

Energy Tidbits

March 5, 2023

Produced by: Dan Tsubouchi

Vitol's Mike Muller on Oil: "Market is Justified in Feeling Upbeat and Positive About Chinese Demand Growth"

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. Earlier this morning, Vitol's Mike Muller laid out the case for why the market is justified in feeling upbeat and positive about Chinese oil demand growth ([Click Here](#)).
2. Saipem says renegotiated EPC deal with TotalEnergies leading to restart of Mozambique LNG in July ([Click Here](#)).
3. Shell CEO Sawan "world will need oil and gas for a long time. As such, cutting oil and gas production is not healthy" ([Click Here](#)).
4. Is Chevron unique? Or will its 2022 Permian Delaware Basin well productivity underperformance due to older 2018/19 DUCs completed in 2022 be applicable, to some degree on others ([Click Here](#)).
5. Upside to many Cdn oil plays as Crescent Point's No Frack tightly spaced multi-leg horizontal technique is applicable to a range of other Cdn oil plays ([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 – 81 bcf draw in US gas storage; now 451 bcf YoY surplus

No one should have been surprised to see such a low storage draw given the Heating Degrees Data released on Monday afternoon that it was 31% warmer than normal and 25% warmer YoY. So for the week of Feb 24, the EIA reported a -81 bcf draw (vs expectations of -75 bcf), a -42% decrease from the -139 bcf draw reported for the week of Feb 25 last year. This compares to last weeks draw of -71 bcf, and the 5-year average draw of -134 bcf. Total storage is now 2.114 tcf, representing a surplus of +451 bcf YoY compared to a surplus of 395 bcf last week and is +342 bcf above the 5-year average vs +289 bcf above last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage Report [\[LINK\]](#).

YoY storage at 451 bcf YoY surplus

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Year ago (02/24/22)		5-year average (2018-22)	
	02/24/23	02/17/23	net change	implied flow	Bcf	% change	Bcf	% change
East	451	479	-28	-28	363	24.2	390	15.6
Midwest	544	575	-31	-31	411	32.4	446	22.0
Mountain	99	106	-7	-7	97	2.1	100	-1.0
Pacific	99	108	-9	-9	166	-40.4	176	-43.8
South Central	922	926	-4	-4	625	47.5	660	39.7
Salt	261	262	-1	-1	164	59.1	187	39.6
Nonsalt	661	664	-3	-3	461	43.4	473	39.7
Total	2,114	2,195	-81	-81	1,663	27.1	1,772	19.3

Source: EIA

Natural Gas – Heating degree days +16% warmer than normal for Feb 25 week

HH prices had a good week in great part driven by the restart of bigger natural gas flows to Freeport LNG. This was in the face of a widening YoY gas storage surplus that was expected based on the HDD data. As a reminder the heating degree days (HDD) comes out on Monday afternoons and provides an indicator for the weekly gas storage estimates that come out on Thursday mornings. On Monday, we tweeted [\[LINK\]](#) “SB another week to see a widening of YoY increase to @EIAgov US #NatGas storage surplus for wk ending 02/24. @NOAA HDD for “gas home heating customer weighted” for wk ending 02/25 was 16% warmer than normal, 27% warmer YoY. One day difference but SB indicative. #OOTT.” NOAA’s HDD data for the week ended Feb 25 was that it was 21% warmer than normal and 26% warmer than last year, but for “gas home heating customer weighted” was 16% warmer than normal and 27% warmer than last year. Note that the heating degree days is for the week ending Sat Feb 25, whereas the EIA weekly gas storage data will be for the week ending Fri Feb 24. There is a one day difference, but, when we saw the HDD data on Monday, we thought the heating degree days would point to a widening of the YoY gas storage surplus. Our Supplemental Documents package includes the NOAA HDD data for the week ending Feb 25. [\[LINK\]](#)

Week ending Feb 25 was 16% warmer than normal

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

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

STATE	WEEK	WEEK	WEEK	CUM	CUM	CUM	CUM	CUM
	TOTAL	DEV	DEV					
		FROM	FROM		FROM	FROM	FROM	FROM
		NORM	L YR		NORM	L YR	NORM	L YR
							PRCT	PRCT
UNITED STATES	153	-30	-22	2866	-281	100	-9	4

GAS HOME HEATING CUSTOMER WEIGHTED

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

UNITED STATES 168 -31 -25 3131 -288 117 -8 4

Source: NOAA

Natural Gas – Feb was warmer than normal and warmer than last Feb in the US

The final heating degree days data for Feb is not yet posted, but the HDDs data thru Feb 25 show Feb was a warmer than normal month although not as hot as Jan that was 18.1% warmer than normal and 19.1% warmer YoY. The AGA HDD data recap for Feb was up to the week ended Feb 25. Other than the week ended Feb 4, the other three weeks were warmer than normal. Below is the AGA HDD seasonal recap thru Feb 25. [\[LINK\]](#) Our Supplemental Documents package includes the AGA winter HDD data thru Feb 25.

A warmer than normal Feb

Figure 3: Excerpt AGA weekly heating degree days data thru week ended Feb 25

WEEKLY COMPARISON

Week Ending	2022/2023	2021/2022	Normal	% Change: 22/23 from 21/22	% Change: 22/23 from Normal
10/01/22	41	20	36	105.0 Colder	13.9 Colder
10/08/22	50	15	48	233.3 Colder	4.2 Colder
10/15/22	56	30	61	86.7 Colder	8.2 Warmer
10/22/22	89	58	76	53.4 Colder	17.1 Colder
10/29/22	75	77	91	2.6 Warmer	17.6 Warmer
11/05/22	72	111	106	35.1 Warmer	32.1 Warmer
11/12/22	97	95	122	2.1 Colder	20.5 Warmer
11/19/22	194	127	139	52.8 Colder	39.6 Colder
11/26/22	161	152	155	5.9 Colder	3.9 Colder
12/03/22	165	137	170	20.4 Colder	2.9 Warmer
12/10/22	163	161	185	1.2 Colder	11.9 Warmer
12/17/22	188	139	197	35.3 Colder	4.6 Warmer
12/24/22	254	183	209	38.8 Colder	21.5 Colder
12/31/22	200	156	218	28.2 Colder	8.3 Warmer
01/07/23	152	214	223	29.0 Warmer	31.8 Warmer
01/14/23	179	208	226	13.9 Warmer	20.8 Warmer
01/21/23	178	229	225	22.3 Warmer	20.9 Warmer
01/28/23	202	248	222	18.5 Warmer	9.0 Warmer
02/04/23	240	231	217	3.9 Colder	10.6 Colder
02/11/23	169	194	210	12.9 Warmer	19.5 Warmer
02/18/23	168	193	199	13.0 Warmer	15.6 Warmer
02/25/23	171	198	187	13.6 Warmer	8.6 Warmer
Cumulative	3264	3176	3522	2.8 Colder	7.3 Warmer

MONTHLY COMPARISON

Month Ending	2022/2023	2021/2022	Normal	% Change: 22/23 from 21/22	% Change: 22/23 from Normal
September	66	42	87	57.1 Colder	24.1 Warmer
October	299	205	310	45.9 Colder	3.5 Warmer
November	588	677	676	13.1 Warmer	13.0 Warmer
December	883	688	884	28.3 Colder	0.1 Warmer
January	811	1003	990	19.1 Warmer	18.1 Warmer

Source: AGA

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Natural Gas – A hot vs cold month can be a swing of ~500 bcf of consumption

Feb is now over, which means the major potential winter cold pull on natural gas is now effectively over. As noted above, the AGA heating degree days data thru the week ended Feb 25 and shows Feb was warmer than normal and Jan was way warmer than normal. HH prices crashed from over \$7 just before Xmas to under \$3 in late Jan and around \$2 after mid-Feb to rally to \$3 this week with the restart of natural gas flows to Freeport LNG. But this winter was a great example of how a hot January can crash natural gas prices. That is because there is a huge swing in residential/commercial natural gas consumption in a hot winter month. On Jan 7, we tweeted [LINK](#) on the below data on why temperature is key for winter natural gas demand and prices. It's why warm weather in the winter, especially in Jan, is never a positive for natural gas prices. There can be huge swings in residential/commercial natural gas demand depending if it's hot, normal, or cold. The different between a hot and cold month can be almost 500 bcf in a month. Below is a table we have previously posted that shows these swings. It shows AGA heating degree days vs US total natural gas consumption and US residential/commercial natural gas consumption. (i) Residential/commercial demand is normally >40% of total US natural gas consumption in DJF. (ii) For the last 10 year average, Jan was 46.7 bcf/d, Feb 43.4 bcf/d, and Dec 38.0 bcf/d. (iii) The high to low swings for Dec can be up to 12.6 bcf/d, Jan can be up to 9.8 bcf/d, and Feb can be up to 17.2 bcf/d. (iv) The biggest months over the past 10 winters were Jan 2014 at 51.9 bcf/d, Feb 2015 at 50.9 bcf/d, and then Dec 2017 at 49.5 bcf/d.

A hot winter month is brutal for gas prices

Figure 4: US Winter Natural Gas Consumption vs Heating Degree Days

US Winter Natural Gas Consumption vs Heating Degree Days													
Heating Degree Days By Month	Days By Month										10 Year Average	%	
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22			2022/23
Oct	308	303	285	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													
	bcf/d										10 Year Average	%	
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22			2022/23
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													
	bcf/d										10 Year Average	%	
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22			2022/23
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 – NOAA sees a colder than normal start to March

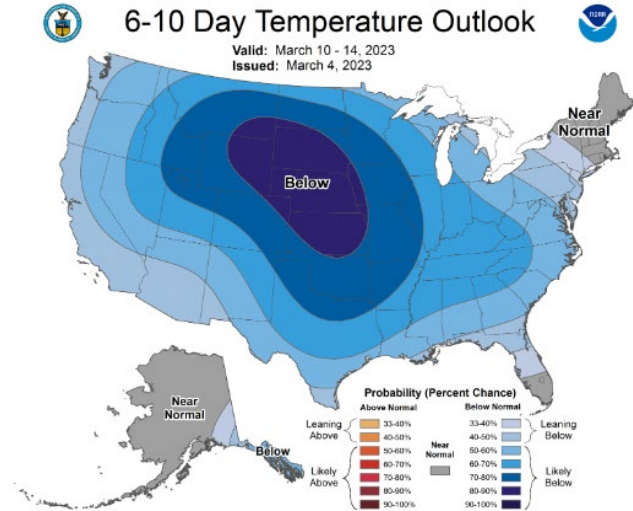
Yesterday, we tweeted [LINK](#) “Unfortunately cold weather in 2nd week of Mar doesn't drive big Res/Com #NatGas consumption, but will a cold Mar will drive some demand so it's better than a warm Mar. @NOAA's updated 6-10, 8-14 day outlook for Mar 10-16.#OOTT.” To put in perspective, AccuWeather forecasts daily highs for Chicago in the low single digits and

NOAA 6-10 & 8-14 day temp outlook

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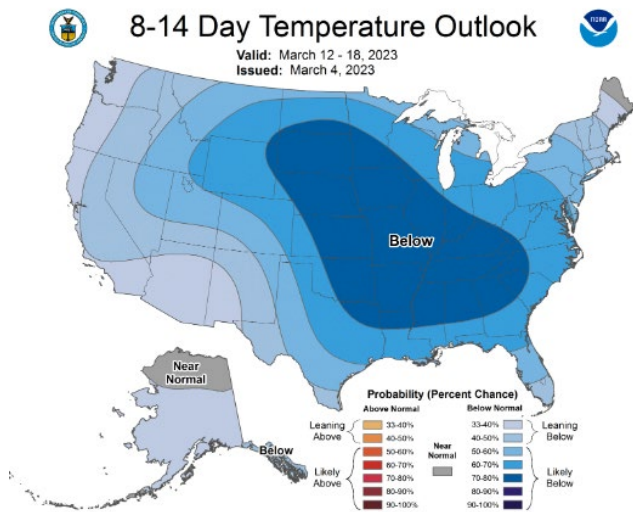
nightly lows around freezing, Other cities like NYC a few degrees warmer. March can be a decent month for cold temperature driven natural gas consumption. Normally , March is 16% of winter residential/commerical natural ga consumption, not too far behind December at 19%. Our tweet yesterday included NOAA's below Feb 25 updated 6-10 day and 8-14 day outlook that run up thru March 16.

Figure 5: NOAA 6-10 day temperature outlook as of Mar 4



Source: NOAA

Figure 6: NOAA 8-14 day temperature outlook as of Mar 4



Source: NOAA

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Natural Gas – Winter weather led to US Dec gas production down MoM to 99 bcf/d

Winter weather led to some temporary interruptions to natural gas in Dec. The big picture story is unchanged - US natural gas supply, driven by shale/tight natural gas, continues to be up strongly YoY. However, winter weather impacted Dec. The EIA released its Natural Gas Monthly on Tuesday [\[LINK\]](#), which includes its estimates for “actuals” for December gas production. The key takeaway from the December actuals is that December’s (-1.9 bcf/d MoM to 99.0 bcf/d) was the first production decline following 9 consecutive MoM increases but is still above the pre-Covid February 2020 level of 98.1 bcf/d. December 2022 is +2.0 bcf/d YoY. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

US November gas production +2.0 bcf/d YoY

Figure 7: US Dry Natural Gas Production

bcf/d	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
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
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	100.9
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	99.0
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

Source: EIA

Natural Gas – US pipeline exports to Mexico down MoM to 5.1 bcf/d in December

The EIA Natural Gas Monthly also provides its “actuals” for gas pipeline exports to Mexico, which were 5.1 bcf/d in December, which was down 0.3 bcf/d YoY and down 0.1 bcf/d from November. 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 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 down MoM

Figure 8: US Pipeline Gas Exports To Mexico (bcf/d)

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.7
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

Source: EIA

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

We had a number of questions if Chevron’s below expectations Permian Delaware Basin well productivity results from older DUCS delivering lesser results was applicable to shale gas plays. Our comment is that we have to believe there is some degree of applicability to all plays, whether they be oil or natural gas plays, that there will be older DUCs that are likely to deliver lesser results. And we also remind people of an item from last week’s (Feb 26, 2023) Energy Tidbits memo “Does CHK Marcellus view point to lower & more costly US gas growth?”. We then wrote *“There was a great example of how managements tend to give the most open comments when they aren’t speaking from a prepared script and having to answer unexpected questions in the Q&A of earnings calls. Chesapeake Energy held its Q4 call on Wed and their comments seem to point to why the growth in US natural gas production will be less and more costly than expected. On Thursday, we tweeted [\[LINK\]](#) “Will US #NatGas growth be less & more costly than expected? \$CHK on why lower #Marcellus well productivity in 2022. In 20/21 “really across the industry, we were having to high-grade locations” “so we absolutely drilled very best wells”, 2022 wells on par with 2018-19! #OOTT.” Chesapeake was asked about the lower productivity wells in the Haynesville and Marcellus in 2022 and management said they drilled their absolute very best wells in 2020 and 2021 because the environment was so tough and they needed the best wells. Note that they said this applied “across the industry” and not just to Chesapeake. So the productivity of their 2022 wells is more in line with their 2018 and 2019 wells. We have to believe this concept applies to others, the question is to what degree for other companies. How much of their absolute best wells did they drill and how much is left? We think the Chesapeake comments point to lower and more expensive US natural gas growth than most expect. Here*

Did industry drill their very best wells already?

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is the more fulsome reply “The other thing, I think, to point out is, you can look back at historical trends. In 2020, 2021, really across the industry, we were having to high-grade locations. And this is no different for Chesapeake. And so, we absolutely drilled very best wells with a relatively modest program in the heart of our core. And so, I think if you were to look back and compare our 2022 well results into something in the 2018 and 2019 timeframe, you’ll actually see productivity that’s on par.”

Natural Gas – US LNG exports up +0.9 bcf/d MoM in Dec to 11.0 bcf/d

The Feb EIA Natural Gas Monthly estimates US LNG exports for December were 11.0 bcf/d and this is a reminder that the US LNG export data is available about two weeks prior to the Natural Gas Monthly. This is in line with the US LNG exports in the DOE monthly LNG data that was posted on Feb 15. LNG exports in Dec were still hurt by then continued shut-in of the 2.2 bcf/d Freeport LNG facility since its June 2022 fire. Here is what we wrote in our Feb 19, 2023 Energy Tidbits, “The US Department of Energy reported the December 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 Dec/22 were 11.0 bcf/d, -1.6% YoY, +12.3% MoM. Still impact #FreeportLNG 2.2 bcf/d 06/08/22 shut. Dec/22 top 5 export markets: UK, Dutch, France, Spain, Korea. Dec/21 top 5 export markets: UK, Turkey, Korea, France, Spain. @ENERGY data 2 wks before @EIAgov. #OOTT”. December saw 339.6 bcf (11.0 bcf/d) of LNG exports, up +12.3% MoM. The top 5 countries with export deliveries from the US were the UK (69.3 bcf), Netherlands (39.9 bcf), France (38.3 bcf), Spain (33.8 bcf), and South Korea (24.7 bcf), representing 60.7% of total US LNG exports. There has been a shift in the over the last year in top 5 exports with the energy crisis in Europe and the geo-political impacts from the Russian invasion of Ukraine when we look at the top export destinations from a year ago. There was 345.4 bcf of exports in December 2021; the top five export countries in December 2021 were UK (60.3 bcf), Turkey (38.4 bcf), South Korea (38.2 bcf), France (33.9 bcf), and Spain (32.6 bcf), representing 59.0% of total US LNG exports through the month.” Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

US December LNG exports

Figure 9: US LNG Exports (bcf/d)

(bcf/d)	2016	2017	2018	2019	2020	2021	2022
Jan	0.0	1.7	2.3	4.1	8.1	9.8	11.4
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

Source: EIA, DOE

Natural Gas – US LNG exports to jump up in March

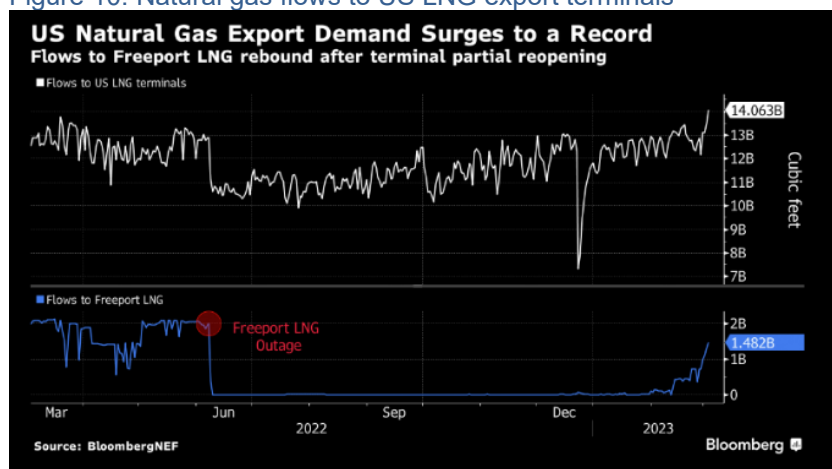
The above EIA US LNG export data is for Dec and was impacted by the then continued shut-in of Freeport LNG. However, the LNG exports should jump up in March. Last week’s (Feb 26, 2023) Energy Tidbits memo noted Freeport LNG received authorization to restart

US LNG exports to jump up in March

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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 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.” Below is the Bloomberg graph.

