Energy Tidbits

June 11, 2023

Produced by: Dan Tsubouchi

Seems Saudi's Extra 1 mmbd Cut Should Hold the Market For a Month or Two Until Summer Seasonal Demand Kicks In

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. Our target is to write on 48 to 50 weekends per year and to post by noon MT on Sunday. The Sunday noon timing was because PMs said they didn't have research to read on Sundays and Sundays are a day when they start to think about the investing week ahead.

This week's memo highlights:

1. Saudi Energy Minister Abdulaziz comments this morning suggest they expect their Saudi's surprise 1 mmb/d cut will hold the market for this month or next until seasonal summer demand kicks in. (Click here)

2. Economy, covid or combination, Baidu city-level road congestion for China's Top 15 cities is now down YoY to below 2022 levels. (Click here)

3. EIA forecasts another big year for US natural gas production +4.6 bc/d YoY to average 102.70 bcf/d in 2023. (Click here)

4. Raymond James says Midland Basin core inventory dwindling at a rapid rate and well productivity has finally rolled over. (Click here)

5. Trafigura says "*difficult to see how US [#Oil] production is going to increase this year*." (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

Table of Contents

US gas storage 562 bcf YoY surplus

Natural Gas – +104 bcf build in US gas storage; now 562 bcf YoY surplus

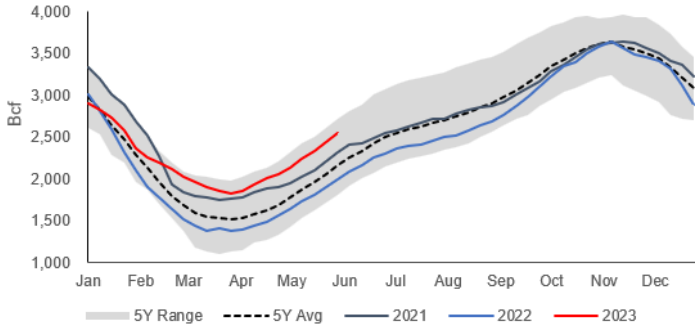
Weather and strong YoY natural gas production continue to lead to an increasing YoY surplus in gas storage. It's early June so it's still normally natural gas injection season at least until there is very hot weather across the US or some other unusual event. For the week of June 2, the EIA reported a +104 bcf build (under the expectations of a 114 bcf build), comparable to the +102 bcf build reported for the week of June 3 last year. This is a slight decrease from last week's build of +110 bcf, and a big increase vs the 5-year average build of +43 bcf. Total storage is now 2.550 tcf, representing a surplus of +562 bcf YoY compared to a surplus of +557 bcf last week and is +353 bcf above the 5-year average, in line with the +349 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)					Year ago (06/02/22)		5-year average (2018-22)	
Region	06/02/23		05/26/23	net change	implied flow	Bcf	% change	Bcf	% change
East	552		522	30	30	372	48.4	427	29.3
Midwest	604		577	27	27	450	34.2	486	24.3
Mountain	137		127	10	10	117	17.1	129	6.2
Pacific	164		151	13	13	209	-21.5	242	-32.2
South Central	1,093	C	1,070	23	37 C	839	30.3	913	19.7
Salt	319		304	15	15	251	27.1	282	13.1
Nonsalt	774	C	766	8	22 C	590	31.2	631	22.7
Total	2,550	C	2,446	104	118 C	1,988	28.3	2,197	16.1

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



Source: EIA, SAF

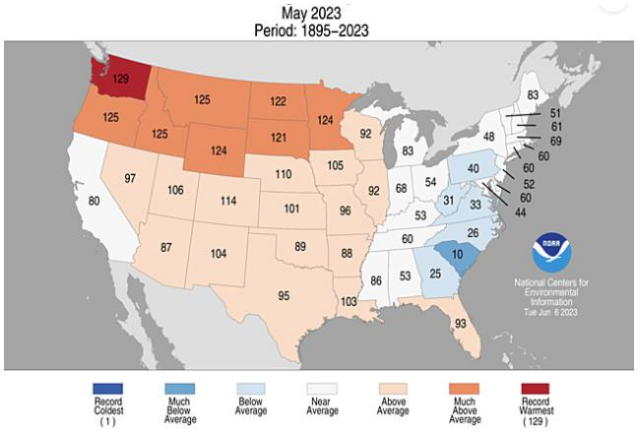
NOAA May climate recap

Natural Gas – NOAA May was very warm, record temperatures recorded in Washington

On Monday, NOAA posted its National Climate Recap for May [LINK]. May is typically the end of shoulder season for natural gas. As a general rule, there isn't really any significant weather driven demand for natural gas. And unless it is hugely warmer than normal in the major population areas, it isn't enough to drive a big air conditioning demand as it's more "leave the windows open" type of weather. On a national basis, NOAA ranked May 2023 as the 11th warmest in the last 129 years. No question it was hot in the NW, Plains and down

thru Texas. Being hot in Texas and Louisiana wouild have driven some A/C demand. But it was generally normal or colder than normal in the more populous eastern half of the US. So overally, it was a hot May but not really a big driver to residential/commerical weather driven demand as May is a shoulder season. Below is NOAA's by state ranking for May temperatures.

Figure 3: NOAA Statewide Average Temperature Ranks – May 2023

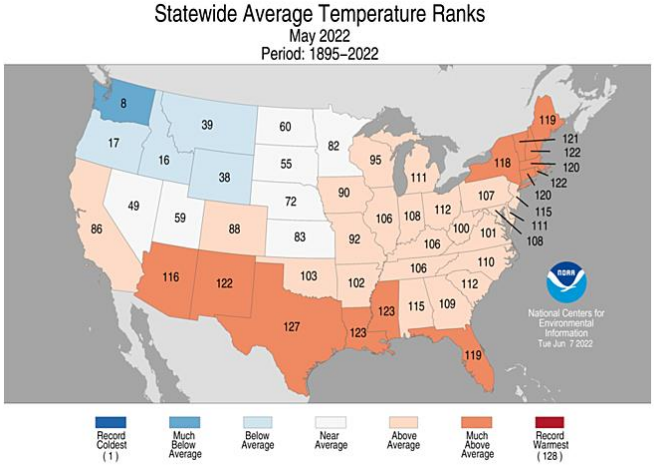


Source: NOAA

May 2022 was hot along the South and NE US.

It's interesting to compare to May 2022 that was hot but not as hot, on a national scale, as May 2023. But last year was reverse with it being hot in all the major populous areas of the eastern US, Gulf Coast and California. May 2022 was hot along the entire US south and eastern half of the US. Overall for the US, it was the 22nd hottest in the then last 127 year and NOAA wrote "the contiguous U.S. average maximum (daytime) temperature during May was 74.4°F, 1.4°F above the 20th century average". t was the hottest May ever in Texas. NOAA wrote "*Triple-digit heat scorched portions of the South throughout the month, setting a number of temperature records across Texas. Amarillo set a record on May 7 for the earliest 100°F day in the calendar year (prior record was May 15). Abilene had 14 100°F days in May, shattering the previous record of 7 days set in 1927 and 2000. Portions of south Texas reached 105°F on May 17 with temperatures from Nebraska to Texas ranging as much as 25°F above average*."

Figure 4: May 2022 Statewide Average Temperature Ranks



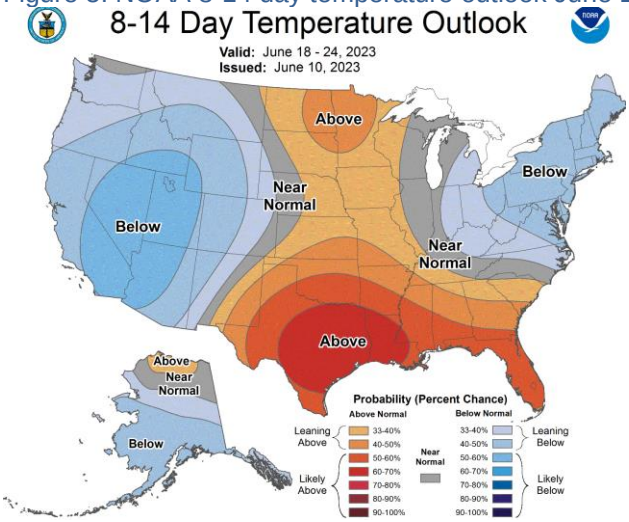
Source: NOAA

Natural Gas – NOAA 8-14 day temperature outlook is no major weather driven demand

NOAA 8-14 day outlook

We are now 1/3 thru June and moving into the normal hottest part of the summer. But we still aren't seeing any broad weather driven demand for natural gas. And that is the case again this week with NOAA's updated temperature outlooks. NOAA posts daily an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [LINK] "*Today's @NOAA 6-10 & 8-14 day temperature outlook covering June 16-24 calls for normal/below normal for NE and West US. Above normal in South. Shouldn't be a catalyst for #NatGas prices. #OOTT."* At this time of year, we don't see this forecast being a big driver of temperature driven natural gas demand.

Figure 5: NOAA 8-14 day temperature outlook June 18-24



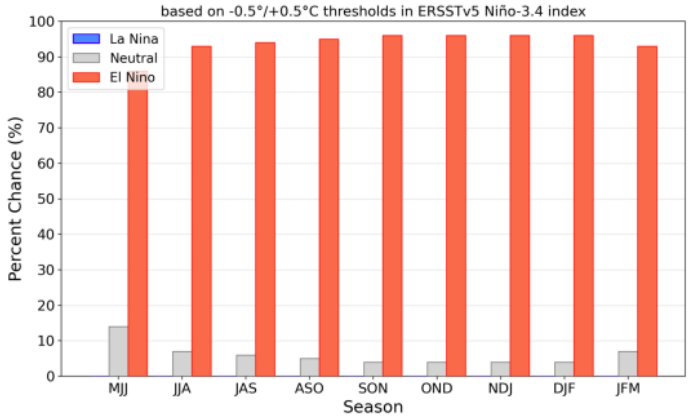
Source: NOAA

Natural Gas – NOAA sees 84% probability for El Nino conditions this summer

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 it is spring, the El Nino/La Nina focus shifts to the summer and to hurricane season. Last month, the probability forecast was a 90% chance for El Nino conditions in the peak hurricane months of Aug/Sept/Oct. In contrast, this week's outlook expects 84% chance of El Nino conditions in May-July. Forecasts state that another westerly wind event in mid to late June is likely to occur. Combined with an above average temperatures in the tropical Pacific Sea, there is strong indication that El Nino conditions have already developed. NOAA writes, *" We expect El Niño to continue into the winter, and the odds of it becoming a strong event at its peak are pretty good, at 56%.; The warm-up following our recent La Niña has been pretty remarkable. We even clocked in a 0.8°C value over the past week in the same dataset, so temperature anomalies are continuing to increase. We anticipate that it will remain above this El Niño threshold for the next several months, based on climate model predictions and current conditions in the tropical Pacific"* Again, weather predictions are never 100% accurate, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Note, it's too early to focus on winter 2023/24, but note how NOAA expects El Nino conditions to continue into the winter. More on this in a few months. Below is the NOAA CPC ENSO Mar update.

Figure 6: El Nino Probability



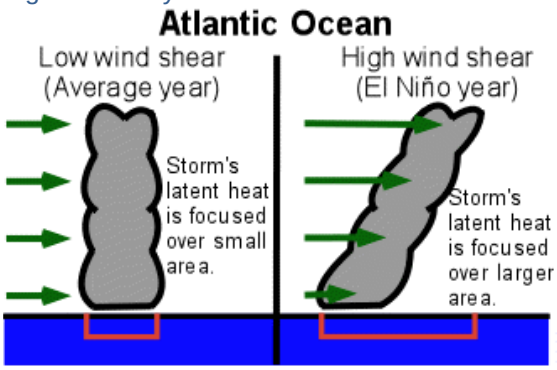
Source: NOAA

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 7: Early-March NOAA El Nino/La Nina Outlook



Source: University of Illinois

Natural Gas – EIA forecasts US gas production +4.6 bcf/d YoY in 2023, +0.3 in 2024

EIA US natural gas production forecast

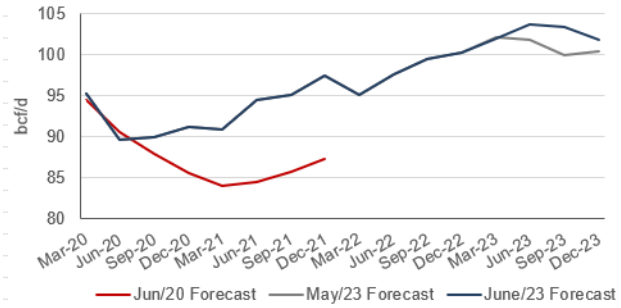
Mild winter aside, the big negative to US natural gas prices in the past six months has been the continued strong growth in US natural gas production. On Tuesday, the EIA released its monthly Short Term Energy Outlook for June 2023 [LINK]. (i) The EIA estimates US dry natural gas production was up approx. 4.4 bcf/d YoY in 2022. This growth was much more than expected going into 2023. US dry natural gas production is expected to continue to have another year of strong YoY growth in 2023 at +4.6 bcf/d YoY, and then down to +0.3 bcf/d YoY in 2024. (ii) Versus its May STEO, the EIA revised up its 2023 forecast for US dry natural gas production by +1.64 bcf/d to 102.74 bcf/d. The EIA wrote "*Higher expected crude oil prices in this month's STEO compared with last month result in our upward revision of natural gas production in this month's outlook, despite lower natural gas prices in the forecast."* (iii) The EIA also increased its 2024 forecast by +1.8 bcf/d to 103.0 bcf/d vs 101.2 bcf/d for the May STEO. 2024 is now +0.3 bcf/d YoY. (iv) The EIA lowered its HH natural gas price expectations to $2.66 USD in 2023 and decreased the 2024 expectation to $3.42 USD. The decrease was driven by growth in stockpiles above the 5-year average, which was followed by a warmer-than-normal winter and subsequent lower-than-normal consumption of natural gas. The EIA commented "*Although we forecast an increase in natural gas prices for the summer months due to inventories narrowing the surplus to the five-year average, we expect high inventory levels will keep prices well below last year's prices"* (vi) Our Supplemental Documents package includes excerpts from the STEO.

Figure 8: EIA STEO Natural Gas Production Forecasts

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
June-2023	94.60	95.10	97.60	99.50	100.30	98.10	102.00	103.70	103.40	101.90	102.70	102.80	102.80	103.00	103.60	103.00
May-2023	94.51	95.10	97.60	99.50	100.30	98.10	102.10	101.90	99.90	100.40	101.10	100.70	101.10	101.40	101.80	101.20
Apr-2023	94.51	95.10	97.60	99.50	100.20	98.10	101.60	100.50	100.50	100.90	100.88	101.20	101.50	101.80	101.80	101.58
Mar-2023	94.51	95.10	97.60	99.50	100.20	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	100.54	98.11	99.87	99.52	100.50	101.60	100.37					
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					

Source: EIA, STEO

Figure 9: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

EIA STEO storage forecast

Natural Gas - EIA STEO forecasts Nov 1, 2023 storage at 3.44 tcf, +0.30 tcf YoY

The EIA STEO also forecasts US gas storage and to no surprise, the warmer than expected winter and increasing YoY natural gas production has led to a notable YoY increase in forecasted US gas storage levels. Although the June STEO [LINK] slightly lowered its storage estimate for the upcoming winter of 23/24. The EIA estimated a significantly higher end for this winter Apr 1, 2023 of 1.86 tcf, which is up +32% YoY vs Apr 1, 2022. For winter 2023/24, the EIA now forecasts Nov 1, 2023 storage at 3.44 tcf, which is +9.4% YoY or +0.30 tcf YoY. In addition, Nov 1, 2024, storage is forecasted to be 3.63 tcf, up +0.19 tcf YoY and down -0.33 tcf from the May STEO. The EIA commented, *"Natural gas storage inventories were 15% above the five-year average at the end of May compared with a deficit of 14% below the2017–2021 average at the end of May 2022."*.

Figure 10: EIA STEO Forecast US Working 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	3,146.0	4,012.7	866.7	3,579.4	12.1%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,146.0	4,012.7	866.7	3,579.4	6.6%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,146.0	4,012.7	866.7	3,579.4	-9.6%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,146.0	4,012.7	866.7	3,579.4	5.1%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,146.0	4,012.7	866.7	3,579.4	9.8%
Mar 2021	1,801.2	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,146.0	4,012.7	866.7	3,579.4	2.4%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,146.0	3,146.0	4,012.7	866.7	3,579.4	-12.1%
Mar 2023	1,856.7	1,184.9	2,486.3	1,301.4	1,835.6	1.2%
Oct 2023	3,441.0	3,146.0	4,012.7	866.7	3,579.4	-3.9%
Mar 2024	1,728.3	1,184.9	2,486.3	1,301.4	1,835.6	-5.8%
Oct 2024	3,629.0	3,146.0	4,012.7	866.7	3,579.4	1.4%

Source: EIA, STEO

Natural Gas – Is Qatar shifting to 15 year deals why Europe customers are interested?

Qatar expects LNG deals with Europe soon

Last week's (June 4, 2023) Energy Tidbits memo highlighted Qatar's new LNG supply deal with Bangladesh and we noted that the deal was for a 15-yr term. We should have emphasized the 15-yr term because that looks to be a change in the typical 20-yr term deals. The 15 years is more in line with other industry deals, but not the norm for Qatar. And also likely a reason why Qatar says they are seeing strong interest from both Europe and Asia customers for new long term LNG supply deals. Last week's (June 4, 2023) Energy Tidbits memo also noted the strong interest in new LNG supply deals. We then wrote "*As noted above, it's a good thing when the right questions are asked It was interesting to see the comments from Qatar that they expect to sign LNG deals (we assume long term) with multiple European customers over the next few months. Also that if they can close on all the advanced discussions, they could sell out all their capacity of the upcoming North Field East and North Field South LNG projects. That's an "IF", but the point is that Qatar could be announcing a very large amount of future LNG being tied up in the coming months. Yesterday, we tweeted [LINK] "No shortage in #LNG buyers for post 2026 supply. @qatarenergy CEO. IF can sign everything are negotiating today "big portion of it will be going to Asia, the other will be going to Europe & we will be more than sold out as far as volumes of NFE and NFS are concerned." #OOTT." Gulf Times (Qatar media) reported on comments by HE the Minister of State for Energy Affairs, Saad bin Sherida al-Kaabi at the media event to announce the above Qatar/Bangladesh deal [LINK]. Gulf Times report was titled "LNG supply deals with European customers likely after summer: Al-Kaabi" and wrote "HE the Minister of State for Energy Affairs, Saad bin Sherida al-Kaabi said on Thursday. "Agreements with several European destinations... are very close to being finalised," he said at a media event at the QatarEnergy headquarters on Thursday. Replying to a question by Gulf Times, al-Kaabi said, "We are talking to many companies in different countries. We are in advanced discussions with some customers. If I put everything that we have on the table and assume that we are going to be successful in signing everything that we are negotiating today, a big portion of it will be going to Asia, the other will be going to Europe and we will be more than sold out as far as volumes of North Field East (NFE) and the North Field South*

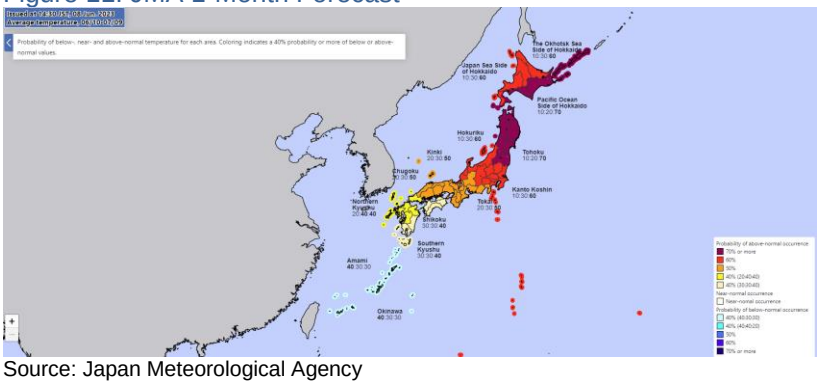
(NFS) are concerned." Our Supplemental Documents package includes the Gulf Times report."

Natural Gas – Should see some weather natural gas demand in Japan in next 2 weeks

Japan's 30-day temperature forecast

It looks like there will be some weather driven natural gas demand for Japan in the next couple weeks. We would be more enthusiastic if not for a major Tokyo push for people to conserve use of electricity. We saw a Tokyo request that air conditioning be set at 28C (82F) as one example. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. Their June 8 update calls for above-normal temperatures in almost all of Japan. We checked AccuWeather's daily temperature forecast for Tokyo for the next couple weeks and the range tends to be from 23 to 30C. [LINK]. Below is the JMA's temperature probability forecast for June10 to July 9.

Figure 11: JMA 1-Month Forecast



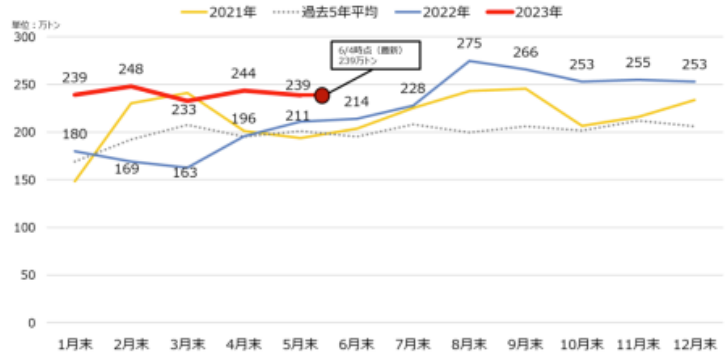
Source: Japan Meteorological Agency

Natural Gas – Japan's LNG stocks down -3.7% WoW to 114.7 bcf

Japan LNG stocks down -3.7% WoW

Japan had a mild winter with a hot March to end the winter season, so it was able to escape any weather-driven LNG shortages. April and May were warm, but this is shoulder season and warmer than normal April and May doesn't drive any significant weather driven push for natural gas. June is expected to be warmer than typical temperatures, which should drive some weather related demand. Our qualifier is that it seems like Tokyo (and likely other cities) are making a strong push to conserve electricity. LNG stockpiles held by Japanese power producers continue to exceed both last year's level and the seasonal average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks on June 4 were 114.7 bcf and are down -3.7% WoW from May 28 of 119.1 bcf, but remain well above the 5-year average of 96.5 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 12: Japan LNG Stocks



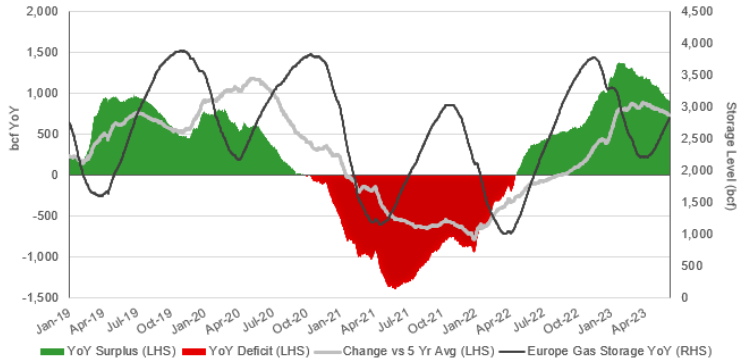
Source: METI

Natural Gas – Europe storage is now +17.13% vs 5-yr average, but within 5-yr range

Europe gas storage

The big global natural gas story for Q1/23 was how mild winters in Europe and Asia were the key reason why Europe made it through winter without a natural gas shortage. We continue to see a modest but steady narrowing of the gas storage surplus on a YoY and vs the 5-yr average. However, this week, it was basically no change to the YoY gas storage surplus. This winter (Nov 1, 2022) began with gas storage at 94.94% capacity, +17.86% YoY and a YoY surplus of 27.02%. The mild winter kept the storage surplus high on a YoY basis. But the last 6 weeks have seen a decline in the YoY surplus and the surplus vs the 5-yr average. This week, Europe storage increased by +1.96% WoW to 70.94% on June 7. Storage is now +20.49% greater than last year levels of 50.45% and is +17.13% above the 5-year average of 53.81%. The prior four weeks, starting with the most recent has seen the YoY surplus at +21.40% +21.50%, +23.53%, and +24.63%. The prior four weeks starting with most recent has seen the surplus vs the 5-yr average at +17.72, +18.18%, +18.69%, and +18.91%. In addition, current storage is currently within the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Figure 13: European Gas Storage Level



Source: Bloomberg

Oil – US oil rigs +1 WoW at 556 rigs on Jun 9, US gas rigs -2 WoW at 135 rigs

US oil rigs up WoW

There was the 1st weekly increase in US oil rigs, albeit only +1, since the week of March 21. Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were up +1 rig WoW as of June 9. The total US oil rig count is now at 556 rigs, -24 rigs YoY. That is up +75 from the 2022 low of 481 rigs in January, and +384 since the 2020 low of 172 rigs on Aug 14. Notably, the Permian is down -2 rigs WoW to 341 rigs, the lowest it has been since the week of March 10. Cana Woodford increased +2 rigs WoW to 23 total rigs. It was expected to see US gas rigs decline given the low $2.30 Henry Hub, which we saw at a -2 WoW decrease, for a total of 135 rigs. Gas rigs are down -26 rigs since the week of April 28. US gas rigs have decreased -16 rigs YoY. Notably, on a per basin basis the Haynesville and Eagle Ford both decreased by -1 rigs to 51 and 2 total rigs, respectively. Below is our graph of total US oil rigs.

