

Energy Tidbits

April 2, 2023

Produced by: Dan Tsubouchi

OPEC+ to Implement Voluntary 1.16 mmb/d Cuts Effective May 1 thru Dec 31

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. Amena Bakr reported on breaking news OPEC+ to make 1.16 mmb/d voluntary cuts effective May 1 thru Dec 31. Note this 1.16 mmb/d is from Saudi Arabia, Iraq, UAE, Kuwait, Kazakhstan and Oman ([Click Here](#)).
2. Tourmaline CEO: Haynesville & Marcellus to hit 50% tipping point in 2nd half of the 2020s, which will be a huge boost to Cdn natural gas values once that path becomes visible ([Click Here](#)).
3. Kurdistan and Iraq agree to resume oil exports as early as this week ([Click Here](#)).
4. Vortexa Chief Economist "Time to get bullish again on crude?" ([Click Here](#)).
5. BloombergNEF forecasts China air travel ramp could add 400,000 b/d in Q2 ([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 – 47 bcf draw in US gas storage; now 442 bcf YoY surplus

It's late-March so even though it was colder than normal, the storage draw wasn't huge. So, for the week of Mar 24, the EIA reported a -47 bcf draw (vs expectations of -54 bcf), in contrast to the +26 bcf build reported for the week of Mar 25 last year. This compares to last week's draw of -72 bcf, and the 5-year average draw of -17 bcf. Total storage is now 1.853 tcf, representing a surplus of +442 bcf YoY compared to a surplus of +504 bcf last week and is +321 bcf above the 5-year average vs +351 bcf above last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [\[LINK\]](#).

YoY storage at 442 bcf YoY surplus

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Year ago (03/24/22)		5-year average (2018-22)	
	03/24/23	03/17/23	net change	implied flow	Bcf	% change	Bcf	% change
East	343	355	-12	-12	268	28.0	285	20.4
Midwest	437	461	-24	-24	317	37.9	346	26.3
Mountain	82	84	-2	-2	89	-7.9	89	-7.9
Pacific	73	72	1	1	160	-54.4	164	-55.5
South Central	917	927	-10	-10	578	58.7	648	41.5
Salt	262	262	0	0	167	56.9	194	35.1
Nonsalt	655	664	-9	-9	411	59.4	453	44.6
Total	1,853	1,900	-47	-47	1,411	31.3	1,532	21.0

Source: EIA

Natural Gas – Reminder cold in late March doesn't move natural gas prices

We haven't been writing on the March weather because colder than normal weather in the last half of March isn't a big driver to HH gas prices. There is a modest narrowing of the YoY storage surplus, but not enough to have a big impact on HH prices. Now, if it had been much warmer than normal, we would have highlighted the weather as it would be a bigger negative to HH gas prices. On Monday, NOAA reported on heating degree days for the week ended March 25 and, on a Gas Home Heating Customer Weighted basis, it was 15% colder than normal and 48% colder YoY. [\[LINK\]](#). HH gas prices stayed stuck this week closing at \$2.18 on March 31.

Week ending March 25 was 44% colder YoY

Figure 2: NOAA HDD for Week ending March 25, 2023

HEATING DEGREE DAY DATA WEEKLY SUMMARY
POPULATION-WEIGHTED STATE, REGIONAL, AND NATIONAL AVERAGES
CLIMATE PREDICTION CENTER-NCEP-NWS-NOAA

LAST DATE OF DATA COLLECTION PERIOD IS MAR 25, 2023
ACCUMULATIONS ARE FROM JUL 1, 2022 TO MAR 25, 2023
-999 = NORMAL LESS THAN 100 OR RATIO INCALCULABLE

STATE	WEEK TOTAL	WEEK DEV	WEEK PERCENT	CUM TOTAL	CUM DEV	CUM PERCENT	CUM PERCENT	CUM PERCENT
		FROM	FROM		FROM	FROM	FROM	FROM
		NORM L YR	NORM L YR		NORM L YR	NORM L YR	PRCT	PRCT

GAS HOME HEATING CUSTOMER WEIGHTED

REGION	WEEK TOTAL	WEEK DEV	WEEK PERCENT	CUM TOTAL	CUM DEV	CUM PERCENT	CUM PERCENT	CUM PERCENT
NEW ENGLAND	176	-11	33	4598	-739	-198	-14	-4
MIDDLE ATLANTIC	164	-8	41	4318	-686	-68	-14	-2
E N CENTRAL	184	4	53	4985	-580	-5	-10	0
W N CENTRAL	208	30	60	5708	-180	306	-3	6
SOUTH ATLANTIC	104	6	41	2820	-431	66	-13	2
E S CENTRAL	107	15	31	2808	-469	-26	-14	-1
W S CENTRAL	65	12	7	2021	-200	112	-9	6
MOUNTAIN	192	44	53	5003	241	634	5	15
PACIFIC	128	43	77	2748	340	536	14	24
UNITED STATES	150	15	48	3936	-288	165	-7	4

Source: NOAA

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Natural Gas – March residential/commercial gas demand is much less than Jan/Feb

The problem with the March weather was that it was a little warmer than normal for the first half of March, but then colder than normal in the last half of March. If it had been switched with a colder than normal first half, then it would have been better for HH prices. Over the prior 10 winters, residential/commercial natural gas consumption averaged 31.8 bcf/d and is normally 16% of winter demand, with a low of 24.4 bcf/d vs a high of 36.2 bcf/d. The averages were 46.7 bcf/d for Jan and 43.4 bcf/d for Feb. Below is our table of HDDs vs residential/commercial demand vs total US natural gas demand for the last 10 winters.

March residential commercial gas demand

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	%											
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	660	804	555	572	638		680	17%	
Oct 1 - Mar 31	4,183	4,599	4,346	3,554	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	%											
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	76.3	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	%											
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	35.3	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 – US Jan gas production up MoM to 101.5 bcf/d; highest in 10+ years

Winter weather led to some temporary interruptions to natural gas in Dec which recovered in Jan 2023. The big picture story is unchanged - US natural gas supply, driven by shale/tight natural gas, continues to be up strongly YoY. The EIA released its Natural Gas Monthly on Friday [\[LINK\]](#), which includes its estimates for “actuals” for January gas production. The key takeaway from the January actuals is that Jan’s (+6.2 bcf/d YoY to 101.5 bcf/d) was the biggest YoY increase to start a new year since 2019 and Jan’s production of 101.5 bcf/d is now at a decade high vs the next closest of 101.0 bcf/d in Nov 2022. In addition, January’s production was +2.3 bcf/d MoM and is +6.9 bcf/d from 94.6 bcf/d in March 2020. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

US January gas production +6.2 bcf/d YoY

Figure 4: US Dry Natural Gas Production

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bcf/d	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan	56.0	60.0	66.0	65.3	66.8	73.4	73.6	70.6	78.7	89.4	95.1	92.8	95.3	101.5
Feb	57.2	58.8	67.0	65.4	68.4	73.8	77.3	71.5	80.4	90.0	98.1	86.2	94.5	
March	57.3	61.5	65.0	65.3	68.9	74.1	73.8	73.2	81.3	90.6	94.6	92.3	95.4	
Apr	57.6	62.3	64.8	66.1	70.5	75.2	73.7	73.3	81.2	91.0	92.9	93.2	96.5	
May	58.0	62.4	65.0	65.9	70.2	74.1	72.9	73.3	82.1	91.7	87.8	93.0	97.7	
June	57.2	62.1	64.6	65.8	70.5	74.0	72.2	74.0	82.5	92.0	88.4	93.2	98.5	
July	58.2	62.5	66.3	67.1	72.0	74.2	72.8	74.7	84.2	92.5	89.8	93.7	98.5	
Aug	58.9	63.2	66.0	66.9	72.4	74.3	72.2	74.7	85.9	94.8	90.2	94.3	99.3	
Sept	59.1	63.1	66.4	66.8	72.4	74.7	71.7	76.0	87.3	94.7	89.5	93.6	100.5	
Oct	60.1	65.1	66.5	67.0	73.1	74.2	71.4	77.3	88.4	96.0	88.9	95.6	100.6	
Nov	60.1	65.9	66.6	67.7	72.6	73.9	72.0	79.8	89.9	96.7	92.0	97.0	101.0	
Dec	61.0	65.6	66.0	66.5	73.2	73.9	71.2	80.4	89.5	97.0	92.5	97.0	99.1	
Average	58.4	62.7	65.9	66.3	70.9	74.2	72.9	74.9	84.3	93.0	91.6	93.5	98.1	101.5

Source: EIA

Natural Gas – US pipeline exports to Mexico up MoM to 5.2 bcf/d in January

The EIA Natural Gas Monthly also provides its “actuals” for gas pipeline exports to Mexico, which were 5.2 bcf/d in January, which was down -0.4 bcf/d YoY and but up +0.11 bcf/d from December. The EIA doesn’t provide explanation for the MoM decrease, but we expect it was also linked to winter weather impacted some US supply. There were no material revisions to last month’s data. Mexico’s relatively 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. Below is our table of the EIA’s monthly gas exports to Mexico.

US pipeline exports to Mexico up MoM

Figure 5: US Pipeline Gas Exports to Mexico (bcf/d)

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

Source: EIA

TC Energy expects +3 bcf/d of Permian gas via pipeline to Mexico by 2030

It may take a couple years to start to ramp up, but we believe an overlooked US natural gas factor is that there should be a big ramp up in Permian natural gas via pipeline to Mexico in the 2020s. TC Energy expects there will be an additional 3 bcf/d of Permian natural gas pipeline demand from Mexico to 2030. Here is what we wrote in our Dec 18, 2022 Energy Tidbits *“It won’t affect stock trading, but for those that look at capital allocation on a mid to long term basis or look at tail-end risks/opportunities, the question of Mexico’s natural gas infrastructure build-out is worth tracking. We had the opportunity to listen to a major energy analysis group recent US natural gas outlook and it didn’t include any slides or commentary on the potential (or expectation by some) for Mexico to ramp up its natural gas pipeline imports from the Permian in the 2020s. It’s something that most either overlook or discount or just don’t care about, but a factor that could a material impact on the US*

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natural gas view. TC Energy is probably the driving force behind much of Mexico's domestic natural gas pipeline infrastructure build-out and has a very bullish view that Mexico will attract an additional +3 bcf/d to 2030. If they are right, this will attract Permian natural gas, and that means there will be less Permian natural gas for LNG export. And will raise the question is there enough natural gas to support the growth in US LNG exports? And, since US LNG export growth, it means that there will be a need to try to get Appalachia natural gas down to the Gulf Coast. And, or course, TC Energy has the solution for that. But you can see how the TC view on Mexico has a very big impact on US natural gas in the 2020s, if not necessarily in the next couple years. We highlighted this in our Dec 4, 2022 Energy Tidbits."

Natural Gas – US LNG exports 10.9 bcf/d in Jan, -4.7% YoY

The March EIA Natural Gas Monthly estimates US LNG exports for January were 10.9 bcf/d and this is a reminder that the US LNG export data is available about two weeks prior to the Natural Gas Monthly. The EIA is a group under the Dept of Energy, and the Dept of Energy posts its LNG Monthly about two weeks before the EIA's Natural Gas Monthly. The data for LNG exports is either identical or just a round issue. Here is a part of what we wrote in our March 19, 2023 Energy Tidbits memo. *"The DOE report is better as it provides detailed information on LNG imports and exports including LNG volumes to the top US export countries. The US Department of Energy reported the January LNG export actuals on Tuesday [\[LINK\]](#) and we continue to see the impact of the Freeport LNG shut-in in June (2.2 bcf/d). On Wednesday, we tweeted [\[LINK\]](#) "US #LNG exports Jan/23 of 10.9 bcf/d, -4.7% YoY, -0.8% MoM. Still impact #FreeportLNG 2.0 bcf/d 06/08/22 shut. Jan/23 top 5 export markets: UK, Turkey, Dutch, France, Korea. Jan/22 top 5 export markets: UK, France, Spain, Turkey, Korea. @ENERGY. LNG data 2 wks before @EIAgov. #OOTT."* Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

US Jan LNG exports

Figure 6: US LNG Exports (bcf/d)

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

Source: EIA, DOE

Natural Gas – Reminder March US LNG exports to jump up with Freeport LNG restart

The above EIA US LNG export data is for Jan. However, the LNG exports should jump up in March. Here is what we wrote in our Feb 26, 2023 Energy Tidbits memo. *"Freeport LNG received authorization to restart commercial LNG shipments from two of three trains. That approval has led to the jump up in natural gas flows to LNG export terminals. On Friday, Bloomberg reported "A record amount of natural gas is heading to US export terminals as a key plant in Texas restarts after a fire last year. Flows to liquefied natural gas facilities along*

US LNG exports to jump up in March

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the US Coast are expected to reach more than 14 billion cubic feet on Friday, or roughly 14% of total domestic output, according to a BloombergNEF estimate based on pipeline nominations. Almost 1.5 billion cubic feet a day of the heating and power-generation fuel are being sent to Freeport LNG, the most since an explosion in June shut the terminal. The plant, which recently received US approval for a partial restart, has capacity to process more than 2 billion cubic feet a day. Increased export demand has helped drive a rebound in natural gas futures. The commodity has jumped more than 42% since touching a 29-month low last week."

Natural Gas – Huge to Cdn NatGas if Haynesville/Marcellus hit 50% tipping point in 20s

We don't often hear comments from interview that make us stop and think we may have heard a potential game changer. But that was the case from Tourmaline CEO Mike Rose in his Friday interview with Andrew McCreath. His comments are a huge potential boost for Cdn natural gas in the back half of the decade, and would be on top of LNG Canada impact. Yesterday, we tweeted [\[LINK\]](#) "Must read! Why Cdn #Montney #NatGas should get huge value lift >2025 on top of #LNGCanada start up. 📌 @TourmalineOil CEO, Haynesville & Marcellus will probably get to 50% tipping point in 2nd half of 2020s ie. production goes into irreversible decline. Thx @forgefirst #OOTT." Rose said the Haynesville and Marcellus will probably hit the 50% tipping point for reservoirs in the 2nd half of the decade, which is the point that, after which, reservoirs start an irreversible decline. And he reminds that US LNG capacity doubles in the later half of the decade. This would be a huge boost to Cdn natural gas demand to move south for US LNG projects. And this is on top of the boost to Cdn natural gas from the start up of LNG Canada exports. We aren't aware of others warning of this tipping point. And once others start to think it's possible or there is visibility. Our tweet included the transcript we made of Rose's comments.

Haynesville & Marcellus risk in 2020s

Tourmaline CEO Rose's warning on Haynesville/Marcellus

Here is the transcript attached to our tweet that we made of Tourmaline CEO's comments on BNN Bloomberg on Friday. SAF Group created transcript of comments from Tourmaline CEO Mike Rose with Andrew McCreath (CEO/CIO Forge First Asset Management) on BNN Bloomberg on March 31, 2023. [\[LINK\]](#). Items in "italics" are SAF Group created transcript. At 14:10 min mark, *McCreath "shifting to geology a couple minutes, your passion shall we say. You definitely see a far richer opportunity set in Canada than in the US and it relates to the geology of the reservoirs here in Canada as opposed to the States". Rose "yeah, partly that and partly the tenure of our most competitive biggest gas plays. Even though the Western Canadian Sedimentary Basin been on production for almost a hundred years, our big gas plays, so the Alberta Deep Basin and the BC/Alberta Montney are much earlier in productive life. So, particularly the Montney, it's produced 22 tcf out of the current ultimate estimate is 645. So baseball terminology, you're top of the first inning. Some of the US, the current big US gas supply basins, so the Permian associated, the Haynesville, and the Marcellus, they're a lot closer to what we call the 50% tipping point. And it's a phenomena when you produce out 50% of the reserves from a reservoir, the ultimate reserves, it will go into irreversible production decline. It was developed for conventional reservoirs but it applies to resource plays because it's well documented now in the Barnett and Fayetteville. It's probably, you can make a curve that kind of shows it's happened in the Bakken already. And so the*

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Haynesville and the Marcellus will probably get there in the second half of this decade so right about the time the US Gulf Coast LNG complex doubles from 12 to 24 b's a day. So there is a great opportunity for Canadian gas going south as well as obviously west. We can be a big player in this global LNG game."