Figure 10: Natural gas flows to US LNG export terminals



Source: Bloomberg

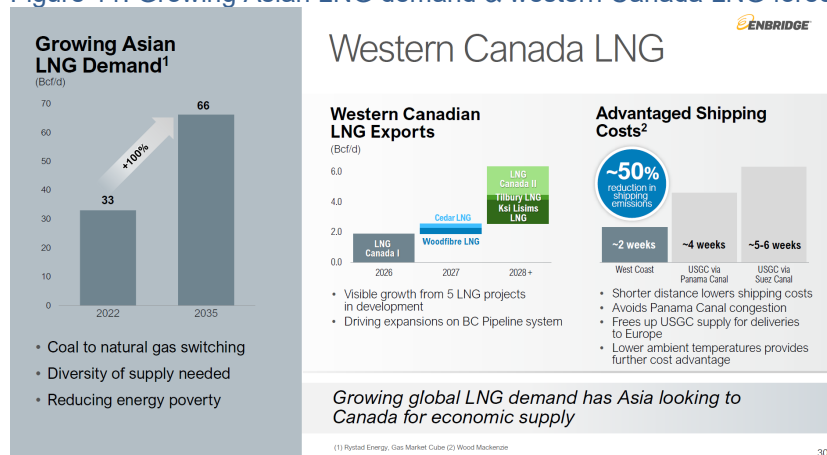
Natural Gas – Enbridge, Cdn LNG positioned to supply Asia’s doubling of LNG imports

Enbridge held its investor day on Wed and put forward a bullish outlook for Asian LNG demand and how BC LNG export projects are well positioned for growth to meet increasing Asian LNG demand. Enbridge forecasts Asian LNG demand to double from 33 bcf/d in 2022 to 66 bcf/d in 2035. We tweeted [\[LINK\]](#) “Enbridge’s Cdn #LNG outlook. Reminds of CAN shipping advantage vs US Gulf Coast. Also #CedarLNG in their 2027 supply forecast, #LNGCanada 1.8 bcf/d Phase 2 in their 2028+ supply. #NatGas #OOTT.” Enbridge sees BC LNG as advantaged with its shorter shipping distance and opportunity to be lower emissions LNG. Their forecast graph assumes LNG Canada 1.8 bcf/d Phase 2 supply in the 2028+ period. Enbridge said “So the story of Western Canada LNG continues to be one of opportunity. It will play an important role in enhancing energy security and reducing global emissions. BC has plentiful gas reserves and its proximity to Asian markets makes it ideal for exporting LNG to help reduce reliance on coal. The availability of hydroelectric power means that BC can have the lowest emitting LNG projects in the world. Canada produces some of the most sustainable energy in the world, and the cooler climate requires less energy to produce LNG.”

Enbridge bullish view of BC LNG.

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Figure 11: Growing Asian LNG demand & western Canada LNG forecast



Source: Enbridge

Natural Gas – Saipem says TotalEnergies Mozambique LNG restart in July

TotalEnergies has not confirmed any restart date for its Mozambique LNG project, but one of its contractors, Saipem, said, in the Q&A of its Q4 call on Tuesday, that “we expect to gradually restart the project according to the information received by our clients starting from July this year, progressive restart.” The LNG project’s EPC contractor is CCS, a joint venture between Saipem, McDermott and Chiyoda. Saipem should know what TotalEnergies is saying as they will have to gear up and plan for the restart ie. this should be good info. Saipem also explained how this got done – there were some contract renegotiations that will see TotalEnergies taking capital risk in the early stages of the restart for some undisclosed period before it the capital risk flips back to the EPC contractors. This was the key – TotalEnergies stepping up in the early parts of the restart. In the Q&A, Saipem explained “Regarding the terms and condition, and what Saipem has mentioned, and what the client has mentioned. What we can state is that the Saipem mentioned this opportunity as the agreement on the principle for the renegotiation of certain sections of the contract has been achieved already with Total Energy. This principle and condition as agreed with Total will contribute to the risk, the initial phase of the project resumption in the best interests of Saipem and Total, prior the return to the fixed contract for project completion. So, we will have -- we are in a situation, where we will have a restart that is currently considering the new situation. We will work together with Total. And then we will continue the project later on following the agreement on a new fixed price for the project. So, this is the situation.”

Renegotiated EPC deal seems to satisfy TotalEnergies rising capex concern

Our Saipem tweet started of “renegotiated part of EPC contract” because this is the key to why there will be a restart as TotalEnergies raised rising capex their big concern for a restart of the Mozambique LNG project. It seems like the renegotiated deal deals with TotalEnergies rising capex concern. Although, it looks like

**TotalEnergies
Mozambique LNG
restart in July ?**

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TotalEnergies has to step in to take some project capex risk in the initial restart stages. Here is what we wrote in our Feb 12, 2023 Energy Tidbits memo. *“Natural Gas – Will rising capex hold back TotalEnergies Mozambique LNG restart? After seeing TotalEnergies CEO Pouyanne’s comments in the Q&A of the Q4 call on Wed, it doesn’t seem like there will be as quick a restart to resuming construction at the Mozambique LNG project as we thought last week. (i) Last week’s (Feb 5, 2023) Energy Tidbits memo noted Pouyanne making his first trip to the Mozambique area. TotalEnergies stopped the project due to area violence and Pouyanne had previously there couldn’t be a restart decision until he could travel there. He did and TotalEnergies post trip release seemed to indicate that they were now comfortable with the security situation. And this was why they stopped. (ii) TotalEnergies had their Q4 call on Wed and. Pouyanne dealt with Mozambique in the Q&A. We tweeted [\[LINK\]](#) “.@PPouyanne 🟡 on MZ #LNG restart. security conditions are okay. will execute recommendation on human rights. BUT “one key condition to restart will be to maintain the costs that we had. If i see the costs going up & up, we’ll wait... & the contractors will wait as well”. #OOTT.” (iii) What won’t hold up a restart is security in the region.. He signaled this last week by going there, he signaled to everyone what he was comfortable the security situation was acceptable so a go ahead could happen. Security, violence and killing was why they called force majeure and stopped the project almost two years ago. But that is not an issue. Pouyanne said “He said “so there the security conditions, I Think are okay”. (iv) The second issue they are waiting on is human rights within Mozambique. They hired someone to give them a report and they said they would follow his recommendations. We do not see this as any item to hold up the project. Rather it will be just things they will do for the regions. Pouyanne said ‘The two next steps. It varies and because there are some, I would say controversies about human rights about the project around the project, not because of us we inherited that from the Anadarko acquisition. So I want a clear view on these human rights issues, which is a salient issue for me, it’s important, I have given a mission to a specialist of human rights, a very well known Dr in France. Mr. Rufin, who has accepted, He is making his job so I’m waiting to see his report to understand exactly what is, I would say what are these issues. if are things to be done, we will execute the recommendation.” (v) But Pouyanne raised a third issue that we don’t believe was raised before. And we think has the potential to cause a delay to a restart decision. Pouyanne gave a big warning to contractors that they better not have changed their costs. And that he is prepared to wait them out if they have cranked up their costs in the last two years. We have trouble he is saying zero cost change given what has happened in the world in the last two years on inflation and interest rates. And believe he will allow some sort of cost inflation. But even still if he wants no or very little cost increases, we have to believe this causes some sort of delay. Here is what Pouyanne said on costs. “And there is a third step, which I can use this question to deliver is that, of course, we have to reengage with the contractors. And one key condition to restart will be to maintain the costs that we had. if I see the costs going up and up. We’ll wait . We have wait, we can continue to wait and the contractors will wait as well. So I’m not really in this condition to restart don’t.” (vi) And his overall assessment in the Q&A, Pouyanne said ‘So there are the security conditions I think are okay. Human rights and there is a report. Costs, I will need another report from my teams. We will ask them to reengage but smoothly. No*

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hurry. Again I can wait on Mozambique LNG. If costs increase, we will review it. And we'll take the time. So that's where we are on these projects."

A TotalEnergies restart will set in motion 5 bcf/d of Mozambique LNG

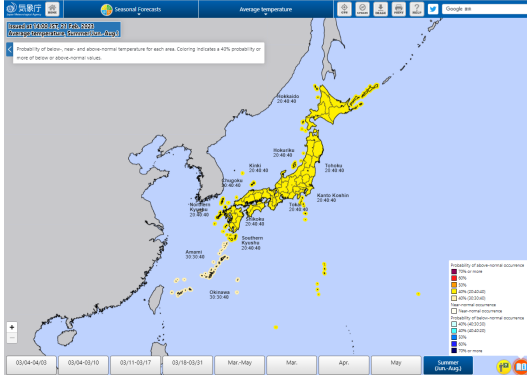
Our Saipem also highlighted the significance of the TotalEnergies Mozambique LNG Phase 1 restart, it sets in motion other linked LNG projects. It is important to remember that a restart of TotalEnergies Mozambique Phase 1 is more than a restart of the 1.7 bcf/d for Phase 1 – it's really sets in motion 5.0 bcf/d of Mozambique LNG. This is why we have highlighting TotalEnergies force majeure on its Mozambique LNG Phase 1 for the past 21 months as the game changing event for LNG markets. TotalEnergies Mozambique Phase 1 at 1.7 bcf/d is significant, but our view has been because TotalEnergies delaying Phase 1 of 1.7 bcf/d is actually leading to a delay of 5.0 bcf/d. This was the reason why, on April 28 2021, we posted a 7-pg blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [\[LINK\]](#) We thought, and still think, there has been a major change to the outlook for LNG supply in the 2020s and one that is still being overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. We saw Total's April 27, 2021 announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d was much more significant that viewed. We just didn't see market focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow, and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022 at the earliest. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We had been warning that Mozambique has a major LNG market impact and its why we posted the April 28 blog. Its also why earlier we said that this is starting the clock running for other LNG projects wanting to go FID to make their mind up ie. like LNG Canada Phase 2."

Natural Gas – Early forecasts call for warmer than normal summer in Japan

We recognize that weather forecasts are far from 100% especially those that look out more than a week or two. However, as we have seen this winter, weather is a huge factor for natural gas prices. Summer weather is less of a direct factor, but is still important. Last week, the JMA provided their first look at summer temperatures in Japan. The Japan Meteorological Agency released its 3-month outlook [\[LINK\]](#) and is forecasting warmer than normal weather throughout the country. .

Japan expects a warmer than normal summer

Figure 12: JMA Temperature Probability Jun - Aug

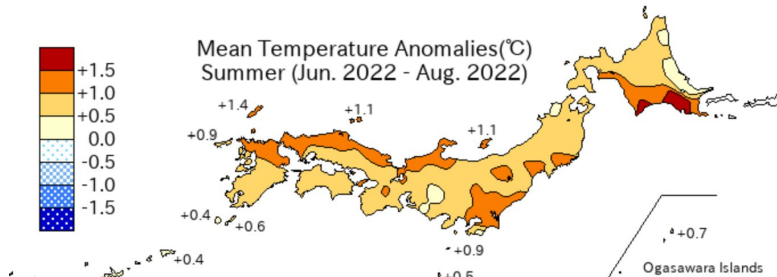


Source: Japan Meteorology Agency

June/July/Aug 2022 was very hot in Japan

Last summer was very hot in Japan. The Japan Meteorological Agency recap of Jun/Jul/Aug 2022 [LINK](#) noted “Seasonal mean temperatures were significantly above normal in eastern and western Japan, and Okinawa/Amami, because warm-air tended to cover the regions through the summer. In western Japan, the temperature was tied for the highest since 1946.” Below is the JMA’s June/July/Aug temperature map.

Figure 13: Japan Temperatures June/July/Aug 2022



Source: Japan Meteorology Agency

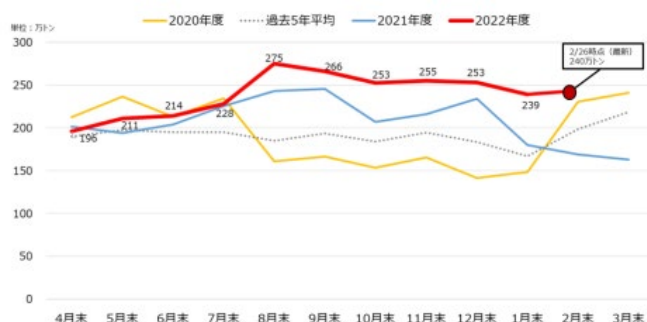
Natural Gas – Japan’s LNG stocks up +3.5% WoW to 115 bcf

We have been highlighting the warm end to Feb and that winter effectively ended and Japan was turning its weather outlook for the upcoming start of Chery Blossom season. The mild Feb led to continued Japan LNG stocks at high levels. The risk of LNG shortages is past. 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 at Feb 26 were ~115 bcf +3.5% WoW from Feb 19 of ~111 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
+3.5% WoW**

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Figure 14: Japan's LNG Stocks



Source: METI

Natural Gas – Vitol CEO “still quite a long way to go to resolve” EU NatGas difficulties

There were a number of oil and natural gas outlook comments from Bloomberg’s interview on Monday with Vitol CEO Russell Hardy. Hardy was another to remind that Europe is still facing challenge for natural gas in 2023. Europe made it thru this winter with consumer savings including forced industrial savings, more LNG cargos freed up with Asia’s mild winter, a mild Europe winter, more coal generation, etc. Vitol is the latest to make this warning. We tweeted [\[LINK\]](#) “1/2. EU #NatGas challenge for 2023. See 📌 transcript. @vitolnews CEO Hardy to @flacqua “still quite a long way to go to resolve some of the [NatGas] supply/demand difficulties”. “consumed ~23% less energy this winter as a result of the weather & people changing”. #OOTT #LNG.” Our tweet included the transcript we made of Hardy’s comments on Europe’s natural gas and power situation this winter, Hardy said “the way I describe the gas situation is you know we are sort of 2-1 up at halftime. There is still quite a long way to go to resolve some of the supply/demand difficulties. This winter, we looked at some statistics. And domestically across Europe, consumers have consumed 13% less energy than they would otherwise have done because they are trying to economize. There’s about another 10% saving coming from the weather. So we’ve consumed about 23% less energy this winter as a result of the weather and people changing. So that’s really helped the supply/demand situation and left us in a much better position at the end of winter”.

Vitol CEO on
Europe #NatGas

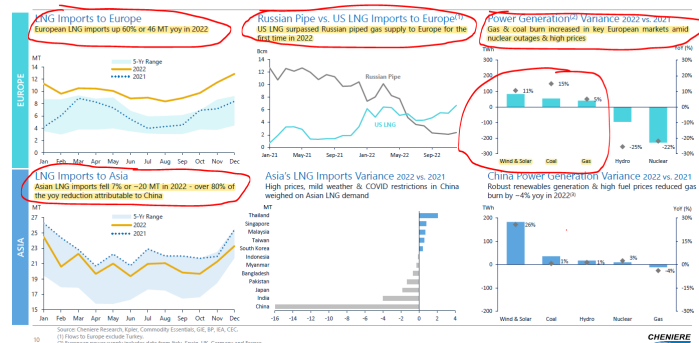
Cheniere, EU’s RUS supply gap 6.8 bcf/d in 2022 up to 10.6 bcf/d in 2023

Vitol CEO Hardy didn’t give many numbers to support his comment that “there is still quite a long way to go to resolve some of the supply/demand difficulties. We tweeted [\[LINK\]](#) “2/2. EU will need more savings, mild winter, more #LNG, etc in 2023 if it keeps cutting off RUS #NatGas. See 📌 look how much RUS #NatGas was delivered to EU in 2022. @Cheniere “supply gap of 70 bcm [6.8 bcf/d] in 2022 but increasing to 110 bcf [10.6 bcf/d] in 2023”. #OOTT #LNG.” Our Vitol tweet had a part two referencing Cheniere’s Europe natural gas outlook for 2023. Last week’s (Feb 26, 2023) Energy Tidbits memo highlighted Cheniere’s challenge for Europe in 2023 for natural gas. Here is what we wrote in the Feb 26, 2023 Energy Tidbits memo. “On its Q4 call on Thursday, Cheniere also highlighted the how Europe was able to get thru this winter without a natural gas outage, but also how Europe faces a bigger challenge in 2023. Cheniere said Europe’s shift from Russia created a supply gap of

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70 bcm (6.8 bcf/d) in 2022 but increasing to 110 bcm (10.6 bcf/d) for 2023. In their prepared comments, mgmt. said “Europe shift away from Russia created an immediate supply gap of approximately 70 Bcm in 2022, which will likely rise to approximately 110 Bcm in 2023. Assuming Russian pipeline supplies are eventually fully curtailed, the gap created of 100 mtpa is equivalent to around 1/4 of the current global LNG market. The magnitude of the supply shock stressed the global LNG market in 2022, resulting in some demand destruction in certain regions during the year.” Below is Cheniere’s graph on how Europe managed thru 2022. Our Supplemental Documents package includes excerpts from the transcript on Cheniere’s Europe natural gas challenge.”

Figure 15: Europe and Asia continued to drive global LNG trade in 2022
Europe and Asia Continued to Drive Global LNG Trade in 2022



Source: Cheniere

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

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. “We have been highlighting how Europe was able to avoid a natural gas crisis because all the cards fell in its favor – mild temperatures in Europe and in Asia, China diversified 50% of its LNG to Europe, demand destruction, increasing coal-fired power, etc. In its LNG Outlook 2023, Shell reminded how Europe is not out of the woods in 2023, rather it is a “multi-year issue”. In the Q&A, mgmt. replied why they see this as a multi-year issue. Mgmt said “my answer was the same that we are not out of the energy crisis in Europe, far from I think. And I would agree with your point that there seems to be some who feel that it’s all back to normal. This is I think a multi-year energy crisis and we all have to collectively figure out how we address that. Why do I say that? I think just looking at some of the fact. So, last year what happened with Russia was roughly 2.5% of global gas demand was taken out because of the reduction in gas supplies from Russia into Europe. That caused havoc in the markets, as you know well. What supported or what bridged the gap? Of course, LNG played an important role, mild weather played an important role and critically demand destruction also played an important role. Let’s take the first one. There isn’t a huge amount of LNG coming into the market over the next two years, it’s around 20 million tons is what we see, but that’s about it. And that one shouldn’t also forget that many of these machines have been running hard now for a good year and you’re beginning to see some of the

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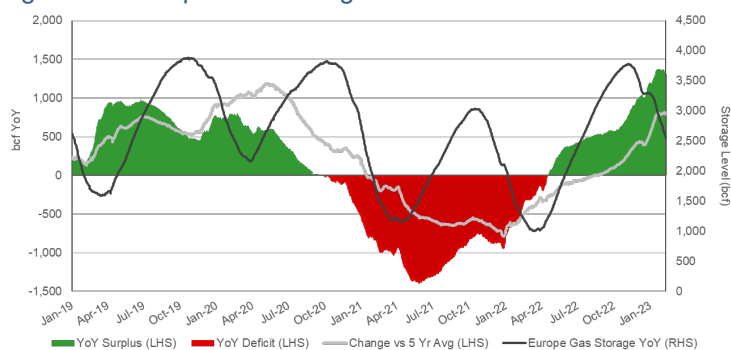
challenges in just the reliability of the machines around the world. So that's, that's an issue. The second issue of course is that China was the one that diversified roughly 50% of its LNG to come here to Europe or 50% of Europe's needs was met with diverted LNG cargoes from China. That might change or is likely to change, given where things are going with the recovery, the economic recovery in China. So you look at that. You don't want to be in a position to be depending on the weather as your savior or the fact that you're going to destroy more demand. And so I do think this is a multi-year issue. We've been very vocal with governments here in Europe that we're going to have to need to move faster. What does Shell do as a result of this? Of course, our portfolio has typically been positioned for Northern Hemisphere winters, that's why we typically have our longs. We, of course, work on significant support in storage. This year or last year, sorry, we invested in storage in Germany and in Austria, which was part of where we used our working capital, for example. We're investing in projects right now. We have peers depressurization that's coming onstream and penguins in the UK. So we have a lot of opportunities to be able to supply the market and of course, create value through the tremendous portfolio that we have in LNG".

