Energy Tidbits

March 12, 2023

Produced by: Dan Tsubouchi

Saudi Aramco CEO "*Risks of Underinvestment in our Industry are Real – Including Contributing to Higher Energy Prices*"

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. Saudi Aramco CEO's warning in today's Q4 that the "risks of underinvestment in our industry are real" and higher energy prices are ahead (Click Here).

2. Saudi/Iran may be restoring relations, but we don't think it reduces the major geopolitical risk to oil – will Israel just sit on sidelines and watch Iran keep moving to nuclear capability (Click Here).

3. Pioneer CEO "*most companies are drilling Tier 2, Tier 3 inventory now. So we just don't have that potential to grow US production ever again. I think we may get back to 13 mmb/d, probably in ~2.5 to 3 yrs at a very slow pace"* (Click Here).

4. Trans Mountain said the expansion "*will be in-service in the first quarter of 2024" "an increase of 590,000 barrels per day to a total of 890,000 barrels per day"* (Click Here).

5. Shell CEO sees Shell's production growth areas *"where we see running room in some of these investment opportunities" "have significant investment opportunities in our #NatGas businesses such as in Qatar and in Canada for example"* (Click Here).

6. Pease 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].

Dan Tsubouchi
Chief Market Strategist
dtsubouchi@safgroup.ca

Ryan Dunfield
CEO
rdunfield@safgroup.ca

Aaron Bunting
COO, CFO
abunting@safgroup.ca

Ryan Haughn
Managing Director
rhaughn@safgroup.ca

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Natural Gas – 84 bcf draw in US gas storage; now 493 bcf YoY surplus

YoY storage at 493 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, on a gas weighted customer basis for the week ended March 4, it was 17% warmer than normal and 10% warmer YoY. So, for the week of Mar 3, the EIA reported a -84 bcf draw (vs expectations of -82.43 bcf), a -32% decrease from the -124 bcf draw reported for the week of Mar 4 last year. This compares to last weeks draw of -81 bcf, and the 5-year average draw of -101 bcf. Total storage is now 2.030 tcf, representing a surplus of +493 bcf YoY compared to a surplus of 451 bcf last week and is +359 bcf above the 5-year average vs +342 bcf above last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (03/03/22)		5-year average (2018-22)	
Region	03/03/23	02/24/23	net change	implied flow	Bcf	% change	Bcf	% change
East	416	451	-35	-35	323	28.8	354	17.5
Midwest	515	544	-29	-29	370	39.2	411	25.3
Mountain	92	99	-7	-7	93	-1.1	95	-3.2
Pacific	81	99	-18	-18	162	-50.0	170	-52.4
South Central	925	922	3	3	587	57.6	640	44.5
Salt	261	261	0	0	153	70.6	182	43.4
Nonsalt	664	661	3	3	435	52.6	458	45.0
Total	2,030	2,114	-84	-84	1,537	32.1	1,671	21.5

Source: EIA

Natural Gas – AGA heating degree days, Feb was 9.6% warmer than normal

February was 9.6% warmer than normal

HH gas prices were above $7 just before Xmas, but the very hot Jan crashed HH to below $3 on Jan 25 and continue to languish with a warm Feb. As noted below, NOAA ranked January 2023 was the 8th hottest in the last 129 years and Feb as the 28th hottest in the last 129 years. Every Monday, the AGA issues the weekly heating degrees data for the week ended the prior Saturday. This week's data also included the recap for Feb that, based on a heating degree days basis, was 9.6% warmer than normal and 9.9% warmer YoY vs Feb 2022.

Figure 2: Excerpt AGA weekly heating degree days data by month

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
February	717	796	793	9.9	Warmer	9.6	Warmer

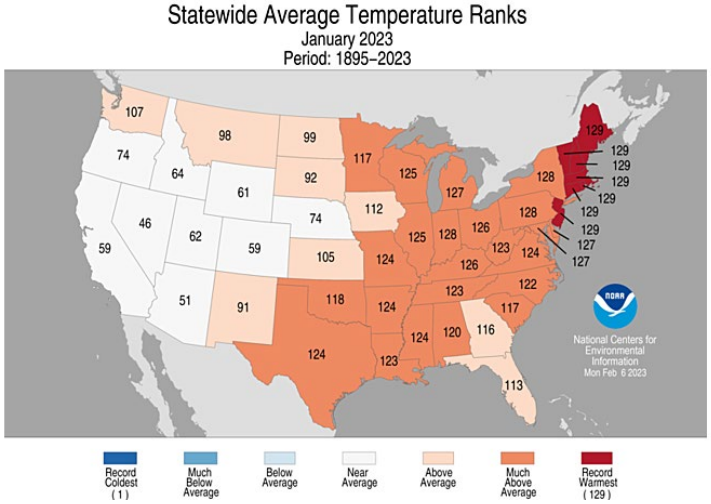
Source: AGA

Natural Gas – NOAA Feb weather in US was the 28th hottest in last 129 years

Feb was 28th hottest month in 129 years

On Thursday, we tweeted [LINK] "*Never good for #NatGas prices when its HOT in winter. Key reason why HH #NatGas fell from >$7 pre Xmas to <$3 in Jan and stayed there. Feb was 28th hottest followed Jan was 8th hottest in last 129 yrs. Dec/Jan/Feb was 17th hottest in last 128 yrs.Thx @NOAA. #OOTT."* All of the populous eastern half of US was well above normal temps in Feb with the Virginia experiencing some of the hottest temps on record. Feb's hotter than normal weather followed Jan being the 8th hottest month in 129 years. No surprise, natural gas prices remained lower thru Feb with HH prices falling from $7 just before Xmas to an average of $2.56 in Feb, a ~60% decline in just two months. Our tweet Thursday included NOAA's below Jan aveage tempurature ranks.

Figure 3: NOAA Historical US Temperate Ranks by State

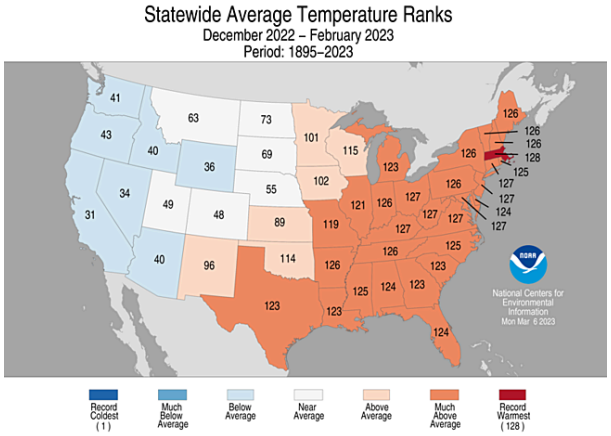


Source: NOAA

As a result, Dec/Jan/Feb was the 17th hottest 3-month period in 129 years

The hot weather in Feb brought the 3-month period from Dec to Feb to the 17th hottest average temperatures seen in 129 years across eastern states with Massachusetts seeing some of the hottest temperatures on record. Over the same period, states along the west coast saw slightly below normal temperatures. No surprise that the warmer months saw US gas storage fall -41% from 3.46 tcf on Dec 2 to 2.03 tcf as of Mar 3 because above average temperatures reduce demand for heating. For context, over the same 3-month period last year, storage fell -57% and -53% in 2021. Below is a graphic depicting the state average temperature ranks.

Figure 4: US Statewide Average Temperature Ranks (Dec 2022 – Feb 2023)



Source: NOAA

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

Jan and Feb were both warmer than last winter and warmer than normal. And these are the two key months for winter temperature driven residential/commercial natural ags consumption. So no surprise, US gas storage went to a big surplus in Jan/Feb and HH gas prices crashed. 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 and Feb 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.

Jan/Feb are the big months for natural gas demand

Figure 5: US Winter Natural Gas Consumption vs Heating Degree Days

US Winter Natural Gas Consumption vs Heating Degree Days

Heating Degree Days By Month

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	HDDs	%
Oct	308	303	265	257	200	218	306	307	308	205	332	280	7%
Nov	572	623	658	484	459	542	650	636	469	539	597	569	14%
Dec	763	920	763	649	856	873	789	778	804	696	876	807	20%
Jan	918	1,019	967	935	843	963	941	808	899	1005		921	23%
Feb	795	903	955	718	597	699	810	760	896	790		793	20%
Mar	827	831	738	511	618	660	804	555	572	638		680	17%
Oct 1 - Mar 31	4,183	4,599	4,346	3,554	3,573	3,955	4,300	3,844	3,948	3,873	1,805	4,050	100%

Note: Oct includes Sept if applicable. March includes Apr if applicable.

Source: AGA, SAF

Total US Consumption

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	%
Oct	61.3	60.2	61.7	64.3	62.1	65.5	73.7	75.1	74.9	73.0	76.4	67.2	13%
Nov	72.3	77.2	78.6	75.2	72.1	78.6	90.5	92.6	81.3	89.8		80.8	15%
Dec	80.8	94.0	86.4	83.6	92.5	99.5	96.8	101.6	101.9	97.0		93.4	18%
Jan	92.8	103.4	100.5	100.0	93.3	107.8	110.0	106.3	106.0	115.9		103.6	20%
Feb	91.6	97.9	104.5	91.8	82.9	96.8	107.5	108.3	108.5	109.3		99.9	19%
Mar	81.3	82.5	83.6	76.3	81.1	90.2	93.8	87.4	84.1	89.8		85.0	16%
Average	**80.0**	**85.9**	**85.9**	**81.9**	**80.7**	**89.7**	**95.4**	**95.2**	**92.8**	**95.8**	**76.4**	**88.3**	100%

Source: EIA, SAF

US Residential & Commercial Demand

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	10 Year Average	
	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	bcf/d	%
Oct	14.6	13.9	13.4	12.8	12.2	13.1	15.9	14.4	14.4	12.6	15.1	13.7	7%
Nov	26.3	28.8	30.2	23.0	22.0	26.3	32.8	32.6	24.4	27.3		27.4	14%
Dec	34.2	43.0	36.9	30.4	40.5	42.2	39.5	39.0	40.1	34.5		38.0	19%
Jan	47.0	51.9	47.4	45.0	42.4	49.5	48.6	42.2	44.1	48.8		46.7	23%
Feb	42.3	48.0	50.9	38.4	33.7	39.8	45.7	42.0	48.2	45.1		43.4	22%
Mar	34.3	36.2	33.1	24.4	30.8	34.8	35.9	27.8	29.7	31.5		31.8	16%
Average	**33.1**	**37.0**	**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

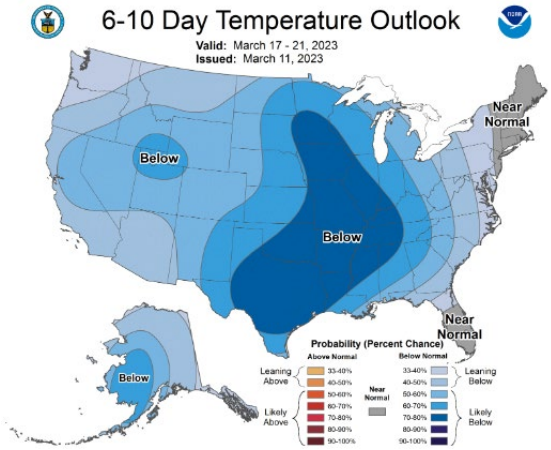
Source: EIA, AGA, SAF

Natural Gas – NOAA sees a colder than normal 3rd week of March

NOAA 6-10 & 8-14 day temp outlook

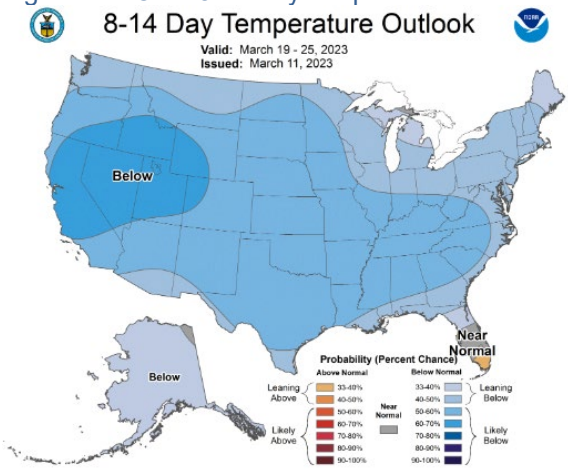
Yesterday, we tweeted [LINK] "*Unfortunately cold weather in 3rd week of Mar doesn't drive big Res/Com #NatGas consumption, but the cold thru Mar 25 should help keep prices from crashing. @NOAA's updated 6-10, 8-14 day outlook for Mar 17-25. #OOTT.*" Cold weather is always better, but cold in the 3rd week of March is not the same as cold in Feb. So we don't think it will be a big catalyst up in natural gas prices, but should keep prices from crashing. To put in perspective, AccuWeather forecasts daily highs for Chicago in the 2 to 10C range and nightly lows around 0 to 5Cfreezing. For New York, AccuWeather forecasts daily highs in the 5-12C ranges and nightime lows 2-7C ranges. March can be a decen 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 March 11 updated 6-10 day and 8-14 day outlook that run March 17-25.

Figure 6: NOAA 6-10 day temperature outlook as of Mar 11



Source: NOAA

Figure 7: NOAA 8-14 day temperature outlook as of Mar 11



Source: NOAA

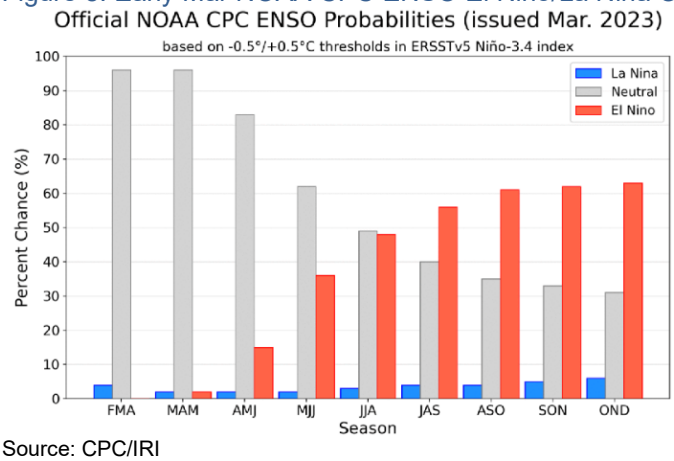
Natural Gas – NOAA sees 60% probability for El Nino conditions during Aug/Sept/Oct

La Nina/El Nino focus to turn to summer

On Thursday, NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. Now that winter is coming to an end and with the first day of spring coming later this month, the El Nino/La Nina focus shifts to the summer and to hurricane season. Comparable to last month, the probability forecast is just above a 60% chance for El Nino conditions in the peak hurricane months of Aug/Sept/Oct. However, the qualifier is said by NOAA that forecasting El Nino/La Nina conditions for the summer is difficult ahead of the spring. NOAA writes "*The smaller chances of El Niño relative to the model predictions are primarily because ENSO forecasts made during the spring are less accurate, and also the tropical Pacific atmosphere is still fairly consistent with a cool/La Niña-like state. However, it is possible that strong warming near South America may portend a*

more rapid evolution toward El Niño and will be closely monitored." Again, weather is never 100% the same, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Below is the NOAA CPC ENSO Mar update.

Figure 8: Early Mar NOAA CPC ENSO El Nino/La Nina Outlook

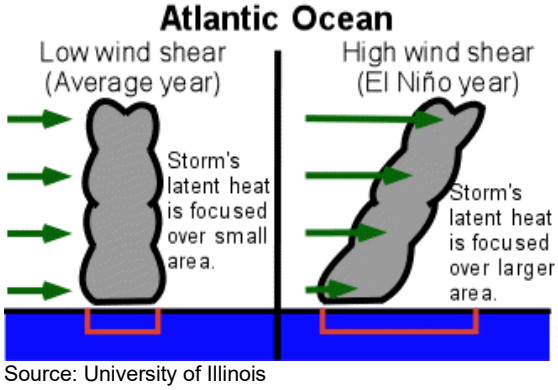


Source: CPC/IRI

El Nino years tend to be low Atlantic hurricane years

Our prior Energy Tidbits over the years/decades noted that "*The hurricane forecasters note that warm El Nino years tend to have less hurricane activity in the Atlantic and Gulf of Mexico, but typically more hurricane activity in the Pacific. The primary explanation for the decline in hurricane frequency during El Niño years is due to the increased wind shear in the environment. It is commonly explained that "In El Niño years, the wind patterns are aligned in such a way that the vertical wind shear is increased over the Caribbean and Atlantic. The increased wind shear helps to prevent tropical disturbances from developing into hurricanes. In the eastern Pacific, the wind patterns are altered in such a way to reduce the wind shear in the atmosphere, contributing to more storms*". This is the common explanation, and we referenced the University of Illinois's description because they also had a good simple graphic (see below). We double checked the link this week, and it is still active after more than a decade, the University of Illinois explanation is found at: [LINK]

Figure 9: Early-March NOAA El Nino/La Nina Outlook



Source: University of Illinois

Natural Gas – EIA forecast US gas production +2.6 bcf/d in 2023, +1.02 bcf/d in 2024

EIA US natural gas production forecast

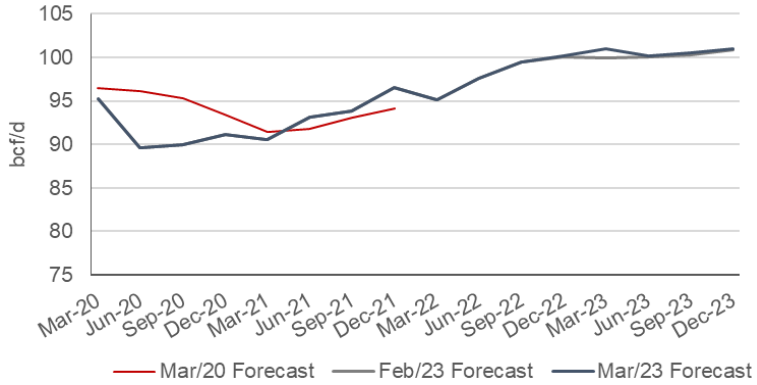
One of the big US natural gas stories in 2022 has been that US dry natural gas production was up approx. 3.5 bcf/d YoY in 2022. This growth was more than expected going into 2022. US dry natural gas production is expected to continue to have strong, but lesser, YoY growth in 2023 and in 2024. The EIA released its monthly Short Term Energy Outlook for Mar 2023 [LINK]. (i) The EIA revised its price expectations from the Feb STEO as warmer winter weather in February led to lower-than-normal consumption of natural gas and pushed inventories above the 5-year average levels. The EIA expects US gas production to increase in Q1/23 to 100.96 bcf/d after revisions to its forecast. The EIA Feb STEO revised its 2022 US gas production forecast from 98.10 bcf/d to 98.08 bcf/d ie. slightly less momentum leaving 2022. This is still up 3.56 bcf/d YoY. (ii) US dry natural gas production is forecasted to average 100.67 bcf/d in 2023 (100.30 bcf/d previously), a +2.6 bcf/d increase YoY. (iii) The EIA slightly revised down its 2024 forecast by -0.01 bcf/d to 101.69 bcf/d vs 101.70 bcf/d for the Feb STEO. But 2024 is still +1.02 bcf/d YoY. Our Supplemental Documents package includes excerpts from the STEO.

