

Energy Tidbits

February 26, 2023

Produced by: Dan Tsubouchi

Russia's Oil Operating Costs +19% YoY to \$44/b in 2022, No Wonder There is a "Voluntary" 500,000 b/d Shut-In

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. Underreported RosStat data that Russia's oil operating costs were +19% YoY to \$44/b in 2022 ([Click Here](#))
2. Lesser US shale growth potential? Chesapeake in 2020/21 "really across the industry, we were having to high-grade locations" "so we absolutely drilled very best wells" ([Click Here](#))
3. Cheniere begins permitting to add 2.6 bcf/d LNG capacity at Sabine Pass with target in-service by end of decade ([Click Here](#))
4. Europe's 2023 natural gas supply challenge, Cheniere estimates Europe's Russia supply gap in 6.8 bcf/d in 2022 will be up +56% YoY to 10.6 bcf/d in 2023 ([Click Here](#))
5. Permian watch? Bloomberg reported Cowen analysts say Chevron's well performance in the Permian declined 25% year-over year ([Click Here](#))
6. Please follow us on Twitter at [\[LINK\]](#) for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [\[LINK\]](#).

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Natural Gas – 71 bcf draw in US gas storage; now 395 bcf YoY surplus

No one should have been surprised to see such a low storage draw given the Heating Degrees Data released on Monday afternoon that it was 31% warmer than normal and 25% warmer YoY. So for the week of Feb 17, the EIA reported a -71 bcf draw (vs expectations of -64 bcf), a -45% decrease from the -129 bcf draw reported for the week of Feb 18 last year. This compares to last weeks draw of -100 bcf, and the 5-year average draw of -177 bcf. Total storage is now 2.195 tcf, representing a surplus of +395 bcf YoY compared to a surplus of 328 bcf last week and is +199 bcf above the 5-year average vs +183 bcf above last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage Report [\[LINK\]](#).

YoY storage at 395 bcf YoY surplus

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	02/17/23		02/10/23		Year ago (02/17/22)		5-year average (2018-22)	
			net change	implied flow	Bcf	% change	Bcf	% change
East	479	498	-19	-19	402	19.2	427	12.2
Midwest	575	601	-26	-26	457	25.8	490	17.3
Mountain	106	114	-8	-8	106	0.0	108	-1.9
Pacific	108	122	-14	-14	176	-38.6	187	-42.2
South Central	926	931	-5	-5	660	40.3	693	33.6
Salt	262	262	0	0	169	55.0	197	33.0
Nonsalt	664	670	-6	-6	491	35.2	496	33.9
Total	2,195	2,266	-71	-71	1,800	21.9	1,906	15.2

Source: EIA

Natural Gas – Heating degree days +31% warmer than normal for Feb 18 week

HH gas prices fell below \$3 on Jan 25 and continue to languish. Last week’s (Feb 12, 2023) Energy Tidbits memo noted the heating degree days HDD data for the week ended Feb 11, which was 19.5% warmer than normal and 12.9% warmer YoY. We only see the HDD data on Mondays. On Monday, we tweeted [\[LINK\]](#) “Negative tone continues for HH #NatGas. SB another week of YoY increase to US #NatGas storage surplus for wk ending 02/17. @NOAA HDD for “gas home heating customer weighted” for wk ending 02/18 was 31% warmer than normal, 25% warmer YoY. #OOTT.” We referenced NOAA’s HDD data and not AGA HDD data because NOAA provides HDD vs normal for US in total and also for “gas home heating customer weighted” ie. HDD data that is linked to natural gas home heating weighting. We expect to reference the NOAA data going forward for this added detail. NOAA’s HDD data for the week ended Feb 18 was that it was 30% warmer than normal and 22% warmer YoY, and for “gas home heating customer weighted” was 31% below normal and 25% warmer YoY. Our Supplemental Documents package includes the NOAA HDD data for the week ending Feb 18. [\[LINK\]](#)

Week ending Feb 18 was 31% warmer than normal

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Figure 2: NOAA HDD for Week ending Feb 18, 2023

LAST DATE OF DATA COLLECTION PERIOD IS FEB 18, 2023
 ACCUMULATIONS ARE FROM JUL 1, 2022 TO FEB 18, 2023
 -999 = NORMAL LESS THAN 100 OR RATIO INCALCULABLE

STATE	WEEK	WEEK	WEEK	CUM	CUM	CUM	CUM	CUM
	TOTAL	DEV	DEV	TOTAL	DEV	DEV	DEV	DEV
		FROM	FROM		FROM	FROM	FROM	FROM
		NORM	L YR		NORM	L YR	NORM	L YR
							PRCT	PRCT
UNITED STATES	153	-30	-22	2866	-281	100	-9	4
GAS HOME HEATING CUSTOMER WEIGHTED								
REGION								
NEW ENGLAND	174	-84	-54	3572	-679	-235	-16	-6
MIDDLE ATLANTIC	157	-89	-72	3382	-604	-127	-15	-4
E N CENTRAL	201	-65	-76	3986	-501	-33	-11	-1
W N CENTRAL	244	-25	-55	4548	-265	263	-6	6
SOUTH ATLANTIC	109	-51	-29	2318	-314	34	-12	1
E S CENTRAL	117	-41	-31	2352	-334	26	-12	1
W S CENTRAL	107	1	5	1740	-111	283	-6	19
MOUNTAIN	243	43	49	3983	63	561	2	16
PACIFIC	143	40	61	2063	118	315	6	18
UNITED STATES	168	-31	-25	3131	-288	117	-8	4

Source: NOAA

Natural Gas – Feb is almost as significant as Jan for winter natural gas demand

Warm weather in February is never good. On Feb 14, we tweeted [\[LINK\]](#) “Never good for #NatGas when it’s this warm in Feb, which is the 2nd most important winter month for temperature driven #NatGas consumption. See 📌 excerpt Jan 8/23 Energy Tidbits memo. Feb res/com10-yr ave 43.4 bcf/d or 22% of winter season. Jan is 46.7 bcf/d, & 23%. #OOTT”. Just like January, warm weather in February is never good. On Jan 7, we tweeted [\[LINK\]](#) on the below data on why temperature is key for winter natural gas demand and prices. It’s why warm weather in the winter, especially in Jan, is never a positive for natural gas prices, but also the same for Feb. There can be huge swings in residential/commercial natural gas demand depending if it’s hot, normal, or cold. The different between a hot and cold month can be almost 500 bcf in a month. Below is a table we have previously posted that shows these swings. It shows AGA heating degree days vs US total natural gas consumption and US residential/commercial natural gas consumption. (i) Residential/commercial demand is normally >40% of total US natural gas consumption in DJF. (ii) For the last 10 year average, Jan was 46.7 bcf/d, Feb 43.4 bcf/d, and Dec 38.0 bcf/d. (iii) The high to low swings for Dec can be up to 12.6 bcf/d, Jan can be up to 9.8 bcf/d, and Feb can be up to 17.2 bcf/d. (iv) The biggest months over the past 10 winters were Jan 2014 at 51.9 bcf/d, Feb 2015 at 50.9 bcf/d, and then Dec 2017 at 49.5 bcf/d.

Feb is a big month for natural gas demand

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Figure 3: US Winter Natural Gas Consumption vs Heating Degree Days

US Winter Natural Gas Consumption vs Heating Degree Days													
Heating Degree Days By Month													
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	%	
Oct	308	303	265	257	200	218	306	307	308	205	332	280	7%
Nov	572	623	658	484	459	542	650	636	469	539	597	569	14%
Dec	763	920	763	649	856	873	789	778	804	696	876	807	20%
Jan	918	1,019	967	935	843	963	941	808	899	1005		921	23%
Feb	795	903	955	718	597	699	810	760	896	790		793	20%
Mar	827	831	738	511	618	680	804	555	572	638		680	17%
Oct 1 - Mar 31	4,183	4,599	4,346	3,654	3,573	3,955	4,300	3,844	3,948	3,873	1,805	4,050	100%
Note: Oct includes Sept if applicable. March includes Apr if applicable.													
Source: AGA, SAF													
Total US Consumption													
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	%
Oct	61.3	60.2	61.7	64.3	62.1	65.5	73.7	75.1	74.9	73.0	76.4	67.2	13%
Nov	72.3	77.2	78.6	75.2	72.1	78.6	90.5	92.6	81.3	89.8		80.8	15%
Dec	80.8	94.0	86.4	83.6	92.5	99.5	96.8	101.6	101.9	97.0		93.4	18%
Jan	92.8	103.4	100.5	100.0	93.3	107.8	110.0	106.3	106.0	115.9		103.6	20%
Feb	91.6	97.9	104.5	91.8	82.9	96.8	107.5	108.3	108.5	109.3		99.9	19%
Mar	81.3	82.5	83.6	78.3	81.1	90.2	93.8	87.4	84.1	89.8		85.0	16%
Average	80.0	85.9	85.9	81.9	80.7	89.7	95.4	95.2	92.8	95.8	76.4	88.3	100%
Source: EIA, SAF													
US Residential & Commercial Demand													
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	%
Oct	14.6	13.9	13.4	12.8	12.2	13.1	15.9	14.4	14.4	12.6	15.1	13.7	7%
Nov	26.3	28.8	30.2	23.0	22.0	26.3	32.8	32.6	24.4	27.3		27.4	14%
Dec	34.2	43.0	36.9	30.4	40.5	42.2	39.5	39.0	40.1	34.5		38.0	19%
Jan	47.0	51.9	47.4	45.0	42.4	49.5	48.6	42.2	44.1	48.8		46.7	23%
Feb	42.3	48.0	50.9	38.4	33.7	39.8	45.7	42.0	48.2	45.1		43.4	22%
Mar	34.3	36.2	33.1	24.4	30.8	34.8	35.9	27.8	29.7	31.5		31.8	16%
Average	33.1	37.0	36.3	29.0	30.3	34.3	36.4	33.0	33.5	33.3	15.1	33.5	100%
Source: EIA, SAF													
Data source EIA Natural Gas Monthly													

Source: EIA, AGA, SAF

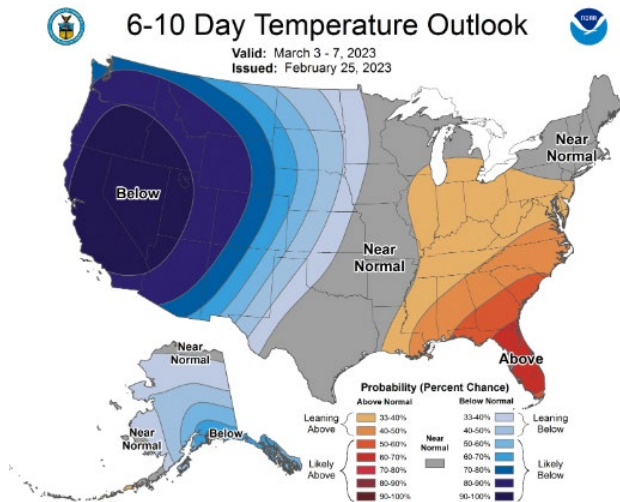
Natural Gas – NOAA sees a colder than normal start to March

Yesterday, we tweeted [LINK](#) "Should be some modest near-term support for HH #NatGas prices. @NOAA 6-10, 8-14 day calls for colder than normal start to March. See 📌 SAF Group 01/08/23 Energy Tidbits memo table. March is normally 16% of res/com winter #NatGas consumption. #OOTT." Our tweet our above table of US winter natural gas consumption vs heating degree days. And we noted that March can be a decent month for cold temperature driven natural gas consumption. Normally, March is 16% of winter residential/commerical natural ga consumption, not too far behind December at 19%. Our tweet yesterday included NOAA's below Feb 25 updated 6-10 day and 8-14 day outlook that run up thru March 4.

NOAA 6-10 & 8-14 day temp outlook

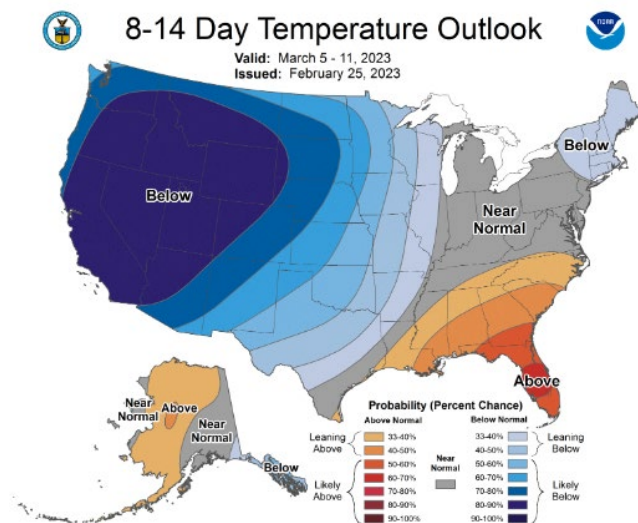
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Figure 4: NOAA 6-10 day temperature outlook as of Feb 25



Source: NOAA

Figure 5: NOAA 8-14 day temperature outlook as of Feb 25



Source: NOAA

Natural Gas – Does CHK Marcellus view point to lower & more costly US gas growth?

There was a great example of how managements tend to give the most open comments when they aren't speaking from a prepared script and having to answer unexpected questions in the Q&A of earnings calls. Chesapeake Energy held its Q4 call on Wed and their comments seem to point to why the growth in US natural gas production will be less and more costly than expected. On Thursday, we tweeted [\[LINK\]](#) "Will US #NatGas growth be less & more costly than expected? \$CHK on why lower #Marcellus well productivity in 2022."

Did industry drill their very best wells already?

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In 20/21 "really across the industry, we were having to high-grade locations" "so we absolutely drilled very best wells", 2022 wells on par with 2018-19! #OOTT." Chesapeake was asked about the lower productivity wells in the Haynesville and Marcellus in 2022 and management said they drilled their absolute very best wells in 2020 and 2021 because the environment was so tough and they needed the best wells. Note that they said this applied "across the industry" and not just to Chesapeake. So the productivity of their 2022 wells is more in line with their 2018 and 2019 wells. We have to believe this concept applies to others, the question is to what degree for other companies. How much of their absolute best wells did they drill and how much is left? We think the Chesapeake comments point to lower and more expensive US natural gas growth than most expect. Here is the more fulsome reply "The other thing, I think, to point out is, you can look back at historical trends. In 2020, 2021, really across the industry, we were having to high-grade locations. And this is no different for Chesapeake. And so, we absolutely drilled very best wells with a relatively modest program in the heart of our core. And so, I think if you were to look back and compare our 2022 well results into something in the 2018 and 2019 timeframe, you'll actually see productivity that's on par."

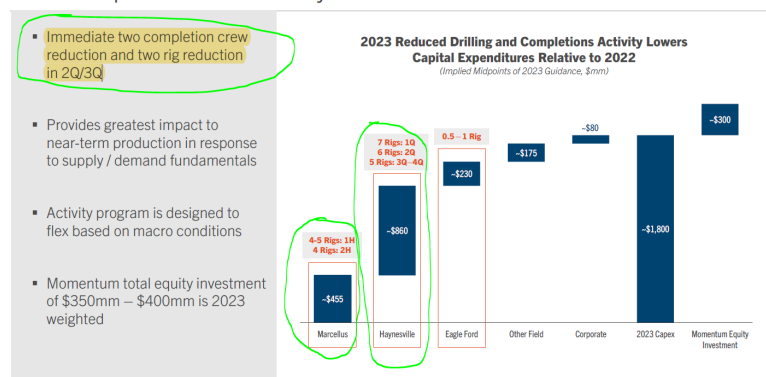
Natural Gas – Chesapeake, another Haynesville/Marcellus player to cut rigs

Also on Chesapeake's Wednesday Q4 call, mgmt. announced an immediate cut drilling rigs and frack completion crews. Note there is an inconsistency in the text from the Q4 call slide deck and mgmt's comments on the Q4 call. In their CHK's 2023 capital slide, it notes notes an "immediate two completion crew reduction and two rig reduction in 2Q/3Q", but the bar chart points to a drop of 3 rigs ie. Marcellus down 1 rig and Haynesville down 2 rigs. The drop of 3 rigs is consistent with mgmt.'s comments on the Q3 call. Mgmt said "Overall, we are dropping two rigs in the Haynesville and one rig in the Marcellus as we move through the year. In addition, we're reducing our completion activity in the near term as the market is currently oversupplied with the warm winter we are experiencing in North America."

Chesapeake cuts rigs

Figure 6: Chesapeake's 2023 Capital

2023 Capital: Prudent Activity Reduction with Attractive Returns



Source: Chesapeake

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Natural Gas – Southwestern, another Haynesville/Marcellus player to cut rigs

No one should be surprised to see US natural gas players cut natural gas rigs with HH in the low \$2's. Southwestern Energy, an Appalachia/Haynesville player was another to announce a cut in natural gas rigs. In the Q4 release, Southwestern CEO said *"Given near-term market conditions, we have proactively moderated activity, resulting in slightly lower expected production for 2023."* Why didn't they just say in the release low natural gas prices. On Thursday, we tweeted [\[LINK\]](#) *"Another Haynesville/Marcellus player to cut #NatGas rigs. \$SWN Q4. expect to ave 10-11 rigs & 4-5 frac fleets, down from 13 rigs & 5 fleets in 2022. Guided 4.6 bcfe/d in 2023, -3.2% YoY vs 4.75 bcfe/d in 2022. #OOTT."* Southwestern did not give a split of the rig cuts by region, but, in 2022, the Haynesville represented 53% of Southwestern's gross wells drilled and 46% of Southwestern's gross wells turned to sales and 39% of its production.

Southwestern cuts rigs

Natural Gas – Cheniere optimized maintenance in 2022 to deliver more LNG for EU

It didn't get much attention, but there was a good reminder from the Cheniere Q4 call on Thursday on a significant LNG theme for 2023 – there will be more maintenance in 2023 as LNG suppliers did all they could to supply maximum LNG for Europe (and also take advantage of huge LNG prices) in 2022. In mgmt's prepared comments, they talked about how they did to provide max LNG to Europe. Mgmt said *"At Cheniere, we were proud to play an important role in helping balance global energy markets at a time when it was needed most. With the early completion and advanced startup of Train 6 at Sabine Pass, as well as optimizing our maintenance schedule, we produced approximately 44 million tonnes of LNG during 2022, 72% of which was directed to Europe further illustrating the value of destination flexibility which Cheniere pioneered."* We remind that 2023 is expected to be a year of heavy maintenance/turnarounds on LNG export facilities following the push on all global LNG facilities to produce as much LNG as possible so Europe could replace Russian natural gas.

