Energy Tidbits

May 21, 2023

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Oil Growth Challenge: Permian DUCs at Fall 2014 Levels, When Permian Oil was 1.67 mmb/d, 35% of 5.79 mmb/d in May 2023

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. Permian oil Drilled UnCompleted Wells are at Sept/Oct 2014 levels, when Permian oil production was 1.67 mmb/d or 35% of Permian May 2023 production of 5.79 mmb/d. (Click Here)

2. Macron says need to reindustrialize and "*we must not make new [Green] rule changes because we will lose all the players*." (Click Here)

3. G7 leaders elevate importance of energy security "*We commit to holistically addressing energy security, the climate crisis, and geopolitical risk."* (Click Here)

4. Should the IEA's very bullish H2/23 demand forecast be discounted? (Click Here)

5. US oil rigs were -11 WoW to 575 rigs & flat YoY, US frac spreads -11 WoW to 262 & -10% YoY. (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].

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Natural Gas – +99 bcf build in US gas storage; now 521 bcf YoY surplus

US gas storage 521 bcf YoY surplus

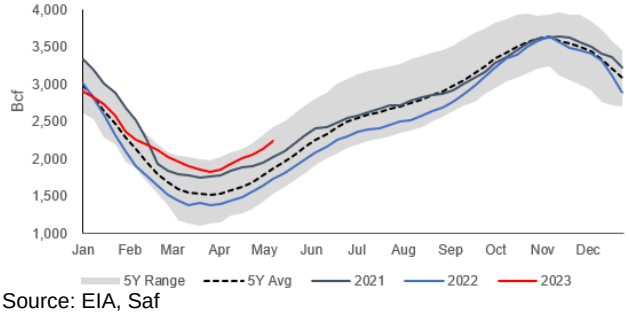
It's May so it's the normal natural gas injection season absent some unusual event. For the week of May 12, the EIA reported a +99 bcf build (under the expectations of a 108 bcf build), compared to the +89 bcf build reported for the week of May 13 last year. This is a slight increase from last week's build of +78 bcf, and the 5-year average build of +43 bcf. Total storage is now 2.240 tcf, representing a surplus of +521 bcf YoY compared to a surplus of +509 bcf last week and is +340 bcf above the 5-year average vs +332 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 (05/12/22)		5-year average (2018-22)	
Region	05/12/23	05/05/23	net change	implied flow	Bcf	% change	Bcf	% change
East	458	422	36	36	293	56.3	345	32.8
Midwest	520	497	23	23	361	44.0	402	29.4
Mountain	112	104	8	8	102	9.8	108	3.7
Pacific	127	114	13	13	186	-31.7	212	-40.1
South Central	1,023	1,002	21	21	776	31.8	833	22.8
Salt	290	287	3	3	250	16.0	266	9.0
Nonsalt	734	715	19	19	528	39.0	567	29.5
Total	2,240	2,141	99	99	1,719	30.3	1,900	17.9

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



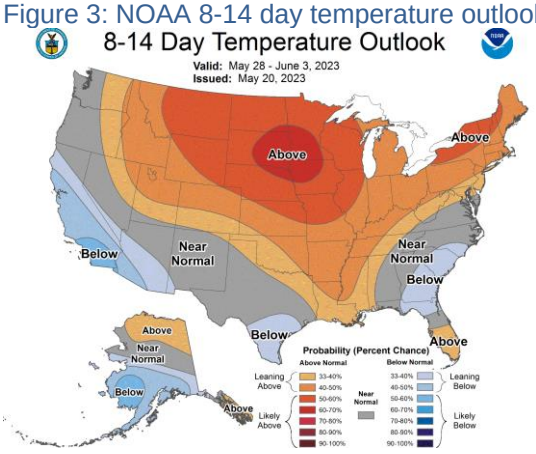
Source: EIA, Saf

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

NOAA 8-14 day outlook

We are now almost finished May and soon to move into the hotter summer temperatures. Sometimes there will be really hot temperatures in May that drive a good weather driven boost to natural gas demand. But so far in May, we haven't seen broad hot temperatures across all the US. NOAA posts daily an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [LINK] "*Updated @NOAA 8-14 day temperature outlook for May 28-June 3. Better WoW, but still not broad big driver for #NatGas demand. Above normal in Plains, Great Lakes, Mississippi Valley & NE US. Normal/below normal on West Coast, Texas, SE east coast. #OOTT.*" Yesterday's NOAA 8-14 day outlook [LINK] is valid for May 28-June 3, and calls for above normal temperatures in the Plains, Great Lakes, Mississippi Valley and NE US. And for normal to below normal temperatures along the West Coast, Arizona, Texas and the SE East Coast. At this time of year, we don't see this forecast being a big driver of temperature driven natural gas demand.

Figure 3: NOAA 8-14 day temperature outlook May 28-June 3



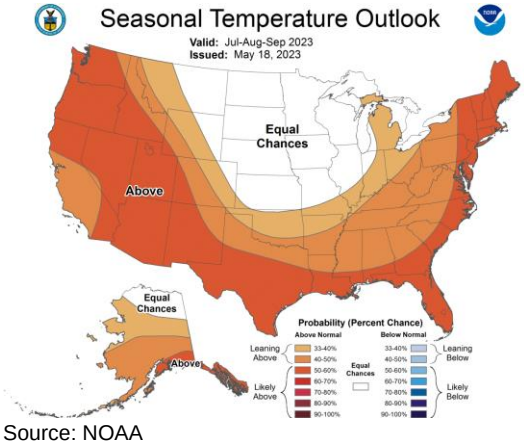
Source: NOAA

Natural Gas – NOAA's still calls for a warmer than normal summer in the US

NOAA forecasts hot summer

On Thursday, the NOAA released a monthly update to its seasonal temperature forecasts [LINK] and NOAA still calls for a warmer than normal temperatures across most of the US for their summer (Jul/Aug/Sep) outlook. We recognize that weather forecasts, even near term, are far from 100% accurate but a warm summer should provide some support for natural gas prices. On Thursday, we tweeted [LINK] "*Will summer JAS 2023 residential/commercial #NatGas demand do better than expected? Another warm summer is @NOAA's updated summer 2023 JAS temperature outlook. Yes, summer 2022 was hottest on record, but HH prices are ~$2.40 vs $7.50-$8 last summer. #OOTT."* On a straight temperature basis, residential/commercial natural gas demand should be less than summer 2023 JAS that was record heat in US. However, our tweet noted that a big YoY change is HH gas prices that are currently ~$2.40 vs $7.50-$8 last summer and we have to believe price plays a factor in how much people turn up the A/C. Below is NOAA's May 18 temperature probability map for the summer months.

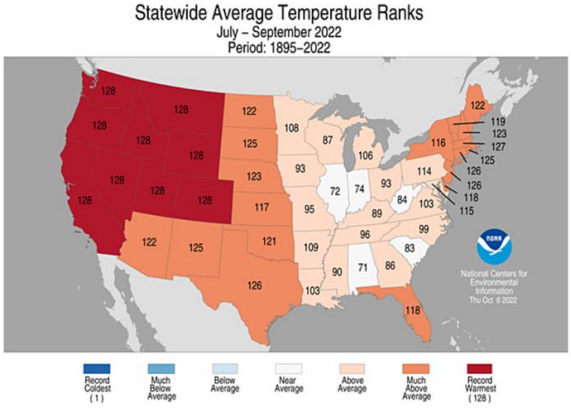
Figure 4: NOAA JAS Temperature Probability Forecast



Source: NOAA

But JAS 2023 will be comp'd vs JAS 2022 hottest summer on record in the US
A warm summer 2023 will provide support for natural gas. As noted are about 1/3 of summer 2022 and that has to have some impact on residential/commercial natural gas demand. On a straight temperature basis, summer 2023 temperature driven demand should be less as summer 2022 was record heat, but we still wonder if summer 2023 residential/commercial demand will surprise due to low price. When natural gas prices are 1/3 of last summer, we have to believe it has an influence on customer behavior on turning up the A/C. Here is what we wrote in our Oct 16, 2022 Energy Tidbits memo. "*It was an excellent summer for weather related natural gas demand in the US. It couldn't' be better. On Thursday, NOAA issued its recap of US climate for September. September was the 5th hottest in the 128-years of recording [LINK],. And July-September was the hottest summer on record. [LINK]. Below are graphics depicting the state average temperature ranks for September and for July-September."*

Figure 5: US Statewide Average Temperature Ranks July – September 2022



Source: NOAA

Natural Gas – Will summer residential/commercial demand be better than expected?
After seeing he above forecast for a warm summer but nowhere near as hot as the record hot temperatures in Summer 2022, we tweeted [LINK] "*Will summer JAS 2023 residential/commercial #NatGas demand do better than expected? Another warm summer is @NOAA's updated summer 2023 JAS temperature outlook.Yes, summer 2022 was hottest on record, but HH prices are ~$2.40 vs $7.50-$8 last summer. #OOTT."* Henry Hub prices rallied to close over $2.50 on Friday, but that is still about 1/3 the prices last summer. And, similar to what we are seeing with Europe natural gas consumption increasing with lower natural gas prices, we have to wonder if residential/commercial natural gas consumption will be better than expected given the cheap natural gas prices relative to last summer.

Will low HH drive more demand?

Natural Gas – EIA, US shale/tight natural gas forecast +6.3% or +5.74 bcf/d YoY in June
The warm winter was the biggest negative to natural gas prices so far in 2023, but then there was also the big negative that continues to be the very strong growth in US natural gas production driven by the major shale/tight plays. Remember also that the top US shale/tight

Shale/tight gas production

oil plays are oil wells that produce associated NGLs and natural gas i.e., so as the Permian, Bakken, Eagle Ford, and Niobrara go on oil production, natural gas production in these plays go the same. On Monday, the EIA released its monthly Drilling Productivity Report May 2023, and the key takeaway is that June 2023 would be the 13th consecutive month of growth for US shale/tight natural gas, albeit the last few have been more modest MoM growth but growth, nonetheless. The DPR [LINK] is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case May) and the next month (in this case June). (i) Shale/tight natural gas is forecasted to have 13 months of consecutive growth and has been breaking out since last April, as increasing US LNG export capacity out of the Gulf Coast is driving natural gas growth in Louisiana and Texas. US shale/tight natural gas was 96.834 bcf/d in Apr and May is forecasted to be 96.983 bcf/d, with June production forecasted to be 97.239 bcf/d. (ii) As for the June forecast, the largest increases are seen in the Permian (+0.082 bcf/d MoM), Haynesville (+0.062 bcf/d MoM), Appalachia (+0.054 bcf/d MoM) and Bakken (+0.035 bcf/d MoM). (iii) Total US shale/tight natural gas production is expected +5.74 bcf/d YoY for June. All shale/tight plays are up YoY, aside from Anadarko, with the most notable YoY increases being the Permian +2.325 bcf/d YoY, Haynesville +1.853 bcf/d YoY, and Eagle Ford +0.710 bcf/d YoY; with Permian and Bakken acting as key shale/tight plays feeding growth US LNG exports. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So, whatever the trends are for shale/tight gas are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

Figure 6: MoM Change – Major Shale/Tight Natural Gas Production

							2023						
mmcf/d	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June YoY
Anadarko	6,767	6,709	7,022	7,139	6,947	6,728	6,866	6,857	6,880	6,902	6,912	6,896	222
Appalachia	35,100	35,014	35,011	34,782	35,251	33,935	35,145	35,030	35,140	35,207	35,256	35,310	364
Bakken	3,145	3,131	3,226	3,187	3,070	2,676	2,853	3,074	3,113	3,151	3,189	3,224	117
Eagle Ford	6,873	6,955	6,975	7,041	7,050	6,918	7,034	7,013	7,094	7,165	7,222	7,248	280
Haynesville	15,303	15,430	15,812	16,177	16,466	16,269	16,422	16,483	16,602	16,720	16,814	16,876	1,604
Niobrara	5,090	5,121	5,173	5,201	5,282	5,000	5,065	5,082	5,102	5,108	5,120	5,133	81
Permian	21,164	21,395	21,974	21,937	21,737	21,804	22,003	22,186	22,297	22,392	22,470	22,552	1,791
Total	93,442	93,756	95,194	95,464	95,804	93,329	95,388	95,727	96,228	96,646	96,981	97,238	4,458

Source: EIA, SAF

Natural Gas – US LNG exports 11.8 bcf/d in March, up marginally MoM and YoY

March 2023 US LNG Exports

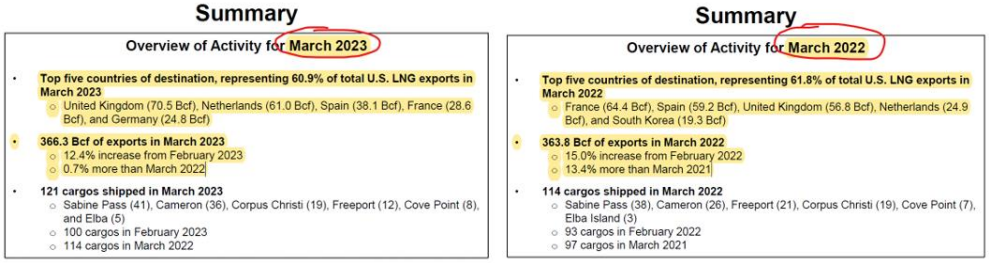
On May 15, the Department of Energy posted its US LNG exports estimates for March [LINK] at 11.8 bcf/d which is +0.100 bcf/d MoM and +0.100 bcf/d YoY. This is a reminder that the US LNG export data is available about two weeks prior to the more popularly referenced US LNG exports from the Natural Gas Monthly. The EIA is a group under the Dept of Energy, and the Dept of Energy posts its LNG Monthly about two weeks before the EIA's Natural Gas Monthly. The data for LNG exports is either identical or just a rounding issue. On Wednesday we tweeted [LINK] *"US #LNG exports Mar/23 of 11.8 bcfd, up marginal YoY & MoM. #FreeportLNG feedstock ramp in Mar, LNG exports ramp up in Apr. Mar/23 top 5 export markets: UK, Dutch, Spain, France, Germany Mar/22 top 5 export markets: France, Spain, UK, Dutch, Korea This DOE LNG export data is 2 wks before @EIAgov Natural Gas Monthly data. #OOTT"*. Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