Figure 10: EIA STEO US Natural Gas Supply Forecasts by Forecast Month

bcf/d	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Mar-2023	94.51	95.08	97.59	99.47	100.2	98.08	100.96	100.21	100.56	100.96	100.67	101.37	101.40	101.96	102.04	101.69
Feb-2023	94.57	95.10	97.60	99.50	100.10	98.10	99.90	100.00	100.30	100.90	100.30	101.20	101.60	102.00	101.90	101.70
Jan-2023	94.57	95.10	97.59	99.44	99.87	98.02	100.82	99.87	100.08	100.62	100.34	101.12	101.75	102.72	103.57	102.29
Dec-2022	93.55	95.08	97.58	99.22	100.5	98.11	99.87	99.52	100.5	101.6	100.4					
Nov-2022	93.55	95.08	97.58	99.43	100.11	98.05	99.00	99.42	99.99	100.33	99.68					
Oct-2022	93.55	95.08	97.55	98.48	99.06	97.54	99.19	99.57	99.73	100.00	99.62					
Sep-2022	93.55	94.60	96.87	97.85	98.99	97.08	99.65	100.51	100.59	100.67	100.36					
Aug-2022	93.55	94.60	96.61	97.02	98.09	96.59	98.90	100.13	100.52	100.51	100.02					
Jul-2022	93.55	94.61	95.51	96.88	97.89	96.23	98.40	99.62	100.60	101.25	99.98					
Jun-2022	93.55	94.61	95.48	96.90	98.94	96.50	99.94	101.30	102.33	102.66	101.57					
May-2022	93.55	94.66	95.82	97.17	99.14	96.71	100.25	101.55	102.42	102.42	101.71					
Apr-2022	93.57	95.41	97.01	97.94	99.23	97.41	99.72	100.56	101.41	101.72	100.86					
Mar-2022	93.54	95.69	96.09	96.97	98.00	96.69	96.11	98.75	99.60	100.10	98.64					
Feb-2022	93.57	95.43	95.54	96.26	97.12	96.09	97.11	97.57	98.34	98.84	97.97					

Source: EIA STEO

Figure 11: EIA STEO US Natural Gas Supply Forecasts by Forecast Month



Source: EIA STEO

Natural Gas – EIA STEO forecasts Nov 1, 2023 storage at 3.88 tcf, +0.315 tcf YoY

EIA STEO storage forecast

The EIA STEO also forecasts US gas storage. No surprise, the warmer than expected winter has led to a big increase in forecast US gas storage levels. The EIA now forecasts storage to end the winter at 1.926 tcf on April 1, which is +0.525 tcf YoY and +0.125 tcf vs its Feb STEO forecast. For winter 2023/24, the EIA now forecasts Nov 1 storage at 3.884 tcf, which is +0.315 tcf YoY, a upward revision from 3.818 tcf in the Feb STEO forecast. The EIA commented, "*As a result of less natural gas consumption than we had expected, we forecast that the United States will close the withdrawal season at the end of March with more than 1.9 trillion cubic feet of natural gas in storage, 23% more than the five-year average and 27% more than we forecast in the January STEO. The Henry Hub natural gas spot price in our forecast averages about $3 per million British thermal units (MMBtu) in 2023, down by more than 50% from last year. We had expected almost $5/MMBtu in the January STEO forecast.*" Our Supplemental Documents package includes excerpts from the STEO.

Figure 12: EIA STEO forecast US gas storage

(billion cubic feet)

	Storage	2016-2024				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,029.0	792.7	3,632.6	10.5%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,029.0	792.7	3,632.6	5.1%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,029.0	792.7	3,632.6	-10.9%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,029.0	792.7	3,632.6	3.6%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,029.0	792.7	3,632.6	8.1%
Mar 2021	1,801.2	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,236.3	4,029.0	792.7	3,632.6	0.9%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.6%
Oct 2022	3,569.4	3,236.3	4,029.0	792.7	3,632.6	-1.7%
Mar 2023	1,926.3	1,184.9	2,486.3	1,301.4	1,835.6	4.9%
Oct 2023	3,884.3	3,236.3	4,029.0	792.7	3,632.6	6.9%
Mar 2024	1,658.2	1,184.9	2,486.3	1,301.4	1,835.6	-9.7%
Oct 2024	4,029.0	3,236.3	4,029.0	792.7	3,632.6	10.9%

Source: EIA

Natural Gas – EIA forecast US pipeline exports to MEX +0.5 bcf/d in both 2023 & 2024

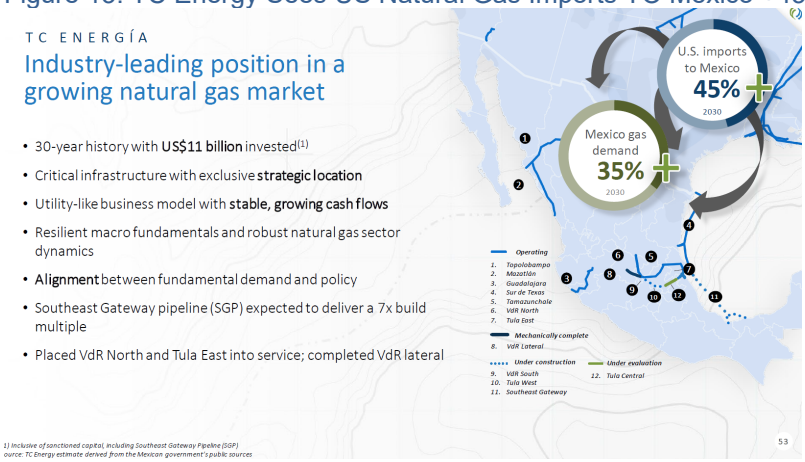
xxxxx

On Wednesday, the EIA posted its blog "*Liquefied natural gas will continue to lead growth in U.S. natural gas exports"* [LINK]. The headlines from the blog were that the EIA forecass US LNG exports "*will average 12.1 billion cubic feet per day (Bcf/d) in 2023, a 14% (1.5 Bcf/d) increase compared with last year. We expect LNG exports to increase by an additional 5% (0.7 Bcf/d) next year."* However, the blog also included an update on US natural gas pipeline exports to Mexico going up by 0.5 bcf/d in both 2023 and 2024. The EIA wrote "*We expect U.S. natural gas exports by pipeline to grow by 0.5 Bcf/d in both 2023 and 2024, mainly because of increased exports to Mexico. Several new pipelines in Mexico—Tula-Villa de Reyes, Guaymas-El Oro, the Mayakan pipeline on the Yucatán Peninsula, as well as some other minor interconnects—are scheduled to come online in 2023–24. We also expect an increase in exports via the Sur de Texas-Tuxpan underwater pipeline to supply the proposed floating liquefaction (FLNG) project off the east coast of Mexico."*

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

The EIA's estimate for ramping up US natural gas pipeline exports to Mexico fits to what we have been watching. 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."*

Figure 13: TC Energy Sees US Natural Gas Imports TO Mexico +45% to 2030



Source: TC Energy

Natural Gas – Freeport LNG gets approval for full restart, expects 2 bcf/d in March

Freeport LNG full restart

On Wednesday, we tweeted [LINK] on the breaking news "*#FreeportLNG gets approval to restart 3rd train and expects to get back 2.0 bcf/d over the next few weeks! #OOTT #NatGas [LINK]". Freeport LNG got the approval to return its third train to commercial operations and expects to get back to its full 2.0 bcf/d LNG production un March. Freeport LNG wrote "FERC and the Pipeline and Hazardous Materials Safety Administration (PHMSA) to restart Train 1, the final train of Freeport LNG's three train liquefaction facility to receive restart authorization. Freeport LNG's Trains 2 & 3 returned to full commercial operation in recent weeks, reaching production levels in excess of 1.5 billion cubic feet per day. As the recommissioning of Freeport's liquefaction facility continues and trains are restarted, changes in feed gas flows and production rates are to be anticipated, given the duration of the plant's outage. As previously stated, a conservative ramp-up profile to establish full three-train production is anticipated to occur over the next few weeks."*

Natural Gas – Shell CEO highlights LNG Canada as significant investment opportunity

LNG Canada Phase 2?

Shell CEO Wael Sawan was at CERAWeek and we couldn't help notice that he highlighted LNG Canada in his list of six projects/areas when he was asked to on areas that he looks to for future production growth. Sawan was asked about production growth and said that would be discussed at the June 26 Capital Markets Day 2023. He wouldn't give any growth targets but then was asked for where he would look for growth, which is where he listed six areas where they see running room that included LNG Canada. And LNG Canada as one of its two significant investment opportunities in its natural gas businesses. We have trouble believing this highlighting is for the under construction LNG Canada 1.8 bcf/d Phase 1 that is due to start up in two years. Rather we have to believe he was pointing to the potential of LNG Canada 1.8 bcf/d Phase 2. It will be interesting to see if there are any more teases on LNG Canada in the run up to the June 26 Capital Markets Day. It's why we tweeted [LINK] *"#LNGCanada 1.8 bcfd Phase 2? @adsteel asks @Shell production growth areas? CEO Sawan: "where we see running room in some of these investment opportunities" "have significant investment opportunities in our #NatGas businesses such as in Qatar and in Canada for example". #OOTT."* Our tweet included the transcript we made of his comments

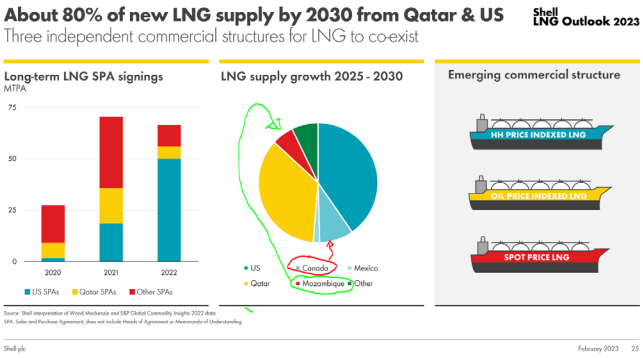
on the Bloomberg clip [LINK]. *Items in "italics" are SAF Group created transcript. At 4:35 min mark, Sawan ". So in June, we will be able to guide the market as to what happens from here on". Steel "so let me ask it in a different way and I appreciate you have to wait for your Capital Markets Day, but could you give me a sense of where you may be interested in trying to grow production. All the CEOs I talk to, especially the oil services, are talking much more about deepwater and offshore in a way that they haven't in years." Sawan "I am biased given I ran the deepwater business for Shell here in the US a few years ago, so absolutely, I see more in the deepwater space. But also other markets. We continue to invest in places like Malaysia at the moment, in places like Kazakhstan and others. But in essence where we see running room in some of these investment opportunities. The US, of course Gulf of Mexico, is a big one. Brazil is a big one for us. So we have a set of eight core assets in our Upstream business and we have significant investment opportunities in our Gas businesses such as in Qatar and in Canada, for example."*

Feb 16, Shell working hard on LNG Canada Phase 2 FID, but not likely in 2023

On Feb 16, Shell said FID on LNG Canada 1.8 bcf/d Phase 2 was not likely in 2023. Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. "*It looks like we will have to wait until 2024 for Shell to FID LNG Canada's 1.8 bcf/d Phase 2 based on mgmt. comments at the Shell LNG Outlook 2023 on Thursday. (i) We say "wait" and not "if" for a couple reasons for two reasons. Shell's forecast for global supply additions 2025-2030 has to include it for the Canada wedge. And when asked about its FIDs for this year and next to add LNG supply coming onstream five years out, Shell led with LNG Canada Phase 2. But they also said they FID for LNG Canada Phase 2 is not likely this year. (ii) Upon seeing the slide deck and ahead of the webcast, we tweeted [LINK] "Does Shell 2025-30 LNG adds assume FID #LNGCanada 1.8 bcfd Phase 2? What else could make CAN LNG adds 25-30 that much larger than MZ that must incl at least @TotalEnergies 1.7 bcfd Phase 1? Reminder #LNGCanada Phase 1 is 1.8 bcfd is already material to Cdn #NatGas. #OOTT." When we saw the slide (see below), we thought Shell is building in LNG Canada Phase 2 In their 2025-2030 forecast as there is no other explanation for the forecast growth in Canada LNG. (ii). In the Q&A, mgmt. was asked "Just had a question on the LNG supply outlook. I just wanted to kind of get your views on what do you expect to be FID in terms of new LNG supply over the course of this year and next year because there does seem to be a lot of gas out there globally to be developed. You talked about the US and the growth from (inaudible). Also, you've got Canada, you've got other places that I think are riskier but have a lot of gas like Tanzania, Senegal, and Mauritania. So just if you could talk through a little bit about your expectations on FIDs and I suppose where you see that kind of range in terms of new supply kind of coming on stream four, five years out." Mgmt led off with LNG Canada replying "Yeah. So let me start with Canada, perhaps, we are working with the joint venture on progressing the second stage of that and showing [ph] an additional third and fourth train. I think the critical thing is getting it to the right level of competitiveness in terms of also the capital returns that we'll then achieve from that project as well as finding the right balance in terms of its carbon footprint also with the local stakeholders and the government of BC and their requirements. It's something that we're working on hard right now, but I don't think, Anish, that we will be seeing that come to an FID this year. So we're continuing to progress that." (iii) So*

the takeaway is that Shell has LNG Canada Phase 2 FID in their forecast for 2025-2030 LNG supply, is working hard on the Phase 2 FID "right now", but but I don't think, Anish, that we will be seeing that come to an FID this year. So we're continuing to progress that". This is why we say we will have to wait until 2024 for Shell to FID LNG Canada Phase 2 and not "if" it will.

Figure 14: Shell forecast global LNG supply additions 2025-2030



Source: Shell

Feb 14, TC Energy says Shell asked them evaluate Coastal GasLink expansion

Here is another item from our Feb 19, 2023 Energy Tidbits memo that is linked to LNG Canada Phase 2. "*It's not just Shell that is working hard right now on the potential LNG Canada 1.8 bcf/d Phase 2 FID, it's also TC Energy at the request of Shell. TC Energy held its Q4 call on Tuesday morning and as the Q&A was going, we tweeted [LINK] "Breaking! See 👇transcript. @TCEnergy just said #LNGCanada "they've asked us to begin the evaluation of Phase 2". Phase 2 adds another 1.8 bcf/d, would take total LNG Canada to 3.6 bcf/d. Positive for Cdn #natgas #OOTT." Here is the transcript we made of the mgmt's reply in the Q&A. At 7:14am MT, mgmt. replied "Coastal GasLink is basically Canada's LNG corridor and we're working with our customer, LNG Canada, who is developing not only their first trains, but they've asked us to begin the evaluation of Phase 2. So as you say, we're very excited to be contemplating the expansion of our system. This would not be a linear development. It's the addition of six compressor stations sites, which we've demonstrated at Wilde Lake that we just brought to mechanically complete that we can deliver those on schedule and on time. The project economics, those are obviously confidential, but we're encouraged by the possibility of advancing to a FID stag that as you say would bring the total investment in that LNG corridor to returns that are more commensurate with what our expectations would be."*

LNG Canada Phase 1 sets up Cdn supply squeeze like in the US today

We remind that the under construction LNG Canada 1.8 bcf/d Phase 1 is a material natural gas event for Alberta/BC natural gas. And that LNG Canada 1.8 bcf/d Phase 2 would be an additional material natural gas supply event. Here is what we wrote in our June 12, 2022 Energy Tidbits memo. "*Yesterday, we also tweeted [LINK] a reminder that the under construction LNG Canada Phase 1 of 1.8 bcf/d sets up a*

similar natural gas supply squeeze as being seen today in the US. And this is just from the under construction LNG Canada Phase 1. We tweeted "#LNGCanada Phase 1 is 1.8 bcfd already sets up Cdn #NatGas supply squeeze like in US. >10% of BC/AB #NatGas supply 16 bcfd ie. like US #LNG exports now ~12 bcfd vs ~100 bcfd total supply. LNG Canada Phase 2 adds another 1.8 bcfd. Cdn nat gas looks very good thru 2030. #OOTT". The US currently exports ~12 bcf/d vs total US natural gas supply of ~100 bcf/d. LNG Canada Phase 1 is 1.8 bcf/d vs BC/Alberta natural gas supply of ~16 bcf/d. The math is very similar. LNG Canada and Shell have never been specific on the exact timeline but have noted that they expect first LNG by the middle of this decade ie. inferring late 2024. And our tweet reminded that LNG Canada Phase 2 is another 1.8 bcf/d for a total of the two phases being 3.6 bcf/d.