Big year for LNG maintenance

Shell reminded 2023 should be a big year of global LNG maintenance

The reason why the Chenier optimizing their maintenance is that it reminded of Shell's comments that 2023 would be year of heavy LNG maintenance. Here is what we wrote in our Feb 5, 2023 Energy Tidbits. *"One of the reasons we like earnings calls is that we often get sector insights from the Q&A, where mgmt has to respond outside of their planned script. Shell held its Q4 call on Thursday. It wasn't a detailed answer but, in the Q&A, Shell CEO Sawan warned that 2023 should be a big year for industry LNG plant maintenance, which makes sense how LNG export facilities were being pushed to deliver as much as possible with Europe needed to replace Russian pipeline gas. We aren't aware of any global LNG plant turnaround schedule. In the Q&A, Sawan replied "Let's take the first one. There isn't a huge amount of LNG coming into the market over the next two years, it's around 20 million tons is what we see, but that's about it. And that one shouldn't also forget that many of these machines have been running hard now for a good year and you're beginning to see some of the challenges in just the reliability of the machines around the world. So that's, that's an issue."*

Natural Gas – Cheniere begins permitting to expand Sabine Pass LNG by 2.6 bcf/d

There was big news on the US LNG market, which also means there will be a big pull on additional natural gas supplies from the Permian, Haynesville and other basins. On

Cheniere's 2.6 bcf/d Sabine Pass expansion

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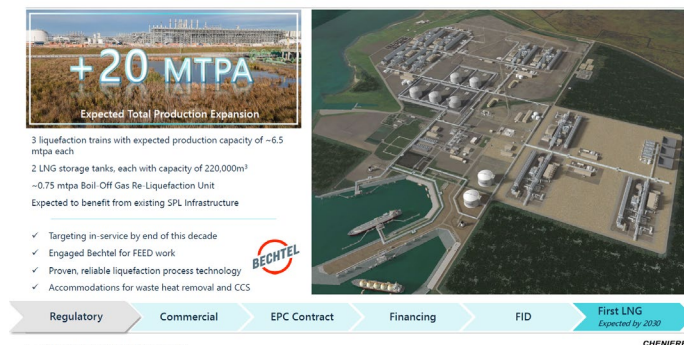
Wednesday, Cheniere announced [\[LINK\]](#) “Cheniere Initiates Permitting Process for Significant Expansion of LNG Export Capacity at Sabine Pass”. This expansion would add 2.6 bcf/d and Cheniere is targeting in service by the end of this decade. Cheniere did not say how the 2.6 bcf/d of new LNG capacity would be phased in over this period, but Cheniere watchers seem to expect some phasing in to start by 2026/27. We believe this would be significant to US LNG and US natural gas production. This could be another pull on 2.6 bcf/d of the same basins that have been key to the ramp up in US LNG exports – Permian, Eagle Ford and Haynesville. And with all the added LNG exports to 2030, we have to believe there will be a pull on natural gas from other basins like the GoM. On Wednesday, we tweeted [\[LINK\]](#) “Cheniere initiates permitting for 2.6 bcf/d #SabinePassLNG expansion. Would be big pull on #NatGas from Permian, Haynesville, GOM?, other basins. Don't forget 📌 12/03 tweet, @TCEnergy expects MEX #NatGas infra buildout to add +3 bcf/d of US pipeline exports to MEX. #OOTT.” Our Supplemental Documents package includes the Cheniere release.

Cheniere “creative solution” to supply gas for Sabine Pass expansion

Many of the reports on Cheniere’s Sabine Pass 2.6 bcf/d expansion noted that it shows Cheniere’s believe in the long term demand for LNG. And mgmt’s comments on the Q4 call reinforce their bullish view of long term LNG demand. One of our questions is on long term supply and were a little surprised that analysts didn’t press mgmt. more for some better insight. Rather the analyst said mgmt’s general rep[ly] was “*crystal clear*”. The analyst insight into how they will supply the natural gas for the Sabine Pass expansion. The analyst asked “*And you touched on this a little bit earlier, but just going back for getting all this gas to Sabine going to kind of require longer higher pipeline access. Just are your customers -- and I know it's early days, but are your customers kind of looking at that at your ability to secure that feed gas before they're willing to commit to it? Or the track record kind of got enough there?*” Mgmt replied “*today, we bought 7.5 Bcf from 70 different producers throughout all of North America, including Canada. We delivered it to our facilities and it will be priced and loaded up on two tankers and shipped off. So this is a blip in the grand scheme of things. We – as you know, we're the largest purchaser of physical gas in the U.S. and the largest holder of gas transport pipeline. We like touching all of the basins because we have to deliver the molecule. So you should expect us to come up with a creative solution.*” So for those of us who don’t see this as a crystal clear answer, we have to wonder what is the creative solution to supply natural gas for the Sabine Pass 2.6 bcf/d expansion?

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Figure 7: Cheniere's 2.6 bcf/d Sabine Pass Expansion Project
Sabine Pass Expansion Project



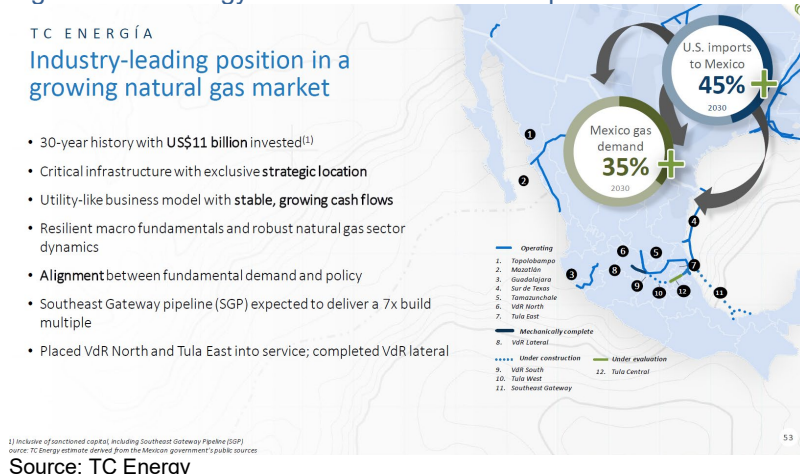
Source: Cheniere

Reminder, TC Energy sees Permian natural gas +3 bcf/d to Mexico by 2030

We recognize Cheniere has a good track record of securing natural gas supply, but we are seeing more indicators pointing to the possibility or potential that US shale gas growth may not be as cheap or as strong as expected. And there will be increasing competition for natural gas supply post 2025 with LNG Canada startup and increasing pipeline exports to Mexico. Our Cheniere tweet said “Don’t forget 📌 12/03 tweet, @TCEnergy expects MEX #NatGas infra buildout to add +3 bcf/d of US pipeline exports to MEX.” We still believe TC Energy’s forecast for the implications of the build out of Mexico natural gas infrastructure is overlooked. Here is what we wrote in our Dec 4, 2023 Energy Tidbits. “One overlooked upside to US natural gas in the 2020s is that the growth Mexico infrastructure projects are starting to kick in. Yesterday, we tweeted [\[LINK\]](#) “Positive for US #NatGas for 2020s. It’s not just increasing #LNG exports, it’s also Mexico. Mexico #NatGas demand from 9 bcf/d to 12 bcf/d in 2030. @TCEnergy expects MEX #NatGas pipeline imports from Permian +45% from 6 bcf/d in 2022 to 9 bcf/d by 2030. #OOTT.” The growth in Mexico natural gas demand is a big plus to the Permian. For the last few years, every time we write on Mexico’s natural gas production, we say it is still stuck below 5 bcf/d and that any increase in Mexico natural gas demand has to be met by increasing natural gas or LNG imports. For the past 5+ years, other than a few months, Mexico gas production was below 5 bcf/d. Mexico’s natural gas demand growth and growing infrastructure was one of the key growth themes at TC Energy’s investor day on Tuesday. Mgmt’s slide deck included the below slide and mgmt said “We expect Mexican natural gas demand to increase by 3% per year across the country from 9 Bcf to 12 Bcf in 2030, with strategic government projects creating over 1 Bcf a day of incremental gas demand in the southeast alone by 2025. Now given Mexico’s limited natural gas production, this increase in demand will likely be served by supplies in the U.S. and more specifically the Permian as we believe Mexican imports from the Permian are likely to increase by 45% from 6 Bcf a day in 2022 to 9 Bcf by 2030.”

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Figure 8: TC Energy Sees US Natural Gas Imports TO Mexico +45% to 2030



Source: TC Energy

Natural Gas – Freeport LNG gets approval to restart 2 of 3 LNG trains

On Tuesday, Freeport LNG announced they had received authorization to restart two of three LNG terminals, and it expects to get to 2 bcf/d of LNG production over the next several weeks. This is a welcome relief to US natural gas markets given Freeport LNG was shut down in June. Freeport LNG announced “*Today’s authorization provides for the immediate full return to service of one liquefaction train, that has already restarted, and the incremental restart and full return to service of a second train. The restart and return to service of Freeport LNG’s third liquefaction train will require subsequent regulatory approval once certain operational conditions are met. A conservative ramp-up profile to establish three-train production of approximately 2.0 billion cubic feet per day is anticipated to occur over the next several weeks as stable operation of each incremental train is established and maintained. Operations are initially utilizing two of Freeport LNG’s three LNG storage tanks and one of its two LNG berths. The second LNG berth and third LNG storage tank are expected to return to service in May. First LNG production and ship loading from the facility began on February 11.*” Our Supplemental Documents package includes the Freeport LNG release. [\[LINK\]](#)

Freeport LNG gets restart approval

Natural Gas – Platts posts great recap of Freeport LNG outage

On Wednesday, Platts posted a great recap “*Freeport LNG outage showed growing connection of US supply, global gas market*”. [\[LINK\]](#) Platts provides the timeline of events for the 250 day impact, the most significant LNG outage in US LNG history, impact on LNG supply as Freeport’s share of US LNG export capacity is 15%, LNG cargos, etc. Below is the infographic from the Platts recap. Our Supplemental Documents package includes the Platts recap.

Freeport LNG outage recap

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Figure 9: Freeport LNG comeback

Freeport LNG comeback

The restart of Freeport LNG following an eight-month outage — a milestone in US LNG export history — returns more than 2 Bcf/d of gas demand to the Gulf Coast region, cutting slack in US supply and potentially lifting Gulf region gas prices. Additional US LNG exports will also ease tightness in the global gas market.

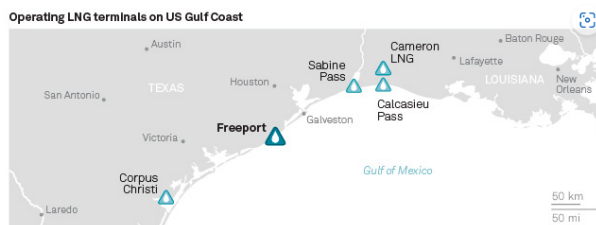
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250 days
Most significant outage in US LNG history
- 

15%
Freeport's share of US LNG export capacity, roughly
- 

3 trains
Production units at the 15 million mt/yr capacity terminal
- 

16-19 cargoes
Freeport's normal monthly capacity, per market sources

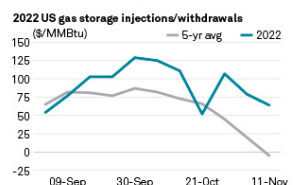
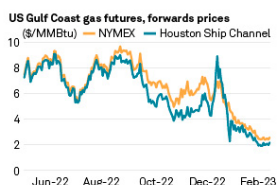
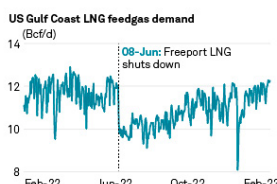


2023

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|---|--|
| <p>January</p> <ul style="list-style-type: none"> 13 East Texas gas traders remain highly skeptical of planned January restart. 26 Freeport gets approval for *its initial step to resuming operations.* | <p>February</p> <ul style="list-style-type: none"> 09 Regulators authorize Freeport to load LNG tankers. 12 Freeport exports first cargo since June 2022 outage. 21 Freeport confirms resumption of LNG production; gets approval for partial return to service. |
|---|--|

2022

- | | |
|---|--|
| <p>June</p> <ul style="list-style-type: none"> 08 Freeport LNG shuts down following explosion and fire at terminal. 14 Outage estimate lengthened; partial service targeted to return in 90 days. 30 US safety regulator orders corrective actions. Freeport projects partial liquefaction operations by early October. <p>July</p> <ul style="list-style-type: none"> 06 Extended shutdown weighs on winter 2022-2023 futures strip as demand falters, storage builds. <p>August</p> <ul style="list-style-type: none"> 03 Freeport and regulators agree on corrective actions prior to restart. 22 NYMEX Henry Hub futures trade at fresh highs as market eyes return of terminal. 23 Freeport delays partial restart by about a month to early-to-mid November as it works to complete repairs. <p>September</p> <ul style="list-style-type: none"> 02 US South Central gas storage rebounds from a seemingly insurmountable deficit amid extended outage. | <p>November</p> <ul style="list-style-type: none"> 11 Freeport refutes "false information" that had moved the market after social media circulation. 15 Safety regulator releases report detailing outage causes; Freeport says it will address issues. 18 Freeport delays initial production target to mid-December; expects 2 Bcf/d of production by January 2023. 22 Forwards traders in the East Texas gas market appear unmoved by Freeport's projected return. <p>December</p> <ul style="list-style-type: none"> 01 Freeport delays restart until the end of the year, about two weeks beyond previous estimates. 05 The NYMEX January contract trades at its lowest since March on Freeport news and milder weather outlook. 12 US regulators send list of requirements for Freeport, prompting speculation about further delays. 23 Freeport LNG pushes back initial restart to the second half of January. |
|---|--|



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Source: Platts

Developed by Corey Paul, J. Robinson, Harry Weber, Joe Fisher, designed by Evelia Gramaj

Natural Gas – Mexico’s natural gas production still stuck below 5 bcf/d, +5.1% YoY

On Friday, Pemex reported [LINK](#) its oil and gas data for January. Pemex reported natural gas production of 4.955 bcf/d, which was +5.1% YoY and up MoM. But the story for Mexico natural gas remains unchanged – for the past 5 years, an ongoing theme of the Mexican energy sector, has been their inability to grow domestic natural gas production. Other than a few months, Mexico’s natural gas production has been stuck below 5 bcf/d since Sept 2017. We have now see one of the largest MoM gains as Mexico has begun increasing exports with downed export capacity in the US associated with the Freeport LNG outage. Mexico’s unchanged production over the past five years has created the need for increased US pipeline exports to Mexico as Mexico builds out its domestic natural gas infrastructure. Pemex does not provide any commentary along with its production data. Below is our ongoing table of Pemex reported monthly natural gas production.

Mexico natural gas still stuck below 5 bcf/d

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Figure 10: Mexico Natural Gas Production (bcf/d)

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%		
Mar	5.383	4.646	4.857	4.946	4.839	4.766	-1.5%		
Apr	5.334	4.869	4.816	4.827	4.671	4.740	1.5%		
May	5.299	4.827	4.841	4.460	4.730	4.702	-0.6%		
June	5.253	4.840	4.843	4.754	4.727	4.744	0.4%		
July	5.216	4.856	4.892	4.902	4.725	4.815	1.9%		
Aug	5.035	4.898	4.939	4.920	4.656	4.796	3.0%		
Sept	4.302	4.913	5.017	4.926	4.746	4.798	1.1%		
Oct	4.759	4.895	4.971	4.928	4.718	4.795	1.6%		
Nov	4.803	4.776	5.015	4.769	4.751	4.845	2.0%		
Dec	4.811	4.881	5.024	4.846	4.697	4.845	3.2%		

Source: Pemex

Natural Gas – Another long-term LNG deal: Venture Global with China Gas

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 thru 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 thru June 30, 2022 rush. Rather, the long-term deals now being done are generally for long term supply starting in 2026 or later. There was one long term LNG deal announced this week. On Thursday, Venture Global announced that it executed two long-term Sales and Purchase Agreements (SPAs) to supply China Gas Holdings with a combined 0.26 bcf/d over 20 years [\[LINK\]](#). The two SPAs stipulate Venture's purchase of LNG on a free-on-board basis from the Plaquemines facility and the CP2 facility, both in Louisiana. Venture Global CEO, Mike Sabel said, "*Venture Global is pleased to welcome China Gas as a customer both at Plaquemines and CP2. Through relentless execution and innovation, our company will continue to bring much needed new capacity to the global LNG market, supporting energy security and environmental progress both in Asia and Europe. Importantly, low-cost LNG supplied to the region will accelerate fuel switching and lower carbon emissions, contributing meaningfully to China and the world's existing climate targets.*" Our Supplemental Documents package includes the release.

Another long term
LNG deal

Asia was early to secure long term LNG supply

Our March 13, 2022 Energy Tidbits memo noted that Europe LNG buyers were starting 9 months behind the wave of Asian LNG buyers who started to lock up long term LNG supply starting in July 2021. The LNG supply crunch is not a 2022 development. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change*

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and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs”. Here is an excerpt from the blog “The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog “Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?” and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum’s massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas.” Our Supplemental Documents package includes our April and July blogs.

