting with the Zionist enemy and using their military capabilities to protect it from Yemeni missiles instead of moving to protect the Palestinian people. He added, "We seek to develop our capabilities to overcome any obstacles and achieve their goals so that this rises to the level of responsibility and meets the desire and will of the Yemeni people and their clear position against the Zionist enemy in its criminal aggression against the Palestinian people in Gaza. We did not target any other country, and we have been patient with the objection operations carried out by some Arab countries and did not target them."

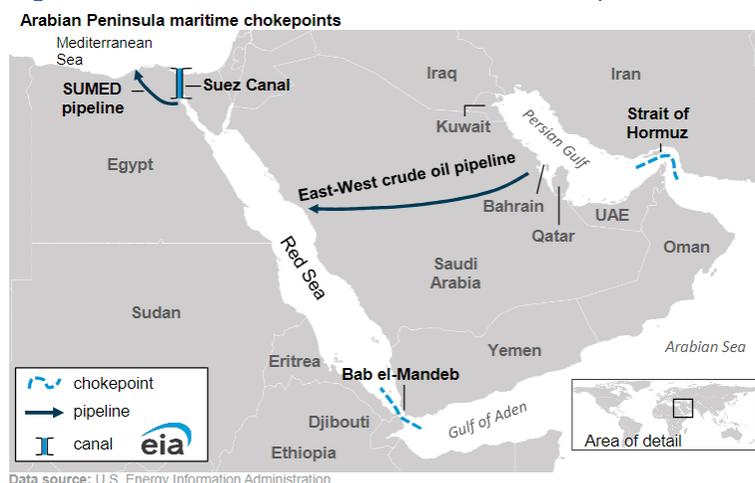
#### **Oil: EIA estimates 8.8 mmb/d & 4.1 bcf/d thru Bab el Mandeb/Red Sea chokepoint**

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."

**Bab el Mandeb  
chokepoint.**

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Figure 48: Bab el-Mandeb Strait, a world oil chokepoint



Data source: U.S. Energy Information Administration

Source: EIA

Figure 49: 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
<b>Total oil flows through Suez Canal and SUMED pipeline</b>	<b>6.4</b>	<b>6.2</b>	<b>5.3</b>	<b>5.1</b>	<b>7.2</b>	<b>9.2</b>
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
<b>LNG flows through Suez Canal (billion cubic feet per day)</b>	<b>3.3</b>	<b>4.1</b>	<b>3.7</b>	<b>4.5</b>	<b>4.5</b>	<b>4.1</b>
<b>Total oil flows through Bab el-Mandeb Strait</b>	<b>6.1</b>	<b>5.9</b>	<b>5.0</b>	<b>4.9</b>	<b>7.1</b>	<b>8.8</b>
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
<b>LNG flows through Bab el-Mandeb Strait (billion cubic feet per day)</b>	<b>3.1</b>	<b>3.9</b>	<b>3.7</b>	<b>4.5</b>	<b>4.5</b>	<b>4.1</b>

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

Source: EIA

**Oil: Saudi use of oil for electricity down big in Oct, ie. more oil available for export**

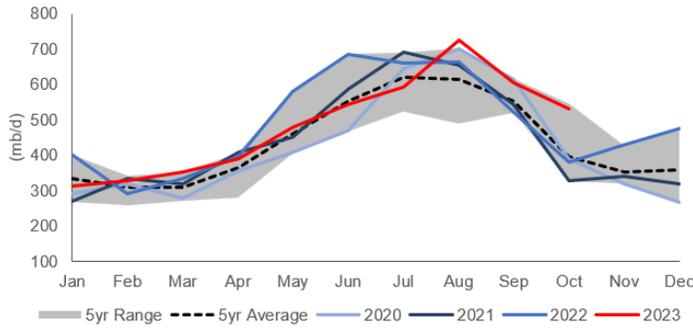
The key seasonal theme for Saudi oil exports is that, all things being equal, Saudi can export more oil in winter months as it uses less oil for electricity and, conversely, it would have less oil for export in summer months as it uses more oil for electricity i.e. air conditioning. Note that a normal peak to trough decline is ~400,000 b/d. If there is less oil used for electricity, then there is more oil for export and vice versa. The JODI data for Saudi Arabia oil supply and demand for October [\[LINK\]](#) was updated on Monday. Saudi used less oil for electricity in October vs September. October was considerably cooler than September, especially at night. We checked AccuWeather’s monthly data for Riyadh, and we saw daytime highs went from the 40’s in September down to the 30’s in October, with the nights around 20C which we’d consider as “leave your windows open” weather as opposed to needing air conditioning. Oil used for electricity generation in October was 531,000 b/d (vs October 2022 of 380,000 b/d) and September was 606,000 b/d (vs September 2022 of 522,000 b/d). Also note that this

**Saudi oil use for electricity down in Oct.**

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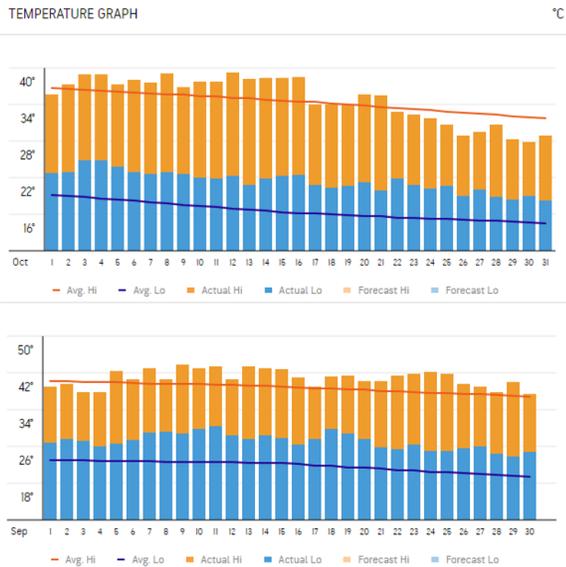
year fits the normal trough-to-peak swing of 400,000 b/d. The low was 312,000 b/d in Jan and we just saw 726,000 b/d in Aug. Below are the AccuWeather Temp maps for Riyadh for September and October.

Figure 50: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI  
Source: JODI, SAF

Figure 51: Riyadh Temperature Recaps for October (top) and September (bottom)



Source: Accuweather

**Oil: Saudi oil exports up +543,000 b/d to 6.297 mmb/d in October**

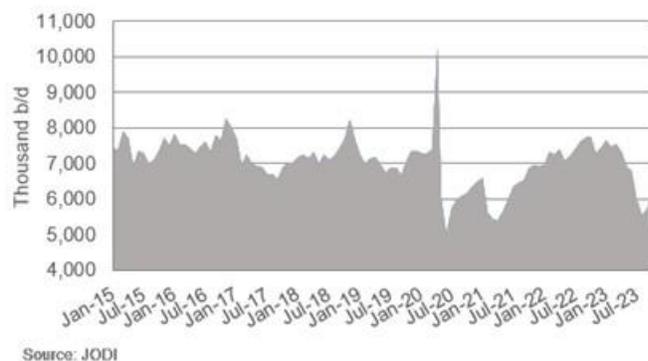
The JODI data was that production was down -35,000 b/d MoM to 8.940 mmb/d. Saudi oil exports were up +543,000 b/d MoM to 6.297 mmb/d. An increase in Saudi oil exports would be expected with less oil being used to generate electricity. However, this was a big

**Saudi oil exports up +543,000 b/d MoM**

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decrease in refinery intake, down ~750,000 b/d. There is no explanation given but this is a huge MoM decrease in Saudi refinery runs, which can only be explained if there was big maintenance or it was a month of big imports of Russia fuel oil. We have noted in the past how Saudi's imports of Russia fuel oil has been a factor in the monthly reconciliation. Below is our graph of Saudi Arabia monthly oil exports.