Figure 7: DOE Monthly US LNG Exports

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023
Jan	0.0	1.7	2.3	4.1	8.1	9.8	11.4	10.9
Feb	0.1	1.9	2.6	3.7	8.1	7.4	11.3	11.7
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7	11.8
Apr	0.3	1.7	2.9	4.2	7.0	10.2	11.0	
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3	
June	0.5	1.7	2.5	4.7	3.6	9.0	10.0	
July	0.5	1.7	3.2	5.1	3.1	9.7	9.7	
Aug	0.9	1.5	3.0	4.5	3.6	9.6	9.7	
Sept	0.6	1.8	2.7	5.3	5.0	9.5	9.8	
Oct	0.1	2.6	2.9	5.7	7.2	9.6	10.0	
Nov	1.1	2.7	3.6	6.4	9.4	10.2	10.1	
Dec	1.3	2.7	4.0	7.1	9.8	11.1	11.0	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	10.6	11.4

Source: DOE

Figure 8: US LNG exports March 2023 vs March 2022



Source: DOE

Cheniere & KOSPO sign LT SPA

Natural Gas – Another long-term LNG deal: Cheniere & KOSPO sign LT SPA

There was a significant slowdown in long-term LNG deals in since the end of H1/22 compared to the activity seen from July 1, 2021 thru June 30, 2022. That's because most, if not all the available long term LNG supply available before 2026 was locked up in the July 1, 2021 thru June 30, 2022 rush. Rather, the long-term deals now being done are generally for long term supply starting in 2026 or later. And the other significant item to note is that these long term deals are going out close to 2050. There was one long term LNG deal announced this week. On Tuesday, Cheniere announced that it has agreed to enter into a long-term LNG sale and purchase agreement with KOSPO (Korea) [LINK]. The deal is set to begin in 2027 and end in 2046, with KOSPO purchasing approximately 0.05 bcf/d annually. Cheniere's CEO Jack Fusco commented, *"This SPA is expected to support the SPL Expansion Project, and we are excited to build commercial momentum as the project's development progresses."* The Sabine Pass SPL expansion project is under development with plans to include up to three LNG trains, with an expected total production capacity increase of +2.6 bcf/d. The project currently has six trains in operation, and a production capacity of ~4 bcf/d. Our Supplemental Documents package includes the Cheniere press release.

Asia was early to secure long term LNG supply

Our March 13, 2022 Energy Tidbits memo noted that Europe LNG buyers were starting 9 months behind the wave of Asian LNG buyers who started to lock up long term LNG supply starting in July 2021. The LNG supply crunch is not a 2022 development. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted

our April 28, 2021 blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas."* Our Supplemental Documents package includes our April and July blogs.

There have been 14.46 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 14.46 bcf/d of long term LNG deals since July 1, 2021. 66% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. Note in our non-Asian LNG deals will major LNG players (ie. Chevron, Shell, etc) buying for their LNG portfolio supply. China has been particularly active in this space, accounting for 75% of all

Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

Figure 9: Long-Term LNG Buyer Deals Since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.26	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Dec 26, 2022	INPEX	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
Dec 27, 2022	JERA	Oman LNG	Japan/Oman	0.11	10.0	2025	2035
Jan 19, 2023	ITOCHU	NextDecade	Japan / US	0.13	15.0	n.a.	n.a.
Feb 7, 2023	Exxon Asia Pacific	Mexico Pacific Ltd	Singapore / Mexico	0.26	20.0	n.a.	n.a.
Feb 23, 2023	China Gas Holdings	Venture Global LNG	China / US	0.26	20.0	n.a.	n.a.
Mar 6, 2023	Gunvor Singapore Pte	Chesapeake Energy	Singapore / US	0.26	15.0	2027	2042
Apr 28, 2023	JERA	Venture Global LNG	Japan/US	0.13	20.0	n.a.	n.a.
May 16, 2023	KOSPO	Cheniere	Korea/US	0.05	19.0	2027	2046
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**9.56**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.30	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.21	20.0	2027	2047
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Dec 6, 2022	ENGIE	Sempra Infrastructure	France / US	0.12	15.0	n.a.	n.a.
Dec 20, 2022	Galp	NextDecade	Portugal / US	0.13	20.0	n.a.	n.a.
Dec 20, 2022	Shell	Oman LNG	UK/Oman	0.11	10.0	2025	2035
Jan 25, 2023	PKN ORLEN	Sempra Infrastructure	EU//US	0.13	20.0	2027	2047
Jan 30, 2023	BOTAS	Oman	Turkey / Oman	0.13	10.0	2025	2035
Mar 27, 2023	Shell	Mexico Pacific Ltd	UK / Mexico	0.15	20.0	2026	2046
Apr 24, 2023	Hartree Partners LP	Delfin Midstream	US / US	0.08	20.0	n.a.	n.a.
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**4.91**			
Total New Long Term LNG Contracts since Jul/21				**14.46**			

Source: SAF

Natural Gas – Tanzania LNG export project keeps moving toward 2028 FID

Tanzania LNG

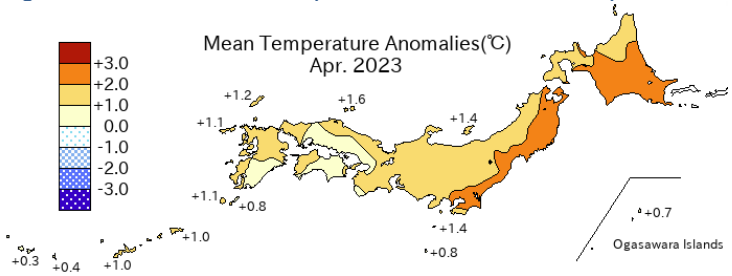
On Friday, Jared Kuehl (VP, Tanzania and Country Chair at Shell) posted a Linkedin article [LINK] that said "*The International Energy Companies (IECs) involved in the Tanzania LNG opportunity are pleased that important negotiations with the Government of Tanzania have concluded. Subject to successful completion of the assurance process over the coming weeks, we anticipate signing a Host Government Agreement (HGA) that covers the onshore elements of the project, and a Production Sharing Agreement (PSA) that oversees its upstream component. This is a significant milestone, on the long path to realising such a major project like Tanzania LNG, with the next steps involving a period of time of detailed engineering design work. Equinor and Shell, as joint operators, are pleased with the steps forward and remain focused on continuing to work together with our partners (ExxonMobil, MedcoEnergi and Pavilion Energy), TPDC and of course the Government of Tanzania.*" Kuehl did not say when to expect FID but, on Tuesday, Bloomberg reported "*Tanzania has revised upwards the cost of its liquefied natural gas (LNG)project to $42bn following a new technical analysis, The East African reports. Felchesmi Jossen Mramba, Tanzania's Permanent Secretary in the Ministry of Energy, is quoted as saying the analysis "shows that offshore drilling and piping will push the project to $42bn", about $2bn more than previously anticipated. Tanzania targets 2028 for the final investment decision (FID) on the project, when it develops 57.54 trillion cubic feet of gas discovered so far, with Shell Plc and Equinor ASA as lead partners and the participating interest from the Tanzania Petroleum Development Corporation (TPDC).*"

Natural Gas – Japan weather in April was hottest on record since 1983

Japan had warmest March since 1898

No wonder JKM LNG prices crashed in April –It continued to be hot, at least on April standards. This followed the hottest March on record in Japan which meant there was very little LNG/natural gas demand in the last of the winter months, But April is spring and shoulder season for natural gas demand so hot April doesn't really do much for LNG and natural gas consumption in April It's what we call the prefect "leave the windows open" type of weather. On Thursday, the Japan Meteorological Agency provided its April recap [LINK], which noted that average temp anomalies for the month of April were tied with 1983 for the hottest on record since 1946. Notably, the northern and eastern regions experienced particularly hot temperatures throughout the month.

Figure 10: JMA Mean Temperature Anomalies for April 2023



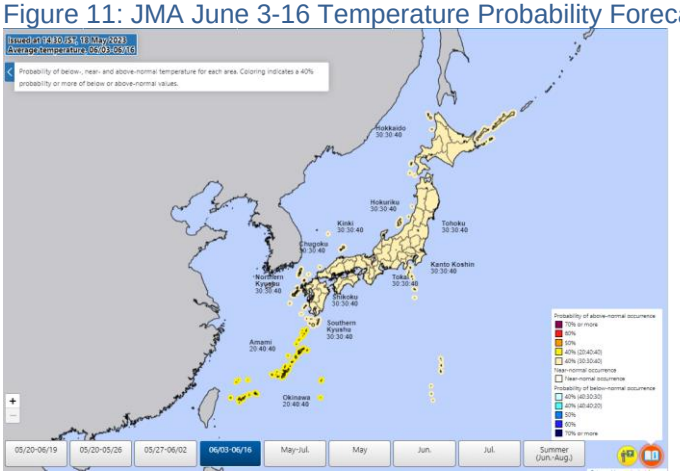
Source: Japan Meteorology Agency

Natural Gas – No major weather natural gas demand expected in early June in Japan

It looks like there won't be any significant weather driven natural gas demand to start June in Japan. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK] and its May 18 update calls for warmer than normal temperatures to end May, but then turning to more normal or slightly above normal temperatures for the first half of June. We checked AccuWeather's daily temperature forecast for Tokyo for the first two weeks of June and the daily highs were between 23 and 26C, so not necessarily hot enough to drive big weather driven natural gas demand. Below is the JMA's temperature probability forecast for June 3 to 16.

Japan's 30-day temperature forecast

Figure 11: JMA June 3-16 Temperature Probability Forecast

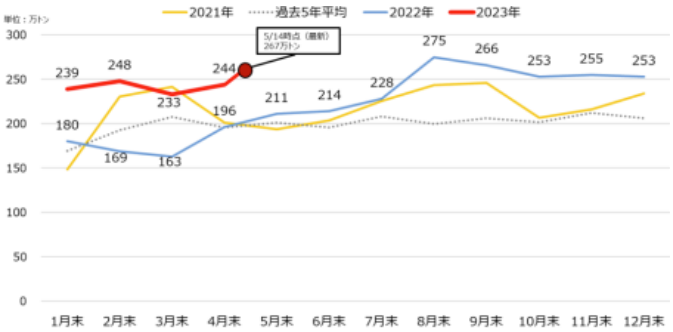


Source: Japan Meteorological Agency

Natural Gas – Japan's LNG stocks up +18.6% WoW to ~128 bcf

Japan had a mild winter with a hot March to end winter, so it was able to escape any weather-driven LNG shortages. April was warm and May started off warm, but this is shoulder season and warmer than normal April and early May doesn't drive any significant weather driven push for natural gas. And the look forward for the start of June is moving bak to more normal temperatures so, at least for now, weather isn't expected to be a huge push for natural gas demand. LNG stockpiles held by Japanese power producers continue to exceed both last year's level and the seasonal average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks on May 14 were 128.2 bcf and are up +18.6% WoW from May 7 of 108.1 bcf, and well above the 5-year average of 96.5 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 12: Japan's LNG Stocks



Source: EIA, SAF

Natural Gas – Japan LNG Imports down -18.7% YoY to 7.25 bcf/d in March

Japan Mar LNG imports -18.7% YoY

As we highlighted in March, it was very in Japan and March 2023 turned out to be the hottest March on record in Japan and meant there really wasn't any temperature driven natural gas and LNG demand in March. So not surprise when, on Thursday, Japan's Ministry of Finance posted its import data for April [LINK] and pointed to a material YoY decline in LNG imports. The MOF reported Japan's March LNG imports were 7.25 bcf/d, which is down -18.2% MoM from 8.86 bcf/d in March, and -18.7% YoY from 8.92 bcf/d in April 2022. Notably, April 2023's imports of 7.25 bcf/d was the lowest LNG imports recorded for the month of March in the last decade. There is also the factor of the high LNG prices to end 2022 that would have impacted LNG imports in the proceeding months of 2023. In addition, Japan's thermal coal imports in Apr were -10.8% YoY, compared to -19.9% YoY in Mar and petroleum products imports were up 8.3% YoY. Plus in March, the look ahead temperature forecast for Japan in April was for hot weather so there was no real urgency to import LNG in March. Below is our table that tracks Japan LNG import data.

Figure 13: Japan Monthly LNG Imports

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	12.66	13.06	11.22	12.85	12.79	11.69	11.63	12.48	10.51	-15.8%	10.56	0.5%
Feb	12.88	13.26	12.30	13.36	14.23	12.61	10.99	13.84	12.19	-11.9%	10.98	-9.9%
Mar	12.46	12.60	12.62	12.61	12.28	11.30	11.16	11.04	10.07	-8.7%	8.86	-12.0%
Apr	11.54	10.56	10.21	10.52	8.97	9.00	8.31	7.96	8.92	12.0%	7.25	-18.7%
May	10.06	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.92	16.3%		
June	10.91	10.61	10.02	9.90	8.88	8.32	8.42	9.13	9.29	1.7%		
July	12.14	10.77	10.19	10.19	10.55	10.56	9.35	9.58	9.54	-0.4%		
Aug	10.92	10.93	11.96	11.24	11.73	9.45	9.04	9.75	9.71	-0.4%		
Sept	11.64	11.06	10.67	9.31	10.04	10.30	10.41	8.66	8.52	-1.6%		
Oct	10.75	9.38	9.73	9.50	10.12	9.75	9.20	7.17	7.88	9.9%		
Nov	11.00	10.71	12.07	10.26	10.15	10.03	9.63	9.38	8.88	-5.4%		
Dec	12.79	12.51	11.69	12.31	11.23	10.54	11.96	10.89	9.39	-13.8%		

Source: Japan Ministry of Finance, SAF

Natural Gas – China natural gas production up +7.0% YoY to 40.7 bcf/d in April

China natural gas production +7.0% YoY

We have been highlighting a big change in China's natural gas and LNG dynamics over the past two years. China has been increasing its domestic natural gas production, which means less need for LNG imports. That has been compounded by China's increasing natural gas pipeline imports of cheaper Russian natural gas. This reduces the need for LNG imports.