Natural Gas – Mexico's natural gas production still stuck below 5 bcf/d, +7.2% YoY

On Monday, Pemex reported [LINK](#) its natural gas data for February. Pemex reported natural gas production of 4.979 bcf/d, which was +7.2% YoY and +0.5% 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. In Jan, we saw one of the largest MoM gains (+2.3%) while Mexico 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

Figure 7: 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%	4.979	7.2%
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: Shell 0.15 bcf/d offtake from Mexico Pacific

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 Monday, Shell announced that it executed a long-term Sales and Purchase Agreement (SPA) to purchase 0.15 bcf/d from Mexico Pacific over a 20-year period [LINK](#). The SPA stipulates Shell's purchase of LNG on a free-on-board basis from the planned Saguaro Energia export facility in Puerto Libertad, Sonora. This marks the second LNG deal between the two companies following the SPA signed in July 2022 that will provide Shell with 0.34 bcf/d of offtake from the first two trains of Mexico Pacific's Anchor LNG facility. The agreement announced on Monday brings Shell's total offtake between Mexico Pacific's Anchor and planned Saguaro facilities to 0.49 bcf/d. Mexico Pacific CEO, Ivan Van der Walt said, "We are delighted Shell has chosen to grow with us, building upon their initial 2.6mn mt/yr commitment from train 1 and train 2, to also underpin more than 20% of train 3

Another long-term LNG deal

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capacity... Our project will provide Asia with low-cost Permian gas, avoiding the Panama Canal to ensure a shorter shipping distance to Asia, to achieve lower transportation emissions and landed pricing versus the US Gulf Coast.” While Shell VP of Energy Marketing, Steve Hill said, “LNG is an increasingly important pillar of global energy security... Investment in liquefaction projects is needed to avoid a supply-demand gap that is expected to emerge in the late 2020s.” Our Supplemental Documents package includes the release.

The buyer rush for long term LNG supply started in 2021, pre-Ukraine

There is no question that Europe’s move to cut off imports of Russia pipeline natural gas led to a scramble in 2022 for more LNG. But we remind that the rush on LNG buyers committing to long term LNG contracts started in 2021, and that almost all of pre-2026 LNG supply was tied up in the 12-month periods July 1, 2021 thru June 30, 2022. And this rush to tie up long term LNG supply was driven by Asian buyers and not Europe buyers. So the LNG supply crunch thru 2026 was 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 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

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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 8: 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	2022	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	Unipecc	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.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				9.38			
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
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	n.a.	n.a.
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				4.83			
Total New Long Term LNG Contracts since Jul/21				14.20			
*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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Russia needs LNG technology

Natural Gas – Novak says Russia needs independence in terms of technology for LNG

On Tuesday, we tweeted [\[LINK\]](#) “#LNG Game changer. Today, Novak, RUS “must ensure independence in technology, equipment” for #LNG. See 📌 12/12/22 & 06/16/22 tweets. No Baker Hughes big turbines = lower RUS LNG capacity for Arctic LNG2. Why LNG is supply short thru 2026. #NatGas #OOTT.” Novak didn’t come out and specifically say it, but the need for Russia to develop LNG technology for LNG is the Baker Hughes big gas turbine issue that we have been highlighting for the past year. Russia doesn’t have the technology to make the big gas turbines, like Baker Hughes, so they can’t power the LNG export facilities to the same capacity as was envisioned. TASS reported [\[LINK\]](#) “Expansion of production and export of LNG. I believe that this is a key task in the current conditions, when the infrastructure to Europe has suffered and we have lost quite large volumes of pipeline gas exports. Yes, we will develop supplies to the eastern countries, however, the LNG market is actively developing,” Novak said. He recalled that the Russian Federation plans several new projects for gas liquefaction. “In my opinion, we should set a more ambitious task - to reach at least 2030 million tons of LNG by 100. To do this, we need, on the one hand, to provide such projects with a resource base, on the other hand, we must ensure independence in terms of technology, equipment production, which we are working on today,” Novak said.” Russia has admitted that not having Baker Hughes big gas turbines means that their new LNG projects only have capacity at 1/3 of their pre-sanctions levels. Our Supplemental Documents package includes the TASS report.

No big turbines, Arctic LNG 2 capacity 0.87 bcf/d vs pre-sanction 2.6 bcf/d

Here is what we wrote in our Dec 18, 2022 Energy Tidbits memo. “We are still surprised that most don’t seem to appreciate how sanctions are hurting Russia’s next wave of LNG projects. On Monday, we saw confirmation of the expected – Russia’s Novatek under construction Arctic LNG 2 would be starting up in Dec 2023 with its three Phases only adding 0.87 bcf/d of LNG capacity in 2023 thru 2026, which is only 1/3 of the pre-sanctions planned capacity of 2.6 bcf/d in 2023 thru 2025. So a little later and a lot less LNG. And a key reason why LNG is supply short thru 2026. (i) We tweeted [\[LINK\]](#) “#LNG Game Changer. No Baker Hughes big turbines = Lower RUS LNG capacity. TASS: under construction Novatek Arctic LNG 2 to add 0.87 bcf/d in 2023-26, 33% of pre-BKR RUS exit capacity of 2.6 bcf/d. See 🗨️ 06/16 thread. Key reason why #LNG is supply short thru 2026. #OOTT #NatGas.” (ii) On Monday, TASS reported “Launch of first line of Arctic LNG 2 set for December 2023” [\[LINK\]](#) “Arctic LNG-2 is Novatek’s second LNG project. It includes the construction of three lines for the production of liquefied natural gas with a capacity of 6.6 mln metric tons per year each and stable gas condensate up to 1.6 mln metric tons per year. The launch of the first line is planned for December 2023, the launch of the second and third lines is expected in 2024 and 2026, respectively.” That is 0.29 bcf/d per phase of 0.87 bcf/d for the three phases. (iii) The pre-sanctions planned capacity for Arctic LNG 2 was to add 0.87 bcf/d per phase for a total of 2.6 bcf/d. The reason for the lower capacity is that Baker Hughes is no longer providing its big gas turbines to power the LNG project. Our Supplemental Documents package includes the TASS report.”

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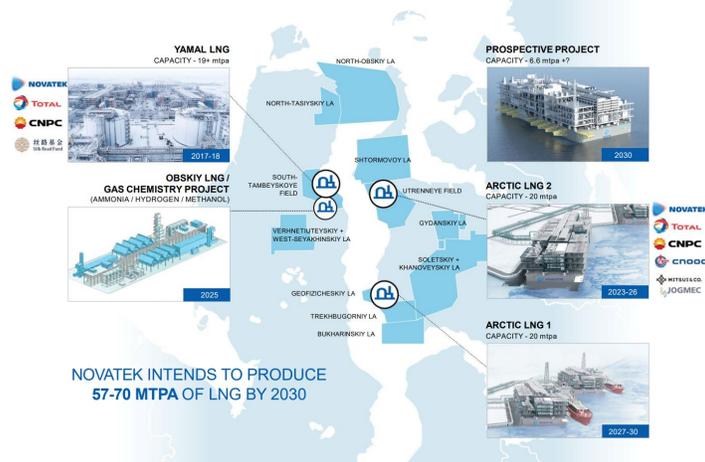
LNG game changer, Baker Hughes stops work on 6.2 bcf/d RUS LNG

We have been highlighting the Baker Hughes Russia stoppage as an LNG game changer. Our June 19, 2022 Energy Tidbits memo was titled “*Game Changer for LNG: ~6.2 bcf/d Russian LNG is at Risk with Reports Baker Hughes to Stop Providing Services/Equipment*”. Here is what we wrote in our June 19 memo. “We are still surprised that others haven’t jumped on what we called the game changer to LNG – the reports Baker Hughes is stopping servicing, replacing parts, etc for in operating Russian LNG projects and will not provide gas turbines for the under construction LNG projects. This is putting at risk 3.6 bcf/d of existing LNG supply and 2.6 bcf/d of under construction LNG. It is huge or, at least we think so. Don’t forget Baker Hughes is the leading global services company for LNG and is involved in almost every recent LNG project. (i) On Thursday, we tweeted [\[LINK\]](#) “1/2. Game Changer for #LNG. 6.2 bcf/d RUS LNG is now at risk incl operating 1.3 bcf/d Sakhalin-2 LNG & 2.3 bcf/d Yamal LNG, and under construction 2.6 bcf/d Arctic LNG-2 w/ phase 1 0.87 planned 2023 in service. #OOTT #NatGas” and [\[LINK\]](#) “2/2. Must read, @Kommersant reports #BakerHughes stopping service/replacement parts for existing #LNG & shipping gas turbines for Arctic LNG-2. Projects are designed for specific turbines. Urgent need for LNG FIDs ie. how about @Shell #LNGCanada Phase 2 is 1.8 bcf/d. #NatGas #OOTT”. Baker Hughes is reportedly stopping servicing two in-service Russian LNG projects (Sakhalin-2 and Yamal LNG) and stopping deliveries on gas turbines for the under construction Arctic LNG-2 project. Sakhalin-2 LNG in operation. Think about what is happening with Nord Stream being shut down waiting on equipment repairs. The operating 3.6 bcf/d LNG will be at risk for now having Baker Hughes servicing and providing any equipment repairs/replacement. And the 2.6 bcf/d of under construction LNG can’t be finished without Baker Hughes equipment. (ii) On Friday, we tweeted [\[LINK\]](#) “Game changer for #LNG. See 📌 Thurs thread, \$BKR pullout is huge. RUS admits delays in new LNG adds, hopes no more than 1-2 yrs. Arctic LNG-2 2.6 bcf/d from 3 phases, phase 1 0.87 bcf/d starting in 2023, all on in 2026. Urgent need for FIDs ie. #LNGCanada Phase 2. #OOTT #NatGas.” TASS reported on comments from Russia First Deputy Minister Sorokin, who admitted that the under construction 2.6 bcf/d Arctic LNG-2 would be delayed and they hoped the delay wouldn’t be more than 1 to 2 years. In the Kommersant Thursday report, they noted that the Baker Hughes equipment could not be replaced. Kommersant wrote ““There is, in fact, nothing to replace this equipment now: analogues are not produced in the Russian Federation, and LNG production lines have already been designed for the LM9000”. (iii) There was a good example on how nothing is every clear in Russia. And that Novatek still sees Phase 1 of Arctic LNG-2 starting on time in 2023. On Friday night, Bloomberg reported “Novatek plans to launch Arctic LNG 2 on time despite all the problems amid sanctions, Interfax reports, citing CEO Leonid Mikhelson at St. Petersburg International Economic Forum. * NOTE: Novatek holds 60% stake in the Arctic LNG 2 project with three LNG production trains with a capacity of 6.6m tons/year each. The first train was expected to start production in 2023 * Novatek has revised Arctic LNG 2 financing scheme, there are no problems with that.”

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Figure 9: Novatek's LNG production platform, May 2021

NOVATEK's LNG Production Platform



Source: Novatek

Baker Hughes Q2 confirmed stopped work on 6.2 bcf/d RUS LNG

Our original comment on this LNG game changer was based on the Kommersant report. But we saw the confirmation, although not as clearly written as we hoped, of this Baker Hughes pull out in the Baker Hughes Q2. Here is what we wrote in our July 24, 2022 Energy Tidbits memo. *“Baker Hughes suspends all LNG equipment & services work in Russia. Baker Hughes reported Q2 on Wednesday. All the analysts focused on the impact of Russia on the financial results, but there didn’t seem to be any real market concerns on what Baker Hughes suspension of all equipment and services contracts for LNG in Russia would mean to LNG markets. It is important to note Baker Hughes is clearly stating they have suspended work on all of their “equipment” and “services” contracts in Russia. Think about what is happening with Nord Stream and this is very similar. It’s not just supplying new equipment for new LNG projects, but also servicing existing equipment in existing LNG projects. We remain surprised that this isn’t a major LNG market focus. Baker Hughes LNG business is within its TPS group. In the Q2 call mgmt. said “In TPS we have suspended work on equipment and service contracts in Russia. As a result, these projects have been removed from RPO and second-quarter revenue was impacted by roughly \$160 million but with minimal impact to TPS operating margins.” And “So at the beginning of the year, we were expecting, around \$300 million of EBITDA for Russia this year and our Russian operations are generally quite accretive to our overall mix really due to the risk premium of operating there as well as some business mix primarily in TPS services as well as in some OFS product lines”.*

Natural Gas – Japan weather forecast pointing to a warmer than normal Apr/May/June

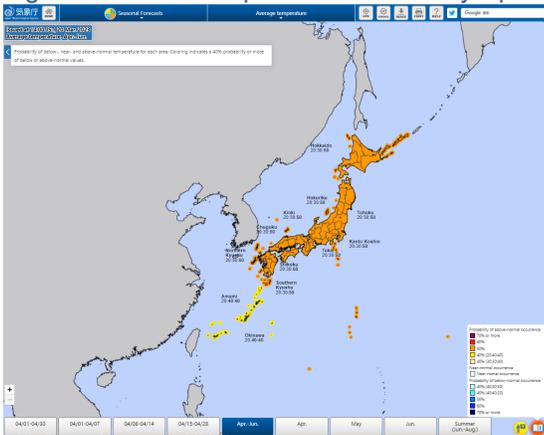
The weather outlook for Japan, Europe, US, etc for our purposes now moves to how hot it will be in the summer months to drive electricity and natural gas demand. April tends to be what

Japan expects a warmer than normal spring

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we call leave the windows open season and not air conditioning weather. But May and certainly June is more air conditioning weather. On Thursday, the Japan Meteorological Agency updated its 30-day outlook [LINK](#) and is forecasting warmer than normal weather for Apr/May/June throughout the majority of the country.

Figure 10: JMA Temperature Probability April-June



Source: Japan Meteorology Agency

Natural Gas – Japan’s LNG stocks down -10.6% WoW to 110 bcf

Japan had a mild winter and was able to escape any LNG shortages in the winter. It’s shoulder season so there isn’t any strong weather related natural gas demand. LNG stockpiles held by Japanese power producers continue to exceed both last year’s level and the seasonal average. Japan’s METI weekly LNG stocks data was released on Wednesday [LINK](#). LNG stocks on Mar 29 were ~110 bcf -10.6% WoW from Mar 22 of ~123 bcf and well above the 5-year average of 99 bcf. Below is the LNG stocks graph from the METI weekly report.