Figure 52: Saudi Arabia Oil Exports (mb/d)



Source: JODI

Source: JODI, SAF

### 11/10/23 Saudi reminds oil exports are seasonal, less in summer/more in winter

Here is what we wrote in the Nov 12, 2023 Energy Tidbits memo. *“We probably should have called it Saudi Oil 101, but we were a little surprised that Saudi Energy Minister felt the need to explain how there is seasonality to Saudi’s oil exports because Saudi domestic consumption of oil has a seasonal pattern. So seasonally, there is more Saudi oil available for export in the fall than in the summer. On Friday, we tweeted [LINK](#) “Agreed, he is explaining Saudi Oil 101. Summer heat = more #Oil used to generate electricity for A/C ie. less for export. Aug 2023 was 726,000 b/d, +414,000 b/d vs Jan 2023. See 📌 SAF 10/22/23 Energy Tidbits graph. Thx @SVakhshouri for flagging. #OOTT.” Well known oil strategist Dr. Sara Vakhshouri tweeted “Saudi Energy Minister on #oil price drop: demand is healthy & speculators are to blame for the recent drop. OPEC exports don’t indicate increased production. Shipments are seasonal, dipping in summer & rebounding in Sep & Oct; not a sign of output changes.” This is the theme we highlight every month when we report on the monthly Saudi oil data for oil to refineries, production, exports, oil for electricity and oil into inventories. Our tweet showed our Oct 22, 2023 Energy Tidbits graph on how Saudi used 414,000 b/d more oil for electricity in Aug than it did in Jan because of the weather. The hot summers always drive up Saudi use of oil for electricity.”*

### Oil: Saudi oil inventories up 3.398 mmb MoM in October

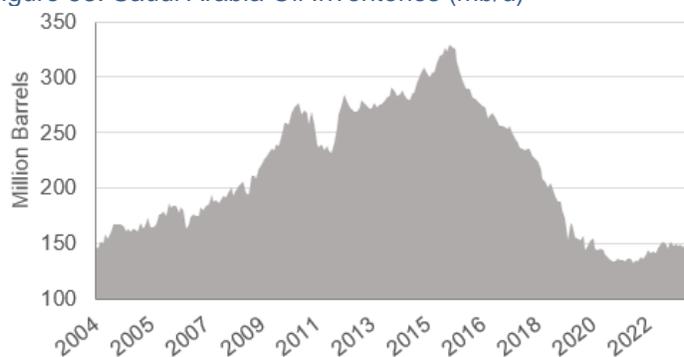
As noted above, there is a missing piece in the math on Saudi oil exports and this also impacts the math to get to the monthly Saudi oil inventory changes. As noted above, we expect the likely culprit is unreported imports of Russia fuel oil and possibly crude. This is what we have seen in the past, when there were unexplained builds in inventories than what the basic math from production, refinery intake, and exports would suggest, and we guessed

Saudi oil  
inventory data

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the culprit was unreported Russian imports. And this month we saw an unexpectedly low build in inventories, which could suggest some unreported exports. JODI data shows inventories were +3.398 mmb MoM, but are down on a b/d basis considering October has one more day than September at -47,642 b/d MoM. Looking at the basic components, we would have expected a build on inventory closer to 247.000 mb/d MoM or up +7.657 mmb MoM. There should have been a MoM inventory build impact from intake of refineries being down -750,000 b/d MoM and crude oil used for electricity -75,000 b/d MoM. The items going against this inventory build were exports being +543,000 b/d MoM and production being -35,000 b/d MoM. This would still imply a build of 247,000 b/d MoM, but inventories were only up by 110,000 b/d MoM leaving ~137,000 b/d of unexplained MoM items. There is always some minor unexplained variance, but this was a larger unexplained variance than normal.

Figure 53: Saudi Arabia Oil Inventories (mb/d)



Source: JODI

Source: JODI, SAF

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

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 1,219,000 barrels per day, and condensate production reached 56,000 barrels per day during the past 24 hours". The NOC has been consistent on splitting crude oil vs condensate.

Libya oil  
production

#### 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 18 tweet, like the NOC Dec 11 tweet said Libya oil production was just over 1.2 mmb/d, this time at 1.219 mmb/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. Bloomberg 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

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*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.”*

### **Oil: Record energy consumption in China with cold now hitting most of China**

The cold in northern China spread to most of China this week and that meant record energy consumption. We tweeted [\[LINK\]](#) “Cold Northern China = record energy consumption incl 1.242 bcm (50.3 bcf/d) of #natgas reports Global Times. No question a positive but not a huge swing vs China daily average #natgas consumption in 2022 of 375.7 bcm/yr or 36.4 bcf/d per @EnergyInstitute data. #OOTT.” Note our tweet had the incorrect bcm but the correct 50.3 bcf/d. Global Times (China communist party media) tweeted [\[LINK\]](#) “China’s energy consumption hit record high on Sunday, consuming 1.242 billion kilowatts of electricity and 1.423 billion cubic meters of natural gas. The country has ample energy reserve, with coal stocks above 200 million tons, meeting 26 days’ use by power plants, as well as high level inventories of natural gas and oil products: NDRC.” 1.423 billion cubic meters is 50.3 bcf/d, which compares to the daily average natural gas consumption of 375.7 bcf/yr or 36.4 bcf/d.

**Record energy consumption in China**

### **Oil: China’s CNPC keeps increasing its forecast for peak oil demand**

It is interesting to see how many are see the big penetration of EVs in China and concerns about China’s economic growth potential and see China reaching peak oil demand in the next few years. That may be the view, but China feels differently. On Friday, we tweeted [\[LINK\]](#) “Does China know more about itself than outsiders? See 🗨️ @JavierBlas post. China keeps increasing its forecast for peak #Oil demand. #OOTT.” China’s CNPC puts out its forecast for when China will reach peak oil demand and every year, they keep increasing (call for higher oil demand) their forecast for peak oil demand. We forwarded Bloomberg’s Javier Blas tweet who reported on the CNPC data. Blas wrote “CHINA AND THE OIL MARKET: Every year around this time, state-owned China National Petroleum Corp. publishes an estimate of when the country’s oil demand might peak. And every year, it gets higher and higher, and now much higher | #OOTT ½” And “The revision from 2017 and 2024 of up to 130 million tonnes equals to ~2.6 million barrels a day (give or take, depending on the multiple used to translate tonnes into barrels -- but in any case, significantly more than the current consumption of Germany). #OOTT 2/2.” Note 800m tonnes is 16.1 mmb/d and that this looks to be crude oil whereas many will include demand for LPG and Ethane, which is probably more than 2 mmb/d. Below is the data from the Blas tweet.

**China peak oil demand**

### **Figure 54: China National Petroleum Corporation forecast for China peak in oil demand**

The evolution of the forecast by China National Petroleum Corporation (CNPC) for the country’s peak in oil demand:

2023: peak “by 2030” at “up to” 800m tonnes  
 2021: peak “by 2030” at 780m tonnes  
 2020: peak “before 2030” at 740m tonnes  
 2019: peak “in 2030” at 705m tonnes  
 2018: peak “by 2030s” at 690m tonnes  
 2017: peak “in 2027” at 670m tonnes

Source: CNPC and Bloomberg Opinion research

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Source: Bloomberg's Javier Blas

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

Please note BloombergNEF isn't publishing its Aviation Indicators Weekly until mid-Jan. Here is an excerpt from what we wrote in last week's (Dec 17, 2024) Energy Tidbits on the last report. "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."