China continued to increase its domestic natural gas production in April 2023. On Wednesday, China's National Bureau of Statistics reported domestic natural gas production of 20.5 bcm (40.7 bcf/d) in April which is +7.0% YoY [LINK]. China does not provide the separate data for Mar vs Apr, so a MoM change is not easily determinable. April's data brings total YTD production to 78.3 bcm (23.0 bcf/d), reflecting a +4.8% YoY increase from 2022 YTD production of 74.7 bcm (21.9 bcf/d).

China natural gas imports

Natural Gas – China LNG imports up +0.1% MoM in April

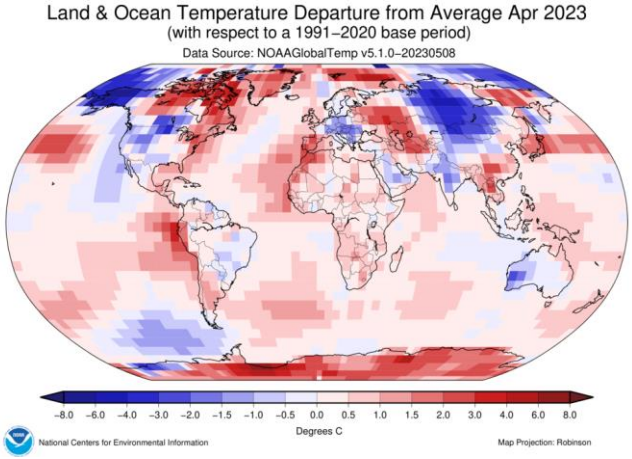
On Thursday, the China's General Administration of Customs released the finalized natural gas import data for April was posted which provided the split of natural gas imports between pipeline imports and LNG imports. (i) Natural gas pipeline imports for Apr were up +19.9% MoM to 5.58 bcf/d and are +12.6% YoY from 4.94 bcf/d in Apr 2022. This is a stark contrast to Mar's -8.1% MoM increase in pipeline imports. (ii) LNG imports were down -11.0% MoM to 7.39 bcf/d in Apr but are up +10.3% YoY from 6.70 bcf/d in Apr 2022. This compares to Mar's -7.0% MoM decrease. (iii) Total natural gas imports (pipeline + LNG) were 12.97 bcf/d in Apr, up +0.02 bcf/d (+0.1%) MoM from 12.95 bcf/d in Mar but are up +1.35 bcf/d (+11.6%) YoY from 11.62 bcf/d in Apr 2022. We typically use bp's conversion factors, which are 1 million tonnes of natural gas = 41.071 bcf, and 1 million tonnes LNG = 48.028 bcf.

Warm April in Western Europe and most of Asia

Natural Gas – Western Europe & most of Asia were warmer than normal in April

April is spring in Western Europe and most of Asia, which means no real temperature driven natural gas demand, perhaps unless really cold in part of China. March was near record warmth around the world, which led to the crashing of JKM LNG and TTF Europe natural gas prices in March. And April being warm also meant that there was no real temperature driven natural gas consumption and JKM, LNG and TTF natural gas prices went even lower. This week, NOAA posted its Global Climate Recap for April [LINK] and "*temperatures were above average throughout most of northeastern North America and Greenland, parts of Central and South America, Africa and Antarctica. In addition, above-average temperatures covered parts of western Europe, eastern and western Asia and Oceania*."

Figure 14: Land & Ocean Temperature Departure from Average 2023



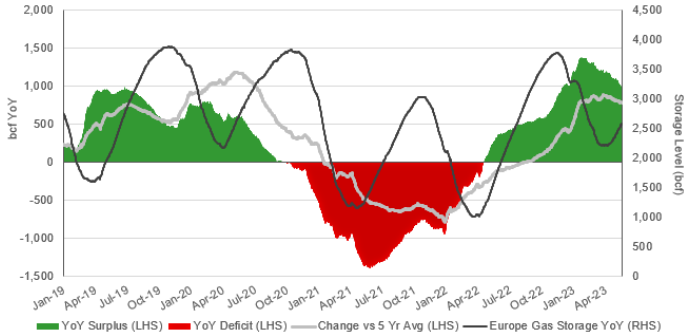
Source: NOAA

Europe gas storage

Natural Gas – Europe storage is now +18.69% vs 5-yr average, but within 5-yr range

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. There was negligible weather driven demand for natural gas, which along with the continued industrial demand destruction, meant storage levels are at still at high levels. However, we are seeing a narrowing of the Europe gas storage surplus with the lower European natural gas prices and the impact of strikes impacting France LNG imports on and off over the past month. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY and a YoY surplus of 27.02%. However, average temps remained a bit warmer this past week resulting in storage increasing slightly by +2.20% WoW to 64.88% on May 18. Storage is now +23.50% greater than last year levels of 41.38% and is +18.69% above the 5-year average of 46.19%. 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 15: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs -11 WoW at 575 oil rigs on May 19, US gas rigs flat WoW

US oil rigs down WoW

There was a big drop in US oil rigs this week. Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -11 rigs WoW as of May 19. We note that crude oil being priced at $70 seems to be where the more marginal players will begin to pull back rigs. The total US oil rig count is now at 575 rigs, -1 rigs YoY, +94 from the 2022 low of 481 rigs in January and +403 since the 2020 low of 172 rigs on Aug 14. Notably, on a per basin basis the Permian was down -4 rigs to 346. The Permian and Eagle Ford rig counts both declined this week by -4 rigs to 346 and -3 rigs to 57, respectively. Note it looks like US gas rigs are starting to feel the effects of the low $2 Henry Hub and were flat WoW at a total of 141 rigs. It is important to note there was no gas rig changes on any basin. US gas rigs have decreased -9 rigs YoY. Below is our graph of total US oil rigs.

Figure 16: Baker Hughes Total US Oil Rigs

Source: Baker Hughes

US frac spreads -10% YoY

Oil – US frac spreads now down 10% YoY

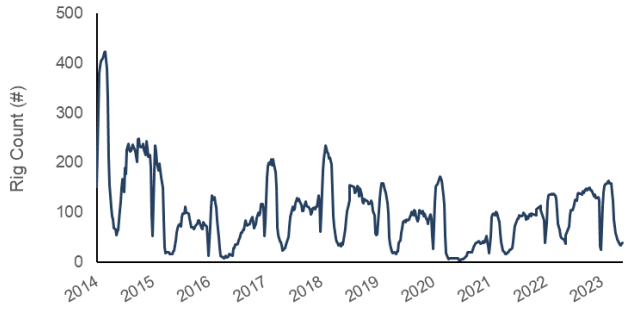
We haven't reported on US frac spreads for the past several months as the Primary Vision weekly frac spread YouTube video went under subscription. But this week, there were multiple people tweeting out the Primary Vision frac spread count for the week ended May 19 was down 10 spreads to 262, which is down 10% YoY. Based on the tweets, it looks like frac spreads recent peak was 294 for week ending April 28, which then declined to 282 for May 5 week, 272 for May 12 week, and then down to 262 to May 19 week. A pretty big drop over the past three weeks.

Cdn total rigs up WoW

Oil – Total Cdn rigs -9 WoW to 85 total rigs, wildfires continue to see rigs go down

Wildfires are the story for Cdn rigs. Cdn drilling is now in what is the normal yearly trough when rigs start to increase from early May thru to Xmas. Traditionally, Cdn rigs hit their trough the last week of April or first week of May. And it looks, at least for now, that happened this year as there was a +1 WoW increase for the week ended May 12. But that changed this week when wildfires led to big rig declines. We are now seeing this reflected in the data for May 19. There is still a risk of more declines over the next couple of weeks. Total Cdn rigs were down -9 rigs WoW at 85 rigs as of May 19. Notably, the week of May 19 saw a -6 rig decrease in AB, and a -3 rig decrease in BC through the wildfires. All other provinces remained flat. Cdn oil rigs were up +2 WoW to 39, while Cdn gas rigs decreased -11 to 46 rigs. Cdn oil rigs are now -1 rig YoY compared to 40 rigs last year, while gas rigs are -2 YoY from 48 rigs. Below is our graph of total Cdn oil rigs.

Figure 17: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil - US weekly oil production weakens -0.100 mmb/d WoW to 12.2 mmb/d

US oil production weakens WoW

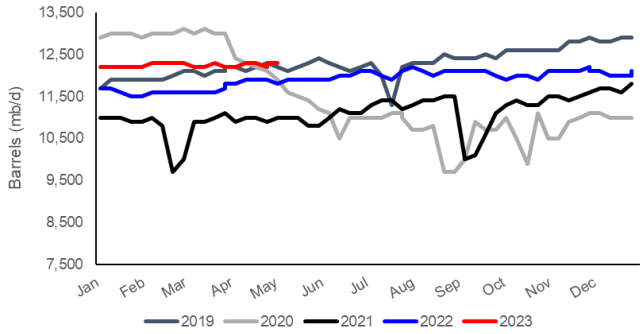
It was another week of relatively no change to the EIA's estimates for weekly US oil production. As noted in the following item, these are estimates of the current week and the actuals have been higher than the weekly estimates ie. the weekly estimates have been low. The EIA estimates US oil production fell -0.100 mmb/d WoW to 12.2 mmb/d for the week ended May 12. The Lower 48 also fell -0.100 mmb/d WoW to 11.9 mmb/d, while Alaska fell -0.037 mmb/d to 0.405 mmb/d. US oil production, based on the weekly estimates, was mostly range bound in 2022 between 11.9 to 12.1 mmb/d since the 2nd week of May. But this year production broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6, and has remained at or above 12.2 mmb/d ever since. 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 Feb 3 at 12.3 mmb/d. US oil production is up +0.300 mmb/d YoY at 12.2 mmb/d but is still down significantly at -0.800 mmb/d since the 2020 peak of 13.1 mmb/d on March 13, 2020.

Figure 18: EIA's Estimated Weekly US Oil Production

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

Source: EIA

Figure 19: EIA's Estimated Weekly US Oil Production



Source: EIA

EIA's Form 914 "actuals" for Feb were +0.18 mmb/d vs weekly estimates

We remind that the EIA's actuals have been running higher than the weekly estimates. Here is what we wrote in out Apr 30, 2023 Energy Tidbits memo. *"As a reminder there is a sizeable difference between what the EIA looks as "actuals" for US oil production vs the EIA's weekly estimates noted above. On Friday, we tweeted [LINK] "#EIA Form 914 actuals: US oil production stronger than many expect. Feb 23 was 12.483 mmb/d, +1.177 mmb/d YoY. 2nd highest since Covid, following revised up Jan 23 of 12.536 mmb/d. Note Feb actuals of 12.483 mmb/d are +0.18 mmb/d vs @EIAgov weekly estimates. #OOTT." On Friday, The EIA released its Form 914 data [LINK], which is the EIA's "actuals" for February US oil and natural gas production. There were two key takeaways from the EIA's weekly US oil production*

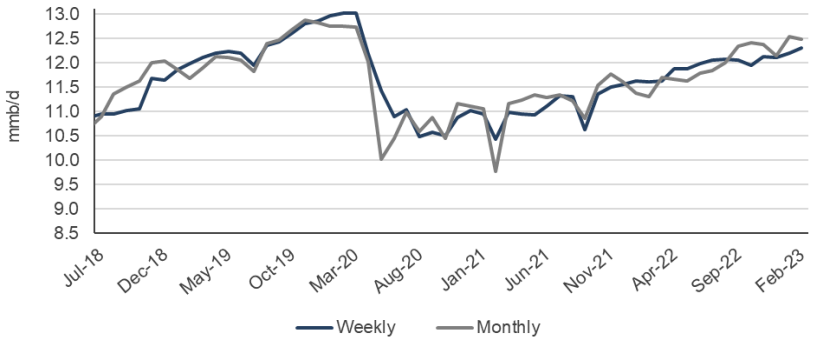
data for Feb – the actuals were 183,000 b/d more than the weekly estimates, and Feb was the 2nd highest US oil production since Covid at +1.177 mmb/d YoY to 12.483 mmb/d vs. Jan's post-Covid peak of 12.536 mmb/d. Note that Jan's data was revised up by +74,000 b/d since the March Form 914 release. (i) Form 914 estimates that total US oil production saw a marginal decrease of -53,000 b/d MoM to 12.483 mmb/d in February. The actuals for February were 183,000 b/d higher than the EIA's weekly estimates that worked out to 12.300 mmb/d. January actuals were adjusted higher to 12.536 mmb/d and were 336,000 b/d higher than weekly estimates of 12.200 mmb. (ii) There was a slight MoM decrease of -0.053 mmb/d vs Jan of 12.536 mmb/d. Our Supplemental Documents package includes the New Mexico, Texas and offshore Gulf of Mexico tables attached to our tweet.