Natural Gas – Another long-term LNG deal: Chesapeake Energy with Gunvor Group

Another long-term LNG deal

There was a significant slowdown in long-term LNG deals in since the end of H1/22 compared to the activity seen from July 1, 2021 thru June 30, 2022. That's because most, if not all the available long term LNG supply available before 2026 was locked up in the July 1, 2021 thru June 30, 2022 rush. Rather, the long-term deals now being done are generally for long term supply starting in 2026 or later. There was one long term LNG deal announced this week. On Monday, Chesapeake Energy Marketing announced that it entered into an HOA to supply Gunvor Group with 0.26 bcf/d over 15 years starting in 2027 [LINK]. The LNG purchase price is said to be indexed to JKM and will be delivered to Gunvor on an FOB basis from an optimal liquification facility in the US; a specific facility will be chosen upon execution of the agreement. Chesapeake CEO, Nick Dell'Osso said, "*This agreement reflects the powerful combination of the premium rock, returns, and runway of our competitively positioned Haynesville natural gas assets combined with the strength of our balance sheet and financial position to securely supply global LNG markets. We are pleased to partner with Gunvor, a leading global commodity and energy logistics company with a deep LNG track record, to deliver independently certified reliable, affordable, lower carbon energy to markets in need.*" Kalpesh Patel, Gunvor Co-Head of LNG Trading, said, "*We are excited to establish this partnership with Chesapeake which will further enhance our global LNG portfolio. We believe our trading expertise together with our robust shipping fleet will not only contribute to the competitive shipping costs, but also ensure reliable offtake operations for Chesapeake and the liquefaction facility which we will jointly select. We very much look forward to the long-term relationship with Chesapeake."* Our Supplemental Documents package includes the release.

Asia was early to secure long term LNG supply

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

this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas."* Our Supplemental Documents package includes our April and July blogs.

There have been 14.06 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 13.80 bcf/d of long term LNG deals since July 1, 2021. 66% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 75% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

Figure 15: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan/Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**9.38**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	Sempra	PKN ORLEN	US / EU	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**4.68**			
Total New Long Term LNG Contracts since Jul/21				**14.06**			
*Excludes Asian short term/spot deals							
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period							
Source: Bloomberg, Company Reports							

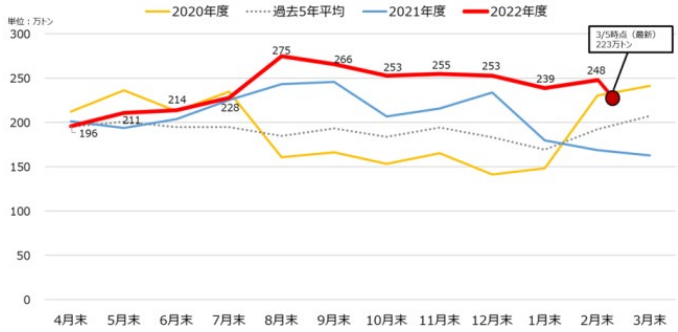
Source: Company reports, SAF Group

Natural Gas – Japan's LNG stocks down -4.7% WoW to 107 bcf

Japan LNG stocks -4.7% WoW

Japan had a warm end to Feb and winter and was able to escape any LNG shortages in the winter. It's shoulder season so there isn't any strong weather related natural gas demand. LNG stockpiles held by Japanese power producers continue to exceed both last year's level and the seasonal average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks at Mar 5 were ~107 bcf -4.7% WoW from Feb 26 of ~112 bcf and well above the 5-year average of 99 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 16: Japan's LNG Stocks



Source: METI

Natural Gas – China's natural gas Jan-Feb imports down -9.4% YoY in 2023

China natural gas imports

No one should have been surprised to see China natural gas imports downY oY in Jan/Feb with the mild weather, increasing domestic natural gas production, earlier Lunar New Year, etc. China's natural gas import data reflects the cumulative import volumes for Jan and Feb with YoY comparisons to using YTD total imports for the same 2-month period last year. On Tuesday, Bloomberg reported on China import data for Jan-Feb that was posted on the General Administration of Customs website [LINK]. Bloomberg reported "**China Jan.-Feb. Nat Gas Imports Fall 9.4% y/y to 17.927m MT*".* Natural gas imports for Jan-Feb totalled 17.93m MT which is down -9.4% YoY from Jan-Feb 2022 and -12.96% below total imports of 20.60m MT for Nov-Dec 2022. We don't have the split of natural gas imports between pipeline imports vs LNG imports so we can't provide the bcf/d conversions. We typically use bp's conversion factors, which are 1 million tonnes of natural gas = 41.071 bcf, and 1 million tonnes LNG =48.028 bcf.

Natural Gas – France nuclear issues, not clear how much it will help EU natural gas

France nuclear issues

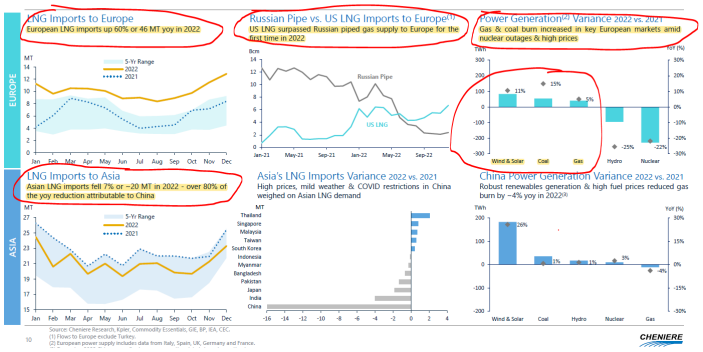
There was big France nuclear news on Wednesday and then again on Thursday, which will inevitably have some impact on nuclear availability in France in 2023. It just too early to know how much of an impact. EDF has had two additional nuclear problems, which, the France authorities, expect will at a minimum lead to longer outages/check times. And, as seen in 2022, France nuclear generation going down is a plus for natural gas. (i) On Wednesday, we tweeted [LINK] "*Support for #NatGas #LNG. Surely an order to review program of nuclear checks will have some impact, even if temp. Especially as @FrancoisDeBeaup reports latest*

crack "means the resilience of the pipe can't be assured, the Autorite de Surete Nucleaire said in a statement". #OOTT." (ii) On Wednesday, Bloomberg reported *"Electricite de France SA must review its program of reactor checks after finding yet another crack earlier this year, the country's nuclear safety authority said. It's not clear how the review will affect nuclear output, which EDF expects to recover this year after plunging in 2022 amid multiple halts for repairs. The shutdowns, caused by stress corrosion cracks on cooling-system pipes, added pressure to Europe's strained energy system as Russian gas supplies dwindled. EDF said last month it found a crack on a pipe at its Penly-1 reactor, which was already offline for maintenance and repairs. The defect is located near a weld that had been mended twice during construction of the plant, which was commissioned in the early 1990s. The latest crack, as much as 23 millimeters (almost 1 inch) deep, means the resilience of the pipe can't be assured, the Autorite de Surete Nucleaire said in a statement Tuesday. Given that EDF hadn't previously expected that section to be prone to stress corrosion, it must now revise its strategy, the ASN said. "The discovery of this materially worse-than-expected defect is likely to lead to more rigorous quality control and potentially longer outages."* (iii) On Thursday, Bloomberg reported "*Electricite de France SA discovered new defects at two of its nuclear reactors that were halted for maintenance and repairs, raising fresh concerns that its electricity output will remain largely constrained this year after plunging in 2022. Flaws tied to so-called thermal fatigue have been found on the pipes of the Penly-2 and Cattenom-3 reactors, the utility said in a statement. The pipes have been replaced as part of broader repairs related to "stress corrosion" cracks — a different type of faults — that are affecting emergency cooling pipes of some of the EDF's atomic plants, according to the nuclear safety authority."* Our Supplemental Documents package includes the two Bloomberg reports and an AFP report on these issues.

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

Any negative for France's nuclear generation in 2023 will be at a terrible time for Europe as its Russia natural gas supply gap is bigger in 2023 than it was in 2022. Our 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 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 17: Europe and Asia continued to drive global LNG trade in 2022



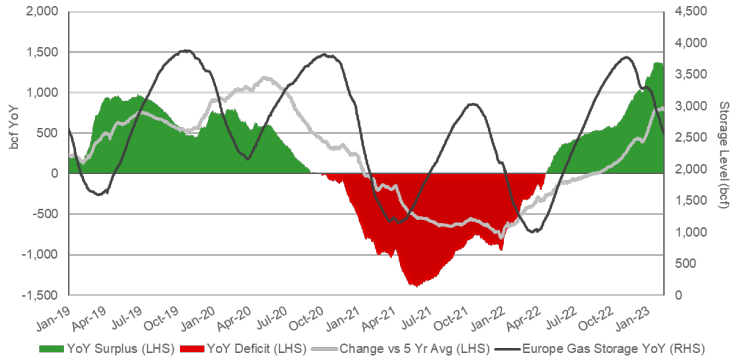
Source: Cheniere

Natural Gas – Europe storage is now +30.77% YoY ie. 57.17% full vs 26.40%

Europe gas storage

The big global natural gas story for the past few 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 30.77%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -2.54% WoW to 57.17% on Mar 10. Storage is now +30.77% greater than last year levels of 26.40% and is +20.59% above the 5-year average of 36.58%. Below is our graph of Europe Gas Storage Level.

Figure 18: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs down -2 rigs to 590 oil rigs on Mar 10

US oil rigs down -2 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -2 rigs to 590 rigs as of Mar 10, notably and to some surprise there was a large -6 rig drop in the Permian, with +1 rig increases in both the Mississippian and DJ-Niobrara, and +2 rigs at more marginal basins such as "Others". The total US oil rig

count is now at 590 rigs, up +63 YoY, +109 from the 2022 low of 481 rigs in January and +418 since the 2020 low of 172 rigs on Aug 14. US gas rigs were -1 rig WoW at a total of 153 rigs, an increase of +18 rigs YoY. We expect that US gas rigs will continue to decline over the coming weeks. Below is our graph of total US rigs.

Figure 19: Baker Hughes Total US Oil Rigs

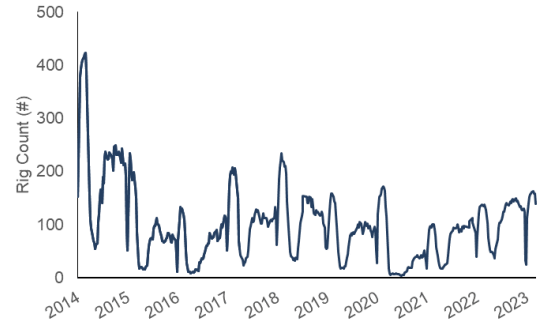
Source: Baker Hughes

Oil – Total Cdn rigs down -23 WoW to 223 total rigs, +17 rigs YoY

Cdn total rigs -23 WoW

The traditional winter drilling season in Canada is ending and we should continue to see large rig declines in the next 1-2 weeks. However, the cold temperatures this week should let some extended drilling for those who want to keep drilling for another week. Total Cdn rigs were -23 WoW to 223 rigs as of Mar 10. Notably, the week of Mar 10 saw a -18 rig decline in AB and a +1 rig increase in BC, with all other areas remaining flat. There is now a total of 223 rigs, +107 vs the comparable Covid period of 116 rigs on Mar 12, 2021. Cdn oil drilling rigs decreased by -19 rigs WoW to 139 rigs, up +12 YoY from 127 rigs a year ago and Cdn gas rigs were down -4 rigs WoW to 84 rigs. Below is our graph of total Cdn oil rigs.

Figure 20: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

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

US oil production down WoW

The EIA estimates US oil production was down -0.1 mmb/d WoW to 12.2 mmb/d for the week ended Mar 3 with also down -0.1 mmb/d to 11.8 mmb/d and Alaska down at 0.440 mmb/d.

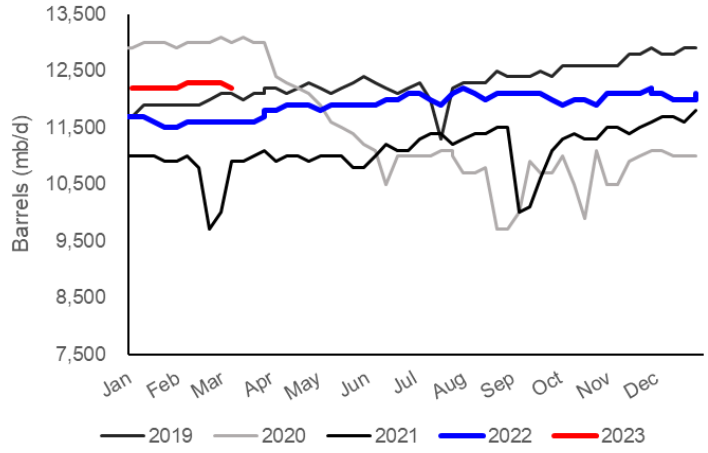
US oil production, based on the weekly estimates, has been mostly range bound between 11.9 to 12.1 mmb/d since the 2nd week of May. But broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 as well as five weeks ago, the first time since it touched 12.2 mmb/d in the 1st week of August. Total US production reached its highest level since March 13, 2020 on Feb 3, 2023 at 12.3 mmb/d. Lower 48 production was down WoW at 11.8 mmb/d this week and Alaska was down at 0.440 mmb/d WoW. US oil production is up +0.600 mmb/d YoY at 12.2 mmb/d but is still down significantly at -0.900 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 21: EIA's Estimated Weekly US Oil Production

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	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		
2023-Mar	03/03	12,200								

Source: EIA

Figure 22: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA STEO increases 2023 oil production based on its decrease to Q4/22

EIA decreases 2023 oil production forecast

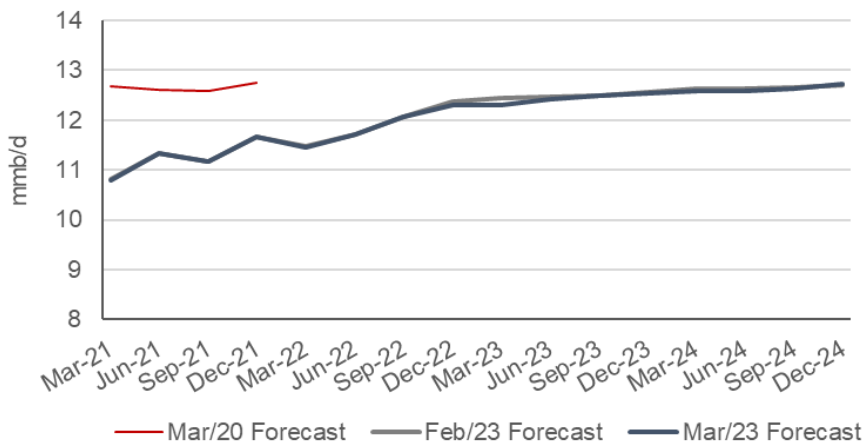
The EIA posted its March Short-Term Energy Outlook on Tuesday [LINK]. (i) The EIA decreasing its 2023 oil production forecasts based on lower Q4/22 exit production i.e., the EIA revised down its 2023 by -50,000 b/d and lowered its forecast for Q4/22 by -60,000 b/d. (ii) The EIA revised down its Q4/22 forecast to 12.30 mmb/d in Mar STEO vs 12.36 mmb/d in Feb STEO. This decreased its average 2022 oil production forecast from 11.90 mmb/d to 11.88 mmb/d, which is +0.64 mmb/d YoY vs 11.24 mmb/d in 2021. (iii) STEO 2023 average forecast is 12.44 mmb/d, which is down -50,000 b/d vs its Feb STEO of 12.49 mmb/d. The YoY growth is +560,000 b/d YoY vs 2022. As noted above, this is less than the EIA's decrease to its Q4/22 forecast of -60,000 b/d. (iv) The EIA is forecasting 2024 oil production to decrease modestly to 12.63 mmb/d which is a YoY increase of +0.19 mmb/d.