China scheduled domestic flights

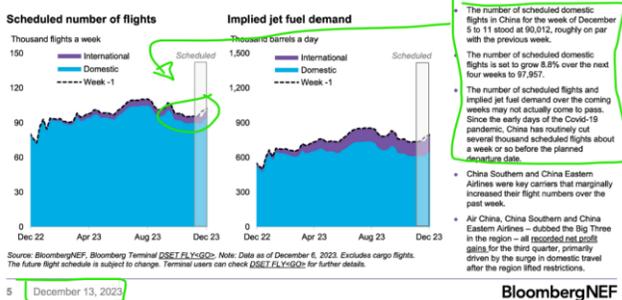
Figure 55: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

<p><b>Dec 5-11: +0.2% WoW to 90,012 flights</b></p> <p>Nov 28-Dec 4: -0.1% WoW to 89,810</p> <p>Nov 21-27: +0.4% WoW to 89,916</p> <p>Nov 14-20: -0.2% WoW to 89,562</p> <p>Nov 7-13: -2.6% WoW to 89,776</p> <p>Oct 31-Nov 6: -0.2% WoW to 92,146</p> <p>Oct 24-30: -0.3% WoW to 92,361</p> <p>Oct 17-23: -6.9% WoW to 92,638</p> <p>Oct 10-16: -1.6% WoW to 99,490</p> <p>Oct 3-9: +4.2% WoW to 101,120</p> <p>Sept 26-Oct 2: +1.3% WoW to 97,009</p> <p>Sept 19-25: essentially flat WoW to 95,742</p> <p>Sept 12-18: -2.7% WoW to 95,853</p> <p>Sept 5-11: -5.0% WoW to 98,469</p> <p>Aug 29-Sep 4: -1.2% WoW to 103,637</p> <p>Aug 22-28: +0.2% WoW to 104,932</p> <p>Aug 15-21: -0.1% WoW to 104,716</p> <p>Aug 8-14: +0.8% WoW to 104,823</p> <p>Aug 1-7: -0.4% WoW to 104,000</p> <p>July 25-31: +0.4% WoW to 104,436</p> <p>July 18-24: +1.3% WoW to 104,011</p> <p>July 11-17: +2.8% WoW to 102,709</p> <p>Jul 4-10: +2.4% WoW to 99,904</p> <p>Jun 27-Jul 3: +1.9% WoW to 97,572</p> <p>Jun 20-26: +3.4% WoW to 95,724</p> <p>Jun 13-19: -0.9% WoW to 92,568</p> <p>June 6-12: -1.2% WoW to 93,328</p>	<p>May 30-Jun 5: +0.2% WoW to 94,486</p> <p>May 23-29: -0.1% WoW to 94,321</p> <p>May 16-22: -2.8% WoW to 94,417</p> <p>May 9-15: basically flat at 97,049</p> <p>May 2-8: +2.8% WoW to 97,087</p> <p>Apr 25-May 1: +0.04% to 94,471</p> <p>Apr 18-24: +2.1% WoW to 94,138</p> <p>Apr 11-17: +0.7% WoW to 92,231</p> <p>Apr 3-10: -4.2% WoW to 91,567</p> <p>Mar 28-apr 3: +6.8% WoW to 95,624</p> <p><b>Mar 21-27: +1.5% WoW to 89,513</b></p> <p>Mar 14-20: -0.6% WoW to 88,166</p> <p>Mar 7-13 week: -0.8% WoW to 88,675</p> <p>Feb 27-Mar 3 week: -2.6% WoW to 89,430</p> <p>Feb 21-27 week: +0.0% WoW to 91,828</p> <p>Feb 14-20 week -0.5% WoW to 91,561</p> <p>Feb 7-13 week -0.7% WoW to 92,007</p> <p>Jan 31- Feb 6 week +10.9% WoW</p> <p>Jan 24-30 week -9.2% WoW to 83,500</p> <p>Jan 17-23 week +7% WoW to 91,959</p> <p>Jan 10-16 week +20% WoW to 85,910</p> <p>Jan 3-9 week: -5.3% WoW to 71,642</p> <p>Dec 27-Jan 2 week: -5.6% WoW to 75,652</p>
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Source: BloombergNEF

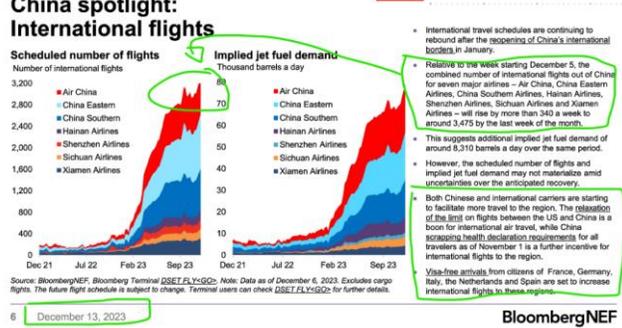
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Figure 56: China Scheduled Domestic flights per Dec 13 report  
China



Source: BloombergNEF, Bloomberg Terminal DSET.FLY:GDQ. Note: Data as of December 6, 2023. Excludes cargo flights. The future flight schedule is subject to change. Terminal users can check DSET.FLY:GDQ for further details.

Figure 57: China Scheduled International flights per dec 6 report  
China spotlight: International flights



Source: BloombergNEF, Bloomberg Terminal DSET.FLY:GDQ. Note: Data as of December 6, 2023. Excludes cargo flights. The future flight schedule is subject to change. Terminal users can check DSET.FLY:GDQ for further details.

**Oil: Visitors to Macau picking up, now at 88.8% of pre-Covid but down MoM**

China is still fighting a pause in its domestic economy recovery but one area that is expected to ramp up is international travel to and from China. On Thursday, Bloomberg posted the updated Macau tourist visitors for Nov. For the updated tourist visitors to Macau data for Nov. Visitors to Macau in Nov back to 88.8% of pre-Covid Oct 2019. Oct 2023 was 85.9% of pre-Covid. Nov. saw 2.584 mm total, incl 1.771 mm from mainland China. Oct 2023 was 2.757 mm total, incl 1.950 mm from mainland China. Nov 2022 was 0.367 mm total, incl 0.320 mm from mainland China, while Nov 2019 was 2.910 mm total, incl 2.031 mm from mainland China.

**Visitors to Macau picking up**

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Figure 58: Visitors to Macau – total



Source: Bloomberg

Figure 59: Visitors to Macau – Mainland China



Source: Bloomberg

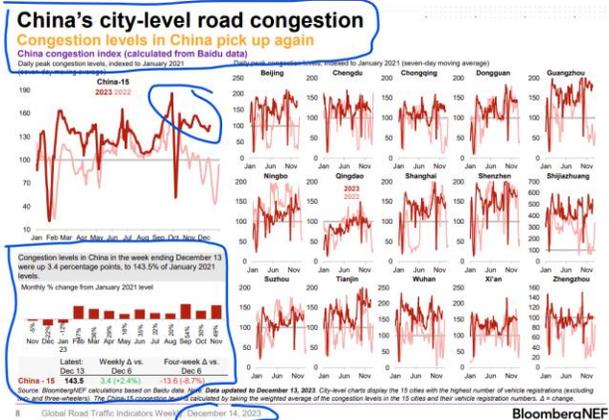
### Oil: Baidu China city-level road congestion inched up after 3 down weeks

Please note BloombergNEF is not publishing its Global Road Traffic Indicators until Jan. Here is an excerpt of what we wrote in last week's (Dec 17, 2023) Energy Tidbits memo on the last report. "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 good indicator that less people out and about and spending money."

### China city-level traffic congestion

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Figure 60: China city-level road congestion for the week ended Dec 13



Source: BloombergNEF

Figure 61: China city-level road congestion for the week ended Dec 13



Source: BloombergNEF

**Oil: China says respiratory diseases down 8.2% WoW and down 30.02% vs peak**

Earlier this morning, Global Times (China communist party media) tweeted [\[LINK\]](#) "The number of patients with respiratory diseases continued to fluctuate and decline in recent days, with data showing that on December 22, the total amount of patients with respiratory diseases at the national secondary and above medical institutions dropped by 8.2% compared to the same period in the previous week and lowered by 30.02% compared with the peak: Mi Feng, spokesperson with China's National Health Commission." We checked Global Times and Xinhua News (China state media) websites as of 4:30am MT today and there was no accompanying story. So, we only have the tweet. But China is saying the respiratory cases are on the decline.