**Japan LNG stocks
-10.6% WoW**

Figure 11: Japan’s LNG Stocks



Source: METI

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Natural Gas – France LNG unloadings still halted at 3 or 4 France LNG terminals

As of our 7am MT new cut off, the latest for the strike on again/off again strike impacting LNG unloadings at the France Dunkerque LNG terminal is back on, which means all four of France LNG terminals are having unloadings impacted to some degree. We have not seen any change in status for the strikes impacting unloadings at Elengy’s three LNG import terminals – Montoir, Fos Tonkin and Fos Cavaou. France has four LNG terminals with a LNG import capacity of ~3.5 bcf/d. We do not know their send-out capacity into France natural gas pipeline network

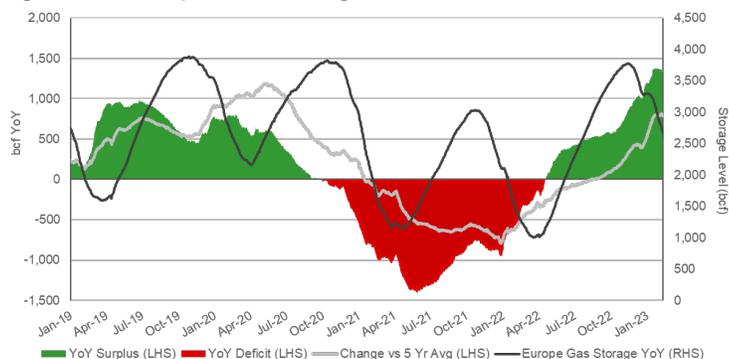
France LNG imports shut down by strikes

Natural Gas – Europe storage is now +21.64% vs 5-yr average, but within 5-yr range

The big global natural gas story for Q1/23 has been how mild winters in Europe and Asia has been the key reason 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 still at high levels. However, we are seeing a narrowing of Europe gas storage surplus with the lower European natural gas price and strikes halting some France LNG imports. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY and is now a YoY surplus of 29.06%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -0.17% WoW to 55.65% on Mar 31. Storage is now +29.06% greater than last year levels of 26.59% and is +21.64% above the 5-year average of 34.01%. But, the storage is now within the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Europe gas storage

Figure 12: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs down -1 rig to 592 oil rigs on Mar 31

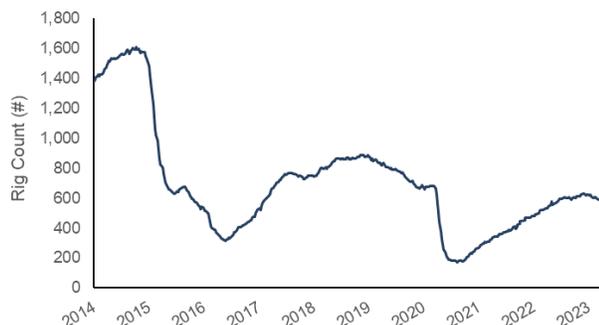
Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -1 rig to 592 rigs as of Mar 31. We were surprised that oil rigs did not see a larger decline based on the comments we heard during Q4 earnings calls. The total US oil rig count is now at 592 rigs, up +59 YoY, +111 from the 2022 low of 481 rigs in January and +420 since the 2020 low of 172 rigs on Aug 14. Notably, on a per basin basis, the Permian and Mississippian both saw a -1 rig decline, while “Others” added +1 rig. It looks as though some of the Permian rigs moved from New Mexico to Texas. US gas rigs were

US oil rigs down -1 WoW

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down -2 rigs WoW to a total of 160 rigs, an increase of +22 rigs YoY and we continue to expect that US gas rigs will continue to decline over the coming weeks. Below is our graph of total US rigs.

Figure 13: Baker Hughes Total US Oil Rigs



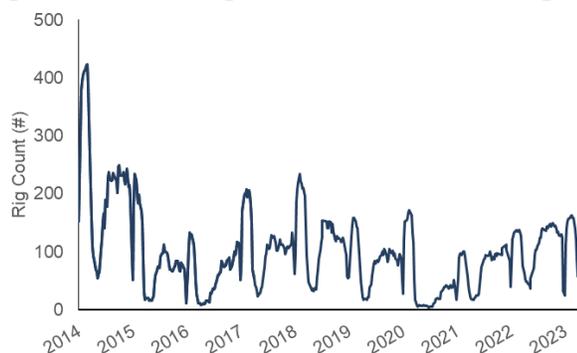
Source: Baker Hughes

Oil – Total Cdn rigs down -26 WoW to 139 total rigs, +15 rigs YoY

The traditional winter drilling season in Canada is coming to an end and as expected Cdn rigs saw another large WoW decline. Moving forward, we expect to see additional rig declines in the next 1-2 weeks. Total Cdn rigs were down -26 WoW to 139 rigs as of Mar 31. Notably, the week of Mar 31 saw huge declines of -27 rigs in AB and -3 rigs in SK, while BC added +4 rigs. There is now a total of 139 active rigs, -11 vs the comparable Covid period of 69 rigs on Apr 1, 2021. Cdn oil drilling rigs accounted for the majority of the overall decline, falling by -28 rigs WoW to 58 rigs, down -6 YoY from 64 rigs a year ago. To some surprise, Cdn gas rigs were up +2 rigs WoW to 81 rigs. Below is our graph of total Cdn oil rigs.

**Cdn total rigs -26
WoW**

Figure 14: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production down -0.1 mmb/d WoW back to 12.2 mmb/d

The EIA estimates US oil production was down -0.10 mmb/d WoW to 12.2 mmb/d for the week ended Mar 24 with the Lower 48 also up down 11.8 mmb/d and Alaska down to 0.432 mmb/d. US oil production, based on the weekly estimates, has been mostly range bound

**US oil production
down WoW**

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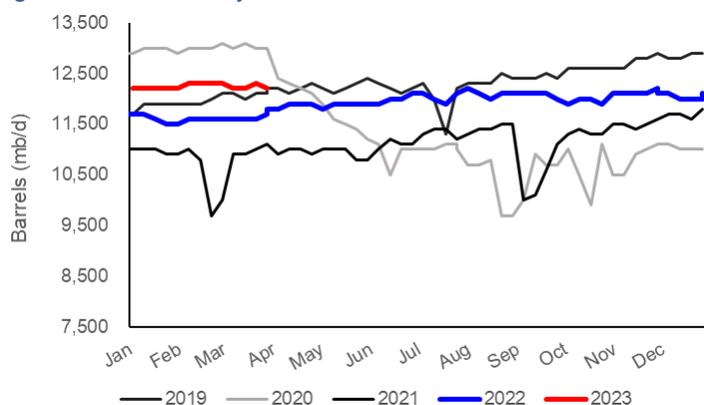
between 11.9 to 12.1 mmb/d since the 2nd week of May. But broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 as well as five weeks ago, the first time since it touched 12.2 mmb/d in the 1st week of August. Total US production reached its highest level since March 13, 2020 on Feb 3, 2023 at 12.3 mmb/d. Lower 48 production was down -0.1 mmb/d WoW to 11.8 mmb/d this week and Alaska was down -0.009 mmb/d WoW to 0.441 mmb/d. US oil production is up +0.500 mmb/d YoY at 12.2 mmb/d but is still down significantly at -0.900 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 15: EIA’s Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	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	02/24	12,300		
2023-Mar	03/03	12,200	03/10	12,200	03/17	12,300	03/24	12,200		

Source: EIA

Figure 16: US Weekly Oil Production



Source: EIA, SAF

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EIA Form 914
January

Oil – EIA Form 914: US Jan oil prod +1.093 YoY to 12.462 mmb/d, highest since Covid

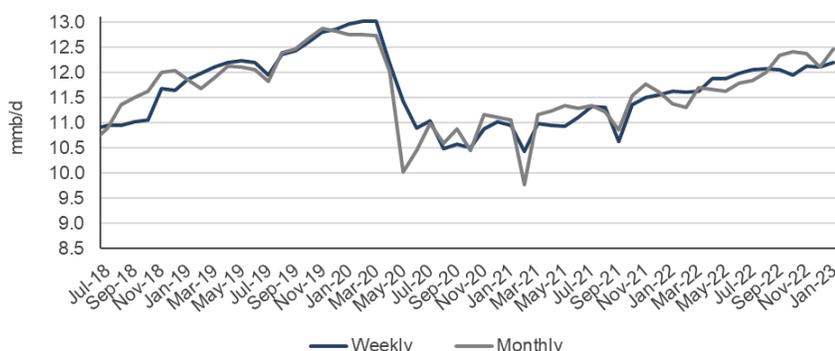
On Friday, we tweeted [\[LINK\]](#) “US oil production stronger than most expect. Jan 23 was 12.462 mmbd, +1.093 mmbd YoY vs 11.369 in Jan 22. @EIAgov actuals from Form 914 today. Biggest YoY increases: New Mexico +0.449 YoY to 1.792 mmbd. Texas +0.384 YoY to 5.237 mmbd. Offshore GoM +0.206 YoY to 1.914 mmbd. #OOTT.” On Friday, The EIA released its Form 914 data [\[LINK\]](#), which is the EIA’s “actuals” for January US oil and natural gas production. There were two key takeaways from the EIA’s weekly US oil production data for Jan – the actuals were 262,000 b/d more than the weekly estimates, and Jan was the highest US oil production since Covid at +1.093 mmb/d YoY to 12.462 mmb/d. There was a moderate MoM increase in US oil production in Jan. (i) Form 914 estimates total US oil production was up +347,000 b/d MoM to 12.462 mmb/d in January. The actuals for January were 262,000 b/d higher than the EIA’s weekly estimates that worked out to 12,200 mmb/d. December actuals were adjusted higher to 12.115 mmb/d from 12.101 mmb/d in last months Form 914. (ii) This is the highest since Covid. There was a big MoM jump of +0.347 mmb/d vs Dec of 12.115 mmbd but remember Dec was hit by weather. Our Supplemental Documents package includes the New Mexico, Texas and offshore Gulf of Mexico tables attached to our tweet.

Figure 17: EIA Form 914 US Oil Production (thousand b/d)

State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	12,462											
2022	11,369	11,316	11,701	11,668	11,629	11,797	11,844	12,002	12,337	12,417	12,379	12,115
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,869	11,673	11,913	12,149	12,154	12,218	11,902	12,486	12,590	12,809	13,000	12,978
2018	10,001	10,281	10,467	10,500	10,435	10,641	10,897	11,392	11,443	11,509	11,886	11,945
2017	8,875	9,110	9,166	9,101	9,185	9,111	9,247	9,250	9,517	9,669	10,085	9,983

Source: EIA

Figure 18: EIA Form 914 US Oil Production vs Weekly Estimate



Source: EIA

Oil – RBN: US E&Ps guide to YoY capex increases; almost back to 2019 levels

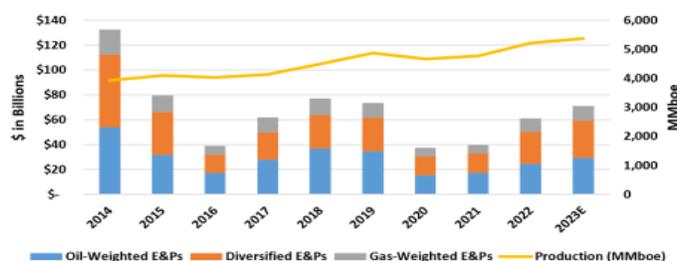
On March 23, RBN posted a good blog “Slow It Down - U.S. E&Ps Temper 2023 Capex Increases After Aggressive Late-'22 Investment Spurt” [\[LINK\]](#), providing an analysis of non-

US E&P Capital
Budgets for 2023

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integrated E&P capital budgets for 2023. The blog noted that the 42 gas-weighted E&P's under RBN coverage are guiding to ~\$74b in total spending for 2023, which is up 17% from 2022 but still -3% below 2019 levels. RBN's comment on gas names was, "These budgets broadly sustain the level of E&P expenditures in Q4 2022... The steady-as-she-goes spending reflects the retreat of oil prices from mid-2022 highs to the \$70-\$80/bbl range and a much sharper decline in domestic natural gas prices exacerbated by a mild winter and LNG facility shut-ins." For the 16 oil-weighted names tracked, companies are guiding to total spending of ~\$30b in 2023, which is 21% higher than spending in 2022 and is expected to result in an 8% YoY uptick in production. RBN noted, "the 16 Oil-Weighted producers, which reported the lowest capital spending increase in 2022, are guiding toward the largest increase in 2023 capex on optimism about a recovery in crude oil prices... That [optimism] is supported by bullish oil demand outlooks issued by OPEC and the International Energy Agency (IEA) tied to China's exit from its zero-COVID policy and OPEC's decision to stick to production cuts until year's end." Finally, the 15 diversified E&Ps covered are looking to spend ~\$30b this year, which is 16% higher than 2022 with RBN commenting, "Natural gas represented 34% of total output for the Diversified companies during Q4 2022, and the steep decline in U.S. gas realizations more heavily impacted investment decisions than for the Oil-Weighted group." There is a lot more in the blog, which is a good one to understand the capital spending guidance for 2023 set out by US E&P's. Our supplemental document package includes the RBN blog.

Figure 19: E&P Capex, Production and Guidance



Source: RBN

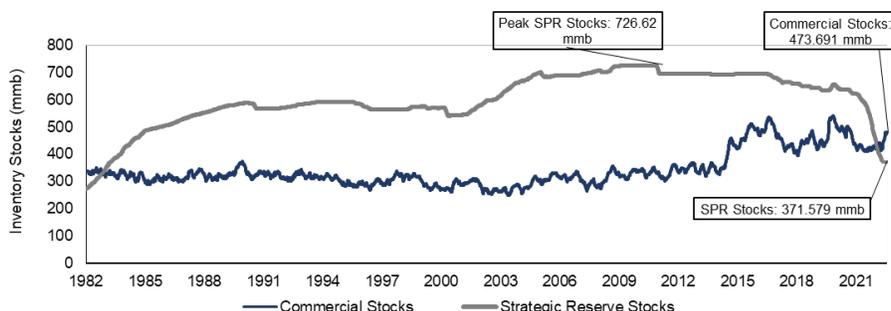
Oil – US SPR reserves now -102.112 mmb lower than commercial crude oil reserves

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 narrowing this week due to the draw on commercial oil stocks. The EIA's new weekly oil data for Mar 24 has SPR reserves at 371.6 mmb vs commercial crude oil reserves at 473.7 mmb. The last time the SPR was down at this level was in Dec 1983 at 371.3 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

US SPR reserves

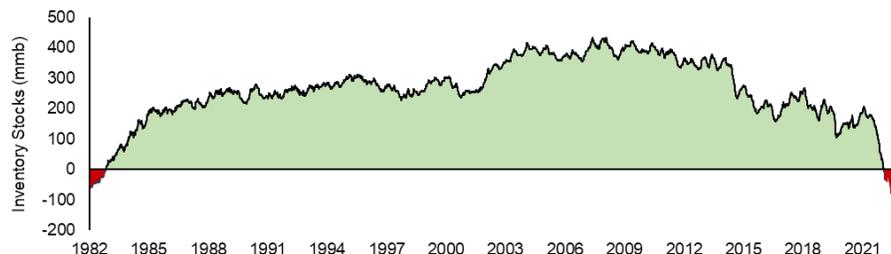
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Figure 20: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 21: 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 our 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 – Granholm backtracks and now says US will buy some oil for SPR in late 2023

Energy Secretary Granholm looks to have modified the Biden Administration position on buying oil for the SPR because here comments last week didn’t go over very well. (i) Last week’s (March 26, 2023 Energy Tidbits memo highlighted Granholm’s comments to congress. We then wrote *“And on Thursday, there was confirmation from Energy Secretary Granholm that the Administration wasn’t going to buying oil to refill the SPR in 2023. On Thursday, we tweeted [\[LINK\]](#) “Breaking. Biden won’t buy #Oil for SPR in 2023. “This year it will be difficult for us to take advantage of this low price,” Granholm said. “But we will*

Biden to buy some oil for SPR in 2023

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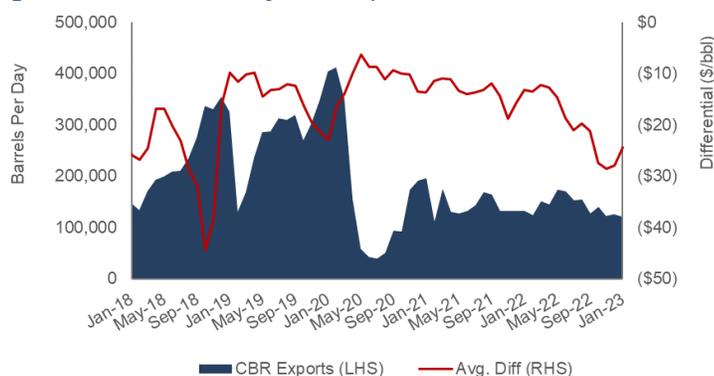
continue to look for that low price into the future because we intend to save the tax payer dollars.” Reports @AriNatter. #OOTT.” Bloomberg reported on comments by Granholm to a House panel, and wrote “US Energy Secretary Jennifer Granholm said it will be “difficult” this year to refill government oil reserves, even as crude prices hovered within the agency’s target buy-back range. Granholm, in testimony before a House panel, said maintenance at two Strategic Petroleum Reserve sites as well as an ongoing 26 million-barrel crude sale mandated by Congress make refilling a challenge. “This year it will be difficult for us to take advantage of this low price,” Granholm said. “But we will continue to look for that low price into the future because we intend to save the tax payer dollars.” (ii) This week, Granholm said they would begin to buy oil for the SPR late in the year. On Wednesday, we tweeted [\[LINK\]](#) “We will begin that process this year but to refill the [#SPR] full amount is impossible to do in one year” @SecGranholm. But expect it to be a very small % of 180 mmb sold just so #Biden can say he bought #Oil for SPR as promised. Thx @TimoGard [\[LINK\]](#) #OOTT.” We suspect Biden wasn’t pleased that she said they wouldn’t be buying for the SPR as that would go against Biden’s promise to do so. So we can buy into this modified approach where the US buys a very small amount of oil for the SPR as it would fulfill Biden’s promise. Our Supplemental Documents package includes the Reuters report.