Figure 20: EIA Form 914 US Oil Production (thousand b/d)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	12,536	12,483										
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 21: EIA Form 914 US Oil Production vs Weekly Estimate



Source: EIA

Oil – US oil production +1.167 mmb/d YoY, but frac spreads -10% YoY, oil rigs flat YoY

Challenge for sustained US oil growth

Our big concern for the forecasts of sustained strong US oil growth is that we have trouble seeing how the math works to support views for sustained strong US oil growth. US oil production is up >1 mmb/d YoY, yet oil rigs are basically flat and now we see US frac spreads are down 10% YoY. After seeing the US frac spreads being down 10% YoY on Friday, we tweeted [LINK] "*Math challenge for SUSTAINED growth in US #Oil production. EIA Form 914 "actuals" Feb oil production +1.167 mmbd YoY to 12.483 mmbd. But oil rigs basically flat YoY, @xendrEcon notes frac spreads -10% YoY. Unless decline rates are reducing, need increasing wells drilled, DUCs & well completions. #OOTT."* We aren't suggesting US oil production will drop, but it is just hard to see the math for how people forecast sustained strong growth in US oil production without seeing a big consistent and

continuing increase in oil rigs to add inventory of DUCs for future completion. Our tweet also says unless decline rates are reducing as a reminder that the first challenge for US oil growth is to replace everyday declines in oil production, especially since the driving force for US oil growth has been shale/tight oil. And, as noted later in the memo, shale/tight oil, including the Permian, have high initial decline rates.

US shale/tight oil production

Oil – EIA shale/tight oil forecast shows slight increase for May/Jun vs Dec/Jan/Feb

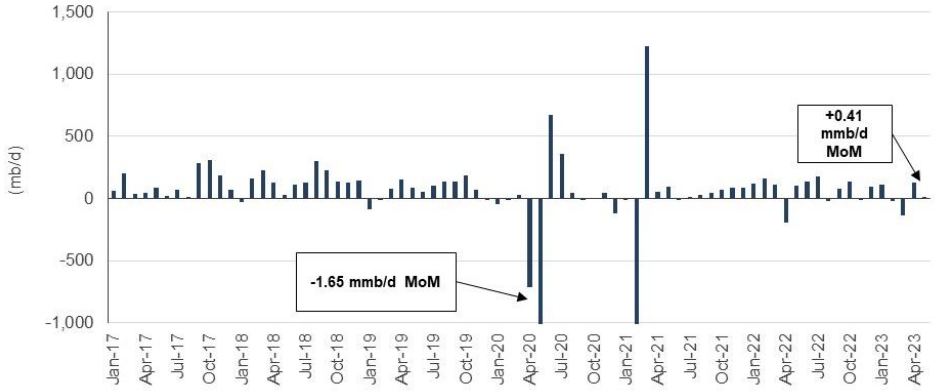
The EIA Drilling Productivity Report May 2023 [LINK] forecast for US shale/tight oil shows a MoM increase in Apr, followed by another increase (albeit to a lesser extent) in May after being fairly stuck throughout July-Oct. The DPR is the EIA's forecast for production for the major shale/tight oil and gas basins for the current month (in this case May) and the next month (in this case Jun). (i) Shale/tight oil was flat from July thru Oct, then increased in Nov, Dec, Jan, was flat in Feb and decreased slightly in Mar before increasing in April. Now the EIA is forecasting two consecutive MoM production increases in May and June. The EIA does not provide any explanations, but this makes sense as we would have expected that May/June would be higher than Dec/Jan as Dec/Jan are normally impacted by winter weather conditions. It will be a trend to watch. (ii) In our Mar 19, 2023, Tidbits, we noted that we wouldn't be surprised to see the EIA revise its Feb estimates upward for the Bakken and its March estimate for the Bakken downward given the comments we heard in the North Dakota Director's Cut monthly for March. April's DPR did in fact show a downward revision for the Bakken's Feb data and brough production down by -56,000 b/d to 1.122 mmb/d and brought March production down by -4,000 b/d to 1.141 mmb/d. (iii) The EIA now forecasts total US shale/tight oil in May at 9.291 mmb/d and June at 9.332 mmb/d. (iv) The growth in May is somewhat distributed across all basins although the Permian and Bakken are forecasted to have the largest MoM increases of +70,000 b/d and +56,000 b/d, respectively. Permian production for June is 5.707 mmb/d, vs 5.692 mmb/d in May and the Bakken is also forecasted to reach production of 1.232 mmb/d in June following an -11,000 decrease MoM in May. (v) Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 22: MoM Change – Major Shale/Tight Oil Production

							2023						
Thousand b/d	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June YoY
Anadarko	380	387	373	388	403	370	415	405	417	429	439	444	50
Appalachia	112	118	120	126	133	127	144	151	152	153	154	155	42
Bakken	1,106	1,103	1,151	1,144	1,123	978	1,069	1,171	1,188	1,204	1,219	1,232	98
Eagle Ford	1,100	1,100	1,118	1,142	1,120	1,063	1,079	1,067	1,083	1,096	1,106	1,108	-12
Haynesville	35	35	36	36	35	33	34	35	35	35	36	36	1
Niobrara	629	639	641	647	659	613	632	627	636	639	645	650	20
Permian	5,262	5,329	5,470	5,507	5,515	5,530	5,652	5,627	5,657	5,680	5,692	5,707	530
Total	8,624	8,712	8,910	8,989	8,988	8,714	9,299	9,083	9,168	9,237	9,290	9,332	728

Source: EIA Drilling Productivity Report

Figure 23: MoM Change – Major Shale/Tight Oil Production



Source: EIA Drilling Productivity Report

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

Low level of Permian DUCs vs growth

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

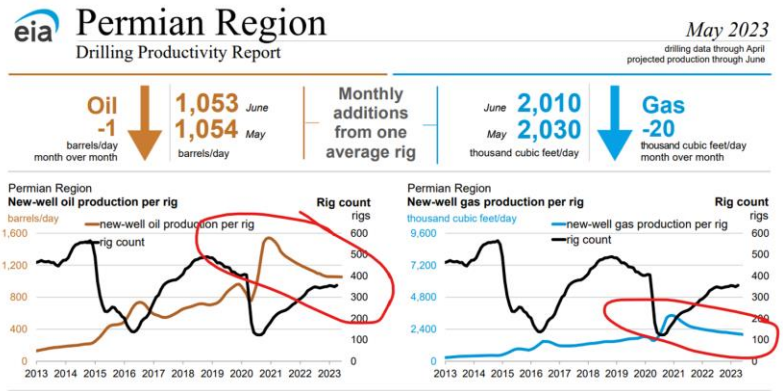
oil plays like the Permian are all fracked. So a drilling rig drills the well, it then leaves the well as uncompleted and waiting for the frack spread to come and frack/complete the well. If drilling isn't high enough to keep adding to the DUCs and the existing DUCs inventory is low, there is less growth 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 24: 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					

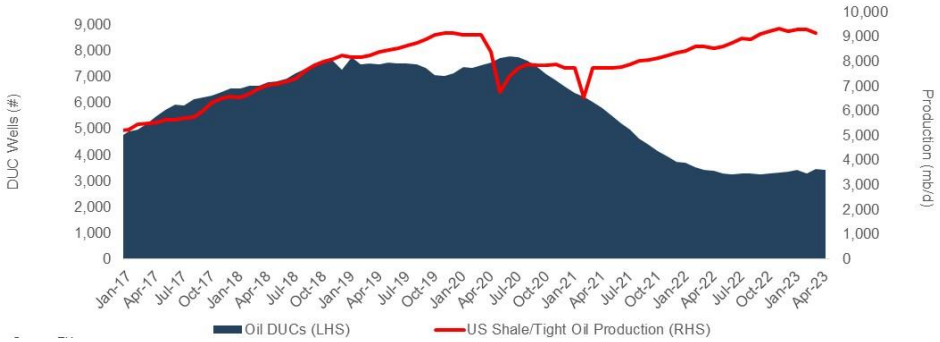
Source: EIA, Baker Hughes

Figure 25: Permian: EIA's Permian new-well-oil production per rig



Source: EIA

Figure 26: EIA Estimated Drilled UnCompleted Wells vs Permian Oil Production



Source: EIA Drilling Productivity Report

Warren Buffett & Charlie Munger highlighted "quick death" in Permian wells

As noted above, the math on how much production growth is straightforward and it starts with decline rates of the existing production base. All oil and gas wells decline and the first challenge for production growth is to add new production to offset the growth and keep production flat. Here is what we wrote in last week's (May 7, 2023) Energy Tidbits memo on Warren Buffett and Charlie Munger highlighting the ver fast decline rates in new Permian shale wells. "*We were surprised by the Warren Buffett and Charlie Munger negative comments on shale considering their large position in Permian producer Occidental Petroleum at the Berkshire Hathaway annual meeting last Saturday. They were very negative on the high decline rate of shale and how tough the high decline rate makes it for US shale. We have to believe that, other than a blind Buffett follower, many listeners would have turned negative on shale after listening to Buffett and Munger. The other thing is that its Buffett so it typically means that, in this forum, the answers aren't short. So there wasn't' much doubt on their concern on high decline raes for shale. On Tuesday, we tweeted [LINK] "Is this what #WarrenBuffett & #CharlieMunger wanted? Reason to not like #Shale? Huge initial production but 1 1/2 yrs, "it becomes practically nothing. "it really dies fast, those shale wells, if you like quick death in your wells, we have them for you", "it's not a long-term source".#OPEC loves it. Doubt about shale oil growth potential is a positive for #Oil in 2020s. See 👇SAF transcript." Here are a couple excerpts from the transcript we made of the Buffett and Munger comments on shale. Buffett "Well, in the Permian, this should sink in on you, in the first day, the first day when you bring in a well, it may be 12,000 barrels, it may be 15,000 barrels. It's dangerous. Occidental had one come in at 19,000 barrels or something like that. One day. And in a year, a year and a half, it becomes practically nothing. It's a different business." Munger "Yeah, it really dies fast, those shale wells. If you like quick death in your oil wells, we have them for you". Our Supplemental Documents package includes the transcript we made of the Buffett and Munger comments."*

Oil – EIA DUC's down marginally MoM in March

We have been warning that we see a key risk to how much US oil production can sustainably grow in 2023 and beyond is the need to increase rig counts (not have less frac spreads) to

DUCs down marginally in Mar

replenish the inventory of Drilled Uncompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. As noted earlier in the memo, we have highlighted how DUCs in the Permian are really about the same level as Sept/Oct 2014 when Permian production was about 1/3 of current levels. The biggest problem in the past with the EIA's Drilling Productivity Report [LINK] estimate of Drilled Uncompleted wells was that the data had been constantly revised and sometimes significantly. (i) However, the DUC estimates provide a clear picture of the trend that DUCs haven't really increased since Feb 2022. It's why there is the need for drilling rigs to pick up to replenish the DUC inventory if the US is to have sustained strong oil growth in 2024 and beyond. (ii) Drilled Uncompleted Wells were down -10 MoM (+383 YoY) in March to 4,676 DUCs, which compares to 4,293 DUCs in Mar 2022. Note that Feb's data (including the Permian) had a net downward revision of -87 to 4,686 from 4,773. (iii) But at 4,686 DUCs, it means that a total 4,188 DUCs were worked down since the Jun/20 peak of 8,874. The largest work downs are coming from the Permian (-541 YoY) and Eagle Ford (-229 YoY). With DUCs being worked down so significantly we will need to see rig counts go up to replenish DUCs in the near future. (iv) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Our Supplemental Documents package includes the EIA DPR.

Figure 27: EIA - Estimated Drilled UnCompleted Wells

Drilled Uncompleted	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Mar YoY %	Mar YoY
Anadarko	740	724	727	723	716	722	723	710	712	722	732	746	750	1%	10
Appalachia	471	497	526	524	529	562	576	597	620	631	662	704	706	50%	235
Bakken	426	429	425	427	426	474	494	501	528	552	579	609	608	43%	182
Eagle Ford	642	612	598	611	620	593	582	561	517	482	434	423	413	-36%	-229
Haynesville	395	419	441	466	483	513	535	558	595	624	662	707	719	82%	324
Niobrara	317	320	310	328	345	362	393	443	497	539	641	704	719	127%	402
Permian	1,302	1,294	1,244	1,218	1,180	1,117	1,097	1,051	1,068	1,079	1,042	793	761	-42%	-541
Total	4,293	4,295	4,271	4,297	4,299	4,343	4,400	4,421	4,537	4,629	4,752	4,686	4,676	9%	383

Source: EIA, SAF

Oil – US SPR releases added 745,000 b/d, 220 mmb, since Russia invaded Ukraine

US SPR releases added 745,000 b/d

Every week, we report on weekly changes to SPR but don't' regularly remind the big picture of what the SPR releases have meant to oil markets. SPR releases have added 745,000 b/d to export markets since Russia invaded Ukraine On Monday, we tweeted [LINK] "*US depleting #SPR is ending in June after adding 700-750 kbd since RUS/UKR. KISS reminder from @Jorgecomments. US main tool to prevent #Oil price rise was deplete the SPR. Even if no refill, it's taking 745 kbd off market."* And [LINK] "*#SPR down 220.3 mmb (745 kbd) since RUS/UKR. Biden inauguration 638.1 mmb. Right before RUS/UKR 582.4 mmb. 05/05/23 362.1 mmb. US reduced SPR by 745 kbd since RUS/UKR. Depleting SPR is ending in June. Thx @Jorgecomments @sean_evers #OOTT."* This good reminder came from Jorge Montepeque (President & Founder, Global Markets) on Gulf Intelligence Daily Energy Markets May 15th podcast. [LINK] Our tweet included the transcript we made of his comments. Items in *"Italics*" are SAF Group created transcript. Montepeque "… *there was, whether it was said or not, an objective by the US and the West to either drive down the price of oil plus cutting the price to Russia to punish them as well as economically prevent a rise that would damage the western economies. A large part of that strategy was borne by the US and the main tool they used was by depleting their SPR. Let's not forget that. That*