China Covid update

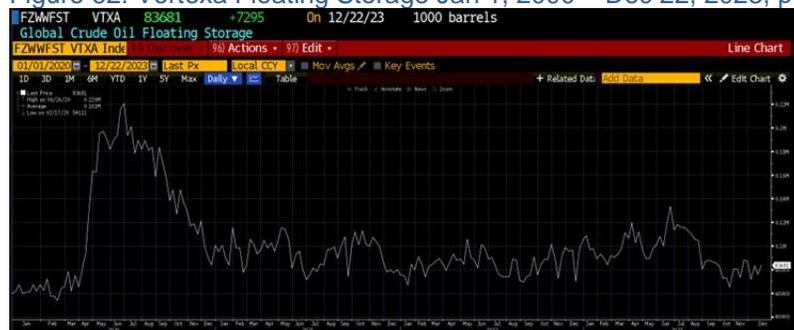
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## Vortexa floating storage

**Oil: Vortexa crude oil floating storage est 83.68 at Dec 22, +7.29 mmb WoW**

We are referencing the Vortexa crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Dec 16 at 9am MT. (i) Yesterday, we tweeted [\[LINK\]](#) "Floating #Oil storage 12/22 is 83.68 mmb, +7.29 WoW vs revised up 12/15 of 76.39 mmb. Last 7-wk average crept back over 80 to 80.53 mmb. Still fine but want to watch coming into seasonally low demand in Q1. Thx @Vortexa @business #OOTT." [\[LINK\]](#) "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 22 at 83.68 mmb, which is +7.29 mmb WoW vs revised up Dec 15 of 76.39 mmb. Note Dec 15 was revised +5.99 mmb vs 70.40 mmb originally posted at 9am on Dec 16. (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 16 are as follows: Dec 15 revised +7.29 mmb. Dec 8 revised -0.95 mmb. Dec 1 revised +0.29 mmb. Nov 24 revised -0.40 mmb mmb. Nov 17 revised -0.47 mmb. Nov 10 revised +2.20 mmb. Nov 3 revised +1.93 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 80.53 mmb vs last week's then seven-week average of 78.87 mmb. The increase is primarily due to the upward revision to Dec 15. (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 22 estimate of 83.68 mmb is -13.94 mmb YoY vs Dec 23, 2022 of 97.62 mmb. (viii) Dec 22 estimate of 83.68 mmb is -136.63 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (ix) Dec 22 estimate of 83.68 mmb is +18.07 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 23, 9am MT Dec 16, and 9am MT Dec 9.

Figure 62: Vortexa Floating Storage Jan 1, 2000 – Dec 22, 2023, posted Dec 23 at 9am MT



Source: Bloomberg, Vortexa

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Figure 63: Vortexa Estimates Posted 9am MT on Dec 23, Dec 16, and Dec 9

Posted Dec 23, 9am MT						Dec 16, 9am MT						Dec 9, 9am MT					
FZWWFST VTXA Inde 9M Dts						FZWWFST VTXA Inde 9M Dts						FZWWFST VTXA Inde 9M Dts					
01/01/2020 - 12/22/2023						01/01/2020 - 12/15/2023						01/01/2020 - 12/08/2023					
1D	3D	1M	6M	YTD	1Y	1D	3D	1M	6M	YTD	1Y	1D	3D	1M	6M	YTD	1Y
Date						Date						Date					
Last Px						Last Px						Last Px					
Fr	12/22/2023			83681		Fr	12/15/2023			70395		Fr	12/08/2023			81357	
Fr	12/15/2023			76386		Fr	12/08/2023			84214		Fr	12/01/2023			70451	
Fr	12/08/2023			83255		Fr	12/01/2023			71322		Fr	11/24/2023			89211	
Fr	12/01/2023			71610		Fr	11/24/2023			87496		Fr	11/17/2023			89888	
Fr	11/24/2023			87097		Fr	11/17/2023			88559		Fr	11/10/2023			74585	
Fr	11/17/2023			88086		Fr	11/10/2023			71370		Fr	11/03/2023			80390	
Fr	11/10/2023			73571		Fr	11/03/2023			78731		Fr	10/27/2023			78680	
Fr	11/03/2023			80658		Fr	10/27/2023			77790		Fr	10/20/2023			63674	
Fr	10/27/2023			80145		Fr	10/20/2023			63486		Fr	10/13/2023			74746	
Fr	10/20/2023			65283		Fr	10/13/2023			73523		Fr	10/06/2023			75022	
Fr	10/13/2023			73117		Fr	10/06/2023			73574		Fr	09/29/2023			85261	

Source: Bloomberg, Vortexa

**Oil: Vortexa crude oil floating storage WoW changes by regions**

Bloomberg also posts the Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the “Other” or rest of world. (i) As noted above, Dec 15, in total, was revised +5.99 mmb. The main revisions in a region vs the originally posted (as of 9am Dec 16) floating oil storage for Dec 15 were Other revised +2.14 mmb and Asia revised +1.68 mmb. (iii) The major WoW changes by region were Asia +10.10 mmb WoW and Middle East -4.01 mmb WoW. (iv) Dec 22 of 83.68 mmb is down a big 49.63 mmb vs the summer June 23, 2023 peak of 133.31 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 -25.56 mmb and Other -19.38 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 15 that was posted on Bloomberg at 9am MT on Dec 16.

Vortexa floating storage by region

Figure 64: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Dec 22/23	Dec 15/23	WoW	Dec 15/23	Jun 23/23	Dec 22 vs Jun 23
Asia	47.98	37.88	10.10	36.20	73.54	-25.56
Europe	6.67	5.98	0.69	5.54	6.44	0.23
Middle East	3.05	7.06	-4.01	6.98	7.17	-4.12
West Africa	4.69	5.82	-1.13	4.68	7.62	-2.93
US Gulf Coast	3.10	2.97	0.13	2.46	0.97	2.13
Other	18.19	16.68	1.51	14.54	37.57	-19.38
Global Total	83.68	76.39	7.29	70.40	133.31	-49.63

Vortexa crude oil floating storage posted on Bloomberg 9am MT on Dec 23  
Source: Vortexa, Bloomberg

Source: Bloomberg, Vortexa

**Oil: Bloomberg Oil Demand Monitor “China Flashes Warning Signs; Supply in Focus”**

We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The major message in this month’s report is that oil

Bloomberg oil demand monitor

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while oil demand is still set to hit record highs this year and next, markets expect the supply side to outpace consumption as futures prices have plummeted. On the supply side, the US is still pumping around near-record highs of 13 mmb/d, and increased production from Guyana and Brazil are so far making up for the OPEC+ cuts. Pockets of softening demand are showing in major economies, namely China and India, which could further aggravate the upcoming imbalance. China saw inbound shipments of crude fall to a 7-month low, partially due to poor refiner margins and export restrictions. The IEA and OPEC largely kept YoY demand growth rate forecasts the same in their OMR and MOMR reports, with the downward revision in year-total consumption in the IEA OMR coming from a downward revision to 2022's historical figures. For the time being, in the west at least there are strong demand signals. Gasoline and diesel sales in the UK grew 7% MoM and the AAA is projecting one of the busiest Christmas travel seasons ever, with a record 7.5 million people in the US flying for the holidays. In terms of global air travel, global flights continued to track comfortably above both 2022 and 2019 levels during the week of Dec 11 but fell -7.6% on a MoM basis. China's domestic flights for the month of October rose +4.9% MoM, but are still -1.6% below 2019 levels. As of Dec 4, road congestion was above pre-pandemic levels in 11 of the 13 global cities tracked by TomTom mobility data. This compares to only 6 cities that were above 2019 levels in last month's oil demand monitor. Refinery utilization in the US as of Dec 8 was up +4.5% MoM to 90.2% but down -2.0% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

#### **Oil: Truck tonnage index in November down -1.2% MoM, -2.4% YoY**

We look to items like truck tonnage for indicators on the US economy, and the November truck tonnage is in line with the expectations for a stalling US economy. Truck tonnage decreased -1.2% MoM and is down -2.4% YoY from November 2022. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for October on Tuesday [\[LINK\]](#). Chief Economist Bob Costello noted *"It seems like every time freight improves, it takes a step back the following month. While year-over-year comparisons are improving, unfortunately, the freight market remains in a recession. Looking ahead, with retail inventories falling, we should see less of a headwind for retail freight, but I'm also not expecting a surge in freight levels in the coming months."* Trucking serves as a barometer of the U.S. economy, representing 72.6% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 11.46 billion tons of freight in 2022. Motor carriers collected \$940.8 billion, or 80.7% of total revenue earned by all transport modes. Our Supplemental Documents package includes the ATA release.