Figure 23: Estimated US Crude Oil Production by Forecast Month

(million b/d)	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Mar-2023	10.79	11.34	11.18	11.66	11.24	11.46	11.70	12.06	12.30	11.88	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.72	12.63
Feb-2023	10.82	11.34	11.18	11.66	11.25	11.47	11.70	12.06	12.36	11.90	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65
Jan-2023	10.82	11.34	11.18	11.66	11.25	11.47	11.70	12.05	12.23	11.86	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81
Dec-2022	10.82	11.34	11.18	11.66	11.25	11.46	11.70	12.03	12.29	11.87	12.24	12.24	12.34	12.51	12.33					
Nov-2022	10.82	11.34	11.18	11.66	11.25	11.46	11.70	11.99	12.15	11.82	12.22	12.24	12.32	12.48	12.31					
Oct-2022	10.82	11.34	11.18	11.66	11.25	11.46	11.70	11.83	11.99	11.74	12.27	12.29	12.36	12.50	12.35					
Sep-2022	10.82	11.34	11.18	11.66	11.25	11.47	11.70	11.81	12.16	11.79	12.42	12.55	12.70	12.87	12.63					
Aug-2022	10.82	11.34	11.18	11.66	11.25	11.46	11.69	12.01	12.28	11.86	12.39	12.50	12.82	13.10	12.70					
Jul-2022	10.69	11.28	11.13	11.63	11.19	11.46	11.75	12.08	12.34	11.91	12.45	12.58	12.87	13.17	12.77					
Jun-2022	10.69	11.28	11.13	11.63	11.19	11.45	11.71	12.08	12.43	11.92	12.64	12.82	13.07	13.33	12.97					
May-2022	10.69	11.28	11.13	11.63	11.19	11.42	11.78	12.07	12.35	11.91	12.56	12.71	12.94	13.18	12.85					
Apr-2022	10.69	11.28	11.13	11.63	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95					
Mar-2022	10.69	11.28	11.13	11.62	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99					
Feb-2022	10.69	11.28	11.13	11.69	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60					
Jan-2022	10.69	11.28	11.12	11.54	11.16	11.58	11.70	11.88	12.05	11.80	12.26	12.33	12.46	12.58	12.41					
Dec-2021	10.69	11.28	11.11	11.63	11.18	11.67	11.72	11.91	12.09	11.85										
Nov-2021	10.69	11.28	11.07	11.47	11.13	11.69	11.77	11.97	12.16	11.90										
Oct-2021	10.69	11.28	10.98	11.13	11.02	11.54	11.64	11.78	11.96	11.73										
Sep-2021	10.69	11.28	11.06	11.28	11.08	11.42	11.58	11.81	12.06	11.72										
Aug-2021	10.69	11.22	11.26	11.30	11.12	11.46	11.62	11.86	12.11	11.77										
Jul-2021	10.70	11.20	11.17	11.34	11.10	11.54	11.72	11.95	12.20	11.85										
Jun-2021	10.70	11.04	11.17	11.38	11.08	11.55	11.67	11.88	12.05	11.79										
May-2021	10.65	10.97	11.12	11.34	11.02	11.51	11.68	11.96	12.21	11.84										
Apr-2021	10.75	10.93	11.13	11.35	11.04	11.54	11.74	11.99	12.18	11.86										

Source: EIA STEO

Figure 24: Estimated US Crude Oil Production by Forecast Month



Source: EIA STEO

Oil – Pioneer CEO "*just don't have that potential to grow US production ever again*"

Pioneer CEO on lack of US oil growth potential

We recognize that there are many who believe the US can growth its oil production at strong rates for multiple years. However, the messaging from a wide range of producers and service companies has been caution on that assumption and that US oil growth expectations should be lowered. Another in this camp is Permian player, Pioneer Natural Resources CEO Scott Sheffield. He made a clear statement that "*most companies are drilling Tier 2 and Tier 3 wells*". On Monday, we tweeted [LINK] "*Bullish for #Oil. $PXD CEO Sheffield "most companies are drilling Tier 2, Tier 3 inventory now. So we just don't have that potential to grow US production ever again. I think we may get back to 13 mmb/d, probably in ~2.5 to 3 yrs at a very slow pace." Thx @SullyCNBC. #OOTT."* Our tweet included the transcript we made of Sheffield's comments. At 2:10 min mark [LINK] "… *and secondly, we just don't have, the industry doesn't have the inventory. Most companies are drilling Tier Two, Tier Three inventory now. So we just don't have that potential to grow US production ever again. I think we may get back to 13 million barrels a day, probably in about 2 and a half to 3 years, at a very slow pace*."

We assume Pioneer CEO was using ~12.4 mmb/d as the starting point

Pioneer CEO Sheffield said US doesn't have the potential to grow oil production, but then said there could be a return to 13 mmb/d in about 2.5 to 3 years. We don't know what he was using for his current production reference point, but our guess would be he is using something like 12.4 mmb/d. Last week's (March 5, 2023) Energy Tidbits memo highlighted the EIA's Form 914 data, which is the estimate for actuals thru Dec. We included the below table that notes the EIA actuals for US oil production in Nov 2022 was 12.4 mmb/d whereas it was down to 12.1 mmb/d in Dec that was impacted by cold winter temporary shut-ins ie. in North Dakota. So we guess Sheffield was more likely using something like 12.4 mmb/d.

Figure 25: 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

Oil – WSJ "*evidence that companies have drilled thru much of their best [shale] wells*"

WSJ on shale

We have been highlighting the comments from shale oil and gas players that point to lesser and more expensive growth ahead for US oil and natural gas. (i) Our Feb 26, 2023 Energy Tidbits highlighted the blunt comments from Chesapeake as to why US natural gas production growth will be less and more costly than expected. 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*

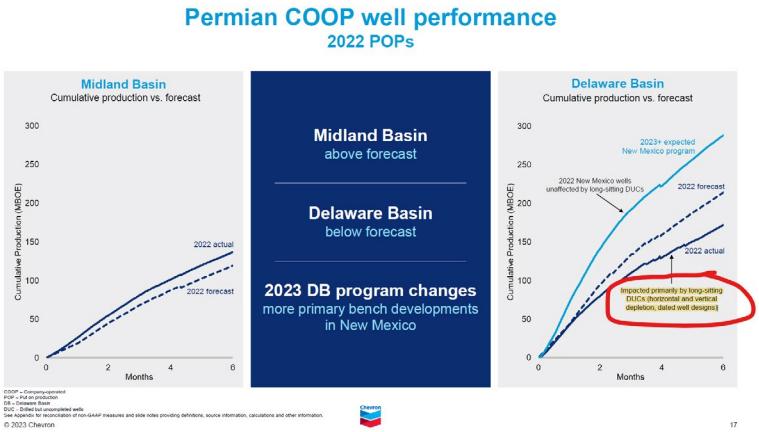
earnings calls. Chesapeake Energy held its Q4 call on Wed and their comments seem to point to why the growth in US natural gas production will be less and more costly than expected. On Thursday, we tweeted [LINK] "Will US #NatGas growth be less & more costly than expected? $CHK on why lower #Marcellus 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." (ii) There are other examples such as Pioneer CEO Sheffield (see above item) that many in industry are now down to drilling Tier 2 and Tier 3 wells. (iii) Last week's (March 5, 2023) Energy Tidbits memo highlighted Chevron's investor day comments on its less than expected Permian Delaware Basin 2022 well productivity results. Mgmt said the key reason for the underperformance is many of the 2022 well completions were DUCs from 2018 and 2019 that led to the significantly lower well productivity. On Wed, WSJ posted its report "*U.S. Shale Boom Shows Signs of Peaking as Big Oil Wells Disappear. America's biggest oil gushers are shrinking, evidence that companies have drilled through much of their best wells."* WSJ reported on wells production and reserves data from FLOW Partners LLC and Novi Labs. WSJ wrote "*Chevron, one of the largest landholders in the Permian, drilled some of the region's most prolific wells in Culberson County, Texas, but some of its newer wells there have seen productivity decline. The wells Chevron brought online in Culberson County last year are ultimately expected to produce 42% less oil, on average, than wells that began producing in 2018, according to FLOW's estimates. The top 10% of wells Chevron brought online across the Delaware last year were about 25% less productive on average than its wells the year before, according to Novi Labs data."* There was other well data in the WSJ report. Our Supplemental Documents package includes the WSJ report. [LINK]

What % of DUCs will disappoint like Chevron 2018/19 Permian DUCs did in 22?

Here is what we wrote In our March 5, 2023 Energy Tidbits memo on the Chevron disappointing 2022 Delaware wells. "*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

Figure 26: EIA Form 914 US Oil Production



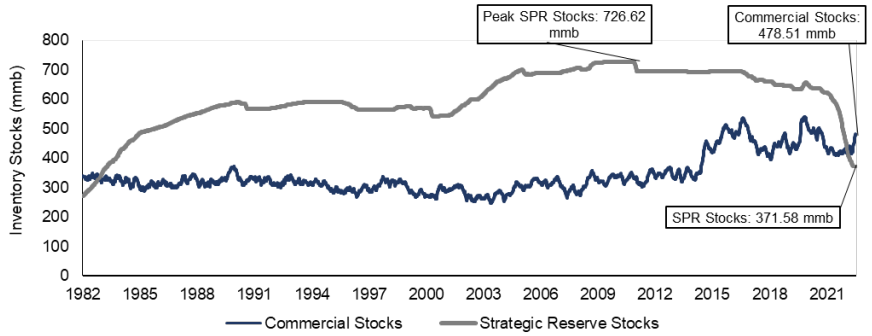
Source: Chevron

Oil – US SPR reserves now -106.934 mmb lower than commercial crude oil reserves

US SPR reserves

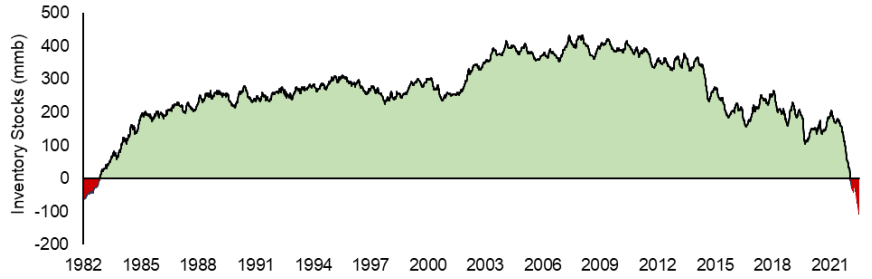
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit narrowing this week due to the draw on commercial oil stocks. There were some weather issues, but this is also the seasonal period for refinery turnarounds ahead of the switch to produce summer fuels. The EIA's new weekly oil data for Mar 3 has SPR reserves at 371.6 mmb vs commercial crude oil reserves at 478.5 mmb. The last time the SPR was down at this level was on Dec 1983 at 371.291 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 27: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 28: US Oil Inventories: SPR less commercial



Source: EIA

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

SPR going 26 mmb lower

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.*

Oil – Trans Mountain says expansion "will be in-service in the 1st Q2 of 2023"

Trans Mountain Expansion update

The headline was how Trans Mountain expansion project capital is now up to $30.9 billion. But we see their Friday afternoon release was good news for Cdn oil producers. We tweeted [LINK] "*1 year to go! @TransMtn expansion update "mechanical completion expected to occur at the end of 2023, and the pipeline WILL be in-service in the first quarter of 2024" "an increase of 590,000 barrels per day to a total of 890,000 barrels per day." #OOTT* " Trans

Mountain's expansion update was in line with its prior update of mechanical completion at the end of 2023, but also added "the pipeline WILL be in-service in the first quarter of 2024". Trans Mountain wrote *"(the Project). Construction of the Project is close to 80 per cent complete, with mechanical completion expected to occur at the end of 2023, and the pipeline will be in-service in the first quarter of 2024. Once completed, the pipeline system will have nearly tripled its capacity, representing an increase of 590,000 barrels per day to a total of 890,000 barrels per day*." Our Supplemental Documents includes the Trans Mountain construction update. [LINK]

Figure 29: Trans Mountain pipeline + expansion map

Source: Trans Mountain

Oil – Cdn oil differentials widened $1.25 to close at $16.40 on March 10

WCS less WTI differentials

This was the first decent widening of the WCS-WTI differential for weeks. This is normally a normal seasonal narrowing of Cdn oil differentials every spring. We aren't aware of any specific reason for this week's action. Two months ago, the WCS-WTI differential was $26.60 on Jan 6, bounced up and down for a week 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 before narrowing last week to $15.15 on March 3. This week, it widened by $1.25 to close at $16.40 on March 10. For perspective, a year ago, the WCS-WTI differential was $12.95 on March 10, 2022. Below is Bloomberg's current WCS–WTI differential as of March 10, 2023 close.

Figure 30: WCS less WTI oil differentials including March 10 close

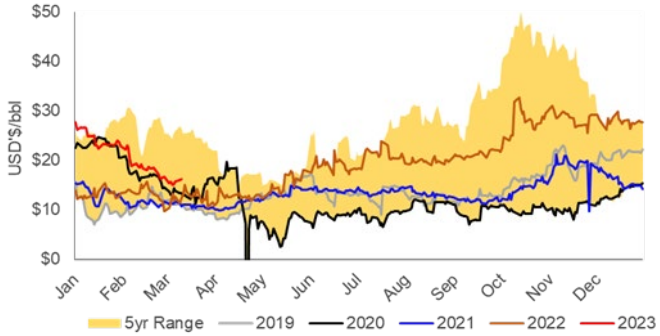
Source: Bloomberg

Oil – This is the normal season narrowing of Cdn heavy oil differentials

WCS differentials normally narrow in spring

Unfortunately, there are often items like Keystone pipeline outage that impact Cdn heavy oil differentials. And the huge item are releases 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 in 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.

Figure 31: WCS less WTI oil differentials



Source: Bloomberg

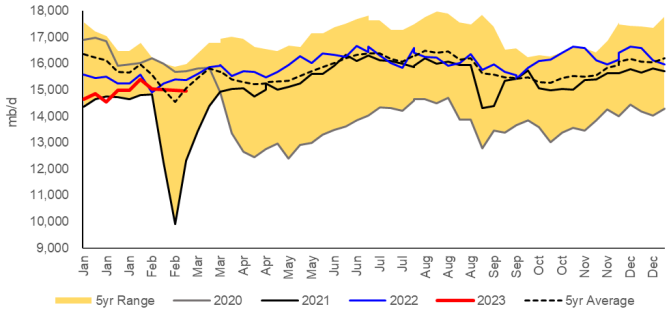
Oil – Refinery inputs down -0.012 mmb/d WoW to 14.967 mmb/d

Refiners switching to summer fuel blends

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 ie. 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 Mar 3. The EIA reported crude oil inputs to refineries were down -0.012 mmb/d this week to 14.967 mmb/d and are -0.410 mmb/d YoY

from 15.377 mmb/d for the week ended Mar 4, 2022. This week's refinery utilization was up to 86%, which is +0.2% WoW and -3.3% YoY. Total products supplied (i.e., demand) decreased WoW, down -1.364 mmb/d to 19.049 mmb/d, and Motor gasoline was down -0.55 mmb/d to 8.562 mmb/d from 9.112 mmb/d last week. The 4-week average for Motor Gasoline was down -0.018 mmb/d YoY to 8.715 mmb/d. The 4-week average of Total demand was down -1.82 mmb/d YoY to 19.746 mmb/d.

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



Source: EIA

Oil – US "net" oil imports up +2.33 mmb/d WoW to 2.909 mmb/d

US "NET" imports were up +2.33 mmb/d to 2.909 mmb/d for the Mar 3 week. US imports were up +0.063 mmb/d to 6.271 mmb/d. US exports were down -2.267 mmb/d to 3.362 mmb/d. The WoW increase in US oil imports was driven mostly by Top 10 with an increase of +0.329 mmb/d. Some items to note on the by country data. (i) Canada was up this week +0.175 mmb/d to 3.780 mmb/d. (ii) Saudi Arabia was up +0.166 mmb/d to 0.476 mmb/d. (iii) Colombia was up +0.079 mmb/d to 0.222 mmb/d. (iv) Ecuador was down -0.042 mmb/d to 0.055 mmb/d. (v) Iraq was down -0.025 mmb/d to 0.265 mmb/d. (vi) Mexico was down -0.169 mmb/d to 0.556 mmb/d

US "net" oil imports up WoW

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	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	Mar 3/23	WoW
Canada	3,066	3,504	2,949	3,737	3,707	3,419	3,587	3,856	3,556	3,197	3,605	3,780	175
Saudi Arabia	513	473	479	464	453	433	640	384	262	545	310	476	166
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	632	581	428	668	909	511	758	913	690	683	725	556	-169
Colombia	71	353	357	246	245	244	216	70	143	284	143	222	79
Iraq	227	289	354	150	201	195	469	230	322	251	290	265	-25
Ecuador	70	274	87	137	0	69	243	207	156	145	97	55	-42
Nigeria	136	66	141	143	211	114	317	248	75	256	98	243	145
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	4,715	5,540	4,795	5,545	5,726	4,985	6,230	5,908	5,204	5,361	5,268	5,597	329
Others	1,104	712	917	805	1,135	920	1,053	1,150	1,028	965	940	674	-266
Total US	5,819	6,252	5,712	6,350	6,861	5,905	7,283	7,058	6,232	6,326	6,208	6,271	63

Source: EIA

Oil – Aramco CEO "*risks of underinvestment in our industry are real*"

We are big believers that very large companies are precise in their language, much like the FED so we always try to do a FED statement check on what they say vs last time. And being precise in their words is especially true for Saud Arabia energy minister Abdulaziz and Saudi

Aramco bullish for energy

Aramco CEO Nasser, who know the world are watching. This morning, we thought there were some subtle but significant changes in Nasser's outlook in the Q4 release vs what he said in the Q3 release that point to a more bullish outlook for oil. There were two noticeable changes in Nasser's Q4 quotes vs his Q3 quotes that caused us to tweet earlier this morning [LINK] "*Note @aramco CEO Q4 vs Q3 quotes as he tends to be precise in his words. Q4: risks of #Oil #NatGas underinvestment are real. aim is to address energy security & sustainability, nothing about affordability, rather see higher energy prices. Sounds bullish for #Oil. #OOTT."* Nasser was clear this time the "risks of underinvestment in our industry are real", which is a step up from simply highlighting global under investment. And Nasser also dropped any reference to affordable energy and also reliable energy. Rather he changed to an "aim of addressing energy security and sustainability". In the Q4 release, Nasser said "*Commenting on the results, Aramco President & CEO Amin H. Nasser, said: "Aramco delivered record financial performance in 2022, as oil prices strengthened due to increased demand around the world. We also continued to focus on our long-term strategy, building both capacity and capability across the value chain with the aim of addressing energy security and sustainability. "Given that we anticipate oil and gas will remain essential for the foreseeable future, the risks of underinvestment in our industry are real — including contributing to higher energy prices. To leverage our unique advantages at scale and be part of the global solution, Aramco has embarked on the largest capital spending program in its history, and last year our capex rose by 18.0% to reach $37.6 billion*.". In the Q release, Nasser said "*Aramco's strong earnings and record free cash flow in the third quarter reinforce our proven ability to generate significant value through our low cost, low-carbon intensity Upstream production and strategically integrated Upstream and Downstream business. While global crude oil prices during this period were affected by continued economic uncertainty, our long-term view is that oil demand will continue to grow for the rest of the decade given the world's need for more affordable and reliable energy. "Against the backdrop of global underinvestment in our sector, we are extending our long-term oil and gas production capabilities while also working towards our previously stated ambition to achieve net-zero Scope 1 and Scope 2 greenhouse gas emissions from our wholly-owned operated assets."* As of our 7am MT news cut off, Aramco has only posted its Q4 release and IFRS reconciliation, there is no full Q4 report. Its Q4 call is tomorrow. Our Supplemental Documents package includes the Nasser Q4 vs Q3 quotes attached to our tweet.