Figure 14: Baker Hughes Total US Oil Rigs

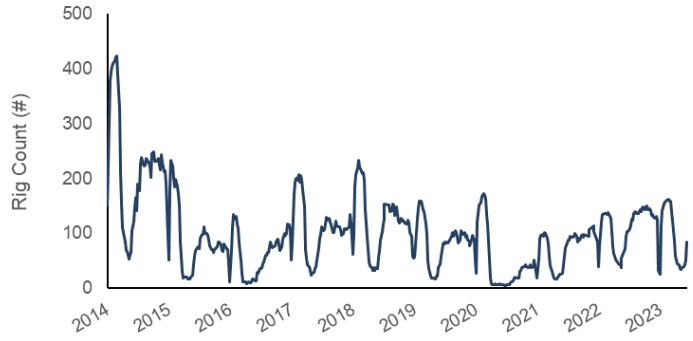
Source: Baker Hughes

Oil – Total Cdn rigs +39 WoW to 136 total rigs, wildfire impact lessening

Cdn total rigs up WoW

Wildfires continue to be the big story in Alberta and BC, but the wildfires are down from their recent peak a month ago. And they are having a lesser impact, at least for now, on drilling activity. This means drilling rigs are in their normal post Spring breakup increase in rigs that typically runs from mid-May to before Xmas. Traditionally, Cdn rigs hit their trough the last week of April or first week of May. That happened this year, but then wildfires caused a further dip in May. But rigs are moving up strongly wit the lesser impact of wildfires. Total Cdn rigs were up +39 rigs WoW at 136 rigs as of Jun 9. Notably, Alberta and Saskatchewan were +23 and +17 rigs WoW, to 90 rigs and 28 rigs, respectively. BC continues to decrease again this week, at -3 rig WoW through the wildfires. Cdn oil rigs were up +34 WoW to 85, and Cdn gas rigs increased +5 to 51 rigs. Cdn oil rigs are now -9 rig YoY compared to 94 rigs last year, while gas rigs are up +4 YoY from 47 rigs. Below is our graph of total Cdn oil rigs.

Figure 15: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production increases +0.200 mmb/d WoW to 12.4 mmb/d

US oil production increases WoW

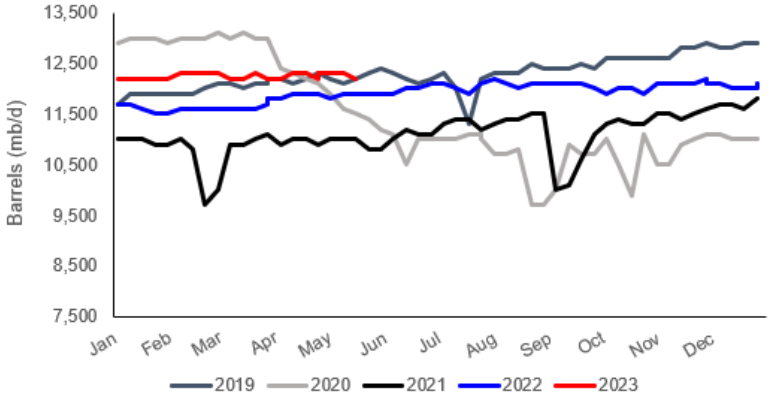
We shouldn't be surprised to see the EIA weekly oil production estimates up this week to 12.4 mmb/d given how the EIA's "actuals" from their Form 914 data have been reporting US oil production higher than the weekly estimates. As noted in the following item, these are estimates of the current week. The actuals have been higher than the weekly estimates ie. the weekly estimates have been low. The EIA estimates US oil production grew +0.200 mmb/d WoW to 12.4 mmb/d for the week ended June 2 [LINK]. Lower 48 was also up +0.200 mmb/d WoW at 12.0 mmb/d, and Alaska +0.012 mmb/d to 0.430 mmb/d. US oil production, based on the weekly estimates, finally has broken above 12.3 mmb/d. It has remained between 12.1 mmb/d and 12.3 mmb/d since the week ended Jan 6, 2023. The first time since it touched 12.2 mmb/d since the pandemic was the 1st week of August in 2022. Total US production reached its highest level since March 13, 2020, this year on this week at 12.4 mmb/d. US oil production is up YoY at +0.500 mmb/d but is still down significantly at -0.700 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 16: 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
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200	08/12	12,100	08/19	12,000	08/26	12,100		
2022-Sep	09/02	12,100	09/09	12,100	09/16	12,100	09/23	12,000	09/30	12,000
2022-Oct	10/07	11,900	10/14	12,000	10/21	12,000	10/28	11,900		
2022-Nov	11/04	12,100	11/11	12,100	11/18	12,100	11/25	12,100		
2022-Dec	12/02	12,200	12/09	12,100	12/16	12,100	12/23	12,000	12/30	12,100
2023-Jan	01/06	12,200	01/13	12,200	01/20	12,200	01/27	12,200		
2023-Feb	02/03	12,300	02/10	12,300	02/17	12,300	02/24	12,300		
2023-Mar	03/03	12,200	03/10	12,200	03/17	12,300	03/24	12,200	03/31	12,200
2023-Apr	04/07	12,300	04/14	12,300	04/21	12,200	04/28	12,300		
2023-May	05/05	12,300	05/12	12,200	05/19	12,300	05/26	12,200		
2023-Jun	06/02	12,400								

Source: EIA

Figure 17: EIA's Estimated Weekly Oil Production



Source: EIA, SAF

EIA Form 914: US March oil actuals +473,000 b/d vs weekly estimates

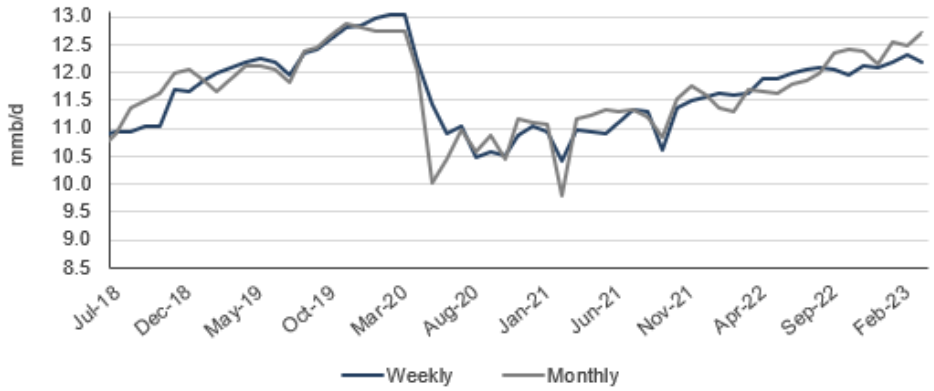
Here is what we wrote in last week's (June 4, 2023) Energy Tidbits memo. "*As a reminder, the EIA's actuals for US oil production continue to be well above their weekly estimates. There is a growing difference between what the EIA looks at as "actuals" for US oil production vs the EIA's weekly estimates noted above. The actuals continue to be significantly higher than the weekly estimates. On Wednesday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for March US oil and natural gas production. (i) On Wednesday, we tweeted [LINK] "US #Oil production continues to surprise to upside. See 👇EIA excerpts. @EIAgov Form 914: Mar/23 actuals of 12.696 mmb/d is +995,000 b/d YoY vs Mar/22 of 11.701 mmb/d. Also +473,000 b/d vs EIA estimates of weekly oil production that were 12.223 mmb/d. #OOTT." The Form 914 actuals for March have March production at 12.696 mmb/d, which is +473,000 b/d vs the EIA weekly estimates. And because of this significant difference, the Form 914 March production is +995,000 b/d YoY, just shy of 1 mmb/d YoY. The actuals paint a picture of much stronger than expected US oil production."*

Figure 18: EIA Form 914 US Oil Production (thousand b/d)

State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	12,568	12,525	12,696									
2022	11,369	11,316	11,701	11,668	11,629	11,797	11,844	12,002	12,337	12,417	12,379	12,149
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,869	11,673	11,913	12,149	12,154	12,218	11,902	12,486	12,590	12,809	13,000	12,978
2018	10,001	10,281	10,467	10,500	10,435	10,641	10,897	11,392	11,443	11,509	11,886	11,945
2017	8,875	9,110	9,166	9,101	9,185	9,111	9,247	9,250	9,517	9,669	10,085	9,983

Source: EIA

Figure 19: EIA Form 914 US Oil Production vs Weekly Estimate



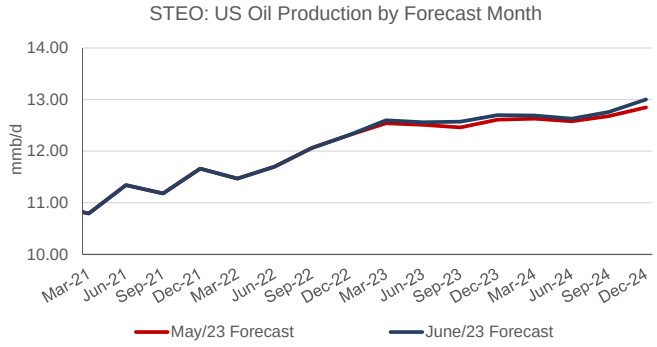
Source: EIA, SAF

Oil – EIA's June STEO increases 2023 US oil production forecast by +80,000 b/d

EIA STEO US oil production forecast

On Tuesday, the EIA posted its June Short-Term Energy Outlook [LINK]. (i) The June STEO forecasts for 2023 US oil production estimated have slightly increased vs the last STEO in May. The June STEO forecast is up 80,000 b/d to 12.61 mmb/d from May STEO of 12.53 mmb/d. All 2023 quarterly estimates increased, with Q1/23 +0.06 mmb/d, Q2/23 +0.05 mmb/d, Q3/23 +0.11 mmb/d, and Q4/23 exit +0.09 mmb/d. (ii) The EIA 2021 and 2022 forecasts remained unchanged from May's STEO. (iii) STEO 2023 average oil production forecast is now 12.61 mmb/d, which is up ~72,000 b/d YoY from 2022's exit production of 11.89 mmb/d. (iv) The EIA increased its 2024 oil production forecast by +16,000 b/d to 12.77 mmb/d compared to 12.69 mmb/d in the May STEO, which is a YoY increase of +0.16 mmb/d.

Figure 20: Estimated US Crude Oil Production by Forecast Month



Source: EIA, STEO

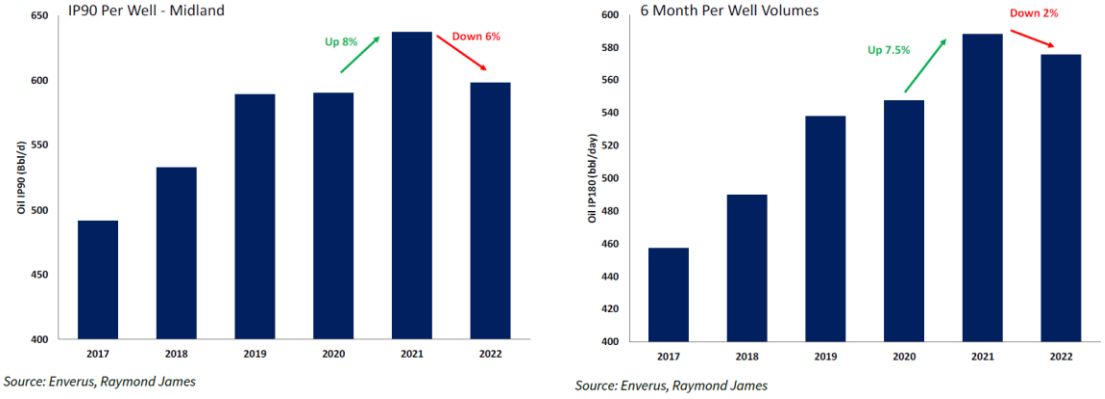
Oil – Raymond James, data supports a maturing Permian Midland Basin

Maturing Permian Midland Basin

On Monday morning, we tweeted [LINK] "*Must read #Permian #MidlandBasin report by @RaymondJames John Freeman. Core inventory dwindling at a rapid rate. Well productivity has finally rolled over (albeit at a slower rate than many would have expected). Bodes well for*

the macro outlook [positive for #Oil] with Midland Basin supply growth likely diminished. #OOTT." (i) On Monday, Raymond James posted a big report "*Midland Basin Deep Dive: Well Productivity & Remaining Core Inventory"* where they "*to answer those two important topics within the Midland Basin: 1) How much core acreage remains within the Midland Basin and 2) What are the well productivity trends in the basin? We take an in-depth look at both topics, both from a basin-wide aspect and on an operator-by-operator basis.".* (ii) This was a "deep dive" and the data takeaways were clear – core inventory is dwindling at a rapid rate and well productivity has rolled over. Those two factors point to increasing costs for new Midland Basin production and are clear signs of a maturing basin. (iii) Note RJ splits acreage into core, and then, down from core, to Tier 1, Tier 2, etc with the tiers referring to acreage outside the core of the Midland Basin. (iv) RJ concludes "*The Midland Basin deep-dive reveals that core inventory is dwindling at a rapid rate and the gap between the haves and have nots is widening."* RJ also noted "*Basin-wide, the Midland contains roughly 7.2 yrs of remaining core inventory. ● Public E&Ps (on average) have 8.6 yrs of remaining core inventory, while privates possess 5.7 yrs."* (v) RJ also concludes "*Well productivity has finally rolled over (albeit at slower rate than many would have expected*)." RJ also said "*We can say with some certainty that for the first time we had per-well productivity slide in the Midland Basin. Three main factors were at play. 1. Slightly lower mix of core vs. Tier 1 drilling 2. Well mix includes more Jo-Mill and less Wolfcamp A. Fewer of the most productive wells were drilled 3. Public vs. Privates: Privates drilled a much higher percentage and generally suffer from weaker well performance (although the gap has closed dramatically). Evidence points to privates choking back wells more often than public counterparts, thus reinforcing the need to look at 6-month data at a minimum instead of IP90s."* (vi) RJ doesn't say Midland Basin won't grow, but the data points to costing more to add production. Rather, RJ concludes "*The analysis also bodes well for the macro outlook with Midland Basin supply growth likely diminished over the next several years relative to the prior decade when well productivity trends kept delivering improved results."* This is a must-read report that will have to be accessed via Raymond James.

Figure 21: Midland Basin: IP90 Per Well, 6 Month Per Well Volumes



Source: Raymond James

Midland Basin production is ~2.4 mmb/d, just behind UAE and Kuwait

One of the key reasons why we highlighted the Raymond James Midland Basin deep dive is that the Permian Midland Basin is significant on a global oil production scale. On Monday, we tweeted [LINK] "*Here's why this 👇is a must read #Permian #MidlandBasin report @RaymondJames John Freeman notes Midland Basin is ~2.4 mmbd or 20% of total US #Oil production. Midland Basin would be just behind UAE of 2.875 mmbd and Kuwait 2.548 mmbd for May-Dec 2023 quota. #OOTT."* We thought it was overlooked how big the Permian Midland Basin is on a global scale. RJ estimates Midland Basin is currently ~2.4 mmb/d. Our tweet noted the May-Dec 2023 levels for the UAE is 2.875 mmb/d and Kuwait is 2.548 mmb/d. Iraq is 4.420 mmb/d.

Hard to see the math for sustained Permian growth based on the DUCs

The Raymond James Midland Basin deep dive was on the producing well data and analysis of core vs non-core acreage. RJ did not get into items like level of DUCs and drilling rigs. Our concern on the assumption that there will be sustained continued growth in the Permian is based on the level of drilling rigs and DUCs. Here is what we wrote in the May 21, 2023 Energy Tidbits memo. "*We have been focused on the level of Drilled UnCompleted Wells (DUCs) in the Permian from the EIA's monthly Drilling Productivity Report because the level of sustained Permian oil growth in the 2020s is perhaps the biggest wildcard and variable to oil prices in the 2020s. It's not that we don't care what US shale/tight oil production is forecast in May or June, absent a big fall off the cliff, it isn't the key data point from the EIA's DPR. Our position is unchanged – we have trouble seeing how the math works for sustained Permian oil growth in the 2020s based on the level of DUCs and oil rigs. Note that the EIA made significant upward revisions to the recent month's Permian DUCs that basically reversed the surprise significant downward revisions in last month's DPR. However, that still doesn't make any real difference to the overall math problem. On Tuesday, we tweeted [LINK] "Bullish for #Oil. Is there SUSTAINABLE Permian oil GROWTH if Permian DUCs are at 2014 levels & Oil rigs ~65% of 2014 levels, but that was when Permian production was >30% of today's b/d? @EIAgov new well prod/rig is 3x 2014 levels, but down 1/3 since 2021.Need DUCs/New Oil wells to offset decline rate challenge. see 👇05/09 tweet on #WarrenBuffett #CharlieMunger views. #OOTT." And [LINK] not suggesting in any way that Permian oil falls off a cliff. rather it's tough to understand the math for Permian oil growth like some, including the EIA, expect. declines have to be offset as Buffett and Munger stressed. and not see the needed ramp up in oil rigs to build DUCs. #OOTT." Permian DUCs are at the same levels as Aug/Sept 2014. Yet Permian rigs are 63% of Aug/Sept 2014, and production is >3.5 times higher than Aug/Sept 2014. There is no question fracking/completions are multiples better than 2014. But if we use the EIA May DPR new production added per rig as a guide (see below EIA excerpt), it's about three times higher than 2014 so a big jump as would be expected. But note that that has dropped by a third in the past two years. That makes sense if you recall some recent producer comments that, in the move to survive in 2020 and 2021, they drilled their best wells. On the flip side, when you look ahead, more companies have drilled up most off, or a good chunk, of their Tier 1 lands and we have been seeing this specifically said by more producers. The math*

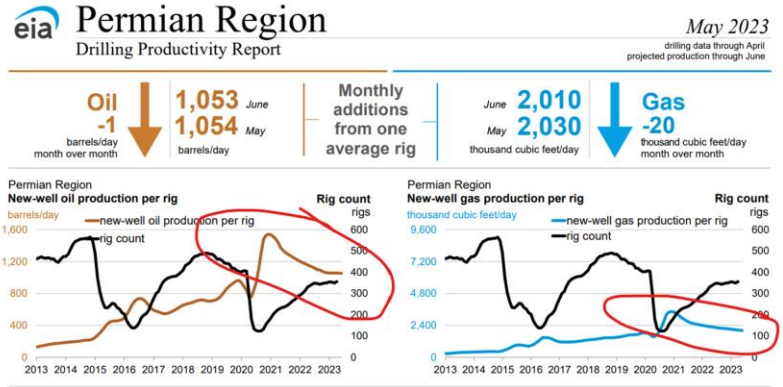
is straightforward. Oil and gas production levels are the result of decline rates and how much can they be offset or more than offset by new well completions. And the ability to complete a well for shale/tight plays needs wells that are being drilled or have been drilled for an inventory of DUCs to be completed to add to production. Shale/tight oil plays like the Permian are all fracked. So a drilling rig drills the well, it then leaves the well as uncompleted and waiting for the frack spread to come and frack/complete the well. If drilling isn't high enough to keep adding to the DUCs and the existing DUCs inventory is low, there is less growth potential. It's math! This is why we still think it's tough to see how there is sustained production growth from the Permian for the coming years. It doesn't mean to say it declines and falls off a cliff, but it's hard to see sustained growth. Below is the table from our tweet showing Permian DUCs vs rigs and production comparing May with Aug/Sept 2014 when DUCs were the same level, and the excerpt from the DPR showing the new well production per Permian rigs that was in the May DPR.