**October Truck  
Tonnage -1.2%  
MoM**

Figure 65: Truck Tonnage Index



Source: ATA

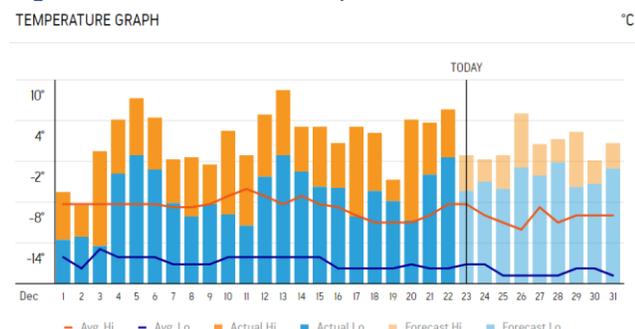
### Oil & Natural Gas: Warm Dec sets up risk for abrupt end to winter drilling in Feb/Mar

Something to think ahead to for end of Feb/early March is the risk to an abrupt end to winter drilling season. Why? Because it's been really warm in Alberta/BC for the past few weeks. The ideal conditions for a long winter drilling season is good sustained cold weather in Nov/early Dec before the snow hits. Good sustained cold will then make sure there is a deep freeze in the ground. The ideal world is get a good deep freeze first and then lots of snow over the winter. If you get lots of snow, it will act as an insulating blanket to keep the deep freeze in the ground for longer once it gets to end of Feb/early March and frozen ground allows a longer winter drilling season. Conversely, the negative is that you don't have good sustained cold and so you don't get a good deep freeze in the ground. And then you get the snow and that acts as an insulating blanket from any cold in Jan from getting deep into the ground for a deep freeze. Recall the concept of how you see documentaries on survival in Alaska and how they keep themselves warm by digging out a snow cave. So the problem is that there isn't a deep freeze so when it starts to get warm in late Feb/early March, the snow melts and there isn't a deep freeze and there is an abrupt end to winter drilling season. We know it's still only Dec but Alberta needs cold weather soon and a lot of it because, if not, we are concerned the very warm weather in Alberta/BC in December is setting up the conditions for an abrupt end to winter drilling. It's been very warm and we looked at Fort St. John (BC) and Grande Prairie (Alberta) as two key temperature markers for temperature around the key Montney and other plays in NW Alberta and NE BC. It's been really warm for the last three weeks. It's why we think, at least for now, the set up is for an abrupt end to winter drilling in late Feb/early March. Below are the AccuWeather temperature graphs for Fort St. John and Grande Prairie as of last night..

**Risk for abrupt end to winter drilling**

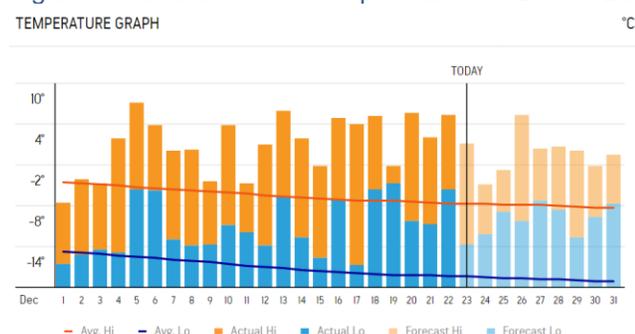
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Figure 66: Fort St. John temperatures for Dec to Dec 22



Source: AccuWeather

Figure 67: Grande Prairie temperatures for Dec to Dec 22



Source: AccuWeather

**Energy Transition: Enphase cuts solar capacity 27.5% to align to “expected demand”**

Our long held view on the energy transition is unchanged – it’s happening but will take much longer, cost much more and be a bumpy/rocky road. And it also means natural gas will be needed for longer as renewable power generation lags energy transition plans. A good example was the big news from solar player, Enphase. On Monday the Enphase CEO posted his “*Message from our CEO to Enphase employees*”, which included Enphases’s staff cuts and rightsizing its operations. He also noted a big decrease in their demand outlook by announcing they were cutting their worldwide capacity by 27.5% “*to be closer aligned to the expected demand.*” That’s a big cut to their expected demand outlook. Our Supplemental Documents package includes the Enphase CEO message. [\[LINK\]](#)

**Enphase reduces solar demand outlook**

**Energy Transition: California approves extending Diablo nuclear plant thru 2030**

We have noted on multiple times before how California has had to backtrack on its plans to shut down natural gas power generation and nuclear power generation as they realized their US leading renewable power generation and clean energy development can’t do what it aspired if California is to have reliable, available electricity generation. So it should not surprise anyone to see the California Public Utilities Commission formally vote to extend its Diablo nuclear power plant by five years thru 2030. This was a vote to approve proposal that came out in 2022. Last week, LA Times reported [\[LINK\]](#) “*California energy officials have*

**California extends Diablo nuclear life**

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*voted to extend the operation of the Diablo Canyon Power Plant through 2030, extending the life span of the state's last nuclear plant an additional five years. The California Public Utilities Commission approved a proposal to keep Diablo Canyon's twin reactors online, overturning an earlier agreement to close the plant in 2025. Three commissioners — Alice Busching Reynolds, John Reynolds and Karen Douglas — voted in favor. Commissioner Darcie Houck abstained and Commissioner Genevieve Shiroma was absent. Thursday's decision is expected to preserve a large bloc of the state's zero-emission power supply. But it also raises concerns over the high cost and potential safety issues associated with operating an aging nuclear power plant. The state utilities commission acknowledged that the costs associated with the plan were still unknown but were expected to exceed \$6 billion. A federal safety review will also be conducted." Our Supplemental Documents package includes the LA Times report.*

### **09/01/22, California legislatures approves Diablo nuclear extension to 2030**

*We say it isn't a surprise to see the LA Times report given we had highlighted the Sept 1, 2022 California legislation approval of extending the Diablo nuclear plant for five years past its then 2025 planned shut down to 2030. Here is what we wrote in our Sept 4, 2022 Energy Tidbits memo. *California may not admit it, but they are the latest to take action to try to avoid electricity outages in the 2020s. We have seen coal power returned, nuclear power returned and more natural gas. In California's case, it's nuclear and natural gas. And California can't blame this on Russia. We really wish leaders would openly acknowledge the deficiencies of trying to rely on intermittent solar/wind without having truly long-duration storage sendout capability. If they did, then we believe they could set a more realistic plan to reach their priority to reduce emissions without causing an energy crisis for years on end. But, at least we are seeing politicians take actions to deal with the intermittency. California is the latest example as they faced potential electricity shortfalls most days this week and continuing. (i) Extending nuclear power for 5 years. On Friday, we tweeted [\[LINK\]](#) "CA may not say it, but realize reliable, available #Electricity needs #NatGas #Nuclear. 09/01/22 CA SB-846 extends Diablo Nuclear power for 5 yrs to 2030. 08/17/21 California Energy Commission order for 5 temp #NatGas plants for min 5 yrs operations. See 📌 12/09/21 tweet. #OOTT." On Thursday, the California legislature approved SB-846 that extends the life of the Diablo nuclear power complex by at least 5 years. It also provided financial support for this move with a reported \$1.4b forgivable loan to PG&E. (ii) Aug 17, 2021 order for 5 temporary natural gas plants for minimum 5 years. Our tweet also noted an item from our August 22, 2021 Energy Tidbits. On Aug 17, 2021, the California Energy Commission approved an order Temporary Power Generator Licensing order that provided for 5 natural gas plants by Oct 31, 2021 on a temporary basis for a minimum of 5 years."**