There have been 13.80 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 13.80 bcf/d of long term LNG deals since July 1, 2021. 66% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 75% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

Figure 11: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipet	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan/Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				9.12			
Non-Asian LNG Deals							
Jul 28, 2021	PGNIG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNIG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	Sempra	PKN ORLEN	US / EU	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				4.68			
Total New Long Term LNG Contracts since Jul/21				13.80			
*Excludes Asian short term/spot deals							
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period							
Source: Bloomberg, Company Reports							
Prepared by SAF Group https://safgroup.ca/news-insights/							

Source: Company reports, SAF Group

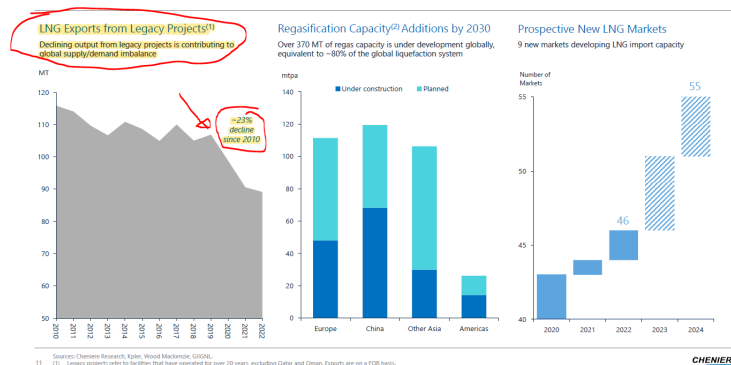
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Legacy LNG supply declines

Natural Gas – Cheniere reminds LNG legacy project face declining supply

One of the overlooked LNG themes is that most forget that LNG projects eventually start to decline driven by the natural gas supply source being depleted. Cheniere highlighted this legacy LNG project decline risk in their Q4 call on Thursday. In their prepared remarks, mgmt. said *“Over the next few decades, both the supply and demand side are supportive of new liquefaction infrastructure. In addition to high project development hurdles, capital intensity and long construction timelines for new LNG facilities, legacy plant utilization rates worldwide continued to decline as a result of outages, feedstock limitations and fleet inefficiencies as well as competing domestic demand in some markets. Since 2010, the volume produced from these legacy projects has declined by 23% or over 25 million tonnes, further contributing to the need for more capacity. While these facilities produced about 1/4 of all total volume last year, their contribution will likely decline overtime. As feedstock resources deplete, their ability to export declines and their performance potentially degrades.”*

Figure 12: LNG exports from Legacy Projects
New Liquefaction Capacity Critical to Serve Growing Demand



Source: Cheniere

Natural Gas – India January natural gas production +3.2% YoY to 3.39 bcf/d

It looks like India’s domestic natural gas production is up modestly from the recent 2020/21 trough, but the growth is still very small. India natural gas production peaked in 2010 at 4.6 bcf/d. Its 2018-2019 production averaged 3.18 bcf/d, declining to 3.02 in 2019-2020 and then further declined to average 2.78 bcf/d 2020-2021. But then natural gas production. Returned to growth in 2021-2022 but that growth has mostly stalled or is modest at best. There was a small MoM gain in January of this year on higher demand for products On Monday, India’s Petroleum Planning and Analysis Cell released their monthly report for January natural gas and oil statistics [\[LINK\]](#). India’s domestic natural gas production was up +3.15% YoY from 3.26 bcf/d in January 2022 to 3.39 bcf/d in January 2023 and up MoM from 3.36 bcf/d in December. Our Supplemental Documents package includes excerpts from the PPAC monthly package.

India natural gas production +3.2% YoY

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Natural Gas – India Jan LNG imports up +7.9% YoY to 2.58 bcf/d, flat MoM

For the past several years, there has been increased India LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 has been the sky-high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we are seeing some modest increases in India’s LNG imports. On Monday, India’s Petroleum Planning and Analysis Cell released their monthly report for January natural gas and oil statistics [\[LINK\]](#). The sky-high LNG prices resulted in India LNG imports declining from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. January 2023 imports were flat MoM at 2.58 bcf/d, up +7.9% YoY.

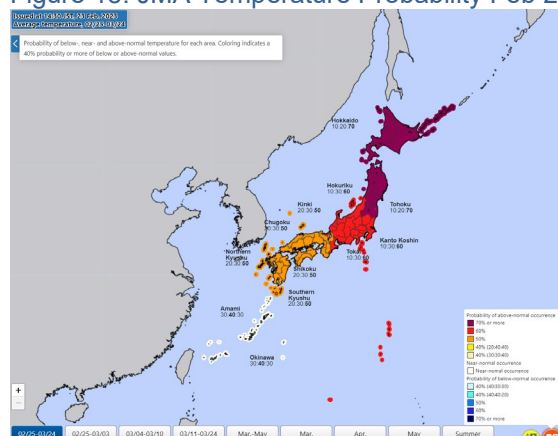
**India LNG imports
+7.9% YoY**

Natural Gas – Japan weather forecast now pointing to warmer than normal Feb/Mar

We won’t be reporting on Japan’s near-term weather forecast for a few weeks. Winter is effectively over and it’s shoulder season so weather isn’t a big driver for natural gas consumption in March/April. But we will pick it up again as the JMA starts to look to May/June temperatures. The outlook to end February hasn’t changed – it’s warm. Any end of winter driven natural gas demand for natural gas appears to be over with another warm outlook for the end of winter in Japan. The focus will now turn to the start of Cherry Blossom season. On Thursday, the Japan Meteorology Agency updated its 30-day outlook [\[LINK\]](#) and is forecasting warmer than normal weather to end Feb/March.

**Japan expects a
warmer than
normal end to
winter**

Figure 13: JMA Temperature Probability Feb 25 – Mar 24



Source: Japan Meteorology Agency

Natural Gas – Japan’s LNG stocks up +2.3% WoW to 126 bcf

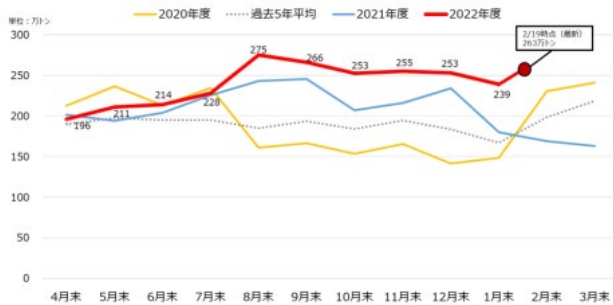
It has been a good winter for Japan with mostly a mild winter and that has meant not a lot of winter temperature driven demand for natural gas. This has led to higher than normal LNG stocks and Japan was able to avoid any LNG shortages this winter. Rather Japan’s LNG stocks have been at higher than normal levels throughout the winter. The key reason why highlight Japan’s LNG stockpiles is that, even at max levels, they are not huge relative to LNG imp[orts that have ranged from 7 to 14 bcf/d since Jan 1, 2021. It doesn’t take too many

**Japan LNG stocks
+2.3% WoW**

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cold days to put a big dent in LNG stocks. But that wasn't a risk this winter. Japan's METI weekly LNG stocks data was released on Wednesday [LINK](#). LNG stocks at Feb 19 were ~126 bcf +2.3% WoW from Feb 12 of ~123 bcf and well above the 5-year average of 95 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 14: Japan's LNG Stocks



Source: METI

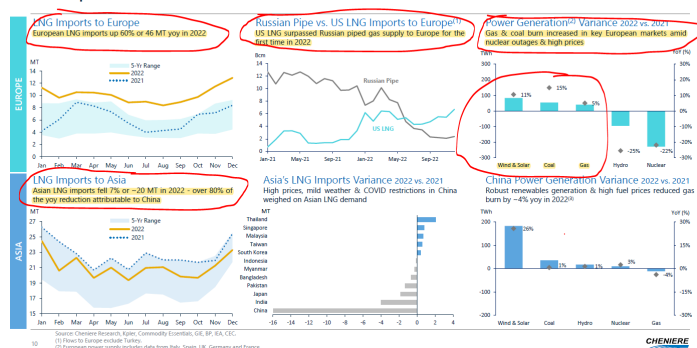
Natural Gas – Cheniere, EU's RUS supply gap 6.8 bcf/d in 2022 up to 10.6 bcf/d in 2023

On its Q4 call on Thursday, Cheniere also highlighted the how Europe was able to get thru this winter without a natural gas outage, but also how Europe faces a bigger challenge in 2023. Cheniere said Europe's shift from Russia created a supply gap of 70 bcm (6.8 bcf/d) in 2022 but increasing to 110 bcm (10.6 bcf/d) for 2023. In their prepared comments, mgmt. said "Europe shift away from Russia created an immediate supply gap of approximately 70 Bcm in 2022, which will likely rise to approximately 110 Bcm in 2023. Assuming Russian pipeline supplies are eventually fully curtailed, the gap created of 100 mtpa is equivalent to around 1/4 of the current global LNG market. The magnitude of the supply shock stressed the global LNG market in 2022, resulting in some demand destruction in certain regions during the year." Below is Cheniere's graph on how Europe managed thru 2022. Our Supplemental Documents package includes excerpts from the transcript on Cheniere's Europe natural gas challenge.

Cheniere on EU's Russia supply gap

Figure 15: Europe and Asia continued to drive global LNG trade in 2022

Europe and Asia Continued to Drive Global LNG Trade in 2022



Source: Cheniere

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Shell reminded why Europe is not out of the woods for natural gas in 2023

Here is what we wrote in last week's (Feb 19, 2023) Energy Tidbits memo. *"We have been highlighting how Europe was able to avoid a natural gas crisis because all the cards fell in its favor – mild temperatures in Europe and in Asia, China diversified 50% of its LNG to Europe, demand destruction, increasing coal-fired power, etc. In its LNG Outlook 2023, Shell reminded how Europe is not out of the woods in 2023, rather it is a "multi-year issue". In the Q&A, mgmt. replied why they see this as a multi-year issue. Mgmt said "my answer was the same that we are not out of the energy crisis in Europe, far from I think. And I would agree with your point that there seems to be some who feel that it's all back to normal. This is I think a multi-year energy crisis and we all have to collectively figure out how we address that. Why do I say that? I think just looking at some of the fact. So, last year what happened with Russia was roughly 2.5% of global gas demand was taken out because of the reduction in gas supplies from Russia into Europe. That caused havoc in the markets, as you know well. What supported or what bridged the gap? Of course, LNG played an important role, mild weather played an important role and critically demand destruction also played an important role. Let's take the first one. There isn't a huge amount of LNG coming into the market over the next two years, it's around 20 million tons is what we see, but that's about it. And that one shouldn't also forget that many of these machines have been running hard now for a good year and you're beginning to see some of the challenges in just the reliability of the machines around the world. So that's, that's an issue. The second issue of course is that China was the one that diversified roughly 50% of its LNG to come here to Europe or 50% of Europe's needs was met with diverted LNG cargoes from China. That might change or is likely to change, given where things are going with the recovery, the economic recovery in China. So you look at that. You don't want to be in a position to be depending on the weather as your savior or the fact that you're going to destroy more demand. And so I do think this is a multi-year issue. We've been very vocal with governments here in Europe that we're going to have to need to move faster. What does Shell do as a result of this? Of course, our portfolio has typically been positioned for Northern Hemisphere winters, that's why we typically have our longs. We, of course, work on significant support in storage. This year or last year, sorry, we invested in storage in Germany and in Austria, which was part of where we used our working capital, for example. We're investing in projects right now. We have peers depressurization that's coming onstream and penguins in the UK. So we have a lot of opportunities to be able to supply the market and of course, create value through the tremendous portfolio that we have in LNG".*

Natural Gas – A cool week to end Feb but won't do much for natural gas demand

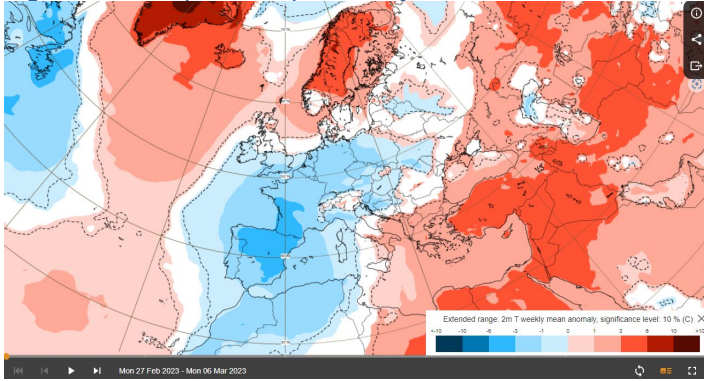
Winter is basically over in Europe at least as far as any material natural gas demand driven by weather. Every Monday and Thursday, the European Centre for Medium-Range Weather Forecasts updates its near-term forecasts. The forecasts normally are released in early afternoon MT. The ECMWF Feb 23 update calls for some colder than normal temperatures for most of western Europe for the Feb 27-Mar 6 week. [\[LINK\]](#) However, colder than normal temperatures at the beginning of March don't drive significant temperature driven natural gas demand. There should be some modest demand support in Germany, where overnight lows

Cool end to Feb

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in some areas will be below 0C. But the largest variance is Spain where overnight lows are more likely in the 5 to 10C range.

Figure 16: Temperature probability forecast for Feb 27-Mar 6 week

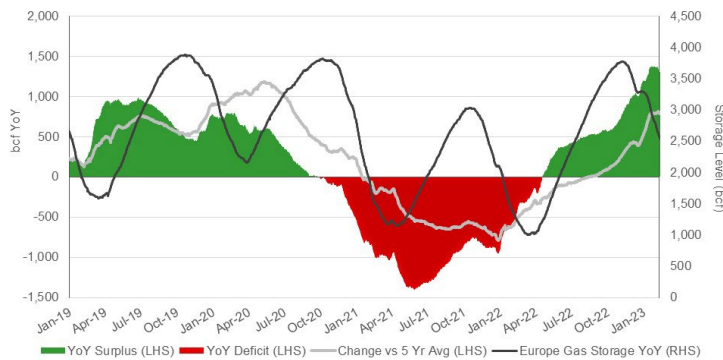


Source: ECMWF

Natural Gas – Europe storage is now +32.8% YoY ie. 62.54% full vs 30.16%

The big global natural gas story for the past two months has been it's been much warmer than normal in Europe and in Asia, and that has been a key for why Europe made it through winter without a natural gas shortage. There has been negligible weather driven demand for natural gas, which along with the continued industrial demand destruction, means storage levels are at very high levels. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY and is now a YoY surplus of 32.5%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -2.96% WoW to 62.54% on Feb 23. Storage is now +32.8% greater than last year levels of 30.16% and is +21.36% above the 5-year average of 41.58%. Below is our graph of Europe Gas Storage Level.

Figure 17: Europe Gas Storage Level



Source: Bloomberg

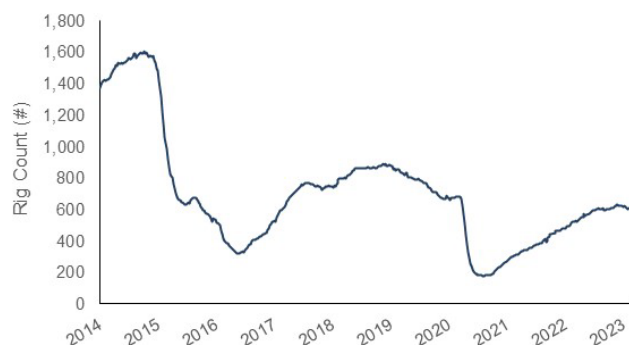
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Oil – US oil rigs down -7 rigs to 600 oil rigs on Feb 24

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -7 rigs to 600 rigs as of Feb 24, notably with -4 rigs in the more marginal basins such as “Others” with other slight declines in the Permian and the Bakken at -1 rigs respectively. The total US oil rig count is now at 600 rigs, up +78 YoY, +119 from the 2022 low of 481 rigs in January and +428 since the 2020 low of 172 rigs on Aug 14. We look for US gas rigs to decline over the coming weeks. US gas rigs were flat WoW at a total of 151 rigs, an increase of +24 rigs YoY. Below is our graph of total US rigs.

**US oil rigs down
-7 WoW**

Figure 18: Baker Hughes Total US Oil Rigs



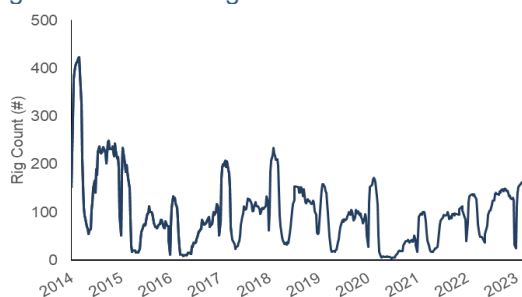
Source: Baker Hughes

Oil – Total Cdn rigs down -4 WoW to 244 total rigs, +21 rigs YoY

The traditional winter drilling season in Canada is about to end and we should start to see large rig declines in the next 2-3 weeks. However, it was very cold in western Canada this week, which should help extend winter drilling another week for those who want to keep drilling. Total Cdn rigs were -4 WoW to 244 rigs as of Feb 24. As noted in last weeks memo, the modest increase in rig count is no surprise as the holiday season officially wrapped up. We previously noted the modest build in rig counts over the last couple weeks was likely due to further clarity on the Blueberry River First Nations and the BC government. Notably, the week of Feb 24 saw a -4 rig declines in AB with all other areas remaining flat. There is now a total of 244 rigs, +21 vs the comparable Covid period of 172 rigs on Feb 19, 2021. Cdn oil drilling rigs have increased to 154, up +20 YoY from 135 rigs a year ago and Cdn gas rigs were up +1 rig WoW to 86 rigs. Below is our graph of total Cdn oil rigs.