Figure 22: Permian: DUCs vs Rigs and Production

	DUCs	Oil Rigs	Gas Rigs	Oil mmb/d	Gas bcf/d
May 2023	915	350	4	5.79	22.5
Aug 2014	902	560	5	1.67	6.0
May 2023 as % Aug 2014	101%	63%	80%	347%	375%
Sept 2014	981	560	5	1.67	5.8
May 2023 as % of Sept 2014	93%	63%	80%	347%	388%
* Rigs are approx for month					

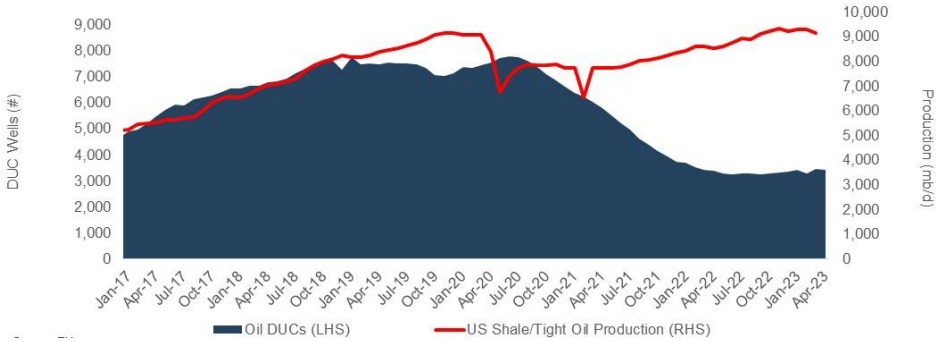
Source: EIA, Baker Hughes

Figure 23: Permian: EIA's Permian new-well-oil production per rig



Source: EIA

Figure 24: EIA Estimated Drilled UnCompleted Wells vs Permian Oil Production



Source: EIA Drilling Productivity Report

Trafigura on US oil production

Oil – Trafigura doesn't see US oil production increasing in 2023

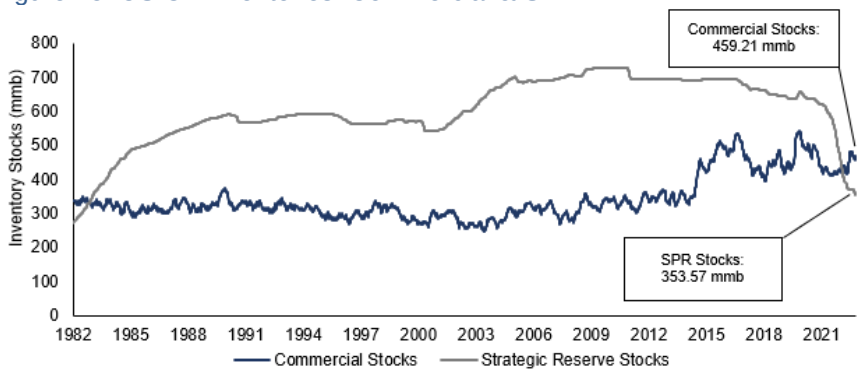
Most are calling for strong growth in US oil production in 2023 but we haven't seen any say no growth in 2023 until we saw the Trafigura interim report on Thursday that makes a clear call for no growth in 2023. On Thursday, we tweeted [LINIK] "*Must Read #Oil#Metals outlook from @Trafigura @saadrahim "difficult to see how US [#Oil] production is going to increase this year..."* Trafigura wrote "*For over a decade, tightening oil markets could always rely on the US shale industry to ramp up production to bring markets back into balance. However, it is difficult to see how US production is going to increase this year given lower oil prices, higher interest rates and rising costs – and certainly not by the levels many forecasters were projecting coming into the year, in some cases as high as 1.0 million barrels per day. We can already see that in the number of oil rigs being deployed, which has fallen steadily by a total of 72 rigs since the most recent peak in November 2022 (which in itself was down almost 1,000 rigs from the all-time peak in 2014*"

US SPR reserves

Oil - US SPR reserves now –105.636 mmb lower than commercial crude oil reserves

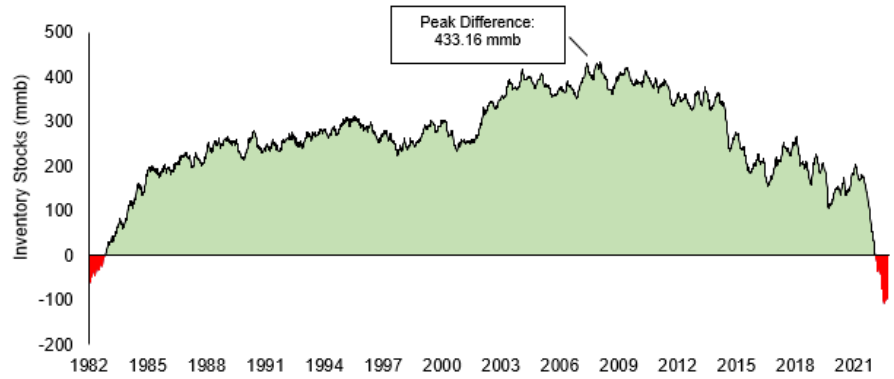
Oil in US Strategic Petroleum Reserves (SPR) continues to move further below total US commercial crude oil reserves. SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit continued to widen this week after a draw in commercial oil stocks of 0.45 mmb. The EIA's weekly oil data for June 2 [LINK] saw the SPR reserves decrease -1.867 mmb to 353.569 mmb, while commercial crude oil reserves decreased -0.452 mmb 459.205 mmb. There is now a -105.636 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 25: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 26: US Oil Inventories: SPR less Commercial



Source: EIA, SAF

Oil – SPR now down 18.0 mmb of planned 26 mmb SPR draw ie. 8.0 mmb to go

8.0 mmb SPR sales to go

We have been reminding that the US SPR was going 26 mmb lower. In Feb, the US Dept of Energy reminded of the congressionally mandated sale of 26 million barrels of crude from the SPR to be enacted this fiscal year. At that time the SPR included 371.579 million barrels. That stayed flat until the sales started at the end of March. Since then the SPR is down 18.010 mmb to 353.569 mmb as of June 2, 2023. This draw of 18.010 million barrels leaves approx. 8 million barrels to go for the full 26 million barrels sales.

Oil – US contracts to buy 3 mmb for SPR, want to buy another 3.1 mmb

US to start SPR purchases

We have stated our expectation that the Biden Administration will start to purchase oil for the SPR so they can tick that off the list of Biden promises. But we also don't expect the Administration to keep repurchasing to refill the SPR. We have been expecting these initial purchases to fulfill the promise. On Friday, the DOE announced [LINK] that "*contracts have been awarded for the acquisition of 3 million barrels of U.S. produced crude oil for the Strategic Petroleum Reserve (SPR). These contracts follow the Request for Proposal that was announced on May 15, 2023. Furthering the Biden-Harris Administration's three-part*

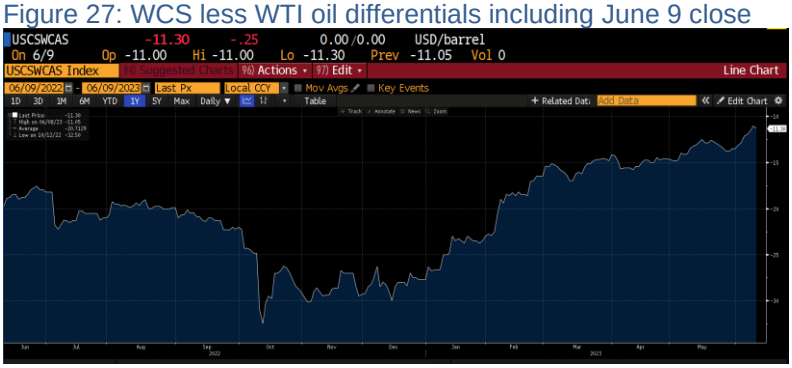
replenishment plan, DOE also announced a new Notice of Solicitation to purchase approximately 3.1 million additional barrels of crude oil to the Big Hill SPR site this September. Today's announcement advances the President's replenishment strategy following his historic release from the SPR to address the significant global supply disruption caused by Putin's war on Ukraine." Our Supplemental Documents package includes the DOE announcement.

Oil – Cdn oil differentials narrowed by $1.60 to close at $11.30 on June 9

WCS less WTI differentials

WCS less WTI differentials narrowed by $1.60 this week to close at $11.30 as of June 9. It's hard to determine exactly what led to the narrowing but it was a good week with Enbridge lowering its tolls effective July 1, likely some impact of the OPEC+ cuts that started on May, and some ongoing concerns on wildfires. WCS less WTI differentials have narrowed since Alberta wildfires started to hit hard in early May. WCS less WTI differentials were $14.15 on March 31, which was the Friday before the Sun Apr 2 reports that OPEC+ was going to cut production effective May 1. The WCS less WTI differential widened to $15.40 on Apr 13, and then narrowed to $14.65 on Apr 28, then to $14.15/b on May 5, then to $12.85/b on May 12, then to $12.80/b on May 19, widened to $13.75 on May 26, narrowed to $12.90 as of June 2 and much lower to $11.30 on June 9. This is contrary to the normal seasonal trend for WCS less WTI differentials that normally widen starting in mid-May. For perspective, a year ago, the WCS-WTI differentials last year were $19.75 on June 9, 2022. Below is Bloomberg's current WCS–WTI differential as of June 9, 2023 close

Figure 27: WCS less WTI oil differentials including June 9 close



Source: Bloomberg

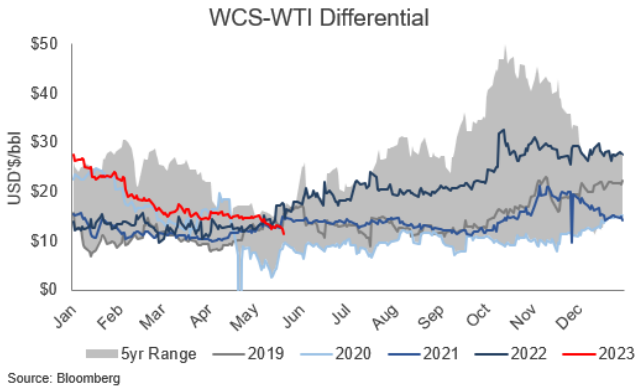
Oil – WCS less WTI differentials normally widen after early May

WCS differentials normally widen after early May

As noted above, we are seeing the impact of extraordinary unplanned events that are impacting WCS less WTI differentials – the wildfires are number one and there is also the OPEC+ cuts. And now a boost from Enbridge lowering its tolls. But the wildfires and OPEC+ cuts have disrupted the normal seasonal pattern for WCS less WTI differentials. Our prior comments on the normal WCS-WTI differentials patter said there are always unplanned events that impact WCs-WTI differentials. However, special items aside, early May is normally when Cdn heavy oil differentials are at their narrowest. In 2022, the narrowest for WCS-WTI differential was May 2, 2022 at $12.50/b and increased to $18.25/b by May 31 and $19.75 on June 9. Cdn heavy oil differentials normally narrow in the Feb/Mar/Apr period as this is 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 April with the narrowest normally being in early May ie. two weeks ago.

Figure 28: WCS less WTI oil differentials



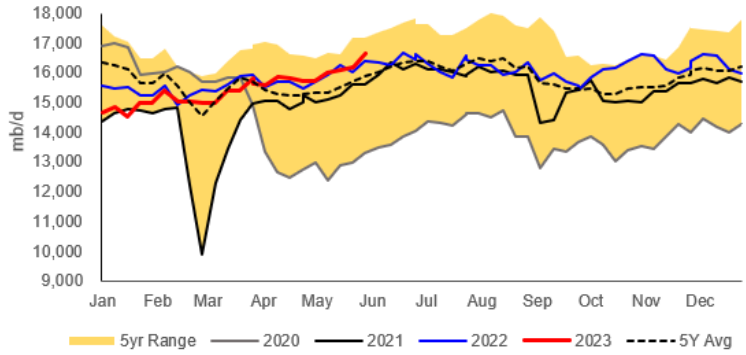
Source: Bloomberg

Oil - Refinery inputs up +0.482 mmb/d WoW to 16.647 mmb/d

Refinery inputs up +0.482 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. This ensures they are producing the key petroleum products at the right time of year. We'll normally see refineries come out of turnarounds in late March/early April to start their ramp up in refining of summer blend fuels, which typically peaks in Aug/early Sep.. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended June 2 [LINK]. The EIA reported crude oil inputs to were up +0.482 mmb/d this week to 16.647 mmb/d and are up +0.260 mmb/d YoY. Refinery utilization was up +2.7% to 95.8%, which is up +1.6% YoY as well. Total products supplied (i.e., demand) decreased WoW, down -0.221 mmb/d to 19.441 mmb/d, and Motor gasoline was up +0.120 mmb/d to 9.218 mmb/d from 9.098 mmb/d last week. The 4-week average for Motor Gasoline was down -0.021 mmb/d WoW to 9.165 mmb/d. The 4-week average of Total demand was down -0.236 mmb/d WoW to 19.730 mmb/d.

Figure 29: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

Oil – BP Whiting turnaround expected for after Labor Day

BP Whiting refinery turnaround

On Tuesday, we tweeted [LINK] "*Negative to Cdn #Oil differentials after Labor Day. @barbarajpowell8 reports major BP Whiting refinery turnaround for 2 months post Labor Day. Whiting capacity is ~440,000 b/d, runs basically on Cdn crude, is the largest refinery in Cdn exports major market - PADD 2 Midwest. #OOTT."* We don't normally tweet on individual refinery turnarounds and even write them up in our Energy Tidbits memos but BP's Whiting refinery is the largest refinery in the Midwest PADD 2 and is the largest individual refinery market for Cdn crude oil off Enbridge's mainline. So it typically has an impact on Cdn differentials. Bloomberg wrote "*BP's Whiting, Indiana, refinery will conduct a turnround beginning mid-September on multiple units, including the second largest of 3 crude units, according to people familiar with maintenance plans. * The biggest crude unit, the 255k b/d Pipestill 12, is scheduled for a 2-month turnaround in fall 2024 that will include a coker ** The last turnround for PS-12 occurred in September and November 2018 * Whiting will begin shutting units for the first turnaround, including the 115k b/d crude unit known as Pipestill 11-C and several hydrotreaters, a few days after the upcoming Sept. 4 Labor Day holiday."* Our Supplemental Documents package includes BP's Indiana fact sheet on its Whiting refinery.

Oil - Something isn't right in the EIA weekly oil imports by country data

US net oil imports

We repeat the same commentary as last few weeks that something doesn't look quite right in the EIA weekly oil imports by country data. It looks like something is off in the EIA's estimates of weekly oil imports by country data, but we don't know if the total US crude oil imports are wrong or if's just that the EIA has incorrectly allocated import volumes to the wrong country. (i) For some reason, the EIA weekly data does not include any oil imports from Venezuela in their weekly reporting of US oil imports by country. Yet we have seen Chevron importing oil from Venezuela into its and other PADD 3 Gulf Coast refineries. What we don't know if the EIA has just allocated to some other country. We have been highlighting how Chevron has steadily increasing US Gulf Coast (PADD 3) imports from Venezuela every month in 2023. And the EIA reports oil imports from Venezuela in its monthly data but for reason not in these weekly estimates. (ii) US "NET" imports were up +1.623 mmb/d to 3.925 mmb/d for the June 2 week. US imports were down -0.817 mmb/d to 6.400 mmb/d. US exports were down -2.440 mmb/d to 2.475 mmb/d. The WoW increase in US oil imports was driven mostly by "Other".

Top 10 was down -0.612 mmb/d. Some items to note on the country data: (i) Canada was down -0.085 mmb/d to 3.504 mmb/d. (ii) Saudi Arabia was down -0.468 mmb/d to 0.066 mmb/d. (iii) Mexico was down -0.266 mmb/d to 0.647 mmb/d. (iv) Colombia was down -0.159 mmb/d to 0.127 mmb/d. (v) Iraq was up +0.316 mmb/d to 0.430 mmb/d. (vi) Ecuador was up +0.004 mmb/d to 0.218 mmb/d. (vii) Nigeria was up +0.046 mmb/d to 0.144 mmb/d. The below graph highlights the US top imports by country.

Figure 30: US Weekly Preliminary Imports by Major Countries

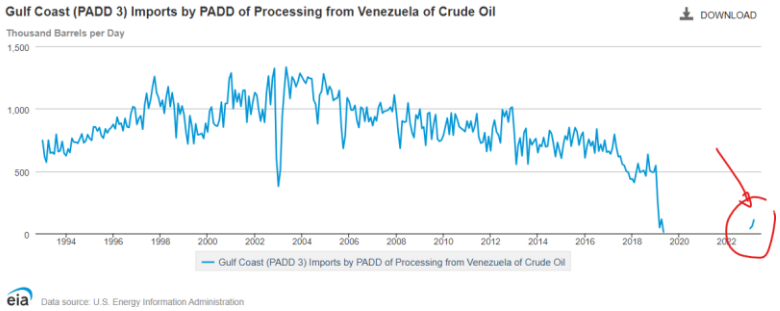
(thousand b/d)	Mar 24/23	Mar 31/23	Apr 7/23	Apr 14/23	Apr 21/23	Apr 28/23	May 5/23	May 12/23	May 19/23	May 26/23	Jun 2/23	WoW
Canada	2,957	3,980	3,590	3,519	3,327	3,526	3,269	3,592	3,707	3,589	3,504	-85
Saudi Arabia	228	514	376	339	393	242	381	415	212	534	66	-468
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	541	920	450	615	728	706	393	676	657	913	647	-266
Colombia	269	71	159	303	143	143	47	339	214	286	127	-159
Iraq	138	345	241	180	222	148	247	174	136	114	430	316
Ecuador	118	80	242	131	36	57	145	101	71	214	218	4
Nigeria	104	302	236	112	104	214	143	329	77	98	144	46
Kuwait	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
Top 10	4,355	6,212	5,294	5,199	4,953	5,036	4,625	5,626	5,074	5,748	5,136	-612
Others	970	932	899	1,095	1,423	1,360	928	1,234	776	1,469	1,264	-205
Total US	5,325	7,144	6,193	6,294	6,376	6,396	5,553	6,860	5,850	7,217	6,400	-817

Source: EIA, SAF

EIA shows imports from Venezuela in its monthly import data.

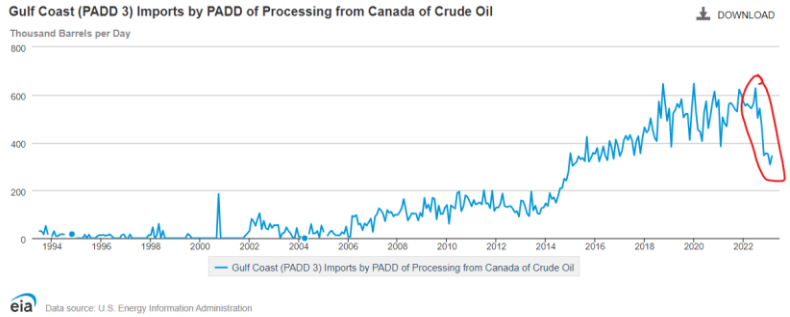
Here is what we wrote in our May 7, 2023 Energy Tidbits memo. *"Last week's (Apr 30, 2023) Energy Tidbits memo highlighted our Apr 29 tweet [LINK] that Chevron's start of Venezuela oil imports into the Gulf Coast is likely impacting Cdn WCS less WTI differentials and how Venezuela oil into the Gulf Coast will be increasing in March and April. On Monday, Bloomberg's Tanker Tracker for Venezuela confirmed the increases in March and April. We tweeted [LINK] 'Blame it on #Chevron. Seasonal narrowing for WCS-WTI differentials, but not as much as might be expected. Increasing PADD 3 Gulf Coast imports of VEN #Oil. Feb: 89 kbd. Mar: 115 kbd. Apr: 143 kbd. Thx @business Tanker Tracker, @lkassai. #OOTT".* (ii) Here is what we wrote in our Apr 30, 2023 Energy Tidbits memo on the EIA monthly data. "*Our tweet included the below EIA graphs of crude oil imports into the Gulf Coast PADD 3. They remind how Cdn heavy/medium crude was able to penetrate PADD 3 (Gulf Coast) because there was a need with declining Mexico and Venezuela crude oil. Conversely, if Venezuela increases, it will mean more Venezuela crude to the Gulf Coast and less need/increased pressure on Cdn differentials. It's hard to see form the graph but we pointed to the first Venezuela oil imports into the Gulf Coast in about 3 ½ years were 40,000 b/d in Jan and 58,000 b/d in Feb, and this will be higher in March."*

Figure 31: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 32: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil - Colombia oil production still below pre-Covid, April was 0.782 mmb/d

It's hard to see how Colombia oil production ever sustainably rallies anywhere back to the 1 mmb/d or even 900,000 b/d given Colombia's goal to reduce oil and natural gas. Despite stronger oil prices post Covid, Colombia oil production has been stuck below 800,000 b/d. There has been some modest recovery in 2023. Following the MoM increase of +1.8% in March, the National Hydrocarbons Agency (ANH) reported [LINK] April's oil production had increased by +1.4% MoM to 0.782 mmb/d on higher drilling, which continues to follow the MoM increases seen in the final months of 2022. On June 5, ANH reported Colombia oil production in April was up +4.1% YoY to 0.782 mmb/d vs 0.751 mmb/d in April 2022 on higher drilling and exploration activities in its core producing fields. April's data brings the average YTD production to 0.771 mmb/d, up +3.4% YoY from 2022's 0.746 mmb/d but production remains -13.0% below pre-Covid levels of 0.886 mmb/d in 2019. Our Supplemental Documents package includes the ANH release.

Figure 33: Colombia Oil Production

mmb/d	2016	2017	2018	2019	2020	2021	21/20	2022	22/21	2023	23/22
Jan	0.986	0.860	0.860	0.899	0.884	0.745	-15.7%	0.740	-0.7%	0.774	4.6%
Feb	0.955	0.864	0.823	0.893	0.878	0.746	-15.1%	0.740	-0.8%	0.757	2.4%
Mar	0.917	0.804	0.856	0.885	0.857	0.745	-13.0%	0.751	0.8%	0.771	2.6%
Apr	0.915	0.857	0.865	0.891	0.796	0.745	-6.4%	0.751	0.8%	0.782	4.1%
May	0.904	0.851	0.866	0.895	0.732	0.703	-3.9%	0.746	6.1%		
June	0.888	0.857	0.864	0.892	0.730	0.694	-4.9%	0.752	8.4%		
July	0.843	0.856	0.860	0.869	0.735	0.731	-0.5%	0.748	2.3%		
Aug	0.827	0.858	0.866	0.883	0.742	0.748	0.8%	0.749	0.1%		
Sept	0.859	0.851	0.869	0.879	0.749	0.744	-0.7%	0.754	1.3%		
Oct	0.846	0.864	0.879	0.883	0.751	0.740	-1.5%	0.757	2.3%		
Nov	0.855	0.851	0.883	0.880	0.761	0.747	-1.9%	0.771	3.2%		
Dec	0.837	0.870	0.889	0.882	0.759	0.745	-1.8%	0.784	5.2%		

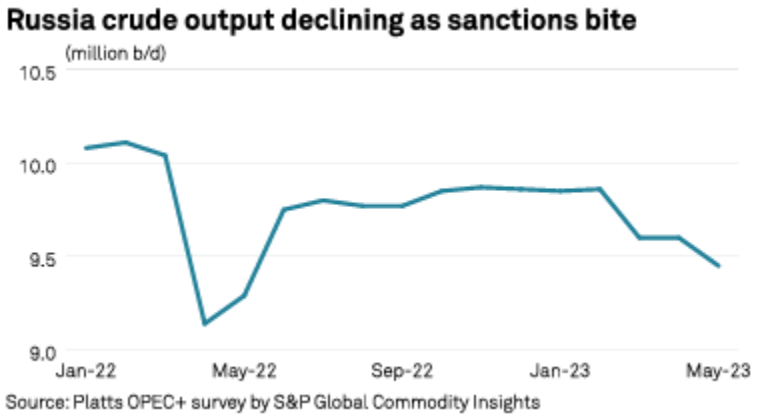
Source: ANH, SAF

Oil – Platts estimates Russia May oil production was -410,000 b/d vs Feb

Russia oil production

On Thursday, Platts posted its "*OPEC+ May crude output tumbles in first month of expanded voluntary cuts: Platts survey*" [LINK], which included its estimates of Russia oil production and that, in May, it was still below its committed 500,000 b/d cut, but was 410,0000 b/d. Platts wrote " *Russia -- the first country to introduce a voluntary cut effective from April -- saw output drop 150,000 b/d to 9.45 million b/d, the survey showed. This was 410,000 b/d below its February production of 9.86 mil b/d -- used as a baseline for its voluntary cut target of 500,000 b/d. Moscow has said it is ratcheting back production in response to EU sanctions and the G7's price cap targeting Russian crude and refined products. Though crude exports remain elevated, Russian refineries have slashed processing runs by more than 5%, according to market sources*."

Figure 34: Russian crude oil production



Source: Platts

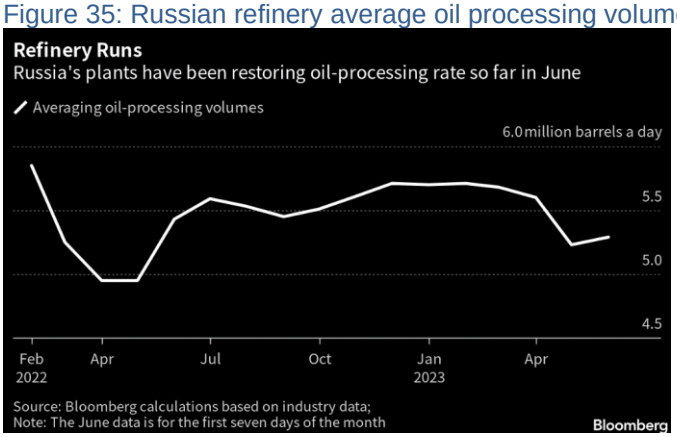
Oil – Russian refineries are increasing oil processed in June ie. less oil for export

Russia oil refineries

It's only the first week of June, but we are seeing data to support the expectation for Russian oil refineries to come out of seasonal maintenance and increase crude oil processing, which means that there should be less oil for export. On Friday, we tweeted [LINK] "*Less Russian #Oil available for export. @ja_herron reports peak of RUS refinery maintenance has passed. Refined +94,000 b/d this wk to 5.29 mmb/d. See 👇05/27 tweet: fits normal seasonal timing for increasing RUS refinery runs, which means less oil for export. #OOTT."* The data came

from a Bloomberg Friday report that wrote "*Russia's oil refineries have been accelerating their crude-processing rates, offering further evidence that the peak of spring maintenance has now passed. Primary processing rates averaged 5.29 million barrels a day in the first week of June, according to a person familiar with the matter. That's more than 94,000 barrels a day higher than in prior seven days, when nation's refineries started to ramp up. Russia's crude supplies to domestic refineries, along with seaborne exports, remain the key gauges for oil market observers seeking clues to the nation's production after the government classified output data following Western sanctions."* Below is the Bloomberg graph. Our Supplemental Documents package includes the Bloomberg report.