### **California approved adding 5 natural gas plants a year ago in Aug 2021**

*Here is another item from our Sept 4, 2022 Energy Tidbits memo. "As a reminder, a year ago, California approved adding five natural gas plants. Our Friday tweet also noted an item from our August 22, 2021 Energy Tidbits. Here is what we wrote "We recognize that this is a terrible year for California with the massive wildfires and drought along the west coast, which has really put California's power security at risk. No question it is a brutal year. But we also think its important to look at their recent*

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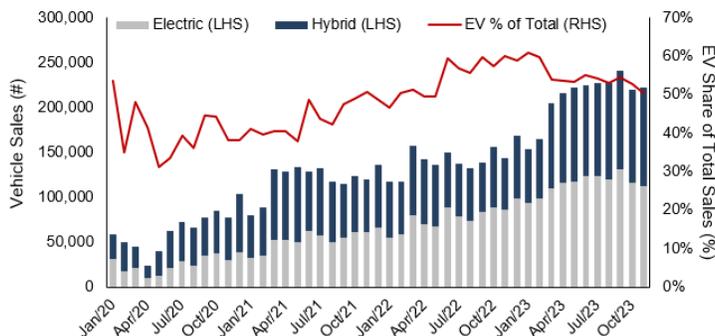
2-step natural gas actions and recognize its more than just dealing with 2021, rather its an acknowledgement that they need natural gas for longer. (i) Step 1 was to increase natural gas generation thru Oct 31. The purposed for this was to get California thru the 2021 wildfire season risk. On Aug 2, we tweeted [LINK](#) “#NatGas power generation to increase thru Oct 31 as CA to pay large energy users to move to backup generation ie #NatGas. #EnergyTransition greenwashing? @GavinNewsom critical times causes forgot to say wildfires don't just hurt transmission, also cut #Solar generation efficiency.” On July 30, California proclaimed a state of emergency that will see them pay large energy users to go to their backup generation, so positive for natural gas as these large energy users get paid to go to their natural gas power. Interestingly, Gov Newsom’s release went on about their moving to clean energy and its almost an after thought that they are allowing these emergency measures. And clearly no mention of natural gas being the backup power. (ii) Step 2 was this week’s approval for 5 natural gas power generators for up to 5 years. The expectation is that these 5 new natural gas generators will be in place before the end of Sept to help provide more support for this 2021 wildfire season, but the part that seemed to be overlooked is that these are approved for 5 years. So while this is being messaged as needed to provide power support for 2021, the reality is that this is being put in place for the next 5 years.”

**Energy Transition: Hybrids taking market share from EVs, EV share of total down MoM**

It’s hard for even the climate change side to deny EVs are not being adopted anywhere near as fast as assumed in the Energy Transition plans and aspirations. But one other item that looks like a trend that isn’t getting as much attention is that hybrids look to be taking market share from EVs at least in certain key markets like the US. We look at the Argonne National Laboratory monthly light duty electric drive vehicles monthly data [LINK](#). The headlines on the monthly data have been on how EV sales have leveled off over the past few months. We agree, but we thought the more interesting trend is how hybrids looks to be taking market share from EVs. Below is a graph we made of the ANL data. EVs as a % of EVs + Hybrids sales reached its peak of 60.8% in Jan 2023, and since we first created the graph in October, we saw this month’s data bring the EV share of total down -230bps from 52.8% in October to 50.5% in November.

**Hybrids gaining share from EVs**

Figure 68: US EV and Hybrid monthly sales



Source: Argonne National Library

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### Energy Transition: Audi is paring back its rollout of EVs

No one can deny EV sales continue to grow at a strong rate but no one can deny that car companies are lowering their EV sales outlook and that the rate of growth is less than they have planned. And this is working thru industry forecasts that are being lowered for EV sales in the 2020s. Audi didn't lower its EV sales outlook but is reportedly paring back its rollout of EVs, which is effectively a lowering of its EV sales outlook. Bloomberg wrote "-- Audi is paring back an ambitious rollout of electric models to avoid burdening factories and dealers amid slower growth in EV sales. "We first looked at what order and density of launches the organization could handle," new Chief Executive Officer Gernot Döllner said in an interview in Audi's headquarters in Ingolstadt, Germany. "In the end, we decided to spread it out to not overwhelm the team and the dealerships." A key profit center for Volkswagen AG, Audi plans to bring out 20 models by 2026, with half of them fully electric. The task is urgent because Audi's portfolio is growing stale as rivals Mercedes-Benz Group AG and BMW AG prepare to bring out their next generation of EVs from mid-decade. The luxury-car maker is looking back on a few torpid months culminating in VW CEO Oliver Blume in June singling out Audi as falling short of its potential. The same month, he swapped out Audi's CEO with Döllner, who has worked with Blume at Porsche, with a task of boosting long-term operating return to 13% from around 9." Our Supplemental Documents package includes the Bloomberg report.

**Audi pares back its EV rollout**

### Energy Transition: Half of Buick dealers opted out from going EV

We don't think there is any big negative to the overall EVs outlook from the news that GM is shutting down half of their Buick dealers because they opted out of investing the capital to support Buick's EV push. We would expect that most of these who opted out are likely smaller dealers (in terms of sales) and/or in rural areas that wouldn't expect to have the incremental EV sales to justify the cost of the EV infrastructure support. But still It's too bad there wasn't an exit interview because we have to believe there will be others in cities that just don't see their Buick clientele being EV buyers and/or worry about profit margins given what they saw in 2023 with how Tesla aggressively cut prices on their EVs. Regardless, GM is closing approx. half of its Buick dealerships. Fairly or not, we expect that if anyone is asked the question to describe what you think is the typical Buick buyers, most would probably use the word older buyers. The Detroit Free Press reported "General Motors said nearly half its Buick dealers took buyouts this year rather than invest in selling and servicing electric vehicles as the automaker's brands transitions to all electric by 2030. That means GM will end 2023 with about 1,000 Buick stores nationwide, down 47% from where it started the year. Late last year, Buick said it would be asking dealers to commit a minimum investment of \$300,000 to \$400,000 to prepare their stores to sell and service EVs. "Buick is transforming, launching the best vehicles the brand has ever had and is the fastest growing mainstream brand in 2023," said GM spokesman Sean Poppitt in an email this week to the Detroit Free Press. "This all needs to be supported by the best customer experience in the transition to EVs. As stated before, this year we've given dealers who are not aligned with Buick's future to exit voluntarily in a respectful and structured way; with the full support of our National Dealer Council." Our Supplemental Documents package includes the Detroit Free Press report. [\[LINK\]](#)

**Half of Buick dealers opt out of EVs**

### Can't help wonder if Buick will follow the way of GM's Pontiac and Oldsmobile

Describing Buick as a brand for older people brings back memories of two other GM brands that have gone away that were big brands in the 1960s and 1970s. In that era, it seemed like Chevrolet and Pontiac were more lower priced brands, then Buick, then Oldsmobile and finally Cadillac at the top. Buick was started in 1899 by David Dunbar Buick. On Oldsmobile, Wikipedia wrote *"Oldsmobile's sales peaked at over one million annually from 1983 to 1986, but by the 1990s the division faced growing competition from premium import brands, and sales steadily declined. When it shut down in 2004, Oldsmobile was the oldest surviving American automobile brand, and one of the oldest in the world, after Peugeot, Renault, Fiat, and Opel."* Wikipedia wrote *"Facing financial problems and restructuring efforts, GM announced during the 2008 financial crash that it would discontinue the Pontiac brand by the end of 2010, as was the case with Oldsmobile in 2004. The last Pontiac-badged cars were built in December 2009, with one final vehicle assembled in January 2010.[10] Franchise agreements for Pontiac dealers expired on October 31, 2010, leaving GM to focus on its four remaining North American brands"*.