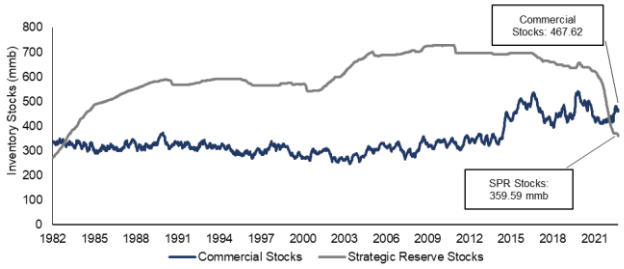
depletion of the SPR is getting to a level that has now become a political issue inside. And the US Secretary and the Biden Administration are under pressure to start buying back and refilling that SPR. So part of the low price we have seen in the last year is that steady release from the US which you could say was 700 to 750,000 b/d. So that's like another country, another producing exporting. That is ending in June. There is still oil in the SPR but, I think going forward that may turn into a buy-in rather than a sell-out. And that is going to alter very much the dynamics. And I don't think anybody wants this war to continue much longer"

Oil - US SPR reserves now -108.04 mmb lower than commercial crude oil reserves

US SPR reserves

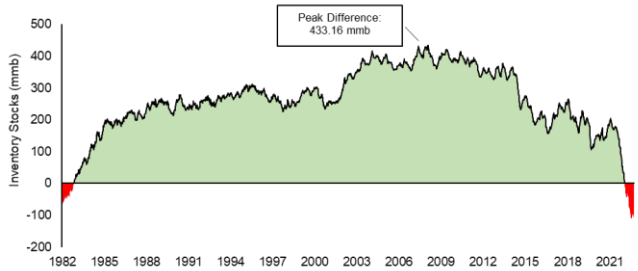
Oil in US Strategic Petroleum Reserves (SPR) continues to move below total US commercial crude oil reserves in the May 12 week for the first time since 1983, with the deficit widening this week due to the build in commercial oil stocks and a draw in the SPR. However, this week's data showed another SPR draw of -2.4 mmb compared to the -2.9 mmb draw last week and came after 10 consecutive weeks of no change between the weeks of Jan 13 and Mar 31. The EIA's weekly oil data for May 12 has SPR reserves at 359.59 mmb vs commercial crude oil reserves at 467.62 mmb. The last time the SPR was down at this level was on Sep 23, 1983, at 358.29 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 28: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 29: US Oil Inventories: SPR Less Commercial



Source: EIA

Oil – SPR now down 11.9 mmb of planned 26 mmb SPR draw ie. 14.1 mmb to go

SPR going 26 mmb lower

We have been reminding that the US SPR was going 26 mmb lower. With the 2.4 mmb draw for the May 5 week, the recent SPR withdraws are now up to 11.9 mmb, which means there is still another 14.1 mmb to go until the 26 mmb draw is reached. Here is what we wrote in

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

Oil – We expect the Biden Administration will buy back the 3 mmb for the SPR

US to buy 3mmb for SPR

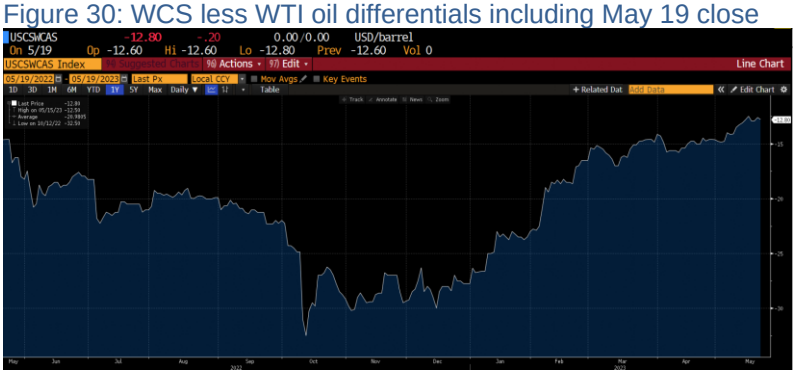
On Monday, the Biden Administration put out a tender to buy 3 million barrels of crude oil to begin to refill the SPR. Then on Tuesday, Reuters reported "*Biden administration does not expect a big surge in summer oil prices this summer that would impact its strategic petroleum reserve efforts, White House energy adviser Amos Hochstein said on Tuesday, one a day after the U.S. Energy Department announced plans to buy 3 million barrels of crude oil to refill the SPR. "This is the beginning. Later this year we'll continue to buy more and significantly more than that into next year," Hochstein told CNBC in an interview."* Many are skeptical that they will actually buy any barrels back. We have a different view as we think they will buy back the 3 mm barrels as it is a nominal amount and this way Biden can say he did what he promised. But the Administration made no clear promises on buying back the other 217 million barrels. Earlier in the memo, we note that the Biden Administration has released 220.3 million barrels from the SPR since Russia invaded Ukraine and that was approximately 745,000 b/d for this period. On Tuesday, we tweeted [LINK] "*yes it makes sense that @amoshochstein says doesn't expect markets to deter plan to buy back 3 mmb for #SPR this summer. that means can say #Biden promise to begin to refill SPR has been met. BUT they aren't committing to the other 217 mmb. #OOTT*."

Oil – Cdn oil differentials narrowed $0.05 to close at $12.80 on May 19

WCS less WTI differentials

WCS less WTI differentials were basically flat this week, narrowing $0.05 to close at $12.80 on May 19. This followed last week's $1.50/b narrowing driven by oil supply interruptions and the continued risk to more supply interruptions from the continued Alberta wildfires. That has been viewed as the main factor, but also in the background on the global scale is that OPEC+ cuts started May 1 and OPEC+ cuts tend to be the medium/heavy barrels. But WCS less WTI differentials have narrowed since the big pick up in Alberta wildfires. 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. 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, and slightly this week to $12.80/b on May 19. For perspective, a year ago, the WCS-WTI differentials had widened in May as is typical to $14.65 on May 19, 2022. And as noted below, WCS less WTI differentials normally begin the widen after early May, but it looks like the extraordinary factors (OPEC+ cuts and wildfires) are having an impact. Below is Bloomberg's current WCS–WTI differential as of May 19, 2023 close.

Figure 30: WCS less WTI oil differentials including May 19 close



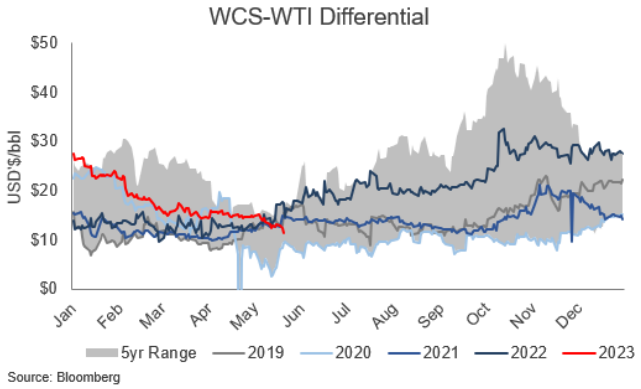
Source: Bloomberg

Oil – May is normally when Cdn heavy oil differentials are at their narrowest

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. The wildfires 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, 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. 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 May ie. right now.

Figure 31: WCS less WTI oil differentials



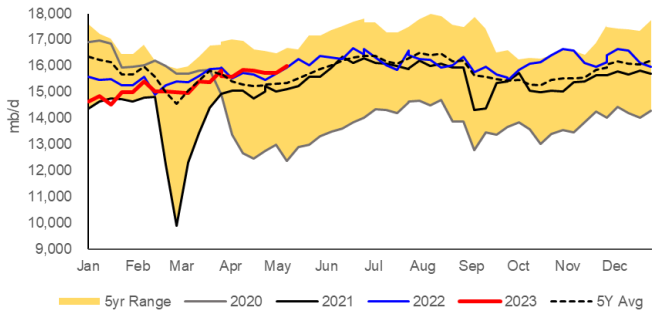
Source: Bloomberg

Oil - Refinery inputs up +0.245 mmb/d WoW to 15.990 mmb/d

Refiners switching to summer fuel blends

There are always unplanned refinery issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance such they are producing the key petroleum products at the right time of year. We normally see Feb/early March as a refinery turnaround season for refineries in the US to be ready to produce summer fuels, including asphalt. So that normally leads to less crude oil inputs during turnaround. And normally, 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 Sept. So, unless there are unplanned refinery issues, we should be in a period of increasing crude oil inputs into US oil refineries in the ramp up for peak driving season. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended May 12. The EIA reported crude oil inputs to refineries were up +0.0245 mmb/d this week to 15.990 mmb/d but are up +0.055 mmb/d YoY from 15.696 mmb/d for the week ended May 13, 2022. This week's refinery utilization was up +1.0% WoW to 92.0% and is up +0.2% YoY as well. Total products supplied (i.e., demand) decreased WoW, down -0.606 mmb/d to 19.558 mmb/d, and Motor gasoline was down -0.395 mmb/d to 8.908 mmb/d from 8.027 mmb/d last week. The 4-week average for Motor Gasoline was up +0.097 mmb/d YoY to 9.085 mmb/d. The 4-week average of Total demand was up +0.060 mmb/d YoY to 19.934 mmb/d.

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



Source: EIA

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

US net oil imports

We repeat the same commentary as last week 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 down -0.127 mmb/d to 2.550 mmb/d for the May 12 week. US imports were up +1.307 mmb/d to 6.860 mmb/d. US exports were up +1.434 mmb/d to 4.310 mmb/d. The WoW decrease in US oil imports was driven in part by "Others" while the Top 10 had an increase of +1.001 mmb/d. Some items to note on the by

country data. (iii) Canada was up this week +0.323 mmb/d to 3.592 mmb/d. (ii) Saudi Arabia was up +0.034 mmb/d to 0.415 mmb/d. (iv) Colombia was up +0.292 mmb/d to 0.339 mmb/d. (v) Ecuador was down -0.044 mmb/d to 0.101 mmb/d. (vi) Iraq was down -0.073 mmb/d to 0.174 mmb/d. (vii) Mexico was up +0.283 mmb/d to 0.676 mmb/d.

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

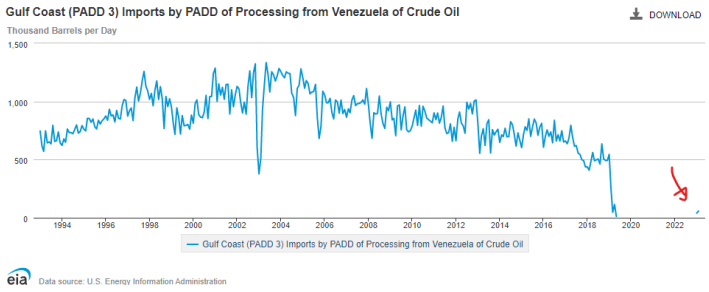
(thousand b/d)	Mar 3/23	Mar 10/23	Mar 17/23	Mar 24/23	Mar 31/23	Apr 7/23	Apr 14/23	Apr 21/23	Apr 28/23	May 5/23	May 12/23	WoW
Canada	3,780	3,371	3,240	2,957	3,980	3,590	3,519	3,327	3,526	3,269	3,592	323
Saudi Arabia	476	385	483	228	514	376	339	393	242	381	415	34
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	556	633	1,118	541	920	450	615	728	706	393	676	283
Colombia	222	294	244	269	71	159	303	143	143	47	339	292
Iraq	265	346	144	138	345	241	180	222	148	247	174	-73
Ecuador	55	46	0	118	80	242	131	36	57	145	101	-44
Nigeria	243	170	129	104	302	236	112	104	214	143	329	186
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	5,597	5,245	5,358	4,355	6,212	5,294	5,199	4,953	5,036	4,625	5,626	1,001
Others	674	971	814	970	932	899	1,095	1,423	1,360	928	1,234	306
Total US	6,271	6,216	6,172	5,325	7,144	6,193	6,294	6,376	6,396	5,553	6,860	1,307

Source: EIA

EIA shows imports from Venezuela in its monthly import data.

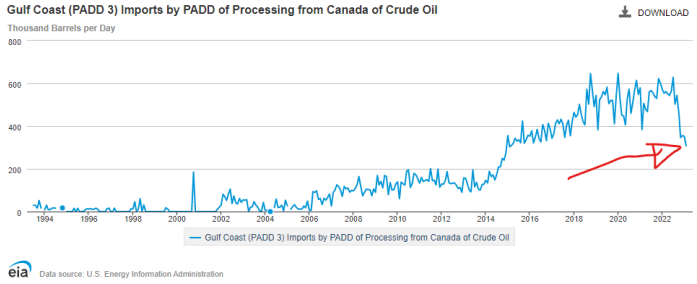
Here is what we wrote in last week's (May 7, 2023) Energy Tidbits memo. *"Last week's (Apr 30, 2023) Energy Tidbits memo highlighted our Apr 29 tweet [LINK] that Chevron's start of Venezuela oil imports into the Gulf Coast is likely impacting Cdn WCS less WTI differentials and how Venezuela oil into 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 34: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 35: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil – Novak says Russia reached its voluntary 500,000 b/d cuts

Russia said it's cut 500,000 b/d

It seems like all the key oil agencies don't believe Russia has made its voluntary cut of 500,000 b/d yet, even though they said they were doing so in March. So it's been two months. On Wednesday, we tweeted [LINK] "*Wonder if The Man, Saudi Energy Minister Abdulaziz, subtly reminded Novak to deliver? "As for the current situation, Russia is cutting [output] by 500,000 barrels per day. We have reached [the announced reduction volume] in May," says Russia Deputy PM Novak. #OOTT*." We have to believe that there might have been some reminders that the OPEC+ meeting is two weeks away and Russia should be able to say they delivered as promised, albeit two months late. On Wednesday, TASS reported [LINK] "*Russia reached oil output cuts volume of 500,000 bpd since May — Novak At the end of April, Alexander Novak said that Russia had already reached the volume of voluntary production cuts. Russia has reached the volume of reducing oil output by 500,000 barrels per day (bpd) since May, Russia's Deputy Prime Minister Alexander Novak told reporters. "As for the current situation, Russia is cutting [output] by 500,000 barrels per day. We have reached [the announced reduction volume] in May," he said."*

Oil – G7 Leaders reaffirm unwavering support for Ukraine

Zelensky at G7

The G7 Leaders meeting in Hiroshima is over and we aren't clear exactly what Zelensky was referring to with his tweet yesterday "*Japan. G7. Important meetings with partners and friends of Ukraine. Security and enhanced cooperation for our victory. Peace will become closer today."* Early yesterday morning, we tweeted [LINK] *""Peace will become closer today" says #Zelensky. Zelensky is in Hiroshima to meet G7. No better place to make such an announcement as Hiroshima was a changer for the world. haven't been since the 70s but the feeling is powerful when you walk and think about The Bomb. #OOTT."* We assume it was because the G7 Leaders Communique was clear in its continued support for Ukraine "*We reaffirm our unwavering support for Ukraine for as long as it takes to bring a comprehensive, just and lasting peace*." The other item from yesterday was the US approved F16 training assuming other countries will supply the F16.