Figure 35: Russian refinery average oil processing volumes

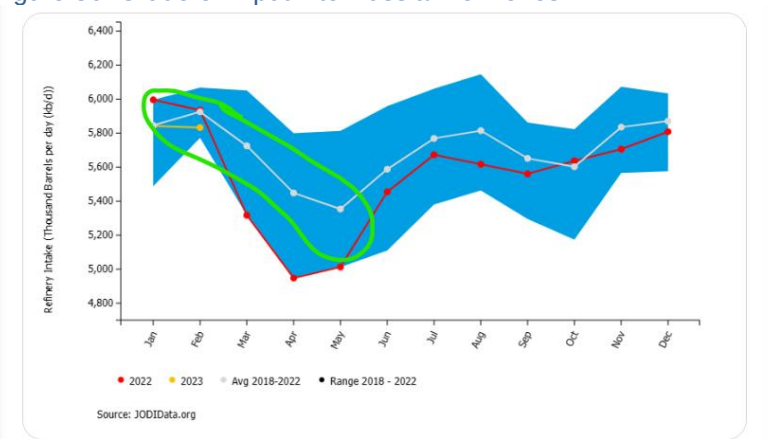


Source: Bloomberg

Russian refineries normally increase oil volumes in June ie. less oil for export

Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*One of the big negatives for oil markets has been the view that more Russian oil crude has been hitting export markets and the generally accepted cause is that Russia hasn't delivered on stated plan to cut 500,000 b/d beginning in March. However, there is another reason why more Russia oil would have hit export markets in March/April/May – it's the season when Russian refineries process less crude due to refinery maintenance. So less crude processed by refineries frees up more oil for export. Yesterday, we tweeted [LINK] "Should see RUS #oil production cuts hit Jun/Jul/Aug physical markets & why cuts hasn't hit exports yet. Normal seasonal pattern of RUS refinery turnarounds reduce oil intake by ~500,000 b/d from Feb thru May. Thx @JODI_Data. #OOTT." Nothing is normal in Russia post its invasion of Ukraine, but the normal seasonal pattern of Russian refineries is that they reduce crude oil inputs in March, April and May, and this is down over 500,000 b/d in this period in the normal seasonal trend. Below is the JODI graph attached to our tweet*."

Figure 36: Crude oil input into Russian refineries



Source: JODI

Oil – Saudi's 1 mmb/d cut to hold markets until summer seasonal demand pick up

Saudi surprise 1 mmb/d cut

We had to go to press last weekend before any official word from the OPEC+ meeting. (i) There were mixed views of the OPEC+ decisions. And as evidenced by the price action over a couple days, most didn't seem to think it was enough in the face of more concerns on the global economic outlook and China stalled recovery. We looked at the actions as more of a reinforcement that Saudi Arabia is prepared to try to keep the market balanced until the expected summer seasonal ramp up in demand kicks in. We look at the 1 mmb/d extra cut as more of an offset to a delayed China recovery. (ii) The big news from OPEC+ came separately when the Saudi Arabia Ministry of Energy announced [LINK] "*the Kingdom will implement an additional voluntary reduction in its production of crude oil, amounting to one million barrels per day, starting in July for a period of one month, subject to extension."* This was the surprise of the OPEC+ meetings. (iii) The negative reaction to Saudi Arabia going alone on the extra cut was that there was no one else prepared to step up alongside Saudi Arabia. (iv) We see the biggest risk to our view of Saudi prepared to hold the market in balance is if others, in particular Russia, don't at least keep their production to their quota ie. no cheating. Saudi Arabia seemed clear that they expected this compliance from all members including Russia.. (v) Revised quotas for 2024. The reduction of the African countries wasn't unexpected give the huge underperformance of Angola and Nigeria relative to their quota. And the increase to the UAE wasn't unexpected given this has been a major UAE issue for years. So overall, the reaction was a negative given it meant higher OPEC production as UAE can deliver the extra volumes and the reduced quota for Angola/Nigeria isn't going to cut their production levels. Our Supplemental Documents package includes the OPEC+ announcement.

Today, Saudi's Abdulaziz highlighted the above this or next month view for oil

We have a 7am MT news cut off so we are just squeezing this item in after ahaving the memo basically ready to go. Today is Day 1 of the Arab-China Business Conference in Riyadh. We started to see headlines of his talk hitting the Bloomberg tape around 4:15am MT and fortunately we were able to find the YouTube live feed so we could listen to his comments and make a couple transcripts. Abdulaziz didn't

say it specifically but it seemed like he was describing the Saudi extra 1 mmb/d cut for July as a holding mechanism for markets for a month or two until summer seasonal demand kicks in. Earlier today, we tweeted [LINK] "*See 👇Saudi Energy Minister Abdulaziz to @dan_murphy "I believe that within this month, hopefully the month after. I don't want to bet on gambling. But it is I think the physical market is telling us something. I think the futures market is telling us something else it's a matter of being in a state of readiness" Sounds like Saudi's extra 1 mmbd cut was to hold the market until seasonal summer #Oil demand ramps up. #OOTT."* Our tweet included the transcript we made of comments by Saudi Energy Minister Abdulaziz with Dan Murphy (Anchor & correspondent, CNBC) at the Arab-China Business Conference in Riyadh on June 11, 2023. [LINK] Items in "*italics"* are SAF Group created transcript.Murphy "*what is necessary to provide this market stability moving forward?*" Abdulaziz "… *that is why we have this agreement [OPEC+]. But also we are working against something called uncertainties and sentiments. And I believe that within this month, hopefully the month after. I don't want to bet on gambling. But it is I think the physical market is telling us something. I think the futures market is telling us something else it's a matter of being in a state of readiness That's why we keep taking these precautionary measures. It's part and parcel of what we call proactive and preemptive To understand OPEC+ as it is today, it's all about being proactive, preemptive and precautionary*."

Oil – Saudi's Abdulaziz is The Man with a plan that isn't focused on the next month

Saudi's Abdulaziz is a man with a plan

We recognize that the market sees Saudi Energy Minister Abdulaziz's actions as being solely focused on getting the oil price up in the near term. And we don't think anyone can disagree that Abdulaziz doesn't want higher prices and higher prices soon. But we also believe that any of his actions are part of a plan for the next number of years, and not just focused on getting the oil price up in the next month or two. It's why, on Thursday, we tweeted [LINK] "*Here's why Saudi Energy Min Abdulaziz is "The Man" - he has plan that isn't focused on this month or next but his plan generally works in near term. Was reminded of this approach by 👇what LIV golf execs say about @PIF_en "There is always a larger plan and they won't stop until they have executed that plan". Thx @AlanShipnuck. #OOTT #Oil."* We read a great Golf Digest story "*What now becomes of LIV Golf? Ask Yasir Al-Rumayyan*" [LINK] that was different from most other reports because they had numerous quotes from unnamed LIV people on their owners – the Saudi Arabia Public Investment Fund. And their LIV quotes reminded of the Saudi mindset – the PIF always have a larger plan. And that made us think of Abdulaziz always has a plan. Golf Digest wrote ""*he PIF guys, they're laser-focused on the numbers," says another LIV executive. "They are very smart and very disciplined. Everyone says the Saudis have unlimited money, but that's because they have made one clever move after another to grow the PIF into what it is. Despite the narrative, they don't burn up money recklessly. There is always a larger plan and they won't stop until they have executed that plan."* For golf fans, it's a good report to read for different background on the deal. Our Supplemental Documents package includes the Golf Digest report.

Oil – Saudi nest egg, its net foreign assets were down $8.6b MoM in April

Saudi net foreign assets

No surprise that in the followup to Saudi Arabia's surprise 1 mmb/d cut for July (that could be extended), there were many reports/opinions of how Saudi Arabia is doing this as they need much higher oil prices that are closer to $90 than $80. Given all the views, we retweeted our

May 30 tweet that we wrote up in last week's (June 4, 2023) Energy Tidbits memo. Here is what we wrote last week. "*We continue to believe the #1 financial theme for Saudi Arabia in the 2020s will be their continued, and likely increasing, use of Other People's Money as they try to transition their country to MBS's Vision 2030. We believe this has been obvious with how Saudi Arabia's net foreign assets dropped by about $300 billion over seven years. We are surprised that markets and oil watchers didn't seem to pay attention to the Saudi net foreign assets data i.e., what we call their nest egg to help them thru the Energy Transition. On Tuesday, we tweeted [LINK] "Why Saudi wants high #Oil prices and also Other People's Money to help fund Vision 2030. KSA Net Foreign Assets, its Nest Egg, was -$8.6b MoM to $410.1b at 04/30/23. Lowest since 01/31/10. That's down $326.9b or $3.1b/mth since peak of $737.0b at 08/31/14. #OOTT." Above $100 oil last year helped arrest the decline in the Saudi nest egg. But Saudi net foreign assets have dropped by $326.9 over the last 8 years & 8 months from is peak of $737.0b on Aug 31, 2014, to $410.1b on April 30, 2023. That is an average of $3,1b per month for the last 104 months since the peak. Oil prices remained relatively flat throughout the month with Brent crude averaging ~$80 in April compared to ~$73 in March. Saudi Arabia's net foreign assets on April 30 were down -$8.6b MoM to $410.1b vs $418.7b in March and $433.0b in February. At $410.1b on April 30, 2023, this is the lowest it has been since Jan 31, 2010 at $409.4b,. The last time Saudi Arabia's net foreign assets were below $400b was on Nov 30,2009 at $388.9b. Saudi Arabia is far from going broke but there has been a huge decline in the last 8 years and 8 months, but it is still a very big nest egg. This net foreign asset depletion is why we have been highlighting that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money (OPM) to fund as much of their Vision 2030 as possible. And no question, accessing OPM has helped to slow down and temporarily pause the decline in net foreign assets. Saudi Arabia's central bank (SAMA) doesn't provide explanations for the monthly swings. Below is our graph of Saudi Arabia net foreign assets updated for the April 30 data."*

Figure 37: Saudi Arabia Net Foreign Assets

Source: Bloomberg

Oil – Are there any serious discussions between US and Iran on a nuclear deal?

Iran US speaking?

It looks like Iran nuclear deal will at least be on market radar screens, or the potential for some sort of interim nuclear deal. Oil dived down on Thursday with the reports that US and Iran were nearing an interim deal that would see Iran pull back on its nuclear program in return for unfreezing some bank accounts and some sanctions relief. We tweeted [LINK] "*Hmmm! Here's Brent #Oil price dived ~noon MT. See 👇 @Reuters report on potential*

Iran/US deal that US reportedly says is "any reports of an interim deal are false" BUT at least in this short answer, US didn't deny discussions may be ongoing. #OOTT." Reuters reported [LINK] "*The United States and Iran on Thursday both denied a report that they were nearing an interim deal under which Tehran would curb its nuclear program in return for sanctions relief. "This report is false and misleading," said a spokesperson for the White House National Security Council, referring to an article on the London-based Middle East Eye website. "Any reports of an interim deal are false." Iran's mission to the United Nations also cast doubt on the report, saying: "Our comment is the same as the White House comment."* Reuters also reported "*Two Iranian officials told Reuters there had been progress but no agreement was imminent. A third said Malley and Irvani met at least three times in the past weeks but gave no details. "There (has) been some progress and we have exchanged proposals and messages with Americans," said a senior Iranian official. "Still, there are lots of details that we need to discuss."* We don't know who decided to leak out the talks, but, at least from the Iran press coverage yesterday and this morning, there looks to be some reasonable level of discussions going on. So we may not know exactly what, but we expect the reports will put Iran nuclear back on radar screens as an item to watch over the coming months. Our Supplemental Documents package includes the Reuters report.

Ayatollah Khamenei a deal is fine if Iran's nuclear infrastructure is untouched

Earlier this morning, we tweeted [LINK] "*Will #Biden accept Iran Supreme Leader offer this morning for some sort of nuclear deal? "There is nothing wrong with a deal in this field as long as the nuclear infrastructure remains intact," Ayatollah Khamenei said reports PressTV #OOTT."* Iran's Supreme Leader Ayatollah Khamenei stated what looks to be his key condition for some sort of nuclear deal. This morning, Iran's PressTV reported [LINK] "*Leader of the Islamic Revolution Ayatollah Seyyed Ali Khamenei says there is nothing wrong with reaching a nuclear deal if the country's nuclear infrastructure remains untouched, noting that the West has reneged on its promises and commitments many times and its untrustworthiness is now proven. "Iranian experts have made breakthroughs in our nuclear industry and have built and developed the great infrastructure of the industry. There is nothing wrong with a deal in this field as long as the nuclear infrastructure remains intact," Ayatollah Khamenei said."* Our Supplemental Documents package includes the PressTV report.

Oil – Still no visibility to when Kurdistan/Iraq oil exports via Turkey will resume

Turkey holds up Kurdistan oil exports

As of 7am MT news cut off, we have not seen any reports, including from Kurdistan news, that there is any indication for any negotiations between Iraq and Turkey to try to resume Kurdistan/Iraq oil exports via Turkey ie. there is no visibility to when the oil exports will resume. Yesterday, Kurdistan 24 reported [LINK] that Iraq and Kurdistan are reach final agreement on the key points regarding oil exports. This means that Iraq and Kurdistan have an agreement on oil exports, and they are just now waiting on getting Turkey to agree to resume exports. Our Supplemental Documents package includes the Kurdistan 24 report.

But Vitol sees Iraq compensating by increasing oil exports from the south

It sounds like the only production being shut-in are the Kurdistan oil volumes and that Iraq has been able to move their oil that normally goes north via Turkey to their southern export port. Here is what we wrote in our May 7, 2023 Energy Tidbits memo. "*One of the supply surprises to the negative from the northern Persian Gulf*

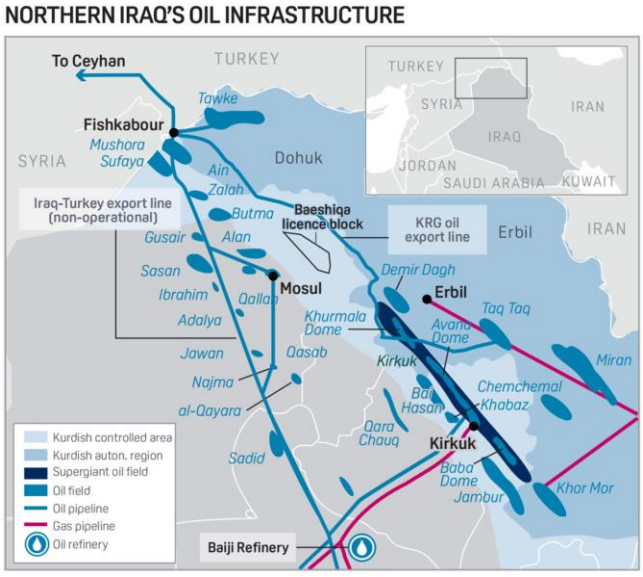
countries is Iraq. No question they are not exporting their +400,000 b/d of Kurdistan/Iraq oil via Turkey. However an interesting comment this morning from Vitol's Mike Muller on the Gulf Intelligence daily podcast that Iraq is making up for a good portion of the >400,000 b/d Kurdistan and Iraq oil that hasn't been able to be moved thru the northern pipeline to export via Ceyhan in Turkey. Earlier this morning, we tweeted [LINK] "#Oil supply surprise. There is no visibility to return of .400 kbd of Kurdish/Iraq exports via Turkey, BUT @michaelwmuller to @gulf_intel "i think Iraq seems to have compensated for reduced or cancelled Kurdish exports to the north by exporting more from the south". #OOTT."

Iraq's court case win halted 370,000 Kurdistan & 75,000 b/d Iraq oil exports

Here is what we wrote in our March 26, 2023 Energy Tidbits memo. "*Breaking news yesterday that Iraq reportedly halted 445,000 b/d of crude oil exports thru its north on the export pipeline to Ceyhan, Turkey. Iraq won an arbitration with Turkey, which means that Turkey has to deal with Iraq's oil marketing arm for approval of all Iraq oil exports, including oil from Kurdistan. It's not clear how long it will take to get to a mechanism for Iraq dealing with Turkey on the oil exports. Don't know if's wishful thinking but Kurdistan media was pointing to not too long to get an understanding. Regardless, until Iraq resumes oil exports via Turkey, it means there will be ~445,000 b/d of crude oil off the market. Yesterday, we tweeted [LINK] Iraq reportedly halts 370 kbd KRG + 75 kbd federal oil thru export pipeline thru Turkey reports @Ahmed_Rasheed_R @RowenaCaine. Positive for #Oil until Iraq resumes northern exports ie. agrees on mechanism to export Iraq oil thru Turkey in line with its arbitration win. #OOTT." Yesterday, Reuters reported [LINK] "Iraq halted crude exports from the semi-autonomous Kurdistan region and northern Kirkuk fields on Saturday, an oil official told Reuters, after the country won a longstanding arbitration case against Turkey. The decision to stop shipments of 450,000 barrels per day (bpd) of crude relates to a case from 2014, when Baghdad claimed that Turkey violated a joint agreement by allowing the Kurdistan Regional Government (KRG) to export oil through a pipeline to the Turkish port of Ceyhan. Baghdad deems KRG exports via Turkish Ceyhan port as illegal. The International Chamber of Commerce ruled in favour of Iraq on Thursday, Iraq's oil ministry confirmed on Saturday. Turkey has informed Iraq that it will respect the arbitration ruling, a source said. Turkish shipping officials told Iraqi employees at the Ceyhan oil export hub that no ship will be allowed to load Kurdish crude without the approval of the Iraqi government, according to a document seen by Reuters. Turkey subsequently halted the pumping of Iraqi crude from the pipeline that leads to Ceyhan, a separate document seen by Reuters showed. On Saturday, Iraq stopped pumping oil through its side of the pipeline which runs from its northern Kirkuk oil fields, an official told Reuters. Iraq had been pumping 370,000 bpd of KRG crude and 75,000 bpd of federal crude through the pipeline, according to a source familiar with its operations. "A delegation from the oil ministry will travel to Turkey soon to meet energy officials to agree on new mechanism to export Iraq's northern crude oil in line with the arbitration ruling," a second oil ministry official said." Kurdistan region Prime Minister Masrour Barzani expects this to be quickly resolved. Yesterday Kurdistan 24 news reported [LINK] "Kurdistan Region Prime Minister, Masrour Barzani, on Saturday reiterated the Kurdistan Regional Government's (KRG) good relations with the Iraqi federal*

government. "Our recent understandings with Baghdad have laid the groundwork for us to overcome the arbitration ruling today," PM Barzani wrote in the tweet. "A team from the KRG will visit Baghdad for talks tomorrow to build on the goodwill of our discussions," Barzani added." Below is a Platts Northern Iraq's oil infrastructure map from 2020 [LINK].

Figure 38: Northern Iraq's oi infrastructure map from 2020



Source: Platts

Oil – Trafigura's bullish oil outlook in the years ahead

Trafigura oil outlook

Earlier in the memo, we noted Trafigura's view that they do not expect US oil production increasing in 2023 that was in their interim report posted on Thursday. In addition, Trafigura also highlighted a bullish oil outlook in the years ahead. (i) We tweeted [LINK] "*Must Read #Oil#Metals outlook from @Trafigura @saadrahim. "difficult to see how US [#Oil] production is going to increase this year..." with new refining capacity "there will likely be a structure dearth of crude oil in the coming years .... raises prospect of heightened volatility in the years ahead, despite the rapidly increasing adoption of electric vehicles" Re "for both metals and energy ... further depress investment in the supply of commodities ....as such when demand recovers, it will do so quickly and run up against short stocks, low spare capacity and few response mechanisms, with new project pipelines running dry".* (ii) Prospect of higher [oil] prices and heightened volatility in the years ahead. Trafigura wrote "*Thus, while refining capacity, which had previously been a bottleneck, is now starting to expand, led by extra capacity in China and the Middle East, there will likely be a structural dearth of crude oil in the coming years to feed both these refineries and any future demand growth needed to meet the needs of a growing global population. This raises the prospect of higher prices and heightened volatility in the years ahead, despite the rapidly increasing adoption of electric vehicles."* (iii) When metals and energy recovers, it will do so quickly and run up against

short stocks. Trafigura wrote "*The important point to note for both metals and energy is that any economic growth slowdown this year will not just impact demand but will also further depress investment in the supply of commodities which are needed for the energy transition and to meet the needs of a growing global population. As such, when demand recovers it will do so quickly, and run up against short stocks, low spare capacity and few response mechanisms, with new project pipelines running dry."* (iv) There is much more in the commodity outlook section. Our Supplemental Documents package includes the 3-pg commodity recap and outlook.

Oil – Exxon CEO mentioned but didn't give his blunt warning on oil decline rates

Exxon CEO on global oil declines

Exxon CEO Darren Woods mentioned oil decline rates in his comments on Norges Bank Investment Management CEO Nicolai Tangen's Podcast on June 7, 2023 [LINK], but did not hammer home a blunt warning on the challenge of oil decline rates. We created a transcript of Woods comments. Items in "*italics*" are SAF Group created transcript. Reminding oil and gas declines have to be offset. At 18:20 min mark, Woods "… *the oil and gas markets are enormous today. We represent a fairly small position in those markets. But they are depleting resources. So as the world works on the transition, there is a continuing need for oil and gas. And as we produce that and that resource depletes, investments are needed to offset that. And our investment in that space is reflective of our market position and the need to kind of offset that depletion and continue to meet society's need while we work on this new industry, the new business of carbon reduction.*" So it was far from a warning like he did last week. Last week's (June 4, 2023) Energy Tidbits memo wrote "*The focus of investor attention on the Exxon sell-side presentation on Thursday was on their shale oil potential. So overlooked was their regular and, at least annual, reminder that there is a 7% annual depletion/decline rate in global oil production. This is on a global basis so would work in the very high decline rates in US shale oil and essentially zero decline rate in oil sands mining. It means that, on average, the world has to add another 7 mmb/d of oil production to stay offset decline and stay flat. This is the challenge for growing global oil supply especially in the face of the well understood underinvestment in the oil and gas upstream. And Exxon says that if you're not investing, the market will be short at some point in time. Exxon CEO Darren Woods said "So you can call it being stubborn. Our focus on it is a disciplined approach to understanding what the business required and sticking to it, because the facts didn't change. And with time, the facts were proven right. And it's not, wasn't that we were somehow magical in understanding it. It's basic math and understanding depletion curves and where the rest of the industry is. I'll tell you something else that's happening right now. If you look at, people continue to forget about the depletion curve and that every barrel of crude that you produce, or every ton of LNG that you produce is that much less supply available to the world. And you have to replace that, even if demand is flat So think about a 7% depletion curve. Maintaining volumes flat means you have to grow production by 7% to offset the decline. That's huge growth. People don't appreciate that. And the bigger the demand, that 7% becomes bigger, the bigger the hole that you're digging every year. If you look at where the demand for oil and gas is today, you look at a depletion and then you look at the investment going into the industry, the industry as a whole is under-investing in those resources. So whatever your view of demand is, and I said before, if we go back in time, what we typically miss is supply. No matter what your view of demand and where that's going to be at, that depletion curve eventually catches up to that demand equation. And if you're not investing, you will find the market gets short at some point in time. And my view is we're in that point in time today. The*

industry is under-investing. You hear that coming out of OPEC in Saudi Arabia, they're making that point. I think many people can see that maybe thinking it's self-serving, but the reality is that's an Issue."