### Energy Transition: Half of Ford dealers not yet opting in for Ev sales

Above we said that having half of the Buick dealers opting out from selling EVs isn't really a major negative to the EV outlook. On Thursday the Detroit Free Press reported [LINK](#) *"Half the Ford dealers in the nation, or some 1,550, have chosen to stick with selling hybrid and internal combustion engine vehicles only in 2024, waiting to decide whether to make the investments needed to sell and service electric vehicles, the Detroit Free Press has learned. "EV adoption rates vary across the country and we believe our dealers know their market best," Ford spokesman Marty Gunsberg told the Detroit Free Press. "As Ford dealers have completed their own local market assessments, enrollments for 2024 are just over 50% of the network, placing 86% of the population within 20 miles of a Ford dealership that can sell and service a Ford EV."* Similar to Buick, we have to believe there are smaller dealers who just don't have the potential revenue base. But this is more significant that for Buick as, in theory, Ford, being the dominant pickup truck company with the F150 should have more of their customers than Buick interested in EVs given Ford sells the F150 pickup truck and, in theory, more of these F150 pickup owners should be logical buyers for the F150 Lightning. Our Supplemental Documents package includes the Detroit Free Press report.

**Half of Ford dealers not yet in on EVs**

### 12/10/23, Ford cutting F150 Lightning production by half due to demand

Ford F150 Lightning sales have been less than expected and Ford just cut its Lightning production due to demand. Here is what we wrote in last week's (Dec 17, 2023) Energy Tidbits memo. *"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 production 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*

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*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.”*

#### **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.”*

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**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, contractors. 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].

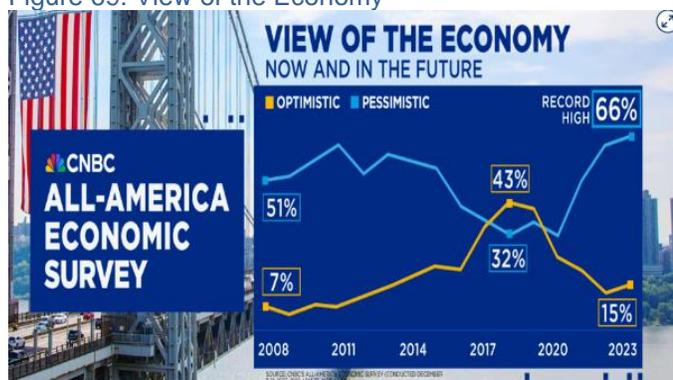
**Capital Markets: CNBC survey, US consumer sentiment is low, but spending is up**

On Tuesday morning, we tweeted [\[LINK\]](#) “US consumer spending more! “never found people [US consumer] more depressed and we’ve never found them spending more” @stevelliesman @SquawkCNBC. same message as 📌 12/05 Jamie Dimon US consumer tension on how they feel vs what they do. #OOTT.” CNBC was highlighting the results from its All-America Economic Survey on Squawk Box. CNBC’s Steve Liesman recapped how the survey respondents say they are going to spend more this holiday, they see average spend up double digits with inflation and people being paid more. But that contrasts with the results of their sentiment data that improved slightly but remains depressed and “66% being pessimistic on their view of the economy is a record high in the 17 years we’ve been doing this”. “never found people more depressed and never found them spending more.” Our tweet included a 1-min clip.

**US consumer  
balances**

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Figure 69: View of the Economy



Source: CNBC All-America Economic Survey

### 12/12/23: Bank of America US consumer balances still 40% above pre-Covid

Our tweet on the CNBC All-America survey also forwarded our 12/12/23 tweet. Here is what we wrote in last week's (Dec 17, 2023) Energy Tidbits memo. "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 than 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

Our tweet on CNBC All-America survey specifically referenced Bank of America Jamie Dimon comments on this very point of US consumers feeling negative on the economy but spending more. Here is what we wrote in our 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."

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*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. I.e. 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: IFIC Equity and balanced funds net redemptions in November**

Earlier this morning, we tweeted [LINK](#) "ICYMI. @ific Massive net redemptions continue to hit Cdn mutual funds balanced and equity funds. YTD Nov 30, net redemptions of \$52.4b from balanced funds & \$23.2b from equity funds. It's been brutal since Q2/22. #OOTT." One of the big Cdn equity stories in 2022 continues to play out in 2023 – the continued net redemptions from active managed Cdn equity and balanced mutual funds. This flipped in Q2/22 from massive net sales into balanced and equity mutual funds to massive net redemptions in equity and balanced mutual funds. On Wednesday, IFIC (Investment Funds Institute of Canada) reported [LINK](#) mutual funds and ETF sales for November. IFIC reported net redemptions for balanced mutual funds were \$6.584b in November vs \$8.569b in October and \$5.061b in September. IFIC also reported net redemptions for equity mutual funds were \$3.254b vs net redemptions of \$4.142b in October and \$2.197b in September. This brought YTD November 2023 net redemptions to \$75.543b out of balanced and equity mutual funds, a large increase compared to YTD November 2022 net redemptions of \$30.416b for a YoY difference of \$45.127b. Note that Q2/22 was when it flipped from net sales into the massive net redemptions to end 2022. Last year net redemptions in balanced and equity funds totalled \$38.47b, which was a massive YoY crashing of \$138.92b vs 2021 that saw net sales in balanced funds and equity funds of \$100.45b. Our Supplemental Documents package includes the IFIC release.

**IFIC Cdn mutual fund data**

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Figure 70: Cdn Mutual Fund Net Sales/Net Redemptions (\$ Millions)

Mutual fund net sales/net redemptions (\$ millions)\*

Asset class	Nov 2023	Oct 2023	Nov 2022	YTD 2023	YTD 2022
Long-term funds					
Balanced	(6,584)	(8,569)	(5,061)	(52,342)	(25,024)
Equity	(3,254)	(4,142)	(3,015)	(23,201)	(5,392)
Bond	(423)	(1,028)	(1,112)	6,204	(11,624)
Specialty	397	199	(10)	3,368	1,203
Total long-term funds	(9,865)	(13,540)	(9,197)	(65,971)	(40,837)
Total money market funds	1,227	997	562	14,035	5,394
Total	(8,638)	(12,544)	(8,636)	(51,936)	(35,443)

Source: IFIC

**There were massive redemptions in Cdn active equity/balanced funds in 2022**

It's been another bad year for net redemptions for Cdn balanced and equity funds, but 2022 was brutal. Here is what we wrote in our Jan 29, 2023 Energy Tidbits memo. "One of the big Cdn equity stories in 2022 continued to play out in the final month of the year – the massive net redemptions from active Cdn equity fund manager's balanced and equity mutual funds in 2022, which is a huge change from the massive net sales into balanced and equity mutual funds in 2021. On Thursday, we tweeted [LINK](#) "WOW! @IFIC balanced & equity mutual funds net sales/redemptions data for 2022. YTD 12/31/22 net REDEMPTIONS of \$38.5b. YTD 12/31/21 net SALES \$100.4b. YoY diff is -\$138.9b!! Makes #Oil #NatGas stocks big outperformance vs TSX and oil prices even more impressive. #OOTT." On Tuesday the IFIC (Investment Funds Institute of Canada) reported [LINK](#) mutual funds and ETF sales for Dec. IFIC reported net redemptions for mutual funds balanced funds were \$4.97b (vs \$5.07b in Nov and \$5.66b in Oct) and YTD Dec 31 of \$29.99b. IFIC reported net redemptions for mutual funds equity funds were \$3.08b in Dec (vs \$3.01b in Nov and \$1.89b in Oct) and YTD Dec 31 of \$8.48b. The change vs 2021 is huge and has widened since the Nov update. YTD Dec 31, net redemptions in balanced funds and equity funds was \$38.47b, which is a YoY crashing of \$138.92b vs YTD Dec 31, 2021 that saw net sales in balanced funds and equity funds of \$100.45b."