Oil – Saudi begins importing Russian diesel

Saudi importing Russian diesel

Add Saudi Arabia to list of countries importing Russian diesel. Note that Saudi has been importing Russian fuel oil for electricity, but the reports this week were specific that Saudi began importing Russian diesel. On Tuesday, Kommersant (Russian media) reported [LINK] "*Russia began supplying diesel fuel to Saudi Arabia. Russia in February shipped in the direction of the ports of Saudi Arabia at least 190 thousand tons of diesel fuel, follows from the data of the company Refinitiv. Riyadh itself is a major supplier of diesel fuel to other countries. According to traders interviewed by Reuters, Russian diesel after processing can be re-exported to other countries. The tanker Srini loaded 66 thousand tons of diesel fuel in the port of Primorsk, now it is being unloaded at the terminal of the port of Jeddah. Two tankers, Apanemo and Zarya, are sailing to the port of Ras Tanura."*

Saudi was importing Russian fuel oil for electricity generation in 2022

As noted above, Saudi has been importing Russian fuel oil for electricity generation. Here is what we wrote in our July 17, 2022 Energy Tidbits memo. "*Saudi Arabia is in its peak summer season for use of its domestic oil production to generate electricity. Last week's (July 10, 2022 Energy Tidbits highlighted that summer oil domestic consumption for electricity can be 300,000 to 400,000 b/d more than during winter. It is still the peak season, but it looks like Saudi Arabia will be using of its own oil for electricity as it importing more Russian fuel oil for electricity generation. This also allows helps Russia maintain exports. On Thursday, Reuters reported [LINK] "Saudi Arabia, the world's largest oil exporter, more than doubled the amount of Russian fuel oil it imported in the second quarter to feed power stations to meet summer cooling demand and free up the kingdom's own crude for export, data showed and traders said. Russia has been selling fuel at discounted prices after international sanctions over its invasion of Ukraine left it with fewer buyers. Moscow calls the war in Ukraine a "special military operation". The increased sales of fuel oil, used in power generation, to Saudi Arabia show the challenge that U.S. President Joe Biden faces as his administration seeks to isolate Russia and cut its energy export revenues." "Data obtained by Reuters through Refinitiv Eikon ship tracking showed Saudi Arabia imported 647,000 tonnes (48,000 barrels per day) of fuel oil from Russia via Russian and Estonian ports in April-June this year. That was up from 320,000 tonnes in the same period a year ago."*

Oil – China brokers Saudi/Iran deal to restore diplomatic relations

Saudi/Iran deal

The big news Middle East news this week was the Friday joint trilateral statement by Saudi Arabia, Iran and China that said "*The three countries announce that an agreement has been reached between the Kingdom of Saudi Arabia and the Islamic Republic of Iran, that includes an agreement to resume diplomatic relations between them and re-open their embassies and missions within a period not exceeding two months, and the agreement includes their affirmation of the respect for the sovereignty of states and the non-interference in internal affairs of states. They also agreed that the ministers of foreign affairs of both countries shall meet to implement this, arrange for the return of their ambassadors, and discuss means of enhancing bilateral relations. They also agreed to implement the Security Cooperation Agreement between them, which was signed on 22/1/1422 (H), corresponding to 17/4/2001, and the General Agreement for Cooperation in the Fields of Economy, Trade, Investment, Technology, Science, Culture, Sports, and Youth, which was signed on 2/2/1419 (H), corresponding to 27/5/1998."* We could not find the details of the 2001 Security Cooperation Agreement. The agreement was short on public details, but the WSJ reported [LINK] "*As part of the deal, Iran pledged to halt attacks against Saudi Arabia, including from Houthi rebels it backs in the Yemen civil war, according to Saudi, Iranian and U.S. officials. Iran and Saudi Arabia will reopen their embassies and missions on each other's soil within two months and agreed that their foreign ministers will hold a summit soon to hammer out other details."* Our Supplemental Documents package includes the trilateral statement.

But still leave the Israel/ Iran risk to oil prices

We don't believe this deal lessens the key geopolitical risk to oil prices – what does Israel do to prevent Iran getting nuclear capability? We aren't in the camp, they just sit on the sidelines and simply watch it happen. Needless to say Israel wasn't

impressed by the Saudi/Iran deal as they don't see how that changes the risk of Iran nuclear progress. The Times of Israel and others reported ""*There was a feeling of American and Israeli weakness, so Saudi Arabia turned to other channels," said the senior Israeli official, briefing reporters who were traveling with Netanyahu in Italy."* And we don't believe seeing the EU positive statement [LINK] on the deal gives Israel any reason to change, especially with the EU closing "*Promoting peace and stability and achieving de-escalation of tensions in the broader Middle East are key priorities for the EU. The EU remains ready to engage with all actors in the region in a gradual and inclusive approach, and in full transparency."* Rather, we suspect Israel looks at Iran wanting to have discussions with the EU to use as a cover or delaying tactic to prevent/slow down action against them when they are having discussions.

Looks to set the stage for an end to Saudi coalition war against the Houthis?
The WSJ reporting certainly seems to suggest that the deal should be a catalyst to end the eight years of Saudi/Houthis fighting, or at least will be given a chance to end the fighting. The war isn't over but there has been a significant reduction in air strikes and drone attacks over the past year, which would seem to at least set the stage for some movement. It is coming up to the 8th anniversary of the Saudi-Houthi war, or at least when the Saudi coalition started its air strikes on the Houthis with the goal of restoring Yemen's ousted government. The fight was only supposed to last a few months at most, but it is still not ended. An end to the Saudi/Houthi war wouldn't be expected to impact oil prices as, other than a few very short terms, oil markets overlooked the risk of Houthis drone and ballistic missile attacks on Saudi Arabia oil infrastructure. Even its Sept 14 successful attack on Abqaiq only jumped Brent $8 to $62.85 on sept 16, but they quickly retreated to $58 by Sept 18 and back to $54 by the end of Sept. So we wouldn't see any Saudi/Houthi deal lead to any change in oil prices from a Houthi risk.

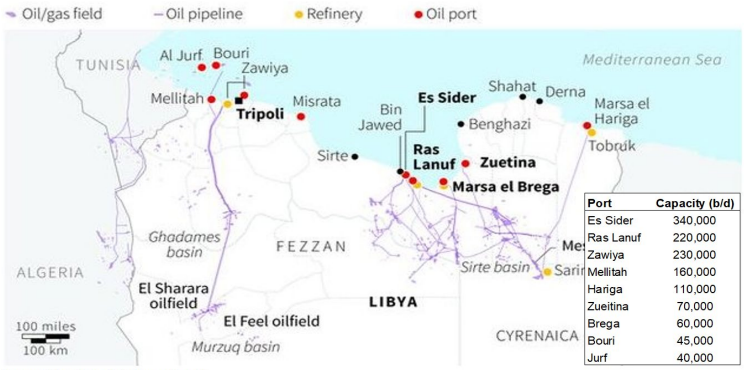
Oil – Libya NOC says oil production continues to be stable at ~1.2 mmb/d

Libya oil production stable at ~1.2 mmb/d

We have to give the Libya National Oil Corporation credit that it's been able to keep oil production pretty stable right around 1.2 mmb/d for the past four or five months. On Friday, the Libya National Corporation posted on its Facebook [LINK] a short update on oil production. The Google Translate was "*Crude oil production reached 1.213 million barrels per day, and condensate production reached 53 thousand barrels per day during the past 24 hours."*

Figure 34: Libya Ports, Major oilfields and Terminals map

SAF Group Compiled Libya Ports & Terminals Status



Port	Capacity (b/d)
Es Sider	340,000
Ras Lanuf	220,000
Zawiya	230,000
Mellitah	160,000
Hariga	110,000
Zueitina	70,000
Brega	60,000
Bouri	45,000
Jurf	40,000

Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Oil – Wood Mackenzie sees peak oil demand 108 mmb/d in 2032, still 93 mmb/d in 2050

Peak oil demand

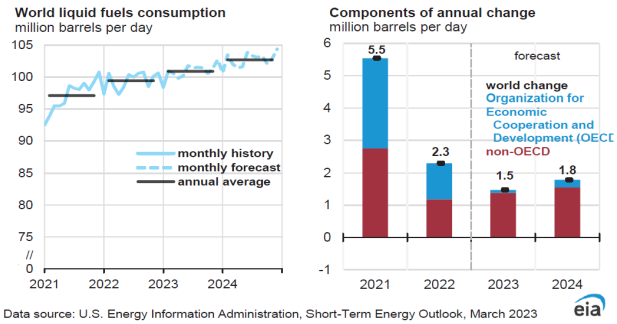
We don't know what Wood Mackenzie's prior oil demand forecast was, but on Wednesday, they posted their 49-min webcast on their report "*Scraping the barrel: is the world running out of high-quality oil and gas?"* [LINK]. It's a good report and we will write on it an upcoming Energy Tidbits memo but, as you can gather from the title, scraping the barrel, there isn't enough existing resource of low cost and low emissions oil to meet demand. Wood Mackenzie set the stage for their report by reminding of their Base Case for oil demand, which is much more bullish than most long-term views for long term oil demand. Wood Mackenzie sees oil demand increasing by +8 mmb/d to 2032 of 108 mmb/d. But perhaps the more significant item is that Wood Mackenzie still sees oil demand of 93 mmb/d in 2050. On Thursday, we tweeted [LINK] "*Bullish @WoodMackenzie Base Case demand + 8 mmbd to peak 108 mmbd in 2032, plateaus for awhile then declines to 93 mmb/d in 2050. Must read on challenge to supply this #Oil. Thx @WMALHittle @AndrewLatham_WM @SimonWFlowers [LINK] #OOTT."* Our tweet included the transcript we made of Wood Mackenzie saying "*.. one is our Base Case. And that's what Simon has basically asked me, which is that we see demand growing a few more years until early next decade. It peaks and then it plateaus for awhile, then it declines. So demand itself climbs another 8 million barrels a day by 2032 and then it declines to 93 million barrels a day by 2050. It's quite a drop. So it's gonna decline from 108 to 93 from 2032 to 2050*."

Oil – Another increase to EIA's forecast for record petroleum demand in 2024

EIA sees record oil demand in 2024

The EIA introduced its first 2024 petroleum consumption forecast for 2024 in its Jan STEO. It made a very small increase to its 2024 forecast in the Feb STEO and a bigger increase in the new March STEO. The new EIA March STEO increased its 2023 global petroleum consumption forecast to 100.90 mmb/d (was 100.47 mmb/d) and its 2024 global petroleum consumption forecast to 102.69 mmb/d (was 102.26 mmb/d). The EIA wrote "*China is the main driver of growth in 2023 as the country shifts away from its zero-COVID policy, a shift that will increase travel."* For 2024, the EIA wrote "*We forecast global liquids fuel consumption will grow by an additional 1.8 million b/d in 2024, and non-OECD countries will account for 1.6 million b/d of the growth."*

Figure 35: Components of annual change in consumption



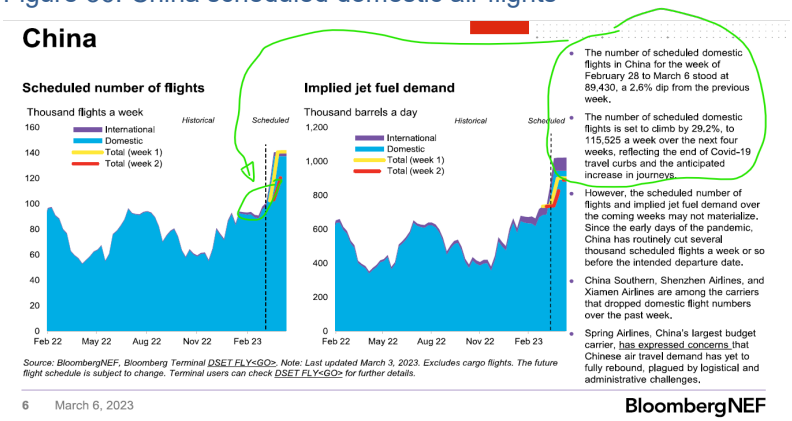
Source: EIA STEO March 2023

Oil – China domestic air flights, 4th week of flat or small WoW declines

China domestic flights

There have now been four consecutive weeks of slight WoW declines or basically flat WoW changes in China's scheduled domestic flights. It seems like a slight pause before a seasonal uptick in Q2 and Q3. On Wed, we tweeted [LINK] "Pause for now! 4th consecutive week of slight WoW decline or flat China domestic flights. Feb 28-Mar 3: -2.6%. Feb 21-27: +0.01%. Feb 14-20: -0.5%. Feb 7-13: -0.7%. Jan 31-Feb 6: +10.9%. Jan 24-30: -9%. Jan 17-23: +7%. Jan 10-16: +20%. Thx @BloombergNEF Claudio Lubis #OOTT." BloombergNEF wrote "*The number of scheduled domestic flights in China for the week of February 28 to March 6 stood at 89,430, a 2.6% dip from the previous week. The number of scheduled domestic flights is set to climb by 29.2% to 115,525 a week over the next four weeks, reflecting the end of Covid-19 travel curbs and the anticipated increase in journeys.*" Below is the NEF China scheduled domestic flights.

Figure 36: China scheduled domestic air flights



Source: BloombergNEF

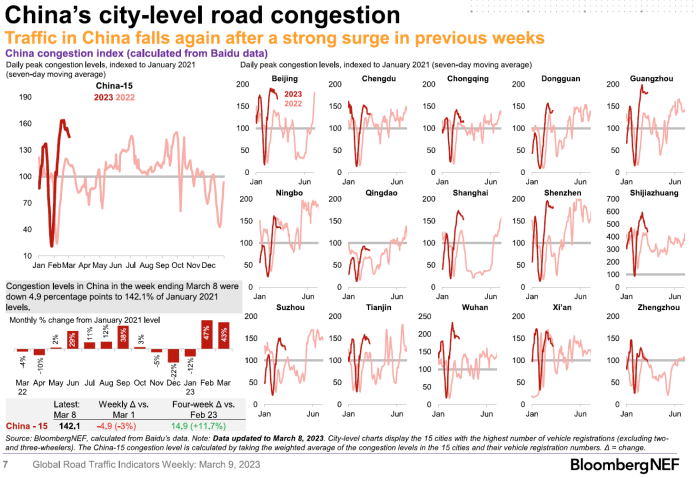
Oil – 3rd consecutive WoW decline in China traffic. But traffic is "exceptionally high"

China's city road congestion down 4.9% WoW

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

found a general post-Covid traffic level ie, its post-Covid gap up is done. China traffic congestion surged with the reopening in Jan, but we now have three consecutive WoW declines in traffic congestion, although the traffic has "been exceptionally high". On Thursday, we tweeted [LINK] ""*Traffic in all key regions remains elevated". China "traffic in Feb & Mar has been exceptionally high". But 3rd consecutive WoW down in CN congestion. -4.9% for Mar 8 to 142.1% of Jan 2021. Thx @BloombergNEF Global Road Traffic Indicators Weekly. #OOTT."* BloombergNEF's Global Road Traffic Indicators Mar 9, 2023 described China's city-level road congestion as "*Traffic in China falls again after a strong surge in previous weeks"* based on the Baidu data "*congestion levels in China in the week ending March 8 were down 4.9 percentage points to 142.1% of January 2021 levels*.". Our tweet also included the below BloombergNEF graphic on China road congestion.

Figure 37: China city-level road congestion for week ended Mar 8



Source: BloombergNEF

Oil – WHO declared COVID-19 a pandemic on March 11, 2020

COVID-19 a pandemic on March 11, 2020

It was on March 11, 2020 that the World Health Organization declared COVID-19 a pandemic. The impacts and concerns had already started to hit the economy and oil, but the WHO pandemic declaration set the western nations into a rush to shut things down. The Canadian' govt urged Canadians to return home ASAP, and closed its borders to non-Canadians (except Americans) on March 16. And then Canada/US closed the border for non-essential travel on March 18. And it just escalated from there. The world was quickly shut down. Note that oil prices had already started to slide in January, when it was still called the Wuhan coronavirus. Recall it was starting to be a topic of discussion/concern in late Jan 2020. . And WTI oil prices that started the year over $60, stayed down below $50 starting Feb 25, hit the low $30's in early March and the $20's on March 16, went below $0 on April 15, had its historic one-day close at -$37.63 on April 20, stayed in the teens until back to $20 on May 4, and back o $30 on May 18. Our Supplemental Documents package includes the Canadian Press Timeline of Covid-19 in Canada. [LINK]

Figure 38: WTI oil prices Jan 1, 2020 thru June 30, 2020

Source: Bloomberg

Oil – Vortexa crude oil floating storage at Mar 10 was 69.57 mmb, -11.31 mmb WoW

Vortexa floating storage

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 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 March 4 at 10am MT. (i) As of 10am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for March 10 at 69.,57 mmb, which is -11.31 mmb WoW vs essentially unchanged March 3 of 80.88 mmb. Note March 3 was only revised +0.52 mmb vs 80.36 mmb posted on Bloomberg as of 10am MT on March 4. (ii) Other than the very small upward revision to March 3, all of the other last several weeks were all revised down by ~2 mmb. The revisions from the estimates posted yesterday at 10am MT vs the estimates posted on Bloomberg at 10am MT on March 4 are as follows: March 3 revised +0.52 mmb. Feb 24 revised -2.45 mmb. Feb 17 revised -2.16 mmb. Feb 10 revised -2.56 mmb. Feb 3 revised -2.30 mmb. Jan 27 revised -1.60 mmb. (iii) Floating storage has been reasonably steady for the past two months. A simple average for the past seven weeks is 77.23, which is down vs last week's simple average of 81.62 mmb. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) March 10 estimate of 69.57 mmb is -150.69 mmb vs the post-Covid peak on June 26, 2020 of 220.26 mmb. (vi)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. (vii) March 10 estimate of 69.57 mmb is +7.35 mmb vs pre-Covid of 62.22 mmb as of March 13, 2020. But note floating storage quickly ramped up in March 2020 given Covid had hit China at the beginning of 2020. (viii) March 10 estimate of 69.57 mmb is -22.10 mmb YoY vs 91.67 mmb as of March 11, 2022. (ix) Below are the last several weeks of estimates posted on Bloomberg as of 10am MT March 11, 10am MT March 4, and 6pm MT on Feb 28.