Oil – IEA OMR: bullish oil demand and supply tightness view for H2/23

IEA Oil Market Report

On Tuesday, the IEA released its monthly Oil Market Report for May at 2am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) Note our following item

wondering if the IEA's bullish H2 oil outlook should be discounted. (ii) Potential discounting aside, on Tuesday, we tweeted [LINK] "*Coming very soon! "The current market pessimism, however, stands in stark contrast to the tighter market balances we anticipate in the second half of the year, when demand is expected to eclipse supply by almost 2 mb/d" @IEA OMR. #OOTT."* (iii) The overall message is bullish with the OPEC voluntary cuts and higher prices ahead. OECD stocks were at 6-month lows on March 31, caused by industrial activity weakening and weather getting warmer. The IEA forecasts demand expected to be nearly 2mmb/d above supply in H2 2023, which is strongly influenced by China exiting its lockdown. (ii) The IEA made an increase of +2.2 mmb/d in its 2023 oil demand forecast to 102 mmb/d, implying YoY growth of +2.1 mmb/d. Total demand of 102.0 in 2023 mmb/d is a record high and well above pre-Covid of 100.5 mmb/d. (iii) The IEA sees oil markets moving from a surplus in H1 to a deficit in H2. IEA forecasts Q2/23 demand +0.8 mmb/d QoQ to 101.3 mmb/d, Q3/23 +1.7 mmb/d QoQ to 103.1 mmb/d, Q4/23 +0.1 mmb/d QoQ to 103.1 mmb/d. (iv) IEA notes, *"Russian oil exports in March soared to the highest since April 2020"*. IEA estimates Russia oil production was rose +600,000 b/d in March to 8.1 mmb/d. Note this is an average for the month and wouldn't reflect the full impact of Russia saying they cut more at the end of March. (v) The IEA writes *"While oil demand in developed nations has underwhelmed in recent months, slowed by warmer weather and sluggish industrial activity, robust gains in China and other non-OECD countries are providing a strong offset. In 1Q23, OECD oil demand fell 390 kb/d y-o-y, but a solid Chinese rebound lifted global oil demand 810 kb/d above year-earlier levels to 100.4 mb/d. A much stronger increase of 2.7 mb/d is expected through year-end, propelled by a continued recovery in China and international travel. For 2023 as a whole, world oil demand is forecast to rise by an average 2 mb/d, to 101.9 mb/d, with the non-OECD accounting for 87% of the growth and China alone making up more than half the global increase. Meeting those gains may prove challenging as the new OPEC+ cuts could reduce output by 1.4 mb/d from March through year-end, more than offsetting a 1 mb/d increase in non-OPEC+ production."* (vi) The IEA commented *"Global observed oil inventories declined by 7.9 mb in March as a surge in oil on water and a slight increase in non-OECD stocks failed to offset a hefty 56 mb decline in the OECD. Led by a sharp draw in products, OECD industry stocks fell to a six-month low of 2 753 mb to 89 mb below their five-year average. Preliminary April data show a build in on land inventories and a draw in oil on water."* But the message is clear - stocks are moving from surplus to deficit. This is sooner than the IEA previously expected, they thought it wouldn't flip to a deficit until H2/23 and now it looks like it is doing so in Q2/23, although they don't say so specifically. (vii) May OMR noted that non-OPEC supply growth decreased by -1.5 mmb/d YoY for 2023 to 67.0 mmb/d (was 67.1 mmb/d). (viii) Please note numbers provided by Bloomberg are rounded. Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 36: IEA Global Demand Forecast by OMR Report Month

mmb/d	2020	2021	21-20	Q1/22	Q2/22	Q3/22	Q4/22	2022	22-21	Q1/23	Q2/23	Q3/23	Q4/23	2023	23-22
May 23	91.0	97.7	6.7	99.6	98.7	100.7	100.7	99.9	2.2	100.5	101.3	103.0	103.1	102.0	2.1
Apr 23	91.0	97.7	6.7	99.6	98.7	100.7	100.7	99.9	2.2	100.4	101.2	103.1	103.0	101.9	2.0
Mar 23	91.0	97.7	6.7	99.6	98.8	100.8	101.0	99.9	2.2	100.7	101.3	101.9	101.9	101.5	1.6
Feb 23	91.0	97.7	6.7	99.5	98.7	100.7	100.8	100.0	2.3	100.1	101.1	102.9	103.5	101.9	1.9
Jan 23	91.0	97.7	6.7	99.5	98.7	100.7	100.5	99.9	2.2	99.6	100.8	102.9	103.5	101.7	1.8
Dec 22	91.0	97.7	6.7	99.5	98.7	100.7	100.8	99.9	2.2	99.7	100.6	102.7	103.4	101.6	1.7
Nov 22	91.0	97.7	6.7	99.4	98.7	100.3	100.7	99.8	2.1	99.6	100.5	102.3	103.0	101.4	1.6
Oct 22	91.0	97.7	6.7	99.4	98.5	100.0	100.6	99.6	1.9	99.5	100.4	102.1	102.9	101.3	1.7
Sep 22	91.0	97.7	6.7	99.5	98.4	99.9	100.9	99.7	2.0	100.2	101.0	102.6	103.3	101.8	2.1
Aug-22	91.0	97.6	6.6	99.4	98.5	100.0	100.8	99.7	2.1	100.3	101.1	102.5	103.3	101.8	2.1
July 22	91.0	97.5	6.5	99.3	97.8	99.4	100.2	99.2	1.7	99.8	100.8	102.0	102.7	101.3	2.1
June 22	91.0	97.5	6.5	99.3	98.2	99.8	100.4	99.4	1.9	100.5	101.1	101.9	102.7	101.6	2.2
May 22	91.0	97.5	6.5	98.8	98.2	100.0	100.4	99.4	1.9						
Apr 22	91.0	97.5	6.5	98.5	98.3	100.1	100.5	99.4	1.9						
Mar 22	91.0	97.5	6.5	99.0	98.8	100.2	100.6	99.6	2.1						
Feb 22	91.0	97.4	6.4	98.9	100.1	101.7	101.6	100.6	3.2						
Jan 22	91.0	96.4	5.4	97.8	99.3	100.9	100.8	99.7	3.3						
Dec 21	91.0	96.2	5.2	97.9	99.1	100.8	100.3	99.5	3.3						

Source: EIA, Bloomberg, SAF

Oil – Should we discount the IEA's H2 bullish oil demand call?

Is IEA under indirect political pressure

Above, we recap the IEA's bullish view of oil demand and supply for H2/23, but we have to wonder if there is indirect political pressure being put on the IEA for their numbers to support any western, especially the US, hopes to try to influence OPEC+ June 4 decision. (i) We had not thought about this potential until listening to Neil Atkinson (Former head of IEA Oil Markets Division) speak on the Gulf Intelligence daily podcast on Wednesday. We have heard him speak many times on this podcast and he always seems very careful and precise in his words. His response here is very much in line with how he always speaks. So when you take into account the speaker, it just jumped at us that what he seems to messaging is that it is different now at IEA and the implication is indirect political pressure. Again, that is assuming that Atkinson was careful in his wording and not just sloppy. It's worth a listen to et your own view. Atkinson said that when did it, "*never on any one occasion was I, as the editor of the Oil Market Report, was put under any* pressure to skew the numbers one way or the other". And then he gives his statement about today "I do not believe that the numbers that the oil team are putting out at the IEA are influenced by direct political pressure from above. I just don't believe that." A careful speaker made sure he inserted the word "direct" political pressure. That is raises our antenna. (ii) The issue is around the IEA OMR Tuesday (noted above) that surprised most by its bullish call on oil demand in H2 and warning of a tight supply market. We have been noting how the IEA seems to have shifted from its original role to one of being the big cheerleader for the pro energy transition side with many caveated views that Net Zero can be accomplished. But after thinking about Atkinson's apparent messaging, we have to wonder if the IEA came out with this very bullish oil demand view and warning ahead of the OPEC+ June 4 meeting to try to influence OPEC+ that they can't make any more cuts and that the IEA numbers suggest OPEC+ needs tokin add more barrels back now. (iii) Recall the implication a few weeks ago when the OPEC+ June 4 meeting became an in-person meeting, no one, including us, believed Saudi Energy Minister Abdulaziz would call an in-person meeting to say no change. Rather, we assumed that Abdulaziz is having an in-person meeting to make some sort of statement. And since the OPEC+ voluntary cuts, the risk to the world economy and China's pace of recovery is worse ie. no reason to add more oil. (iv) Below is the transcript we made but it doesn't do just justice to Atkinson's clear emphasis on words like "direct". It's worth a listen because if anyone is going to know the difference on political pressure, direct or indirect, it should be Atkinson.

SAF transcript of Neil Atkinson's (former IEA) comments on political pressure

It's worth a listen to Atkinson's comments. Here is the SAF Group created transcript of comments by Neil Atkinson (Former Head of Oil Markets Division, International Energy Agency) with host Sean Evers (Managing Director, Gulf Intelligence) on Gulf Intelligence Daily Energy Markets May 17th Podcast. [LINK] Items in "italics" are SAF Group created transcript. Evers "….. *they [IEA] do seem to be sliding. I remember all the years, one would say you can always rely on the IEA numbers and not so much on the OPEC numbers because they were biased in their own political ways. Everyone reporting their own numbers though. Now it seems things have slipped, flipped the other way around. If you want to respond to that or not, your thoughts*". Atkinson "*Yeah, sure, I have no connection to the IEA. Can say exactly what I like. My experience in producing 62 Oil Market Reports for the IEA was that never on any one occasion was I, as the editor of the Oil Market Report, was put under any pressure to skew the numbers one way or the other. Now, when writing the commentary on the market, which was my little piece of authorship every month, Yes, you knew there were limits. You can't overtly attack say OPEC and say a decision based taken is going to destroy the global economy or anything like that. You can make a suggestion that higher prices are damaging and put it in a diplomatic way. There are limits. So I understood that. …….. the IEA remains on the high side [for Oil demand]. I do not believe that the numbers that the oil team are putting out at the IEA are influenced by direct political pressure from above. I just don't believe that*."

End of an era – the IEA used to be the most important view on energy

After hearing Neil Atkinson's above comments, it feels like the final confirmation of what we have been noting – it's the end of an era where the IEA's view on oil markets was considered the go-to view on oil. And readers weren't wondering if there was indirect political pressure to message a certain way, including in their forecasts. I was an E&P executive in the 80s/90s but the IEA wasn't part of everyday E&P thoughts. But when I joined he sellside in the late 90s for energy research and later energy investment banking, I very quickly realized the critical role the IEA played for the analysis and interpretation of oil markets as their focus wasn't on selling a message or theme, but giving data and analysis focused on what was important to the world - energy security. Don't forget the IEA was formed after the 1973/74 Arab Oil Embargo to provide critical analysis for the US and other oil consuming countries. The IEA was the bible and Robert Priddle (IEA Executive Director 1994-2002) was the Charles Schwab of oil markets – when he talked, people listened. Partly it was the world, where we didn't have twitter and media and he didn't have to, or chose not to, weigh in publicly on everything, everyday to put a pro this or pro that spin. So markets listened because they didn't have to look at Priddle and the IEA's message because their focus and mandate was clear. Atkinson's comments make me feel it is the end of an era.

Oil – Reminder OPEC+ 1.157 mmb/d voluntary cuts were to start May 1

We remind May 1 was when the OPEC+ voluntary cut (production adjustments) of 1.157 mmb/d were to start and to run thru 2023. This was the breaking news in our April 2, 2023

OPEC+ voluntary cuts

Energy Tidbits memo, which OPEC followed up with their April 3, 2023 press release. [LINK] . These voluntary cuts were in addition to Russia's prior announcement of cutting 500,000 b/d vs Feb 2023 production and that would be until the end of 2023. The voluntary cuts were Saudi Arabia 500,000 b/d, Iraq 211,000 b/d, UAE 144,000 b/d, Kuwait 128,000 b/d, Kazakhstan 78,000 b/d, Algeria 48,000 b/d, Oman 40,000 b/d, and Gabon 8,000 b/d.