Figure 71: Cdn Mutual Fund Net Sales/Net Redemptions (\$ Millions)

Mutual Fund Net Sales (Net Redemptions) (\$ Millions)\*

Asset Class	Dec. 2022	Nov. 2022	Dec. 2021	2022	2021
Long-term Funds					
Balanced	(4,969)	(5,066)	1,628	(29,999)	63,346
Equity	(3,080)	(3,014)	462	(8,480)	37,102
Bond	(2,254)	(1,104)	(1,276)	(13,790)	14,530
Specialty	(97)	(10)	415	1,166	6,010
Total Long-term Funds	(10,340)	(9,194)	1,229	(51,103)	120,988
Total Money Market Funds	1,642	551	185	7,026	(7,414)
Total	(8,698)	(8,643)	1,415	(44,077)	113,574

Source: IFIC

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**Demographics: Canada's "total population" +430,635 in Q3 to 40,528,396 at Oct 1, 2023**

On Tuesday, Statistics Canada reported [LINK](#) Canada's population grew by 430,635 in Q3 to 40,528,396 at Oct 1, 2023. This was +1.1% QoQ, which was the higher percentage increase QoQ since Q2 1957 of +1.25. That brought Canada's total population growth for the first nine months of 2023 to +1,030,378, which has exceeded the record growth for any full year including last year's record growth. What was interesting was that 96.0% (420,728) the total population growth was due to the "international migration". This was split 107,972 immigrants and 312,758 non-permanent residents. Our Supplemental Documents package includes the Statistics Canada numbers.

**Canada total  
population  
40,528,396**

**Reminder forecasts tend to exclude non-permanent residents**

It is important to remember that most forecasts for Canada's population growth do not include non-permanent residents. Rather the forecasts normally only include growth in immigrants. We find this a little misleading as adding people is adding people to the country and it seems like non-permanent residents are here for much longer than many expect. It isn't unusual to speak to people in the service industry who have been in Canada for more than a decade as non-permanent resident. And in the case of Q3/23, non-permanent residents were 3x the growth of immigrants. It's why, when we saw the Statistics Canada data, we tweeted [LINK](#) "Reminder why cACdn housing demand keeps surprising to upside. Forecasts for "immigrants" normally do not include "non-permanent residents". There were 3x as many non-permanent residents vs immigrants in Q3/23: 107,972 immigrants vs 312,758 non-permanent residents.

**Canada's house shortfall forecast didn't include non-temporary residents**

The reason why our Tuesday tweet highlighted how the exclusion of non-permanent residents is a reason why housing demand surprises to the upside is because of the recent forecast by CHMC of housing gap of 3.45 mm housing units by 2030. Here is what we wrote in our Sept 17, 2023 Energy Tidbits memo. "Will Canada be short 3.5mm, 4.0 mm or more housing units by 2030? Canada's housing crisis was elevated in the Cdn press on Thursday with PM Trudeau's speech that included his measure to help build more rental housing with "the federal government: • will incentivize the construction of much-needed rental homes by introducing legislation to remove the Goods and Services Tax (GST) on the construction of new apartment buildings for renters." In the reporting around this issue, the common reporting was on how the CMHC (Canada Mortgage and Housing Corporation) forecast a supply gap of 3.45 million housing units by 2030. This estimate came from the CMHC Sept 13 report "Housing shortages in Canada. Updating how much housing we need by 2030". We had reviewed the short report when it came out so we were concerned that everyone was using the CMHC 3.45 million number as the shortfall of housing units. It is their baseline forecast but that forecast and their high case forecast both look low when you look at their key assumptions. Any analyst will tell you a forecast is only as good as its assumptions. So we tweeted [LINK](#) "Canada housing shortage. Don't have to be a housing analyst or demographer to read CHMC assumptions & think high case 4.01 mm short might be better than base case 3.45 mm short. Base and even high case are way less than 2022 immigrant & non-

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permanent resident levels.” The CMHC base forecast assumes lower immigration numbers after 2025 because the Govt of Canada doesn’t have formal immigration targets post 2025. [Note the current immigration targets are higher in 2024 and again higher in 2025] The CMHC wrote “The government has not yet determined the long-term level of immigration until 2030. For this reason, Statistics Canada and Oxford Economics project a relatively sharp decline in growth in the overall population in the years up to 2030. As a result, in this year’s analysis, Canada’s projected 2030 population of around 43 million people isn’t significantly higher than last year’s projection.” And even in their high case of 4.01 mm housing units short, they use 600,000 to 700,000 immigrants per year as the number. Our concern on the high case is that it seems to infer that they aren’t including temporary or non-permanent residents as the Govt of Canada immigration targets are for permanent immigrants ie. excluding temporary or non-permanent residents. In 2022, Canada had 437,180 immigrants and 607,782 non permanent residents. On March 22, 2023, Statistics Canada wrote ““For the year 2022, Canada welcomed 437,180 immigrants and saw a net increase of the number of non-permanent residents estimated at 607,782. Both of these numbers represent the highest levels on record, reflecting higher immigration targets and a record-breaking year for the processing of immigration applications at Immigration, Refugees and Citizenship Canada. The estimated gains in non-permanent residents recorded for 2022 are the highest for a single calendar year for which comparable data are available. Furthermore, it is the first time these gains are superior to those from immigrants over the same period.”.

Figure 72: Supply gaps by scenario, 2030, millions of housing units

Table 5: Supply gaps by scenario, 2030, millions of housing units

	Baseline	Low-economic-growth	High-population-growth
Ontario	1.48	1.31	1.65
Quebec	0.86	0.77	1.09
British Columbia	0.61	0.55	0.69
Alberta	0.13	0.13	0.17
Manitoba	0.17	0.15	0.18
Saskatchewan	0.06	0.06	0.08
Nova Scotia	0.07	0.06	0.07
New Brunswick	-	-	-
Newfoundland and Labrador	0.06	0.03	0.07
Prince Edward Island	-	-	-
Canada	3.45	3.07	4.01

Source: CMHC calculations. Numbers may not add up because of rounding.

Source: CMHC

### Canada’s targets increase thru 2025 for permanent residents

Here is another item on the CMHC forecast from our Sept 17, 2023 Energy Tidbits memo. “As noted above, our concern is that the CMHC may not be including temporary or non-permanent residents in its high case given that the referenced Govt of Canada targets are for permanent residents or permanent immigrants. And that a combination of the two is much higher and should be included as temporary or non-permanent residents also need a place to live. In their 2022 Annual Report to Parliament on Immigration, the Govt of Canada formal estimates for permanent

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residents [\[LINK\]](#) has targets of 465,000 in 2023, 485,000 in 2024 and 500,000 in 2025. Again, we note this does not include temporary residents.”

### Demographics: Italy population keeps declining, now down 1.6mm from peak

Italy’s population continues to decline. Its peak was ~60.6 mm in 2010 and population was down 1.6 mm to the end of 2022. On Monday, Bloomberg posted an Xinhua report “*Italy’s population continued to decline in 2022, dropping below 59 million people, the National Institute of Statistics (ISTAT) said on Monday. The 59 million threshold was first exceeded in Italy in 2009, and in the following year the population reached 60.6 million for the first time in the country’s history. The latest census data released on Monday showed that 58,997,201 people resided in the country as of Dec. 31, 2022, 32,932 less than a year earlier.*” And the future look is for further declines in population as birth rates continue to be low. Xinhua wrote “*The number of births broke a “negative record,” ISTAT said. The country registered 393,000 births in 2022, equaling a birth rate of 6.7 per thousand population. This was almost 7,000 below the 2021 figure and 183,000 below the 2008 figure.*”

Italy’s declining population

### 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.

@Energy\_Tidbits on Twitter

### LinkedIn: Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

### Misc Facts and Figures.

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

#### Reminder of a gift long ago given

It was great to see an email from a just turned 21-yr old son of a good friend with the below picture saying he was going to crack it open. It was the picture of a Taylor Fladgate 2000 vintage port that I gave to his parents for him 20 years ago for when he turned 21. The 2000 vintage port was considered as good a vintage for port as 2000 was for Bordeaux. And, at that time, the Taylor Fladgate was given near 100 points and said should be age worthy. When the ratings came out in 2002 and 2003, both Robert Parker and Wine Spectator rated it at 98 points. It’s a good reminder for me to crack one of these open in 2024.

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Figure 73: Taylor Fladgate 2000 vintage port



Source: SAF Group

### Ohtani contract reminds of Bonilla

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.*”

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