Cdn rigs -4 WoW

Figure 19: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat at 12.3 mmb/d WoW

The EIA estimates US oil production was flat WoW at 12.3 mmb/d for the week ended Feb 17 with lower 48 production up and Alaska production down WoW. US oil production, based on the weekly estimates, has been mostly range bound between 11.9 to 12.1 mmb/d since the 2nd week of May. But broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 as well as five weeks ago, the first time since it touched 12.2 mmb/d in the 1st week of August. Total US production reached it's highest level since March 13, 2020 on Feb 3, 2023 at 12.3 mmb/d. Lower 48 production was up WoW at 11.9 mmb/d this week and Alaska was down at 0.447 mmb/d WoW. US oil production is up +0.700 mmb/d YoY at 12.3 mmb/d but is still down significantly at -0.800 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

US oil production flat WoW

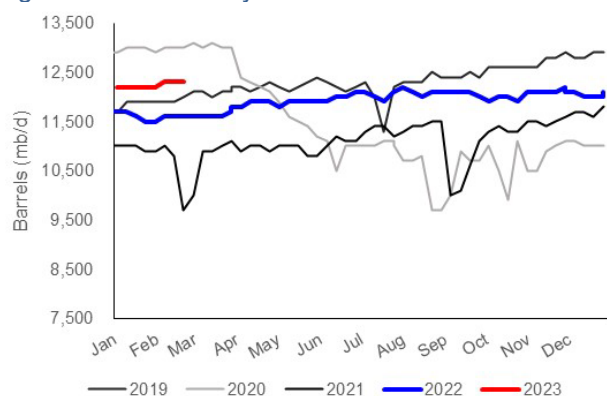
Figure 20: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
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				

Source: EIA

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Figure 21: US Weekly Oil Production



Source: EIA, SAF

Oil – Cowen says Chevron’s Permian wells performance down 25% YoY

We have been saying that US shale oil growth can continue but it will cost more to do so and take longer to reach growth targets. There is a huge question to be addressed at Chevron’s Investor Day 2023 on Tuesday – did your Permian well productivity decline by 25% YoY in 2022? If not, by how much did they decline? We don’t have access to Cowen’s research, but, on Friday, Bloomberg reported “*Chevron’s Permian Oil Productivity Dropped 25%, Cowen Says. Chevron Corp. is suffering significant productivity declines in its Permian Basin wells and fixing the problem may require raising capital spending, Cowen Inc. wrote in a note. Chevron’s well performance in the Permian declined 25% year-over year, analysts led by Jason Gabelman wrote, citing data from state records. Cowen analyzed wells’ cumulative production to take into account natural decline rates. The weak performance is driving the stock’s underperformance compared with peers this year, Gabelman said. Chevron has declined 10% this year compared with a 4.4% decline in the S&P 500 Energy Index. “We compiled data that shows a marked decline in production curves,” the analysts wrote. “Chevron could have to increase spend to account for this.” Several operators reported weaker well productivity in 2022 as the basin runs out of top tier locations and producers sample drilling in alternative zones with different methods. Chevron, which holds an investor day next week, said in January that it’s changing its drilling plans after discovering some wells were clustered too closely together.*”

Chevron’s Permian well performance

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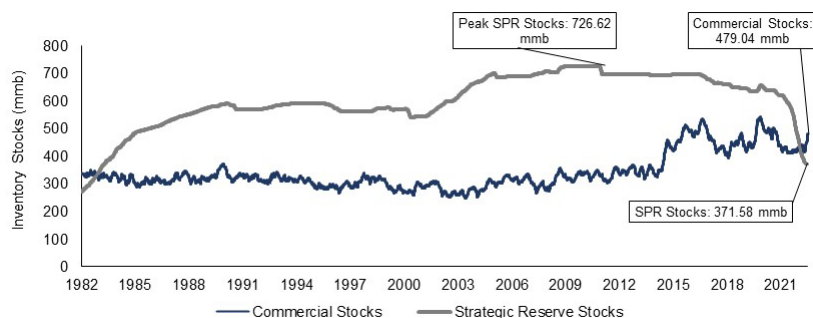
Chevron expects lower Permian oil growth in 2023 & seems at a higher cost

Chevron didn't mention lower Permian productivity rates in its recent Q4 call. However, they pointed to lower Permian oil growth in 2023 and at a higher cost. So a lower productivity Permian well rate would fit that overall direction. Here is what we wrote in our Jan 29, 2023 Energy Tidbits memo. "Chevron reported Q4 on Friday and it included a strong year for its Permian growth being +16.3% YoY from 608,000 boe/d in 2021 to 707,000 boe/d in 2022. They didn't provide details on the Q4 call but they are calling for a little lower Permian oil growth at what we expect will be at higher costs. (i) Lower Permian oil growth in 2023. In the Q4 call, Chevron didn't provide a forecast level of Permian growth in 2023, but did say "And then our Permian growth would be a little bit lower in '23. A couple of things. One, in '22, we had the benefit of a lot of prior DUCs that had been sitting that came online and it boost early production in '22, a little bit more." (ii) Sounds like the Permian growth in 2023 will be more expensive/costly. Chevron did not say this, but it's hard to interpret the differences to their 2023 Permian approach as anything other it should cost more. They talk about doing a few more single benches than developing multiple benches, and a few more rig moves. This has to add something to costs. Mgmt said " And then we also are re-optimizing some of our development plans to factor in some of the things we continue to learn relative to interactions between wells and benches, how we space laterals and do single or multibench development. So our revised plan will have some deeper targets, a few more rig moves and a few more single bench developments all of which brings that pace down a little bit. So that's kind of at the highest level, what is behind the production numbers."

Oil – US SPR reserves now -107.462 mmb lower than commercial crude oil reserves

Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit widening again this week due to the big build in commercial oil stocks that was primarily driven by another drop in US oil exports during the cold weather in the Gulf Coast. The EIA's new weekly oil data for Feb 17 has SPR reserves at 371.6 mmb vs commercial crude oil reserves at 479.0 mmb. The last time the SPR was down at this level was on Dec 1983 at 371,291 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

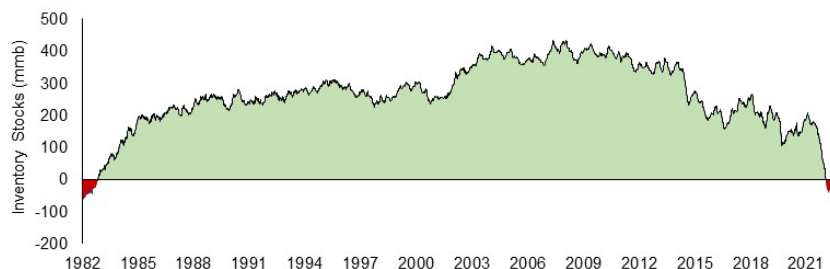
Figure 22: US Oil Inventories: Commercial & SPR



Source: EIA

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Figure 23: US Oil Inventories: SPR less commercial



Source: EIA

Oil – Reminder US SPR going 26 mmb lower over the coming months

Here is what we wrote in last week's (Feb 19, 2023) Energy Tidbits memo. "On Monday, Bloomberg reported "The Biden administration plans to sell more crude oil from the Strategic Petroleum Reserve, fulfilling budget directives mandated years ago that it had sought to stop as oil prices have stabilized. The congressionally mandated sale will amount to 26 million barrels of crude, according to people familiar with the matter. The sale is in accordance with a budget mandate enacted in 2015 for the current fiscal year, said a spokesperson for the Department of Energy. The Energy Department has sought to stop some of the sales required by 2015 legislation so that it can refill the emergency reserve, which currently has about 371 million barrels. After this latest release, the reserve will dip to about 345 million." The last time the SPR was 345 mmb was in Aug 1983 at 345.7 mmb.

SPR going 26
mmb lower

Oil – Trans Mountain adding drag reducing agents to increase effective capacity

It looks like Trans Mountain will be increasing the effective capacity of its existing 300,000 b/d Trans Mountain oil pipeline. They started using Drag Reducing Agents (DRAs) on Jan 1, and we suspect it should be able to add 30,000 to 40,000 b/d to its capacity. Yesterday, we tweeted [\[LINK\]](#) "#TransMountain using drag reducing agents Jan 1 to increase effective capacity vs current 300 kbd. surprised haven't before as DRAs were big push from \$ENB \$EPD etc 5 yrs ago. See 📌 DRAs +12% or +100 kbd to Seaway capacity from 850 to 950 kbd in 2018. Thx @roberttuttle. #OOTT." Adding DRAs is not new, rather the big push on using DRAs on oil pipelines was about five years ago. We were surprised to hear Trans Mountain was only just now starting to use DRAs. On Friday, Bloomberg reported "Trans Mountain began using drag reducing agents for heavy crude shipments starting in Jan., co. says in email. * NOTE: Trans Mountain ships predominately light oil but also heavy crude and refined fuels from Alberta to Vancouver area where it connects to marine terminal and another pipeline that supplies Washington state refineries * NOTE: Drag reducing agents are chemicals that allow more oil to be shipped through a pipeline."

Drag Reducing
Agents

Enterprise added 100,000 b/d to Seaway pipeline capacity using DRAs

Our tweet yesterday included an item from our Aug 12, 2018 Energy Tidbits memo on how DRAs added 12% or +100,000 b/d to Seaway's oil pipeline capacity from

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850,000 b/d to 950,000 b/d. Here is what we wrote on Aug 12, 2018. *“Drag Reducing Agents” are adding heavy oil capacity. One of the now common themes for pipelines is the use of drag reducing agents (“DRA”) to increase the effective capacity of an oil pipeline. A good example was the Enterprise Products comments of the Q&A in last week’s Q2 call. Mgmt highlighted how the use of DRAs will be adding about 100,000 b/d to the Seaway capacity. Mgmt replied “I’ll take that. We’re evaluating expanding Seaway. I think there’s others out there doing the same thing. The one thing that we can do immediately because we’re adding DRA to Seaway 2, that’ll be online in September and that adds about 100,000 barrels a day of capacity.” The potential impact of DRAs is not a new theme. We looked back to our 2010 investor presentations and memos for our non technical explanation that DRAs tend to be polymers that reduce the friction of oil in pipes and by reducing friction allows more oil to flow thru the pipe in a given period. The use of DRAs is not limited to North America, but any oil pipeline. Plus the use of polymers has also been used in cold heavy oil wells to improve flow rates. One thing to keep in mind.”*

Enbridge added 75,000 b/d using DRAs in 2018

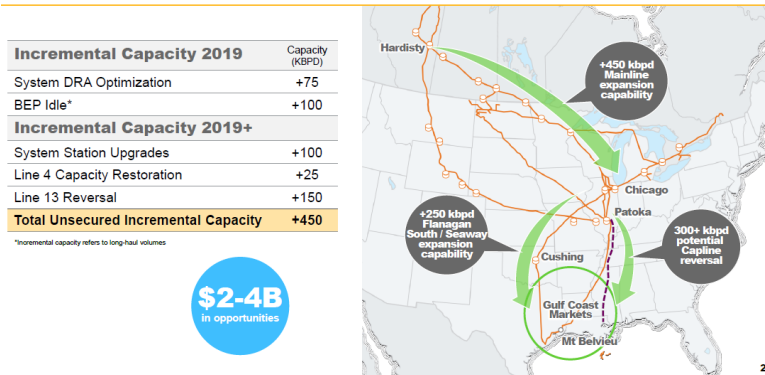
We also highlighted DRAs in our Sept 18, 2018 blog *“Enbridge’s “Other” Projects Could Add 325,000 b/d Egress On Top Of Its Line 3 Replacement Add Of 375,000 b/d.”* Here is what we wrote in that blog. *“We believe that at least 325,000 b/d of these “Other” projects looks executable for around 2020. We took the Enbridge list of “Mainline Expansion Opportunities” for 450,000 b/d as a starting point for our review. And what stuck in our mind was the comments from last year as Enbridge made a point of emphasizing the low cost and highly executable nature of these additions. To be clear, these are not their Line 3 replacement, these are projects separate from their 375,000 b/d Line 3 replacement project. We shouldn’t have been surprised to see they seem like low hanging fruit and identified projects that look to be highly likely to work and are to be impactful around 2020. Perhaps what surprised us the most is that these “Other” projects have been ignored by markets. After reviewing these projects, we came to the view that there is probably at least 325,000 b/d of additional available capacity on the mainline in and around 2020. (i) There is 75,000 b/d of DRA optimization. DRA is drag reducing agents. DRAs are not unique to Enbridge’s oil pipelines, they are working on other oil pipelines. We assume this will work. (ii) The BEP idle of 100,000 b/d is their Bakken expansion program that has underutilized capacity of 100,000 b/d. It is there for 2019. We assume this will work. (iii) The Line 13 reversal of 150,000 b/d is the potential reversal of their Line 13, which is also known as the Southern Lights pipeline that brings condensate from Illinois up to Edmonton so it can be blended with heavy oil for pipeline transportation. We believe the strong success of the condensate rich Duvernay and Montney is decreasing the need for condensate imports via this line, which at least provides the opportunity for condensate to be captured to replace the current Line 13 condensate volumes. Therefore we believe why Enbridge puts this as a highly executable project. We assume this will work. (iv) We do not have enough of a familiarity with the other two projects to get to the 450,000 b/d to include in our analysis, so have left off for now.”* Below is the Enbridge August 2018 slide included in our Sept 18, 2018 blog.

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Figure 24: Enbridge Mainline Expansion Opportunities August 2018

Low cost, highly executable, staged expansions to match supply growth

Mainline Expansion Opportunities



Source: Enbridge August 2018 Investor Presentation

Oil – Cdn oil differentials narrowed \$2.00 to close at \$16.50 at close on Feb 24

Note that we have been expecting to see a normal seasonal narrowing of Cdn oil differentials as normally happens every spring. Seven weeks ago, the WCS-WTI differential was \$26.60 on Jan 6, but narrowed to \$23.00 on Jan 13, bounced up and down to close at \$23.75 on Jan 27, down the next week to close at \$22.50 on Feb 3, then down last week to close at \$18.65 on Feb 10, stayed flat for a couple weeks, but then narrowed \$2.00 to close at \$16.50 on Feb 24. For perspective, a year ago, the WCS-WTI differential was \$12.25 on Feb 24, 2022. Below is Bloomberg's current WCS–WTI differential as of Feb 24, 2023 close.

WCS less WTI differentials

Figure 25: WCS less WTI oil differentials including Feb 17 close



Source: Bloomberg

Oil – Moving into normal season narrowing of Cdn heavy oil differentials

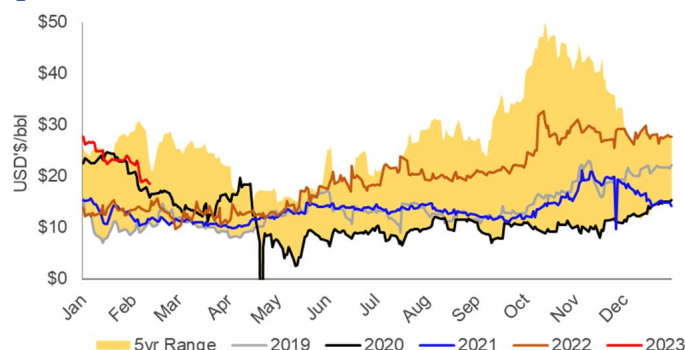
Unfortunately, there are often items like Keystone pipeline outage that impact Cdn heavy oil differentials. And the huge item, the release of mostly medium oil out of the SPR. It's not just unplanned events, but there are many items that impact Cdn heavy oil differentials, but we remind that we are just moving into the time of the year that normally sees Cdn heavy oil

WCS differentials normally narrow in spring

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differentials narrow. This is the time of year, when refineries tend to maximize production of asphalt ahead of the annual summer paving season. As is said in Canada, there are two seasons in Canada – winter and paving season. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials from Feb thru May.

Figure 26: WCS less WTI oil differentials



Source: Bloomberg

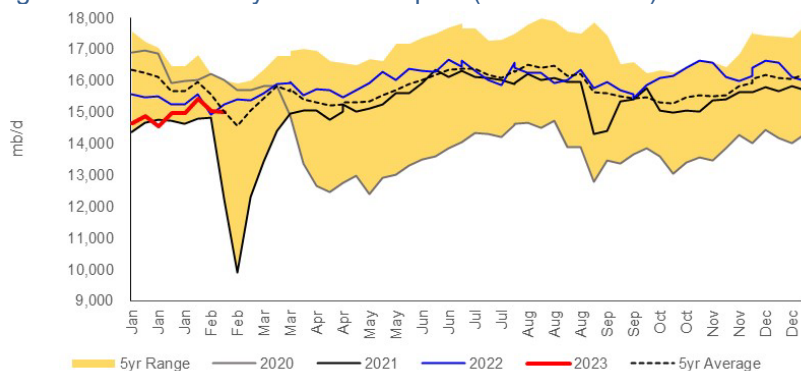
Oil – Refinery inputs down -0.017 mmb/d WoW to 15.010 mmb/d

Refinery crude oil inputs declined slightly this week. There are always unplanned refinery issues, but we remind Feb/early March is normally when we see refineries move into turnaround/maintenance i.e. crude oil inputs seasonally decline as refineries switch to produce more summer blend fuels. On Thursday, the EIA released its estimated crude oil input to refinery data for the week ended Feb 17. The EIA reported crude oil inputs to refineries were down -0.017 mmb/d this week to 15.010 mmb/d and are -0.236 mmb/d YoY from 15.246 mmb/d for the week ended Feb 18, 2022. This week's refinery utilization was down to 85.9%, which is -0.6% WoW and +1.5% YoY. Total products supplied (i.e., demand) increased WoW, down +0.916 mmb/d to 20.218 mmb/d, and Motor gasoline was up +0.636 mmb/d to 8.910 mmb/d from 8.274 mmb/d last week. The 4-week average for Motor Gasoline was down -0.0119 mmb/d YoY to 8.526 mmb/d. The 4-week average of Total demand was down -1.838 mmb/d YoY to 20.041 mmb/d.

**Refiners
switching to
summer fuel
blends**

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Figure 27: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

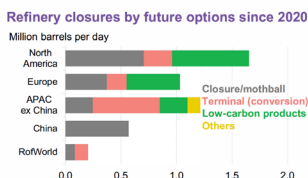
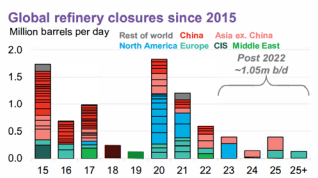
Oil – BNEF “wave of [refinery] closures comes to an end”

On Thursday, BloombergNEF posted its “Global Oil Refinery Closures Tracker: Wave of closures coming to an end”. This is a good recap of global oil refineries all the way back to 2015, but the big wave of closures was in 2020 and 2021. BloombergNEF notes that wave is coming to an end. BloombergNEF writes “Nearly 1.05 million barrels per day (b/d) of oil refining capacity has been earmarked for closure in the next few years, including 400,000 b/d in 2023. This is in addition to the 3.62 million b/d of refinery closures between 2020 and 2022, when global oil demand plummeted due to Covid-19 and refining margins fell sharply. • No closures have been announced in the past six months. After the pandemic forced the most vulnerable refineries to shut down, the wave of capacity closures appears to have come to an end. In addition, high refining margins since last June have brought relief to many refiners.”