Figure 39: Vortexa Floating Storage posted on Bloomberg Mar 11 at 10am MT

Source: Bloomberg, Vortexa

Figure 40: Vortexa Estimates Posted Mar 11 10am MT, Mar 4 10am MT, Feb28 6pm MT,

Posted Mar 11, 10am MT

Date	Last Px
Fr 03/10/2023	69574
Fr 03/03/2023	80876
Fr 02/24/2023	83764
Fr 02/17/2023	75787
Fr 02/10/2023	75999
Fr 02/03/2023	80687
Fr 01/27/2023	73921
Fr 01/20/2023	88707
Fr 01/13/2023	84955
Fr 01/06/2023	96742
Fr 12/30/2022	94617

Mar 4, 10am MT

Date	Last Px
Fr 03/03/2023	80364
Fr 02/24/2023	86212
Fr 02/17/2023	77948
Fr 02/10/2023	78563
Fr 02/03/2023	82986
Fr 01/27/2023	75517
Fr 01/20/2023	89737
Fr 01/13/2023	83830
Fr 01/06/2023	95522
Fr 12/30/2022	93295
Fr 12/23/2022	84626

Feb 28, 6pm MT

Date	Last Px
Fr 02/24/2023	85002
Fr 02/17/2023	76893
Fr 02/10/2023	79385
Fr 02/03/2023	82671
Fr 01/27/2023	74775
Fr 01/20/2023	88329
Fr 01/13/2023	84190
Fr 01/06/2023	95841
Fr 12/30/2022	93537
Fr 12/23/2022	84879
Fr 12/16/2022	63772

Source: Bloomberg, Vortexa

Oil – Vortexa's team specializes in tracking the "*so-called dark fleet*"

Vortexa tracking the "dark fleet"

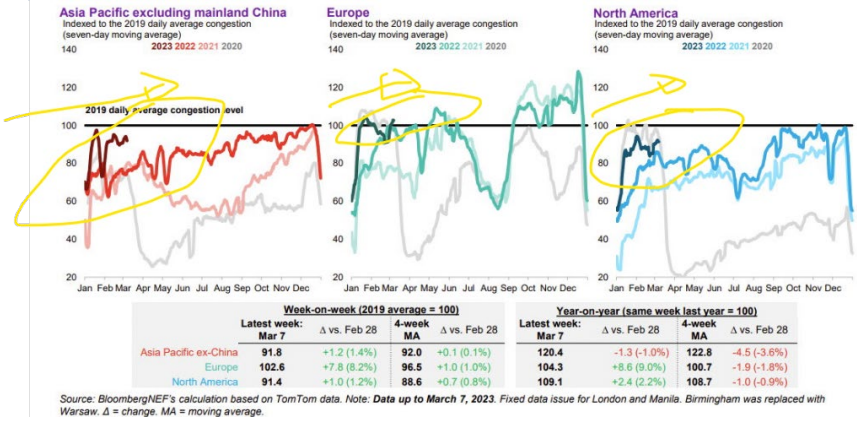
There was a great commentary on Friday from Vortexa's Senior Market Analyst Pamela Munger on how Vortexa has focused on tracking the growing dark fleet of tankers who turn off transponders. The dark fleet has had a huge growth with Russian sanctions adding to Iran dark fleet and others. And Vortexa has focused on tracking this dark fleet. We tweeted [LINK] "*Why we like & follow @Vortexa weekly crude oil floating storage! "we do a lot of tracking for the so-called dark fleet" "we have a great team that specializes in analyzing signals & gaps in the signals & where vessels appear" @Vortexa Pamela Munger on @gulf_intel podcast. #OOTT."* Our tweet included the transcript we made of Munger's comments on the Gulf Intelligence PODCAST: Daily Energy Markets – March 10th. [LINK]. At 24:30 min mark, Munger *"… we do a lot of tracking for the so-called dark fleet, if you want to call it. There is a certain set of vessels that we have noticed patterns where they turn off their transponders. And we do have special sets of technology on the back end where we analyze. We have a great team that specializes in analyzing signals and gaps in the signals and where vessels reappear*."

Oil – US TomTom mobility indicator shows traffic in all key regions remains elevated

US oil indicators weekly

In the BloombergNEF US Oil Indicators Weekly report we continue to see the same signals from the indicators for US gasoline consumption from BloombergNEF US Oil Indicators Weekly. On Friday we tweeted, [LINK] "*"Traffic in all key regions remains elevated." China "traffic in Feb & Mar has been exceptionally high." But 3rd consecutive WoW down in CN congestion. -4.9% for Mar 8 to 142.1% of Jan 2021.Thx @BloombergNEF Global Road Traffic Indicators Weekly. #OOTT.*" Mobility indicators like TomTom data point to stable levels in North American driving YoY, although cumulative road congestion has yet to recover to 2019 levels. Following the WoW increase for the week of Feb 28, North American and European road congestion was up WoW for the week of Mar 7. Although the data is stronger than the comparable period in 2021/22, it remains below relative levels in 2020 prior to the start of the pandemic. The TomTom mobility data seems logical as MoM North American road traffic was up resulting in a lowered differential to 2022's levels, but overall congestion remains below the 2019 average. Traffic in the Asia-Pacific region has been exceptionally high since Feb but is down WoW which looks like a seasonal trend. It its worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 41: Mobility Indicators



	Week-on-week (2019 average = 100)				Year-on-year (same week last year = 100)			
	Latest week: Mar 7	Δ vs. Feb 28	4-week MA	Δ vs. Feb 28	Latest week: Mar 7	Δ vs. Feb 28	4-week MA	Δ vs. Feb 28
Asia Pacific ex-China	91.8	+1.2 (1.4%)	92.0	+0.1 (0.1%)	120.4	-1.3 (-1.0%)	122.8	-4.5 (-3.6%)
Europe	102.6	+7.8 (8.2%)	96.5	+1.0 (1.0%)	104.3	+8.6 (9.0%)	100.7	-1.9 (-1.8%)
North America	91.4	+1.0 (1.2%)	88.6	+0.7 (0.8%)	109.1	+2.4 (2.2%)	108.7	-1.0 (-0.9%)

*Source: BloombergNEF's calculation based on TomTom data. Note: **Data up to March 7, 2023**. Fixed data issue for London and Manila. Birmingham was replaced with Warsaw. Δ = change. MA = moving average.*

Source: BloombergNEF

Oil – International air passenger travel growth in Jan underpinned by China reopening

Air travel up significantly in Jan

We remind that the IATA air passenger data is for January, which was positively impacted by China's reopening in on Jan 8, but the impact was limited in Jan. The International Air Transport Association (IATA) announced passenger data for January 2023 on Wednesday [LINK]. Total traffic in January, measured in revenue passenger kilometers, rose +67.0% YoY, a significant increase from the +39.7% YoY growth seen in December 2022. Globally, traffic is now at 84.2% of January 2019 levels. Domestic traffic for January 2023 was up +32.7% YoY, now at 97.4% of pre-pandemic levels. This is a major increase from the +2.6% YoY growth in December, which stood at 79.6% of December 2019 levels. International traffic saw the largest increase in January with growth coming in at a staggering +104.0% YoY reaching 77.0% of pre-pandemic levels. All markets continued reporting strong growth, led by Asia-Pacific. IATA's Director General Willie Walsh stated, *"With the lifting of the zero-Covid*

policy in China, domestic traffic picked up pace in January. The dynamic nature of travel restrictions in China has been reflected in volatile domestic passenger traffic trends since 2020. Nevertheless, the latest policy development is accommodative to the strong willingness to travel demonstrated by passengers." Our Supplemental Documents package includes the IATA release.

Figure 42: January 2023 Air Passenger Market

	World share[1]	January 2023 (% year-on-year) RPK	ASK	PLF (%-pt)[2]	PLF (level)[3]
TOTAL MARKET	***100.0%***	**67.0%**	**35.5%**	**14.7%**	**77.7%**
Africa	*2.1%*	113.8%	76.9%	12.8%	74.2%
Asia Pacific	*22.1%*	114.9%	58.8%	20.2%	77.4%
Europe	*30.7%*	53.2%	27.1%	13.0%	76.2%
Latin America	*6.4%*	24.3%	20.0%	2.8%	81.3%
Middle East	*9.8%*	91.1%	42.5%	20.1%	79.1%
North America	*28.9%*	42.2%	19.6%	12.5%	78.4%
International	***57.9%***	**104.0%**	**53.7%**	**19.4%**	**78.6%**

Source: IATA

Oil – Air cargo demand shows weak data in Jan to start the year

Air cargo demand weak in Jan

We remind that the IATA air cargo data is for January which captured the effect of China reopening and a weakened US dollar throughout the month. The International Air Transport Association (IATA) announced on Monday [LINK] that global demand in air cargo markets weakened for the 11th consecutive month in January 2023. Global demand, measured in cargo tonne-kilometres, fell -14.9% YoY compared to January 2022 levels with international demand also falling -16.2% YoY. Asia-Pacific airlines saw their air cargo volumes decrease by 20.0% YoY in January 2023. Airlines in Asia-Pacific suffered from supply chain disruptions and reduced trade and manufacturing activity due largely in part to the lingering effects of Covid restrictions and the Lunar New Year holiday. North American carriers posted an -8.7% decrease in cargo volumes in January 2023 YoY while European carriers saw a -20.4% decline in cargo volumes YoY, largely due to the ongoing war in Ukraine. Middle Eastern carriers experienced a -11.8% YoY decrease in January 2023. In contrast, Latin American carriers reported an increase of +4.6% in cargo volumes in January 2023 YoY. IATA's Director General Willie Walsh said, *"Global economic growth is forecast to remain weak… High inflation will continue curtailing purchasing power, dampening consumption and global trade. These impacts are worsened by currency depreciations relative to the US dollar... Oil price volatility will likely remain in 2023, owing to the EU ban on maritime transportation of Russian crude oil and petroleum products. Finally, the ongoing war in Ukraine remains the greatest geopolitical risk to the global economy."* Our Supplemental Documents package includes the IATA release.

Figure 43: January 2023 Air Cargo Market

	World share [1]	January 2023 (% year-on-year) CTK	ACTK	CLF (%-pt)[2]	CLF (level)[3]
TOTAL MARKET	*100.0%*	**-14.9%**	**3.9%**	**-9.9%**	**44.8%**
Africa	*2.0%*	-9.5%	-1.8%	-3.8%	43.9%
Asia Pacific	*32.4%*	-19.0%	8.8%	-15.5%	45.2%
Europe	*21.8%*	-20.4%	-9.3%	-7.5%	54.1%
Latin America	*2.7%*	4.6%	34.4%	-9.3%	32.5%
Middle East	*13.0%*	-11.8%	9.6%	-10.0%	41.1%
North America	*28.1%*	-8.7%	2.3%	-5.1%	42.3%

Source: IATA

Oil & Natural Gas – sector/play/market insights from CERAWeek

Earlier in the memo, we have noted comments at CERAWeek from Pioneer and Shell, There were many more items to note even if there weren't webcasts. However, we ran out of time this weekend to write up most of these CEO insights from CNBC and Bloomberg interviews on the sidelines at CERAWeek.

Sector insights from calls & presentations

Baker Hughes – positive on oil and gas for 2020s due to underinvestment

Bloomberg interviewed Baker Hughes CEO Simonelli on the sidelines at CERAWeek in Houston. Simonelli is bullish on oil and LNG as he looks forward and he highlighted the years of industry underinvestment as a key factor as demand is in a multi-year recovery. On Monday, we tweeted [LINK] *"Another CEO bull on 2020s #Oil #NatGas. $BKR @simonelli_l to @adsteel. "we have to remember though is this is a long cycle industry & we've had several years of underinvestment... we think we are in a multi-year upswing of demand coming back and also us needing to supply". #OOTT."* Our tweet included the transcript we made of Simonelli's comments on the Bloomberg posted video . [LINK]. On their bullish long term international view, at 7:50 min mark, Simonelli "*we're always looking at the economic situation, the risk of a recession. What we have to remember though is this is a long cycle industry and we've had several years of underinvestment. The pandemic was obviously an impact. Also you see the conflict between Russia and Ukraine. So we think we are in a multi-year upswing of demand coming back and also us needing to supply*."

Occidental – Bullish oil view for end of 2023 and over next couple years

Occidental CEO Vicki Hollub was interviewed by CNBC's Brian Sullivan on the sidelines at CERAWeek in Houston. She was bullish on oil to end 2023 and for the next couple years. On Monday, we tweeted [LINK] "*Bullish $OXY CEO view on #Oil. End of 2023, expects bit of a supply issue vs expected demand. Next couple yrs. "are in a scenario where prices will be higher because of the lack of supply, the lack of investment in our industry over the years". Great interview @SullyCNBC. #OOTT."* Our tweet included the transcript we made of Hollub's key comments from the video [LINK]. (i) Holub says Occidental could produce more, but won't in their return of capital model. At 1:00 min mark, Sullivan "*do you have the ability to produce more oil*?" Hollub "*We do, but we have a value proposition that includes an active share buyback program and also a growing dividend. And we always want to make sure we maximize our return on capital employed. So we are very careful with how we*

structure our capital programs on an annual basis to ensure we still have sufficient cash to buy back shares." (ii) Hollub sees $75-80 a sustainable price scenario. At 1:35 min mark, Hollub "*well actually I think prices are in a good place right now. If you are in the 75 to 80 dollar range for oil prices, that's a sustainable price scenario for the industry to continue to be healthy. And I think gas prices at the pump are not so bad at this price*." (iii) Sees prices higher to end 2023. Qt 2:10 min mark, Hollub "*I do believe that the mid cycle price of oil is close to $80, maybe $75 to $80. But I do believe that's the mid cycle price. Used to be 60 but now it's different because the world is globalized.. ….. I do think that toward the end of this year, we'll have a little bit of a supply issue vs what demand I expect will be by the end of the year."* Sullivan "*sounds like that could send prices a little higher*" Hollub "*that could."* (iv) Sees stronger oil prices over the next couple of years. On refilling the SPR, at 2:50 min mark, Hollub "*I think over time, the Administration will buy that storage back, will start to refill. It's going to be hard to do anytime in the next couple years because I do believe*." Sullivan "*couple years*?" Hollub "*I do believe we are in a scenario where prices will be higher because of the lack of supply, the lack of investment in our industry over the years*."

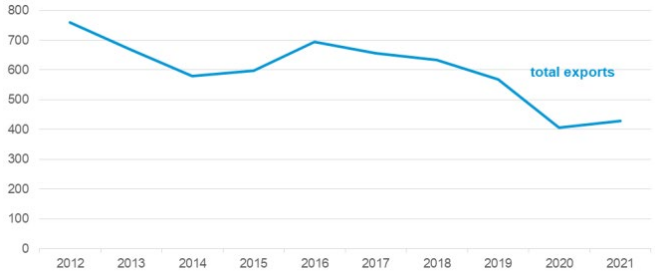
Oil & Natural Gas – Updated EIA Algeria country brief

EIA's country brief on Algeria

We continue to recommend adding the EIA's country analysis briefs to reference libraries as good quick references, in this case its new EIA country executive summary [LINK] on Algeria. Algeria is a key crude oil and natural gas player in Africa and is a member of OPEC. The country is self-sustaining in terms of meeting its energy consumption demands through domestic production, meaning it typically imports very small amounts of crude oil. From 2012 to 2021, Algerian crude oil exports averaged ~559,000 b/d and in 2021, the country exported roughly ~428,000 b/d with most of the crude going to Europe (289,000 b/d) and to a lesser extent, Asia and the Western Hemisphere. Algeria's mature oil fields produce light, sweet crude but has been struggling to prevent production declines due to a lack of upstream investment. In 2019, the Algerian government implemented a tax incentive across upstream activity to induce investment. The country held ~12,200 mmb of proven crude oil reserves at the start of 2023. Dry gas production averaged ~3.2 tcf from 2012 to 2021 while consumption averaged ~1.5 tcf. Production in 2021 reached a record high of 3.6 tcf and Algeria exited 2022 with an estimated 159 tcf of proved natural gas reserves. The average surplus of ~1.7 tcf between 2012 and 2021 means that Algeria does not import any natural gas and is one of the largest LNG exporters in Africa with ~1.7 tcf of excess production being exported between 2012 and 2021. In 2021, the country exported ~1.9 tcf of natural gas (~567 bcf of LNG) with the majority going to Europe. Algeria has four LNG terminals all falling under Sonatrach ownership with total liquification and storage capacity of 3.33 bcf/d and 0.038 bcf, respectively. In Feb 2022, Sonatrach signed a contract to upgrade its Skikda facility to increase storage capacity and accommodate larger vessels at port facilities. The country also has 3 operational transcontinental gas pipelines with cumulative capacity of 5.44 bcf/d. Two major regional pipelines have been proposed but there has yet to be an official decision made. One of the two proposals is for the construction of the Trans-Saharan pipeline, which would transport 2.9 bcf/d of natural gas from Nigeria to the Hassi R'Mel field and eventually supply Europe via Algeria's intercontinental pipelines. As of Jan 2020 (most recent data), Algeria had 6 refineries with total capacity of 0.671mmb/d; Skikda is the largest refinery and sees more than 0.477 mmb/d of total capacity processed by its two facilities. The Hassi

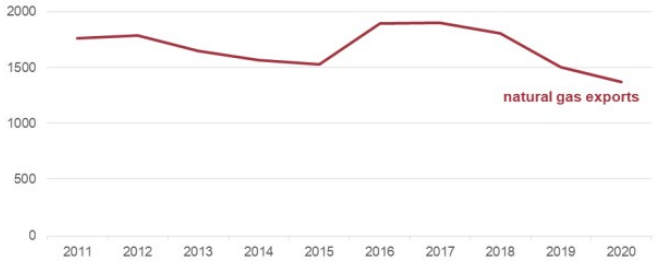
Messaoud refinery is currently under construction with completion expected by 2024 and would have the capacity to produce ~37.3 mmb of oil products and ~5.8 bcf of natural gas. Total planned capacity is ~112,000 b/d. Our Supplemental Documents package includes the EIA brief.