Oil – Cdn crude by rail exports at 120,075 b/d in January, down -8.7% YoY

Last month we noted that when the Dec crude by rail data gets reported there will likely be some impact from the very cold temperatures in late Dec, but this was not the case. However, the big fall in crude by rail exports in Jan may be a lagged reflection of the cold weather at Dec month end. The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were down -6,123 b/d MoM in January to 120,075 b/d vs 126,198 b/d in December [\[LINK\]](#). This puts January export volumes at -11,422 b/d YoY (-8.7%) vs January 2022 of 131,497 b/d. CBR volumes are +81,208 since the Covid July 2020 bottom of 38,867 b/d. January WCS-WTI differentials decreased to -\$24.37, and a decrease YoY provides economic deterrent to ship Cdn crude by rail into US markets. Below is our graph of Cdn crude by rail exports compared to the WCS–WTI differential.

Cdn crude by rail exports

Figure 22: Cdn Crude by Rail Exports vs WCS Differential



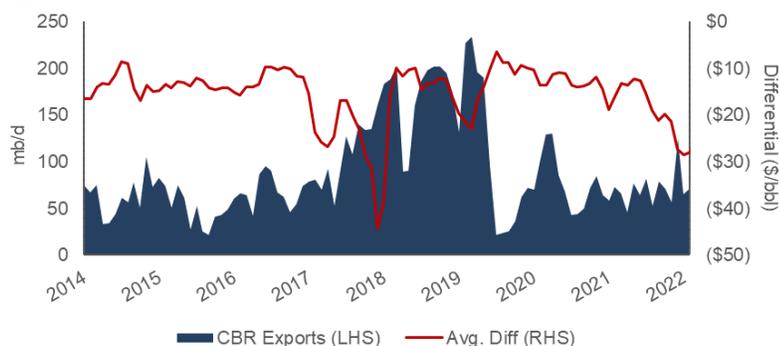
Source: Canadian Energy Regulator, Bloomberg

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Oil – EIA estimate total Cdn crude by rail imports up +6.0% MoM to 100,000 b/d in Jan

As noted above, there was a difference in the US vs Cdn crude by rail to US data for Jan. And the US data was more in line with what we expected given that the very cold weather first occurred near the end of Dec rather than being reflected in Jan. The EIA posted its monthly “U.S. Movements of Crude Oil by Rail” [LINK](#) on Friday, which also provided good insight on Canadian crude by rail exports. The EIA estimates that total Cdn crude by rail exports to the US increased +6.3% MoM to 100,000 b/d in Jan compared to 94,000 b/d in Dec. Canadian CBR volumes to PADD 3 (Gulf Coast) were 77,000 b/d in January, a MoM increase of +6,000 b/d from 71,000 b/d in December, and up +10,000 b/d YoY vs 66,000 b/d in January 2022. Note that December’s data had a major revision of +14,000 b/d to 71,000 b/d from 57,000 b/d previously. Below is our graph of Cdn CBR exports to the Gulf Coast and WCS differential over time.

Figure 23: Canada CBR exports to US Gulf Coast vs WCS differential



Source: EIA, Bloomberg

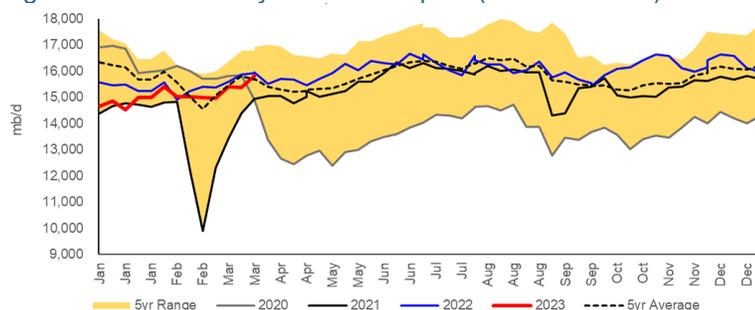
Oil – Refinery inputs up +0.437 mmb/d WoW to 15.813 mmb/d

Following last week’s decrease, refinery crude oil inputs increased this week. There are always unplanned refinery issues, and 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. And normally, refineries come out of turnarounds in late March/early April to start their ramp up in refining of summer blend fuels. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended Mar 24. The EIA reported crude oil inputs to refineries were up +0.437 mmb/d this week to 15.813 mmb/d and are down -0.100 mmb/d YoY from 15.913 mmb/d for the week ended Mar 25, 2022. This week’s refinery utilization was up +1.7% WoW to 90.3% but is down -1.8% YoY. Total products supplied (i.e., demand) increased WoW, up +0.45 mmb/d to 20.476 mmb/d, and Motor gasoline was up +0.185 mmb/d to 9.145 mmb/d from 8.960 mmb/d last week. The 4-week average for Motor Gasoline was up +0.055 mmb/d YoY to 8.815 mmb/d. The 4-week average of Total demand was down -1.049 mmb/d YoY to 19.666 mmb/d.

Refiners switching to summer fuel blends

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Figure 24: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – Negative to oil, France now has 0.9 mmb/d of refinery capacity shut-in

As of our 7am MT news cut off, we have not seen any reports indicating any movement by workers to end the strikes have caused France's major refineries to shut or reduce refinery operations. This is a big negative to oil markets as it has been reducing an estimated 0.9 mmb/d of crude oil demand. There are no official estimates of reduced crude oil inputs at these refineries. But last week's (March 26, 2023) Energy Tidbits memo noted "There is now 900,000 b/d of France refinery capacity off line, which is a big hit to oil demand. It's almost 1% of total global oil demand. (i) Yesterday, we tweeted [\[LINK\]](#) "👉 must read @adamporterargus report. negative to #Oil, 0.9 mbd France refineries are down re strikes (XOM 236 kbd Port Jerome, TTE 247 kbd Gonfreville, Petromeos 207 kbd Lavera) and accident (TTE 219 kbd). bad timing for drivers with summer ramp in #Diesel #Gasoline. #OOTT." Our tweet included the Argus Friday report "Another French refinery to shut: Union" that noted Exxon's 236,000 b/d Port Jerome refinery in northern France is to be closed due to strike action at the nearby port of Le Havre. Argus also listed the other France refineries that have been shut-in due to strikes or accidents. In total, it's now up to 0.9 mmb/d. Argus noted strikes have now shut down 683,000 b/d of France refineries: ExxonMobil 236,000 b/d Port Jerome, TotalEnergies 246,900 b/d Gonfreville, and UK Chinese venture Petromeos 207,100 b/d Lavera. Argus [\[LINK\]](#) also noted an accident before the strikes shut down TotalEnergies 219,000 b/d Donges.

France refinery shut-ins

Oil – US "net" oil imports down -0.499 mmb/d WoW to 0.741 mmb/d

US "NET" imports were down -0.499 mmb/d to 0.741 mmb/d for the Mar 24 week. US imports were down -0.847 mmb/d to 5.325 mmb/d. US exports were down -0.348 mmb/d to 4.584 mmb/d. The WoW decrease in US oil imports was driven in part by "Others" while the Top 10 had a decrease of -1.003 mmb/d. Some items to note on the by country data. (i) Canada was down this week -0.283 mmb/d to 2.957 mmb/d. (ii) Saudi Arabia was down -0.255 mmb/d to 0.228 mmb/d. (iii) Colombia was up +0.025 mmb/d to 0.269 mmb/d. (iv) Ecuador was up +0.118 mmb/d to 0.118 mmb/d. (v) Iraq was down -0.006 mmb/d to 0.138 mmb/d. (vi) Mexico was down -0.577 mmb/d to 0.541 mmb/d.

US net oil imports

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Figure 25: US Weekly Preliminary Oil Imports by Major Countries

US Weekly Preliminary Crude Imports By Top 10 Countries (thousand b/d)													
(thousand b/d)	Jan 6/23	Jan 13/23	Jan 20/23	Jan 27/23	Feb 3/23	Feb 10/23	Feb 17/23	Feb 24/23	Mar 3/23	Mar 10/23	Mar 17/23	Mar 24/23	WoW
Canada	3,737	3,707	3,419	3,587	3,856	3,556	3,197	3,605	3,780	3,371	3,240	2,957	-283
Saudi Arabia	464	453	433	640	384	262	545	310	476	385	483	228	-255
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	668	909	511	758	913	690	683	725	556	633	1,118	541	-577
Colombia	246	245	244	216	70	143	284	143	222	294	244	269	25
Iraq	150	201	195	469	230	322	251	290	265	346	144	138	-6
Ecuador	137	0	69	243	207	156	145	97	55	46	0	118	118
Nigeria	143	211	114	317	248	75	256	98	243	170	129	104	-25
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	5,545	5,726	4,985	6,230	5,908	5,204	5,361	5,268	5,597	5,245	5,358	4,355	-1,003
Others	805	1,135	920	1,053	1,150	1,028	965	940	674	971	814	970	156
Total US	6,350	6,861	5,905	7,283	7,058	6,232	6,326	6,208	6,271	6,216	6,172	5,325	-847

Source: EIA

Oil – Pemex oil production down slightly in February at 1.582 mmb/d

Pemex reported their production figures for February on Monday [\[LINK\]](#), we note that they do not provide explanation on the data. Pemex's Feb oil production for its interests was down MoM, in a similar size as the MoM decrease in their partners production. On Monday, Pemex released its February production for its interests, it was 1.582 mmb/d of oil, which is still down from the last several months. Pemex has been unable to grow its own oil production and failed to hit hits refining targets for most of 2022. As a result, total Mexico oil production (Pemex and non-Pemex) was 1.849 mmb/d for February and 1.850 mmb/d for January. Below is our table tracking Pemex oil production.

Pemex Feb oil productionFigure 26: 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	1,582	-6.1%
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

Oil – Mexico exports 949,000 b/d of oil in February

Please note that we continue to expect Mexico oil exports to decline throughout 2023 as they start up their new refinery. On Monday, Pemex posted its oil exports for February [\[LINK\]](#), which were 0.949 mmb/d, up +2.6% YoY from 0.925 mmb/d in Feb 2022, and down -3.2% MoM from 0.980 mmb/d in Jan. Oil exports can normally vary +/- 1.0 mmb/d, but changes in export volumes can be impacted by varying production levels of petroleum products. Although this month was not impacted, an increase in the production of petroleum products (i.e., Mexico refined more of its oil) would result in further reductions in export volumes. Mexico oil exports to the US were 0.650 in Feb, which is down -13.8% from 0.754 in Jan and -4.8% YoY. Below is our table of the Pemex oil export data.

Pemex Feb oil exports

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Figure 27: 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%	949	2.6%
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%		

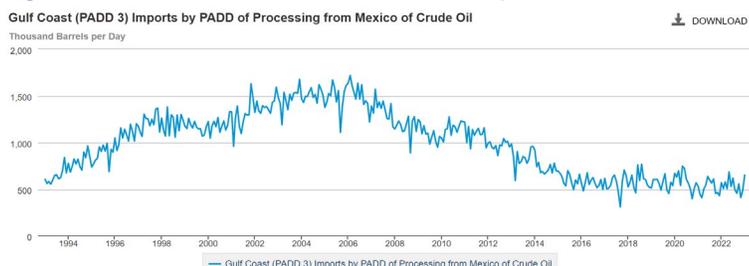
Source: Pemex, CNIH

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

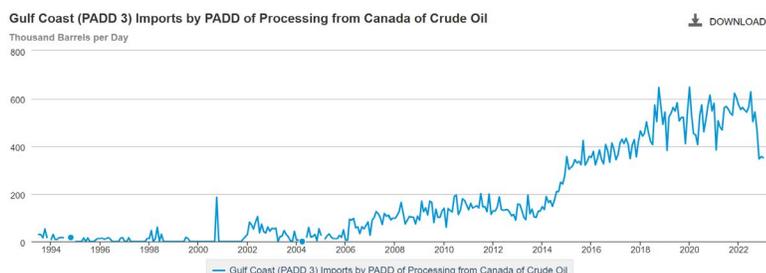
Figure 28: Gulf Coast PADD 3 crude oil imports from Mexico



Source: EIA

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Figure 29: Gulf Coast PADD 3 crude oil imports from Canada



Source: EIA

Oil – Russia oil production down 300,000 b/d in 1st three weeks of March

As of four news cut off at 7am MT, we have not seen any reports, including from TASS, on where Russian oil production ended up to close March. Recall, Novak said Russia would get its voluntary 500,000 b/d cut done in March and that the cuts would continue thru June. On Wednesday, Reuters reported [\[LINK\]](#) “Russian oil output down 300,000 bpd in first three weeks of March – sources. Russian oil production fell by around 300,000 barrels per day (bpd) in the first three weeks of March as Moscow reduces output in the face of Western sanctions, two sources familiar with the data told Reuters on Wednesday. According to the sources, Russian crude oil production excluding gas condensate was around 9.78 million bpd in the period, down from about 10.07 million bpd for the whole of February on average. Russia is targetting oil production cuts of 500,000 bpd, or around 5% of output C-RU-OUT, to 9.5 million bpd on average through June.”

**Russia down
300,000 b/d**

Oil – OPEC+ to voluntary cut 1.16 mmb/d effective May 1 thru Dec 31

This is an extremely short item as we had to squeeze it in in the last 20 min we went to press. We had to make an exception to our 7am MT news cut off once we saw the breaking tweets by Amena Bakr (Energy Intelligence) of the surprise OPEC+ to make voluntary cuts of 1.16 mmb/d effective May 1 thru Dec 31. There is no OPEC release posted as of 9:30am MT. Amena Bakr tweeted the cuts were Saudi Arabia 500,000 b/d, Iraq 211,000 b/d, UAE 144,000 b/d, Kuwait 128,000 b/d, Kazakhstan 78,000 b/d, and Oman 40,000 b/d. Leave it to Saudi Energy Minister to surprise with this breaking news when the expectation was for no change at tomorrow’s OPEC+ Joint Ministerial Monitoring Committee meeting tomorrow.