Global refinery closures

Figure 28: Global refinery closures since 2015

No new closures announced as many assets find buyers



Source: BloombergNEF, OPEC ETPI, company announcements. Note: CIS refers to the Commonwealth of Independent States. Data includes plans to close, convert and mothball. See attached database for more details.

- Nearly 1.05 million barrels per day (b/d) of oil refining capacity has been earmarked for closure in the next few years, including 400,000 b/d in 2023. This is in addition to the 3.62 million b/d of refinery closures between 2020 and 2022, when global oil demand plummeted due to Covid-19 and refining margins fell sharply.
- No closures have been announced in the past six months. After the pandemic forced the most vulnerable refineries to shut down, the wave of capacity closures appears to have come to an end. In addition, high refining margins since last June have brought relief to many refiners.
- However, global oil majors have not slowed down their efforts to consolidate their downstream assets. Elevated margins in recent months have made it easier to strike a deal. The latest example is Exxon Mobil's sale of its refining and terminal assets in Thailand and Italy. Both buyers are existing shareholders in the local markets. BP also sold its stake in the Toledo refinery last August.
- Downstream portfolio optimization is inevitable as oil majors shift their strategic focus. Decarbonization targets are forcing many to reduce their refining capacity and prioritize assets that can create synergies and generate profits. At risk of further consolidation are standalone refineries that are not integrated with petrochemical facilities, or those that are not viable for conversion to renewable fuel plants.

1 February 23, 2023

BloombergNEF

Source: BloombergNEF

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Oil – US “net” oil imports down -1.357 mmb/d WoW to 1.729 mmb/d

US “NET” imports were down -1.357 mmb/d to 1.729 mmb/d for the Feb 17 week. US imports were up +0.094 mmb/d to 6.326 mmb/d. US exports were up +1.451 mmb/d to 4.597 mmb/d. The WoW increase in US oil imports was driven mostly by Top 10 with a increase of +0.157 mmb/d. Some items to note on the by country data. (i) Canada was down this week -0.359 mmb/d to 3.197 mmb/d. (ii) Saudi Arabia was up +0.283 mmb/d to 0.545 mmb/d. (iii) Colombia was up +0.141 mmb/d to 0.284 mmb/d. (iv) Ecuador was down -0.011 mmb/d to 0.145 mmb/d. (v) Iraq was down -0.071 mmb/d to 0.251 mmb/d. (vi) Mexico was down -0.007 mmb/d to 0.683 mmb/d.

US “net” oil imports down WoW

Figure 29: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Dec 2/22	Dec 9/22	Dec 16/22	Dec 23/22	Dec 30/22	Jan 6/23	Jan 13/23	Jan 20/23	Jan 27/23	Feb 3/23	Feb 10/23	Feb 17/23	WoW
Canada	3,423	3,795	3,066	3,504	2,949	3,737	3,707	3,419	3,587	3,856	3,556	3,197	-359
Saudi Arabia	274	317	513	473	479	464	453	433	640	384	262	545	283
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	585	602	632	581	428	668	909	511	758	913	690	683	-7
Colombia	292	248	71	353	357	246	245	244	216	70	143	284	141
Iraq	252	282	227	289	354	150	201	195	469	230	322	251	-71
Ecuador	159	157	70	274	87	137	0	69	243	207	156	145	-11
Nigeria	159	171	136	66	141	143	211	114	317	248	75	256	181
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	5,144	5,572	4,715	5,540	4,795	5,545	5,726	4,985	6,230	5,908	5,204	5,361	157
Others	868	1,295	1,104	712	917	805	1,135	920	1,053	1,150	1,028	965	-63
Total US	6,012	6,867	5,819	6,252	5,712	6,350	6,861	5,905	7,283	7,058	6,232	6,326	94

Source: EIA

Oil – Pemex oil production up slightly in January at 1.584 mmb/d

Pemex reported their production figures for January on Friday [LINK](#), we note that they do not provide explanation on the data. Pemex’s Jan oil production for its interests was down MoM, in a similar size as the MoM increase in their partners production. On Friday, Pemex released its January production for its interests, it was 1.584 mmb/d of oil, which is still down from the last several months. Pemex has been unable to grow its own oil production and has failed to hit refining targets for most of 2022. But 3rd party non-Pemex oil production continues to increase and was up at 366,000 b/d in January and has averaged ~70,000 b/d for YTD December 31, 2022. As a result, total Mexico oil production (Pemex and non-Pemex) was 1.850 mmb/d for January and 1.797 mmb/d for YTD December 31. Below is our chart tracking Pemex oil production.

Pemex Dec oil 1.584 mmb/d

Figure 30: Pemex (Excl 3rd Party) 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		
Mar	2,217	2,018	1,846	1,691	1,745	1,697	1,696		
Apr	2,177	2,012	1,868	1,675	1,703	1,693	1,686		
May	2,174	2,020	1,850	1,663	1,633	1,688	1,690		
June	2,178	2,008	1,828	1,671	1,605	1,698	1,702		
July	2,157	1,986	1,823	1,671	1,595	1,701	1,707		
Aug	2,144	1,930	1,798	1,683	1,632	1,657	1,691		
Sept	2,113	1,730	1,808	1,705	1,643	1,709	1,685		
Oct	2,103	1,902	1,747	1,655	1,627	1,692	1,698		
Nov	2,072	1,867	1,697	1,696	1,633	1,691	1,706		
Dec	2,035	1,873	1,710	1,706	1,650	1,694	1,576		

Source: Pemex

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Oil – Mexico exports 980,000 b/d of oil in January

Please note that we expect Mexico oil exports to decline in 2023 as they start up their new refinery. On Friday, Pemex posted its oil exports for January, which were 0.980 mmb/d, up +17.8% YoY from 0.832 mmb/d in Jan 2022, and up +11.8% MoM from 0.900 mmb/d in Dec 2022. Oil exports can normally vary +/- 1.0 mmb/d, but the decline may be different this time as petroleum products production was up ie. Mexico refined more of its oil. Mexico oil exports to US were 0.754, which is slightly below its YTD average of approx. 0.65 mmb/d. Below is our table of the Pemex oil export data.

Pemex Jan oil exports

Figure 31: Pemex Mexico Oil Exports

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	1,119	1,085	1,107	1,071	1,260	979	832	-15.0%	980	17.8%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	925	-8.1%		
Mar	1,062	1,001	1,176	1,150	1,144	925	905	-2.2%		
Apr	1,081	1,017	1,266	1,023	1,179	923	1,024	10.9%		
May	1,204	958	1,222	1,205	1,062	1,031	965	-6.4%		
June	1,098	1,157	1,110	995	1,114	1,106	1,029	-7.0%		
July	1,146	1,255	1,156	1,079	1,051	1,173	1,062	-9.5%		
Aug	1,261	1,114	1,181	1,082	1,190	1,099	915	-16.7%		
Sept	1,425	1,159	1,206	995	1,023	983	1,022	4.0%		
Oct	1,312	1,342	1,027	963	908	935	971	3.9%		
Nov	1,273	1,388	1,135	1,114	1,171	1,025	893	-12.9%		
Dec	1,115	1,401	1,198	1,115	1,243	1,037	900	-13.2%		

Source: Pemex, CNIH

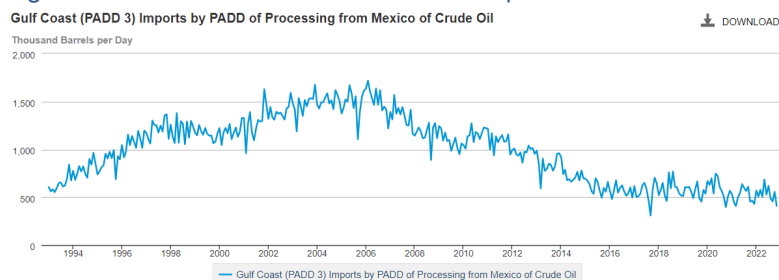
Oil – A key 2023 oil theme is Mexico should significantly reduce oil exports in 2023

We remind that a key theme for Cdn oil in 2023 will be Mexico significantly reducing its oil exports. Here is what we wrote in our Dec 25, 2022 Energy Tidbits memo. “Yesterday, we tweeted [\[LINK\]](#) “Key #Oil theme for 2023 - Mexico refines more oil in its plan to cut exports to zero! Positive to Cdn oil ie. less MEX oil to Gulf Coast. AMLO: Olemecca refinery to hit 170 kbd July 1, full 340 kbd Sept 15. In Nov, Pemex exported 894 kbd incl 499 kbd to Gulf Coast. #OOTT.” One of our key oil themes for 2023 is that Mexico expects to cut oil exports down to zero over the next 12 to 18 months. This was supposed to be happening around now, but the big delay and cost overruns at the new Olemecca (Dos Bocas) refinery pushed that back a year. The stoppage of oil exports wasn't just Olemecca it was the capital put into trying to improve operations to more consistent refinery production at its existing refineries. Our tweet referenced the AMLO tweets on how Olemecca should refine 170,000 b/d July 1, and then an additional 170,000 b/d on Sept 15. AMLO's goal has been to eliminate all Mexico oil exports by adding the new Olemecca refinery and putting capital to increase the capacity utilization of Pemex's existing refineries. And by the added and improved refinery utilization, Mexico could then be able to process all Mexico oil production and therefore eliminating exports. And if Mexico eliminates oil exports, it is a positive for Cdn oil going to the Gulf Coast (PADD 3). Below are the EIA current graphs showing Gulf Coast (PADD 3) oil imports from Mexico and Canada.”

Mexico reducing oil exports

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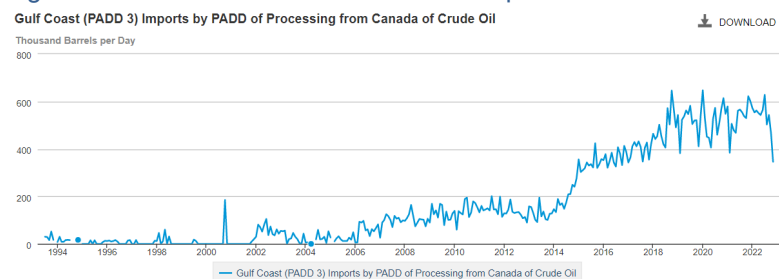
Figure 32: Gulf Coast PADD 3 crude oil imports from Mexico



eia Data source: U.S. Energy Information Administration

Source: EIA

Figure 33: Gulf Coast PADD 3 crude oil imports from Canada



eia Data source: U.S. Energy Information Administration

Source: EIA

Oil – Norway January oil production of 1.754 mmb/d, down -1% MoM

The Norwegian Petroleum Directorate released its January production figures [\[LINK\]](#) of 1.754 mmb/d of oil, which +1.0% YoY but down -1.0% MoM from December of 1.772 mmb/d. January production was down -3.0% (-0.055 mmb/d) from the forecast amount of 1.809 mmb/d. The NPD does not provide any explanations for the MoM changes. The theme for Norway through 2022 was that Norway oil production returned to growth because of the Johan Sverdrup oil field, and tax breaks from the government allowing increased capex in the energy sector. Norway oil production was still expected up modestly in 2023.

Norway oil production

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Figure 34: Norway January 2023 production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm ³ /day	Total MSm ³ o.e./day
Production	January 2023	1.754	1.979	356.8	0.671
Forecast for	January 2023	1.809	2.003	343.4	0.662
Deviation from forecast		-0.055	-0.024	13.4	0.009
Deviation from forecast in %		-3 %	-1.2 %	3.9 %	1.4 %
Production	December 2022	1.772	2.001	360.3	0.678
Deviation from	December 2022	-0.018	-0.022	-3.5	-0.007
Deviation in % from	December 2022	-1 %	-1.1 %	-1 %	-1 %
Production	January 2022	1.736	1.965	343.2	0.656
Deviation from	January 2022	0.018	0.014	13.5	0.015
Deviation in % from	January 2022	1 %	0.7 %	3.9 %	2.3 %

Source: Norwegian Petroleum Directorate

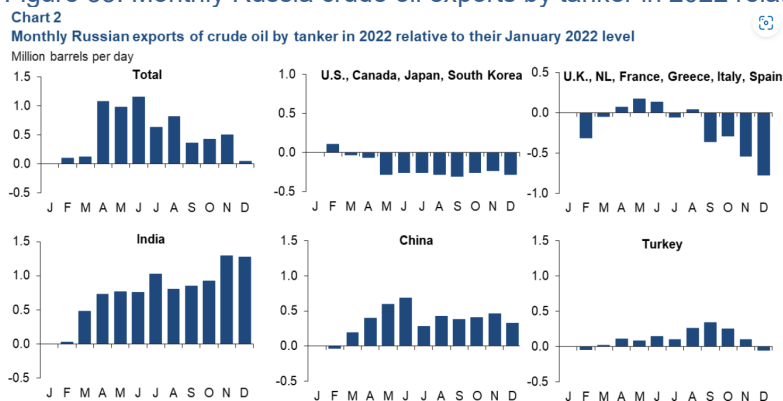
Oil – Russian oil exports to India +1.3 mmb/d in Dec vs Jan.

Everyone knows India and China have been the big buyers of discounted Russian crude oil since the sanctions post Russia invasion of Ukraine. But we saw a good graph recap of exactly where Russian crude oil exports post Jan have gone. On Tuesday, we tweeted [\[LINK\]](#) “Who doesn’t love a good graph! Monthly RUS crude oil tanker exports in 2022 “relative to their Jan 2022 level”. No surprise, biggest buyer of discounted RUS #Oil is India +1.3 mmb/d in Nov & Dec. Thx @DallasFed Lutz Killian & Kunai Patel. #OOTT.” On Tuesday, the Dallas Fed posted a blog “Trade diversion has helped ease the impact of the embargo on Russian oil”. [\[LINK\]](#) Dallas Fed wrote “As recently as 2021, Russia exported 4.7 million barrels of crude oil per day (mb/d) to the rest of the world, along with 2.8 mb/d of petroleum products. Some of the crude oil exports to Europe and Asia relied on oil pipelines, which were operating near full capacity before the invasion. Since the pipeline exports of about 0.8 mb/d to Europe remained stable in 2022 and pipeline exports to Asia could not be increased, much of the adjustment of export flows relied on oil tankers loading Russian oil at Black Sea and Baltic Sea ports as well as ports in the Arctic and East Asia. Total Russian oil tanker exports during 2022 increased substantially despite reduced deliveries to the West (Chart 2). Russia was not only able to divert crude oil originally destined for Europe and its allies to countries not participating in the embargo but was able to raise its overall oil tanker export volume by as much as 40 percent.” Our tweet included the Dallas Fed’s graph that notes how, relative to their January 2022 levels, India was +1.3 mmb/d Nov & Dec, China hit a peak of +0.7 mmb/d in June, but was down to +0.3 mmb/d in Dec, whereas Europe (UK, Netherlands, France, Greece, Italy & Spain) were down 0.8 mmb/d in Dec. Our Supplemental Documents package includes the Dallas Fed blog.

Increasing
Russian oil
exports to India

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Figure 35: Monthly Russia crude oil exports by tanker in 2022 relative to their Jan 2022 level



SOURCES: TankerTrackers.com, Jan. 31, 2023; Federal Reserve Bank of Dallas.

Federal Reserve Bank of Dallas

Source: Dallas Fed

Oil – No wonder RUS is shutting in 500,000 b/d, Its oil operating costs \$44/b in 2022

There was an overlooked and underreported huge Russian oil story this week that provides support for our view that Russia's voluntary 500,000 b/d cut for March isn't voluntary but driven by the high-cost oil not being profitable with high operating costs, price discounts, higher shipping/insurance costs, etc. Most of the Russian media reporting, such as TASS, on the RosStat (official Russian data) reporting focused only on Russian oil production data, and did not report on the RosStat data on Russian oil operating cost data. However, Kommersant did report so. And that led to our tweet earlier this morning [\[LINK\]](#) "why RUS 500,000 b/d "voluntary" cut is likely = non-profitable. Official RosStat data, RUS oil operating costs. 1 RUB= US\$0.013. Q1/22: \$59/b. Q2/22: \$45/b. Q3/22: \$38/b. Q4/22: \$33/b. 2022: \$44/b. Then add on price discount, higher shipping/insurance. See 📌 09/02/21 thread. #OOTT." Note our tweet used 1 RUB = US\$0.013, whereas the Kommersant report used a different exchange rate. But Kommersant reported [\[LINK\]](#) ""The average cost of oil production in Russia in 2022 increased to 24.6 thousand rubles. per ton (rubles / ton), which is 19% more than in 2021 (20.69 thousand rubles), follows from the data (.xls) published on the website of Rosstat. Taking into account the average dollar exchange rate last year (67.46 rubles), the average cost of production per barrel of oil in the Russian Federation was \$ 50. According to statistics provided by the department, during 2022, the cost of oil production decreased. In the first quarter, it was 33.1 thousand rubles / ton, in the second - 25.1 thousand rubles / ton, in the third - 21.4 thousand rubles / ton, in the fourth - 18.6 thousand rubles / ton." There is no explanation as to why, but we have to believe this is reflecting the impact of sanctions on input costs and withdraw of western services/equipment. Q1 is also the peak of winter, which we would normally expect to see some seasonal price impact. Throw in the impact of price discounts on Russian crude, increased shipping/insurance costs, etc, we believe it supports our view that the 500,000 b/d cut isn't necessary "voluntary", but driven by unprofitable oil. Our Supplemental Documents package includes the Kommersant report.