04/28/23: Exxon, oil & gas is a depletion business, basically on a treadmill

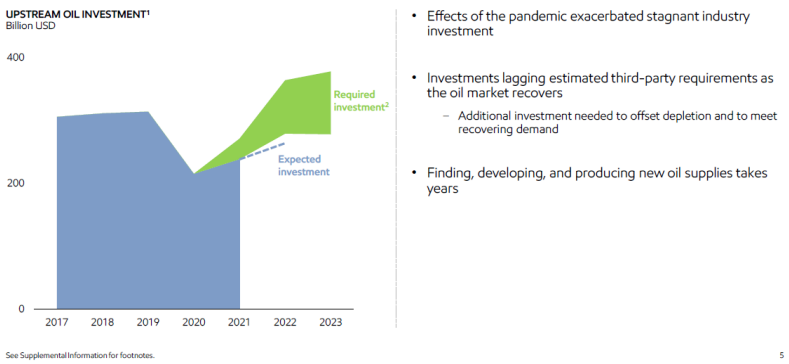
Here is what we wrote in our April 30, 2023 Energy Tidbits memo. "*Exxon CEO Woods was on CNBC Squawk Box on Friday morning after the Q1 release and before the Q1 earning call. And he reminded that the first priority for Exxon is to replace declines. Basically every barrel produced has to be replaced just to keep production flat. He was asked about capital allocation priorities given the big profits. We tweeted [LINK] a video clip of Woods comments and wrote "1st & foremost priority for #Exxon capital allocation. CEO woods "this is a depletion business on the #Oil & #NatGas side ... basically on a treadmill, every barrel is another barrel you have to replace". World needs ~5mmbd adds to stay flat. Thx @BeckyQuick @SquawkCNBC #OOTT." Woods replied "first and foremost" and then went on to highlight how "this is a depletion business on the oil and gas side and you're on basically a treadmill. Every barrel you produce is another barrel you have to replace. So finding the projects that do that cost effectively, have low cost of supply, that are advantaged versus rest of the industry is kind of job number one." Note that in our tweet we referred to ~5 mmb/d that needs to be added to keep global oil production flat. In a reply to one of our Twitter followers, we said we didn't use Exxon's prior stated 7% decline (ie. 7 mmb/d of adds needed) as Woods didn't refer to that in his Squawk Box comments and, given there is a range of views on global oil decline rate, we put in 5% or 5 mmb/d to make the point*."

Exxon is using a global oil production supply base decline of ~7% per year

The 7% decline curve referenced by Exxon on Thursday is unchanged. Here is what we wrote in our July 31, 2022 Energy Tidbits. "*There was a great reminder from Exxon's Q2 call presentation of one of the reasons why oil looks good for the 2020s. Everyone has been made well aware of the underinvestment in the oil and gas sector, whether it be from industry, OPEC countries or pro-climate change agencies like the IEA. But most have overlooked the biggest challenge for the oil sector – the existing production supply base declines every day. This is very bullish for oil in the 2020s. We were reminded of this in the Exxon Q2 call prepared remarks. Exxon posted the remarks shortly before their Q2 call and we tweeted [LINK] "Bullish for #Oil. #Exxon reminds #Oil #NatGas supply declines at ~7% per year ie. need to replace 7% to stay flat. not a new argument, see 👇SAF 06/20/19 blog ""Exxon's Math Calls For Overall Global Oil Decline Rate of ~7%, A Very Bullish Argument For Post 2020 Oil Prices" #OOTT." On an existing oil supply base of 100 mmb/d, that is approximately 7 mmb/d of annual declines. Note that Exxon said for oil and natural gas and they have previously suggested the oil decline rate was lower ie. below 6%. So that is 6 mmb/d of declines. Exxon said "As a depletion business, large annual investments in oil and gas production are needed to offset the decline in supply – roughly a 7% per year reduction. Even more investment is required to grow net production. As the world began to recover from the pandemic, demand for all but jet*

fuels recovered far faster than the time required to bring on new investments. As a result, the industry hasn't been able to meet the recovery in demand."

Figure 39: Industry Investment Not Keeping Up With Recovering Demand



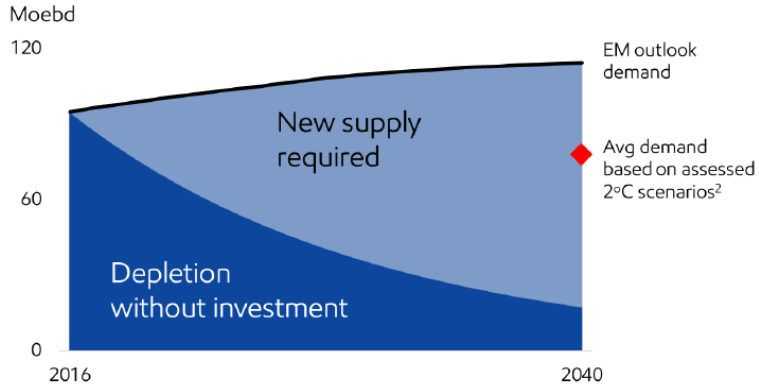
Source: ExxonMobil

Our June 19, 2019 blog was all about global oil decline rate

Exxon's warning on global oil decline rates in June 2019 was the reason for our SAF Group June 19, 2019 blog "*Exxon's Math Calls For Overall Global Oil Decline Rate Of ~7%, A Very Bullish Argument For Post 2020 Oil Prices"* [LINK]. Exxon presented at a sellside conference that week in June 2019 and then thought Exxon presented a very bullish argument for oil prices beyond 2020 which was overlooked because most readers only flip thru a slide deck and don't listen to or read transcripts of management's spoken words. Exxon's spoken words highlighted one of the forgotten (and perhaps most important) oil supply/demand concerns for post 2020 – the mid term challenge to replace increasing rate of overall global oil declines. And what was eye opening was Exxon's estimated overall global oil decline rate, which is way higher than any we could then ever remember seeing. Our blog said *"Its impossible to tell from the small oil supply/demand graph in the slide deck, but Exxon's spoken words says long term oil demand is 0.7% per year and then "When you factor in depletion rates, the need for new oil grows at close to 8% per year and new gas at close to 6% per year." Exxon may not specifically say what the global decline rate is, but their math is that the world needs new oil supply to grow annually at close to 8% to meet the 0.7% annual increase in oil demand and offset declines ie. an overall global decline rate of approx. 7%. This is an overall global oil decline rate for OPEC and non-OPEC".* At that time in 2019, BP's estimate of overall global oil decline rate is 4.5% and we expect most are probably assuming something around 5%, certainly not above 6%. No one should be surprised by the increased decline rate given that high decline US shale and tight oil have increased by ~2.5 mmb/d in the last ~2 years. But an implied ~7% overall global oil decline rate is way higher than expectations. There is a big difference between needing to offset oil declines of ~7 mmb/d vs declines of ~4.5 mmb/d ie. an additional 2.5 mmb/d of new oil supply every year. Even if the implied difference was to 6%, it would still be an additional

1.5 mmb/d of new oil supply and that would also be very bullish for post 2020 oil. At that time, we said we recognized that the 2019/2020 oil supply demand story is the need for OPEC+ to keep cuts thru 2020, but Exxon's math implying ~7% overall global oil decline rate sets up a very bullish view for oil post 2020. We believe the reality to replace oil declines post 2020 is overlooked. Our Supplemental Documents package includes our June 19, 2019 blog.

Figure 40: Exxon Estimated Oil Supply/Demand, June 2019 slide deck



Source: ExxonMobil June 2019

Oil – Very little China Covid reporting, peak still expected in June

China Covid 1st timers

As of our 7am MT news cut off, we have not seen any new Chinese state media (Global Times, People's Daily & Xinhua) reports on Covid. The only health reports this morning were from Global Times on two monkeypox cases in Guangzhou following two cases in Bejing. (i) We have checked these Chinese state media daily and there were almost zero Covid reports this week. (ii) On Friday, Global Times reported [LINK] "*China approves world's first XBB-specialized COVID-19 vaccine as second wave nears end by June* ". And "*The news came as some Chinese cities are undergoing a second wave of the COVID-19 epidemic. The country started to witness gradually climbing COVID-19 reports since late April and the epidemic spread at a low rate since mid-May, media reported citing data from the national health authority. XBB variants dominated more than 90 percent of the new cases, media said. The newly approved XBB-specialized vaccine will effectively help the country and the world fight against the virus in the post-pandemic era, experts said. Experts predicted that the epidemic in Beijing will subside by the end of June based on the latest data. According to the Beijing health authority, 23,526 cases of infectious diseases were reported in the 22nd week this year (in May 29-June 4) with two deaths, declining by 23 percent compared with last week."*

China's model predicted new Covid wave peaks at 65 million/week in late June

Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*On Monday, China admitted there is a new wave of Covid that their predictive model calls for a peak of 65 million cases per week at the end of June, but also thinks the impact wont' be as bad. On Tuesday, we tweeted [LINK] "China on market watch for next several weeks as to how severe is this new wave of Covid. State media: China's top*

respiratory disease expert says new COVID-19 wave will likely peak in late June at ~65 million cases per week. Thinks 2nd peak won't be as bad as 1st, now will hospitals be overloaded as usually mild symptoms. Also new variant XBB has no significant change in pathogenicity. Even if only mild, will slow down pace of recovery. #OOTT". Our tweet included the Global Times (China state media) reporting that included "A small wave of COVID-19 infections at the end of April and early May was "anticipated." Projections showed that a small peak of infections is likely at the end of May, with the number of infections peaking at about 40 million per week. By the end of June, the epidemic is expected to peak at about 65 million infections a week. The second peak won't be as bad as the first, nor will hospitals be overloaded as reinfection usually comes with milder symptoms, Wang Guangfa, a respiratory expert at Peking University First Hospital, told the Global Times on Monday.".

Reminder these are predictive models that might be wrong

Here is another item from our May 28, 2023 Energy Tidbits memo. "*Earlier this morning we tweeted [LINK] on the Global Times Friday reporting "Wave of COVID-19 reinfection in China has 'limited impact' on everyday life" that included the reminder that these are predictive models that might not be accurate. Global Times wrote 'The country is predicted to face a peak at the end of June, with about 65 million people infected with COVID-19 each week, according to Zhong. But Zhong also noted that it's predicted based on model calculation, which might not be accurate." As a reminder, last week's (May 21, 2023) Energy Tidbits included the updates from Chinese state media and how there was a low probability of large scale infection. We wrote "On Wednesday, Xinhua news reported [LINK] "China sees low possibility of a large-scale COVID-19 epidemic outbreak in the country at the current stage, according to an expert with the Chinese Center for Disease Control and Prevention (China CDC The number of confirmed COVID-19 cases reported nationwide has been on the rise since mid-to-late April, according to official surveillance data, said Wang Liping, a researcher with the China CDC, adding the symptoms of the majority of confirmed cases reported are mild. The COVID-19 Omicron XBB subvariants had developed into dominant subvariants in China as of early May, while there is no significant change in the pathogenicity of XBB subvariants, said Chen Cao, a researcher with the China CDC."*

Oil – China scheduled domestic flights remain back at 3rd week of April levels

China scheduled domestic flights

Chinese domestic air travel mobility indicators continue to point to a stalling or at least a much slower than expected China recovery in China domestic scheduled flights continuing into June. China scheduled domestic flights have given back the early May gains and are back to the 3rd week of April levels. On Tuesday, we tweeted [LINK] "*China consumers continue to take a pause. Scheduled domestic air flights still stuck after falling back to late Apr levels. Scheduled domestic flights +0.2% WoW to 94,486. Scheduled "over" next 4-wk is increasing to 101,197 flights is -15.1% vs 119,180 flights that were scheduled on Mar 28 for Apr. Thx @BloombergNEF Claudio Lubis. #OOTT #Oil."* This week's (June 6) update of scheduled China domestic flights continued with the same negative as the last two weeks – it's a give back of first part of May's scheduled domestic flight increases and scheduled domestic flights are back to the 3rd week of April levels. On Tuesday, BloombergNEF posted

its Aviation Indicators Weekly June 6, 2023. BNEF reported China scheduled domestic flights were +0.2% WoW to 94,486 flights for May 30–Jun 5 week vs 94,321 flights for May 23-29 week, The recent 5-day May Day Holiday was Apr 29-May 3. Note scheduled domestic flights for May 30-Jun 5 at 94,486 flights is -20.7% vs what was scheduled on March 28 for the then next 4-weeks ie. April) of 119,180 flights. The new June 6 number of scheduled domestic flights for the next four weeks is set to increase by 7.1% "over" the next four weeks to reach 101,197 flights. Again, still -15.1% below the 4-week scheduled on March 28 for the end of April that was 119,180 domestic scheduled flights. This is still saying the big jump up in scheduled domestic flights for April didn't happen . China scheduled domestic flights are back to pre May Day Holiday levels. And, at best there is modest increases in scheduled flights to levels far less than expected on March 28. Our tweet included the BloombergNEF charts from June 6 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

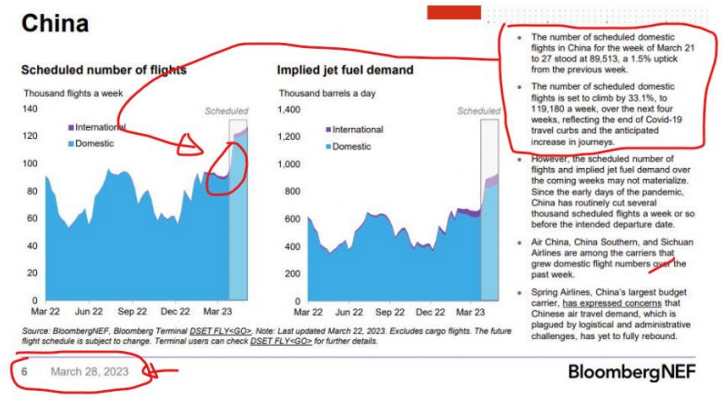
Figure 41: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

May 30-Jun 5: +0.2% WoW to 94,486 flights
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW to 94,138
Apr 11-17: +0.7% WoW to 92,231
Apr 3-10: -4.2% WoW to 91,567
Mar 28-apr 3: +6.8% WoW to 95,624
Mar 21-27: +1.5% WoW to 89,513
Mar 14-20: -0.6% WoW
Mar 7-13 week: -0.8% WoW
Feb 27-Mar 3 week: -2.6% WoW
Feb 21-27 week: +0.0% WoW (note this was +0.01%)
Feb 14-20 week -0.5% WoW
Feb 7-13 week -0.7% WoW
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW
Jan 17-23 week +7% WoW
Jan 10-16 week +20% WoW
Source: BloombergNEF

Figure 42: China scheduled domestic air flights as of June 6

Source: BloombergNEF

Figure 43: China scheduled domestic air flights as of March 28



Source: BloombergNEF

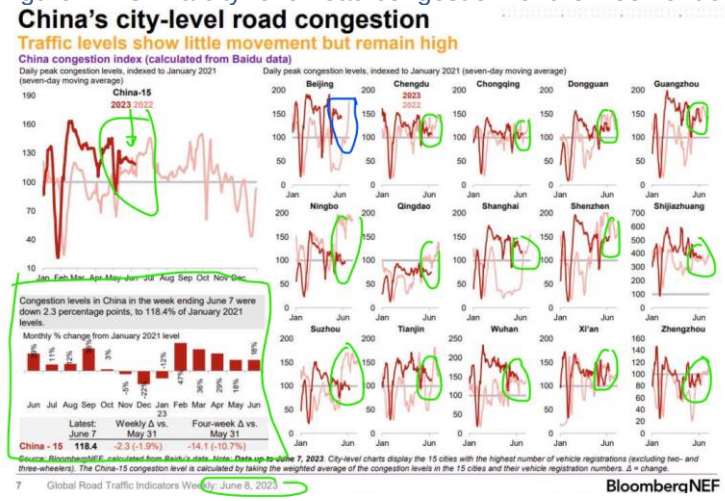
China city traffic congestion

Oil – Baidu China Top 15 cities road congestion is down YoY to below 2022 levels

We recognize that Baidu city-level road congestion is only an indicator but we couldn't help highlight that the Baidu data for the week ending June 7 was down YoY. Early Thursday morning, we tweeted [LINK] "*China Slowdown. Economic slowdown, Covid impact or combination thereof. See 👇@BloombergNEF Baidu city-level road congestion. All major cities road congestion, except Beijing, have crossed or about to cross over to lower YoY. #OOTT."* The Baidu data for the June 7 week for China's Top 15 cities was 99, when indexed vs same period in 2019. But this is down YoY when compared to June 2022 that was 108 when indexed vs same period in 2019. Don't forget the China reopening from Covid wasn't announced until Dec 2022 so many will be surprised that June 2023 is down YoY vs June 2022. No one knows how much of this is due to the economic slowdown vs Covid expected to peak in late June. But we have to believe these are the two key contributing factors. Our tweet included the below graph from the BloombergNEF Global Road Traffic Indicators June 8 weekly report. BloombergNEF wrote *"Congestion levels in China in the*

week ending June 7 were down 2.3 percentage points, to 118.4% of January 2021 levels." Below is the BloombergNEF China city-level congestion data for the week ended June 7.

Figure 44: China city-level road congestion for the week ended June 7



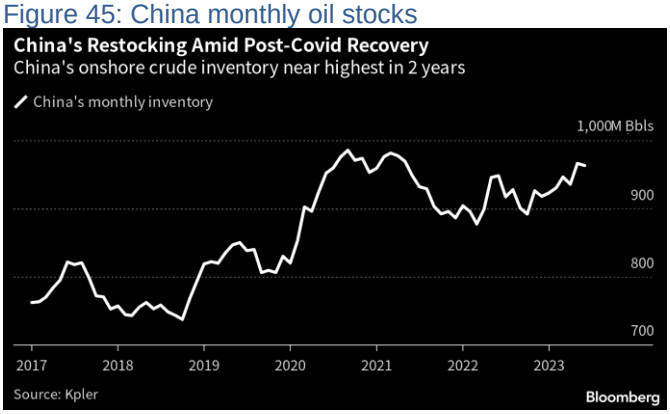
Source: BloombergNEF

Oil – China oil stocks hit 2-year high

China oil stocks

One of the problems with tracking China oil is that there are any official current oil inventory levels, so we have to look for oil inventory/stocks estimates from firms like Kpler and Vortexa. This week, there was another good indicator that the China recovery hasn't been as fast as expected – China oil stocks hit 2-year highs. On Friday, we tweeted [LINK] "*Stalled China recovery leads to China onshore #Oil stocks at 2-yr high. @business John Liu, Sarah Chen reporting on. @Kpler data: onshore stocks 963 mmb in June, 966 mmb in May. see 👇graph. @Vortexa onshore stocks 960 mmb. #OOTT."* Bloomberg reported on China onshore oil stock levels at May 31 as estimated by Kpler and Vortexa. The estimates were essentially the same. Bloomberg wrote "*China's onshore crude oil stockpiles hit a two-year high in May as demand fell short of expectations amid a disappointing economic recovery. Inventories climbed to 966 million barrels, before easing back to 963 million barrels in June, according to analytics firm Kpler. That compares to a five-year average of 858 million barrels. Refiners have been on a post-Covid buying spree, betting that oil demand would quickly rebound after China reopened its economy. That hasn't been the case and consumption has stagnated at the same time as processors have idled facilities for spring maintenance."* Then Bloomberg also reported "*A customs probe in Shandong has also kept oil from clearing storage, said Emma Li, an analyst at Vortexa Ltd., which puts onshore inventory at 960 million barrels, its highest since December 2020*." Our Supplemental Documents package includes the Bloomberg report.

Figure 45: China monthly oil stocks



Source: Bloomberg, Kpler

Oil – Kpler estimates China's oil stock capacity is 1.63 billion barrels

China oil stocks capacity

As noted above, there aren't current official estimates of China oil stocks/inventory so it's always tough to get the true picture. Above, we noted the Bloomberg reporting of Kpler's estimates that China oil stocks were 963 million barrels at May 31, down marginally from 966 million barrels at April 30. Those were the headlines but there was also a good tidbit at the end of the story "*New refining capacity and storage facilities are also expanding the amount of oil that China can stockpile. Inventory capacity grew to 1.63 billion barrels in June, compared to 1.55 billion barrels a year ago, according to Kpler*."

Oil – India oil products consumption +9% YoY in May, highest

India petroleum production consumption +9% YoY

It's great to see no negative surprises from India on petroleum products consumption – India continues to have solid YoY growth in almost all petroleum products. On Wednesday, we tweeted [LINK] "*Continued growth in India #PetroleumProducts consumption in May. Across the board for all key products. Gasoline +11% YoY. Diesel +13% YoY. Naptha +38% YoY. LPG +8.7% YoY. Only Petcoke down -2.5% YoY. Thx @business. #OOTT."* Every month, India's Petroleum Planning & Analysis Cell (part of the Ministry of Petroleum & Natural Gas) posts a spread sheet [LINK] with its consumption of petroleum products by product and the data comes normally out a few days before they post their monthly oil and gas recap. Our tweet included the PPAC spreadsheet and also the Bloomberg recap of the data. Bloomberg highlighted "*India's oil-product consumption in May rose 9% y/y, up the most since November, to 20 million tons, according to provisional data published by the oil ministry's Petroleum Planning & Analysis Cell".* Our Supplemental Documents package includes the PPAC spreadsheet and the Bloomberg summary.

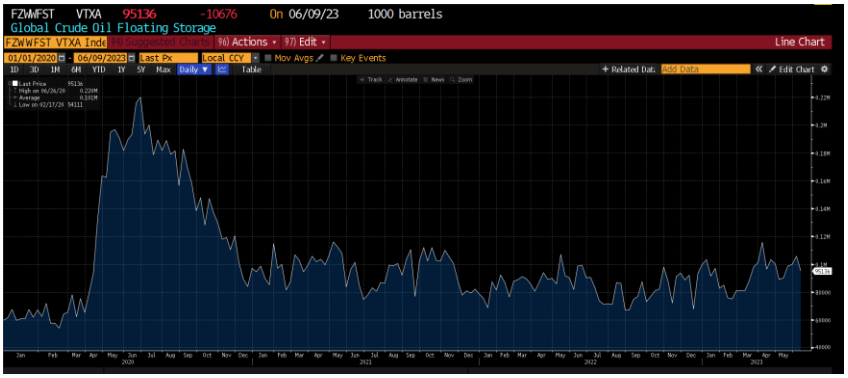
Oil – Vortexa crude oil floating storage at June 9 was 95.14 mmb, -10.67 mmb WoW

Vortexa floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on June 3 at 9am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for June 9 at 95.14 mmb, which was -10.67 mmb WoW vs hugely upwardly revised June 2 of 105.81 mmb. Note June 2 was

revised +17.32 mmb vs 88.49 mmb posted on Bloomberg as of 9am MT on June 3. (ii) We will want to watch to see if more upward revisions this week. In theory, we have been expecting to see lower average floating storage trends as May is when the OPEC+ cuts were to kick in. (iii) June 2 was revised huge, May 26 and May 19 revised up over + 5 mmb, and then only small revisions for the rest of the last seven weeks. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am on June 3 are as follows: June 2 revised +17.32 mmb. May 26 revised +5.09 mmb. May 19 revised +5.90 mmb. May 12 revised -0.07 mmb. May 5 revised -0.51 mmb. Apr 28 revised +1.24 mmb. Apr 21 revised +0.72 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 96.99 mmb, which is up vs last week's then seven-week average of 93.93 mmb. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison. (vi) Note the below graph now goes back to Jan 1, 2020 and not just three years as floating storage in Apr 2020 had started to reflect the Covid impact. (vii) June 9 estimate of 95.14 mmb is -124.91 mmb vs the Covid peak on June 26, 2020 of 220.05 mmb. (viii) June 9 estimate of 95.14 mmb is +29.53 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) June 9 estimate of 95.14 mmb is -3.58 mmb YoY vs June 10, 2022 of 98.72 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT June 10, 9am MT June 3, and 9am MT May 27, and 9am MT May 20.