**OPEC surprise
cuts**

Oil – Saudi Arabia ties up 480,000 b/d of China’s longer oil demand

On Monday, Saudi Aramco announced [\[LINK\]](#) it will “acquire a 10% interest in Shenzhen-listed Rongsheng Petrochemical Co. Ltd. (“Rongsheng”) for RMB 24.6 billion (\$3.6 billion at current exchange rates), in a deal that would significantly expand its downstream presence in China.” And “Deal involves placement of 480,000 barrels per day of crude to the largest integrated refining and chemicals complex in China.” “Among other assets, Rongsheng owns a 51% equity interest in ZPC, which in turn owns and operates the largest integrated refining and chemicals complex in China with a capacity to process 800,000 bpd of crude oil and to produce 4.2 million metric tons of ethylene per year.”

**Saudi ties up
480,000 b/d of
China demand**

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Rongsheng just completed its 400,000 b/d expansion to 800,000 b/d

Our Monday tweet on the deal [\[LINK\]](#) was “Rongsheng just completed 400,000 b/d expansion to get to 800,000 b/d, one of the largest refineries in the world. #Aramco signed MOU for this in Oct 2018. thx @Amena__Bakr #OOTT .” Our tweet included the below EIA Aug 2022 graphic of major global refinery projects in 2022 and 2023. Our Supplemental Documents package includes the EIA’s Aug 2, 2022 blog “Several refining projects are scheduled in Asia and the Middle East”.

Figure 30: Norway February 2023 production

Selected major global refinery projects scheduled for 2022 and 2023



Data source: U.S. Energy Information Administration

Source: EIA

Oil – Saudi Arabia to open real estate market to foreigners soon

This feels like a lost in translation report where an interview in one language gets reported in English and something is missing. Last Sunday night, the Saudi Gazette reported [\[LINK\]](#) “REGA chief: Foreigners will be allowed to own property in Saudi Arabia”. REGA is the Real Estate General Authority and its CEO, Abdullah Alhammad, was on Saudi TV and “the authority chief stated that foreigners will be allowed to own real estate soon.” What seems odd was his comment that high property values in Saudi Arabia are caused by a supply/demand gap and then that is linked to opening up the market to foreign buyers. In markets, more buyers than sellers means prices go up and not down. Think about Mexico when the govt opened up properties along the coastlines to foreign buyers 30 years ago. the Saudi Gazette reported “Attending Al-Liwan program on Rotana Khalejia Television channel, the authority chief stated that foreigners will be allowed to own real estate soon. The authority is not satisfied with the high real estate prices, and this rise is negative for the real estate sector as a whole Alhammad said while noting that the real estate market is an open market and it is subject to supply and demand. “The rise in real estate prices is negative for all parties, as the economy is in continuous rotation, and the state is working to enable demand

Saudi to open up real estate market

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in a way that achieves economic balance for the real estate sector.” Our Supplemental Documents package includes the Saudi Gazette report.

Oil – Houthis continuing attacks in Marib (Yemen’s oil province) during Ramadan

One of the reports on the Houthis was Saudi Arabia media, Arab News, Wednesday report *“Hundreds flee fighting in Yemen’s Marib province”*. [\[LINK\]](#). Marib is Yemen’s oil province and is the only major province in the old North Yemen that is not under Houthi control. Arab News reported *“Hundreds of Yemenis have been forced from their homes in the central province of Marib as the Houthis continued to attack government troops, according to the UN International Organization for Migration. Fighting has raged between Yemeni forces and the Houthis over the last 10 days in the Harib district, south of Marib, and Merkhah Al-Ulya area, in the southern province of Shabwa, leaving scores of fighters dead or injured. Between March 19 and 25, the IOM reported that 235 families (1,410 people) had been displaced in Marib, Hodeidah, and Taiz, while 2,030 families (12,180 people) had been relocated to different Yemeni provinces since January. A UN-brokered truce that came into force in April last year resulted in a major decrease in hostilities in battlefields around the country, particularly in Marib, as well as a significant fall in internal displacements and civilian deaths. But recent Houthi strikes against government troops in Harib, and for the first time in a year attacks on loyalists, in Merkhah Al-Ulya, have shattered hopes of a peace pact to end the conflict.”*

**Houthis
continue to
attack Marib**

Does Houthi push on Marib signal the end is near for the Saudi/Houthi war?

Here is what we wrote in last week’s (March 26, 2023) Energy Tidbits memo. “Today marks the 8th anniversary of the start of the Saudi coalition attacks on the Houthis in a war that MBS expected to last a matter of weeks. Last Sunday morning, we only saw one report (Xinhua) on the Houthi attacks in Marib, which is Yemen’s oil province and also was part of the old Northern Yemen. This week, we saw more reports of increasing Houthi attacks from news agencies such as Al Jazeera. On Wednesday, we tweeted [\[LINK\]](#) *“Fighting picking up in Marib reports Al Jazeera. See 📌 03/19 tweet, makes sense for #Houthis to try to capture what used to be in Northern Yemen before any deal. Seems to point to deal is not too far away. Possession is 9/10th of the law. #OTT [LINK]*. We thought there is significance to the reports that the Houthis have carried out attacks on Marib because of the Saudi/Iran deal two weeks ago. If the Houthis think some sort of forced peace deal will be happening soon, it makes sense that they would want to capture Marib. Marib is the capital of the oil producing region, and this oil producing region was part of the old North Yemen before they and South Yemen joined together to form Yemen. It makes sense the Houthis want to be the ones in control before any peace talks/deal. Our tweet included the Al Jazeera report that said *“A new bout of front-line fighting in Yemen has disrupted diplomatic efforts to expand a United Nations-brokered truce deal that has largely held since its expiry six months ago. Military and government sources told news agencies that the clashes erupted late on Tuesday when the Houthi rebels, who control most of northern Yemen, launched an attack on Harib district, in the oil-rich Marib province. The Houthis “made progress on that front, causing the displacement of dozens of families”, one of the sources told AFP, speaking on condition of anonymity.”* From an oil market perspective, it doesn’t

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seem like oil prices have reflected any geopolitical risk premium from the Houthis/Saudi coalition war so any deal in the near term shouldn't have an impact on oil prices. But we tend to see this push as a push to control more territory before any deal is forced upon the Houthis.

Figure 31: Yemen 1967-1990 Pre-Unification



Source: Wikipedia

Figure 32: Yemen Oil and Natural Gas Infrastructure



Source: EIA

Oil – Kurdistan says Iraq deal will allow oil exports to resume this week via Ceyhan

Early this morning, we tweeted [\[LINK\]](#) “Breaking. #Oil market story for the open. Kurdistan’s @LawkGhafuri tweets deal reached with Iraq to resume #Oil exports this week thru Ceyhan. [\[LINK\]](#) #OOTT.” Lawk Ghafuri is head of Kurdistan Foreign Media Affairs and his tweet early this morning said “Following several meetings between the Kurdistan Regional Government

Iraq/Kurdistan deal

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& Federal Government, an initial agreement has been reached to resume oil exports through Ceyhan this week. This agreement will remain in effect until the oil & gas law bill is approved by Iraqi Parliament.” Ghafuri did not provide the details. Yesterday, we tweeted that it seemed like a face-saving deal had been reached. We tweeted [LINK](#) “Could be the #Oil market story on Monday. seems like face saving deal for both Iraq and KRG. KRG oil be jointly exported, revenue into acct managed by KRG & supervised by Baghdad.Thx @RowenaCaine @Ahmed_Rasheed_R @Orhan__Coskun #OOTT.” Reuters scooped others by reporting that a deal was about to happen. When we saw the Reuters report, we thought the reported potential deal provide a face saving deal for both sides as both sides gain more or less equal control over Kurdistan oil and oil revenues. The issue will always come in what happens if the two sides don’t agree on something to do when the revenues come in. But, the Reuters report certainly sounds like a deal that will satisfy both sides. Reuters reported [LINK](#) “Baghdad and KRG close to deal to resume Iraq’s northern oil exports.” “Iraq’s federal government and the Kurdistan Regional Government (KRG) are close to striking a deal aimed at resuming northern oil exports, four sources familiar with the discussions told Reuters on Saturday.” “An initial agreement between the two sides states that Iraq’s northern oil exports will be jointly exported by Iraq’s state-owned marketing company SOMO and the KRG’s ministry of natural resources (MNR), according to two of the sources – a senior Iraqi oil official and a KRG official. Revenues will be deposited in an account managed by the MNR and supervised by Baghdad, the KRG official said. The preliminary agreement has been sent to Iraq’s prime minister for final approval, according to two of the sources. The KRG source expects the deal to be confirmed by Monday. The KRG declined to comment. Iraq’s oil ministry spokesman could not immediately be reached outside regular business hours.” Our Supplemental Documents package includes the Reuters report.

Can/will Turkey stall the resumption of Iraq/Kurdistan tanker loadings?

We made an exemption to our 7am MT news cut off for the reminder that Turkey is still a factor to deal with on the resumption of Iran/Kurdistan oil exports out of Ceyhan terminal in Turkey. Can or will they stall the resumption of actual tanker loadings out of Ceyhan. We tweeted [LINK](#) “Not clear how long Turkey can/will stall actual Iraq/Kurdistan #Oil exports. 🙌 @RowenaCaine noted Turkey still some unfinished business before they sign off. @CnkGt warned on this Turkey complication. #OOTT.” Rowena Edwards (Reuters) tweet noted “Turkey had wanted an unfinished court case settled before reopening – sources”.

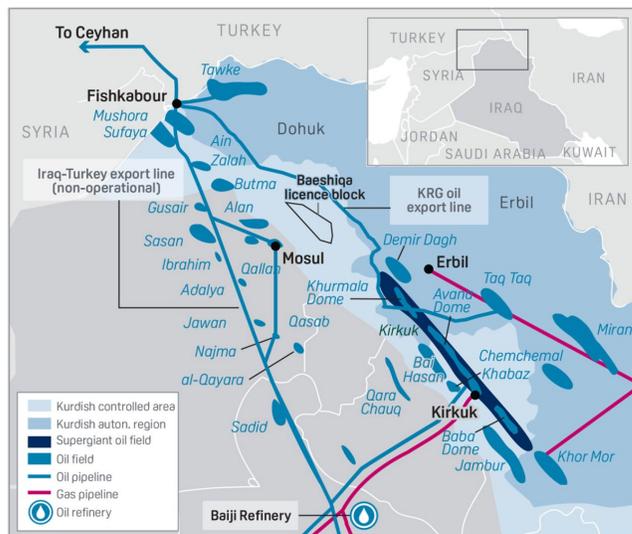
Iraq’s court case win halted 370,000 of Kurdistan oil exports

Here is what we wrote in last week’s (March 26, 2023) Energy Tidbits memo. “Breaking news yesterday that Iraq reportedly halted 445,000 b/d of crude oil exports thru its north on the export pipeline to Ceyhan, Turkey. Iraq won an arbitration with Turkey, which means that Turkey has to deal with Iraq’s oil marketing arm for approval of all Iraq oil exports, including oil from Kurdistan. It’s not clear how long it will take to get to a mechanism for Iraq dealing with Turkey on the oil exports. Don’t know if’s wishful thinking but Kurdistan media was pointing to not too long to get an understanding. Regardless, until Iraq resumes oil exports via Turkey, it means there will be ~445,000 b/d of crude oil off the market. Yesterday, we tweeted [LINK](#) Iraq reportedly halts 370 kbd KRG + 75 kbd federal oil thru export pipeline thru Turkey reports @Ahmed_Rasheed_R @RowenaCaine. Positive for #Oil until Iraq resumes

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northern exports ie. agrees on mechanism to export Iraq oil thru Turkey in line with its arbitration win. #OOTT.” Yesterday, Reuters reported [\[LINK\]](#) “Iraq halted crude exports from the semi-autonomous Kurdistan region and northern Kirkuk fields on Saturday, an oil official told Reuters, after the country won a longstanding arbitration case against Turkey. The decision to stop shipments of 450,000 barrels per day (bpd) of crude relates to a case from 2014, when Baghdad claimed that Turkey violated a joint agreement by allowing the Kurdistan Regional Government (KRG) to export oil through a pipeline to the Turkish port of Ceyhan. Baghdad deems KRG exports via Turkish Ceyhan port as illegal. The International Chamber of Commerce ruled in favour of Iraq on Thursday, Iraq’s oil ministry confirmed on Saturday. Turkey has informed Iraq that it will respect the arbitration ruling, a source said. Turkish shipping officials told Iraqi employees at the Ceyhan oil export hub that no ship will be allowed to load Kurdish crude without the approval of the Iraqi government, according to a document seen by Reuters. Turkey subsequently halted the pumping of Iraqi crude from the pipeline that leads to Ceyhan, a separate document seen by Reuters showed. On Saturday, Iraq stopped pumping oil through its side of the pipeline which runs from its northern Kirkuk oil fields, an official told Reuters. Iraq had been pumping 370,000 bpd of KRG crude and 75,000 bpd of federal crude through the pipeline, according to a source familiar with its operations. “A delegation from the oil ministry will travel to Turkey soon to meet energy officials to agree on new mechanism to export Iraq’s northern crude oil in line with the arbitration ruling,” a second oil ministry official said.” Kurdistan region Prime Minister Masrour Barzani expects this to be quickly resolved. Yesterday Kurdistan 24 news reported [\[LINK\]](#) “Kurdistan Region Prime Minister, Masrour Barzani, on Saturday reiterated the Kurdistan Regional Government’s (KRG) good relations with the Iraqi federal government. “Our recent understandings with Baghdad have laid the groundwork for us to overcome the arbitration ruling today,” PM Barzani wrote in the tweet. “A team from the KRG will visit Baghdad for talks tomorrow to build on the goodwill of our discussions,” Barzani added.” Below is a Platts Northern Iraq’s oil infrastructure map from 2020 [\[LINK\]](#).