**Russia
operating costs
hammered**

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Oil – Novak says Russia’s 500,000 b/d voluntary cut is only for March, at least so far

Note the above item that we believe supports our view that the voluntary cut wasn’t necessarily voluntary. One of the big oil stories this week was TASS reporting [\[LINK\]](#) *“Russia has only made a decision on voluntary reduction of crude production by 500,000 barrels per day for March so far, Deputy Prime Minister Alexander Novak told reporters, adding that the policy would be extended later depending on the situation. “We will see how the market situation will unfold, and depending on this, decisions will be taken on the market,” he said, adding that “the present decision has only been made for March.” It wasn’t clear why Novak made the statement or if he thought it would have a major market impact. However, the TASS report also noted :Meanwhile, a TASS source in the industry specified that the reduction in production would be calculated from the real volume of production, and not from Russia’s production quota under the OPEC+ deal. According to the deal, from November 2022, Russia is to produce 10.478 mln barrels per day. In January 2023, as Novak said earlier, Russia produced approximately 9.8-9.9 mln barrels per day.”* Perhaps the purpose of the TASS contact was to let the market know that Russia can get back to 9.8 to 9.9 mmb/d of crude oil if they are cutting 500,000 b/d therefrom. It makes us wonder if Russia is inferring they couldn’t get to the Nov 1-Dec 31, 2023 quota of 10.478 mmb/d. We are skeptical on how much oil Russia can produce on a sustainable basis given the price discounts, increased shipping, insurance costs, etc. This is why, when we saw the TASS report, we tweeted [\[LINK\]](#) *“Novak says Russia’s “voluntary” reduction of 500,000 b/d is only for March so far, will see how market unfolds as to extend or not. Will want to see if can add back easily, See 📌 02/10 thread, RUS’s prior admission on a lot of marginal #Oil. #OOTT.”* If Russia inferring they have lost ~500,000 b/d of economic oil (ie. can only get back to 9.8 to 9.9 mmb/d), we think that makes sense. We still want to see them get back to 9.8 to 9.9 mmb/d if they decided to do so. Our tweet referenced Russia’s admission that ~half of their reserves aren’t profitable at \$50 and that was before sanctions added cost and price discount. So is today’s \$80 Brent or so really the equivalent of \$50 to Russia with the price discount and increased shipping/transportation costs, etc? It’s why we wonder how much more of their production doesn’t make money at Brent \$80? Our tweet referred to Russia’s 2021 comments on their high-cost oil base. Below is what we wrote in last week’s (Feb 19, 2023) Energy Tidbits memo on the high-cost oil base. Our Supplemental Documents package includes the TASS report.

**Russia’s
500,000 b/d
voluntary cut**

Two years ago, Russia said only half of its reserves were profitable at \$50

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. *“There have been a number of different views on why Russia said they were voluntarily reducing production by 500,000 b/d in March. We have had a much simpler view because we have been following and highlighting Russia’s own comments that half of their reserves aren’t profitable at \$50. So our approach has been that their voluntary cut is because they have production that isn’t worth producing given the hit to their revenue per barrel from how sanctions have forced Russia to discount their oil prices, increased shipping and insurance costs, etc. After seeing a range of views on why Russia is doing the voluntary cuts, we retweeted our Feb 10, 2023 tweet that started off “Voluntary = non-profitable?”. On Wed, we tweeted [\[LINK\]](#) “see 📌 thread how two years ago russia acknowledged, at least in russian media, half of their oil reserves weren’t profitable at \$50. no one should be surprised they are shutting in*

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500,000 bpd given price discounts etc #OOTT.” Our Feb 10 tweet was “[[LINK](#)] “Voluntary = non-profitable? Russia’s “voluntary” reduction of 500,000 b/d. Makes sense, See 📌 09/02/21 & 01/27/21 tweets, admitted had a lot of marginal #Oil. Then add forced price discount & higher shipping, insurance costs from sanctions. #OOTT”. Russia’s 2021 comments makes believe their voluntary cut is really just an acknowledgement that some of its oil production wasn’t profitable given the impact of forced price discount, added shipping and insurance costs from sanctions. Long before sanctions, Russia openly acknowledged, at least in Russia press, that half of its reserve weren’t profitable at \$50. Now that was referring to reserves and not necessarily production, but given how Russian oil exports are being hit by price discounts, higher shipping and insurance costs, we have to wonder if the 500,000 b/d is really just shutting in production that isn’t profitable.”

Sept 2, 2021, Russia said only half of its oil reserves were profitable at \$50

Here is what we also wrote in our Feb 19, 2023 Energy Tidbits memo. “Our Friday tweet linked to a Sept 2, 2021 tweet [[LINK](#)] “Only half of Russia’s #Oil reserves are profitable at \$50 says Deputy Energy Minister Sorokin. Fits Jan 27 linked tweet. Bullish for mid/long term oil prices. Detailed comment in SAF Group Jan 27, 2021 Energy Tidbits memo <https://safgroup.ca/news-insights/#OOTT>.” Our Sept 5, 2021 Energy Tidbits memo was titled “Only Half of Russia’s Oil Reserves are Profitable at \$50 says Deputy Energy Minister Sorokin.” We then wrote “We will ask the same rhetorical question as we did in our Jan 31, 2021 Energy Tidbits – imaging what markets would say if Exxon were to come out in their year end reporting and say only 50% of its existing oil reserves are profitable at \$50? On Thursday, we tweeted [[LINK](#)] “Only half of Russia’s #Oil reserves are profitable at \$50 says Deputy Energy Minister Sorokin. Fits Jan 27 linked tweet. Bullish for mid/long term oil prices. Detailed comment in SAF Group Jan 27, 2021 Energy Tidbits memo”. There was a typo in the tweet as we should have said the Jan 31, 2021 Energy Tidbits memo that was titled “Russia Says Increasing Water Cut, Deteriorating Development, Etc Mean Only 36% of Its Oil Reserves are Profitable.” This week, Russia’s Deputy Energy Minister Sorokin came out with almost identical comment as he did on Jan 27, 2021 saying “even in our current structure of reserves, a significant part of it is unprofitable at a price of \$50 – about half there. There is a very large layer of opportunities for working with the current resource base: with small fields, with depleted, with tailing assets, with deeper and more difficult layers. What you need to concentrate on”. Sorokin’s Jan 27 comments were basically overlooked as they were only in the TASS Russian news version. But we thought then and still think know that this is a significant admission from Russia as to the mid/long oil supply and we believe a bullish comment for oil in the 2020s. One difference is that Sorokin gave much more insight into the uneconomic oil reserves in his Jan 27 comment in Russia. Below is what we wrote in our Jan 31, 2021 Energy Tidbits on his comments. Our Supplemental Documents package includes the TASS Sept 2 report on Sorokin’s comments.”

Jan 27, 2021, Sorokin said 64% of oil reserves not profitable

Here is what we also wrote in our Feb 19, 2023 Energy Tidbits memo. “Our Friday tweet also linked to a Jan 27, 2021 tweet. Here is what we wrot in or Jan 31, 2021

Energy Tidbits memo on that tweet. "Imagine what markets would say if Exxon were to come out in their year end reporting and say that 64% of its existing oil reserves are not profitable at >\$50 oil. The stock would be creamed as markets would think Exxon wouldn't have oil growth potential and its oil production had likely peaked. This is what Russia said this week for their oil reserves. We were surprised by a TASS Russian news story on Wed morning and would have thought it was a fake if it wasn't on TASS as we would never have thought Russia's #2 oil official (after Novak) would be saying what he did. We tweeted [\[LINK\]](#) "1/2. must read, bullish for oil @tass_agency story "only 36% of oil reserves in Russia are profitable". multiple indicators of maturing oil supply ie. deeper, smaller pools, etc. Effectively says RUS has more or less reached peak oil supply unless #Oil prices are higher #OOTT .." and [\[LINK\]](#) "2/2. surprising RUS lays this out, but fits to Novak's Dec comments and why they would want higher oil prices for 2020s sooner. see SAF Group blog Russia Says its a Price Taker at \$45 in 2021, May Be the New Strategy Needed for OPEC+ to Fix Post Covid Oil Prices For 2020s. #OOTT". TASS wrote "Only 36% of 30 billion tons of oil reserves in Russia are profitable, which is associated with the deterioration of development conditions and a drop in the quality of reserves, writes the Deputy Minister of Energy of the Russian Federation Pavel Sorokin in an article for the Energy Policy magazine. "According to the data of the inventory of the economics of field development, carried out on behalf of the Russian government, out of 30 billion tons of recoverable oil reserves in Russia, only 36% is profitable in the current macroeconomic conditions. This is due to the deterioration of development opportunities: an increase in water cut, the need to permeability and compartmentalization of reservoirs, withdrawal into marginal zones and strata with small thicknesses, and so on, "Sorokin explained." This is significant, Sorokin is basically saying Russia has more or less reached peak oil supply, or at least peak oil supply unless prices are going higher. Maybe there is some growth but Russia has to first arrest declines. This is very different than what we see in the Middle East. Russia is saying its maturing oil production/reserves base needs higher oil prices as its oil base is maturing and they are going after smaller pools (higher cost per barrel), deeper zones (higher costs per barrel) and need new technology (we wonder if this means shale, although Putin has been negative). And also very different than Saudi Arabia. Their costs are going up to, but they aren't saying their oil production/reserves needs higher oil prices to be economic. Rather they and others like we saw with Kuwait this week need higher oil prices to balance their govt budget. They don't say they need higher oil prices to develop its oil reserves. One reminder, producing oil reserves isn't like drinking a glass of water, where you turn the cup down and the water flows out at the same rate until the glass is empty. As oil reserves produce more from a reservoir that is economic today, the oil recovery rate declines over time and the future barrels become more expensive to produce. This is more than food for thought. If peak oil demand isn't here until 2030, then its bullish for oil post Covid. Even if oil demand only recovers to pre Covid, its bullish or at least supportive of higher prices. Our Supplemental Documents package includes the Google Translate version of the TASS Russian story."

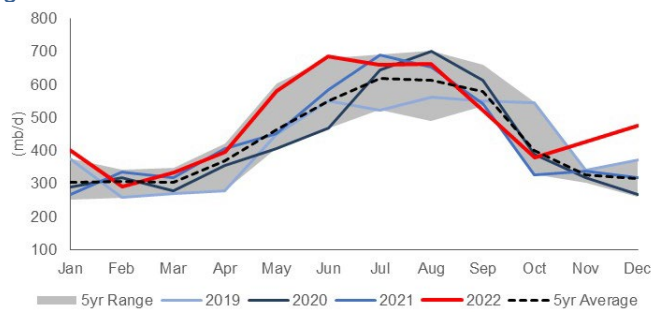
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Saudi to have more oil for export

Oil – Saudi use of oil for electricity in seasonal decline

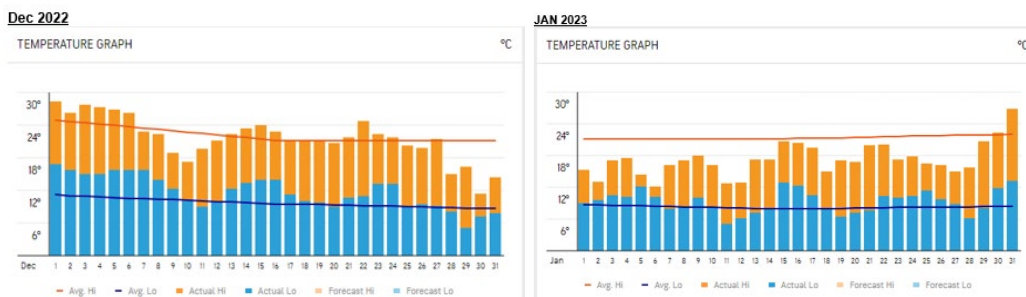
The key theme for the winter months is that Saudi is able to export more oil as it uses less oil for electricity vs the summer months. A reminder a normal peak to trough decline of ~400,000 b/d from oil used for electricity in the peak summer vs trough winter. If there is less oil used for electricity, then there is more oil for export. There is one additional wildcard that isn't in the JODI data but could lead to more Saudi oil for export -the JODI data doesn't include how much fuel oil Saudi imports and we saw reports in Q2 that Saudi was importing some Russian fuel oil via Fujairah terminal. The JODI data for Saudi Arabia oil supply and demand for December was updated on Monday. Saudi used more oil for electricity in December vs November and set a 5-year seasonal high for direct use of oil for electricity. This is attributed to the warmer than average temperatures experienced throughout December. December saw temperatures that were close to the higher average range for most of the month. It is important to note that January experienced colder temperatures than December and colder means less air conditioning/electricity demand. December was 477,000 b/d (vs December 2021 of 318,000 b/d) and November was 429,000 b/d (vs November 2021 of 339,000 b/d) and well above the 5-year seasonal high for December of 317,000 b/d. Below are the AccuWeather Temp maps for Riyadh for December and January. Careful they are different scales but look for oil for electricity to decrease as we move out of peak season.

Figure 36: Saudi Arabia Direct Use of Crude Oil For Electric Generation



Source: JODI

Figure 37: Riyadh Temperature Recaps for December and January



Source: AccuWeather

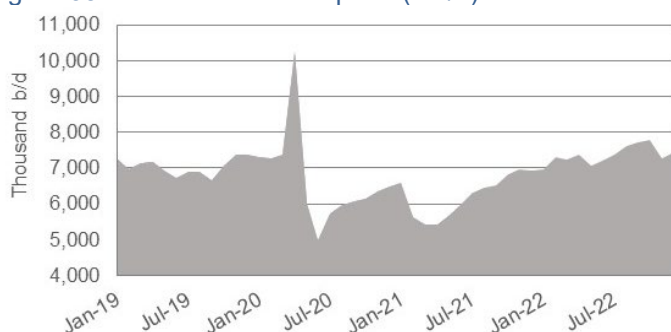
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Oil – Saudi oil exports up 157,000 b/d to 7.437 mmb/d in December

It looks like Saudi Arabia sold oil out of inventory in Dec in increase oil exports. Saudi oil exports in December were higher +157,000 b/d MoM in Dec. Without sales out of inventory, Saudi oil exports would have been down about 41,000 b/d MoM in Dec, not +157,000 b/d MoM to 7.437 mmb/d in Dec. Saudi oil production was down -33,000 b/d MoM to 10.435 mmb/d and Saudi used +48,000 b/d more MoM for electricity. Offsetting those two were Saudi oil intake into refineries were down -40,000 b/d MoM in Dec. The combination of these three factor would have reduced exports by -41,000 b/d MoM in Dec. However, Saudi reduced oil inventories by -3.047 mmb or -98,000 b/d MoM in Dec. Adding the oil inventory reduction would have led us to assume Saudi oil exports were +57,000 b/d MoM. So we are still missing a 100,000 b/d item that would lead to increased MoM Saudi oil exports.

Saudi oil export data for Dec

Figure 38: Saudi Arabia oil exports (mb/d)



Source: JODI

Oil – Saudi oil inventories decreased MoM, down -3.047 mmb barrels MoM

As noted above, it looks like Saudi reduced oil inventories to increase oil exports in Dec. JODI doesn't provide data for Saudi fuel oil imports, but, based on the math, we would assume that there were Saudi fuel oil imports in Dec. The JODI data also reported Saudi oil inventory decreased -3.047 mmb MoM to 148.58 mmb at Dec 31. But as noted above, we still can't reconcile the numbers and are missing 100,000 b/d.

Saudi oil inventory data

Figure 39: Saudi Arabia Crude Oil Inventories (mmb)



Source: JODI

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Oil – India forecasts record petroleum product consumption in 2023-24

India continues to have strong growth in petroleum products consumption and forecasts record consumption in 2023-24. On Thursday, Bloomberg reported on the new India Petroleum Planning & Analysis Cell's forecast for refined products consumption for fiscal year April 1, 2023 to March 31, 2024. Bloomberg reported *"India Sees Demand for Oil Products Rising to Record in 2023-24. 2023-02-23. India's demand for refined oil products is expected to increase by 4.9% y/y to a record 233.8m tons in 2023-24, according to data from the oil ministry's Petroleum Planning & Analysis Cell. * That compares with an estimated 222.9m tons for 2022-23 * NOTE: The forecast period starts April 1 and ends March 31 * Diesel demand is expected to rise 4.3% y/y to 90.56m tons * Gasoline demand +7.7% to 37.8m tons * Jet fuel demand +16% to 8.61m tons * LPG demand +1.7% to 29.12m tons * Naphtha demand -1.6% to 12.1m tons."* We went to the PPAC website to download their forecast table. [\[LINK\]](#)

India petroleum consumption forecast

Figure 40: India estimated petroleum product consumption 2023-24

All figures in TMT	
Estimated Petroleum Product Consumption	
Product	OE 2023-24
(A) Sensitive Products	
LPG	29,117
SKO	450
Sub total	29,567
(B) Major Decontrolled Products	
MS	37,800
Naphtha	12,100
HSD	90,560
ATF	8,607
LDO	710
Lubes/Greases	3,900
FO/LSHS	7,120
Bitumen	8,541
Sub total	169,338
(C) Other Minor Decontrolled Products	
Petcoke	19,000
Others	15,900
Sub total	34,900
All Products	233,805

Others include sulfur, propylene, propane, reformat, L.A.B.F.S, CBFS, butane, MTO etc.

Source: India PPAC

Oil – China domestic flights -0.5% WoW, but passenger load factors up big

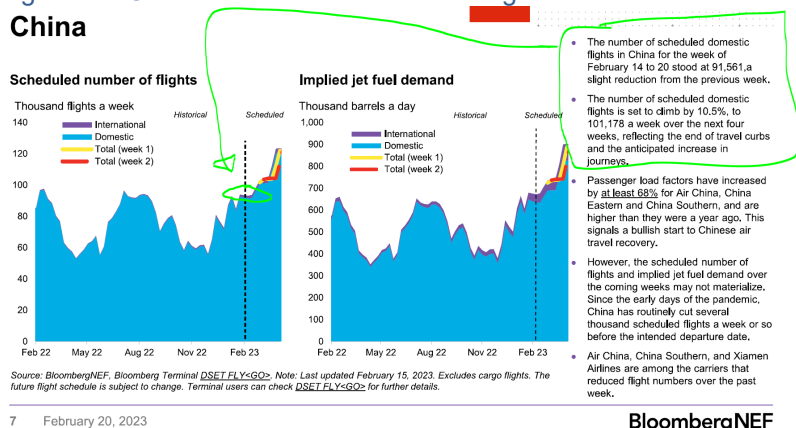
China's scheduled domestic flights were down immaterially for the second consecutive week, but load factors are increasing so more people are flying. Also scheduled international flights continue to ramp up. On Monday, we tweeted [\[LINK\]](#) *"More people flying post China Covid restrictions lift. "Passenger load factors have increased by >68% ..." Feb 14-20: -0.5% WoW. Feb 7-13: -0.7% WoW. Jan 31-Feb 6: +10.9% WoW. Jan 24-30: -9% WoW. Jan 17-23: +7% WoW. Jan 10-16: +20% WOW. Thx @BloombergNEF Claudio Lubis #OOTT #Oil."* BloombergNEF wrote *"the number of scheduled domestic flights in China for the week of February 14-20 stood at 91,561, a slight reduction from the previous week. The number of scheduled domestic flights is set to climb by 10.5% to 101,178 a week over the next four*

China domestic flights

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weeks, reflecting the end of travel curbs and the anticipated increase in journeys. Passenger load factors have increased by at least 68% for Air China, China Eastern and China Southern, and are higher than they were a year ago. This signals a bullish start to Chinese air travel recovery. Below is the NEF China scheduled domestic flights.