Natural Gas – Europe storage is now +31.99% YoY ie. 60.62% full vs 28.63%

The big global natural gas story for the past two months has been it's been much warmer than normal in Europe and in Asia, and that has been a key for why Europe made it through winter without a natural gas shortage. There has been negligible weather driven demand for natural gas, which along with the continued industrial demand destruction, means storage levels are at very high levels. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY and is now a YoY surplus of 31.99%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -2.32% WoW to 60.62% on Mar 1. Storage is now +31.99% greater than last year levels of 28.63% and is +21.46% above the 5-year average of 39.16%. Below is our graph of Europe Gas Storage Level.

Europe gas storage +31.99% YoY

Figure 16: Europe Gas Storage Level



Source: Bloomberg

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Oil – US oil rigs down -8 rigs to 592 oil rigs on March 3

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -8 rigs to 592 rigs as of Mar 3, notably with the more marginal basins such as “Others” down -5 rigs while other slight declines were seen in the Permian and the Haynesville at -3 and -1 rigs respectively. The total US oil rig count is now at 592 rigs, up +73 YoY, +111 from the 2022 low of 481 rigs in January and +420 since the 2020 low of 172 rigs on Aug 14. US gas rigs were up +3 rigs WoW at a total of 154 rigs, an increase of +24 rigs YoY. We expect that US gas rigs will decline over the coming weeks. Below is our graph of total US rigs.

**US oil rigs down
-8 WoW**

Figure 17: Baker Hughes Total US Oil Rigs



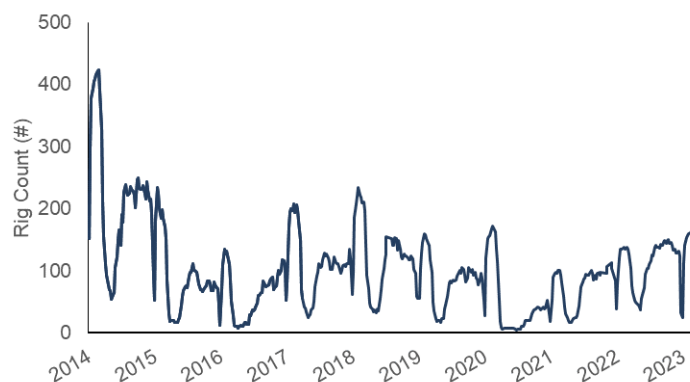
Source: Baker Hughes

Oil – Total Cdn rigs up +2 WoW to 246 total rigs, +30 rigs YoY

The traditional winter drilling season in Canada is about to end and we should start to see large rig declines in the next 2-3 weeks. However, it was very cold in western Canada this week, which should help extend winter drilling another week for those who want to keep drilling. Total Cdn rigs were +2 WoW to 246 rigs as of Mar 3. We previously noted the modest build in rig counts over the last couple weeks was likely due to further clarity on the Blueberry River First Nations and the BC government. Notably, the week of Mar 3 saw a +4 rig increase in AB and a -1 rig decrease in both BC and SK, with all other areas remaining flat. There is now a total of 246 rigs, +105 vs the comparable Covid period of 141 rigs on Mar 5, 2021. Cdn oil drilling rigs have increased to 158, up +24 YoY from 134 rigs a year ago and Cdn gas rigs were up +2 rigs WoW to 88 rigs. Below is our graph of total Cdn oil rigs.

Cdn rigs +2 WoW

Figure 18: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

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

The EIA estimates US oil production was flat WoW at 12.3 mmb/d for the week ended Feb 24 with lower 48 production also flat and Alaska production down WoW. US oil production, based on the weekly estimates, has been mostly range bound between 11.9 to 12.1 mmb/d since the 2nd week of May. But broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 as well as five weeks ago, the first time since it touched 12.2 mmb/d in the 1st week of August. Total US production reached it's highest level since March 13, 2020 on Feb 3, 2023 at 12.3 mmb/d. Lower 48 production was flat WoW at 11.9 mmb/d this week and Alaska was down at 0.445 mmb/d WoW. US oil production is up +0.700 mmb/d YoY at 12.3 mmb/d but is still down significantly at -0.800 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

US oil production flat WoW

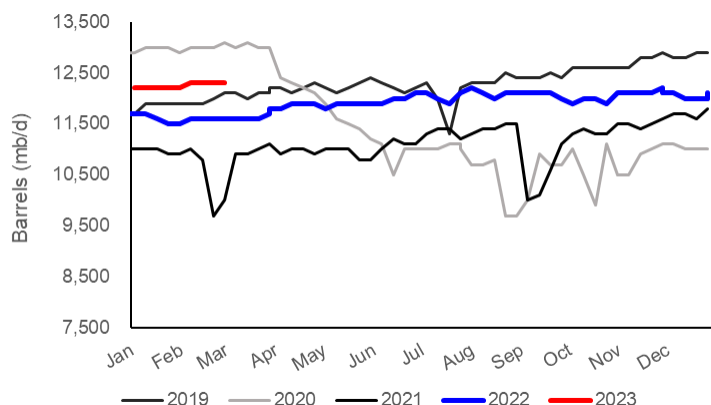
Figure 19: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200	08/12	12,100	08/19	12,000	08/26	12,100		
2022-Sep	09/02	12,100	09/09	12,100	09/16	12,100	09/23	12,000	09/30	12,000
2022-Oct	10/07	11,900	10/14	12,000	10/21	12,000	10/28	11,900		
2022-Nov	11/04	12,100	11/11	12,100	11/18	12,100	11/25	12,100		
2022-Dec	12/02	12,200	12/09	12,100	12/16	12,100	12/23	12,000	12/30	12,100
2023-Jan	01/06	12,200	01/13	12,200	01/20	12,200	01/27	12,200		
2023-Feb	02/03	12,300	02/10	12,300	02/17	12,300	02/24	12,300		

Source: EIA

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Figure 20: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA Form 914: Nov oil prod +0.773 mmb/d YTD, +257,000 b/d vs weekly estimates

There were two key takeaways from the EIA’s weekly US oil production data for Nov – the actuals were 257,000 b/d more than the weekly estimates, and Nov is now +773,000 b/d YTD. There was a moderate MoM decrease in US oil production in Nov. The EIA released its Form 914 data [\[LINK\]](#) on Tuesday, which is the EIA’s “actuals” for November US oil and natural gas production. (i) Form 914 estimates total US oil production was down -40,000 b/d MoM to 12.377 mmb/d in November. The actuals for November were 257,000 b/d higher than the EIA’s weekly estimates that worked out to just over 12.120 mmb/d. October actuals were adjusted higher to 12.417 mmb/d from 12.381 mmb/d in last months Form 914. (ii) One of the growing questions has been how much US oil will grow in 2022. November actuals are 12.377 mmb/d or +773,000 b/d more than Dec 2021; this is lower than October actuals, which were +813,000 b/d more than the year end Dec 2021 average of 11.604 mmb/d.

**EIA Form 914
November**

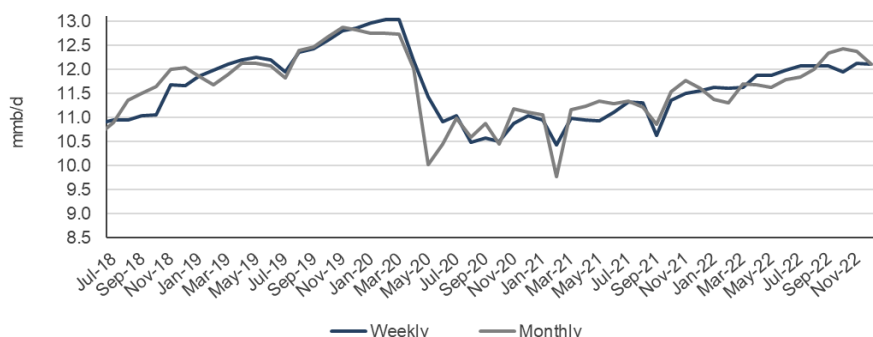
Figure 21: EIA Form 914 US Oil Production

State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	11,369	11,316	11,701	11,668	11,629	11,797	11,844	12,002	12,337	12,417	12,377	12,101
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
2016	9,202	9,066	9,101	8,874	8,835	8,676	8,662	8,690	8,544	8,804	8,903	8,816

Source: EIA

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Figure 22: EIA Form 914 US Oil Production vs Weekly Estimate



Source: EIA

Oil – What % of DUCs will disappoint like Chevron 2018/19 Permian DUCs did in 2022?

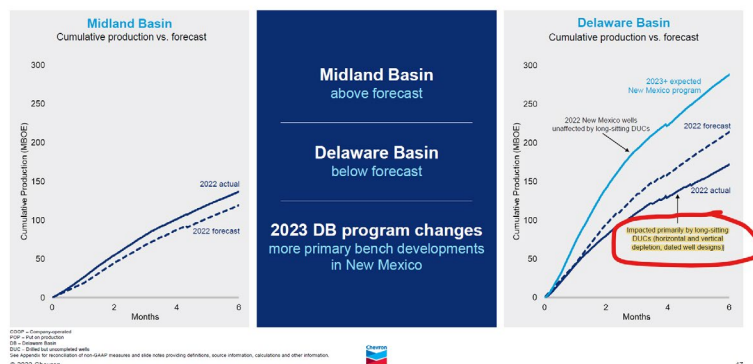
How can US shale oil growth not be less than expected, or certainly way more costly than expected, if the existing inventory of US DUCs (Drilled UnCompleted wells) not only includes wells that are likely to never be completed and also wells that are completed that will deliver significantly less than expected productivity? Maybe industry can make up for these lesser quality older DUCs, but that means growth will be more expensive as more wells will be needed. (i) On Thurs, we tweeted [\[LINK\]](#) “US shale #Oil growth less than expected? 1. Some DUCs were crappy wells & can’t justify \$MM for fracking. 2. Some older DUCs will deliver less results. See 🟡 \$CVX Delaware underperformance driven by older 2018/19 DUCs completed in 2022. Surely this isn’t unique to CVX. #OOTT.” (ii) We have noted many times our view that there will be a percentage of DUCs that will never be completed. These are wells that were drilled that didn’t find enough potential to justify the cost to frack and complete the well. (iii) Prior to Chevron’s statements, we have not put a separate bucket of DUCs that, if and when completed, would be expected to deliver significantly less than expected productivity. (iv) It’s hard to believe Chevron is unique and that other producers won’t have some degree of similar impact as Chevron saying that it’s older (2018/2019) DUCs delivering less than expected results are the reason why Chevron’s overall 2022 Permian wells had lower productivity than planned. Because unless this older 2018/2019 DUCs underperformance was unique to Chevron, it points to US shale growth being less than expected. Chevron included the below graph that showed its less expected Permian well productivity in 2022 was due to a big miss on the Delaware wells, whereas the Midland beat expectations. Chevron graph blamed the significant Delaware underperformance on “Impacted primarily by long-sitting DUCs (horizontal and vertical depletion, dated well designs)”. And then in the Q&A, Chevron said “And I want to point to the basis of design, because these -- the vintage of these wells where many of them were drilled in 2018 and 2019. They built a long inventory of DUCs into 2020, and it was only during 2022 that most of that DUC inventory got worked off.” (v) So unless Chevron’s significant underperformance of its 2018/2019 DUCs is unique to Chevron, it has to raise the question on what percentage of industry DUCs are likely to deliver significantly less than expected productivity. (vi) Please note this doesn’t necessarily

Chevron’s older DUCs disappoint

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Figure 23: EIA Form 914 US Oil Production

Permian COOP well performance 2022 POPs



Source: Chevron

Plus CVX says more single and not multi bench development in the Delaware

Please note that having some percentage of less quality DUCs doesn't mean growth can't be achieved as producers can compensate by spending more and drilling more wells. Similarly, producers can compensate for developing less multi-bench areas in the Delaware developing more single bench areas. It will just cost more. One other Chevron investor day disclosure was CEO Wirth responding "We learn every year in the Permian. It's a great big basin. It's multiple basins. You have the Midland and the Delaware, and then you've got sub-basins within each of those. And there is not one game plan that applies everywhere. It's not a homogeneous geologic setting. There's a lot of heterogeneity. And where single bench may work in one area better than multiple bench, there's other areas where the reverse is the case." CEO Wirth didn't say specifically there will be less multi-bench development in the Delaware Basin, but that seemed to be the inference.

Last week, Cowen said Chevron's Permian wells performance down 25% YoY

The reason why the Permian had a spotlight at the Chevron investor day was last week's Cowen research comment that reportedly said Chevron's Permian oil productivity declined by 25% YoY in 2022. Cowen looked at on an overall Permian Basin perspective and not looking at only the Chevron Delaware Basis. Here is what we wrote in our Feb 26, 2023 Energy Tidbits memo. "We have been saying that US shale oil growth can continue but it will cost more to do so and take longer to reach growth targets. There is a huge question to be addressed at Chevron's Investor Day 2023 on Tuesday – did your Permian well productivity decline by 25% YoY in 2022? If not, by how much did they decline? We don't have access to Cowen's research, but, on Friday, Bloomberg reported "Chevron's Permian Oil Productivity Dropped 25%, Cowen Says. Chevron Corp. is suffering significant productivity declines in its Permian Basin wells and fixing the problem may require raising capital spending, Cowen Inc. wrote in a note. Chevron's well performance in the Permian declined 25% year-over-year, analysts led by Jason Gabelman wrote, citing data from state

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records. Cowen analyzed wells' cumulative production to take into account natural decline rates. The weak performance is driving the stock's underperformance compared with peers this year, Gabelman said. Chevron has declined 10% this year compared with a 4.4% decline in the S&P 500 Energy Index. "We compiled data that shows a marked decline in production curves," the analysts wrote. "Chevron could have to increase spend to account for this." Several operators reported weaker well productivity in 2022 as the basin runs out of top tier locations and producers sample drilling in alternative zones with different methods. Chevron, which holds an investor day next week, said in January that it's changing its drilling plans after discovering some wells were clustered too closely together."

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

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

Oil – Dallas Fed forecasts US shale oil growth in 2023 to be half of 2022 growth

No one should be surprised to see the Dallas Fed Economist expect lower US shale oil growth in 2023. This is in line with the comments from the big shale oil players ie. Chevron. But on Tuesday, Bloomberg reported "US Shale Growth Set to Halve This Year, Fed Economist Says". And "Growth for oil production in US shale basins could slow this year amid labor shortages and supply chain snarls, according to Jesse Thompson, a senior business economist at the Federal Reserve Bank of Dallas. "We see shale output growth could slow to around 300,000 barrels a day this year, which is half of the growth we saw last year," Thompson said at an event in Houston. "Issues with labor shortages and supply chain bottlenecks are plateauing, but still challenging for the industry." Drillers are also having hard time finding enough supplies of equipment and chemicals used to extract oil, he said at the

**Dallas Fed on
US shale oil
growth**

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McCombs School of Business 2023 Business Outlook.” Note this is for “shale” oil growth so won’t include non-shale and GoM.

EIA forecasts US oil production +590,000 b/d YoY in 2023

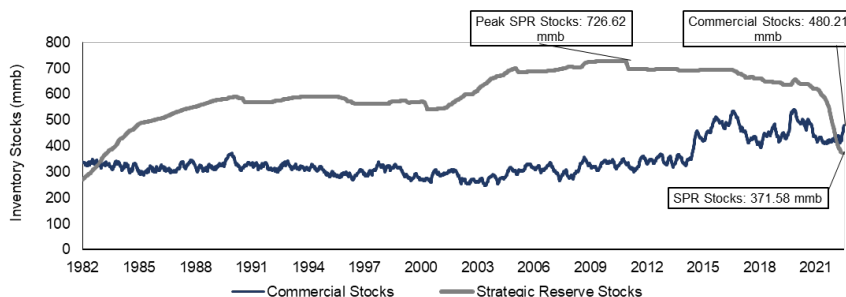
The EIA Short Term Energy Outlook March is being released this week. Its latest STEO is for Feb. The EIA forecasts total US crude oil production is +650,000 b/d YoY to 11.90 mmb/d in 2022. And forecasts +590,000 b/d YoY to 12.49 mmb/d in 2023. But the rate of growth is much smaller when looking at exit 2023 vs exit 2022. The EIA forecasts total US crude oil production to be +200,000 b/d YoY to 12.56 mmb/d in Q4/23 vs 12.36 mmb/d in Q4/22.