Figure 44: Algerian Annual Net Exports of Crude Oil (Thousands b/d)



Source: EIA

Figure 45: Algerian Annual Net Exports of Natural Gas (bcf/d)



Source: EIA

Energy Transition – Chevron, renewable fuels target is only 100,000 b/d by 2030

Chevron renewable fuels target

There was a good reminder from Chevron on Monday that the focus of supermajors on renewable fuels and renewable natural gas will be insignificant thru the 2020s. On Monday, we tweeted [LINK] "*Renewable fuels won't have any significant impact on #Gasoline consumption in 2020s. Promo on @gmfb, #Chevron committed to increasing renewable fuels production up to 0.10 mmb/d by 2030, vs 12/31/22 global refinery capacity 1.779 mmbd. #OOTT."* Chevron ran a commercial on Good Morning Football on Monday morning that we saw and it was their commercial on how they are working to reduce the carbon intensity of the fuels to transport goods showing a number of trucks. The Chevron commercial notes they are driving ahead on biofuels like bio diesel and their target is to produce 100,000 b/d of biofuels by 2030. Sounds good except when put in context of Chevron's existing business. The commercial announcer "we're committed to increasing our renewable fuels production" and the graphic on the scree says "*up to 100,000 barrels per day by 2030*". Our tweet noted that 100,000 b/d of renewable fuels by 2030 is a very small relative to Chevron's Dec 31, 2022 refinery worldwide capacity of 1.779 mmb/d. Note Chevron's US refinery capacity was 1.059 mmb/d.

Capital to renewable fuels/natural gas makes sense, at least for now

Chevron's target to get to 100,000 b/d of renewable fuels production fits our thesis of why supermajors are focusing on renewable fuels and renewable natural gas. The levels of renewables is insignificant and that likely sets up continued strong government subsidies/tax credits for renewable fuels/natural gas. They sound great, can slot right into the existing supply chain and any subsidies, while huge on a $/b or $/mcf basis to make it economic, aren't that bad on an absolute basis because the level of production will be immaterial. Governments wouldn't be able to afford huge subsidies if the absolute level of production was material to the country or global supply capacity. This is the reason why the supermajors are focusing on renewable fuels and renewable natural gas for their transition – the math works with incentives. And why they have de-emphasized wind and solar – the math doesn't work.

Energy Transition – Australia PM does about face, #NatGas key to energy security

Australia PM does 180 on natural gas

It's amusing how political leaders don't want to say it directly, but are increasingly being forced to acknowledge that their energy transition aspirations and plans won't work and that to keep on that path would lead to energy security problems. They don't say that directly, but it is the only conclusion. (i) It's the reality check that they do not want to be blamed if electricity isn't reliable, affordable and available 24/7. We saw clear correlation when Ontario PM Doug Ford won a majority govt as the previous Liberals govt was blamed for Ontario electricity prices. (ii) On Tuesday, we tweeted [LINK] "*Another leader admits #NatGas is key to guarantee energy security & "we will need additional supply". Must read 👇AU PM speech/Q&A. 180 vs his Powering AU election plan. No suprise, leaders don't want to be blamed if electricity isn't reliable, affordable and available 24/7. #OOTT."* (iii) Australia PM Albanese is from the Labour Party and there was nothing like this in their election platform "Powering Australia" from less than a year ago. But this week, Albanese made a major speech that clearly said natural gas is the key for Australia. A few of Albanese prepared remarks were: "*Everyone recognises that the global transition to net zero will take time. Equally, we understand there is no time to waste. The work of transition will require massive investment in building new physical assets and modifying existing ones. This is where gas in particular has a key role to play, as a flexible source of energy – providing peaking power today and continuing to provide firming power. Helping to smooth the transition to renewables, while guaranteeing energy security both for Australia and for our partners in the region."* (iv) In the Q&A, the PM was asked "*You talk about energy security and the volatile energy market, and in doing so you go out of your way to mention the role of gas in the transition."* Albanese reply was that he was just "being straight" on his priority on natural gas. Albanese started off his reply "*It's just aimed at where we're coming from, being straight. And being straight, gas will play a role in renewables. A company, I don't know if they're here or not, but I assume they are somewhere, like Rio, what they want to do in Gladstone with their aluminium refinery and other activity. They want to move towards hydrogen, they want to move towards renewables and to power that, they need the firming capacity of gas. And that is the case for so many companies as they move towards net zero where they want to be*." (v) Albanese said Australia needs new natural gas supply. Albanese was asked "*Well, following on from that, principally, would you be opposed, to ensure the transition to a new gas field or an expanded gas field if that was what was required over the next few decades?"* He replied "*I firmly believe that those decisions should be based upon the return on capital that private sector make. The Government's role is to set a framework but also to obviously*

have proper environmental assessment based upon the merits of projects. Governments have a role to do that, but we will need, in coming years, we will need additional supply." (vi) There is much more in the speech and Q&A. Our Supplemental Documents package includes the speech and Q&A. [LINK]

Dec 9, 2021, our 2022 Prediction, leaders admit energy transition isn't working

Readers of our Energy Tidbits memo know that we have been calling for leaders to admit, albeit not directly, that the energy transition wasn't working as per plans and aspirations. Most leaders took advantage to blame Russia/Ukraine for any delays in the energy transition, But everyone should remember that Q3 and Q4 of 2021 was already showing the energy transition wasn't working. Our Australia tweet this week iincluded our tweet from 15 months ago, our Dec 9, 2021 tweet with our 2022 predictions. Here is what we wrote in our Dec 12, 2021 Energy Tidbits memo. "Its December and so analysts will soon be coming out with 2022 predictions, so we thought we would beat them with one of our main 2022 predictions. On Thursday, 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 return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT*." This should not surprise readers as we have been noting the start of energy transition leaders starting to admit, in a politician's manner, that the energy transition isn't working as per aspirations and energy costs will be a lot higher than aspired. We have said for years that the energy transition will happen, but it will take longer, be bumpy road and cost more than the aspirations. Last week's (Dec 5, 2021) Energy Tidbits wrote on the ADNOC CEO speech *There was much more in the speech, which is why we tweeted [LINK] "If more leaders have a "Macron Moment" in 2022, maybe COP28 UAE in 2023 can be catalyst for getting down to work on practical, commercial, sustainable energy solutions: pro climate/pro growth? See SAF Group transcript of @SultanAhmedalj8 #ADIPEC keynote. #EnergyTransition #OOTT." We do wonder if we will see more world leaders accept that the energy transition isn't working according to their aspirations and that there is an increasing risk of a decade of energy crisis like seen in Europe in H2/21 unless the world puts in an achievable energy transition plan."* We think COP26 will turn out to be turning point, but a turning point to force energy transition leaders into changing their plan. It why we think we will more of the energy transition leaders come out of the closet and admit this in 2022. But what got us to tweet this week was after seeing Saudi Aramco CEO Nasser speech at the WPC in Houston. Nasser said "*There is one more thing that can no longer remain unsaid. A majority of key stakeholders agree with these realities as much as they believe in addressing climate change. We know this, because they say so in private. They should say it publicly too. I understand their dilemma. Publicly admitting that oil and gas will play an essential and significant role, during the transition and beyond, will be hard for some."* So our #1 2022 Prediction is that we will see leaders come out of the close and admit, in a politician's way, that the energy transition plan needs to be changed. The key result will be that fossil fuels are needed for way longer and the outlook for oil, natural gas and LNG will be stronger thru 2030 and beyond.

A #MacronMoment can take three forms

Here is another item from our Dec 12, 2021 Energy Tidbits memo. "*We use the term "Macron Moment" and the #MacronMoment as when an energy transition leaders come to the realization that the energy transition will take longer, be bumpy and cost more ie. it just won't be ready for prime time and they need to change their plans on how quickly they get rid of oil and natural gas. We are already seeing politicians start to publicly have a #MacronMoment but, so far, it has come in three forms of admission as noted below."*

First, a direct #MacronMoment clearly saying it isn't working as planned

Here is another item from our Dec 12, 2021 Energy Tidbits memo. "*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. And, even more importantly, he wants to bring a more pragmatic Energy Transition plan to the EU. On Nov 9, we tweeted [LINK] on Macro's address to the nation [LINK] that closed with his call for a more practical approach to the CO2 emissions and one that will include Europe. Macron said "But France will not be strong alone. With the European Union:➔ We will be able to build a credible strategy for reducing our CO2 emissions, compatible with our industrial and technological sovereignty." The Macron release had at the bottom a reminder "Next January, it is a new model of investment and growth that the President will defend with the French presidency of the Council of the European Union." 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. Our Supplemental Documents package includes the FT Macron report from Oct 30."*

Second, Japan says must have a "*pragmatic time frame*" for decarbonization

Here is another item from our Dec 12, 2021 Energy Tidbits memo. "*No one should is surprised to see how Japan says their #MacronMoment. They don't say it isn't working, they don't say energy costs are way higher than expected. But they do clearly make the point. They say it important to have a pragmatic time frame for decarbonization. That sounds like Japan-speak for the energy transition aspirations plan isn't working and needs to be changed. On November 9, Japan and the IEA issued a press release and we tweeted [LINK] "Today's Japan "go slow" getting rid of #Oil #NatGas fits Japan's Nov 9 on acceleration of decarbonization that must have "the importance of measures with pragmatic time frame". Japan is having a "Macron Moment". See Nov 9 tweet [LINK] #OOTT." 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.".

Third, US doesn't say it isn't working, just higher energy costs for yrs to come

Here is another item from our Dec 12, 2021 Energy Tidbits memo. "*US Energy Secretary Granholm has shown the third way of admitting the energy transition plan isn't working. She doesn't say specifically the energy transition plan isn't working or needs to be changed. She just avoids saying that. But she puts on the record that high energy costs are here for years. No one ever heard the Biden sales pitch on accelerating the push to Net Zero and reducing emissions including the warning that this will mean higher energy prices are here for years. That wasn't in the sale pitch. Here is what we wrote in our November 14, 2021 Energy Tidbits "Last week's (November 7, 2021) Energy Tidbits noted Biden seemed to also acknowledge a longer life for oil and natural gas. On Oct 31, we tweeted [LINK] "Is #Biden following #Macron & finally realizing demand for #Oil #NatGas is going to be more for 2020s than in his #NetZero aspiration? Oops, cancel #KeystoneXL, do zero to support US oil supply growth, etc. 2020s will be very good for #Oil #NatGas prices & #OPEC+. #OOTT." Biden wasn't as direct as Macron the week before on demand (see our Oct 31, 2021 Energy Tidbits), but seemed to be acknowledging demand for oil isn't going away as fast as he had planned. And, as everyone now knows, supply has been hurt by lack of oil investment so its sets up the tighter oil market for the 2020s. In his closing G20 press conference, Biden said "Well, on the surface, it seems like an irony, but the truth of the matter is — you've all known; everyone knows — that the idea we're going to be able to move to renewable energy overnight and not have — from this moment on, not use oil or not use gas or not use hydrogen is just not rational." Energy Secretary Granholm was on MSNBC Morning Joe on Monday. We tweeted [LINK] on her comments and noted she that US/Can voters weren't warned in the recent elections that the Energy Transition will happen but will lead to higher prices on oil, natural gas and electricity for years to come. We 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."*

Energy Transition – Kerry/Granholm talk big on reality check on Energy Transition

Kerry/Granholm reality check

We would have had a much more positive header for this section if Biden hadn't introduced his budget proposal on Thursday. But he did and he certainly looked to cut the legs out from Kerry's and Granholm's at CERAWeek in Houston. (i) At CERAWeek, we were pleased to see the very public comments from US climate envoy John Kerry and Energy Secretary Granholm that both seemed to clearly point to the Biden Administration making a big shift in their view on the energy transition. These are likely the two most significant cabinet members on the energy transition, and both clearly noted that the energy transition needs to focus on both providing energy security from the existing energy system AND also move to increase activity on clean energy. They both highlighted the "AND" and didn't say it was an OR. On Tuesday, we tweeted [LINK] "*Finally Kerry sees #EnergyTransition is AND not OR. "can't suddenly just shut off your economy .. have to keep things going. But at the same time you can stay focused on reducing the emissions that are the by-product of providing that*

energy that keeps your economy moving" #OOTT." Our tweet included the transcript we made of Kerr's comments "*President Biden is saying we need more oil now, but at the same time then doesn't want oil in the future. That feels confusing when you're a Chevron or Exxon developing shale in the US." Kerry "I understand, it can sound confusing, confusing. The demand is there globally and people are demanding that we keep our economies moving. You can't suddenly just shut off your economy. And shut off the heat, Shut off the lights. You have to keep things going. But at the same time you can stay focused on reducing the emissions that are the by-product of providing that energy that keeps your economy moving*.". (iii) Then on Wednesday, we tweeted [LINK] "*Positive for #NatGas for 2020s. Granholm sees #EnergyTransition is AND not OR. "need both traditional & new energy". "make sure this is a managed transition" "ready & able to meet consumer energy demand today, while expanding into more & more diverse sources for tomorrow". #OOTT."* Here are some of her quotes "*We need both traditional and new energy. As this transition progresses, our energy mix will change. And that means we all have to play a part to make sure this is a managed transition. ne that keeps us ready and able to meet consumer energy demand today, while expanding into more and more diverse sources for tomorrow."* (iv) The CERAWeek commentary was all positive on how Granholm and Kerry were indicating a big shift in the Biden Administration position on the need to have energy security from the existing energy system (ie. fossil fuels) as a priority. And how they couldn't have picked a better audience (CERAWeek is the major US oil gathering) to lay out this new view. (v) But after seeing the Biden budget proposal on Thursday, we have to wonder if the idea was to send Kerry and Granholm out to get some positive commentary from the oil patch for future soundbites. Biden's budget proposal was clearly anti oil and gas and focused on taking away any existing tax programs or incentives for oil and gas. It's why it looks like Kerry and Granholm talking big to get some positive feedback from the oil and gas sector, knowing full well what was coming on Thursday. Our Supplemental Documents package includes the Granhom speech and the White House Fact Sheet on Biden's budget proposals.

Biden is committed to "*leveling the playing field for clean energy*"

Here are some excerpts from the White House Fact Sheet. Under the section "*Ending Wasteful Spending to Special Interests*" there is a small section "*Eliminating Tax Subsidies for Oil and Gas. The President is committed to ending tens of billions of dollars of Federal subsidies for oil and gas companies, leveling the playing field for clean energy. Oil companies had record profits in 2022 and undertook record stock buybacks that benefited executives and wealthy shareholders, all while continuing to benefit from tax subsidies worth billions of dollars. The Budget eliminates special treatment for oil and gas company investments, as well as other tax preferences."* Wonder what the oil and gas sector said when they saw this after the Kerry and Granholm comments to the oil and gas sector. Especially as Biden is doing this to the oil and gas sector in his move to "*leveling the playing field for clean energy*."

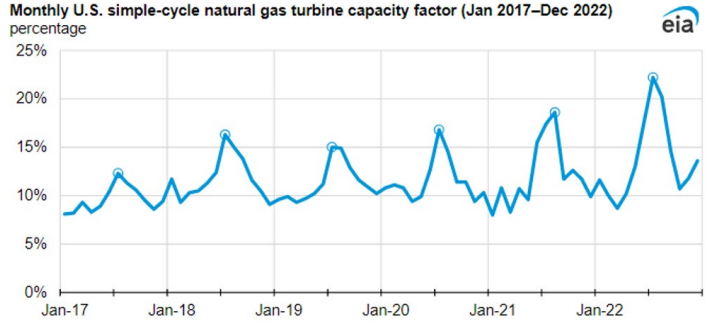
Energy Transition – EIA, Increasing renewables = increasing NatGas peaking power

Renewables need NatGas peaking power

We have to believe the Biden Administration sees the data, on how the intermittent natural nature of solar and wind means there is an increasing need for natural gas to fill in the holes. This is especially so with power generation. Yesterday, we tweeted [LINK] *"More #Solar #Wind = more need for #NatGas peaking generation. @EIA "need for more electric grid support during the day is growing as the share of electricity generation from intermittent*

renewables grows", US #NatGas peakers operated at record highs in summer 2022! #OOTT." Last week, the EIA posted its blog "*U.S. simple-cycle natural gas turbines operated at record highs in summer 2022*" [LINK]. The EIA notes that natural gas peakers operated at record highs in summer 2022. And the EIA clearly said "*Electric grid operators can use SCGT power plants to respond quickly to fluctuating demand for electricity. The need for more electric grid support during the day is growing as the share of electricity generation from intermittent renewables grows. SCGT power plants can meet demand if there is a lull in wind or solar output. SCGT power plants can best provide grid support because they can produce electricity quickly to immediately fill gaps in electricity output on the grid, and they can ramp down just as quickly. Other natural gas-fired electricity generators, such as CCGT or steam boiler plants, can take two to three times longer than SCGT power plants to start and ramp up to full load."* Our Supplemental Documents package includes the EIA blog.