Figure 33: Northern Iraq's oil infrastructure map from 2020
NORTHERN IRAQ'S OIL INFRASTRUCTURE



Source: S&P Global Platts, PolGeoNow
Source: Platts

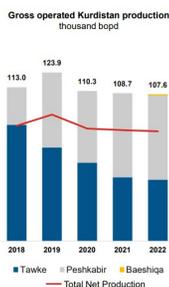
Oil tanks filled up quickly so DNO had to shut in its Kurdistan oil production

No one was surprised to see that any tank storage for oil was quickly filled up, which meant that Kurdistan oil production had to be shut-in as there was no place to put the oil. On Wednesday, we tweeted [LINK](#) “#DNO starts shutdown of 107,000 b/d #Oil production, 1/4 of Kurdistan production. No more tank storage space so time to shut-in production. See last night's 🗨️ tweet, sounds like oil will be shut-in until KRG gives in. #OOTT.” DNO’s operated fields account for approx. ¼ of Kurdistan’s oil production. Our Supplemental Documents package includes the DNO release. [LINK](#)

Figure 34: DNO’s Kurdistan Operations

Kurdistan operations

- Tawke license gross operated production averaged 107,100 bopd in 2022 (106,500 bopd in Q4 2022), of which Peshkabr field 62,000 bopd and Tawke field 45,100 bopd
- Ramped up activity in both fields with stepped up drilling campaign to manage natural decline; first quarterly Tawke field production increases since 2015
- Completed USD 25 million expansion of Peshkabr-to-Tawke gas project, Kurdistan’s only gas capture and enhanced recovery injection project
- Since 2020, the project has captured 1.2 million tonnes of CO₂e through avoided flaring, simultaneously improving Tawke field performance through gas injection
- Fast-track development of Baeshiqia license with test production commencing from first discovery wells in June 2022, averaging 1,000 bopd and ~12 MMscf/d



Page 3
Source: DNO

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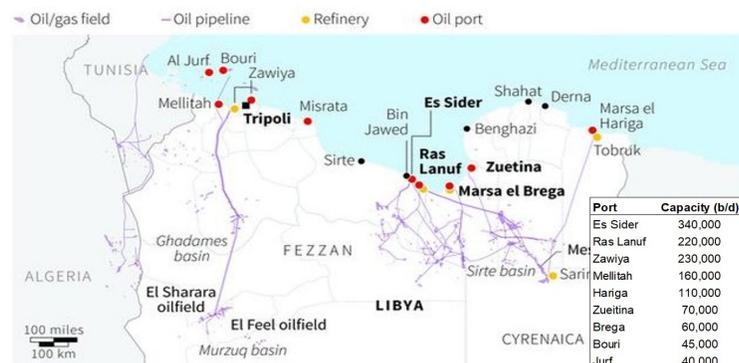
Oil –Libya NOC says oil production continues to be stable at ~1.2 mmb/d

We have to give the Libya National Oil Corporation credit that it's been able to keep oil production pretty stable right around 1.2 mmb/d for the past six months or so. The Libya National Corporation tends to post a short oil production update on its Facebook [\[LINK\]](#). The latest update was yesterday and the Google Translate was “Crude oil production reached 1.213 million barrels per day, and condensate production reached 55 thousand barrels per day during the past 24 hours.”

Libya oil production 1.2 mmb/d

Figure 35: Libya Ports, Major oilfields and Terminals map

SAF Group Compiled Libya Ports & Terminals Status



Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Libya sees low-risk development to go from 1.2 to 1.5 mmb/d in 2023

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. “We have been reporting on how Libya has surprisingly been able to keep oil production steady ~1.2 mmb/d. At the same time, we have always highlighted the big near term upside potential to its oil production if east vs west armed fighting can stay on the sidelines as that will see the return of foreign capital for both natural gas and oil. But even before foreign capital, the Libya National Oil Corporation has many low risk development opportunities to increase oil production. On Tuesday, the Libya Herald reported [\[LINK\]](#) on comments from one of Libya NOC’s operating companies, Arabian Gulf Oil Company (AGOCO) Chairman Salah Gaatrani. The Libya Herald wrote “The continuation of the Arabian Gulf Oil Company’s (AGOCO) development operations at this pace will inevitably lead to Libya reaching a production rate of more than 1.5 million barrels of oil per day in 2023, AGOCO chairman Salah Gaatrani said in an exclusive statement to Libya Herald. He said this was because of the stability witnessed by the country in general, and by the oil sector in particular. Therefore, he continued, the Gulf Company has developed its own plan within the efforts of the National Oil Corporation (NOC). Libya has been unable to maintain production beyond 1.2 million bpd. Gaatrani was commenting to Libya Herald following Sunday’s AGOCO’s meeting on developing reserves and increasing oil production in the sector companies, attended by relevant AGOCO and NOC management. The AGOCO chairman said that his company has already begun to implement the plan prepared

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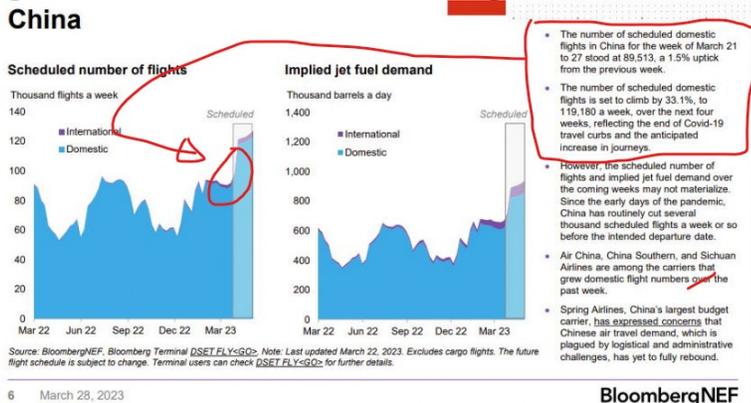
by the NOC to raise production and increase reserves.” Our Supplemental Documents package includes the Libya Herald report.”

Oil – China scheduled domestic air flights +1.5% WoW for Mar 21-27

We finally saw a WoW increase in China scheduled domestic flights after six consecutive weeks of slight WoW declines or basically flat WoW changes in China’s scheduled domestic flights. It seems like a pause before a seasonal uptick in Q2 and Q3. Our March 19, 2023 Energy Tidbits noted Cathay Pacific CEO saying that they are ramping up by the Hong Kong/London routes for the summer season, which he said was the end of this month ie. March. This means we should be seeing the summer ramp up start in April. On Tuesday, we tweeted [\[LINK\]](#) “China scheduled domestic flights. Mar 21-27: +1.5% WoW. Mar 14-20: -0.6%. Mar 7-13: -0.8%. Feb 28-Mar 3: -2.6%. Feb 21-27: +0.01%. Feb 14-20: -0.5%. Feb 7-13: -0.7%. Jan 31-Feb 6: +10.9%. Jan 24-30: -9%. Jan 17-23: +7%. Jan 10-16: +20%. Thx @BloombergNEF Claudio Lubis. #OOTT” Below is the NEF China scheduled domestic flights.

China domestic flights

Figure 36: China scheduled domestic air flights



Source: BloombergNEF

Oil – China scheduled flights est to add +400,000 b/d of implied jet fuel demand in Q2

On Friday, BloombergNEF posted its “China Oil Markets Monthly” and included a more detailed chart of near term China scheduled flight departures and implied jet fuel demand than its regular chart in the Global Aviation Indicators weekly. It shows how the big rump up in flights is happening in April. We tweeted [\[LINK\]](#) “China Jet fuel demand set to benefit from surging overseas travel in 2Q”. Potential add ~400,000 b/d demand. @BloombergNEF. Fits 📌 03/14 #CathayPacific CEO back to 4 to 5 daily flights Hong Kong/London starting the end of March. #OOTT.” And most of all, BloombergNEF estimates the ramp up will add approx. 400,000 b/d of implied fuel demand. Below is the BloombergNEF chart attached to our tweet. Note at the bottom of the chart it says China Oil Markets Monthly February 2023, but it must be an item that wasn’t updated as it says that in all the charts in the China Oil Markets Monthly March 2023.

China scheduled flights & jet fuel demand

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Figure 37: China flight schedules and jet fuel demand

Flight schedules and jet fuel demand**Jet fuel demand set to benefit from surging overseas travel in 2Q.**

Source: BloombergNEF

Cathay Pacific CEO reminds about to resume key international air flights

How tweet referenced the Cathay Pacific CEO comments on how they are cranking up their key international route, Hong Kong/London, for the start of the summer season, which he said was starting the end of March. Here is what we wrote in our March 19, 2023 Energy Tidbits memo. “On Tuesday night (North American time), the day after the China announcement on resuming issuing visas, Bloomberg TV interviewed Cathay Pacific CEO Ronald Lam. We are fortunate that Bloomberg’s China Open and Asia Open shows run in the evenings MT. On Tuesday night, we tweeted [LINK](#) “China air travel. #CathayPacific CEO “seeing a lot of long haul travel resuming” “. London route, which we are planning to resume, very soon, back to 4 to 5 daily, flight between Hong Kong & London...by summer season, starting the end of this month (March)” Thx @RishaadTV #OOTT. Note his reference to summer season restarting the 4 to 5 daily flights between Hong Kong and London is starting the end of this month. Our tweet included a 42-second clip of Lam’s bullish view on how they are seeing a lot of long haul travel resuming. Lam also highlighted the pickup in travel around Asia outside of China.”

Foreign airlines are also 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. Of Feb 20, 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

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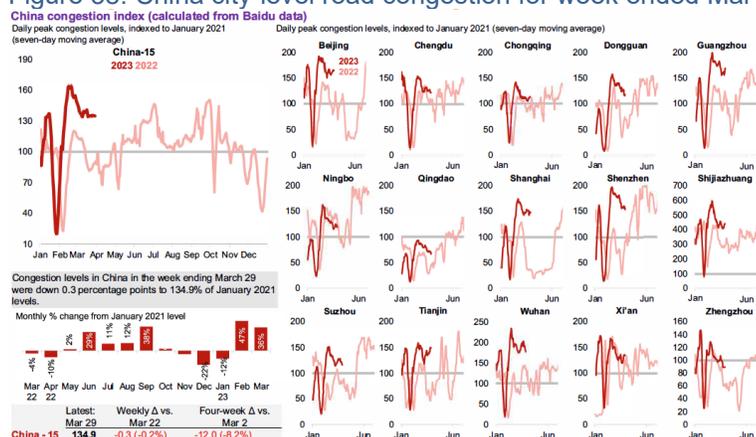
Airlines, Air France, Lufthansa, British Airways and Qatar Airways. Below is the BloombergNEF china international air flights graph per our tweet. Our Supplemental Documents package includes the Global Times report.

Oil – 6th consecutive WoW decline in China traffic. But 134.9% of Jan 2021 levels

No one can deny that China’s traffic surged in 2023 following the removal of Covid restriction, but with five consecutive WoW declines in traffic congestion, we have to wonder if China has found a general post-Covid traffic level ie, its post-Covid gap up is done. China traffic congestion surged with the reopening in Jan, but we now have seen six consecutive WoW declines in traffic congestion, although the traffic “remains exceptionally high”. On Thursday, we tweeted [\[LINK\]](#), “Global traffic stalling out ahead of normal summer ramp. #EU still >2019 levels. NA, Asia excl China, up YoY but <2019 levels. China “traffic in Feb & Mar has been exceptionally high”. BUT 6th consecutive WoW decline, -0.2% WoW to 134.9% of Jan 2021. Thx @BloombergNEF. #OOTT.” BloombergNEF’s Global Road Traffic Indicators Mar 30, 2023 described China’s city-level road congestion as “almost unchanged” from last week based on the Baidu data. Our tweet also included the below BloombergNEF graphic on China road congestion.

China road traffic congestion

Figure 38: China city-level road congestion for week ended Mar 29



Source: BloombergNEF

Oil – No Vortexa crude oil floating storage in this week’s memo

One of regular week items is the Vortexa global crude oil floating storage data posted on the Bloomberg terminal for data as of Friday and that are posted on Saturday mornings MT. Unfortunately, our IT service noted there is a supplier issue that impacts our Bloomberg remotd access for us as well as other services for our IT group. They yet to hear an ETA, but, as of 7am MT news cut off, we don’t have access to Bloomberg to get the Vortexa data as of March 31.

Vortexa floating storage

Oil – Vortexa makes case “time to get bullish again on crude?”

Early yesterday morning, we tweeted [\[LINK\]](#) “Time to get bullish again on crude?” @Vortexa chief economist @david_wech “Vortexa real-time global onshore inventory data is showing

XXXXX

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substantial, widespread and persistent draws over the last two months. Seven of the last nine weeks saw draws, averaging a strong 1.6mbd" #OOTT." Wech posted his blog on March 30 and we were surprised that it didn't get much attention as it is one of the only major views we have seen suggesting oil markets may be tipping to the positive earlier than the summer. It's a short blog and worth a read. Our tweet included his below graph and his key description *"With ample supply and limited demand, crude balances shouldn't be supportive to prices at this point of the year, with the picture widely expected to tighten substantially, but only in H2 2023. However, Vortexa real-time global onshore inventory data is showing substantial, widespread and persistent draws over the last two months. Seven of the last nine weeks saw draws, averaging a strong 1.6mbd. China has kicked off the trend of draws early in the year, but has turned around to builds in more recent weeks. This may be reflective of two things: currently lacklustre refining economics and strong crude procurement from all around the world, including Russia, Iran and parts of the Atlantic Basin. Barrels arriving currently and over the coming months have been bought at low outright prices, and more is expected to come as seasonal demand and rising prices may stimulate more purchases amid concerns of even high prices in the future. Dirty tanker rates are already lofty, especially for the bigger vessel classes, giving support to the notion of strong Chinese buying and even more upside is expected for the remainder of the year. That is if the supply is actually there to meet crude oil demand! But either way, crude prices are set to rise."* Our Supplemental Documents package includes the Vortexa blog.

Figure 39: World onshore crude inventory change by region (4-wk average, mbd)



Source: Vortexa

Oil – BNEF: global oil and product stocks surplus widened WoW to 49.8 mmb

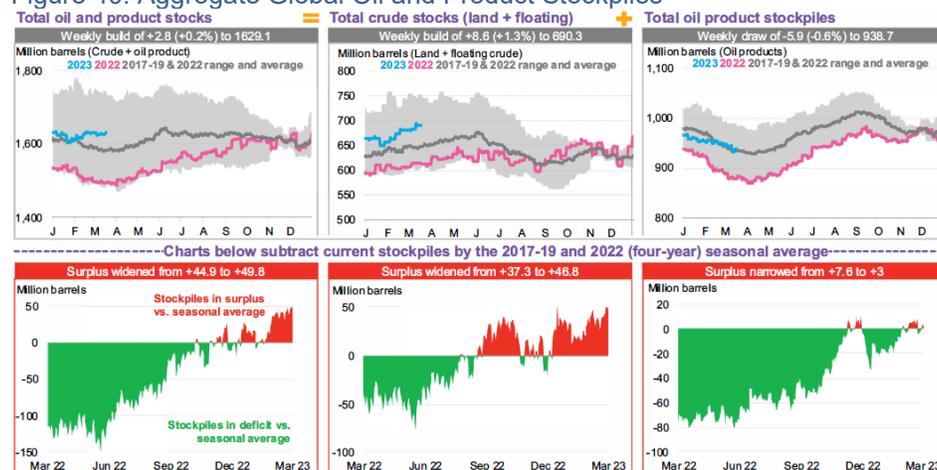
One of the negatives for oil going into 2023 was that there was expected to be surplus oil in Q1 and a building of global oil inventories. That's happened. So a key data point to watch will be does the building in Q1 and early Q2/23 start to turn into a draw as markets move thru Q2/23. But for now, the build continues. For those with a Bloomberg terminal we recommend

**BNEF's global
oil inventories**

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flipping through BloombergNEF’s “Oil Price Indicators” weekly that came out on Tuesday as it provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products surplus widened from 44.9 mmb to 49.8 mmb for the week ending Mar 17. Crude oil inventories decreased slightly WoW to 600.0 mmb, narrowing the surplus against the five-year average (2016-2019, 2022) by -3.9 mmb to 1.4 mmb. Total crude inventories (incl. floating) increased by +1.3% WoW to 690.3 mmb, widening the surplus from 37.3 mmb to 46.8 mmb. Total product stocks were down slightly by -0.6% WoW and the stockpile surplus against the 4-year average (2017-2019,2022) narrowed from 7.6 mmb to 3.0 mmb. The gas, oil, and middle distillate stocks fell -2.5% to 153.8 mmb/d and deficit widened against the four-year average from 16.2 mmb to 19.0 mmb. Jet fuel consumption by international departures for the week of April 3 is set to increase by +246,700 b/d WoW, while consumption by domestic and passenger departures will increase by +49,500 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 40: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

Oil – TomTom mobility indicators: traffic mostly static; up slightly in North America