Oil – US SPR reserves now -108.628 mmb lower than commercial crude oil reserves

Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit widening again this week due to the build in commercial oil stocks. There were some weather issues but this is also the seasonal period for refinery turnarounds ahead of the switch to produce summer fuels.. The EIA’s new weekly oil data for Feb 24 has SPR reserves at 371.6 mmb vs commercial crude oil reserves at 480.2 mmb. The last time the SPR was down at this level was on Dec 1983 at 371.291 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

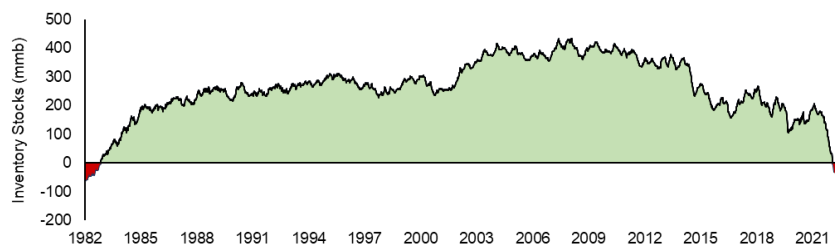
US SPR reserves

Figure 24: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 25: US Oil Inventories: SPR less commercial



Source: EIA

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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

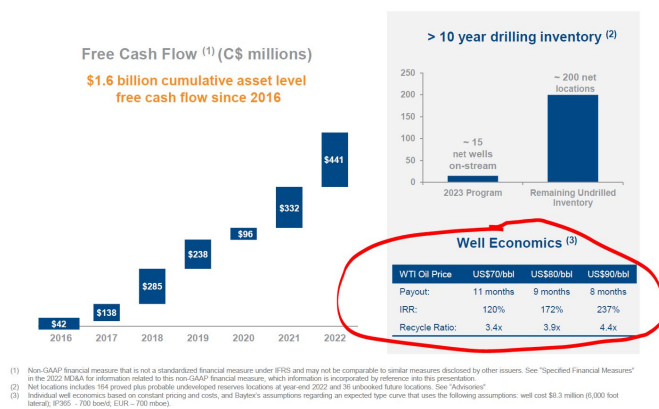
Oil – Clearwater “superior well performance & economics” vs Eagle Ford economics

The big oil patch news on Tuesday morning was Baytex announcing its \$3.4b (US\$2.5b) acquisition of pure play Eagle Ford producer, Ranger Oil. Baytex said they were acquiring 67-70,000 boe/d (87% liquids) of Eagle Ford production. Baytex posted a slide deck on the acquisition, and a separate March investor slide deck. There were slides in the March investor slide deck that caught our attention. Baytex included slides that used to be common for all producers but have dropped by the wayside over the past few years – the IRRs and payout for all of their key plays. No surprise, the IRRs and payout for the Eagle Ford were very strong, but they weren’t as good as the Clearwater oil play. And look at how Baytex described the two plays: “Eagle Ford: Strong Free Cash Flow and Deep Drilling Inventory” vs “Peavine Clearwater: Superior Well Performance and Economics.” The Eag Early Tuesday morning, we tweeted [\[LINK\]](#) “WOW! Clearwater vs Eagle Ford wells. \$BTE C\$3.4b acq of 67-70 mboed pure play Eagle Ford, Ranger Oil, supported by very strong well economics at WTI \$70, IRR 120%, 11 mth payout. Just not as great as BTE’s 11 mboed Clearwater wells, at WTI \$70, IRR 237%, 7 mth payout. #OOTT.” Below are the Clearwater and Eagle Ford well economics from the general March investor slide deck.

Clearwater vs Eagle Ford economics

Figure 26: Baytex Eagle Ford well economics

Eagle Ford: Strong Free Cash Flow and Deep Drilling Inventory



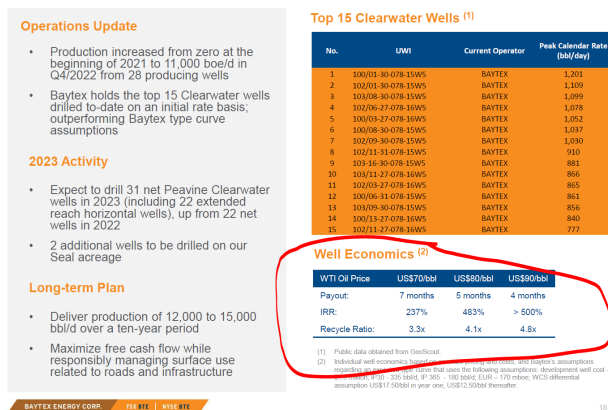
(1) Non-GAAP financial measure that is not a standardized financial measure under IFRS and may not be comparable to similar measures disclosed by other issuers. See “Specified Financial Measures” in the 2022 MD&A for information related to this non-GAAP financial measure, which information is incorporated by reference into this presentation.
 (2) Net locations includes 154 proved plus probable undeveloped reserves locations at year-end 2022 and 36 unbooked future locations. See “Advisories”.
 (3) Individual well economics based on constant pricing and costs, and Baytex’s assumptions regarding an expected type curve that uses the following assumptions: well cost \$13 million (0,000 foot lateral), \$795 – 700 boe/d, EUR – 700 mboe/d.

Source: Baytex March Investor Slide Deck

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Figure 27: Baytex Clearwater well economics

Peavine Clearwater: Superior Well Performance and Economics



Source: Baytex March Investor Slide Deck

Oil – It’s working, CPG multi-lateral No Frack wells have “materially improved returns”

We have been waiting to see what Crescent Point Energy would say on its open hold multi-lateral well in the Viewfield Bakken since the Q3 call on Oct 26. These are the tightly spaced multi lateral wells without fracks. CPG released Q4 and held its Q4 call on Thursday morning and the update was positive. CPG said the wells are working, the multi-lateral wells are leading to material improved returns. CPG wrote that in H2/22, they “began leveraging open hole multi-lateral drilling techniques in the Viewfield Bakken. The Company’s most recent eight-leg wells have delivered strong IP30 rates averaging over 225 bbl/d per well. This innovation has materially improved returns by enhancing estimated ultimate reserves, lowering water cuts and improving capital efficiencies. The Company has identified approximately 150 additional locations with potential for open hole multi-lateral drilling within the play, equating to approximately four years of additional drilling inventory. Crescent Point plans to drill several of these wells in 2023, while also exploring the potential to implement this technique in other areas within its asset portfolio.” The key to this drilling technique is that it will work across many oil plays in Alberta and Saskatchewan. (i) When we saw the release, we tweeted [\[LINK\]](#) “Upside to many Cdn #Oil plays! \$CPG Q4: strong performance from NO FRACK tightly spaced 8-leg wells Viewfield Bakken. Can be applied to other plays. See 📌 SAF Group 10/30/22 Energy Tidbits, applicable & upside to many Cdn plays, advantage to US plays that need fracks. #OOTT.” (ii) Then after seeing the Q4 call Q&A, we tweeted [\[LINK\]](#) “we’re looking at applying this across ALL of our areas” \$CPG in Q4 re NO FRACK tightly spaced multi leg hz wells. This is why highlighted in 📌 SAF Group 10/30/22 Energy Tidbits. it’s applicable & upside to many Cdn #Oil plays and for all size producers. #OOTT.” (iii) Shaunavon oil play. In the Q&A, mgmt. was asked if this drilling technique would work in the Shaunavon. Mgmt replied “Yeah, you bet and the Shaunavon is thicker as well. So maybe instead of just doing multilaterals that our The kind of the same height, maybe we start to access more vertical heights in our reservoirs in Shaunavon, but early days there, it’s a different reservoir different rock, but our teams are looking at it and exciting to try

CPG No Frack drilling is working!

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something here soon.” Our Supplemental Documents includes excerpts from the CPG Q4 call & slides.

Upside to many Cdn oil plays from CPG tightly spaced multi leg no frac wells

Our tweets this week included our Oct comments on why we highlighted CPG’s early indications on this drilling technique ie. we saw it applicable to a wide range of Cdn oil plays and for big and small producers. And it is a drilling technique that should be able to done effectively by every producer, no matter the size. Here is what we wrote in our Oct 30, 2022 Energy Tidbits memo. *“We think its worth noting this “technology” development from that is applicable to a wide range of oil plays for a wide range of Cdn oil producers. This should provide upside to many Cdn oil and gas oil plays. On Wednesday, we tweeted [\[LINK\]](#) “It’s Working! Upside is applicable to many Cdn #Oil plays by small/big producers. See 📈 \$CPG tightly spaced multi-leg horizontal wells without need for fracking cost/execution. Works in Viewfield, looking at Shaunavon & “see if “can apply it throughout our other assets”. #OOTT”. Crescent Point held its Q3 call on Wednesday. This seems straightforward and not any proprietary technology. It’s a simple drilling concept and the reality of the world is, it’s the part of drilling a well (the horizontal section) that would seem difficult to not execute. Afterall, industry has been drilling horizontal wells, especially in SE Sask, since the late 80s. This can be copied easily by any company especially small ones that are disadvantaged by not being able to access the frac spreads. Technology advancements are on plays that we have called for years crappy conventional oil zones that became way better with multi stage frac wells. We don’t think the math will work as well for true shale plays, but, the reality is that most of the “new” oil plays over the past decade are crappy conventional oil zones in Canada and the US. This should make more of any potential recoverable oil reserves economic, extend the recovery factor of these pools by sweeping up more of the pool edges. This will add to reserve values as it makes previously uneconomic oil reserves economic. The concept is drilling multi-leg horizontal wells on a tight spacing without fracking. So it is a drilling cost play. And not a fracking play. Crescent Point is doing it in the Viewfield Bakken and say also the Shaunavon, but there is no reason why the concept shouldn’t work in the other crappy conventional plays. And they also note that they are looking to apply it “throughout our other assets”. Here is what CPG said in the opening statement, and then in the Q&A where they explained it. It’s not huge but we suspect the payouts are very quick. And the other advantage is that it becomes impossible to screw up a well, which could happen with a bad frac job. This is drilling several legs so each leg is an independent well bore. “For example, in our Viewfield Bakken play, we drilled our first multilateral open horizontal well and are now drilling a second based on the success of the first. By adopting a new well design, we have removed the need for fracture stimulation in these multilateral horizontals, expanding the economic boundaries of the play. We also continue advancing our decline mitigation projects throughout our Saskatchewan operations to enhance secondary recoveries and moderate future capital requirements” “Yeah, thanks for the question, Michael. So this is something that our teams have been looking at. Trying to figure out how to expand the economic boundaries of the play as you step out from the core. So with this, I think drilling has - - the drilling technology has gotten so good that -- it’s a little bit cheaper now to attack*

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some of the areas in this play with just drilling instead of having to frac. So these multilaterals are obviously tighter space than our frac wells and if you look at total recovery and initial production from a section under these multilateral wells versus our conventional frac well, you get higher production and higher reserves potentially for lower capital. So we're pretty excited about it. It's early days, 125 plus boe per day per well, and if our production hangs in and it hits our UR estimates, we probably have over 100 or more locations to go and incorporate that into our five-year plan in Viewfield. And we are looking at other areas in our portfolio i.e. like Shaunavon, obviously this area and Viewfield has a little bit better porosity permeability maybe then say Shaunavon does. So early days still, but we will to see if we can apply it throughout our other assets." There was nothing specific in the slide deck."

Oil – Cdn oil differentials narrowed \$1.35 to close at \$15.15 on March 3

Note that we have been expecting to see a normal seasonal narrowing of Cdn oil differentials as normally happens every spring. Two months ago, the WCS-WTI differential was \$26.60 on Jan 6, bounced up and down for a weeks to close at \$23.75 on Jan 27, down the next week to close at \$22.50 on Feb 3, then down three weeks ago to close at \$18.65 on Feb 10, stayed flat for a couple weeks, but then narrowed \$2.00 to close at \$16.50 on Feb 24. This week, it narrowed by \$1.35 to close at \$15.15 on March 3. For perspective, a year ago, the WCS-WTI differential was \$12.30 on March 3, 2022. Below is Bloomberg's current WCS-WTI differential as of March 3, 2023 close.

WCS less WTI differentials

Figure 28: WCS less WTI oil differentials including March 3 close



Source: Bloomberg

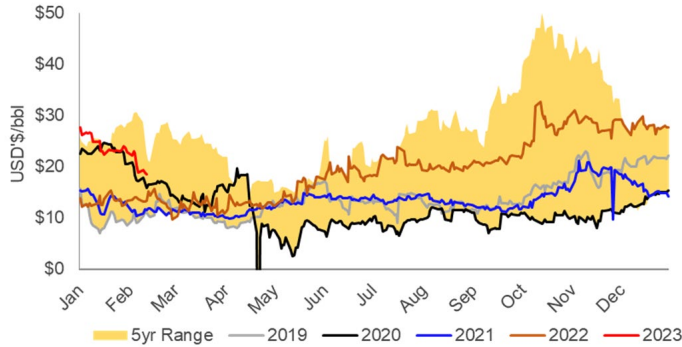
Oil – Moving into normal season narrowing of Cdn heavy oil differentials

Unfortunately, there are often items like Keystone pipeline outage that impact Cdn heavy oil differentials. And the huge item, the release of mostly medium oil out of the SPR. It's not just unplanned events, but there are many items that impact Cdn heavy oil differentials, but we remind that we are just moving into the time of the year that normally sees Cdn heavy oil differentials narrow. This is the time of year, when refineries tend to maximize production of asphalt ahead of the annual summer paving season. As is said in Canada, there are two seasons in Canada – winter and paving season. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials from Feb thru May.

WCS differentials normally narrow in spring

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Figure 29: WCS less WTI oil differentials



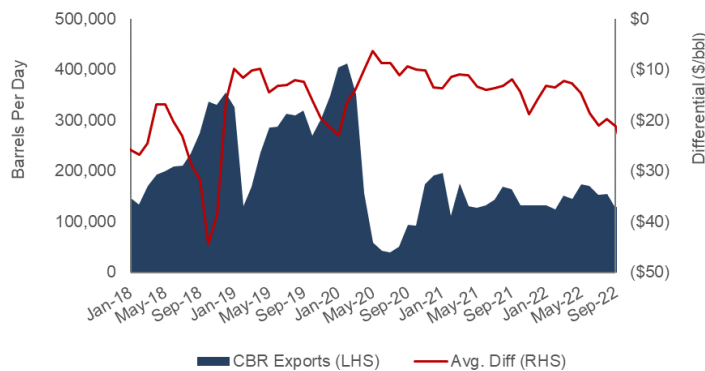
Source: Bloomberg

Oil – Cdn crude by rail exports at 126,198 b/d in December, down -3.8% YoY

Note there is a difference in the data on Cdn crude by rail exports to US in the Cdn vs US data for the month of Dec. 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, at least in the Canadian sourced data. The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were up +4,291 b/d MoM in December to 126,198 b/d vs 121,907 b/d in November [\[LINK\]](#). This puts December export volumes at -5,026 b/d YoY (-3.8%) vs December 2021 of 131,224 b/d. CBR volumes are +87,331 since the Covid July 2020 bottom of 38,867 b/d. December WCS-WTI differentials decreased to -\$27.88, 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 30: Cdn Crude by Rail Exports vs WCS Differential



Source: Canadian Energy Regulator, Bloomberg

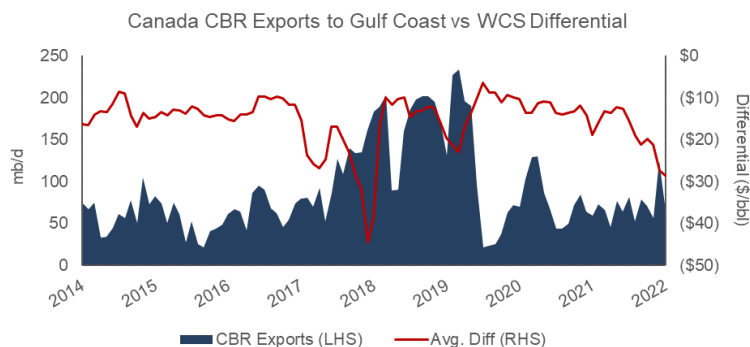
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Oil – EIA est Cdn crude by rail imports down 39% MoM to 70,000 b/d in Dec

As noted above, there was a difference in the US vs Cdn crude by rail to US data for Dec. And the US data was more in line with what we expected given the very cold weather in Dec. The EIA EIA posted its monthly “U.S. Movements of Crude Oil by Rail” [\[LINK\]](#) on Tuesday, which also provided good insight on Canadian crude by rail exports. The EIA estimates Cdn crude by rail exports to the US declined 39% MoM to 70,000 b/d in Dec, down from 116,000 b/d in Nov. This was what we had expected with the cold weather in Dec and not an increase in crude by rail as in the CER data above. Canadian CBR volumes to PADD 3 (Gulf Coast) were 57,000 b/d in December, a MoM decline of -8,000 b/d from 65,000 b/d in November, and down -16,000 b/d YoY vs 73,000 b/d in December 2021. Note that November’s data had a major revision of +26,000 b/d to 65,000 b/d from 39,000 b/d previously. It wasn’t just PADD 3 that saw less CBR flows in December as total Canadian CBR exports to the US fell 39% MoM to 70,000 b/d in December from 116,000 b/d in November. Below is our graph of Cdn CBR exports to the Gulf Coast and WCS differential over time.

Cdn CBR imports to US down in Dec

Figure 31: Canada CBR exports to US Gulf Coast vs WCS differential



Source: EIA, Bloomberg

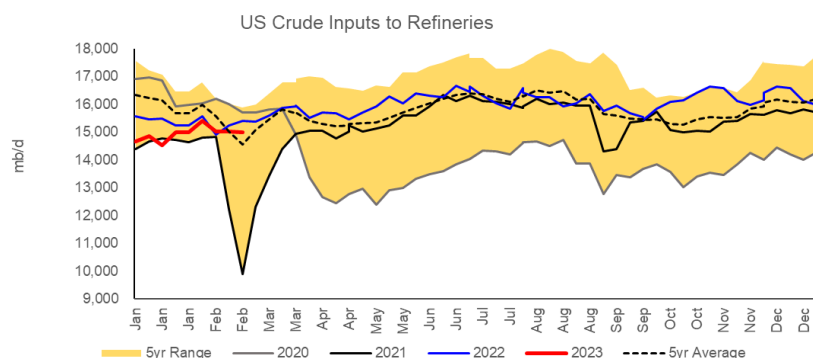
Oil – Refinery inputs down -0.031 mmb/d WoW to 14.979 mmb/d

Refinery crude oil inputs declined slightly again this week. There are always unplanned refinery issues, but we remind Feb/early March is normally when we see refineries move into turnaround/maintenance i.e. crude oil inputs seasonally decline as refineries switch to produce more summer blend fuels. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended Feb 24. The EIA reported crude oil inputs to refineries were down -0.031 mmb/d this week to 14.979 mmb/d and are -0.419 mmb/d YoY from 15.398 mmb/d for the week ended Feb 25, 2022. This week’s refinery utilization was down to 85.8%, which is -0.1% WoW and -1.9% YoY. Total products supplied (i.e., demand) increased WoW, up +0.195 mmb/d to 20.413 mmb/d, and Motor gasoline was up +0.202 mmb/d to 9.112 mmb/d from 8.910 mmb/d last week. The 4-week average for Motor Gasoline was down -0.093 mmb/d YoY to 8.681 mmb/d. The 4-week average of Total demand was down -1.617 mmb/d YoY to 20.117 mmb/d.