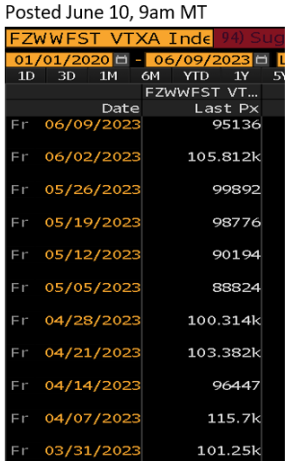
Figure 46: Vortexa Floating Storage posted on Bloomberg June 10 at 9am MT



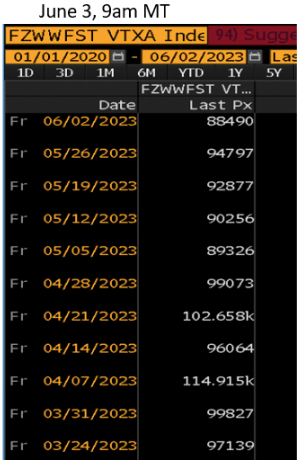
Source: Bloomberg, Vortexa

Figure 47: Vortexa Estimates Posted June 10 9am MT, June 3 9am MT, May 27 9am MT

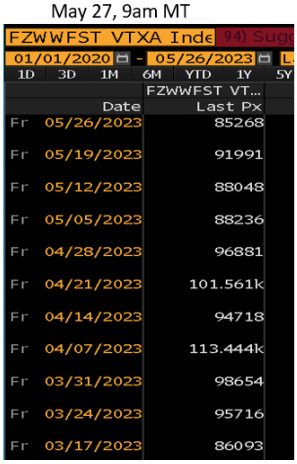
Posted June 10, 9am MT



June 3, 9am MT



May 27, 9am MT



Source: Bloomberg, Vortexa

Oil – Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Please note the following comment on Iran/Russia floating storage. Bloomberg also posts the Vortexa crude oil floating storage in the key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. The largest WoW changes were in Asia -12.80 mmb. But note this was because of a big revision to June 2 for Asia, which was revised +10.94 mmb. Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for June 2 that was posted on Bloomberg at 9am MT on June 3.

Figure 48: Vortexa Estimates Posted June 10 9am MT, June 3 9am MT, May 27 9am MT

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	June 9/23	June 2/23	WoW	June 2/23	Apr 7/23	June 9 vs Apr 7
Asia	44.84	57.64	-12.80	46.70	60.58	-15.74
Europe	8.05	7.39	0.66	6.97	23.81	-15.76
Middle East	9.33	8.72	0.61	4.91	4.97	4.36
West Africa	3.89	6.57	-2.68	5.60	5.97	-2.08
US Gulf Coast	0.90	0.01	0.89	0.11	3.16	-2.26
Other	28.13	25.48	2.65	24.20	17.21	10.92
Global Total	95.14	105.81	-10.67	88.49	115.7	-20.56
Vortexa crude oil floating storage posted on Bloomberg 9am MT on June 10						

Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: "Economic Jitters Cast Doubt on 2H Outlook"

Bloomberg oil demand monitor

We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Concerns revolving around the global economic outlook has brought doubt to whether or not we'll see oil demand growth in H2/23.These concerns are particularly derived from China's slow recovery, as well as rate hikes and the threat of recessions in other major economies around the world. The executive director of the

Paris-based IEA, Fatih Birol, commented *"The Asian nation's economic performance is the single most important factor for the oil market; If the Chinese economy weakens, or growth is much lower than many international economic institutions believe, of course this can lead to bearish sentiment".* Oil demand in the US is expected to grow less than 1% in 2023, which is less then half of the 2% growth seen in 2022. In May, India's oil-product consumption grew ~9% YoY, with notable increases for both gasoline and diesel. This was the largest growth India's seen since November 2022. Commercial airline flights at the start of this week were ~26% higher YoY, and ~4.5% above 2019 levels (pre-Covid), according to a 7-day average tracked by Flightradar24. As of Monday morning, road congestion was above pre-pandemic levels in 4 the 13 major global cities tracked by TomTom mobility data, with China's traffic continuing to remain strong in major cities following the huge initial recovery seen after the country's zero-Covid policy was lifted. Refinery utilization as of June 2 was up +4.8% MoM to 95.8% and up +1.6% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Oil - International and Domestic air passenger travel continues to grow in April

Air travel up significantly in April

On Monday, the International Air Transport Association (IATA) announced passenger data for April 2023 [LINK]. (i) Total traffic in April, measured in revenue passenger kilometers (RPK), rose +45.8% YoY. March 2023 was +52.4% YoY. Please note the IATA splits out total market air travel into International travel vs Domestic travel. (ii) For April 2023, total global RPKs were -9.5% vs April 2019 levels, but that was split International RPKs down 16.4% vs April 2019 and Domestic RPKs +2.9% vs April 2019 levels. (iii) The IATA commented, "*This significant recovery in international routes between the Asia Pacific region and the rest of the world reflects the resilience demonstrated by airlines in the region. Furthermore, traffic within Asia itself also showed positive momentum, reaching 55.6% of pre-pandemic levels"* Our Supplemental Documents package includes the IATA release.

Figure 49: April 2023 Air Passenger Market

	World share[1]	April 2023 (% year-on-year) RPK	ASK	PLF (%-pt)[2]
TOTAL MARKET	***100.0%***	**45.8%**	**39.7%**	**3.4%**
Africa	*2.1%*	47.1%	41.7%	2.6%
Asia Pacific	*22.1%*	170.8%	135.1%	10.3%
Europe	*30.8%*	22.2%	15.6%	4.5%
Latin America	*6.4%*	15.3%	15.8%	-0.4%
Middle East	*9.8%*	36.8%	26.4%	5.8%
North America	*28.8%*	13.9%	13.8%	0.1%
International	***58.0%***	**48.0%**	**38.1%**	**5.5%**

Source: IATA

Oil - Air cargo in April "capacity returns to pre-covid levels as traffic decline slows"

Air cargo demand in April

The slowing or risk to the global economy is showing up in air cargo. Air cargo volume is the result of export orders and trade so it isn't really a leading indicator. Rather the air cargo data reflects export orders, trade, and the state of the global economy. On Wednesday, the International Air Transport Association (IATA) announced cargo data for the month of April

[LINK]. The global demand in air cargo markets remained in a YoY deficit for the 14th consecutive month in April 2023. However, the IATA wrote "*Industry-wide cargo capacity returned pre-pandemic levels for the first time in three years, with available cargo-tonne kilometers (ACTKs) surpassing April 2019 levels by 3.2%".* Global demand, measured in cargo tonne-kilometres, fell -6.6% YoY in April, compared to last month's -7.7% YoY decline. Despite the YoY weakness total demand was -3.2% below pre-pandemic levels. Cargo demand continues to be under 2019 levels, since total demand broke the threshold for the first time in 8 consecutive months in February 2023. On the international level, all regions except Africa saw their YoY declines in April and continue to remain below levels seen a year ago. Asia-Pacific airlines saw their air cargo volumes decrease by -0.4% YoY in April (-7.3% YoY in Mar), North American carriers posted a -13.1% YoY decrease (-9.4% YoY in Mar), European carriers saw a -8.2% YoY decline (-7.8% YoY in Mar), and finally, Middle Eastern carriers experienced an -6.8% YoY decline in cargo volumes (-5.5% YoY in Feb). Our Supplemental Documents package includes the IATA release.

Figure 50: April 2023 Air Cargo Market

	World share [1]	April 2023 (% year-on-year) CTK	ACTK	CLF (%-pt)[2]
TOTAL MARKET	***100.0%***	**-6.6%**	**13.4%**	**-9.2%**
Africa	*2.0%*	0.9%	5.3%	-2.1%
Asia Pacific	*32.4%*	-0.4%	41.2%	-18.5%
Europe	*21.8%*	-8.2%	7.8%	-8.6%
Latin America	*2.7%*	-1.6%	8.1%	-3.6%
Middle East	*13.0%*	-6.8%	10.0%	-7.8%
North America	*28.1%*	-13.1%	-1.5%	-5.0%

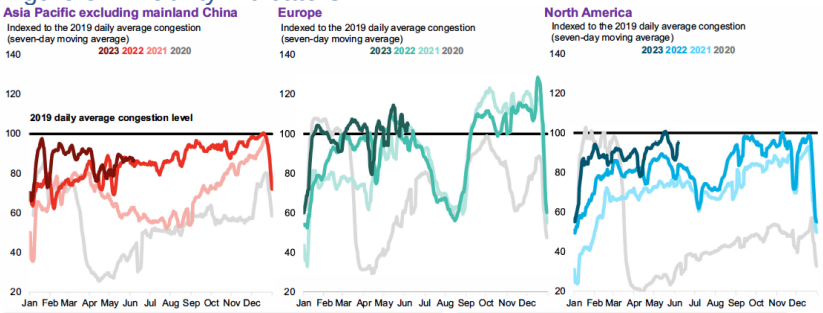
Source: IATA

Global road traffic indicators

Oil – TomTom mobility indicators: NA and EU traffic increases, Asia Pacific decreases

On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly report, which recaps traffic indicators in all the major economic regions of the world ie. mobility indicators like TomTom. For week ending June 6, North American and European and traffic levels increased, while Asia Pacific (ex-China) decreased WoW by +8.9%, +0.7%, and -1.1%, respectively. Traffic levels in Europe are now +4.6% above the 2019 average and up +13.0% YoY. North America and Asia Pacific (ex-China) traffic are -5.1% and -13.4% below the 2019 average and are +12.9% and +3.6%YoY, respectively. Traffic in Europe and the Asia-Pacific region has steadily increased last month in May. 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 51: Mobility Indicators



Week-on-week (2019 average = 100)

	Latest week: Jun 6	Δ vs. May 30	4-week MA	Δ vs. May 30
Asia Pacific ex-China	86.6	-0.9 (-1.1%)	87.4	+0.7 (0.8%)
Europe	104.6	+0.8 (0.7%)	105.5	-0.5 (-0.4%)
North America	94.9	+7.7 (8.9%)	94.4	-0.1 (-0.1%)

Year-on-year (same week last year = 100)

	Latest week: Jun 6	Δ vs. May 30	4-week MA	Δ vs. May 30
Asia Pacific ex-China	103.6	+2.8 (2.8%)	101.9	-2.4 (-2.3%)
Europe	113.0	+5.1 (4.8%)	105.2	+3.7 (+3.6%)
North America	112.9	+0.3 (0.3%)	113.3	+1.3 (+1.2%)

Source: BloombergNEF

Oil and Natural Gas – Another increase in total number of Alberta wildfires this week

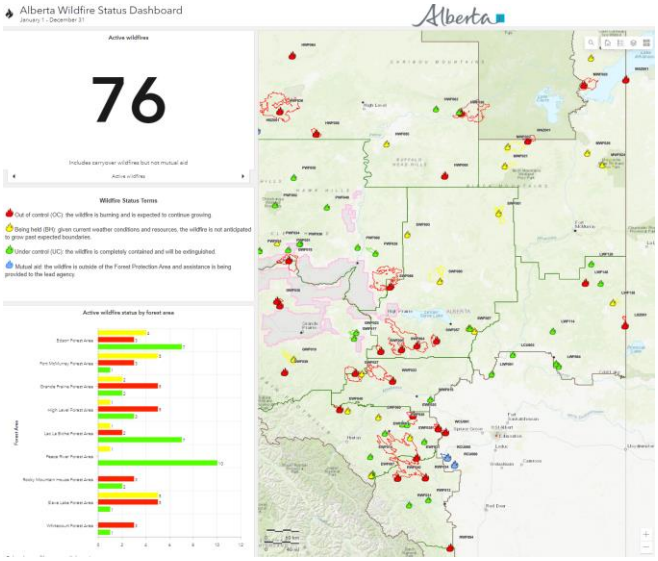
Increase in Alberta wildfires

It was the second consecutive week of increasing wildfires in Alberta. Three week ago, there were 86 total wildfires on May 21, that dropped to 51 total wildfires on May 27, but up to 57 total wildfires on June 3, and now up to 76 total wildfires as of 7pm on June 10. There was also an increase in the number of Out of Control wildfires in Alberta.

Links to Alberta and BC wildfire status maps

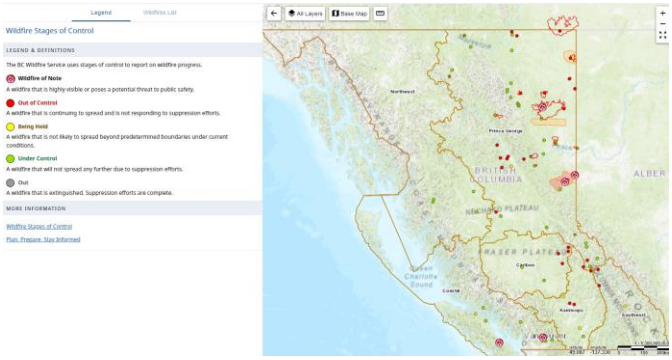
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [LINK] and the BC Active Wildfires interactive map [LINK]. Please note these links have changed over the past few years. Both maps are interactive and open up for the information on any particular fire. Here are the wildfire maps as of 7:30pm MT last night.

Figure 52: Alberta wildfire map as of 7pm MT on June 10



Source: Alberta Wildfire Status Dashboard

Figure 53: BC wildfire map as of 7pm MT on June 10



Source: Alberta Wildfire Status Dashboard, BC Wildfire Service

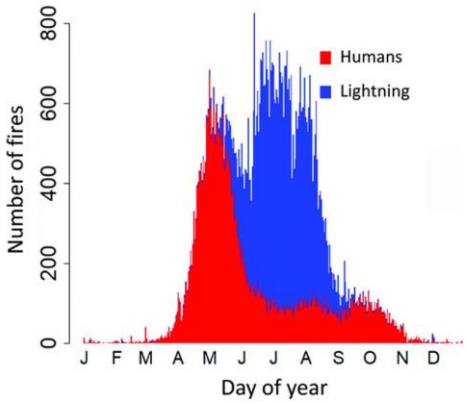
Oil and Natural Gas – High wildfire risk in Alberta/BC as peak is normally Jul/Aug

Wildfire peak is normally July Aug

We don't track wildfires data outside Alberta/BC as our focus is on the oil and gas sector but, the big Canada story this week were the wildfires in eastern Canada with potential risks to energy such as to Quebec transmission lines. It's a reminder that wildfires are not just a western Canada. It's always better to see less wildfires. But we remind that wildfire season is just starting. Unfortunately, we have to remind that wildfire season peak isn't normally until July/Aug. (i) On May 9, we tweeted [LINK] *"#Wildfire season is, unfortunately, only just starting with normal peak Jul/Aug. See 👇excerpts. SAF 06/13/21 Energy Tidbits re distribution of wildfires by month in Canada. SAF 05/07/23 Energy Tidbits re heightened 2023 risk with very low precipitation in Nov 1-Mar 31 & Apr. Hope everyone can be safe! #OOTT."* (ii) Our tweet included two graphs from our June 13, 2021 Energy Tidbits memo that shows

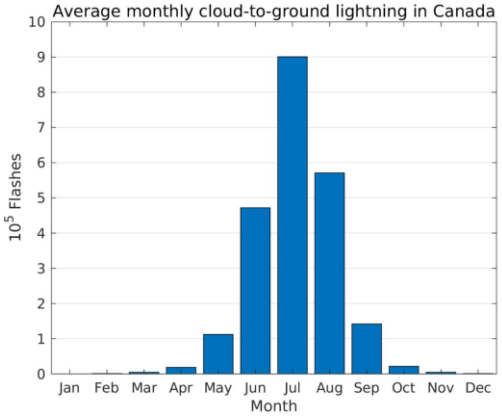
the normal peak for Canada wildfires is July/Aug with a key reason being that is when lightning strikes normally peak. (ii) Our tweet also included the Alberta Environment maps of precipitation % of normal for Nov 1 thru Mar 31, and for the month of April that clearly show how dry it was this winter and especially so in April. We have included these maps previously in our memos.

Figure 54: Canada Wildfires Distribution Over Year



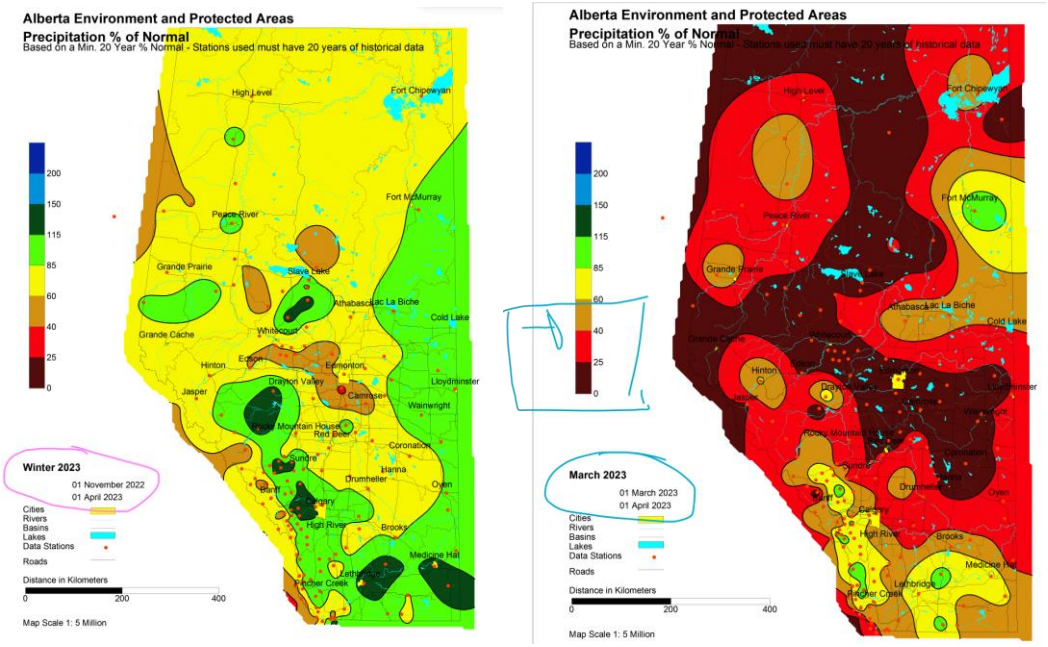
Source: Wildfire Today

Figure 55: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 56: Alberta Precipitation % of Normal for Nov 1-Mar 31, and for April



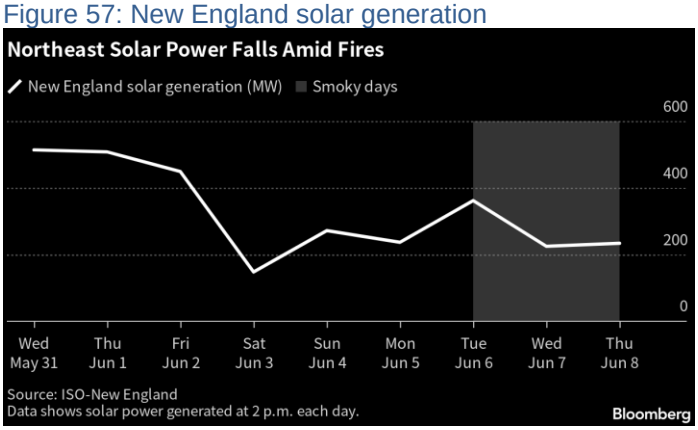
Source: Alberta Environment

Energy Transition – Wildfire smoke his New England solar, but solar is small

Wildfires smoke hit US solar generation

The smoke in the NE from Cdn wildfires provided a reminder on the intermittency of solar generation. The smoke had a big impact on solar generation but, fortunately, solar is only 3% of total power generation in New England. On Thursday, Bloomberg wrote "*A shroud of smoke has sent solar power generation in parts of the eastern US plummeting by more than 50% as wildfires rage in Canada. Solar farms powering New England were producing 56% less energy at times of peak demand compared with the week before, according to the region's grid operator."* Below is the Bloomberg graph.

Figure 57: New England solar generation

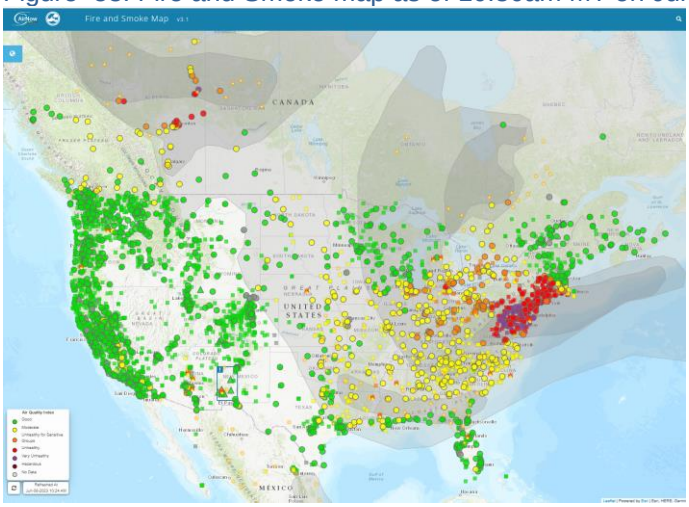


Source: Bloomberg

NE has been hammered by smoke from Cdn wildfires

Anyone who has watched CNBC or BloombergTV this week has seen the live shorts of the smoke-filled New York City skies from the winds bringing smoke south from the Cdn wildfires. And how that interrupted air flights in many NE US airports. On Thursday, we tweeted [LINK] "*Winds continue to bring major smoke from Cdn wildfires to NE US. Good link to live air quality index map is from @AIRNow. https://fire.airnow.gov #OOTT."* Our tweet included the below AIR Now live fire and smoke map as of 10:30am MT on Thursday.

Figure 58: Fire and Smoke map as of 10:30am MT on June 8



Source: AIR Now

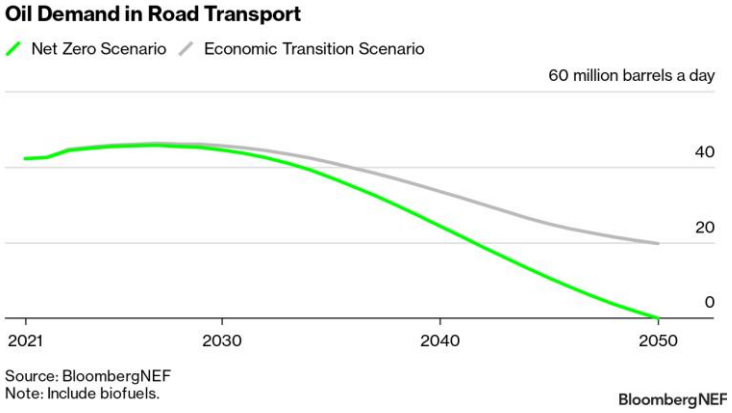
Energy Transition – BNEF, demand for road fuels to peak in 2027 because of EVs

BNEF on EVs displacing oil

On Thursday, BloombergNEF published its annual Electric Vehicle Outlook and Bloomberg posted some key highlights of the report. The outlook has some very good data, forecasts and food for thought. (i) EV sales will surge in the coming years. We think it is hard for anyone to disagree that EV sales are increasing at a very fast rate and doing so in the major countries of the world. Bloomberg wrote "*The share of electric vehicles in sales of new passenger vehicles is set to more than double globally in the next few years — to 30% in 2026. Their penetration in some markets will be even higher, with EVs reaching 89% of sales in the Nordics, 52% in China and 42% in Europe. Our latest near-term EV sales outlook is brighter than what BNEF published last year, mostly due to policy changes in the US, where a major investment push sparked by the Inflation Reduction Act will help more than triple the share of EVs in new sales, to 28% by 2026."* (ii) We don't have an EV sales model but we agree that EV sales are likely to continue at very high growth rates as long as policy/incentives stay in place. And we don't expect to see any major pull back in policy/incentives over the next few years. Our concern on EV sales growth rates is more towards 2030 and we wonder if the availability and cost of critical metals will be a limiting factor to EV sales growth rates. (iii) BloombergNEF sees the growth in EV sales will be "*leading to demand for road fuels peaking in 2027*". Their graph is below. Peaking road fuels demand in 2027. (iv) No one can disagree that EVs lead to displacement of gasoline consumption. The question is at what rate and what are the key assumptions for any forecast. The assumptions determine the rate of displacement of gasoline. (v) We confirmed with BloombergNEF that they use a similar assumption as the IEA did in their recent Global EVs Outlook 2023. We asked them "*one question on your below oil demand graph. Do you take a similar approach in estimating oil displacement by EVs as the IEA did in their Global EVs Outlook 2023. The IEA wrote "How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each)."* BloombergNEF replied "*Yes, that's correct, we use a similar approach to account for what type of vehicle kilometer is being 'displaced' in each market*." It's hard to see what other choice they have for this assumption other than pick a % to reduce the 1-for-1 replacement. But if they did so, they would be hammered by the climate change side for picking an arbitrary % that doesn't have any facts. (vi) As we highlighted in our April 30, 2023 Energy Tidbits memo on the IEA's EV outlook, we don't believe this effective one-for-one replacement in terms of distance driven has proved out so far. On March 22, 2023, we tweeted [LINK] "*4/7. But for many, an EV is a 2nd or 3rd car. Norway is recognized leader in terms of EVs penetration. 03/22 tweet. Yet #EVs distance driven 22.6% in 2022. EVs were >80% of new car sales in 2022, been 60% for ~4 years. [LINK] #OOTT*". On April 26, 2023, we tweeted [LINK] "*5/7. In Norway, EVs are 2nd or 3rd cars! 03/25 Equinor explains why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness [LINK] #OOTT."* Absent governments mandating ICE vehicles get junked, the other key factor is that ICE vehicles are lasting longer. On April 26, 2023, we tweeted [LINK] *"6/7. A concept everyone has experienced - ICE vehicles are lasting longer. 03/31. @BloombergNEF. at least in China, ICE vehicles retirements are at a very low level even in the face of increasing EV and ICE sales. #OOTT."* (vii) EVs sales are accelerating and that means there is an increasing

displacement of gasoline by EVs. The question is at what rate. Our Supplemental Documents package includes the Bloomberg report on the BloombergNEF Electric Vehicle Outlook.