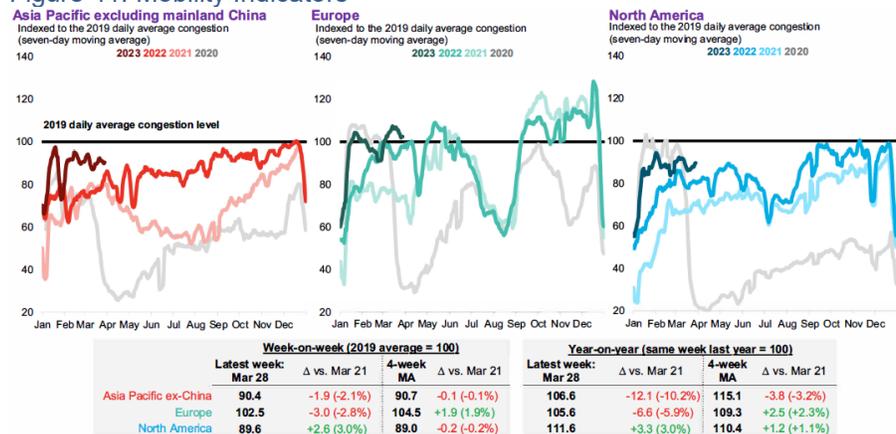
In the BloombergNEF Global Road Traffic Indicators Weekly report we continue to see the same signals as the US gasoline consumption data from BloombergNEF US Oil Indicators Weekly. On Thursday, we tweeted [\[LINK\]](#), “Global traffic stalling out ahead of normal summer ramp. #EU still >2019 levels. NA, Asia excl China, up YoY but <2019 levels. China “traffic in Feb & Mar has been exceptionally high”. BUT 6th consecutive WoW decline, -0.2% WoW to 134.9% of Jan 2021. Thx @BloombergNEF. #OOTT.” Mobility indicators like TomTom data point to stable levels in North American driving YoY, although cumulative road congestion has yet to recover to 2019 levels. For week ending Mar 28, European and Asia Pacific (ex-China) traffic levels were both down WoW by -2.8% and -2.1%, respectively. In contrast, North America traffic was up +3.0% WoW following last weeks -1.4% decline. Traffic levels in Europe are now +2.5% above the 2019 average and up +5.6% YoY. North American traffic is -10.4% below the 2019 average and is +11.6% YoY. Finally, traffic levels in the Asia Pacific (ex-China) region are -9.6% below the 2019 average but up +6.6% YoY. Traffic in the Asia-

Global road traffic indicators

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Pacific region has been exceptionally high since Feb. The TomTom mobility data seems logical as MoM North American road traffic is up slightly resulting in a widened differential to 2022's levels, but overall congestion remains strong despite being below the 2019 average. It is worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 41: Mobility Indicators



Source: BloombergNEF's calculation based on TomTom data. Note: Data up to March 28, 2023. Fixed data issue for London and Manila. Birmingham was replaced with Warsaw. Δ = change. MA = moving average.

Source: BloombergNEF

Oil – Asian Pacific Airlines Feb air traffic shows passenger demand growth

On Tuesday, the Association of Asian Pacific Airlines released its Feb traffic results [\[LINK\]](#), which is comprised of aggregate data across a total of 40 Asia Pacific airline carriers. The AAPA report highlighted steady growth in passenger demand but further weakness in cargo markets. On Wednesday, we tweeted [\[LINK\]](#), "Asia economic indicator warning. "air cargo markets continued to weaken amid challenging circumstances, inflationary pressures & worsening economic conditions... demand outlook for international travel is positive but expected to moderate in the coming mths." @AAPAirlines. #OOTT." In Feb 2023, Asian Pacific airlines served a total of 16.9mm passengers, which is up +645% YoY from 2.3mm in Feb 2022 with international traffic measured in revenue per passenger kilometers (RPK) up +482% YoY to 64.2b vs 11.0b in Feb 2022. The uptick in regional air traffic resulted in an average international load factor of 81.3% in Feb which is now at pre-Covid levels. In contrast, international air cargo demand measured in freight tonne kilometres (FTK) fell -9.8% YoY in Feb, leading to a -9.7% decline in the international freight load factor to 61.7%. Weak air cargo data was cited to be the result of worsening global economic conditions and less willingness to spend on shipments. AAPA Director General, Subhas Menon commented, "On the other hand, air cargo markets continued to weaken amid challenging circumstances. Inflationary pressures, and worsening economic conditions, weighed down on spending affecting demand for air shipments. The first two months of the year saw a 15.5% fall in air cargo demand for Asian carriers... Asian airlines are proactively taking steps to reduce the strain on operations where possible. This includes intensifying recruitment of staff, returning stored aircraft to service and continued investments in digitalising the travel process."

Asian Pacific international air traffic

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Figure 42: AAPA Preliminary International Air Traffic Data

International	Feb-23	Feb-22	% Change
Passengers (Thousand)	16,880	2,265	+ 645.3%
RPK (Million)	64,204	11,038	+ 481.7%
ASK (Million)	78,948	25,838	+ 205.5%
Passenger Load Factor	81.3%	42.7%	+ 38.6 pp
FTK (Million)	4,529	5,019	- 9.8%
FATK (Million)	7,342	7,284	+ 0.8%
Freight Load Factor	61.7%	68.9%	- 7.2 pp

Source: AAPA

Oil – Carnival came off record cruise booking, strength continuing thru rest of 2023

As a reminder, almost all cruise ships are powered by diesel. We recognize that more are calling for a slowdown, but one area that is not showing any signs of a slowdown is travel including cruise ships. Carnival provided its First Quarter 2023 Business Update on Monday and then CEO Josh Weinstein was on CNBC's Squawk on the Street. Carnival had just come off record booking in the peak winter season, and then CNBC's Sara Eisen asked if that strength was continuing in March and throughout the rest of the year. Weinstein said "absolutely" and gave some more color. We tweeted [\[LINK\]](#) "#Diesel demand. #Carnival CEO 'came off record booking period", @SaraEisen "is the strength continuing in March & throughout rest of year?" CEO "absolutely" "highest booking was last wk of Feb" "momentum continued into Mar" "over 70% booked for remainder of yr". #OOTT."

Asian Pacific
international air
traffic

Oil & Natural Gas – Dallas Fed Survey, costs rose for eight consecutive quarter

One of our favorite quarterly reports is the Dallas Fed quarterly energy survey posted this week [\[LINK\]](#). The survey provides a good window into what the US oil and gas sector is thinking about prices, activities, and issues. It's a must read. It is important to remember that the data for this survey was collected March 15-23 from a total of 147 firms, 95 E&P and 52 oilfield services. Even though optimism waned in the new survey, it is possibly higher today. WTI rose from \$73.28 to \$75.50, and Henry Hub fell from \$2.55 to \$2.28 as the survey was being conducted. (i) The headlines were different vs. last quarter with this month's report citing stalling expansion in oil and gas activity, cost pressures building, and alleviation in supply-chain delays. (ii) Activity shrunk significantly compared to last quarter, the Dallas Fed wrote "*The business activity index—the survey's broadest measure of conditions facing Eleventh District energy firms—was 2.1 in the first quarter, down sharply from 30.3 in fourth quarter 2022. The near-zero reading indicates activity was largely unchanged from the prior quarter, a break from the more than two-year stretch of rising activity.*" (iii) Six-month outlooks declined overall, with the operating-margin index remaining positive following a huge decline from 25.9 last quarter to 1.9. After a jump in the uncertainty index last month, it jumped again from 39.6 to 62.6 suggesting that uncertainty continued to climb sharply QoQ. (iv) On average, respondents expect a West Texas Intermediate (WTI) oil price of \$80 per barrel by year-end 2023; responses ranged from \$50 to \$160 per barrel. Survey participants expect Henry Hub natural gas prices of \$3.43 per million British thermal units (MMBtu) at year-end.

Dallas Fed
quarterly energy
Survey

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For reference, WTI spot prices averaged \$74.04 per barrel during the survey collection period, and Henry Hub spot prices averaged \$2.44 per MMBtu. (v) One big red flag in the survey was the rising costs for the ninth straight quarter with indexes near historical highs. The Dallas Fed wrote “*Firms reported rising costs for a ninth consecutive quarter as all series remained significantly above their averages. Among oilfield services firms, the input cost index was roughly unchanged at an elevated 61.6. Among E&P firms, the finding and development costs index slipped to 46.8 from 52.5. Additionally, the lease operating expenses index declined 11 points to 37.6.*” (vi) We are interested in the respondents answer to special survey questions. When asked, the average WTI price needed to break-even on existing well opex was ~\$37 per barrel and ranged between \$29-\$45 per barrel. The same question last year yielded an average price of \$34. In terms of the required price to achieve a profitable new well in currently active areas was ~\$62 per barrel on average and ranged between \$56-\$66 per barrel. Notably, new well breakeven prices in the Permian increased by \$9 per barrel YoY to an average of ~\$61 per barrel. Finally, 30% of participants said that cost-inflation and/or the health of the global economy will be the biggest drag on profitability in 2023. In addition, ~13% of firms cited access to and cost of capital, ~10% government regulation, <5% supply chain constraints, while 16% of firms cited other factors. Our Supplemental Documents package includes excerpts from the Dallas Fed survey.

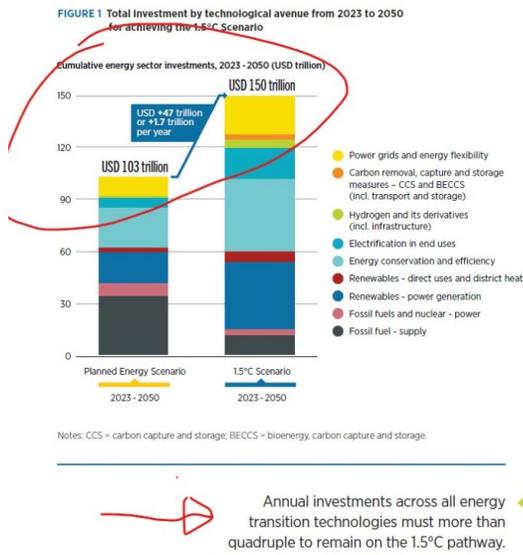
Energy Transition – IRENA warns Energy Transition is far off track

IRENA is the International Renewable Energy Agency, which is a pro international agency for renewable energy. On Tuesday, we tweeted [\[LINK\]](#) “*No more denial from renewable side. It will take way longer & cost way way more. @IRENA #EnergyTransition is off-track, investment in transition tech needs to average >\$5t PER YEAR (vs \$1.3t in 22) OOPS! #Oil .#NatGas is needed for way longer, but ESG forces capital out. #OOTT.*” It is a good reminder that the Energy Transition is nowhere near on track, which means that the existing energy system will be needed for way longer. And with investment not being anywhere near enough on the existing system, it means higher prices. Given the agency, this is to get the momentum for governments to accelerate climate change actions in the run up to COP 28 in 7 months. So maybe there is a little hype so they can push for a ridiculous amount to get a lot. Our concern isn’t that they use this report to say the world needs to accelerate to try to get on track for clean energy. But they don’t But we think is mostly non-hype, which gets back to our thesis from years ago. The energy transition will take longer, be a rocky/bumpy road and energy will cost a lot more. And with obvious implications like natural gas will be needed for longer. One other key point – whether it’s power generation or EVs, the original energy transition thesis made a fundamental assumption that has proven wrong. It’s not that the renewable power generation system replaces the existing power generation on a one-for-one basis, or anywhere near that. Rather, to the most part, its just additive at least for the next decade or two. And the same thing for EVs in the northern hemisphere, where we use Norway, the EV sales leader for the last several years, EVs are to the most part 2nd or 3rd cars and not the primary car. This is a good report to review and there is a lot of good data. But the message is clear – the Energy Transition needs \$ trillions more every year. Our Supplemental Documents package includes excerpts from the IRENA report.

IRENA on Energy Transition

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Figure 43: Total investment by technological avenue 2023-2050 to hit 1.5C



Source: IRENA

Energy Transition – Kerry highlights energy conservation/efficiency

For the last two years, we have highlighted our surprise/shock that Biden and Kerry didn't prioritize energy conservation and efficiency in their push to Net Zero. On Monday, Kerry was interviewed by Yahoo on the energy transition and he leads off with energy conservation and efficiency. Kerry says "And that was the meaning of the IPCC report that just came out. It's another kick in the you-know-what to get people moving. So, that's our fight is to get people to do all the things we can do. Another example: buildings. Buildings lend themselves to remarkable gains and efficiency just by retrofitting them. And efficiency is perhaps the largest gain at our disposal, efficiency in vehicles, efficiency in appliances and so forth. I find that the marketplace writ large has bought into this. They're on board." Biden and Kerry were both 30+ (Biden was a US Senator) in 1973/74 when the Arab oil embargo hit sending the US and Canada into a crash and a panic on how to use less oil. An adult in the US in 1973/74 knows the big push on energy conservation and efficiency. Don't forget oil was used for more 50 years ago ie. for power generation. The Low hanging fruit when they won the Nov 2020 election was conservation and efficiency if they wanted to cut emissions. But they didn't even focus on it. See our April 4, 2021 Energy Tidbits memo. But now Kerry in his Yahoo interview on Monday basically leads off with conservation and efficiency. We are big believers that these can cut energy consumption over time. The problem is that the efficiency gains aren't as great for items like cars as they were in the 70s, They are forcing automakers to stop make ICE instead of making them way more fuel efficient so there won't be as much easy R&D changes like there were in the 70s. the same thing goes for homes, appliances, buildings, a lot of the low hanging fruit has been done. So we are not convinced the impact on energy consumption will be as much as in the 70s. But there will conservation and

Energy conservation and efficiency

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efficiency gains on energy consumptions. Our Supplemental Documents package includes the Kerry interview.