Refiners switching to summer fuel blends

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Figure 32: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – US “net” oil imports down -1.150 mmb/d WoW to 0.579 mmb/d

US “NET” imports were down -1.150 mmb/d to 0.579 mmb/d for the Feb 24 week. US imports were down -0.118 mmb/d to 6.208 mmb/d. US exports were up +1.032 mmb/d to 5.629 mmb/d. The WoW decrease in US oil imports was driven mostly by Top 10 with a decrease of -0.093 mmb/d. Some items to note on the by country data. (i) Canada was up this week +0.408 mmb/d to 3.605 mmb/d. (ii) Saudi Arabia was down -0.235 mmb/d to 0.310 mmb/d. (iii) Colombia was down -0.141 mmb/d to 0.143 mmb/d. (iv) Ecuador was down -0.048 mmb/d to 0.097 mmb/d. (v) Iraq was up +0.039 mmb/d to 0.290 mmb/d. (vi) Mexico was up +0.042 mmb/d to 0.725 mmb/d.

US “net” oil imports down WoW

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Dec 9/22	Dec 16/22	Dec 23/22	Dec 30/22	Jan 6/23	Jan 13/23	Jan 20/23	Jan 27/23	Feb 3/23	Feb 10/23	Feb 17/23	Feb 24/23	WoW
Canada	3,795	3,066	3,504	2,949	3,737	3,707	3,419	3,587	3,856	3,556	3,197	3,605	408
Saudi Arabia	317	513	473	479	464	453	433	640	384	262	545	310	-235
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	602	632	581	428	668	909	511	758	913	690	683	725	42
Colombia	248	71	353	357	246	245	244	216	70	143	284	143	-141
Iraq	282	227	289	354	150	201	195	469	230	322	251	290	39
Ecuador	157	70	274	87	137	0	69	243	207	156	145	97	-48
Nigeria	171	136	66	141	143	211	114	317	248	75	256	98	-158
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	5,572	4,715	5,540	4,795	5,545	5,726	4,985	6,230	5,908	5,204	5,361	5,268	-93
Others	1,295	1,104	712	917	805	1,135	920	1,053	1,150	1,028	965	940	-25
Total US	6,867	5,819	6,252	5,712	6,350	6,861	5,905	7,283	7,058	6,232	6,326	6,208	-118

Source: EIA

Oil – Add to reference libraries, Platts periodic table of oil

On Tuesday, we tweeted [\[LINK\]](#) “Great #Platts reference on comparable crudes. reinforce why Mexico’s plan to reduce exports in 2023 and down to zero in 2024/25 is a positive for Cdn #Oil to PADD 3. Cdn WCS API 20.9, H2S 3.57%. MEX Maya API 22, H2S 3.9%. Thx @eklavyagupte.#OOTT.” It’s a good link to bookmark [\[LINK\]](#) as it is an interactive table where you move your cursor over an item and a pop up shows more details such as the full name of the crude, the country of origin, the name of the crude, the production volume, API and H2S. Our tweet referenced WCS and My as it shows how these two crudes are comparable, which is why we highlight Mexico’s plan to reduce oil exports should create more opportunity for WCS in PADD 3 Gulf Coast. Below is the table.

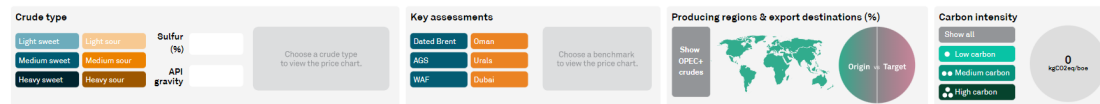
Platts periodic table of oil

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Figure 34: Platts periodic table of oil: The 5th edition

Platts periodic table of oil: The 5th edition

Crude quality and carbon intensity have increased in importance with the energy transition. Below is an interactive chart selected by S&P Global Commodity Insights. It represents the most diverse and key streams in global oil markets. [Click here](#) to learn more about Platts' carbon intensity crude values.



Source: Platts

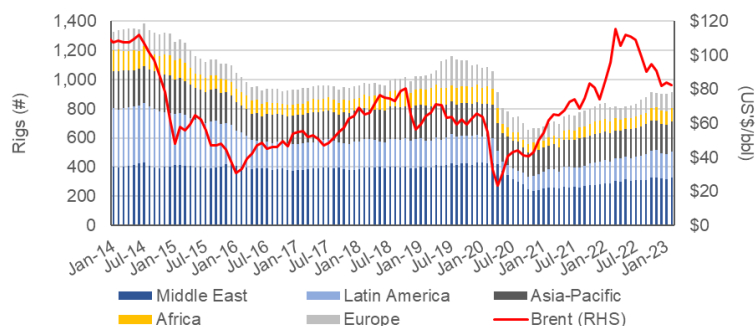
Oil – Baker Hughes International rigs +14 MoM to 915 rigs in February

Baker Hughes posted its monthly update to international rigs on Friday, which showed a large MoM increase in rig counts. Feb's increase is back in-line with the six-month trend of rig net additions seen from May to October. Note International rigs don't normally see a dip during the holiday season like Canada does. (i) Total international rigs increased by +14 rig MoM to 915 rigs in February, and total rigs are now up +109 rigs from the recent low of 806 in April 2022. Feb 2023 is now +102 rigs YoY from 813 in Feb 2022. (ii) Iraq, Columbia and Ecuador had the largest MoM increases of +7 rigs to 62 rigs, +3 rigs to 35 rigs and +3 rigs to 8 rigs, respectively. In contrast, Turkey had the largest decline of -8 rigs to 18 rigs. (iv) February's count of 915 rigs was +13% YoY from 813 in February 2022, but still down -14% vs pre-Covid March 2020 of 1,059 rigs. The YoY rig count is as follows: Africa +13, Asia-Pacific 12, Europe +9, Latin America +28, and the Middle East +40. The North Sea's total count was down +2 rigs MoM with the UK up +1 offshore rig to 11 rigs and Norway also up +1 rig to 17 rigs. (v) Rig counts continue to be solid in the major Persian Gulf countries but remain below pre-Covid levels. Since February 2022, the UAE has added +19 rigs YoY to 53 active rigs in February 2023, while Saudi Arabia added +12 rigs and Iraq added +16 rigs each over the same period. Africa moderately increased its rig count YoY with Nigeria adding +5 rigs and Angola adding +3 rigs. Below is our graph of international rigs by region and avg monthly Brent price.

International rigs +14 MoM

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Figure 35: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg

Oil – Venezuela’s Hugo Chavez died March 5 2013 setting stage for Maduro to succeed

We suspect that many probably think it feels like more than 10 years, but it then Venezuela President Hugo Chavez died on March 5, 2013. Under the Venezuela constitution, there was a special election to elect a President to fill out the remainder of Chavez’s term. No surprise the special election in April led to Maduro becoming Venezuela President as he was VP to Chavez. Maduro was re-elected in the 2018 election..

Chavez died
March 5, 2013

Oil – US says Iran can make fissile material for a bomb “in about 12 days”

We recognize that most don’t seem worried about Israel and Iran, but we have trouble believing Netanyahu will sit by and watch as Iran reaches the capability to make enough fissile material for a bomb, even if they can’t yet make the actual bomb delivery system. On Tuesday, we tweeted [\[LINK\]](#) “Time for #Oil risk premium? Does anyone believe Israel will just stand by & watch Iran keep getting closer to nuclear capability even if they haven’t yet mastered technology to build a bomb. Thx @idreesali114. #OOTT”. Reuters reported [\[LINK\]](#) “Iran could make enough fissile for one nuclear bomb in “about 12 days,” a top U.S. Defense Department official said on Tuesday, down from the estimated one year it would have taken while the 2015 Iran nuclear deal was in effect. Under Secretary of Defense for Policy Colin Kahl made the comment to a House of Representatives hearing when pressed by a Republican lawmaker why the Biden administration had sought to revive the deal, the Joint Comprehensive Plan of Action (JCPOA) “Because Iran’s nuclear progress since we left the JCPOA has been remarkable. Back in 2018, when the previous administration decided to leave the JCPOA it would have taken Iran about 12 months to produce one bomb’s worth of fissile material. Now it would take about 12 days,” Kahl, the third ranking Defense Department official, told lawmakers.” Our Supplemental Documents package includes the Reuters report.

Iran moving
closer on its
nuclear target

Oil – IAEA says an Israel attack on Iran nuclear facilities would be illegal

No surprise, Israel PM Netanyahu came out last night in a televised speech shooting down IAEA Director General Rafael Grossi’s comments that any Israel attack on an Iran nuclear facility would be illegal just like any Russian attack on a Ukraine nuclear facility. (i) Grossi’s Saturday comments. Times of Israel reported [\[LINK\]](#) “The UN nuclear watchdog chief said Saturday after meetings with Iranian officials in Tehran that any military attack on a nuclear facility was illegal. Head of the International Atomic Energy Agency (IAEA) Rafael Grossi was initially referring to Ukraine’s Zaporizhzhia plant, which has come under repeated attack amid

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the Russian invasion, with Moscow receiving increasing military backing from Tehran. However, asked about threats by Israel and the United States to target Iran's nuclear sites, Grossi said that the principle stood for all nuclear facilities around the world. "I think any attack, any military attack on a nuclear facility is outlaw [sic], is out of the normative structures that we all abide by," Grossi said at a press conference in Tehran. "We certainly hope that we are going to be able to protect the nuclear power plant which is under threat now, which is [Ukraine's] Zaporizhzhia," Grossi said. "But this is valid and applicable to every nuclear facility in the world." (ii) Netanyahu's comments last night were carried on nationwide TV. Jerusalem Post reported [\[LINK\]](#) "'Rafael Grossi is a worthy person who made an unworthy remark,'" Israeli Prime Minister Benjamin Netanyahu told the government before its weekly meeting on Sunday. How is it possible, he wanted to know, that the IAEA's concern is that an Israeli attack might be illegal? "Outside of what law?," Netanyahu asked. "Is it permissible for Iran that openly calls for our destruction to defend the instruments of destruction that will slaughter us? Are we not allowed to defend ourselves? Of course, we are allowed, and of course, we do it. "And we do it through discussions or actions that occur around the clock which of course I will not detail here. "I say this because nothing will prevent us from defending this state, and preventing the oppressors from eliminating the Jewish state," Netanyahu said."

Oil – Vitol, market is justified in feeling upbeat & positive about China demand growth

Earlier this morning, Mike Muller, Head Vitol Asia led out the factor why the market is justified about strong Chinese oil demand growth over the balance of 2023. (i) We tweeted [\[LINK\]](#) "Market is justified in feeling upbeat & positive about Chinese demand growth" #Vitol @michaelwmuller. beginning of air travel uptick, economy w/ support of cash-rich central govt, reduced products exports. See 📌 SAF Group transcript. @CristolEnergy @DyalaSabbagh_GI. #OOTT #Oil." Our tweet included the transcript we made of Muller's comments on this bullish oil demand outlook for the balance of 2023. (ii) "Seen the beginning of a reasonable uptick in air travel". He reminded that international travel is only business so far as it is still not possible to travel as a tourist. China is not issuing tourist visas yet or allowing Chinese to go on tourist trips leaving China. This fits to the ramp up in western airlines not happening until Q2. (iii) "There do seem to be some very real policy incentives from provincial governments to start building roads, construction of municipal buildings, etc, etc." (iv) He was in Shanghai in Feb and "The congestion was very much normal and everyone is saying that things are busier. For example, if you go into Shanghai before Covid, they had such a congestion problem that they had to rule out certain number plates on certain days. So when my colleagues connected me from cities outside Shanghai, they had to come into the city the day before because they couldn't have driven into Shanghai to pick me up in their car. So back to normal in that sense." (iv) "But, I think this has led to a sense of optimism, as you said Dyala, in terms of [???] see a surge in Chinese demand. Not just for jet fuel as the Chinese tourists come back and vice versa, but in terms of Chinese economy, with full support of their pretty cash rich central government, consuming more." (v) Also "we are seeing it in terms of reduced exports of petroleum products in stark contrast to Q4 where we had a policy directive for Chinese refiners to crank up their runs and maximize exports in what some people believe was an attempt to improve trade balance at the tail end of the year." (vi) "And now the question is What from Here? It's awfully difficult to read, of course, but that just serves to illustrate that the market is justified in feeling upbeat and positive about Chinese demand growth." (vii) "Most analysts seem to be revising their estimates for Chinese

**Vitol bullish on
China oil
demand growth**

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oil and gas consumption up for the balance of this year. Substantially so, which will make 2023 one of the biggest year-on-year demand growth stories that we've seen. With the big ones being I think 2009 and 2001 or 2 if I remember correctly. In one of those years, just after the turn of the millennium, China grew by 2 million barrels a day of oil demand, year-on-year." (viii) "So the fear of that happening again has the bulls talking their book and suggesting that we could enter a world where spare capacity is in the hands of Russia and Saudi Arabia only. And effectively, that is base case for many people going forward into the second half of the year." Our Supplemental Documents package includes the transcript we made of Muller's response.

Fits Vitol's 12/15/22 call for China demand recovery as soon as Q2/23

It was interesting to hear Vitol's Mike Muller's comments this morning on the timing for China oil demand recovery and it reminded us his timing comments from Dec 15, 2022, when he thought the ramp up in China oil demand could be as soon as Q2/23. We titled our Dec 18, 2022 Energy Tidbits memo "*Is China Pushing to Herd Immunity? If So, Vitol Sees "J" Shaped Recovery in China Transportation Fuels as Early as Q2/23.*" Here is what we wrote in our Dec 18, 2022 Energy Tidbits memo. "*Great food for thought on China's Covid relaxation from Mike Muller (Head, Vitol Asia) in his monthly appearance on the Gulf Intelligence Daily Energy Markets podcast on Thursday. [\[LINK\]](#). (i) China is clearly relaxing its Covid restrictions with the key assumption that Omicron version of Covid is not anymore deadly than the flu. And Muller notes that Covid is spreading quickly. So is China effectively moving to herd immunity strategy near term by letting the less deadly Covid version spread quickly? If so, it means that the next few months should see choppy, up and down non-broad recovery, But if China gets to herd immunity, does it set up "J" shaped recovery in Q2/23? (ii) Early Thursday morning, we tweeted [\[LINK\]](#) "Nike swoosh or J shaped recovery in China demand transportation fuels. See 🍌 Vitol @michaelwmuller inbound international air travel to China as soon as Q2. Freedom of travel + population less scared of Virus = China move faster to herd immunity. @sean_evers @CrystalEnergy. #OOTT." (iii) Our tweet included the transcript we made of Muller's comments. Items in "italics" are SAF Group created transcript. 14:40 min mark. "Covid headlines out of China have all been rather constructive of late. There are clear signs that public policy has shifted towards no longer Zero tolerance and restrictive measures and a realization, that's probably guided by their chief medical scientists, that this particular variation of Omicron that is running thru the population a lot faster, I think if you just go through the small sample of my own colleagues in China, many of them have it right now, they all know somebody in their family or in their close circle of friends that has it and that's across three different cities. So it looks like China is in the process of becoming self immunized if you like by a more liberal policy of allowing the virus to spread in a way that is reasonably contained." 15:50 min mark. "there is a lot more freedom of movement. There has not yet been an edict from central government that the grand migrations for Chinese New Year, where you can get half a billion people getting on trains, cars, public buses and going to their families at Chinese New year is going to be discouraged as was the case for the last two cycles. Chinese New Year falls early and this is going to start around January 7/8. Air travel is up, public transport is being made free of charge in certain cities. China Eastern came out with a headline today they have*

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1,380 scheduled domestic flights that compares to five hundred and forty odd flights on the first of December. The population of China seems less scared of the Virus than was the case just a few weeks ago, and self-immunizing in a way that might happen a lot faster than we think". 17:15 min mark. "... and, as such, it stands a reasonable chance of not suffering the same toll that was the case in many other large countries. So with that degree of confidence in the economy, we have colleagues in China suggesting that international inbound air travel in China could be a reality as soon as Q2 next year, which was not in most people's balances in supply demand predictions going forward. So that gives you a bit of a Nike swoosh or "J" shaped sort of view on demand for transportation fuel in China, notably jet fuel which is the big absent portion of the oil demand barrel. And has people getting quite bulled up for the second half of next year, if not somewhat sooner. But in the near term, of course, one has to be cautious because the public has been conditioned to self-isolate themselves and to avoid getting this virus if they can."

Oil – Vitol: peak oil demand somewhere between 2028 & 2030, oil \$90-100 in H2/23

The big headlines out of Vitol CEO Russell Hardy's interview with Bloomberg were on his view of a tightening oil market and oil in the \$90-100 in the second half of 2023. However, he also highlighted how Peak Oil Demand is creeping sooner. (i) Peak oil demand. On Monday, we tweeted [\[LINK\]](#) "#PeakOilDemand. @vitolnews CEO Hardy "somewhere between 28 & 30" "creeping forward as sustainable energy comes to the fore & people invest in that field " @vitolnews CEO to @flacqua. Didn't say how much demand growth until then? Thx @BNNBloomberg for running interview. #OOTT." Hardy is saying the big push from the IRA, RePower for Europe is pushing big capital into renewables and sustainable energy is having an impact and moving peak oil demand sooner. Our tweet included the transcript we made of his comments. "I think if anything, it has come forward a little bit because if you think about the IRA and think about RePower the EU, there's going to be an enormous amount of investment into renewables and sustainable energy and so that will bring that peak day, which people think is somewhere between 27 and 32. It's very difficult to estimate but we've got it somewhere between 28 and 30. That's creeping forward as sustainable energy comes to the fore and people invest in that field." (ii) \$90-100 oil in H2/23. This is where the headlines were on Hardy's comments. We tweeted [\[LINK\]](#) ""we do expect things to tighten in the 2nd half of the year so i think the prospect of higher prices in the 2nd half of the year in sort of \$90-100 range is a real possibility" @vitolnews CEO Hardy to @flacqua. Thx @BNNBloomberg for running the interview. #OOTT." Our tweet included the transcript we made of Hardy's comments "but in terms of price direction, where we think things are going. In the very long term, investments still needed, in hydrocarbons, because we have decline and we're going to need new sources of production in the future. In the short term, we're quite comfortable at the moment. The market's got a reasonable of stock for the next six months. But we do expect things to tighten in the second half of the year so I think the prospect of higher prices in the second half of the year in sort of \$90 to \$100 range is a real possibility."