Oil – Two weeks until OPEC+ in-person June 4 meeting

OPEC+ June 4 in-person meeting

We are now two weeks away from OPEC+ June 4 ministerial meeting in Vienna. At first, there was no indication that OPEC+ would have an in-person meeting, rather OPEC watchers were given the expectation for another virtual meeting. However, that changed last week, when key OPEC watchers reported that the meeting was now an in-person meeting at the OPEC offices in Vienna. As we wrote in last week's (May 7, 2023) Energy Tidbits memo, we have trouble believing that OPEC+, in particular Saudi Energy Minister Abdulaziz, would change from a virtual to an in-person meeting if they didn't expect or, at least set the expectation, for something other than a no change. Rather we would think Abdulaziz will do something other than no change, whether it be to change to their production levels, either voluntary or via quota changes, or some clear signal on more OPEC support for oil prices. It's why, on May 3, we tweeted [LINK] "*Can't see "The Man" Saudi Energy Minister Abdulaziz having an in-person OPEC meeting June 4 in Vienna to say no change. His track record is clear: great read of supply/demand, surprises are to support Oil. Especially given the below #IMF breakeven prices ie. KSA $80.90. #OOTT."*

Are we giving too much credit to Abdulaziz's track record?

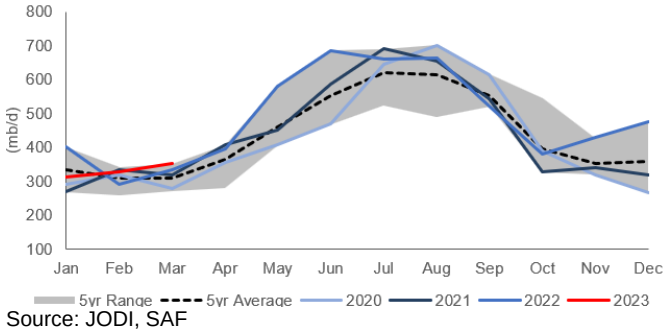
We have trouble believing Saudi Energy Minister arranged to have an in-person meeting to have the visuals of all the OPEC+ ministers there and say no change. It just isn't his track record. Wh isn't as clear this time is what does he want the message to be. His track record is clear that he takes actions to support oil prices and, as he has said before, he likes to leave the gamblers on oil prices "*ouching like hell.* Here is what we wrote in our Oct 2, 2022 Energy Tidbits memo that was just before the Oct 5 OPEC+ meeting that resulted in the 2 mmb/d cut. "*It's hard not to expect something significant at OPEC+ meeting on Wed given the last-minute change to the first in-person meeting since Covid. Surely Saudi Energy Minister Abdulaziz isn't organizing this public show of force to say no change to OPEC quotas. Rather, we have to believe the better odds are for a significant cant. The last in-person OPEC+ meeting was March 2020. OPEC+ surprised yesterday morning with the last minute change to have its Wed Oct 5 meeting be the first in-person meeting since Covid. [LINK]. Early yesterday morning, we tweeted [LINK] "Oops! Abdulaziz wants to some gamblers on #Oil price "ouching like hell". Last minute change to a 1st post-Covid in-person #OPEC+ Oct 5 meeting. Must want visuals for something significant ie. a bigger #Oil supply cut. That's why he is "The Man". Thx @Amena__Bakr. #OOTT." Saudi Energy Minister Abdulaziz has done a great job of having short OPEC+ meetings because of his prep work in building a consensus before the actual meeting. We can't remember the last time there was a hint of a contentious meeting."*

Oil – Saudi use of oil for electricity up small in Mar ie., less oil available for export

Saudi oil use for electricity in Mar

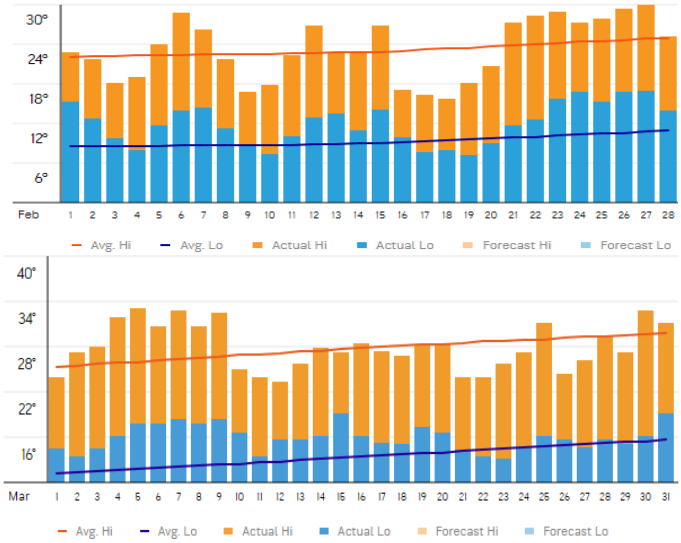
The key theme for winter months was that Saudi would be able to export more oil as it uses less oil for electricity vs the summer months. However, in normal years, we wouid expect this theme to reverse as the data starts to reflect electricity usage for warmer months in the spring and summer. With Mar being even closer to spring and the weather starting to warm up, it was no surprise that Saudi oil use for electricity was up small again in March. Note that a normal peak to trough decline is ~400,000 b/d. If there is less oil used for electricity, then there is more oil for export and vice versa. There is one additional wildcard that imports isn't in the JODI data but could lead to more Saudi oil for export -the JODI data doesn't include how much Russian fuel oil Saudi imports. And the reports are that Saudi Arabia continues to ramp up imports of Russian fuel oils. If Saudi imports more Russian fuel oil, it would mean Saudi refineries could produce at lower levels i.e. use less oil. The JODI data for Saudi Arabia oil supply and demand for March was updated on Wednesday. Saudi used more oil for electricity in March vs February. The increased electricity usage was primarily driven by daily temperatures being at or above the average high throughout most of the month. Notably, temperatures throughout the first week of March were much warmer than normal. It is important to note that March experienced warmer temperatures than February and warmer weather means more air conditioning/electricity demand. Oil used for electricity generation in March was 354,000 b/d (vs March 2022 of 335,000 b/d) and February was 329,000 b/d (vs February 2022 of 291,000 b/d). Below are the AccuWeather Temp maps for Riyadh for March and February. We but look for oil used toward electricity to increase as we move closer to peak cooling season.

Figure 37: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI, SAF

Figure 38: Riyadh Temperature Recaps for February (top) and March (bottom)



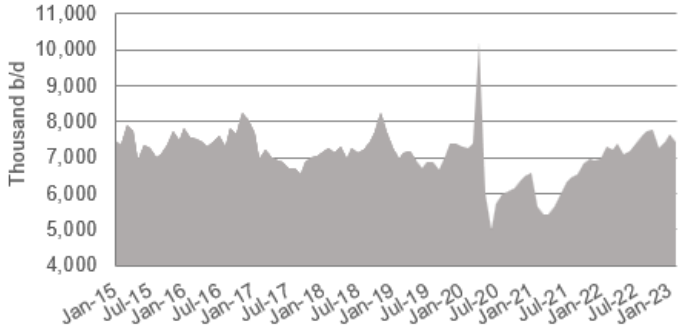
Source: AccuWeather

Oil – Saudi oil exports up +68,000 b/d to 7.523 mmb/d in March

Saudi oil exports slightly up

This month's JODI data is a good illustration to remind that Saudi can also build oil inventories and not just increase oil exports if they have a lesser need for domestic consumption. And we believe that this is due to increasing imports of Russian fuel oil. In Mar, refiner intake increased +289,000 b/d to 2.73 mmb/d, oil used for electricity increased by +14,000 b/d to 0.354 mmb/d and production increased by +14,000 b/d MoM but remained relatively flat MoM at 10.464 mmb/d. So, in theory, Saudi Arabia could have more oil for export. This was the case as oil exports in March were 7.523 mmb/d, up +68,000 b/d MoM from 7.523 mmb/d in Feb. Normally, we have found that Saudi Arabia takes advantage of lesser need for oil for electricity in winter months as an opportunity to increase oil exports without increasing production. As noted below, there looks to be some missing barrels as, in theory, their oil inventories should have increased more than what was reported in the JODI data.

Figure 39: Saudi Arabia Oil Exports (mb/d)



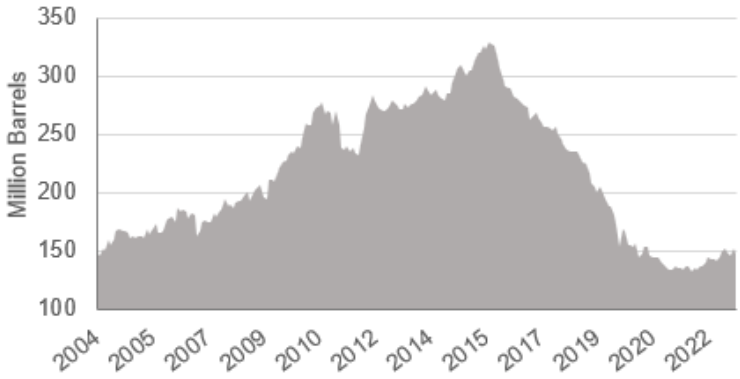
Source: Jodi, SAF

Oil – Saudi oil inventories only -4.492 mmb MoM because of Russian imports

Saudi oil inventory data

It looks like there was 223,000 b/d of missing barrels in the March numbers, which we assume is primarily linked to increasing imports of Russian oil and fuel oil. There is always a plug but it isn't normally this much. The JODI data also reported Saudi oil inventory decreased -4.492 mmb MoM to 147.420 mmb as at March 31. But it shouild have been a larger draw on inventories. Exports were +68,000 b/d MoM, crude oil intake to refineries were +289,000 b/d MoM and oil used for electricity was +25,000 b/d MoM. This is increased use of 382,000 b/d MoM. Production was only +14,000 b/d MoM. So we would have expected a draw from inventory close to 368,000 b/d in March. Yet JODI data was a draw of 145,000 b/d, which leaves a difference of 223,000 b/d.

Figure 40: Saudi Arabia Crude Oil Inventories (mmb)



Source: Jodi, SAF

Oil – Still no visibility for restart Iraq/Kurdistan oil thru Turkey

Turkey holds up Kurdistan oil exports

The key conclusion from our update this week is unchanged – there is no visibility to when Kurdistan/Iraq oil will resume exports via Ceyhan in Turkey. As of our 7am MT news cut off, we have not seen any reports giving any indication of when there will be a resumption of ~450,000 b/d of Iraq/Kurdistan oil exports via Ceyhan (Turkey). That isn't unexpected given

the Turkey Presidential election has moved to a May 28 runoff and no one is expecting any restart until sometime after the runoff. And even then, the expectation is that Turkey still wants to negotiate on the award against them and knows their best leverage is while they are holding up a resumption of exports.

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

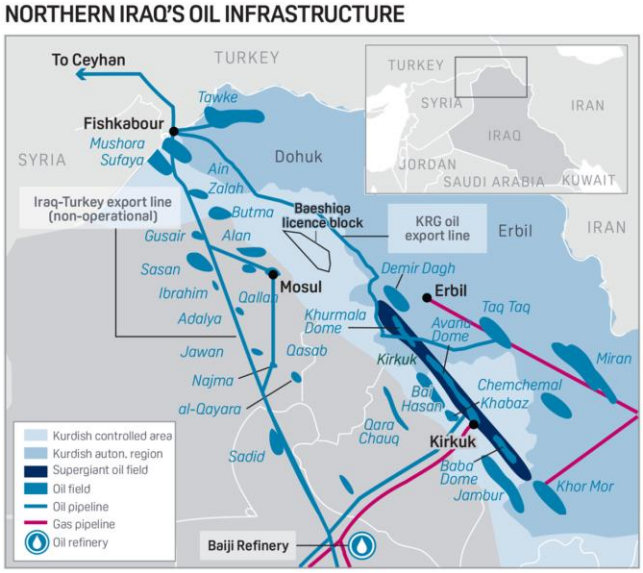
It sounds like the only production being shut-in are the Kurdistan oil volumes and that Iraq has been able to move their oil that normally goes north via Turkey to their southern export port. Here is what we wrote in our May 7, 2023 Energy Tidbits memo. "*One of the supply surprises to the negative from 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 41: Northern Iraq's oi infrastructure map from 2020



Source: Platts

Oil – Libya NOC Chair sees production about 1.3 mmb/d by yr-end

Libya targets 1.3 mmb/d for yr end

For the past few months, we have been expecting to see some indication from the Libya National Oil Corporation of where they see oil production growth in 2023, especially since we are almost at the end of May. Libya oil production has been steady right around 1.2 mmb/d. On Friday, Bloomberg reported that Libya NOC Chair Farhat Bengdara expects production to reach ~1.3 mmb/d by yr-end 2023 and, with $17b, could reach 2 mmb/d within five years. We have been expecting a higher 2023 exit production rate given the Feb comments from one of the Libya NOC operating companies (see following item) that production to reach 1.5

mmb/d by yr-end 2023. Bloomberg wrote "*Libya is aiming to boost oil production by about 8% by December, a level that would catapult it to the highest in a over a decade. North Africa's biggest producer should be able to pump about 1.3 million barrels a day by the end of the year, Farhat Bengdara, chairman of the National Oil Company, said in an interview. Avoiding field closures and steps like improving oil workers' pay already helped boost output by nearly a quarter since January 2022 to 1.2 million barrels a day now, he said. Libya has been dogged by political turmoil ever since the overthrow and killing of leader Moammar Al Qaddafi in 2011, with a political stalemate pitting rival governments and factions against each other."* And "*Bengdara said that $17 billion of investment across 45 projects would allow the National Oil Corp. to raise production to 2 million barrels a day within five years. If sustained, that would far exceed anything achieved during Qaddafi's rule."* Our Supplemental Documents package includes the Bloomberg report.