Figure 46: Monthly US simple-cycle natural gas turbine capacity factor



Source: EIA

Energy Transition – Williams, More renewables = more peak NatGas pipelilne demand

Renewables need NatGas peaking power

It's not just that increasing solar and wind is leading to increasing natural gas peaking power demand, it's also increasing natural gas pipeline demand. Yesterday, we tweeted [LINK] "*More #Solar #Wind = More peak #NatGas pipeline demand. @WilliamsUpdates CEO to @adsteel. growth in renewables leads to increases in peak demand on its two major #NatGas pipelines. "this kind of volatility in demand continuing to increase". #OOTT."* Williams CEO was interviewed by Bloomberg on the sidelines at CERAWeek [LINK]. He was talking about the increasing need for natural gas storage. And he noted how the big increase in renewables is leading to increasing demand on their major natural gas pipelines. Our tweet included the transcript we made of Armstrong's comment. "At 10:18 min mark, Armstrong "*well we really think storage is going to be critical. One of the things that is really fascinating is on both NorthWest pipeline which serves all of the northwest part of the country and on Transco which is the nation's largest pipeline, we've seen 85 and 86% growth in the last three years in renewables in those markets. So 85% growth of renewable power has been added into those markets. At the same time our peak demand on those two pipelines have gone up, and these are big large scale pipelines. And they've gone up by 14% and 9%. So as renewables keep getting added, our actual incremental peak load continues to go up. Now that doesn't mean that the total demand for gas, but we sell capacity, Right. So we don't care if moved one day or 365 days. We sell capacity. And so we've seen this kind of volatility in demand continuing to increase.*"

Energy Transition – Other EV challenge, car buyers are looking for cheaper cars

Car buyers looking for cheaper cars

We aren't the only ones who have, over the past couple years, noted the key challenge for EVs to get mass buying has been that EVs are more expensive, even with subsidies, so haven't had the strong penetration of lower/middle income families. And that was under extremely low car financing interest rates. Unfortunately for EVs, rising interest rates is making consumers even more price conscious ie. a negative for EVs. CarGuru's CEO Trevisan highlighted that rising car loan interest rates now ahs more consumers interested in cars under $30,000 and not over. On Monday, we tweeted [LINK] *Challenge to #EVs sales in 2023. @RystadEnergy "sales collapse as subsidies & tax credits come to an abrupt halt" ie. higher net price. Higher interest rates = consumer more interested in <$30,000 cars, EVs or ICE. See 👇@CarGuru CEO to @Lebeaucarnews. #OOTT."* Our tweet included the transcript we made of Trevisan's reply to CNBC's Phil LeBeau on the impact of rising car interest rates on CNBC on Monday. [LINK] At 4:50 min mark, LeBeau "*Jason, I am curious as we have seen auto loan interest rates rise over the last year, how much has that slowed down demand in your opinion, or do you look at this and say people simply trade down. They were going to buy at x percent or at x priced vehicle, the interest rate makes them move down a little bit*". Trevisan "*Great question Phil, I think It's done both. So we see car volumes, used car volumes are in fact down from where they were a year ago. Now 2021 was a very active year in used sales, but they are down year over year. We're also seeing a shift on our site, consumers searching for and shopping for lower priced cars. $30,000 seems to be a trigger point where consumers seem to be more interested in cars under 30,000 than over thirty when they were before. And when you look at interest rates and you think about the monthly payment on a $30,000 car with rates where they are, it's getting to be numbers that are just too significant for a lot of people.*"

Global EV sales collapse as subsidies come to an abrupt end

Last week's (March 5, 2023) Energy Tidbits memo highlighted the Rystad Energy release on collapsing global EV sales in Jan. And the reality is that it is linked to interest rates as cutting subsidies/tax credits increases the net cost to EV buyers. We don't know if Tesla's 2nd round of price cuts fully offsets the loss of subsidies/tax credits. Here is what we then wrote "*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. 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."

Energy Transition –Overlooked risk, Russia is major uranium supplier to West

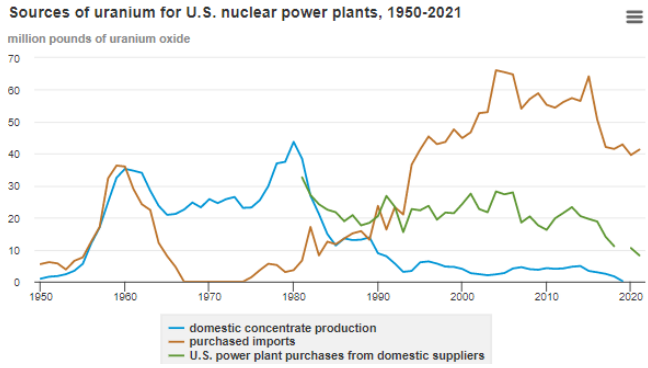
Russia uranium exports

On Wednesday, we tweeted [LINK] "*#EnergyTransition risk no one wants to talk about - need RUS for imports of nuclear fuel. RUS/UKR led to west push to increase nuke power for #EnergyTransition & energy security resiliency. US cut off RUS energy imports Except #Uranium. Thx @SVakhshouri @gulf_intel #OOTT.*" We had forgotten about this risk when a former nuclear executive mentioned it last spring on how Russia was an important global supplier of uranium for nuclear power plants in the West, including in the US. Perhaps the biggest change to the success to move to Net Zero post the west's determination to cut off Russia oil and gas imports is how the West has put a big push on nuclear power as the key – extending the life of existing nuclear and pushing for new nuclear generation, in particular small modular reactors ie. what we have called for decades, mini-nukes. But we were reminded of this by Dr. Sara Vakhshouri (Founder & President, SVB Energy International) on the Gulf Intelligence March 10 podcast [LINK] the UIS was quick to announced it was putting sanctions on Russia and would not import any Russian energy. At that time, we thought it wasn't a big deal. But as Vakhshouri reminded, the US did not include uranium for nuclear reactors in this ban on Russia energy imports. Our tweet included the transcript we made of her comments. At 28:28 min mark, Vakhshouri "… *even in the US. US Administration announced, the moment the war broke in Ukraine, that they are voluntarily going to put sanctions on Russia and not import any energy from Russia. But that energy did not include nuclear fuel. The US is still importing nuclear fuel from Russia*." Then at 30:05 min mark, Vakhshouri "…. *But something it seems that no one, especially in the US at least where I am sitting in Washington, DC, wants to acknowledge, think or even talk is Russia's influence in nuclear, an important part of the Energy Transition. Because now that war with Russia happened, Europe's strategy and many countries strategy for increasing their energy security resiliency is to increase their nuclear power generation for Energy Transition. And that is going to increase Russia's role.*"

14% of US 2021 uranium imports came from Russia, same as Canada & AUS

We have seen no reports that US has stopped importing Russian uranium. And we suspect it is something that is a bit of a dirty little secret that the US doesn't want to broadcast. The latest EIA data is for 2021 in their "Nuclear Explained: Where our uranium comes from" [LINK]. For 2021, the US imported about 80% of their uranium needs with the top supplier Kazakhstan (35% of imports), then down a lot toe Canada (15% of imports), Australia (14% of imports), and then Russia (14% of imports). Our Supplemental Documents package includes the EIA blog.

Figure 47: Sources of uranium for US nuclear power plants



Source: EIA

Capital Markets – FED Chair Powell's Senate testimony

Powell's Senate testimony

Fed Chair Powell's comments at his senate testimony on Tuesday were the big negative market story sending interest rates up and stocks down. That is, until SLB crash. But, in case you do want to see some of Powell's testimony. On Wednesday morning, Bloomberg Surveillance ran a great 34 second clip of Powell's key comments. We attached our phone video clip in our tweet at [LINK] that we called a compilation of FED chair Powell's greatest hits from his testimony.

Capital Markets – BOA CEO says to redeploy investment bankers to middle markets!

BOA's redeployment of investment bankers

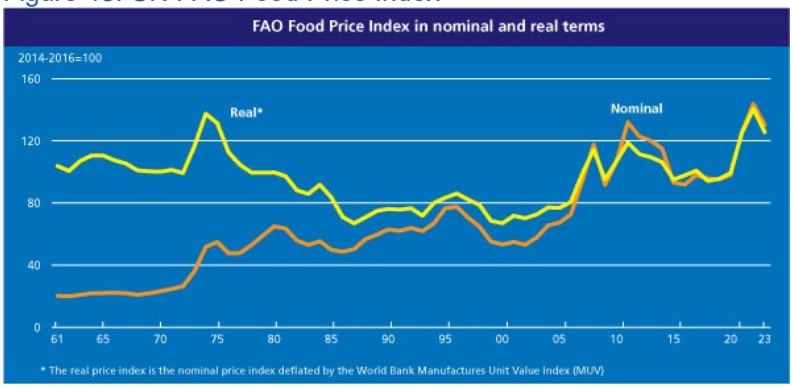
Anyone who has led an investment banking group or been an investment banker had to wince seeing BOA CEO Brian Moynihan's comments on Bloomberg on Thursday. We tweeted [LINK] "*Ouch! If investment banking is relationship driven & pay linked to eat what you kill, some unhappy bankers as BOA CEO "we'll redeploy people across the franchise incl investment bankers to other parts of the franchise to help us in the middle market investment banking" #OOTT*." Moynihan was talking about reducing headcount and then talked about redeploying investment bankers to help in the middle market investment banking. We don't know how BOA pays investment bankers, but there has to be a big element of the pay being what revenues did the investment banker bring into the firm. And a big factor investment bankers generating revenue is the strength of their relationships with the companies. So Moynihan saying they are going to redeploy investment bankers to new relationships and to middle market has to also be a signal to investment bankers time to go look for another job if you want to get paid.

Capital Markets – UN FAO Food Price Index dropped in February and is down YoY

UN Food Price Index down MoM

We recognize the UN FAO Food Price Index isn't a measure of what people pay when they go to the grocery store. We know this because grocery prices aren't going down. The UN global food price index for February 2023 was down for the 11th consecutive month. The UN wrote, *"The marginal decline of the FFPI in February reflected significant drops in the price indices of vegetable oils and dairy, together with fractionally lower cereals and meat indices, more than offsetting a steep rise in the sugar price index."* It was -8.8% YoY, and that is down huge from the record high YoY increase of +33.6% seen in March 2022. On Mar 3, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*The FAO Food Price Index drops again in February, albeit only marginally"* Note that the index is calculated on a Real price basis. The FFPI averaged 129.8 points for February 2023, which was a decline of -0.6% MoM and down -8.8% YoY. February's decline has the FFPI currently sitting -18.8% below the all-time high of 159.8 seen in March 2020. The FFPI also reported MoM declines for most of its sub-indices in February. The Vegetable oil index was down -3.2% MoM, after 10 months of decline. The Meat Price Index was down -0.1% MoM and the Dairy Price Index was down -2.7% MoM and -7.2% YoY, while the Cereal Price Index was down -0.1% MoM, still up +1.4% YoY. Finally, the Sugar Price Index was up +6.9% MoM and remains +13.0% YoY. Below is the all time FFPI graph. Our Supplemental Documents package includes the UN FAO Food Price Index update.

Figure 48: UN FAO Food Price Index



Source: UN

Capital Markets – FRED data shows grocery staples prices up hugely YoY

Grocery prices

Every month, we say the same thing – the UN FAO Food Price index and the US Consumer Food Price Index really don't come close to representing the price escalation people pay when they go to the grocery store. On Friday, The Hill posted its report *"How expensive are groceries in 2023? These 5 graphs show prices skyrocket*". [LINK]. The Hill reported on monthly data tracked by the Federal Reserve Bank of St. Louis including "*on the cost of grocery staples, like bananas, coffee, cereal, and anything else you might throw in your cart. The prices of all those items (and more) haven't just crept up over the past year – they've shot up. The cost of groceries jumped up 11.3% across the board over the last year, according to the most recently available Consumer Price Index calculations. To take a closer look at what that means for the average shopper, we picked five breakfast grocery items and searched the St. Louis Fed for answers on how much more expensive they've grown in*

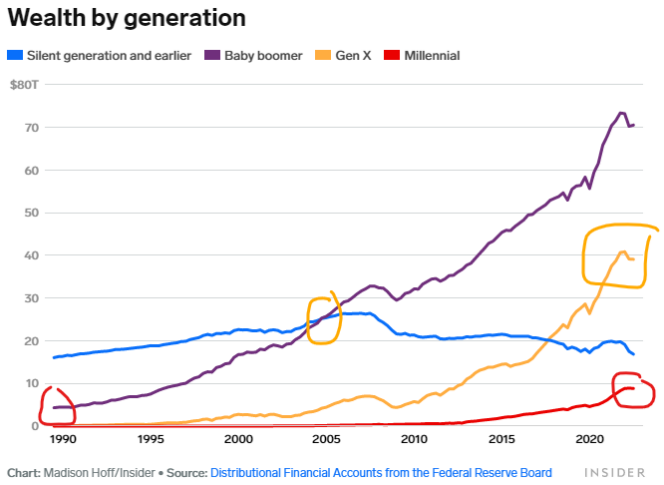
recent years. Eggs – *"No other grocery staple in the past year has seen a meteoric rise in quite like eggs. At the start of 2022, a dozen large eggs cost the average American shopper $1.93. At the start of 2023, that carton cost $4.82 – a 250% increase*". Milk – "*With some ups and downs in 2020, milk prices really started rising in March 2021. Back then, a gallon of conventional whole milk cost about $3.35 on average. In January of 2023, the price was up to $4.20*." Butter – "*Along with eggs, butter is one of the grocery staples that has seen prices increase the most. Sticks of butter went from $3.67 per pound to $4.88 in just one year*." Bacon – "*Finally something that's getting cheaper. After growing steadily more expensive for about 18 months, the price of sliced bacon started to drop in October of last year. The most recent data available shows its price is $6.80 per pound*."

UN Food Price Index down MoM

Demographics – Are Millennials & Gen X behind or ahead of Boomers on wealth?

On Wednesday, Business Insider posted a report "*Millennials in their 30s are sitting in an economic quagmire that could stick with them through retirement"* [LINK]. The report leads off "*Millennials in their 30s are living in a perfect storm of economic factors right now. Pandemic-specific circumstances, such as the cost of childcare when schools closed, are still adversely affecting young parents. In the long run, millennials' retirement may also be affected if Social Security benefits are cut. Plus, they're accruing debt at the fastest rate since the 2008 financial crisis, according to a recent Wall Street Journal analysis of New York Fed data."* And they include the below graph on wealth by generation, which got us thinking. No one knows the future of markets and wealth accumulation, but if you look at where Boomers were in the wealth accumulation stage at the same age as today's Gen X and Millennials, it looks like both ahead of Boomers. We used the mid-point of generations. Boomers 1946-64, used 1955 or 67 yrs old. Gen X 1965-80, used 1973, or 49 6rs old. Millennials 1981-1996, used 1989 or 33 yrs old. So Boomers in 1990 were 35 yrs old so close to where Millennials are today. Boomers in 2005 were 50 yrs old so close to where Gen X are today. Our Supplemental Documents incudes the Business Insider report.

Figure 49: Wealth by generation



Source: Business Insider

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

@Energy_Tidbits on Twitter

For new followers to our Twitter, we are trying to tweet on breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. Our Twitter handle is @Energy_Tidbits and can be followed at [LINK]. We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos for over 20 consecutive years. Please take a look thru our tweets and you can see we aren't just retweeting other tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures

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

Vikings' KJ Osborn helps pull man from burning car

NFL players get lots of media coverage when they do something negative off the field, but don't seem to get the same amount of media coverage when they do something great off the field. To be fair, it seems that way for everyone – bad things get big coverage. There was a great off the field story on Sunday night when 25-yr old Minnesota Vikings wide receiver, KJ Osborn, helped pull a man out of a burning car to save his life. We only saw it because we had NFL Network on Tuesday. Last Sunday night, Osborn was in an Uber going home in Austin. A car sped by them and others and then crashed into a bridge. The car's front was smashed and the car was on fire. Osborn's Uber driver stopped, jumped out to open the passenger door. A few seconds later, Osborn and another separate driver got to the car, to pull the driver out thru the passenger side, then Osborn dragged the driver 15 yards away in case the car blew up. Osborn's missed his first Uber and ended up in the 2nd Uber, which put him on the road at the time. Osborn said "*I'm just grateful that I was in the position to be able to help him as well as the three other heroes to be there*." *"I was at the right place at the right time."*

Figure 50: KC Osborn & others pull driver from burning car

Source: Fox News

CFL/NFL great Bud Grant passed away at age of 95

Bud Grant passed away yesterday at the age of 95. He and Marv Levy were two hugely successful CFL head coaches who were able to do the same in the NFL. Grant played in the NFL and then finished his pro football playing career in the CFL with the Winnipeg Blue Bombers. After retiring, he started his career as head coach of the Bombers leading them to four Grey Cups from 1957-1966. And then jumped to be head coach of the Minnesota Vikings from 1967 thru 1983 taking them to four Super Bowls, but unfortunately losing each time. Grant also played for two years in the NBA with the Minneapolis Lakers (forerunner to the Los Angeles Lakers) including being on the Lakers 1949-50 championship team.

Buffalo Bills Micah Hyde on why great players make a difference

Can't help but always appreciate having had the opportunity with great people who have driven big success in the financial industry. It's much like sports, you have to deep roster of good players, but the difference between being the best and good is having those one or two exceptional people who don't just lead but also lift the game of the good players. Was reminded of this in a couple of comments from Buffalo Bills safety Micah Hyde on Good Morning Football on Friday. He was asked what makes Bills QB Josh Allen special, he said *"I think just the person. When he walks the building everyday, he gives everybody confidence that we're gonna have a shot to go out each and every Sunday and win."* And then later, he was asked the prospect of facing Aaron Rodgers twice a year if Rodgers ends up on the New York Jets. He said "*I am going to see how many times on this show I can say confidence. When Aaron Rodgers steps in that locker room with the Jets, if it happens, he is going to give that whole team confidence. They're all going to get better because of it*."