Figure 59: Oil demand in road transport



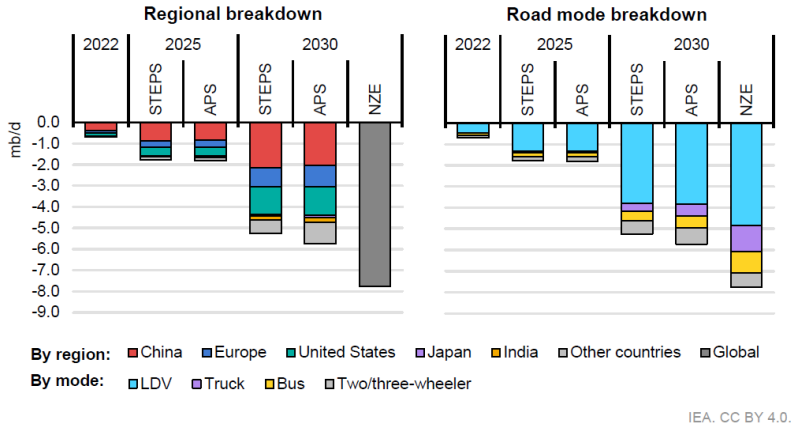
Source: BloombergNEF

IEA forecasts EVs displacing ~6 mmb/d of gasoline by 2030

Here is what we wrote in our April 30, 2023 Energy Tidbits memo. "*The most important assumption on when peak oil demand hits is how quickly the accelerating share that EVs have of all new car sales leads to a big decline in oil consumption. The IEA forecasts EVs will displace nearly 6 mmb/d of oil demand by 2030 if governments deliver on their stated policies. And says that EVs displaced 700,000 b/d of oil demand in 2022. We had a 7-tweet Twitter thread that reminded that the displacement is all about forecast assumptions. We agree that EVs have to displace some oil demand, but we question the primary assumption and therefore believe this nearly 6 mmb/d displacement is too optimistic. (i) On Wed, the IEA released its major report "Global EV Outlook 2023: Catching up with climate ambitions". [LINK]. There is no question it is an excellent report with a lot of data and global EV insights. We recommend adding to reference libraries. (ii) We tweeted [LINK] "1/7. @IEA Global EVs Outlook 2023. #Oil Bears and Bulls will both love it! Oil Bears and western leaders like headline, EVs to be 60% of total car sales in 2030, EVs to displace nearly 6 mmbd of oil by 2030, already displaced 0.7 mmbd in 2022. #OOTT." We expect western leaders will just run with the nearly 6 mmb/d displacement and not worry about the key assumption. (ii) Oil bears assume this nearly 6 mmb/d means the IEA expects oil demand to be down ~6 mmb/d by 2030. But we reminded in our tweet [LINK] "2/7. Oil bulls remember @IEA World Energy Outlook Oct/22 incl EVs to be 50% of total car sales in 2030, and IEA forecast #Oil demand to increase 0.8%/yr this decade to peak around 103 mmbd n mid 2030s." The IEA's flagship annual report World Energy Outlook in Oct 2022 assumed EVs would be 50% of total car sales in 2030, so less than its new forecast of 60% in 2030. But even including a 50% assumption, the IEA WEO forecast oil demand to keep increasing in the 2020s and not peak until the mid 2030s at ~103 mmb/d. (iii) Here is the key assumption to displacing ~6 mmb/d that most probably didn't read. We are*

big believers that it is important to look at the key forecast assumption on pg 132. We tweeted [LINK] "Oil bulls also note KEY assumption to @IEA #EVs replacing 6 mmbd is that distance travelled by EVs basically replaces the distance an ICE or hybrid would have driven. ie. infers a new EV is added to fleet, an ICE is effectively retired from fleet. #OOTT." The IEA wrote "How much oil really gets displaced by electric vehicles? Oil displacement through the use of EVs can be estimated by assuming that the distance (total kilometres) travelled by EVs by segment each year would have otherwise been travelled by ICE vehicles or hybrid electric vehicles (HEVs) (based on the stock shares of each)." Basically, the IEA assumes the EV effectively replaces the distance driven by an ICE vehicle. (iv) We don't believe this effective one-for-one replacement in terms of distance driven has proved out so far. We tweeted [LINK] "4/7. But for many, an EV is a 2nd or 3rd car. Norway is recognized leader in terms of EVs penetration. 03/22 tweet. Yet #EVs distance driven 22.6% in 2022. EVs were >80% of new car sales in 2022, been 60% for ~4 years. [LINK] #OOTT". (v) On March 25, Equinor highlighted this EVs are 2nd or 3rd cars in Norway. We tweeted [LINK] "5/7. In Norway, EVs are 2nd or 3rd cars! 03/25 Equinor explains why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness [LINK] #OOTT." (vi) Absent governments mandating ICE vehicles get junked, the other key factor is that ICE vehicles are lasting longer. We tweeted [LINK] "6/7. A concept everyone has experienced - ICE vehicles are lasting longer. 03/31. @BloombergNEF. at least in China, ICE vehicles retirements are at a very low level even in the face of increasing EV and ICE sales. #OOTT." (vii) It is important to remember that the IEA forecasting a 60% EV share of total car sales means a displacement of nearly 6 mmb/d in 2030 is not an IEA forecast that says its oil demand forecast will be reduced by 6 mmb/d. It's WEO Oct 2022 assumed EVs were 50% of total car sales in 2030 and didn't see peak oil demand until the mid 2030s. So the incremental 10% EV sales penetration, by itself, isn't likely to move its peak oil demand closer by very much. Our last tweet [LINK] "7/7. #Oil Bears and western leaders will love @IEA EVs headlines on increasing EV sales and oil displacement. #Oil Bulls (Saudi Arabia) will love the IEA report and think this won't have much impact on @IEA forecast for peak oil demand around 103 mmbd in mid 2030s. #OOTT." (viii) EVs are having an impact on oil and energy, but it isn't a one-for-one replacement. Plus we wonder if it's just additive on an "energy" basis in what it does to the demand for natural gas and other forms of reliable electricity to power the new EV ecosystem."

Figure 60: Oil displacement by region and mode, 2022-2030



Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario; LDV = light-duty vehicle. Oil displacement based on internal combustion engine (ICE) vehicle fuel consumption to cover the same mileage as the EV fleet.

Source: IEA

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

Here is what we wrote in our March 26, 2023 Energy Tidbits memo. "*The Equinor Chief Economist Wareness comment to the FT also supported the above item on how Norwegians aren't using their EVs as much as would be expected given the massive penetration of new car sales over the past several years. Yesterday, we tweeted [LINK] "Here's why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness. many other reality check energy transition views in his @FT interview [LINK] #OOTT." Waerness says that Norwegians really have bought EVs as their 2nd or 3rd cars and not the principal car. Whereas historically car buyers buy new cars as a principal car other than the wealthy who have more than a couple cars. The FT wrote "Norway's experience with electric vehicles provides an example, Wærness suggested. Subsidies to buy battery-powered cars had rapidly increased their number, and Norway has been repeatedly cited as an example of how quickly customers could switch to EVs. But the overall car fleet had swollen too, Wærness said. "We've kept a lot of the diesel cars and gasoline cars, and we've added EVs, and it took 10 years before gasoline demand went down," he said. "We've bought an EV instead of taking the bus, or it becomes the second or the third car."*

Energy Transition – IATA Sustainable Aviation Fuel has a challenging, long road ahead

Challenging road for SAF

It didn't get much attention in all the IATA and airline CEO comments coming out of the IATA AGM but, we couldn't help note the data and forecasts for Sustainable Aviation Fuel (SAF) penetration of total jet fuel to 2030. It reinforces that it will take a lot longer than expected to decarbonize the airline industry ie. this part of the energy transition will take a very long time. (i) On Tuesday, we tweeted [LINK] "*Challenge and will take a very long time to decarbonize airline industry. @IATA Sustainable Aviation Fuel update. SAF to provide 62% of carbon mitigation by 2050. SAF tripled in 2022, BUT only to 0.1% of jet fuel use. IATA says SAF of*

24 mm tonnes in 2030 IF 30% of renewable fuel production. achieving 30% "is not a given". 24 mm is 9.4% of 2022 jet fuel consumption. #OOTT". (ii) On Tuesday, the IATA (International Air Transport Association) issued a press release and provided a slide deck at its AGM on the outlook for Sustainable Aviation Fuel. (iii) It's a good example of the challenge for a hard to decarbonize airline industry. IATA said SAF is being counted on to provide 62% of the airline industry's carbon mitigation goals for 2050. (iv) As a reminder, SAF is one of the renewable energy fuels along with items like renewable diesel and naptha. (v) SAF is on a huge rate of growth, but that is basically from zero. SAF tripled in 2022 but IATA highlights that was to 0.1% of total jet fuel consumption. The IATA says SAF "*output set to rise exponentially again in 2023*". (vi) For growth to 2030, the IATA says "*If renewable energy production reaches 69 billion liters by 2028 as estimated, the trajectory to 100 billion liters (80 million tonnes) by 2030 would be on track. If just 30% of that produced SAF, the industry could achieve 30 billion liters (24 million tonnes) of SAF production by 2030*." IF SAF gets to 24 million tonnes, that would equal to 9.4% of 2022 jet fuel consumption of 256 million tonnes. That is 2022 levels and does not assume the expected continued growth in jet fuel consumption to 2030. So the actual percentage should be significantly less than 9.4%. (vii) Note the IATA has a big qualifier on this forecast to 2030 and highlights their assumption that SAF is 30% of total renewable fuel generation is not guaranteed. The IATA wrote "*Achieving the necessary SAF percentage output from these new and expanding facilities is not a given. But with governments the world-over agreeing at ICAO to a long-term aspirational goal (LTAG) of net zero by 2050, they now share accountability for aviation's decarbonization*." (viii) The Energy Transition is happening including the decarbonization of the airline industry, but the reality is that both will take a lot longer, cost a lot more and be a bumpy/rocky road. We have highlighted this theme for years as it means energy markets will not change as quickly as the aspirations and that means there will a much longer need for oil and natural gas. Our Supplemental Documents package includes the IATA press release and excerpts from the IATA slide deck.

Figure 61: Recap of Sustainable Aviation Fuel Share of Total Jet Fuel

Source: IATA

Energy Transition – Exxon, if cut LNG to meet Scope 3, then coal will fill the gap

Exxon on Scope 3 emissionsrs

Exxon CEO Darren Woods was on Norges Bank Invsestment Management CEO Nicolai Tangen's Podcast on June 7, 2023. [LINK]. Norges Bank is the investment manager for

Norway's wealth fund. There was a lot in this interview. One of the headlines from Woods comments was his warning that if Exxon were to cut LNG shipments to Asia, it would be replaced by col ie. more coal will be consumed if Exxon focused on Scope 3 emissions. On Wednesday, we tweeted [LINK] "*Common sense! #Exxon CEO, LNG to Asia is absolutely critical to backing out coal & reducing the world's emissions. But if Exxon focused on reducing Scope 3 by less #LNG, it would mean more #Coal & related emissions in Asia. Great interview Darren Woods, Nicolai Tangen #OOTT."* We created a transcript of Woods comments. *I*tems in "*italics*" are SAF Group created transcript. At 25:00 min mark, Woods ".. *I will give you an example of some of the unintended consequences associated with Scope 3 targets for a company like ExxonMobil. We produce LNG, liquefied natural gas. For every ton of natural gas that we produce and ship typically to Asia, we back out coal and therefore we reduce emissions. So growing our LNG business today, certainly in the medium term, short to medium term, is absolutely critical to backing out coal and reducing the world's emissions while we're working on these other solutions sets, while we're working on the transition. If I have a Scope 3 target, every ton of LNG I produce is more Scope 3 emissions for me as a company. So if I want to meet my objectives of reducing Scope 3, I stop growing LNG and the world burns more coal. That's not a good answer for society."*

Exxon CEO, EU's stick approach just shifts emissions to other jurisdictions

Exxon CEO Woods also talked about the same above concept but from what has been happening in Europe on how Europe's policies are not changing the demand for products, but forcing industry to other countries ie. shifting the emissions to other jurisdictions. And all this does is shift emissions but drives prices up. We created a transcript of Woods comments on this point. Items in "*italics*" are SAF Group created transcript. At 29:15 min mark, Woods "…. *the other thing they're [Europe] is doing is penalizing companies or taxing them so it's more of a stick approach. One of the issues there, frankly, is you start to drive industry out of the economy. So it has significant consequences associated with that, with penalizing companies for the emissions associated with making products that society still needs. Way too much emphasis on the supply side of the equation, not enough on the demand side of the equation. So as long as society continues to demand products, supply is going to come from somewhere. Taking it out of Europe and penalizing European companies or companies that are located in Europe for making those products, just shifts that to some other jurisdiction. But ultimately, as long as the demand is sustained, prices go up but consumers, society continue to use those products because, today, we don't have good alternatives*. "

Energy Transition – Exxon, buyers aren't stepping up for lower carbon products

Exxon on lower carbon products

Exxon CEO Darren Woods was another to highlight the big challenge to growing lower carbon products like hydrogen – there aren't buyers stepping up for these products or as Woods says, there isn't a market. The problem for the energy transition is that lower carbon suppliers need buyers to commit fro long term supply for the suppliers to step up with major capital investment to build/develop the lower carbon products on a commercial scale. Woods made this point on the Norges Bank Investment Management CEO Nicolai Tangen Podcast on June 7, 2023. [LINK]. On Wednesday, we tweeted [LINK] "*Need markets/buyers to drive lower carbon products like hydrogen. government cannot subsidize this business in perpetuity" "there are very few companies who are willing to pay for lower carbon intense"*

products ie. no market force driving things. #Exxon CEO Woods. Fits 👇05/23/23 tweet, Saudi can't find blue hydrogen buyers. #Oil #NatGas will be needed for longer. Great interview @XOM Darren Woods, Norges Bank Nikolai Tangen! #OOTT." Our tweet included the transcript we made of Woods' comments. Items in "*italics*" are SAF Group created transcript. Reminding buyers aren't willing to pay for lower carbon products. At 19:15 min mark, Woods "…. *There really is no market today for carbon reduction. There are very few companies who are willing to pay for lower carbon intense and so there is not a market force that is driving things. And the technology, as I said in most cases, remains high, the cost is high. So we got to work on bringing that down. Frankly, the policies put in place today are incentivizing some of those investments. And the way I look at that is it's a good catalyst to get us started. We've got to find on this path and start down the road But ultimately, a market is going to have to develop. The government cannot subsidize this business in perpetuity. It can act to accelerate it, it can catalyze it, the needed investments, it can start industries down this technology curve to get us going. But ultimately, markets are going to have to develop.*"

Today Saudi Energy Minister offtakers aren't stepping up to buy hydrogen

Today is day 1of the Arab-China Business Conference in Riyadh and Saudi Arabia Energy Minister Abdulaziz once again reminded of the problem holding back scaling up hydrogen – there aren't buyers. Earlier this morning, we tweeted [LINK] "*Reality Check holding back #Hydrogen at scale.Just now Saudi Energy Minister Abdulaziz "people talk a lot about hydrogen. But, again, i would stress where are the incentives that will make the offtaker commit to the offtake" #OOTT #EnergyTransition."*

05/23/23. No EU, Japan, Korea off-takers stepping up for Saudi blue hydrogen

Hereis what we wrote in our May 28, 2023 Energy Tidbits memo. "No one should be surprised to have seen Saudi Energy Minister Abdulaziz's comments on Monday that there haven't been any European, Japanese or Korea buyers willing to step up to be a long-term off-taker for a blue hydrogen development. And the problem is that, with the huge relative cost to produce hydrogen, it needs long-term off-taker commitments for the hydrogen supplier, in this case Saudi Arabia, step up with the billions of dollars of investment needed to get a commercial project. Early Monday morning, we tweeted [LINK] "Hydrogen, the fuel of the future, can't take off until there are buyers. Saudi Energy Minister Abdulaziz "who is going to be the off-taker?" no clear policies for off-taker to step up & pay the price needed for producer to develop the #hydrogen.no surprise, see 👇05/10/23 tweet, #SaudiAramco CEO said #BlueHydrogen cost $250/boe & can't identify EU, Japan, Korea customers to step up. #EnergyTransition is happening but will take way, way longer than aspirations. #NatGas #LNG will be needed for a very long time. #OOTT, Our tweet included a transcript we made of Saudi Energy Minister Abdulaziz comments at the Qatar Economic Forum on May 23, 2023. [LINK] Items in "italics" are SAF Group created transcript. At 40:00 min mark, Abdulaziz "… including by the way hydrogen. People talk about hydrogen as the fuel of the future. I ask you who is going to be the off-taker. And where is the price for hydrogen today? We go around, you go around talking about blue, green, purple, pink hydrogen but, in the final analysis, who is going to be the off-taker, what would be the price of hydrogen. We're not talking oil. We're not talking gas. We're talking about THE so-called cleanest of cleanest future

fuel of the future. And yet you don't have the off-takers. But again there are no clear policies for the off-taker to say I have been given an incentives package that will enable me to buy that hydrogen, even green hydrogen for that price for producers to produce it. If this is happening to hydrogen . And what we saw in Europe in terms of power, last autumn, rescued by a gift of god that winter was not as cold as was projected. How in earth one can envisage an energy future with all this uncertainty and, more important, with all these big questions that are not being answered,"

05/10/23 Aramco CEO, can't get off-take as blue hydrogen cost ~$250/boe

Here is what we wrote in our May 14, 2023 Energy Tidbits on Saudi Aramco CEO saying they can't get off-take as blue hydrogen costs ~$250/boe. *We continue to believe that one of the key assumed parts of the energy transition, hydrogen, will take way longer than the aspirations. There will be small deals, but the challenge for the needed big anchor deals is that hydrogen is very expensive. There is no question that Saudi Aramco has been trying to do long term Blue Hydrogen supply deals, but Saudi Aramco CEO Nasser also gave a reality check why that hasn't happened – Blue Hydrogen is too expensive at a cost of $250/boe/d. That's a huge premium and why Saudi Aramco hasn't been able to get a major long term capital commitment to get the needed anchor deals. No one should be surprised to hear that, and we actually thought the cost might be higher. On Wednesday, we tweeted [LINK] "#NatGas #LNG will be needed for a very long time. #SaudiAramco CEO, #BlueHydrogen cost ~$250/boe! "very difficult to identify any off-take agreement in EU" "Even the customers in Japan and Korea are waiting for government incentives ...." Thx @MattMartin128 @faaj22 #OOTT." Nasser made his comments in the Q&A of the Aramco Q1 call on Wed. Our tweet included the Bloomberg report, which was consistent with the Q1 call transcript that wasn't public until Thursday night. Here is what Bloomberg wrote "Yet existing technology means blue hydrogen could cost the equivalent of around $250 a barrel of oil, Aramco's chief executive officer said on Tuesday. "It is very difficult to identify any off-take agreement in Europe" for blue hydrogen, Amin Nasser said on a call with analysts on Tuesday. "Even the customers in Japan and Korea are waiting for government incentives. Until they get these incentives, it'll be costly for them to pursue that blue hydrogen." The company won't make a final investment decision to build hydrogen export facilities without first signing supply deals, he said. It's so far sent test shipments in the form of ammonia to South Korea and Japan. "This is a very expensive program," Nasser said. "It's a lot of capital and you need customers. So we will not sanction a project without securing an off-take agreement." Our Supplemental Documents package includes the Bloomberg report."*

01/08/23, Norway minister, hydrogen light years away from being reasonable

In January, Norway came out with very blunt comments that hydrogen is "light years away from being justifiable of reasonable". Here is what we wrote in our Jan 15, 2023 Energy Tidbits memo. "*Earlier this morning, we tweeted [LINK] on Norway cabinet minister Moe's common sense approach as to why hydrogen is "light years away from being justifiable or reasonable". Moe said "And we must have a proven relationship with simple factors such as resource efficiency and effectiveness". He just wants to go with the economics as known. We also earlier tweeted [LINK]*

"Inmate escaping or crazyman? See 👇Norway cabinet minister Moe 01/08 posting. Hydrogen has large energy losses at both ends of the process, "in my opinion, light years away from being justifiable or reasonable". Energy will be $$$$ in the #EnergyTransition. #OOTT #NatGas ." Our tweet referenced a Facebook Jan 8 posting by Norway cabinet minister Moe. Moe is currently Minister of Research and Higher Learning, but was previously Minister of Petroleum and Energy from 2011 to 2013. Moe went thru his analysis of the energy losses in hydrogen and why he says "It is, in my opinion, light years away from being justifiable or reasonable." Here is his math on why hydrogen doesn't' make sense. This is from Google Translate "Hydrogen is certainly good for many things, but the fact is that it is a highly explosive storage medium with large energy losses at both ends of the process. If you use 100 kwh of electricity to produce hydrogen, you will be left with an amount of energy in hydrogen corresponding to 50 kwh. In other words, half of the energy is lost. If you are going to use this hydrogen in a fuel cell, you lose a further 50%. If you run it in a turbine to produce electricity, you lose 70%. In other words, you get a utilization rate in a car of about 25% or 25 kwh of the original 100 kwh due to energy loss in the processes. In a simple turbine, the loss is even greater. Alternatively, this current/energy could have been used directly all the time it is taken from the grid in Norway with a utilization rate for, for example, heating, production or transport of 90-100%! If Statkraft together with NEL succeeds in establishing 2 gw electrolysis of hydrogen in Norway, this corresponds to an energy quantity of approximately 17.5 twh, or approximately 12-13% of all power production in Norway." Our Supplemental Documents package includes Moe's Facebook posting and the Google Translate thereof."

Energy Transition – Oher energy transition themes from Exxon CEO Woods interview

There was a lot to unpack on other Energy Transition themes from Exxon CEO Darren Woods interview with Norges Bank CEO Nicolai Tangen. The reason why we note these other themes is that they are relevant to some of the upcoming discussions on energy transition items like COP28, wind/solar returns, etc.