Figure 41: China scheduled domestic air flights



Source: BloombergNEF

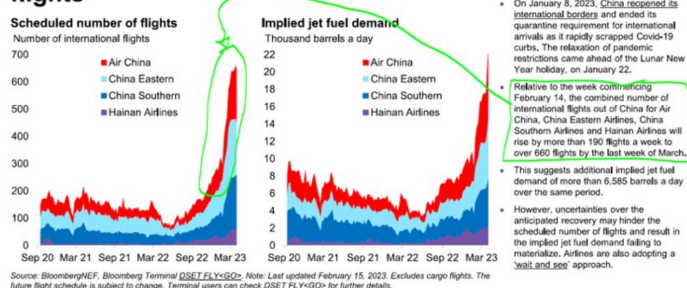
Oil – Foreign airlines about to rapidly escalate flights to/from China

Our Energy Tidbits memos and tweets have also included the BloombergNEF graph of scheduled international flights from China and how they are about to rapidly escalate in H1/23. Our Monday tweet [\[LINK\]](#) also included the BloombergNEF international flight graph that noted “Relative to the week commencing February 14, the combined number of international flights out of China for Air China, China Eastern Airlines, China Southern Airlines and Hainan Airlines will rise by more than 190 flights a week to over 660 flights by the last week of March.” This week, we saw a recap of what some, not all, of the major western airlines are doing for ramping up their flights to China. On Monday night, we tweeted [\[LINK\]](#) “China reopening! Major airlines to ramp up flights to China. KLM: 03/26, AMS/HKG, 6/wk. Air France: CDG/PKX, HKG, PVG to daily in July. Lufthansa. Mar, double from 5 to 9/wk. Qatar Airlines. DOH/PKX, CAN, resume daily 03/26. British Airways. LHR/PVG, 7/wk 04/23. And more. #OOTT.” Our tweet referenced the Global Times (China) report [\[LINK\]](#) “Foreign airlines ramp up international flights to China amid rising demand” that recapped the planned schedules return of international flights from KLM Royal Dutch Airlines, Air France, Lufthansa, British Airways and Qatar Airways. Below is the BloombergNEF china international air flights graph per our tweet. Our Supplemental Documents package includes the Global Times report.

Foreign airlines
flights to/from
China

Figure 42: China scheduled international flights.

China spotlight: International flights



8 February 20, 2023

BloombergNEF

Source: BloombergNEF

Oil – “Traffic in China retreats after a strong surge in previous weeks”

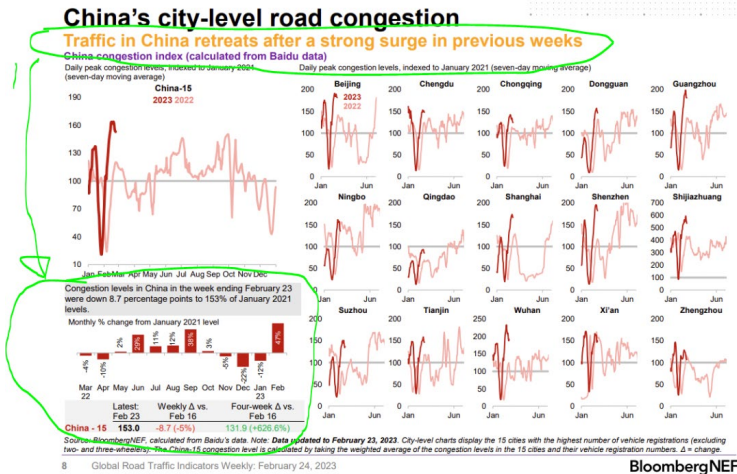
No one can deny that China's traffic has surged in 2023 following the removal of Covid restriction. But the question is now moving to if this gap up has finished and if China's traffic congestion has found its post-Covid levels? On Friday, we tweeted [\[LINK\]](#) “Traffic in China retreats after a strong surge in previous weeks”. China city-level road congestion (Baidu data). -8.7% WoW for wk ending Feb 23 to 153% of Jan 2021 levels. Has China traffic caught up to move like other regions ie. all down this week? Thx @BloombergNEF OOTT.”

BloombergNEF's Global Road Traffic Indicators Feb 24 2023 described China's city-level road congestion as “Traffic in China retreats after a strong surge in previous weeks” based on the Baidu data for the week ending Feb 23 that estimated China congestion level was -8.7% WoW to 153% of Jan 2021 levels. This is the first pause in a huge increase in congestion over the past month. Our tweet also included the BloombergNEF chart that showed traffic in all key regions declined WoW, which is why we are wondering if China's post Covid gap up has more or less ended and its traffic congestion levels will be more in line with normal changes and not a recovery gap up? It will be something to watch over the next few weeks. Our tweet included the below BloombergNEF graphics on China and global road congestion..

China's city road
congestion down
8.7% WoW

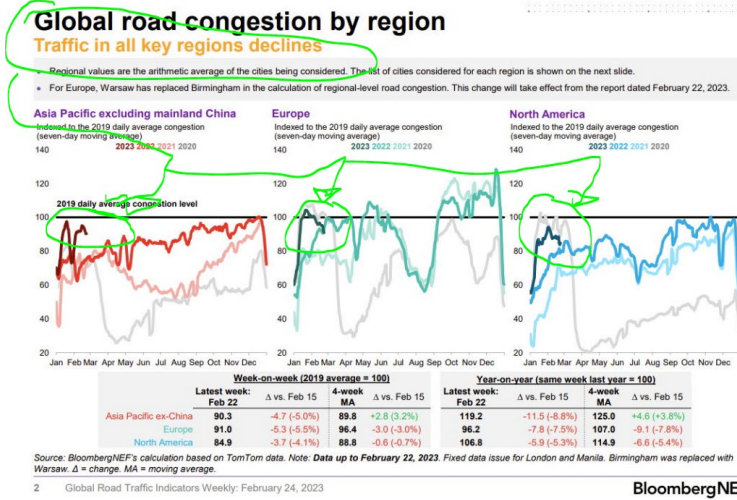
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Figure 43: China city-level road congestion for week ended Feb 23



Source: BloombergNEF

Figure 44: Global road congestion by region



Source: BloombergNEF

Oil – Another China reopening indicator is air quality is getting worse

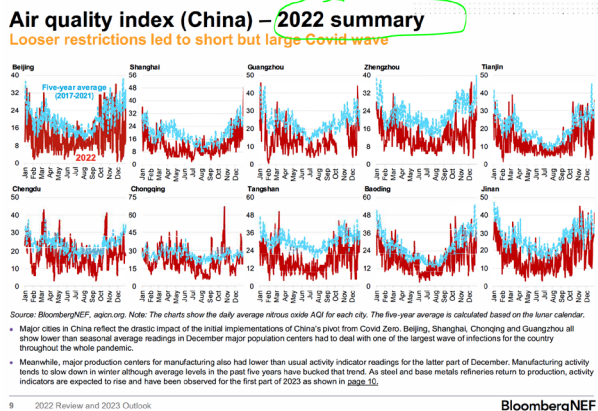
On Wednesday, BloombergNEF posted its Industrial Metals Monthly, which also included two graphs on China's air quality index that provide a good indicator that China has reopened – the air quality index was much below the 2017-2021 levels in 2022, but have just jumped above the 2018-2022 average with the removal of Covid restrictions. A low number on the index means air quality is good, whereas a high number on the index means air quality is bad. On Wednesday, we tweeted [LINK](#) "another indicator of china reopening post removal

China air quality index

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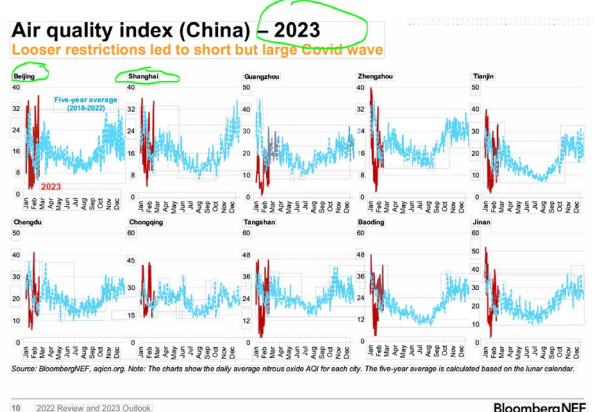
of Covid restrictions. More people are out driving, business is recovering, etc, which means air quality is worse. Thx @BloombergNEF #OOTT.”

Figure 45: China air quality index – 2022 summary



Source: BloombergNEF

Figure 46: China air quality index – 2023



Source: BloombergNEF

Oil – Foreign direct investment in China +14.% YoY

No one should be surprised to see the reports that foreign direct investment in China is picking up. We have already seen capital flow into China’s financial markets. Both are supportive indicators fo the China recovery to see foreign capital is returning. On Monday, we tweeted [\[LINK\]](#) “China reopening attracting more capital. “Foreign direct investment (FDI) into the Chinese mainland, in actual use, expanded 14.5 percent year on year to 127.69 billion yuan in January, the Ministry of Commerce said Monday” reports People’s Daily. #OOTT.” China’s People’s Daily reported [\[LINK\]](#) “Foreign direct investment (FDI) into the Chinese mainland, in actual use, expanded 14.5 percent year on year to 127.69 billion yuan in

Foreign direct investment in China

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January, the Ministry of Commerce said Monday. In U.S. dollar terms, the FDI inflow went up 10 percent year on year to 19.02 billion U.S. dollars. High-tech industries saw a rapid FDI increase of 62.8 percent in January. Specifically, foreign investment in high-tech manufacturing surged 74.5 percent, while that in the high-tech service sector rose 59.6 percent. FDI flowing into the country's central region reported a year-on-year expansion of 25.9 percent, followed by 21.6 percent in the western region.” On Tuesday night, Bloomberg TV graphed the FDI data.

Figure 47: China city-level road congestion for week ended Feb 15



Source: Bloomberg

Investors coming back to China

Here is what we wrote in our Jan 22, 2023 Energy Tidbits memo. “One of the markets stories over the past week to gain momentum is that investors are now going back into China. We were watching Bloomberg Markets China Open on Monday night, when Blomberg put up the below chart. We tweeted [LINK](#) “China reopening. May not necessarily be smooth, but foreign investors are increasingly believing it will happen. “Foreign investors piling back into China” graph an hour ago from @YvonneManTV on @markets China Open. #OOTT.”

Figure 48: Bloomberg, Foreign Investors Piling Back into China



Source: Bloomberg

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Oil – No Vortexa crude oil floating storage Feb 24 data posted as of 7am MT

As of our news cut off at 7am MT, we did not see any Vortexa global crude oil floating storage data for Feb 24 posted on the Bloomberg terminal. Normally, the Friday data is posted on the Bloomberg terminal by about 8am MT on Saturday mornings. But still nothing posted as of yet.

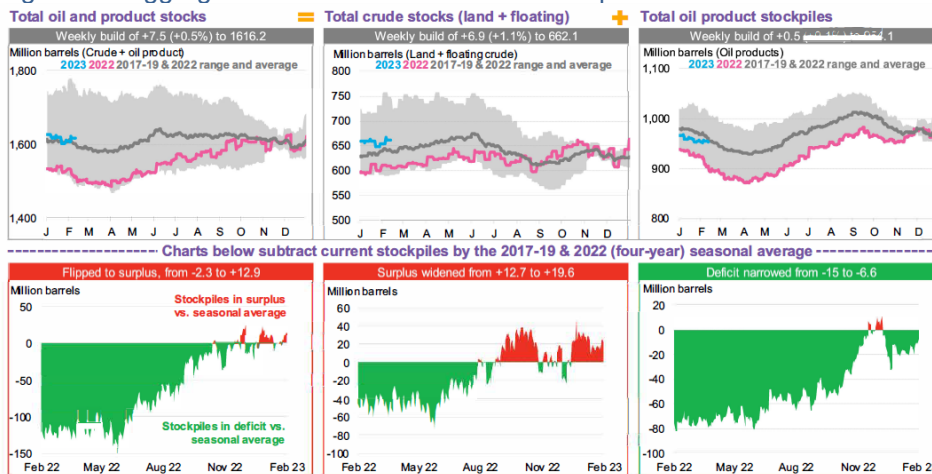
No Vortexa crude oil floating storage

Oil – BNEF: global oil and product stocks deficit flips to -2.7 mmb deficit

For those with a Bloomberg terminal we recommend flipping through BloombergNEF’s “Oil Price Indicators” weekly that came out on Monday as it provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products flipped from a deficit of 2.3mmb to a surplus of 12.9 mmb for the week of Feb 20. Crude oil inventories were relatively flat WoW at 572 mmb, further widening the deficit against the five-year average (2016-2019, 2022) by -0.4 mmb to -6.6 mmb. Total crude inventories (incl. floating) increased 1.1% WoW to 662.1 mmb, widening the surplus from 12.7 mmb to 19.6 mmb. Product stocks were down slightly by -0.1% WoW while the stockpile deficit against the 4-year average (2017-2019,2022) narrowed from 15.0 mmb to 6.6 mmb. Gas, oil, and middle distillate stocks have narrowed against the four-year average deficit from 9.8 mmb to 2.7 mmb. Jet fuel consumption by international departures for the week of Feb 27 is set to increase by 32,300 b/d WoW to 5.55 mmb/d, while consumption by domestic and passenger departures will increase by 13,900 b/d WoW, respectively. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

BNEF’s global oil inventories

Figure 49: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

Oil – People aren’t trading down on hotels or shortening their stays

At least so far, we are not seeing signs that point to any lowering of expectations for increasing jet fuel and gasoline demand in 2023. One of the big market stories was the concern on the outlook for retail spending from the Home Depot and Walmart earnings.

Booking.com CEO

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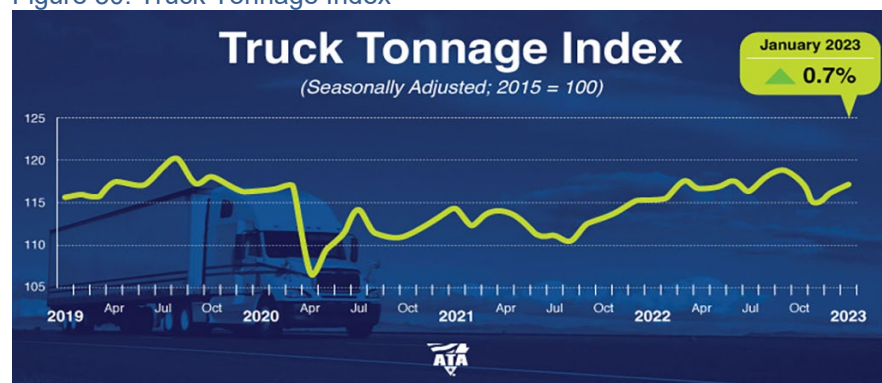
Anyone who has travelled this year can tell you travel is not being hit. Rather, travel seems to be picking up even more and this is really before the impact of China reopening. Booking.com CEO Glen Fogel was on CNBC Squawk Box on Friday and hammered home how hotels are not seeing any slowdown even with very high pricing. He said the revenge travel after Covid is still continuing and people are not trading down to lower quality/price hotels or shortening their stays. We tweeted [\[LINK\]](#) "1/2. Positive for 2023 #JetFuel #Gasoline demand. Travel still not being hit. "we are not seeing people trading down for a lower [Hotel] star rating & we're not seeing people cutting back on the # of nights they're going to stay" @BookingHoldings CEO to @andrewsorkin #OOTT." And [\[LINK\]](#) "2/2. " First of all, people were, let's face it, they were cooped up in their homes for a long time with the pandemic. And people want to travel. That revenge travel is still happening right now" @BookingHoldings CEO to @andrewsorkin. Positive for #JetFuel #Gasoline. #OOTT."

Oil – Truck tonnage rose 0.7% in January to 117.1

Truck tonnage grew by 0.7% MoM in January, after record growth in Q4/22. October and November were confronted by a soft trucking season that resulted in a MoM contraction of -2.3% and -2.5%, respectively. Despite a weaker Q4, cumulative growth throughout the year totalled 3.4%, which is the largest single year increase observed since 2018. In addition, January's 0.7% YoY growth marked the seventeenth consecutive YoY gain, highlighting the slow but apparent recovery from 2020 lows. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for December on Thursday [\[LINK\]](#). Chief Economist Bob Costello noted, "Tonnage has increased nicely in the last couple of months; I suspect that some of the gain is attributable to capacity coming out of the network, especially those carriers that primarily operate in the spot market and/or bought expensive used equipment in the last couple of years. This would push more freight to contract carriers, which dominate this index." Trucking serves as a barometer of the U.S. economy, representing 72.2% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 10.93 billion tons of freight in 2021. Motor carriers collected \$875.5 billion, or 80.8% of total revenue earned by all transport modes, equating to roughly 3.6% of total U.S. GDP in 2021. Our Supplemental Documents package includes the ATA release.