Surprised conservation/efficiency wasn't a bigger Biden priority

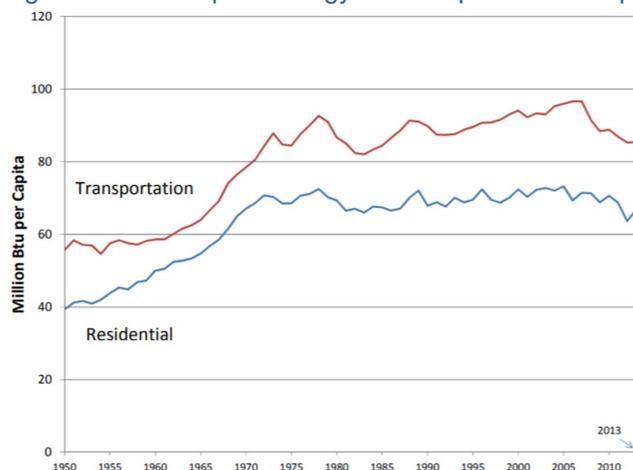
Here is what we wrote two years ago in our April 4, 2021 Energy Tidbits memo. *“One of the surprises to us in the Biden infrastructure plan was that there wasn't a huge priority placed on energy conservation and efficiency of energy use. Note in mentioning conservation here, we are also including improving efficiency of energy use. It was there for buildings and homes, but we have always wondered if there would be a separate category push on energy conservation as a priority in all energy uses. Its one thing we don't see in the push for a renewable energy world, how much emissions could be reduced by energy conservation. We have always believed it's a big number and one that isn't a politically touchy subject. But it probably doesn't get the attention as it isn't a great headline item. But we thought Biden might elevate it as a priority because Biden is lived thru the period where the US priority was on energy conservation and it worked. Biden became a US Senator in 1973, just in time for the Arab Oil Embargo in Oct 1973 that changed the world of energy and led to the election of Jimmy Carter in 1976. Interestingly, Biden's Wikipedia page features a picture of Biden and Carter in the section on Biden's senate career. The reality is that if Biden wants to make a huge dent in emissions, he should have a priority on conservation and efficiency as a key focus area. Again this is another thing that jumps out at us from not being in Biden's plan – this priority on conservation as an area, because we remember Jimmy's Carter's first major address after taking office in 1977. His famous sitting by the fireplace wearing a cardigan speech to the nation. [\[LINK\]](#) Carter says “our program will emphasize conservation. The amount of energy being wasted, which could be saved is greater than the total energy we are importing from foreign countries”. For those who also saw the speech then, it's worth a second listen.*

It worked, conservation led to big reductions in energy consumption

Here is another item from our April 4, 2021 Energy Tidbits memo. *“The push on energy conservation worked as it led to less energy consumption per capita. Carter won the Nov 1976 election and took office in Jan 1977. Carter's big push was on energy efficiency and conservation, and its also forgotten that he was the one who led to big expansion in coal and in the first substantial tax incentives for shale oil that set the stage for US shale/tight oil and gas growth in the last decade. To be fair, Nixon also started some energy conservation such as implementing a national high speed limit of 55 mph whereas prior to that there wasn't a national standard, but most states were 70 or 75 mph. But the point is that it worked. And we would expect lower consumption would have led to lower emissions. Biden lived thru this as a senator, which is why we are surprised that it wasn't a bigger priority in itself.”*

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Figure 44: Per Capita Energy Consumption in Transportation & Residential Sectors



Energy Transition – Big lag between EV sales & hit to fuel consumption

No one can disagree that EV sales are increasing at a very strong rate – the auto sales numbers show that. What can be disputed is how quickly the increasing EV sales will impact fuel consumption. We are well aware that all forecasts are all about assumptions. Our concern is that the Net Zero assumptions are overly optimistic and, if so, it will be a key factor to a multi year energy crisis. There were two charts from BloombergNEF’s Friday “*BNEF Oil: The Month in Short*” that remind how/why the impact of EVs will take longer than expected.

(i) On Friday, we tweeted [\[LINK\]](#) “Will take way longer for #EVs sales to hit fuel consumption. China ICE vehicle retirements are lower. EVs in EU only hit fuel demand by 300,000 b/d to 2030. Thx @BloombergNEF. Fits 📌 03/25 Equinor, EVs are 2nd or 3rd cars and not primary car. #OOTT”. (ii) China. BNEF doesn’t say it, but their data looking back at retirement rates of ICE vehicles supports the Equinor view that EVs tend not to be a replacement for a primary ICE vehicle but a supplemental 2nd or 3rd vehicle. BNEF wrote “At the same time, the turnover rate of gasoline and diesel vehicles in China significantly lags sales. According to BloombergNEF’s Electric Vehicle Outlook, an average of 3 million passenger cars were retired annually between 2017 and 2021 - in other words, just 1.2% of the total fleet - well below the roughly 20 million new gas guzzlers that appeared on the road over this period.”

So EV sales have been accelerating but ICE retirements at much lower rate ie. why EV sales take longer to impact fuel consumption. (iii) Europe. BNEF had a blunt message on its forecast for EU “EVs and Energy cuts will only dent Europe’s oil demand by 2030. European road fuel demand to only fall by 300,000b/d by 2030.” “Europe’s policies to cut fuel use and the rapid uptake of electric vehicles might suggest an imminent and weighty decline in oil demand, but the downward trajectory remains sluggish. Oil demand in the region is likely to fall by only 10% to 15% up to 2030, according to BloombergNEF analysis.” Below are the two BNEF charts from our tweet.

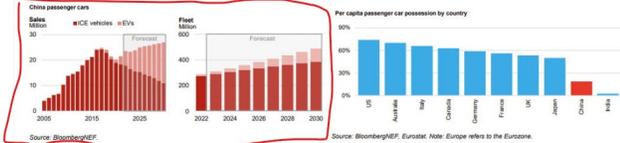
**Takes time for
EVs to hit fuel**

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Figure 45: China's roads to remain the engine of oil demand growth

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

- Fleet of gasoline and diesel vehicles will continue to grow
- Only 19% of population owns a car, far below OECD countries



Electrification of China's road fleet is quickly gaining pace, with EVs reaching close to 30% of total passenger car sales in 2022. There are now more than 13 million EVs on the country's roads and a further 7 million are expected to be added this year. But even as EV sales accelerate, they are still some way off outpacing sales of ICE vehicles. While EV sales could reach around 10 million by mid-decade, there are still likely to be 10 million ICE vehicles being added to the fleet each year.

At the same time, the turnover rate of gasoline and diesel vehicles in China significantly lags sales. According to BloombergNEF's Electric Vehicle Outlook, an average of 3 million passenger cars were retired annually between 2017 and 2021 – in other words, just 1.2% of the total fleet – well below the roughly 20 million new gas guzzlers that appeared on the road over this period.

Even assuming a more aggressive retirement rate of 2% per year, the ICE passenger car fleet would still grow by more than 60 million units by 2030, according to BNEF's projected sales. It's unlikely that China's ICE passenger car fleet will reach a turnover rate that would offset the sales of new vehicles in the years ahead. The country's passenger car fleet is relatively young, with most of its 250 million units having been purchased over the past decade. Meanwhile, the share of SUVs – which have a longer lifespan – has also increased rapidly in recent years.

In addition, the number of people who purchase a car is likely to expand as China's per-capita ownership of passenger cars remains low at about 20%, compared to more than 50% in most OECD countries.

The proportion of gasoline and diesel vehicles in China's commercial fleet also continues to expand at an even more rapid pace as trucks are more difficult to electrify.

Published March 2, 2023

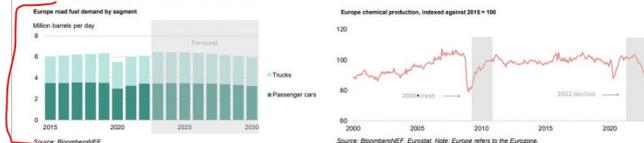
BloombergNEF

Source: BloombergNEF

Figure 46: EVs and energy cuts will only dent Europe's oil demand by 2030

EVs and Energy Cuts Will Only Dent Europe's Oil Demand by 2030

- European road fuel demand to only fall by 350,000 b/d by 2030
- Retreating chemical output is unlikely to cut much oil demand



Europe's policies to cut fuel use and the rapid uptake of electric vehicles might suggest an imminent and weighty decline in oil demand, but the downward trajectory remains sluggish. Oil demand in the region is likely to fall by only 10% to 15% up to 2030, according to BloombergNEF analysis. As domestic production stagnates, the continent will remain dependent on external suppliers, swapping Russia for the Middle East and the US.

Europe has a history of reducing its fuel consumption. Oil demand in European nations that are members of the Organisation for Economic Co-operation (excluding Turkey) fell to 12.6 million barrels per day in 2022 from 15.2 million b/d in 2005, driven by a heavy curtailment of residual fuel and other products in shipping and industries. The coming years could see a continued fall at a similar pace – declines of about 150,000 b/d annually.

Road transport accounts for some 40% of Europe's oil demand. With EVs making up 23% of Europe's total passenger car sales in 2022, electrification is making a dent in fuel consumption. But total annual car sales hover around 15 million units compared to a fleet of about 295 million, meaning a major impact is going to take time. BNEF's Electric Vehicle Outlook 2022 expects fuel consumption in Europe's passenger car segment to fall by some 300,000 b/d by 2030 compared to 2022.

Retreating chemical production could subside naphtha, LPG and ethane demand in Europe. In 2015, those products together made up some 2.24 million b/d of demand, which fell to 2.0 million b/d in 2022 and a 15% decline in chemical production. Taking a more extreme scenario and assuming that chemical output remains around an average of 70% of its 2015 levels over the next decade, this would lower demand by another 250,000 b/d or so compared to 2022.

Published March 18, 2023

BloombergNEF

Source: BloombergNEF

Equinor chief economist says Norwegians bought EVs as 2nd or 3rd cars

Our Friday tweet linked to an item from our March 26, 2023 Energy Tidbits memo. Here is what we then wrote. "The Equinor Chief Economist Wærness comment to the FT also supported the above item on how Norwegians aren't using their EVs as much as would be expected given the massive penetration of new car sales over the past several years. Yesterday, we tweeted [LINK](#) "Here's why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWAerness. many other reality check energy transition views in his @FT interview [LINK](#) #OOTT." Wærness says that Norwegians really have bought EVs as their 2nd or 3rd cars and not the principal car. Whereas historically car buyers buy new cars as a principal car other than the wealthy who have more than a couple cars. The FT wrote "Norway's experience with electric vehicles provides an example, Wærness suggested. Subsidies to buy

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battery-powered cars had rapidly increased their number, and Norway has been repeatedly cited as an example of how quickly customers could switch to EVs. But the overall car fleet had swollen too, Wærness said. “We’ve kept a lot of the diesel cars and gasoline cars, and we’ve added EVs, and it took 10 years before gasoline demand went down,” he said. “We’ve bought an EV instead of taking the bus, or it becomes the second or the third car.”

Energy Transition – China supplies 98% of EU’s rare earths, 97% of its lithium

It’s easy to see why there is an aggressive push into Africa and South America for critical metals and also why natural gas will be needed for much longer than the EU’s Net Zero aspirations. This was made clear by European Commission President Ursula von der Leyen on Thursday, who highlighted a key vulnerability – Europe relies on China for essentially all of its rare earth supply. On Thursday, we tweeted [\[LINK\]](#) “#EnergyTransition reality check. @vonderleyen: “we rely on one single supplier” China 98% of rare earth, 93% of magnesium. 97% of lithium. How can EU not need #NatGas for way way longer than the NetZero aspirations? Thx @disclosetv #EnergyTransition #NatGas #OOTT.” Our tweet included the transcript we made of von der Leyen’s comments [\[LINK\]](#). Von der Leyen said “We know this is an era where we rely on one single supplier. China. 98% of our rare earth supply. 93% of our magnesium. 97% of our lithium, just to name a few. We are deeply mindful of what happened with Japan’s imports of rare earths a decade ago. When foreign policy tensions between the two in the East China Seas became acute. Our demand for these materials will skyrocket as the digital and green transition speed up. Battery powering our electric batteries that are powering our electric vehicles are forecast to drive up demand for lithium by 17 times by 2050.”

**China supplies
98% of EU’s rare
earths**

Capital Markets – Royal LePage est Cnd recreational properties values -4.5% in 2023

On Tuesday, Royal LePage posted its annual recap and forecast for Canada’s single family recreational property market. The biggest surprise for most is the Royal LePage ranking of Alberta as the highest price region forecast at \$1.17 mm in 2023, even above BC at \$1.05 mm despite Whistler at \$3.60 mm being >2 three times higher value than Canmore at \$1.53 mm. Overall, Royal LePage wrote “According to Royal LePage, the aggregate price of a single-family home in Canada’s recreational regions is forecast to decrease 4.5 per cent in 2023 to \$592,005, compared to 2022, as activity in the market wanes. This is due to reduced demand as a result of economic uncertainty and a lack of available housing stock, which has helped to keep prices stable. Despite a modest decrease expected this year, the national aggregate price would remain more than 32 per cent above 2020 levels, after two years of double-digit price gains in the country’s recreational real estate market. With the exception of Alberta, which is expected to see a 0.5 per cent increase, all of Canada’s provincial recreational markets are forecast to see a decrease in single-family home prices in 2023. The province of Quebec is forecasting the greatest price depreciation, at -8.0 per cent.” Our Supplemental Documents package includes the Royal LePage release and table.

**Cdn recreational
property**

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Figure 47: Canada: 2023 Recreational Single-Family Home Price Forecast

2023 Recreational Single-Family Home Price Forecast

	2022 (Actual)	2023 (Forecast \$)	2023/2022 (Forecast %)
National	\$619,900	\$592,005	-4.5%
Atlantic Canada	\$279,900	\$271,503	-3.0%
Quebec	\$373,400	\$343,528	-8.0%
Ontario	\$634,800	\$603,060	-5.0%
Prairies	\$271,300	\$263,161	-3.0%
Alberta	\$1,165,500	\$1,171,328	0.5%
British Columbia	\$1,071,300	\$1,049,874	-2.0%

Source: Royal LePage

Demographics – Starbucks CEO uses political speak “respectively” on Sen Sanders

Starbucks CEO Howard Schultz was called before the Senate Health, Education, Labor, and Pensions Committee, chaired by Sen Bernie Sanders, on Wednesday to be grilled on Starbucks labor practices. Bloomberg posted a good clip where Schultz uses political speak on Sanders. It caught our attention because we don't normally hear business CEOs use political speak against politicians. Schultz used “respectively” a couple of times and Sanders looked pretty steamed because he knows full well respectfully means without respect. Schultz knows using respectfully means without respect. We didn't see the entire testimony. But we have to wonder if Schultz also used other political speak like “let me be clear” ie. In case you people don't understand what I am saying, let me repeat it. The clip is at [LINK](#). Schultz said *"Respectfully, that's more than the minimum wage of every senator that's represented a state on this committee, including, respectively, Chairman Sanders, where the minimum wage in Vermont is \$13.18. We're at \$17.50."*

“respectively”

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.

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Cdn PGA star Corey Connors goes for his 2nd win at Valero Texas Open

Looks like it will be golf afternoon for Cdn gofl fans today as Cdn PGA start Corey Connors is in the final group teeing off at 10:41am MT. Patrick Rodgers is in the lead at -12, Connors is at -11 and fan favorite Matt Kuchar is at -9. Was able to watch a good portion of today's round. Connors had tough front nine with a double bogey so was one over for the front and not looking good. But he was four under on the back nine including a birdie on 18. Connors has some great memories of the Valero Texas Open at this same Oaks Course in San Antonio. Connors has one career PGA win and it was the Valero Texas Open in 2019

Detroit Lions RB Williams great speech on Hard Knocks report

We didn't see the 2022 Hard Knocks last year but, yesterday, NFL Network replayed the series so it was on in the background. It was during training camp and the Lions had a bad session and coach Campbell let them know it. But in the final huddle before the session ends, running back Jamaal Williams makes a great speech to the team that is worth a listen. There are a number of great expressions including his like a puppy line. And we have attached a report that has a full transcript and the report includes the 3:47 min clip showing his and Campbell's speech. It's definitely worth a listen and reminder that you can't one bad day become two, then slips into a third and before you know it, it becomes a new normal. Our Supplemental Documents includes the Detroit Sports Nation report. [\[LINK\]](#)

The new rules of tipping

We are sure everyone has noticed the big increase in restaurant food and drinks prices over the past year plus the always increasing mystery hospitality or something charges. But the one caught our attention was when you get the machine to pay your bill on credit card, it asks add a tip and then it pops up three choices. It couldn't have been than year or two ago that the choices were 15%, 18% or 20%, but now we are seeing more move to 20%, 25% or 30%. And the challenge is that it seems like one of the common criticisms in the last year is that service quality continues to decline. On Tuesday, Bloomberg posted a report "*Work Shift: The New Rules of Tipping Mean Everyone Expects 20% to 25%*" [\[LINK\]](#). It was a limited survey, but the restaurant servers are in line with the machine of 20% to 30%. But we were surprised to see the comments some restaurants ask for an 18% to 25% tip on takeout orders. The one that really jumped out at us was the "Private pilots and crew: 20% to 30%" but it turns out it looks like they were referring to items like private pilots on hot air balloons and not private pilots on small jets. Our Supplemental Documents package includes the Bloomberg report.