Exxon CEO on Energy Transition

Exxon reminds the problem to solve is to reduce/eliminate emissions

We call this a COP28 item because Exxon CEO Woods highlighting what the problem to solve for climate change is to reduce/eliminate emissions is really the way UAE is trying to shape the focus for COP28. This will inevitably be the attempted focus or theme for COP28 - reminding the problem to solve is to reduce/eliminate emissions. And the starting problem isn't to eliminate oil and gas. Here is the transcript we created of Woods comment on this reminder. Items in "*italics*" are SAF Group created transcript. Reminding the problem is reducing or eliminating emissions. At 16:40 min mark, Woods *"… just step back a moment and think about it. Does it make sense. At the end of the day, the issue we are trying to deal with are emissions and the reduction of emissions. People have taken a shortcut. And there's been a narrative that's been progressed that says what that means is you got to get rid of oil and gas. That may be true in some applications. But if you can preserve the infrastructure, the industrial processes that we have today and reduce the emissions or eliminate the emissions, that's a much lower cost solution for society. I think the challenge here is stay focused on the problem statement, which is reduction of*

emissions and elimination of emissions. How do you do that. Like I said, in some cases, that means eliminating the combustion of oil and gas or oil products. In other cases, it may mean eliminating the emissions associated with that combustion. We're kind of agnostic as to which way it goes. We're just looking for what makes the most economic sense. What's the lowest cost for society. How do you continue to meet these other needs, the benefits that today people are enjoying while eliminating the cost. And that's where our focus has been on."

Exxon, any transition has to continue to meet the other needs of society

This is another COP28 theme that UAE will be wanting to be front and center at COP28 – any energy transition has to be able to meet the current needs of society for available, affordable and reliable energy. Exxon CEO Woods reminds that meeting these other needs of society can't be forgotten in the energy transition. We created a transcript of Woods comments. Items in "*italics*" are SAF Group created transcript. At 9:45 min mark, *Woods "well, I think the challenge here is we focus on the point around climate change, and emissions and the costs associated with the use of today's energy system and the emissions associated with it. You got to at the same time though as you're thinking about how things are going to change be very cognizant of the benefits and recognizing the benefits it's providing to society. And as you move to change the energy system and reduce emissions, you got to at the same time think about how do you continue to meet the other needs of society. So it is a multi-dimensioned a lot of give and takes. And the challenge that we have is finding alternatives that have the same utility, the same affordability, the same availability. That's been the challenge here. And I think if you look at then the cost of that transition and society's ability to bear that cost, that's been a huge challenge here. And I think we will continue make progress but it won't be at the rate and pace that society's objectives reflect.*" This is the same concept as UAE's Al Jaber, the President for COP28 said on May 2. Our May 7, 2023 Energy Tidbits quoted Jaber highlighting the need for a pragmatic energy transition. Jaber said "*And on that point, let me say this and let me be perfectly clear. In a pragmatic, just and well-managed energy transition, we must be laser focused on phasing out fossil fuel emissions, while phasing up and scaling up viable, affordable, zero carbon alternatives."*

Exxon, shouldn't focus on a solution (ie solar, wind) & give up returns

Exxon CEO Woods also tried to highlight something that is often overlooked – shouldn't just focus on the solution at the cost of returns. This is what we have seen in the backtracking of BP and Shell in 2023, where they have moved away from just picking a solution (wind and solar) that don't generate competitive returns within their allocation of capital. Instead of identifying the solution of wind and solar, the objective should be to find the solution to the problem of reducing/eliminating emissions and then come up with solutions. Woods was diplomatic in not criticizing BP and Shell or others who have found wind/solar returns aren't competing when asked if he was surprised by the low returns his competitors are accepting on wind and solar. Here is our transcript of Woods comments. Items in "*italics*" are SAF Group created transcript. At 14:50 min mark, Tangen "*are you surprised by the low returns that some of your competitors are accepting on some of their projects on wind and solar?".* Woods "*I think what we're challenging ourselves on is if we bring a*

real advantage to this space, then we ought to be able to generate above average industry leading returns. And that's the criteria that we are using. And if we can't do that, then it says to me you are not bringing a unique valuable advantage to this space and therefore you have to look for other areas. So that's the standard we hold ourselves to. We don't have to focus on a solution and give up returns, or focus on returns and give up a solution. We can do both of these things. The projects that we are pursing are allowing us to do both – to generate solutions, invest in solutions and generate returns. "

Energy Transition – Shell CEO to lay out his priorities on Wed

Shell Capital Markets Day

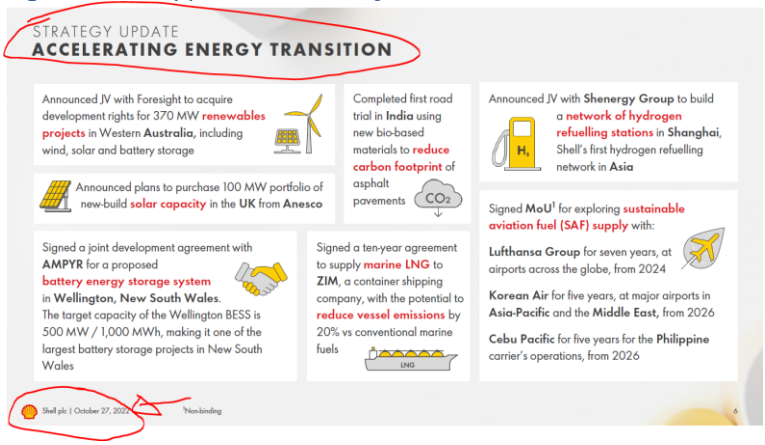
One of the big oil and gas events this week will be Shell Capital Markets Day on Wednesday June 14. Everyone expects CEO Sawan to lay out his shift in priorities as Shell moves to towards its energy transition goals. Sawan has been clearly signaling a shift since his first major public comments after taking over as CEO in January. No one should be surprised. It's not just an increased priority on oil, natural gas and LNG, it's also like hw has been saying, renewables have to have competitive returns ie. they will be sounding more like Exxon. On Friday, Reuters reported [LINK] "*Exclusive: Shell pivots back to oil to win over investors*" and "*Shell (SHEL.L) will keep oil output steady or slightly higher into 2030 as part of CEO Wael Sawan's efforts to regain investor confidence as the energy giant wrestles with poor returns from renewables while oil and gas profits are booming, company sources said. Sawan will announce at an investor event next week the scrapping of a target to reduce oil output by 1% to 2% per year having already largely reached its goal for production cuts, mainly through selling oil assets such as its U.S. shale business, the three sources said. Sawan, who took the helm in January with a vow to improve Shell's performance as its shares lag rivals, said oil and gas will remain central to Shell for years to come, insisting that efforts to shift to low-carbon businesses cannot come at the expense of profits.His more cautious approach to the energy transition marks a change in tack from his predecessor Ben van Beurden who introduced the carbon reduction targets and the energy transition strategy."* Our Supplemental Documents package includes the Reuters report.

02/02/23: Shell highlights upstream downplays energy transition

As we said above, no one should be surprised by Sawan's changing priorities. We have noted his changes on multiple times in our Energy Tidbits memos starting with his first major public comments after taking over as CEO. Here is what we wrote in our Feb 5, 2023 Energy Tidbits memo. "*European supermajors went all-in on the energy transition and push to renewables so they can't ever say they are backing away from their energy transition priorities. But, we are seeing is that they are having to down play or slow play the energy transition due to the renewable returns. They just can't say it directly. Shell 's Q4 results and call is a great example. (i) Downplaying renewables. They removed their key slide on accelerating the energy transition and added a new slide on investing purposefully in energy transition. We had hoped some analyst might ask a bit of a cheeky comment in asking how were you investing before? Shell posted the Q4 slides ahead of the Q4 call. No surprise, there were differences vs the Q3 calls slide deck. We tweeted [LINK] " 👇 @Shell Q3 v Q4 slides point to #EnergyTransition reality check. Q3/22 slide dropped "Accelerating Energy Transition". New Q4/22 slide "Investing purposefully in energy transition". looks like 02/01 tweet on @bp_plc. Positive for #natgas. #OOTT." (ii)*

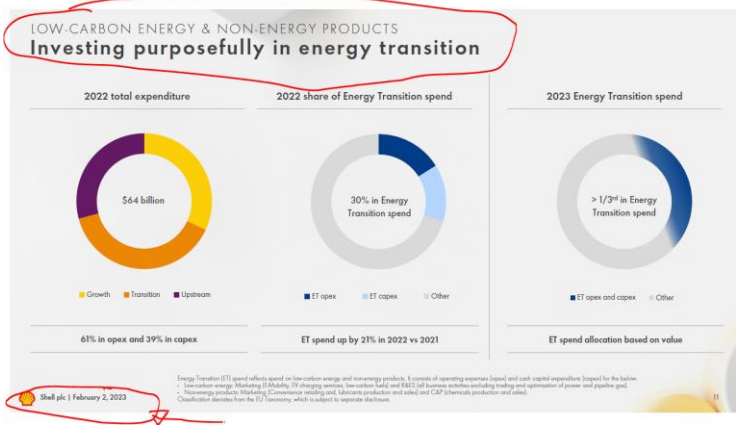
Highlighting oil and gas. It's bad for the climate change side that Shell down plays the energy transition, but then they have to see Shell highlight its "excellent upstream business" and also tell markets they are looking to add more crude oil production. Prior to the Q4 call, CEO Sawan made the media rounds including with CNBC that clearly indicated, without using the word core business" that upstream oil and gas, LNG and marketing were the cornerstones for Shell and these three businesses will provide for Shell's hope to help customers on their "journey" to decarbonize. We tweeted [LINK] "See 👇transcript why @Shell CEO Sawan thinks they can be the winner in #EnergyTransition. "excellent upstream business, a world leading #LNG business & an unparalleled marketing business. And on the back of that .... " Positive for 2020s #NatGas #LNG Thx @steve_sedgwick #OOTT." Here is the transcript we created of Sawan's full comment "as we look ahead, I think we have a unique opportunity to be able to succeed as the winner in the energy transition. We have a portfolio that I think is second to none. We have an excellent upstream business, a world leading LNG business and an unparalleled marketing business. And on the back of that, we hope to be able to support our customers on the journey to decarbonization and towards net zero. My focus will be very much around performance and capital discipline." (iii) Will be highlighting upstream in the June Capital Markets Day. Sawan's closing comment before the Q&A was "As we look into the future, longevity of Upstream and our Upstream resource is a key focus area for me and for Sinead, that's going to be something we focus on. More on exactly how that looks, I think is better discussed in our Capital Markets Day in June 2023 but longevity is a core part of our focus.." (iv) Will add more crude oil production. We think one of the surprises from the Q4 Q&A were Sawan's comments about adding oil production. In the Q&A, Sawan said "Absolutely. You've heard me say earlier as well, we will continue to look at how do we have longevity in our oil business," Then later in the Q&A, Sawan said "Thanks, Sinead. I'll answer to the question around longevity. We will go after the most attractive projects that's come our way. We don't have any specific restriction where we're not going to go into oil or into gas. Clearly, we think we have more gas opportunities at the moment because we're able to add a lot of value. So yes, we are looking at growing our production and gas and you can see it through our efforts on Integrated Gas, for example, what we did last year. On oil, what we're looking to do is to have a -- just a -- lot -- a much longer period of ability to be able to produce our oil profitably. Simply given where the world is, we continue to believe that oil has a role to play. A big part of what we announced a few years ago was how are we going to be able to move to actually prune the portfolio to high grade what we have as an Upstream business. I think we have done a lot of that, and therefore, what you see right now is a lot more strength and stability in that business, and I'd like to extend that strength and stability into the coming years."

Figure 62: Dropped slide from Q3/22 call slide deck on Oct 27, 2022



Source: Shell

Figure 63: New slide in Q4/22 call slide deck on Feb 2, 2023



Source: Shell

AI & Automation – Exxon CEO, can high grade the things they ask people to do

AI & Automation to hit Exxon workforce

There is no change to our view on AI and Automation. We are big believes that AI and Automation is a game changer. We find it both fascinating and scary when we see talks on AI's potential. But from a more simplistic cause and effect on companies, AI and Automation should cause huge job losses from current way businesses and governments do business. And the impact will be soon and felt across a wide range of professions. We wonder if any politician will ever jump board for AI to redo the government bureaucracy? Exxon CEO Darren Woods was also asked about AI in his interview with Norges Bank CEO Nicolai Tangen. Woods doesn't say it bluntly, but he sees it eliminating the need for junior people to do info, data and analysis. Rather Woods says it will allow Exxon to high grade the work they ask people to do ie. AI and Automation will take care of the lower tasks. Here is the transcript we created of Woods comments on AI and Automation. Items in "*italics*" are SAF Group

created transcript. On how AI will change Exxon, at 35:15 min mark, Woods "…. *It's gonna have a profound impact I think on the world in all industries including ourselves. at the heart of things, as I mentioned before, we are a technology company. and I think using AI and applying it to our business in the different technical aspects that we do is going to have huge benefits. I think fundamentally the advances in AI are going to allow us to high grade the work that we ask our folks to do. A lot of things, we can now automate*" Tangen "*when you say high grade, you mean do less boring stuff?"* Woods "*yeah, and frees our people up to do the higher value, more intellectually challenging opportunity sets and improve.*

> **"AI will change everything, but it's not clear how everything will change"**
> Here is our unchanged view on AI and Automation. When we speak with investors, management and boards on AI and Automation, we will say how we are both fascinated and scared by what seems to be the potential for AI and Automation. As noted, the straightforward impact will be job losses. But that is just a small part of the huge potential impact that we doubt anyone can predict in full. Our way of describing the impact is that "AI will change everything but it's not clear how everything will change". We haven't seen this impact description elsewhere so, at least for now, it is our quote.

Capital Markets – Not many changes in quarterly review of TSX Composite Index

TSX Composite Index changes

It was one of the quarters with as few changes as we can remember in the quarterly review of the TSX Composite Index. Last Friday (June 2), the S&P Dow Jones Indices announced the results of its quarterly review of the S&P/TSX Composite Index. [LINK] The changes take place prior to the open of trading on Monday June 19. The only changes announced were the deletion from the S&P/TSX Composite Index of Converge Technology Solutions Corp, RB Global Inc, and Canopy Growth Corporation.

Capital Markets – Blackstone CEO Schwarzman on what's common on his best deals

Blackstone CEO Schwarzman

When we listened to the Exxon CEO podcast with Norges Ban k CEO TangenIt, we saw Tangen's other recent podcast guests and noted one was Blackstone CEO Stephen Schwarzman on April 28. Schwarzman was aske if there was any common item in his best deals – they seem logical to say yes to ie. not trying to squeezer a square peg in a round hole. We tweeted [LINK] "*Here's a key to great capital allocation over decades, @Blackstone CEO Schwarzman re what's common on his best deals. "they're the easiest ones to say Yes to" "the most successful deals .... just seem completely logical at the time you do them. And that's usually how they work out" "the more meetings you have to have on something, I found that the outcomes can be good, but they're seldom great" #OOTT."* We created a transcript of the comments by Blackstone Founder and CEO Stephen Schwarzman on Norges Bank Investment Management CEO Nicolai Tangen's Podcast on April 25, 2023 [LINK]. Items in "*italics*" are SAF Group created transcript. At 10:05 min mark, Tangen "*when you look at your best deals, have they got something in common*?" Schwarzman "*Yes. They're the easiest ones to say Yes to."* Tangen "*what does that mean*?" Schwarzman "*That means, in every organization that commits capital, you always end up with a thick memo that goes to an investment committee. It gets debated and the most successful deals require the least debate, have the least controversy, they just seem completely logical at the time you do them. And that's usually how they work out. The more meetings you have to have on something, I found that the outcomes can be good, but they're seldom great. And some of*

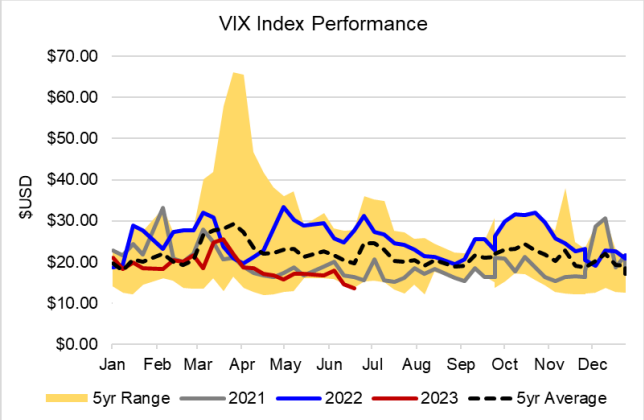
those investments sometimes become ultimately uninteresting. So that's one thing I've learned."

VIX seasonality?

Capital Markets – Are there seasonal impacts on the VIX?

Unless there is some other big event such as World Cup, we will have the business news on in the background pre and when markets are open. We heard a PM say that he won't be surprised to see the VIX stay low as this is a seasonal low period for the VIX. We hadn't looked at a seasonal pattern to the VIX. Rather we have always looked as the VIX being driven by events and the big factor, quarterly reporting time. And we still think that is the case. However, we created the below graph of the VIX and can kind of rationalize some reasons for a seasonal impact in the summer and the beginning of Dec. Going back to the dealing with buyside for ~15 years, there were a few clear periods of lesser and more PM trading activity. Keep in mind this the underlying seasonal trend and events would take precedence and increase trading. No question though that more PMs would be less active in the summer and that would bring an inevitable get back it for trading after Labor Day. And the other normal seasonal period was early December when PMs would be more active for their year-end positioning and lower activity from mid Dec thru New Year. Is there some seasonality to the VIX if there is some seasonality to investor activity?

Figure 64: VIX index



Source: Bloomberg

Russia's shrinking population

Demographics – Russia population continues its post 2019 decline

We don't know how Rosstat accounts for Ukraine war deaths but, on Friday, they reported population stats for YTD April 2023 [LINK]. No surprise, Russia's population continues to decline, continuing a trend seen since 2019. Rosstat is the official Russian statistics. For April, there were 96,131 births and 135,915 deaths for net decline of 39,784. For YTD April 30, there were 407,188 births vs 595,693 deaths for net decline of 188,505 people. We would have expected a larger net decline if all the war casualties were included. Our Supplemental Documents package includes the Google Translate of the Rosstat release.

Pre-Ukraine, Putin's greatest concern was Russia's shrinking population

Here is an item from our Dec 26, 2021 Energy Tidbits memo. "*Putin's big press conference comments on Russia's population reminded us of an item we forgot to include in our Dec 5, 2021 Energy Tidbits – Putin's greatest concern is the shrinking Russia population. This week, Putin noted "There are issues that cannot but cause concern, including life expectancy, which has slightly decreased from 71.5 to 70.1 years." The item we forgot to include was Putin's comments at the "Russia Calling! Investment Forum" on Nov 30. [LINK]. Putin was asked "What keeps you awake at night?" In the sense, "What is your greatest concern?". Putin responds "We have domestic issues typical of Russia, primarily demographic problems. We had two natural declines in our demographic development: during World War II or the Great Patriotic War, as we call it, in 1943–1944, and in the early and middle 1990s after the collapse of the Soviet Union. There was an equal drop in the birth rate. It was the lowest in 1999 – I believe a little over 1,200,000. In 2006, we already had almost two million births – more than 1,900,000. This problem has acquired a systemic and economic character due to the shortage of workforce in the labour market. We have a little over 80 million there and our losses amount to 1.1–1.2 percent a year. In this context, demographics is one of our main problems both for humanitarian and economic considerations, and because we need to strengthen our statehood as well. I will not enumerate all the measures and instruments we are using and intend to continue using in the future in order to tackle this problem. In general, we managed to get things moving in the recent past. Overall, we understand what we can do and know how to do it."*

Demographics – Blackstone's Schwarzman's advice to young people

Find something you love

The last question to Blackstone CEO Schwarzman on the Norges Bank podcast was what kind of advice would you give them to the young people today? It was find something you love. Simple but true. Think about people you know who never found something they love to do so their job was always just work for these people. And if it was just work, then it was inevitably a grind day after day. We created a transcript of Schwarzman's full answer. Items in *"italics*" are SAF Group created transcript. At 34:50 min mark, Tangen "*.. what kind of advice would you give them, to the young people today*?" Schwarzman "*You should recognize that you are only going to be really good at something that you really love. When you enter the grown up world, there's all kinds of different jobs to take, some are very prestigious, some aren't. You can start with a prestigious job to gain foundational skills. But you have to end up doing something that you love. Because if you just sort of like what you do, then it is work. If you do something where you have the aptitude and the care and the excitement what you're working on, it's not work. it just becomes you. And that's when you can do some extraordinary things. So it's really about finding a match between something you don't know, which is the outside world, and yourself, which you increasingly learn more about as you get older."*

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.

Wouldn't it be great if Nick Taylor or Corey Connors go realy low today?

It was good day have golf on in the background especially to watch Cdn golf Nick Taylor shoot tournament low 63 to move to -11 and be T8 going into the final round. The leader C.T. Pan is -14, then six are tied at -1, including defending champ Rory McIlroy. Corey Connors is alone in 10th at -10.The final round of the Canadian Open is tomorrow and the last Canadian to win our national championship was Pat Fletcher in 1954. It's not impossible but it will be tough.

Golf club shopping isn't very easy anymore

Went out this week for buy some new golf clubs as mine are probably a couple years pre Covid. Figured I would check them all out and, while doing so, inevitably a salesperson sees you picking up a driver, and will come over and ask if you need some help. But that's the old days. I learned that the woods are all locked up. The irons are all locked up except for the 7-iron that has the alarm device. So you now need a salesperson to come over and to unlock them before you can pick one up. The challenge becomes that salespeople get tied up with people who might be there just to browse and it's tough to get the clubs unlocked. The cashier says have to wait for a salesperson and they had to do this because of theft. One example she gave was that people have been unscrewing the heads of the woods to walk out with them and not set off the alarm. Some just walkout and dare people to stop them. It just means if you want to look for clubs, you may not be able to have someone to unlock them. But it's probably just as well as one of the guys at the Palmilla Golf Club reminds me "it's not the arrow, it's the Indian".

Figure 65: Shopping for golf clubs in the old days


Source: Golftown

Shock move, Lionel Messi` joining Inter Miami in MLS

There was a huge shock in the football (soccer) world on Wednesday with the reports that Lionel Messi isn't going to finish his career at Barcelona or make a move to play in Saudi Arabia. Rather Messi informed that he was joining Inter Miami in the MLS. He said that they were still working on final details. But even though Messi is near the end of his career, getting who many consider the best footballer of the last decade is a huge coup for Inter Milan and the MLS. Jonathan Ferro of Bloomberg Surveillance is a huge football fan and we couldn't help tweet his comments on the Messi move. On Thursday, we tweeted [LINK] "*When people are the best in their sport or profession, you know it right away! @FerroTV on Messi - Sometimes Tom players burst on a team, they get the ball, they're scared of it & they pass it back immediately. This guy was nothing like that. you knew almost immediately he was special. Pick your generation & sport! ie for boomers @RealBobbyOrr @kaj33 @jacknicklaus."* It's true, when someone is special, it's obvious. We know everyone would name Tiger Woods and Michael Jordan, but we thought we would add some from the good old days – Bobby Orr, Kareem Abdul-Jabbar and Jack Nicklaus.

National Lobster Day is June 15

It's a good time of year in Canada to have National Lobster Day on June 15. For many, it means lobster with melted butter. But for man who grew up in places like New Brunswick, it means cold lobster. The interesting thing about lobster is that it has turned into what is considered a luxury food item. But in the 50's and 60s down east, it was more of a working class food that were in lunch boxes of the working class kids and not in the richer kids lunch boxes.

Bloomberg daily saying "*it is a bad plan that admits of no modification*"

We always like when we turn on our Bloomberg terminal and see their daily quote. And it isn't often that we see a quote that both sides of any issue can use to describe the other side's rigidness. On Wednesday, the daily quote was *"it is a bad plan that admits of no modification"* Publilius Syrus.