Vitol on Peak Oil Demand

Oil – China domestic flights flat again, but passenger load factors up big

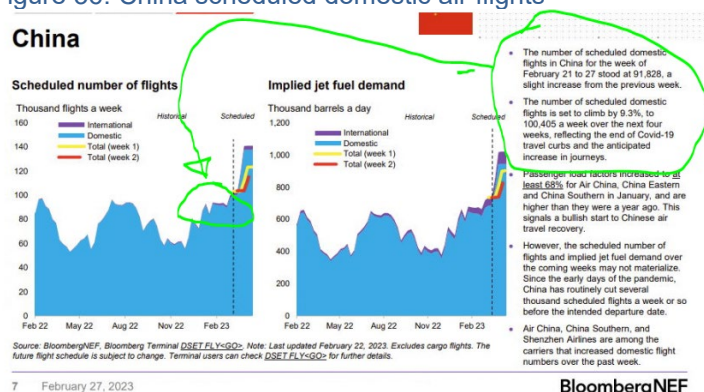
There have now been three consecutive weeks of basically flat WoW changes in China's scheduled domestic flights. It looks like we could see a few weeks of modest growth. But at least from an economic perspective, China continues to see increasing passenger load

China domestic flights

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factors. On Monday, we tweeted [\[LINK\]](#) “3rd wk of basically flat WoW China domestic flights, but passenger load factors to >68%. Feb 21-27: 0.0% WoW. Feb 14-20: -0.5% WoW. Feb 7-13: -0.7% WoW. Jan 31-Feb 6: +10.9% WoW. Jan 24-30: -9% WoW. Jan 17-23: +7% WoW. Jan 10-16: +20% WOW. Thx @BloombergNEF Claudio Lubis #OOTT.” BloombergNEF wrote “The number of scheduled domestic flights in China for the week of February 21 to 27 stood at 91,828, a slight increase from the previous week. • The number of scheduled domestic flights is set to climb by 9.3%, to 100,405 a week over the next four weeks, reflecting the end of Covid-19 travel curbs and the anticipated increase in journeys. • Passenger load factors increased to at least 68% for Air China, China Eastern and China Southern in January, and are higher than they were a year ago. This signals a bullish start to Chinese air travel recovery.” Below is the NEF China scheduled domestic flights.

Figure 36: China scheduled domestic air flights



Source: BloombergNEF

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

There were a number of market comments this week on how international flights to and from China are about to increase. On Friday, we tweeted [\[LINK\]](#) “ICYMI. major western airlines are to ramp up flights to/from china on Q2. #OOTT.” We retweeted an item from last week’s (Feb 26, 2023) Energy Tidbits memo – the ramp up of western airlines in their to/from China flights that starts to ramp up in Q2. The retweet was our Feb 20, 2023 tweet [\[LINK\]](#) “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 Feb 20 tweet referenced the Global Times (China) report [\[LINK\]](#) “Foreign airlines ramp up international flights to China amid rising demand” that recapped the planned schedules return of international flights from KLM Royal Dutch Airlines, Air France, Lufthansa, British Airways and Qatar Airways. Below is the BloombergNEF china international air flights graph per our tweet. Our Supplemental Documents package includes the Global Times report.

Foreign airlines flights to/from China

Oil – 2nd consecutive WoW decline in China traffic congestion

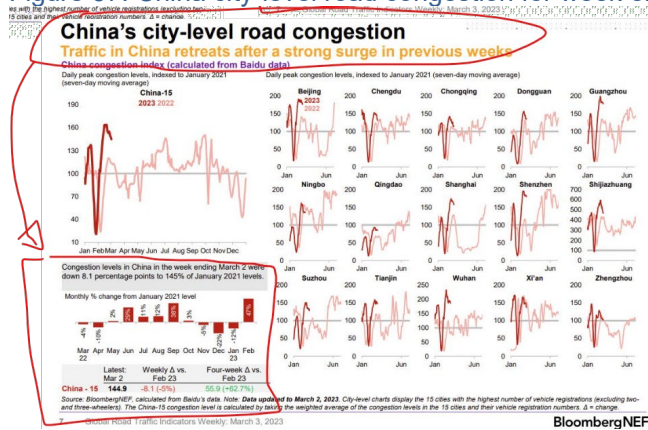
No one can deny that China’s traffic surged in 2023 following the removal of Covid restriction, but with two consecutive WoW decline in traffic congestion, we have to wonder if China has

China’s city road congestion down 8.1% WoW

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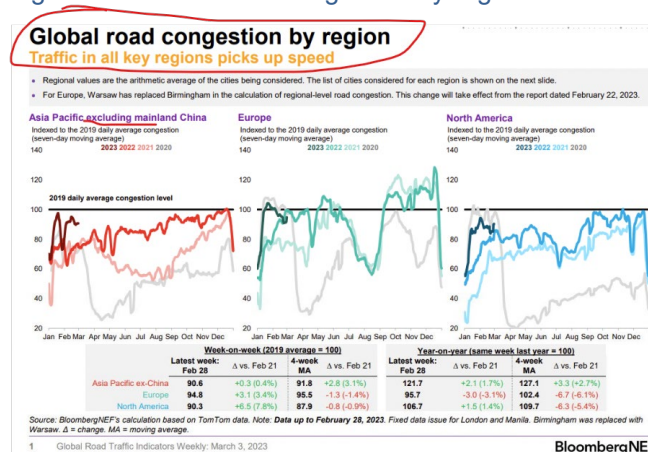
found a general post-Covid traffic level ie. it closed its gap. China traffic congestion surged with the reopening in Jan, but we know have two consecutive WoW declines in traffic congestion. On Friday, we tweeted [LINK](#) "2nd consecutive WoW decrease in China road congestion following huge surge from reopening. -8.1% WoW for wk ending Mar 2 to 145% of Jan 2021 levels. -8.7% WoW for wk ending Feb 23 to 153% of Jan 2021 levels. Thx @BloombergNEF Global Road Traffic Indicators Weekly. #OOTT." BloombergNEF's Global Road Traffic Indicators Mar 3, 2023 described China's city-level road congestion as "Traffic in China retreats after a strong surge in previous weeks" based on the Baidu data for the week ending Mar 2 that estimated China congestion level was -8.1% WoW to 145% of Jan 2021 levels. Our tweet also included the BloombergNEF chart that showed traffic in all key regions were up other than China. Our tweet included the below BloombergNEF graphics on China and global road congestion.

Figure 37: China city-level road congestion for week ended Mar 2



Source: BloombergNEF

Figure 38: Global road congestion by region



Source: BloombergNEF

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BNEF's China Oil Markets Monthly

Oil – BloombergNEF China Oil Markets Monthly “demand surges after reopening”

On Monday, BloombergNEF posted its “China Oil Markets Monthly – Demand surges after reopening”, which is a recap of most every demand indicator for oil in China. BloombergNEF notes that latest update for each particular demand indicator and many of the demand indicators’ latest updates is December data, which is before the China reopening. We tweeted [\[LINK\]](#) “China “demand surges after reopening”, headline from @BloombergNEF China Oil Markets Monthly. Note 📌 snapshot, some of the latest data/indicator updates are for Dec ie. before the reopening. reminds still just now starting to ramp up. Thx @BloombergNEF Sisi Tang. #OOTT.” The key is that the recovery is just now starting to ramp up after the reopening in January. BloombergNEF is bullish and writes “Recovery shows strong momentum • China’s mobility data is showing a strong recovery in activity, painting a positive outlook for oil demand. • The number of vehicles on China’s expressways is consistently 20-30% higher than in 2019, as more people prefer to drive privately. • The road congestion index rebounded sharply in February, rising 47% month-on-month. Subway ridership across major cities has rallied to 110% of pre-pandemic levels, indicating a resumption of mobility activity. • Flight schedules remain high after the Chinese New Year holiday. International flights are set to increase after March as regulators approve schedule plans for the next two quarters.” Our Supplemental Documents package includes excerpts from the China Oil Markets Monthly.

Figure 39: China oil markets monthly snapshot

China oil markets monthly snapshot

Indicator	Value	Change	Last update	Comment
Demand				
Traffic		M-o-M	Y-o-Y	
Road freight volume	603 bin ton-km	+1%	-2%	Dec 2022
Air passenger traffic	31 bin ppl-km	+53%	-25%	Dec 2022
Port cargo throughput	1.37 bin tons	-1%	+3%	Dec 2022
High frequency index		W-o-W	M-o-M	
Road congestion index	153%	-9 ppt	+132 ppt	Feb 23, 2023
Subway traffic index	110%	-0 ppt	+78 ppt	Feb 22, 2023
Flight schedules		Increase	Increase	Feb 15-21, 2023
Refining				
Refinery utilization		M-o-M	Y-o-Y	
State-owned refineries	77%	+4 ppt	-1 ppt	Feb 23, 2023
Independent refineries	66%	+0 ppt	+1 ppt	Feb 24, 2023
Refinery output (monthly)				
Gasoline	11.7m tons	-5%	-13%	Dec 2022
Diesel	19.0m tons	+1%	+16%	Dec 2022
Jet kerosene	3.0m tons	+23%	+32%	Dec 2022
Trade				
Crude imports		M-o-M	Y-o-Y	
National total	11.4m b/d	-0%	+4%	Dec 2022
Selected routes (BBG)	4.4m b/d	-18%	-5%	Jan 2023
Fuel exports				
Quota usage*	97%	(*gasoline, diesel and kerosene only)		Jan-Dec 2022
Gasoline	1.9m tons	+28%	+103%	Dec 2022
Diesel	2.8m tons	+33%	+758%	Dec 2022

1 China Oil Markets Monthly: February 2023

BloombergNEF

Source: BloombergNEF

Oil – Vortexa crude oil floating storage at Mar 3 was 80.36 mmb, -5.85 mmb WoW

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 10am MT yesterday. Note that these estimates get revised over the

Vortexa floating storage

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course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on Feb 28 at 6pm MT. (i) Recall that we did not have a Vortexa item in last week's (Feb 26, 2023) Energy Tidbits memo as we did not see Vortexa Feb 24 estimates until sometime after noon Monday when we checked again at 6pm on Tues. (ii) As of 10am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for March 3 at 80.36 mmb, which is -5.85 mm WoW vs upwardly revised Feb 24 of 86.21 mmb. Note Feb 24 was revised +1.21 mmb vs 85.00 mmb posted on Bloomberg as of 6pm MT on Feb 28. (iii) We have to wonder if the fact there weren't Vortexa estimates posted until sometime between Monday noon and Tues 6pm, instead of the normal Sat morning, led to smaller than normal revisions. All of the revisions for the past seven weeks were relatively modest. The revisions from the estimates posted yesterday at 10am MT vs the estimates posted on Bloomberg at 6pm on Feb 28 are as follows: Feb 24 revised +1.21 mmb. Feb 17 revised +1.06 mmb. Feb 10 revised -0.83 mmb. Feb 3 revised +0.32 mmb. Jan 27 revised +0.74 mmb. Jan 20 revised +1.41 mmb. (iv) There is still a wide range of floating storage for the past several weeks, but a simple average for the past seven weeks is 81.62 mmb, which is unchanged vs last week's 81.61 mmb. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (vi) Mar 3 estimate of 80.36 mmb is -139.92 mmb vs the post-Covid peak on June 26, 2020 of 220.28 mmb. (vii) The below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in Q2/20 as Covid started to have a huge impact. (viii) Mar 3 estimate of 80.36 mmb is +2.12 mmb vs pre-Covid of 78.24 mmb as of Mar 6, 2020. (ix) Mar 3 estimate of 80.36 mmb is -10.46 mmb YoY vs Mar 4, 2022 of 90.82 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 10am MT Mar 4, 6pm MT on Feb 28, and 10am MT on Feb 18.

Figure 40: Vortexa Floating Storage posted on Bloomberg Mar 4 at 10am MT



Source: Bloomberg, Vortexa

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Figure 41: Vortexa Estimates Posted Mar 4 10am MT, Feb28 6pm MT, Feb 18 10am MT

Posted Mar 4, 10am MT						Feb 28, 6pm MT						Feb 18, 10am MT					
FZWWFST		VTXA		Inde		FZWWFST		VTXA		Inde		FZWWFST		VTXA		Inde	
ID	3D	1M	6M	YTD	5Y	ID	3D	1M	6M	YTD	5Y	ID	3D	1M	6M	YTD	5Y
Fr	03/03/2023					Fr	02/24/2023					Fr	02/17/2023				
	Last Px						Last Px						Last Px				
	80364						85002						71255				
Fr	02/24/2023					Fr	02/17/2023					Fr	02/10/2023				
	86212						76893						77614				
Fr	02/17/2023					Fr	02/10/2023					Fr	02/03/2023				
	77948						79385						81021				
Fr	02/10/2023					Fr	02/03/2023					Fr	01/27/2023				
	78563						82671						76527				
Fr	02/03/2023					Fr	01/27/2023					Fr	01/20/2023				
	82986						74775						87680				
Fr	01/27/2023					Fr	01/20/2023					Fr	01/13/2023				
	75517						88329						84266				
Fr	01/20/2023					Fr	01/13/2023					Fr	01/06/2023				
	89737						84190						96303				
Fr	01/13/2023					Fr	01/06/2023					Fr	12/30/2022				
	83830						95841						93975				
Fr	01/06/2023					Fr	12/30/2022					Fr	12/23/2022				
	95522						93537						85571				
Fr	12/30/2022					Fr	12/23/2022					Fr	12/16/2022				
	93295						84879						64145				
Fr	12/23/2022					Fr	12/16/2022					Fr	12/09/2022				
	84626						63772						90452				

Source: Bloomberg, Vortexa

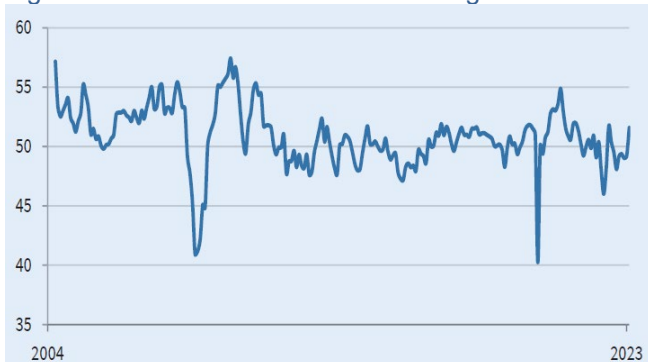
Oil – Caixin PMI increased +2.4 MoM to 51.6 in Feb, greater optimism for year-ahead

On Wednesday, IHS Markit released the Caixin China Manufacturing PMI data for February [LINK] and the index broke above the 50 level for the first time in six months with Feb at 51.6 (vs expectations of 50.7) and up from Jan at 49.2. On February 28 we tweeted [LINK], “China Recovery! China Caixin PMI for Feb 51.6 vs Est 50.7 & Jan 49.2, Dec 49.0, Nov 49.4. Worth a read - looks like across the board positive numbers and expectations. Thx @IHSMarkitPMI. #OOTT. #Oil.” There was a significant shift in tone for manufacturers as expectations for consumer demand growth underpinned the optimistic outlook for the year ahead with business confidence hitting its highest level since March 2021. Production increased MoM, marking the first uptick seen since August 2021 and at the fastest rate since June 2022. Manufacturers cited easing Covid restrictions, a return to more normal business conditions, and growing demand as the main drivers behind Feb’s PMI growth. Feb also saw growth in new business, employment, and purchasing activity following over a year of suppressed activity. The Caixin Insight Group commented, “Optimism continued to improve among manufacturers in February. The reading for their expectations for future output reached a high not seen since March 2021. They expressed strong confidence in a post-Covid economic recovery.”, “In a nutshell for February, the economy saw a faster pace of recovery following a peak in the recent wave of Covid infections as supply and demand expanded, overseas demand surged, employment started to rebound, and logistics recovered at a faster pace. The quantity of purchases also increased, while inventories dropped, and prices remained stable. Manufacturers expressed stronger confidence in future economic activity.” And “Currently, the foundation for economic recovery is not yet solid, and it will take time to fully restore production and social order to normal.” Our Supplemental Documents package includes the Caixin China PMI for January.

Caixin PMI increased +2.4 MoM

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Figure 42: China General Manufacturing PMI



Source: Caixin, S&P Global

Oil – Asian Pacific Airlines Jan air traffic results show passenger demand growth

On Thursday, the Association of Asian Pacific Airlines released its Jan 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. In Jan 2023, Asian Pacific airlines served a total of 17.2mm passengers, which is up +645% YoY from 2.3mm in Jan 2022 with international traffic measured in revenue per passenger kilometers (RPK) up +467% YoY to 67.55b vs 11.92b in Jan 2022. The uptick in regional air traffic resulted in an average international load factor of 81.5% in Jan which is now at pre-Covid levels. In contrast, international air cargo demand measured in freight tonne kilometres (FTK) fell 20.5% YoY in Jan, leading to a -9.7% decline in the international freight load factor to 59.2%. Weak air cargo data was cited to be the result of global economic weakness and export market constraints. AAPA Director General, Subhas Menon commented, *“Notwithstanding the challenges brought on by the global economic uncertainty, growth prospects for passenger markets look positive for the year ahead. The desire to travel remains strong, with latest forward booking trends pointing to sustained high demand. Nevertheless, cost pressures represent a key challenge to airline financial performance, driven by the elevated fuel prices and inflationary pressures on operating expenditure, including labour and maintenance. Overall, Asia Pacific airlines remain vigilant in striving for cost efficiencies whilst restoring flights in the COVID-19 recovery period.”*

Asian Pacific international air traffic

Figure 43: AAPA Preliminary International Air Traffic Data

International	Jan-23	Jan-22	% Change
Passengers (Thousand)	17,205	2,311	+ 644.5%
RPK (Million)	67,548	11,916	+ 466.9%
ASK (Million)	82,915	28,106	+ 195.0%
Passenger Load Factor	81.5%	42.4%	+ 39.1 pp
FTK (Million)	4,561	5,739	- 20.5%
FATK (Million)	7,703	8,328	- 7.5%
Freight Load Factor	59.2%	68.9%	- 9.7 pp

Source: AAPA

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Oil & Natural Gas – CAPP forecasts Canadian upstream capex +\$4.0b YoY to \$40.0b

It will be interesting to do the lookback after 2023 on how much is actually spent in the oil and gas sector in 2023. There are big projects like Trans Mountain expansion and catch up drilling in NE BC looking towards the start up of LNG Canada 1.8 bcf/d Phase 1 that are going ahead. But it is still a wildcard on how low natural gas prices will impact activity. On Wed, the Canadian Association of Petroleum Producers (CAPP) released its forecast for 2023 capital spending [\[LINK\]](#). CAPP expects spending to increase 11% over 2022 to \$40.0b for 2023, surpassing pre-Covid levels and 80% above the Covid low of \$22.0b in 2020. Spending on Canadian energy is rising as U.S. oil prices remain elevated relative to the past seven years. West Texas Intermediate futures are trading at more than ~\$80 a barrel while natural gas down about -30% year-to-date amid concerns about energy security stemming from Russia's invasion of Ukraine. This would mark the third straight year of significant increases in capital spending. \$28.5b of this is expected to be invested in conventional, up from \$21.2bn in 2022 and \$11.5bn is expected for oil sands which is a slight decrease from \$11.6b in 2022. CAPP warns that Canada is still losing market share to other energy producing regions; Canada was formerly viewed as a top tier energy investment region, attracting 10% of total global upstream oil and natural gas upstream development. CAPP expects that Alberta will see the largest increase in spending, being up \$3.5bn to \$28.0bn. Saskatchewan and BC are expected to see \$2.6bn and \$1.0bn of investment in O&G in 2023 while offshore investment in Newfoundland is forecasted to remain relatively flat at \$1.3bn, up from \$1.6bn last year. Lisa Baiton, CAPP President & CEO had this to say, *"The year 2023 may be one of the most pivotal moments in time for Canada's oil and natural gas industry. With an emerging liquefied natural gas export industry, the expected completion of the Trans Mountain pipeline expansion, and billions of dollars in emissions reduction investments waiting to be unlocked, Canada is positioned to play a much larger role in providing responsibly produced energy resources to the world."* Our Supplemental Documents package includes the CAPP release.