Truck tonnage index +0.7% YoY in December

Figure 50: Truck Tonnage Index



Source: ATA

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Oil & Natural Gas – Transocean, elevated offshore demand for “foreseeable future”

There was a good reminder from the Transocean Q4 call on Wednesday of two key oil and gas themes for the 2030s – NOCs/IOCs are increasing capex to develop long term oil and gas supply, and the increasing oil and gas capex for the 2020s isn't just short cycle plays but including elevated offshore drilling for the foreseeable future. Offshore drilling is not considered short-cycle plays. Transocean is the big offshore drilling company. Transocean notes that 2022 was a pivotal year for offshore drilling with “*offshore contracting activity increased significantly*”. “*We expect that the demand for our rigs and services will remain elevated for the foreseeable future. In fact, if current tendering and bidding opportunities that we're aware of for work starting in 2024 and 2025 develop as expected, demand cannot be met by the current active supply of drillships.*” Transocean comments also reinforce that the big NOCs and IOCs are prepared to crank up offshore drilling.

Bullish offshore drilling outlook

Transocean fits SLB’s “distinctive” new multi-pronged oil and gas upcycle

Transocean comments fit the SLB recent comments that there is a “distinct” new upcycle for oil and gas that includes short and long cycle, oil and gas, and offshore and onshore. Our Jan 22, 2023 Energy Tidbits memo was titled “*Tight/Short Oil/Gas Supply for 2020s? SLB’s “Distinctive” New Phase in Upcycle, “It’s Multi-Pronged. It Moves Multiple Engines, Short and Long, Oil and Gas, Offshore and Onshore.*” Here is what we wrote in our Jan 22, 2023 Energy Tidbits. “*Oil & Natural Gas – Bullish for 2020s oil & gas, SLB’s “distinct” new upcycle phase. We believe many overlooked Schlumberger’s outlook on Friday. They made a point of highlighting there is a distinctive new phase for the upcycle that is seeing IOCs/NOCs not just doing short-cycle but a also long cycle across international basis. We believe this is these IOCs/NOCs putting their capital to work and believing that there will be tight or short supply for oil, natural gas and LNG for the 2020s. This is different from a couple years ago when the IOCs shifted to short cycle and the NOCs were sitting on the sidelines. Now they are moving to long-cycle and the NOCs are cranking up their exploration and production for the 2020s. Moving away from a short cycle focus is significant. And we believe this is a bullish for oil and gas. Earlier this morning, we tweeted [\[LINK\]](#) “Hmmm! Bullish indicators #Oil #NatGas for 2020s. \$SLB “distinctive” new phase in upcycle. “it’s multi-pronged. It moves multiple engines, short and long, oil and gas, offshore and onshore”. Points to tight/lack #Oil #NatGas #LNG supply for 2020s! #OOTT.” Schlumberger reported Q4/22 results on Friday. Some of their comments from the Q4 release and Q4 call were “Le Peuch said, “The fourth quarter affirmed a distinctive new phase in the upcycle. In the Middle East, revenue increased by double digits sequentially, with growth in Saudi Arabia, Iraq, and the United Arab Emirates in the solid teens, affirming the much-anticipated acceleration of activity in the region.” “But I think what I will say is that, what is characterizing international as we see it, is that it has a lot of resilience, because it’s multi-pronged. It moves multiple engines, short and long, oil and gas, offshore and onshore.”.*”

Energy Transition – Electrify America increase EV charging rates 12% on March 6

Imagine if Exxon or Chevron gas stations announced they were cranking up their at the pump gasoline prices by \$0.40 per gallon? There would be a huge political backlash. But we looked yesterday but didn't see any Biden Administration officials jump on Electrify America for announcing a 12% increase to its EV charging price per-kwh from \$0.43 to \$0.48 effective

EV charging rates going up

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March 6. They apparently sent this notice out on Friday and we hadn't seen any reporting until we saw CNBC Brian Sullivan's tweet [\[LINK\]](#) with the notice. The Electrify America notice said *"Beginning March 6, 2023, we'll be increasing our per-kilowatt-hour (kwh) and per-minute pricing. We've tried hard to maintain our current pricing, but rising operational and energy costs have now made adjusting our pricing necessary. We shall continue to maintain simple, uniform pricing across the country, and this adjustment ensures we can uphold our commitment to drive electric vehicle (EV) adoption and the future of electric mobility. As a Pass member, here's what you can expect to see on March 6, 2023. The price per-kwh will increase from \$0.43 to \$0.48."* We have to believe they are referring to the energy costs as being from renewable because they can't be blaming that on the declining natural gas and coal prices. Yesterday, we tweeted [\[LINK\]](#) *"Can't blame this on declining Fossil Fuels prices. Imagine if #Exxon or #Chevron announced a \$0.40/gallon gasoline price increase. #EnergyTransition is happening, it will just take longer, & cost more than expected and be a rocky road. #NatGas needed for longer. #OOTT."*

Climate Change – NCC, no skating on Ottawa's Rideau Canal for 1st time in >50 yrs

We recognize that the linkage to the 1st winter without skating on Ottawa's Rideau Canal is being linked to GHG emissions and climate change. But, there are weather impacts besides GHG or, at least, that seems to be the case based on the NCC's skating season projections on various GHG emissions scenarios. Most may not be aware that the Rideau Canal is over 200 km and is a UNESCO World Heritage Site, that stretches from Kingston to the well-known section ending in Ottawa. The well-known section in Ottawa is one of the world's longest skating rinks as it opens every year for skating since it opened for skating in 1971. That is, until this winter. On Friday, the National Capital Commission announced [\[LINK\]](#) *"Despite all the efforts by our teams, and even with the colder temperatures of the last 24 hours, the latest ice tests show that the Rideau Canal Skateway remains unsafe for skating. With further efforts unlikely to yield a different result, we are unable to open the Skateway for this season. We share everyone's disappointment with this outcome. The NCC has been assessing and preparing for the impacts of climate change on our assets and operations for several years, and this year taught us a great deal about the effects of milder winters on the Skateway. The July 2021 Risk assessment of the effects of climate change on the Rideau Canal Skateway report led to our partnership with Carleton University to collect data on the Skateway and test options for ice management. We will analyze the data and the results of our pilot projects and remain committed to applying what we learn going forward."* The Friday statement links to their July 2021 risk assessment [\[LINK\]](#) of the impact of GHG emissions on its skating season projections. I.e. that led off with its skating season projections that looked at the skating season over "the next decades" based on various GHG emissions scenarios. The NCC did not have any projections of no winter skating seasons. It's why it seems there must be more than just climate change for this winter. Our Supplemental Documents package includes the NCC's skating season projections from July 2021.

**No skating on
Rideau Canal**

Capital Markets – Is it "A once in a generation opportunity to lock in high yields"??

The big market story this week was rising interest rates. And the question investors and markets are trying to figure out – how long will these interest rates last? We were watching Bloomberg Surveillance on Wed morning and couldn't help think of a question from Bloomberg's Jonathan Ferro on the longevity question of interest rates. We didn't have a

**High yields here
to stay?**

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PVR on so had to wait until the show was posted so we could get his exact quote. On Wed night, we tweeted [LINK](#) *“Are we facing a once in a generation opportunity to lock in high yields or are we facing a new generation of high yields?” great question from @FerroTV on @bsurveillance. If it's the latter, other sectors better follow #Oil #NatGas co's who have cut debt levels. #OOTT.*” We don't follow other sectors in detail, but good thing for the oil and gas companies who have to the most part significantly reduced debt levels over the past two years so shouldn't be hammered if high rates are here to stay for some time.

Capital Markets – IFIC: continued big redemptions in Cdn active equity/balanced funds

One of the big Cdn equity stories in 2022 continued to play out to start 2023 - the massive net redemptions from active Cdn mutual funds 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](#) *“2022 exodus from Cdn balanced & equity mutual funds is not stopping. @IFIC Jan data: net redemptions: balanced funds \$4.38b, equity Funds \$0.67b See 01/26 tweet on 2022 \$38.5 net redemptions vs 2021 \$100.4b net sales. #OOTT*” On Thursday the IFIC (Investment Funds Institute of Canada) reported [LINK](#) mutual funds and ETF sales for Jan. IFIC reported net redemptions for mutual funds balanced funds were \$4.38b (vs \$4.97b in Dec and \$5.07b in Nov). IFIC reported net redemptions for mutual funds equity funds were \$0.67b in Jan (vs \$3.08b in Dec and \$3.01b in Nov). This continued the huge net redemptions in 2022 that saw net redemptions in balanced funds and equity funds of \$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.

Big redemptions in active Cdn equity funds

Figure 51: Cdn mutual fund net sales/net redemptions (\$ millions)

Asset Class	Jan. 2023	Dec. 2022	Jan. 2022
Long-term Funds			
Balanced	(4,384)	(4,969)	3,095
Equity	(668)	(3,083)	2,926
Bond	3,463	(2,253)	356
Specialty	650	(37)	631
Total Long-term Funds	(940)	(10,342)	7,009
Total Money Market Funds	463	1,642	178
Total	(477)	(8,700)	7,186

Source: IFIC

Capital Markets – Macron not giving in to protests, wants to raise retirement age

We are like many and have had a longstanding simple view that governments will have to increase retirement ages with people living longer and pension/senior benefits liabilities. It's inevitable everywhere. And something people need to put into their retirement planning – they will be working for longer. One of the big France news stories for the past month has been the increasing protests over Macron wanting to raise the age of retirement in France. On Tuesday, DPA (German press agency) reported [LINK](#) *“French President Emmanuel Macron is sticking to his pension age reform plans despite mass protests which have lasted weeks. “Deep down people know that we have to work a bit longer on average because otherwise we will not be able to fund our pensions properly,” Macron said on Tuesday in*

Macron to raise retirement age

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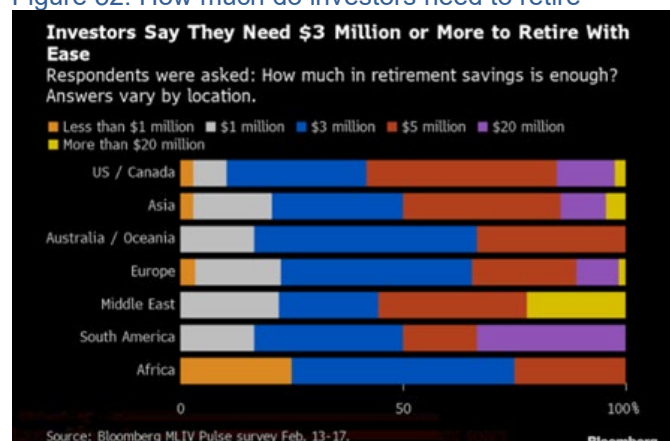
Paris. The president wants to raise the pension age to 64 from 62 because the working population has to pay for a growing number of pensioners. There must be exceptions for people who start working at an early age or who work in strenuous jobs, Macron said.”

Capital Markets – Is \$3-5 million enough to retire? Most investors say Yes.

For the past 10-15 years, we have seen many baby boomers have their retirement plans thrown away by government actions, market moves and, of course, Covid. Unfortunately, it inevitably turns out that people just don’t have enough to maintain their envisioned retirement style because they didn’t leave themselves a cushion for unexpected items. And unfortunately, it’s tough to get caught up when the person is in retirement mode. On Tuesday, Bloomberg posted a report that wrote “It’s one of the thorniest financial questions: how much is enough to retire comfortably? The answer is somewhere between \$3 million and \$5 million, according to the 553 investors worldwide who shared their views in the latest MLIV Pulse survey. About a third of investors pegged it at \$3 million, and roughly another third at \$5 million. Most respondents are optimistic they’ll move closer to their retirement goal by ending 2023 with more in retirement savings than at the end of 2022. Last year, inflation and rising borrowing costs hammered stocks, and since bond prices also plunged, the average US 401(k) retirement account was down 20% at plans where Vanguard Group is a recordkeeper. This year, both professional and retail investors expect stocks and bonds to resume their traditional relationship by moving in opposite directions, with fixed-income serving as a cushion for any potential losses from riskier assets. Respondents were not as sure about whether they’d ultimately have enough saved to maintain their lifestyle in retirement. Less than half of investors placed the odds of that at 100%.” Our Supplemental Documents package includes the Bloomberg report.

How much do you need to retire?

Figure 52: How much do investors need to retire



Source: Bloomberg

Capital Markets – USDA consumer price index for food +10.1% YoY in January

The USDA’s official food price data keeps going up, but we continue to believe it is nowhere as much as what Americans feel when they go to the grocery stores in the US. This feels like what we heard in summer 2021 about inflation being transitory, the real food price increases that people pay at the grocery store are way higher than the consumer price index for food.

USDA CPI for food +10.1% YoY

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The USDA posted its consumer price index for food data for January on Thursday [\[LINK\]](#), which is +0.7% MoM and +10.1% YoY, compared to December at +10.4%; while it is up over 10%, it still seems very low. Due to recent travel, we had the opportunity to ask a different circle of US friends what they think their grocery bills have increased YoY and the common number tends to be over 20%. The +10.1% YoY is for the overall food price index, which has a relative weighting for the various food categories. Some of the YoY % increases that just don't sound anywhere near reality are fats/oils +20.9% YoY, poultry +11.2% YoY, fresh fruits & vegetables +7.2% YoY, and eggs +70.1% YoY. We wonder what their forecasts are used for as they forecast overall food price escalation of 5.5% to 10.3% for 2023.

Capital Markets – Shrinkflation, AMEX stops free Plus Ones at airport lounges

Any air traveler knows that airport lounges are to overflow levels with credit cardholder eligibility, airline eligible travelers and first class ticket holders. Many are packed so they have to turn away potential lounge visitors. So no one should be surprised to see the reports this week that American Express will no longer let its premium cardholders bring in free guests to airport lounges. The reports didn't say so, but we believe this is only if the cardholder puts less than \$75,000/yr on their card. But the cardholders can bring guests, they will just have to pay \$50 for adult guests and \$30 for children ages 2-17.

No more free Plus Ones at AMEX lounges

Demographics – China's singles population likely increased hugely since Covid

China's population declined in 2022 for the 1st time in 60 years, and it looks like China's single >30 yrs old is exploding post Covid. The Ministry of Civil Affairs of China data had 240 million singles >30 yrs in 2018. On Friday, we saw reports of a Wuhan University study covering 425 cities/counties/districts in China's 34 provincial level administrative regions noted the increasing number of singles in both urban and rural areas. We only saw a few reports on the survey and what wasn't clear from the reporting is if the survey actually gives a forecast number of singles. Or if it does so, over what period. But the reports were the same saying China's single population to reach 400 million. Regardless of the actual number, it reinforces the challenge for China – how to get higher birth rates in demographic shift to less marriages. Our Supplemental Documents package includes the Big News Network reporting. [\[LINK\]](#)

China singles population

China's population declined in 2022 for 1st time in 60 years

Here is what we wrote in our Jan 22, 2023 Energy Tidbits memo. *“Demographic impacts don't surprise overnight, but demographics are predictive. And one of the key demographic trends for the next 30 years is China's aging population. And it looks like Covid caused an abrupt pivot to a declining population in 2022. And it may be down the road, but China, like any aging population will eventually face a Japan problem. On Monday, we tweeted [\[LINK\]](#) “China population shrinks by 850,000 to 1.4118 b, 1st decline in 60 yrs. Seems Covid impact with deaths and also lower birth rates. But reminds of long-term challenge for China - an aging population ie. a Japan demographic problem in 10 or 20 years. Thx @sunyue_luna. #OOTT.” The South China Morning Post [\[LINK\]](#) reported “2022 officially marked the year China saw its first population decline in six decades, with the national birth rate falling to a record low. And the deepening demographic crisis threatens far-reaching implications for China's already slowing economic growth. China's overall population plummeted by 850,000 people – to 1.4118 billion in 2022, from 1.4126 billion a year earlier, the*

National Bureau of Statistics (NBS) said. Mothers in China had 9.56 million babies last year, a 9.98 per cent drop from 10.62 million in 2021. The national birth rate fell to a record low of 6.77 births for every 1,000 people in 2022, down from 7.52 in 2021, and marking the lowest rate since records began in 1949. The national death rate was 7.37 per thousand last year, putting the national growth rate at negative 0.6 per thousand people..” Our Supplemental Documents package include the SCMP report.”

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 and Calgary items.

“Comfort is the enemy of progress” Eric Bienemy

Heard a great line from the NFL Network coverage of the press conference introducing Eric Bienemy as the new Offensive Coordinator and Asst Head Coach of the Washington Commanders. Bienemy is best know for his just finished role as Offensive Coordinate for the Kansas City Chiefs and the surprise that he hasn't been able to land a head coach job for the past few years. At his press conference, he said “comfort is the enemy of progress”. As soon as he said that, it reminded of many people in the investment community who have a big year in a hot equity market and then stop doing what they were doing to get there as if it would happen automatically for all future years. There have been many people exposed over the years for coasting or, as Eric Bienemy puts it, feel comfortable and end up going backwards.

National Margarita Day in San Jose del Cabo

We had the good fortune to be in San Jose del Cabo on Wed Feb 22, which is National Margarita Day. So took advantage to have a couple of classic margaritas at one of the top restaurants in San Jose del Cabo – La Lupita Taco & Mezcal. They may not be cheap tacos but they are the best. Plus there are many other specialities. And like any good Mexican restaurant, there are a wide range of tequilas and

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mezcal. Our preferred choice for a not too expensive tequila for the Margarita is Codigo 1530 Tequila Reposado. It's also a good sipping tequila.

Figure 53: Margaritas at La Lupita Taco & Mezcal



Source: SAF Group

Armand Duplantis sets new pole vault record of 20' 4"

Don't think have mentioned pole vault for 15 or more years since noting former Canadian pole vault champion from the 70s, Bruce Simpson, who was an Agincourt Collegiate graduate. Simpson's personal best was 5.38 metres in 1976. But yesterday, Swedish pole vaulter Armand Duplantis set another new world record of 6.22 metres or 20 feet 4 inches. This was his 6th world record. The first person to break the 6 metre mark was the famous Sergey Bubka who did it in 1985. Watching the video, it looked like Duplantis had plenty of clearance to keep bumping up his world record in the near future.

Figure 54: Armand Duplantis clearing 6.22 metres



Source: athletv.fr

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