**CAPP 2023
Capital Spending
forecast****Energy Transition – Shell CEO “cutting oil and gas production is not healthy”**

There was a great new Shell CEO Wael Sawan interview with The Times, which we believe was right in line with where Sawan was pointing to in the recent Q4/22 call. (i) There were a number of energy transition themes in this interview, which we believe fit where Sawan pointed in the recent Q4 call. (ii) Early Friday morning, we tweeted [\[LINK\]](#) *"Look, i wish it was different but this is the reality" "world will need #Oil & #NatGas for a long time to come. As such, cutting oil & gas production is not healthy" @Shell CEO Sawan to @thetimes. 🟡 SAF Feb 5 Energy Tidbits, Q4 signaled this shift. #OOTT. [\[LINK\]](#)."* (iii) Cutting oil and gas production is not healthy. The Times wrote *"The experience of last year, when Russia curtailed gas supplies sending prices soaring, has shown "the fragility of the energy system when we starve it of the supply that is required", Sawan says. "I am of a firm view that the world will need oil and gas for a long time to come. As such, cutting oil and gas production is not healthy."* (iv) Swan says not the intent to shrink the oil production business. The Times wrote *"However, Sawan's statement stands in contrast to Shell's stated plan for its oil output to decline by 1 to 2 per cent each year this decade, from a peak in 2019. Does the target still stand? "Until advised otherwise," Sawan says, promising to say more at the company's capital markets day in June and making clear that it is under review. "We're reflecting on what is the right guidance to the market." And "When we set that target the context was not, 'I*

**Shell CEO
interview**

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would like to shrink my oil business.’ That was never the intent. The intent of the target was we were just too diluted and we needed to really focus on the core countries that create the majority of our value.” (v) Transition spending has to make money. The Times wrote “‘But there is an onus on our zero and low-carbon energy investments to make money in their own right,” Sawan says. “This is not about one part of Shell subsidising another part of Shell.” (vi) Challenge to get returns in solar and wind. The Times wrote “It is also not about becoming the biggest electricity company, an ambition that Shell floated a few years ago that Sawan says no longer stands: “That’s not our forte.” And “He says it would be short-sighted to judge its renewables efforts purely by solar and wind, where achieving desired returns from standalone projects is “a challenge”, especially in offshore wind where Shell is grappling with supply chain pressures and cost inflation.” (vii) Biofuels, hydrogen and EV charging. This is where Sawan sees the greater energy transition potential. The Times wrote “He sees much greater potential for Shell in biofuels and hydrogen — “a lot of our strengths will sit in green molecules” — as well as in electric vehicle charging, where it has almost 140,000 charge points globally, more than some of its peers are aiming to have this decade.” Our Supplemental Documents package includes the interview.

Q4 call, Shell highlighted upstream, downplayed energy transition

Our Shell CEO tweet this week said he signaled these points in the Q4 call and our tweet included what we wrote on this signaling in our Feb 5, 2023 Energy Tidbits memo. Here is what we wrote in that memo. “European supermajors went all-in on the energy transition and push to renewables so they can’t ever say they are backing away from their energy transition priorities. But, we are seeing is that they are having to down play or slow play the energy transition due to the renewable returns. They just can’t say it directly. Shell ‘s Q4 results and call is a great example. (i) Downplaying renewables. They removed their key slide on accelerating the energy transition and added a new slide on investing purposefully in energy transition. We had hoped some analyst might ask a bit of a cheeky comment in asking how were you investing before? Shell posted the Q4 slides ahead of the Q4 call. No surprise, there were differences vs the Q3 calls slide deck. We tweeted [\[LINK\]](#) “👉 @Shell Q3 v Q4 slides point to #EnergyTransition reality check. Q3/22 slide dropped “Accelerating Energy Transition”. New Q4/22 slide “Investing purposefully in energy transition”. looks like 02/01 tweet on @bp_plc. Positive for #natgas. #OOTT.” (ii) Highlighting oil and gas. It’s bad for the climate change side that Shell down plays the energy transition, but then they have to see Shell highlight its “excellent upstream business” and also tell markets they are looking to add more crude oil production. Prior to the Q4 call, CEO Sawan made the media rounds including with CNBC that clearly indicated, without using the word core business” that upstream oil and gas, LNG and marketing were the cornerstones for Shell and these three businesses will provide for Shell’s hope to help customers on their “journey” to decarbonize. We tweeted [\[LINK\]](#) “See 👉 transcript why @Shell CEO Sawan thinks they can be the winner in #EnergyTransition. “excellent upstream business, a world leading #LNG business & an unparalleled marketing business. And on the back of that ” Positive for 2020s #NatGas #LNG Thx @steve_sedgwick #OOTT.” Here is the transcript we created of Sawan’s full comment “as we look ahead, I think we have a unique opportunity to be able to succeed as the winner in the energy transition. We have a portfolio that I think is second to none. We have an excellent upstream business, a

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world leading LNG business and an unparalleled marketing business. And on the back of that, we hope to be able to support our customers on the journey to decarbonization and towards net zero. My focus will be very much around performance and capital discipline.” (iii) Will be highlighting upstream in the June Capital Markets Day. Sawan’s closing comment before the Q&A was “As we look into the future, longevity of Upstream and our Upstream resource is a key focus area for me and for Sinead, that’s going to be something we focus on. More on exactly how that looks, I think is better discussed in our Capital Markets Day in June 2023 but longevity is a core part of our focus..” (iv) Will add more crude oil production. We think one of the surprises from the Q4 Q&A were Sawan’s comments about adding oil production. In the Q&A, Sawan said “Absolutely. You’ve heard me say earlier as well, we will continue to look at how do we have longevity in our oil business,” Then later in the Q&A, Sawan said “Thanks, Sinead. I’ll answer to the question around longevity. We will go after the most attractive projects that’s come our way. We don’t have any specific restriction where we’re not going to go into oil or into gas. Clearly, we think we have more gas opportunities at the moment because we’re able to add a lot of value. So yes, we are looking at growing our production and gas and you can see it through our efforts on Integrated Gas, for example, what we did last year. On oil, what we’re looking to do is to have a -- just a -- lot -- a much longer period of ability to be able to produce our oil profitably. Simply given where the world is, we continue to believe that oil has a role to play. A big part of what we announced a few years ago was how are we going to be able to move to actually prune the portfolio to high grade what we have as an Upstream business. I think we have done a lot of that, and therefore, what you see right now is a lot more strength and stability in that business, and I’d like to extend that strength and stability into the coming years.”

Figure 44: Dropped slide from Q3/22 call slide deck on Oct 27, 2022

STRATEGY UPDATE
ACCELERATING ENERGY TRANSITION

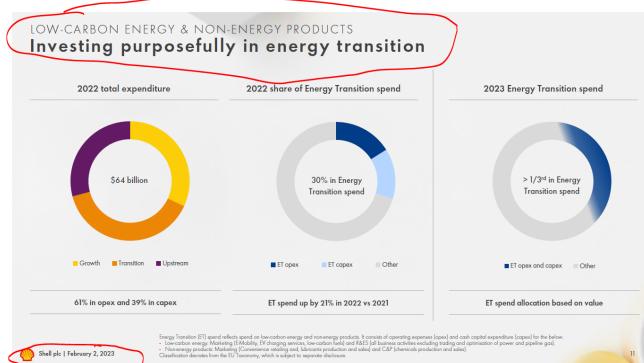
- Announced JV with Foresight to acquire development rights for 370 MW renewables projects in Western Australia, including wind, solar and battery storage
- Completed first road trial in India using new bio-based materials to reduce carbon footprint of asphalt pavements
- Announced JV with Shengery Group to build a network of hydrogen refuelling stations in Shanghai, Shell's first hydrogen refuelling network in Asia
- Announced plans to purchase 100 MW portfolio of new-build solar capacity in the UK from Anesco
- Signed a joint development agreement with AMPR for a proposed battery energy storage system in Wellington, New South Wales. The target capacity of the Wellington BESS is 500 MW / 1,000 MWh, making it one of the largest battery storage projects in New South Wales
- Signed a ten-year agreement to supply marine LNG to ZIM, a container shipping company, with the potential to reduce vessel emissions by 20% vs conventional marine fuels
- Signed MoU for exploring sustainable aviation fuel (SAF) supply with:
 - Lufthansa Group for seven years, at airports across the globe, from 2024
 - Korean Air for five years, at major airports in Asia-Pacific and the Middle East, from 2026
 - Cebu Pacific for five years for the Philippine carrier's operations, from 2026

Shell | October 27, 2022

Source: Shell

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Figure 45: New slide in Q4/22 call slide deck on Feb 2, 2023



Source: Shell

Energy Transition – CPPIB buying California oil & gas fits its 12/15/21 “new” strategy

It looks like many were surprised to see CPPIB’s Feb 28 announcement [\[LINK\]](#) that “agreed to purchase 49% of Aera Energy from IKAV. Created as a joint venture between Shell and ExxonMobil, Aera Energy is California’s second-largest oil and gas producer and accounts for nearly 25% of the state’s production.” Buying 49% of the second largest oil and gas producer in the state that is probably the most against oil and gas! It will be interesting to see how green supporters view this acquisition and what CPPIB plans to do make this oil and gas producer fit with the push to Net Zero. CPPIB said they “and IKAV intend to help Aera balance its energy transition efforts with the need to continue meeting California’s conventional energy demands by investing in a renewable energy portfolio that will power Aera’s existing operations. Over time, renewable power will be deployed across Aera’s land holdings, while selected legacy oil and gas infrastructure will be repurposed to create carbon capture and storage capability.” This isn’t much different than what many oil and gas producers are or are planning to do so it will be interesting to see if CPPIB gets a pass from the green side for something that wouldn’t be enough if it was being driven by an oil and gas producer. Regardless, investors should not be surprised by this move. We tweeted [\[LINK\]](#) “#CPPIB buys 49% of 2nd largest CA #Oil #NatGas producer accounting for ~25% of CA produc

tion. Green investors may not like, but, see 📌 12/19/21 SAF Group Energy Tidbits memo, it’s 100% consistent with CPPIB’s then “new” oil & gas investment approach announced 12/15/21. #OOTT.” Our Supplemental Documents package includes the CPPIB release.

CPPIB’s
California oil
and gas
purchase

Dec 15, 2021, CPPIB announced its “new” oil & gas investment approach

We said no one should be surprised by the CPPIB California oil and gas deal because they changed their investment approach to oil and gas on Dec 15, 2021. We highlighted this change in our Dec 19, 2021 Energy Tidbits memo. Here is what we wrote in that memo. “There was a significant positive to oil and gas investing this week and one that we expect others to follow, and this will lead to more long term investor capital allocation to oil and gas. On Wednesday, CPPIB announced its “new” investment approach in its release “CPP Investments highlights importance of decarbonizing hard-to-abate sectors in addressing climate change”. [\[LINK\]](#) This is a

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significant change for a couple of reasons and one that we have been expecting based on the feedback we hear from long term investors. CPPIB calls it a “new investment approach” including on oil and gas. (i) CPPIB is a leader and is providing the messaging framework that we expect others to follow. Big long term investors like CPPIB have mostly all come out plans on how they taking their investment strategy to Net Zero. But, in discussions, more are realizing the Energy Transition isn’t happening as fast as expected so their challenge is how to slow play their capital allocation to Net Zero. CPPIB provide the messaging on how they will do so. (ii) CPPIB now calls oil and gas a “strategic sector” and one for capital allocation. CPPIB said “helping businesses decarbonize is critical to addressing climate change, according to a recent perspective published by Canada Pension Plan Investment Board (CPP Investments). The perspective, “Investing to enable an economy-wide evolution to a low-carbon future,” highlights the opportunity decarbonization presents for long-term investors, noting the need to address a particularly serious obstacle to decarbonization: strategic sectors that are essential, high-emitting and hard-to-abate. The perspective also outlines CPP Investments’ new investment approach which aims to identify, fund and support companies that are committed to creating value by lowering their emissions over time, consistent with CPP Investments’ time horizon advantage. “High-emitting companies that successfully navigate the economy-wide evolution to a low-carbon future will preserve and deliver embedded value for patient long-term investors like CPP Investments,” said Deb Orida, Global Head of Real Assets & Chief Sustainability Officer. “This new investment approach complements the Fund’s ongoing commitment to investing in companies that have the potential to develop innovative climate technologies around the world and furthers our existing capabilities in technologies that enable the energy evolution.” Strategic sectors that are essential, high emitting and hard-to-abate within this investment approach include agriculture, chemicals, cement, conventional power, oil and gas, steel and heavy transportation. The successful decarbonization of these sectors is not only essential to meet wider net-zero ambitions, but also to sustain economic growth, stability and a responsible transition.” Our Supplemental Documents package includes the CPPIB announcement.”


Dec 21, 2021, Norway’s wealth fund also changed it oil and gas investing

There was another high-profile pension fund that changed its oil and gas investment approach before Xmas 2021. Pre-Xmas announcements are like press releases or government announcements on Friday afternoons before long weekends – they are issued then to minimize coverage. But on Dec 21, 2021, Norway’s wealth fund followed CPPIB in changing their investment stance on oil and gas. Our Dec 26, 2021 Energy Tidbits memo was titled “*Norway’s Wealth Fund is Another Major Investor, Like CPPIB, to Keep Investing in Oil & Gas Stocks.*” Here is what we wrote in that memo. “*Last week’s (Dec 12, 2021) Energy Tidbits highlighted our #1 2022 prediction that more Energy Transition leaders (politicians and capital providers) will come out of the closet and admit (most indirectly) that they need to change their energy transition plans as the energy transition is taking longer, be bumpy and will cost more. On Dec 9, we tweeted [\[LINK\]](#) “Time for #2022Predictions. My #1 is more #EnergyTransition #NetZero leaders come out of closet, have a #MacronMoment ie. have “transition” not self inflicted shortage so 2021 energy crisis isn’t every year. A*

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return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT.” A #MacronMoment can take three forms. (i) A direct #MacronMoment clearly saying it isn't working as planned. We aren't picking on Macron, but he recently said it the clearest when he warned the energy transition aspiration has to be modified/reduced or else there will be years of an energy crisis. The day before COP26 started, we tweeted [\[LINK\]](#) on Macron's comments to the FT [\[LINK\]](#) that was a clear view on higher fossil fuel prices for the foreseeable future. Macron said “on demand for fossil fuels isn't going away for the foreseeable future. Macron said “What is happening now is ironic, because we are building a system where in the medium and long term fossil energy will cost more and more, that's what we want [to fight climate change].” he said.” Japan is another calling for a pragmatic time frame ie a change in the plan. (ii) Japan now says must have a “pragmatic time frame” for decarbonization. No one should be surprised to see how Japan says their #MacronMoment. They use Japan-speak for the energy transition aspirations plan isn't working and needs to be changed. On Nov 9, we tweeted [\[LINK\]](#) on Japan's release [\[LINK\]](#) on its conference with IEA Executive Director Faith Birol. Japan wrote “The two sides also exchanged views on acceleration of decarbonization efforts following COP26, and shared the importance on measures with pragmatic time frame based on individual circumstances that each countries face including its renewable energy potentials”. A pragmatic time frame or a go slow process, whatever you want to call it, it means the same thing – Japan doesn't want to get rid of fossil fuels too quickly. (iii) The US doesn't say its isn't work, just that there will be higher energy costs for years to come. US Energy Secretary Granholm has shown the third way of admitting the energy transition plan isn't working. She avoids saying the plan isn't working or needs to be changed, just that she puts on the record that high energy costs are here for years. We tweeted on her comments on MSNBC Morning Joe and created a transcript of her saying “So the long term strategy is that. and yes we have a short term cost issue because the economy is still coming back on. we have a supply, demand that does not, the supply doesn't meet the demand. that is an issue we are going through. The president is all over this both in the short term and in the long term. Our Supplemental Documents package includes the Norway wealth fund announcement.

Energy Transition – BP CEO reiterates its recent changed transition growth priorities

BP CEO Bernard Looney spoke at International Energy Week on Tuesday. We only saw the 2:16 min clip posted by Gulf Intelligence [\[LINK\]](#) and Looney reinforced some of the key themes from the recent BP changed transition growth strategy in his comments on the outlook to 2030. (i) Our tweet [\[LINK\]](#) was limited to two of Looney's key points “See  transcript, @bp_plc CEO looking to 2030. Hydrogen is still at "hopeful" stage that can take to scale in 2030s. "we need investment IN today's systems [#Oil #NatGas] AND we need to invest in accelerating the #EnergyTransition". Thx @gulf_intel for posting interview! #OOTT.” (ii) Not sure everyone “believes” this. Looney said “so we will have new arms to our company. we will still be producing oil and gas because all of us, I think, understand and believe will still me needed”. (iii) Reminds that hydrogen is at best a long term business. Looney said “we'll hopefully have a hydrogen business that we can take and scale in the 2030s”. We don't know the odds, but Looney saying “hopefully”, it seems like a long shot at best. (iv) This is the big pivot BP made in their transition growth strategy made a month ago where they came out with the revised transition growth strategy that led investors back to

BP CEO on its transition growth strategy

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them that they needed to grow oil and gas. Looney said *“that’s what the world needs. It needs companies that can do the AND bit. All too often, I think as Chris said, we put ourselves in camps. We actually need AND not OR. We need investment IN today’s systems AND we need to invest in accelerating the energy transition. That’s our strategy. That’s how we become an integrated energy company”*.

Feb 7, BP ramps up oil and gas capex in transition growth strategy update

Here is what we wrote in our Feb 12, 2023 Energy Tidbits. *“No one was surprised (thanks to the WSJ report last week) to see BP come out with a big change in strategy along with their Q4 results on Tuesday. BP issued a separate press release strategy update that announced a major increasing oil and gas expenditures, production and EBITDA. No surprise, the Twitter comments were on what BP name stood for. It’s original was British Petroleum that changed to mean Beyond Petroleum and now it was considered Back to Petroleum. Needless to say the climate change side was not impressed. (i) Early Tuesday morning, we tweeted [\[LINK\]](#) on what we thought were the three big changes to their energy transition and corporate strategy. “#BP strategy “UPDATE” ie. wasn’t working increasing #Oil #NatGas to add \$2b EBITDA in 25, \$3-4b in 30. investing more in higher return bioenergy & convenience & EV charging has visible EBITDA growth to add \$1b in 25, \$2b in 30. lowest return wind is “longer term” build. #OOTT.” (ii) Increasing oil and natural gas capex and production. This was the a big about face for BP and the key reason for why they are now forecasting a big increase in EBITDA to 2030. Our tweet included their key graphic on how BP is going to invest an addition \$1b per year in oil and natural gas and they expect this to generate an additional EBITDA of ~\$2 in 2025 and \$3-4b in 2030. Pretty impressive returns. (iii) The second key change was that they were changing their capital allocation priority for energy transition items with a focus and investing more into higher return Bioenergy and Convenience & EV charging. But at least they see an increase to EBITDA by spending more in these areas, just nowhere near the additional EBITDA growth from oil and gas. (iv) Less of a priority on offshore wind, which is their lowest return area and BP now calls a “longer term” build. (v) Our Supplemental Documents package includes excerpts from the BP strategy update and slides.”*

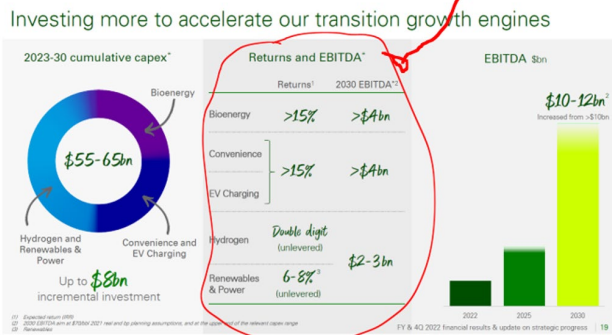
BP doesn’t use comparable returns for oil and gas vs energy transition items

Here is another excerpt from our Feb 12, 2023 Energy Tidbits on BP’s updated transition growth strategy. *“We understand that BP doesn’t want to show the energy transition priorities have a hugely lower returns than oil and gas, which must be the reason they don’t use comparable returns. BP highlights the expected returns for transition growth engines such as >15% for bioenergy, >15% for convenience and EV charging, double digit (unlevered) for hydrogen, and 6-8% unlevered for renewables and power. But, for oil and gas, it notes the “investment hurdle rate” of 15-20% as if to imply this is the expected return. . The hurdle rate is not the expected returns, it is the minimum expected return for bp to approve an investment in oil and gas ie. the expected returns are higher. But given that BP is increasing investment in bioenergy, convenience & EV charging by \$1b a year (the same increase for oil and gas), but the expected added EBITDA is about half as for oil and gas, it’s pretty clear that the oil and gas 15-20% hurdle rate will actually turn into*

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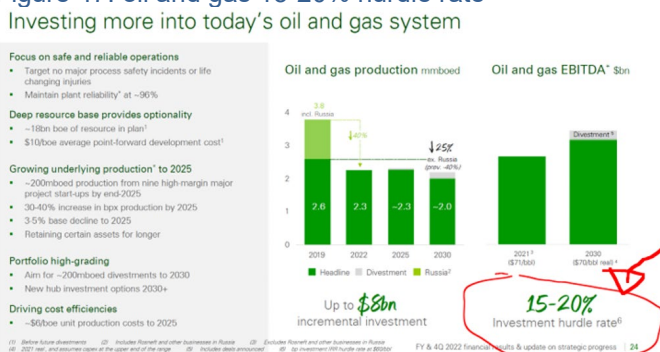
expected returns way way higher. We just don't know why companies don't provide investor with comparable metrics."

Figure 46: Expected returns from transition growth engines



Source: BP

Figure 47: oil and gas 15-20% hurdle rate



Source: BP

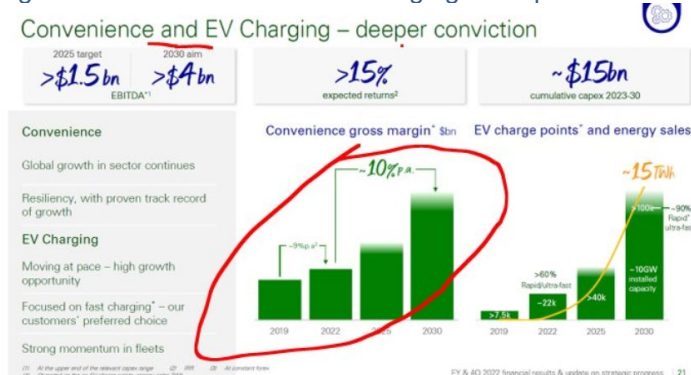
BP's grouping of convenience & charging makes sense

Here is another excerpt from our Feb 12, 2023 Energy Tidbits memo. *"BP talks about convenience & EV charging, which makes sense linking the two because they do go hand U& hand. We tweeted [LINK](#) "Here's why @bp links gas stations & EV chargers, and why forecast increasing convenience store margins with increasing chargers. See 📌 11/02/21 tweet. #EV drivers are captive shoppers during charge time so can spend on high margin coffee, etc. like theatres and popcorn #OOTT." BP has previously noted how EV chargers lead to sales of higher return items because they get people with time on their hands to spend money on higher margin products like coffee. We put in our tweet it's kind of like going to a movie. The cost of the movie ticket basically covers the cost of the movie and where the theaters make the money is selling popcorn and soft drinks. Our tweet forwarded our Nov 2, 2021 tweet on BP's Q3/21 call and management's comment on this very point of linking EV charging to convenience. Our tweet said "Reminder why gas stations don't want EV*

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charging too fast. @BP CFO notes fast EV charging can be double the ICE fill up time, "hopefully, they come in, & they get a nice cup of Wild Bean coffee & a sandwich, & then that will certainly enhance those returns". Thx @business #OOTT." Our Nov 2, 2021 tweet included the BP CFO's full comment "and if you wanted to measure returns, the general stat we hold s if you get 10% utilization on a fast charger, you'll make a 10% return. That's just the pure electrons themselves. Of course, this is not just about the electrons, it's about the convenience as well. And hopefully, they come in, and they get a nice cup of Wild Bean coffee and a sandwich, and then that will certainly enhance those returns."

Figure 48: Convenience and EV Charging – deeper conviction



Source: BP

BP focus away from offshore wind reminds more natural gas will be needed

Here is another excerpt from our Feb 12, 2023 Energy Tidbits memo. "We also tweeted [\[LINK\]](#) "More #NatGas will be needed for longer. bp's focusing on bionergy & convenience/EVs doesn't replace #NatGas for power generation. #OOTT." BP's initial big push in its energy transition was in offshore wind, which is now being pushed to back burner being replaced by bioenergy, convenience and EV charging. Having a lesser priority for offshore wind means a lesser priority in producing renewable energy for electricity, which means that there is more of a need for natural gas for electricity generation.

WSJ last week "BP's CEO plays down renewables push as returns lag"

Here is another excerpt from our Feb 12, 2023 Energy Tidbits memo. "It looks like WSJ did have a good scoop last week on BP downplaying items like offshore wind. Here is what we wrote in last week's (Feb 5, 2023) Energy Tidbits memo. "It sounds like BP will be following a similar path as seen in the Shell Q4 call in playing down or slow playing in some way their push on renewables driven by the lack of returns. Shell didn't specifically say the renewable returns can't be attained, but said on multiple times that returns have to meet acceptable levels. The concept is the same. The question will be how do they message this change. These European supermajors can't back away from any climate pledges so will have to say this in an indirect way. These supermajors went into renewables, in particular offshore wind,

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knowing the expected returns would be much less than oil and gas and refining. Fortunately, they have had the benefit of high oil, natural gas and LNG prices to fund this push into renewables. We expect BP will be taking a similar tact when they release Q4 results on Tuesday morning and we have to believe they will be playing down their renewable push, much like their UK peer Shell did this week. And there should be multiple analyst questions in light of the WSJ's Wednesday exclusive report "BP's CEO Plays Down Renewables Push as Returns Lag: Bernard Looney seeks to sharpen strategic focus, with less emphasis on environmental goals." [\[LINK\]](#). We don't believe the WSJ would go out with this type of exclusive if they didn't have good sources. WSJ wrote "Chief Executive Bernard Looney plans to dial back elements of the oil giant's high-profile push into renewable energy, according to people familiar with recent discussions. Mr. Looney has said he is disappointed in the returns from some of the oil giant's renewable investments and plans to pursue a narrower green-energy strategy, the people said. He has told some people close to the company that BP needs to do more to convince shareholders of its strategy to maximize profits in areas where it has a competitive advantage, including its legacy oil-and-gas operations. In some of the conversations, Mr. Looney has said he plans to place less emphasis on so-called ESG goals—a catchall term for environmental, social and governance—to help clarify that those aren't distracting the company from its ability to deliver profits, the people said. Mr. Looney, the people said, is casting the moves as a modest short-term course correction rather than a major strategic pivot for the 114-year-old company."

Energy Transition – Global EV sales collapse as subsidies come to an abrupt end

It looks like we are seeing the first real test for EV manufacturers and to see if they will follow Tesla in making big price cuts. EV cars are expensive, but they aren't too expensive for higher income people even if there aren't subsidies or tax credits. The challenge for EVs has been to get more lower and middle-class income buyers. Price matters especially if people have to take a car loan out in the higher interest rate environment. On Wed, Rystad Energy posted its press release [\[LINK\]](#) "EV sales collapse as subsidies and tax credits come to an abrupt halt." Rystad wrote "The global electric vehicle (EV) market is reeling from one of the most dramatic collapses in monthly sales to date, with Rystad Energy research showing that only 672,000 units were sold in January, almost half of December 2022 sales and a mere 3% year-on-year increase over January 2022. The EV market share among all passenger car sales also tumbled to 14% in January, well down on the 23% seen in December. EV sales have been on a relatively consistent upward trajectory in recent years – aside from periods impacted by Covid-19 pandemic-related supply chain issues – and a significant collapse in sales is worrying news for the industry. Tax credits and government subsidies have propped up the EV market to date as countries identify passenger car fleet electrification as a core tactic for meeting net-zero emissions goals, but the reduction or removal of these subsidies this year has dampened consumer sentiment. Automakers are now scrambling to reverse the downward spiral and salvage the market in 2023. The automotive market is usually cyclical, with sales taking a hit after new subsidy rules come into effect at the start of each year, followed by a gradual recovery. However, the cuts in January this year hit harder than normal, triggering this dramatic collapse. The ramifications of this will be long-lasting and will impact sales through the first quarter of the year and potentially the rest of 2023." It seems pretty simple – abrupt end to many EV subsidies and tax credits leads to a collapse in sales.

China cutting EV subsidies

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Rystad also noted how some sales were moved forward into Dec so buyers could take advantage of incentives before they stopped. What caught our attention was Rystad seeing the ramifications being “long-lasting” and “will impact sales through the first quarter” and “potentially the rest of 2023.” It’s why, on Friday, we tweeted [LINK](#) “#EVs “sales collapse as subsidies & tax credits come to an abrupt halt”, “the ramifications of this will be long-lasting & will impact sales through the first quarter of the year and potentially the rest of 2023”. #EnergyTransition will take longer. Thx @RystadEnergy. #OOTT #Oil.” Our Supplemental Documents package includes the Rystad release.

China EV subsidies to 30% in 2022, down to zero in 2023

We have been waiting to see how China EV sales would be impacted in 2023 for over a year. Rystad highlighted the big MoM drop in China EV sales in Jan was in line with a 50% MoM decline. Rystad wrote “China, the largest EV market globally, experienced a near 50% cut in EV sales in January 2023 compared to the prior month, but the year-over-year change was relatively flat due to the affinity of consumers for cheaper domestic-made models. The Chinese Association of Automotive Manufacturers forecasts a slowing of sales momentum this year, predicting around 8 million EV sales this year.” Here is what we wrote in our Jan 2, 2022 Energy Tidbits memo. “It’s hard for anyone to not accept that EVs are here and growing. We certainly do, it’s a question at what rate of growth and what that means to the impact on oil consumption. There should be a good test of the resiliency of EVs growth in 2022 and 2023 in China, who is the global leader in EVs. China is reducing the subsidies on new energy vehicles in 2022 and eliminating them in 2023. This should be the test of the maturity of the market and how subsidies will impact EV sales growth. On Friday, we tweeted [LINK](#) “Good test for #EVs sales in 2022 & 2023. China is the global EV leader. China Finance Ministry is reducing new energy vehicle subsidies in 2022 by 30% vs 2021, and then down to zero subsidies in 2023. #OOTT.” On Friday, China’s Ministry of Finance posted “Interpretation of the “Notice of the Development and Reform Commission of the Ministry of Industry and Information Technology of the Ministry of Finance on the Promotion and Application of New Energy Vehicles in 2022.” [LINK](#) that noted China’s subsidy policy for new energy vehicles “will continue to decline in an orderly manner in accordance with the established arrangements to create a stable policy environment.” The MOF then stated “According to document No. 86 of Caijian [2020], the subsidy standard for purchase of new energy vehicles in 2022 will be reduced by 30% on the basis of 2021” and “the “Notice” clarifies the purchase of new energy vehicles on December 31, 2022 The subsidy policy is terminated, and vehicles with a license after December 31 will no longer be subsidized.”

Energy Transition – “EV charging during peak hours now comes with premium price”

We were a surprised to see the Bloomberg report on Friday “EV Charging During Peak Hours Now Comes With Premium Price: BNEF” because we just assumed that EV chargers would be no different than home electricity consumers and pay a premium price during peak hours. But, that apparently has been the case so far. Rather, Bloomberg reported “Companies offering public electric vehicle charging in the US and Europe have introduced increased prices for periods of high demand to incentivize drivers to charge outside peak hours. It now costs more to charge between 4 p.m and 9 p.m., coinciding with peak electricity prices and

**Public EV
charging during
peak hours**

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demand across the grid. Grid operators raise costs to use the network at peak times to recoup some of the required grid investment costs stemming from higher utilization. Yet, higher prices dissuade further peak demand and the need for grid upgrades, while also reducing queuing for drivers.” Our Supplemental Documents package include the BloombergNEF report.

Capital Markets – Why investors follow insider selling filings

There was a good reminder on CNBC Squawk Box on Monday morning on why investors follow, or should follow, insider selling filings. We tweeted [\[LINK\]](#) “Why investors follow insider selling filings..”when you look at selling, the accuracy on the selling on the whole is way better than the average investor” @andrewsorkin with @JoeSquawk & @BeckyQuick on @SquawkCNBC. #OOTT.” They referenced studies they had previously seen. Our tweet included the more fulsome conversation that we made from our PVR.

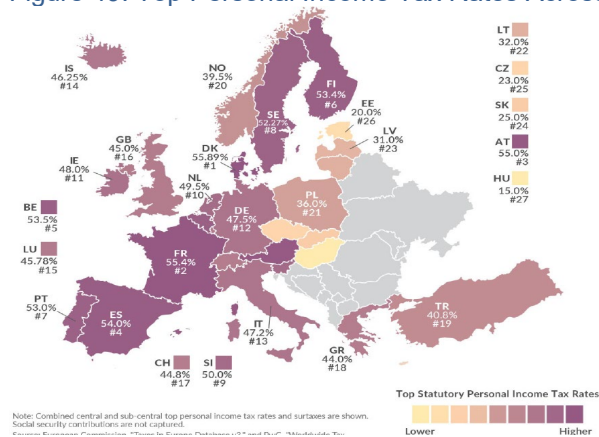
Insider selling filings

Capital Markets – Personal tax rates across European OECD countries

When we saw the Tax Foundation data on the top personal tax rates across Europe [\[LINK\]](#), we were expecting to see higher top personal tax rates. Many countries, including European OECD countries, follow a progressive bracket structure such that every dollar earned above a certain threshold is subject to a respective tax rate. The tax rates across Europe ranges widely from 15.0% - 55.9% with Denmark having the highest top statutory tax rate of 55.9%, followed closely by France at 55.4% and Austria at 55.0%. Hungary is at the bottom end of the range at 15.0%, followed by with Estonia at 20.0% and Czech Republic at 23.0%. Across Europe, there are a total of 9 countries subject to tax rates above 50% with 18 countries below the 50% tax rate. Our Supplemental Documents package includes the posting.

European top tax brackets 2022

Figure 49: Top Personal Income Tax Rates Across Europe



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

@Energy_Tidbits on Twitter

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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.

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.

Messi gives a £175,000 24-carat gold engrave iPhone to Argentina teammates
Argentina won the World Cup in Dubai. This week, The Sun and all the UK press reported on the gifts Argentina superstar Lionel Messi bought for his World Cup winning teammates and staff – a £175,000 24-carat personalized iPhone. Each iPhone had the players name and number in addition to Argentina winning the World Cup. Messi apparently ordered 35 of these £175,000 iPhones for a total of a £6,125,000.

Figure 50: Lionel Messi £175,000 iPhone gift



Source: The Sun

What a story - Cdn twin brothers, Sydney and Chase Brown at NFL Combine

Had the NFL Combine on for much of the day yesterday while working on the memo and heard NFL Network's Stacey Dales (another former great Cdn pro basketball player) highlighted the story of DB Sydney Brown and his twin brother Chase who is testing today with the RBs. Both just finished their college careers at University of Illinois. NFL Network posted a clip [\[LINK\]](#) of her telling how the brothers, from London Ontario, grew up without anything, and spent time living in shelters. Last Oct, SI ran a great story on their journey titled "*From Shelters to Stardom: Chase and*

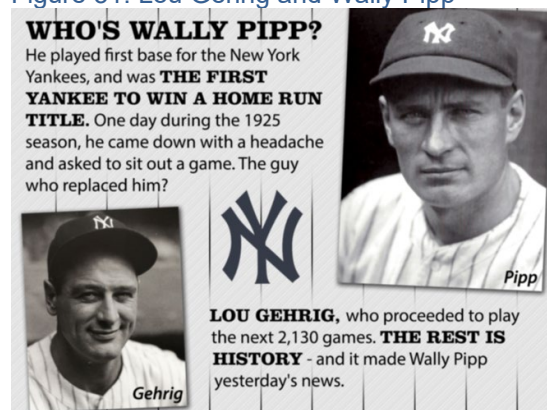
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Sydney Brown's Path to Gridiron Glory, The Brown brothers lived through a life of change—switching homes and schools and fighting through financial hardships to play football. Together again in Champaign, Chase and Sydney have found stability and stardom.” [\[LINK\]](#) Our Supplemental Documents package include the SI report.

Lou Gehrig and Wally Pipp of 1925 New York Yankees

We don't normally respond to random questions posed on Twitter but did so on Saturday. The question posed was “Name two athletes that are forever connected in history” with the picture of older Kirk Gibson and Dennis Eckersley. Gibson hit the famous two-run walk-off home run to win Game 1 of the 1988 World Series between the LA Dodgers and Oakland A's. There were many replies with more current pairs like John McEnroe/Bjorn Borg, Nolan Ryan pounding Robin Ventura, Mark McGwire/Sammy Sosa, Tonya Harding/Nancy Kerrigan etc. But our entry was almost 100 years ago with Lou Gehrig and Wally Pipp of the 1925 New York Yankees. First baseman Wally Pipp got sick one day, Lou Gehrig stepped and went on to play 2,130 consecutive games. And there aren't many athletes whose has become a verb. To become Wally Pipped is to for a regular to miss a start being sick and then lose their job forever with someone steps in and never gives the job back.

Figure 51: Lou Gehrig and Wally Pipp



Source: The Catholic University of America