02/14/23, Libya's AGOCO Chair forecast production to hit 1.5 mmb/d in 2023

As noted above, we have been expecting the Libya NOC to come out with a higher production estimate to end 2023. The Libya National Oil Corporation is really the top level company with various regional operating companies from both the east and west. One of the operating companies is Arabian Gulf Oil Company (AGOCO) that looks like it is producing ~250,000 b/d or about 20% of Libya's oil production. In Feb, the AGOCO Chair forecast Libya oil production would reach 1.5 mmb/d by year-end 2023. Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. "*We have been reporting on how Libya has surprisingly been able to keep oil production steady ~1.2 mmb/d. At the same time, we have always highlighted the big near term upside potential to its oil production if east vs west armed fighting can stay on the sidelines as that will see the return of foreign capital for both natural gas and oil. But even before foreign capital, the Libya National Oil Corporation has many low risk development opportunities to increase oil production. On Tuesday, the Libya Herald reported [LINK] on comments from one of Libya NOC's operating companies, Arabian Gulf Oil Company (AGOCO) Chairman Salah Gatrani. The Libya Herald wrote "The continuation of the Arabian Gulf Oil Company's (AGOCO) development operations at this pace will inevitably lead to Libya reaching a production rate of more than 1.5 million barrels of oil per day in 2023, AGOCO chairman Salah Gatrani said in an exclusive statement to Libya Herald. He said this was because of the stability witnessed by the country in general, and by the oil sector in particular. Therefore, he continued, the Gulf Company has developed its own plan within the efforts of the National Oil Corporation (NOC). Libya has been unable to maintain production beyond 1.2 million bpd. Gatrani was commenting to Libya Herald following Sunday's AGOCO's meeting on developing reserves and increasing oil production in the sector companies, attended by relevant AGOCO and NOC management. The AGOCO chairman said that his company has already begun to implement the plan prepared by the NOC to raise production and increase reserves." Our Supplemental Documents package includes the Libya Herald report."*

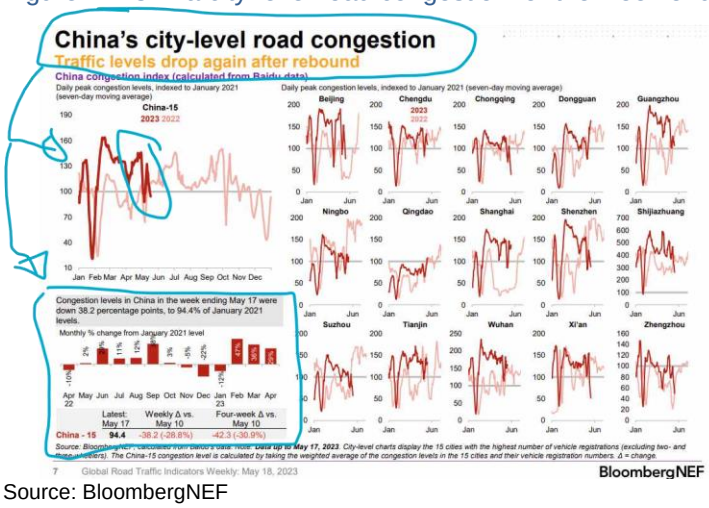
Oil – It's only 1 week, but is China city-level road congestion strength cracking?

China city traffic congestion

We were surprised by the BloombergNEF Global Road Indicators data for China traffic the week of May 17. On Thursday, we tweeted [LINK] *"Is China now seeing a crack in the post Covid restrictions strength of people driving? China city traffic congestion -38% WoW, and*

down YoY & vs Jan 2021. est of world was up. Asia Pacific Ex China +6% WoW, now 11% <2019. EU +6% WoW, 13% >2019. NA +5% WoW, back to 2019. Thx @BloombergNEF Global Road Traffic Indicators." City congestion was up WoW in all regions on the world except for a big WoW decrease in China city level road congestion. The big -38.2% WoW in China gave back and more the prior week +35.4% WoW increase in China city congestion following the May Day holiday. Have to question if people driving in China is cracking. China traffic congestion just moved to down YoY and back below Jan 2021. BloombergNEF only compares to Jan 2021 and not pre-Covid. And we would assume pre-Covid traffic congestion was higher than Jan 2021. Our tweet also included the below BloombergNEF graphic on China road congestion.

Figure 42: China city-level road congestion for the week ended May 17



Source: BloombergNEF

Oil – China says low possibility of large-scale Covid-19 epidemic outbreak

China on potential Covid-19 outbreak

We haven't been digging into the risk of Covid-19 or other viruses being a factor in the stalling out of the Chinese economy because when we highlighted in late April, no one, especially any commentators on the business channels thought it was worth following. See below on what we wrote in our April 30, 2023 Energy Tidbits memo. There are increasing cases but so far, we aren't seeing any reports of hospitalization issues or deaths. But we will still monitor. (i) There is nothing to specifically indicate a potential issue, but we put back on our watch list after the well followed on Twitter, Josh Young, replied to our above tweet on the big drop in China traffic with a reply [LINK] "*I'm hearing about another wave of Covid in China, which is coinciding with a drop in road traffic this past week. These are temporary, and there are no announced lockdowns so far. But worth being aware of.*" (ii) Based on the comments from China state media, there are increasing cases, but the cases have been mild and China sees low possibility of a large-scale COVID-19 outbreak. (iii) 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." (iv) On Thursday, Global Times reported [LINK] "*The currently circulating XBB strain variant is a recombinant of Omicron. The data show that its transmissibility and immune escape ability are stronger than that of the early circulating Omicron variant, but there is no significant changes in its pathogenicity, the National Health Commission said in a report on Wednesday via its WeChat account."* And "*Since December 9, 2022, the positive rate of COVID-19 nucleic acid testing in the country increased at the beginning and then decreased, according to the latest report released by the Chinese Center for Disease Control and Prevention on April 29. The number of COVID-19 cases decreased to 2,661 on April 20, and increased in the week from April 21 to April 27, to 6,752 on April 27, said China CDC. The main COVID-19 strain circulating in Guangzhou, South China's Guangdong Province is XBB1.9.1. According to current data from fever clinics in the city, 20 to 25 percent of fever patients are infected with COVID-19, respiratory disease expert Zhong Nanshan said on May 15, according to media reports."* (v) Yesterday, South China Morning Post (Hong Kong, non state media) reported [LINK] "*Coronavirus Hong Kong: daily caseloads hit 10,000, but health chief says outbreak manageable amid high vaccination rate, lower Covid severity. Secretary for Health Lo Chung-mau warns residents to stay vigilant however as 'there will always be another epidemic'.* And "*Up to 10,000 Hongkongers are contracting Covid-19 every day, according to the city's health minister, although one respiratory medicine expert estimates the caseload may be five times that figure. Despite the surge, Secretary for Health Lo Chung-mau expressed confidence that the outbreak remained manageable due to the population's high vaccination rate and the lower severity of the illness. "According to the estimates of the Health Bureau, there are more than 10,000 new cases of coronavirus infections in Hong Kong every day," Lo said in an interview with mainland Chinese media on Friday. "There will always be another epidemic."* (vi) We will continue to monitor.

04/30/23: No one seemed worried about China's virus update last Sunday night

Here is what we wrote in our April 30, 2023 Energy Tidbits. "*No one seems too worried about China's virus update last Sunday night. Last Sunday night, we thought China's virus update would be a big market and news story this week, but that doesn't seem to be the case. If anything, the comments we heard on Bloomberg TV on Tues night almost seemed to suggest the reports were not big deal. The reason why we noted it was that it wasn't from rumors or third parties, rather it was from China state media – Global Times. Early Monday morning, we tweeted [LINK] "#Oil markets back on China virus info digging again? China state media. China CDC found 42 cases of XBB.1.16 new variant, the dominant variant in India since Mar. Also not "yet" in 2nd wave of COVID-19. but Covid-19 cases increasing. #OOTT." We would have assumed that others would have a similar view of a report from China state media on a virus that the working assumption would have been that the virus numbers are understated. But, at least for now, no one else seems concerned on the Global Times report especially give the title of the report "China not yet in middle of second wave of COVID-19: epidemiologists". Not "Yet" sounded like a warning to us. Global Times wrote [LINK] "China not yet in middle of second wave of COVID-19: epidemiologists." The Chinese Center for Disease Control and Prevention*

(China CDC), which has been monitoring COVID-19 infection numbers and new variants, said on Sunday that health departments reported 2,661 positive COVID-19 cases nationwide on Thursday. The COVID-19 positive rate for Thursday was slightly higher than it was on April 13. On March 13, the China CDC announced that 1.3 percent of those who took nucleic acid tests were positive, and the rate on Thursday was 1.7 percent." And "The China CDC claimed it had detected 12 new variants in this country. The center had found 42 cases of XBB.1.16 - referred to as "arcturus"—which has been the dominant variant in India since March. The China CDC assured the public, saying that there are a very small number of XBB.1.16 carriers, which have yet to form a transmission trend. Although the scale won't be as huge as the previous wave, Zhang still called for stockpiling of small molecule antivirals of COVID-19, and at the same time establishing a model that could treat COVID-19 patients within 48 hours." Our Supplemental Documents package includes the Global Times report."

Oil – China scheduled domestic flights for May/Jun still well below Mar 28 expectation

China domestic flights

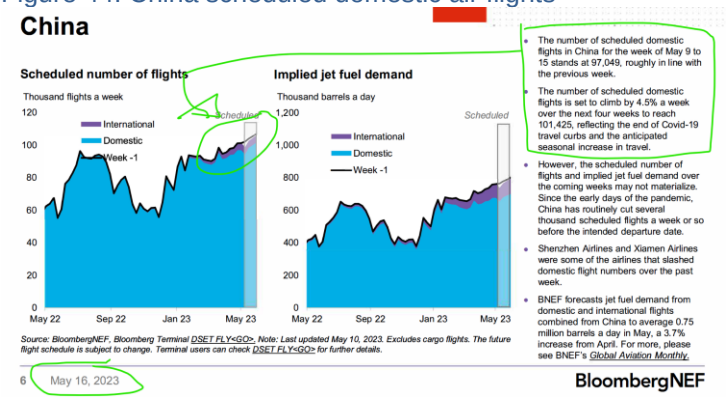
The Chinese mobility indicators continue to point to a stalling or at least a slower than expected China recovery in China domestic scheduled flights in May and continuing into June. China scheduled domestic flights are increasing but at a much slow rate of increase than expected at the end of March. On Tuesday, we tweeted [LINK] "*Much slower increase in China domestic flights than expected at end of Mar. China scheduled domestic flights flat WoW for May 9-15 to 97,049. Scheduled next 4-weeks is increasing to 101,425. BUT that is -14.9% vs 119,180 flights that were expected on Mar 28 for Apr. Thx @BloombergNEF Claudio Lubis #OOTT."* China's scheduled domestic flights were down immaterial WoW and the negative or the stalling China domestic air travel remains in that the scheduled next 4 weeks of domestic flights for the last two weeks of May and the first two weeks of June is still well below the next 4 weeks flights forecast from March 28 for April of 119,180 flights. This big drop from the March 28 forecast for April and May is the negative as it is showing the recovery seems to be stalling out or at least is growing at a much slower than expected pace vs March 28. This is still saying the big jump up in scheduled domestic flights for April didn't happen and not expected to happen in May or June. Rather April was a more modest increase and May is expected to be more of the same. BNEF wrote "*The number of scheduled domestic flights in China for the week of May 9 to 15 stands at 97,049, roughly in line with the previous week. • The number of scheduled domestic flights is set to climb by 4 .5% a week over the next four weeks to reach 101 ,425 , reflecting the end of Covid-19 travel curbs and the anticipated seasonal increase in travel."* Our tweet included the BloombergNEF chart and our listing of WoW changes from the prior BloombergNEF reports.

Figure 43: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

May 9-15: basically flat at 97,049 flights
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW
Apr 11-17: +0.7% WoW
Apr 3-10: -4.2% WoW
Mar 28-apr 3: +6.8% WoW
Mar 21-27: +1.5% WoW
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 44: China scheduled domestic air flights



Source: BloombergNEF

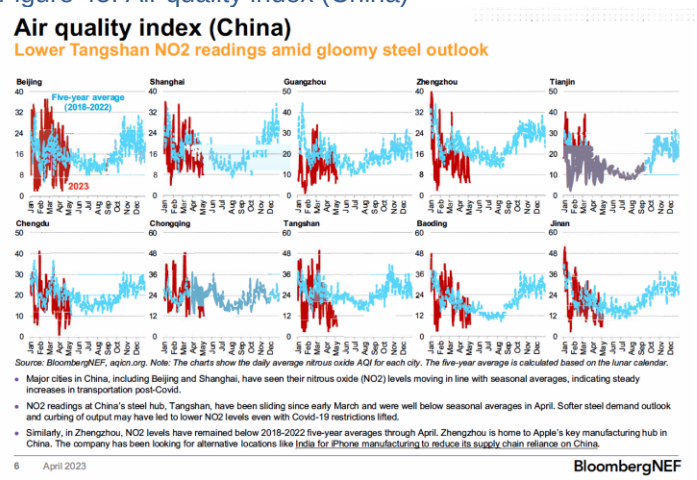
Oil – Air quality levels show difference in China reopening cities vs manufacturing

China air quality index

We also look to pollution as an indicator for the China recovery. On Thursday, we tweeted [LINK] "*Uneven China recovery. NO2 levels show split in China recovery. People are back driving in the major cities. But steel & manufacturing hubs lag as indicated by NO2 levels still below even with Covid-19 restrictions lifted. Thx @BloombergNEF Industrial Metals Monthly. #OOTT."* Our tweet included the below graphs from BloombergNEF's May 18 Industrial Metals Monthly. We think these graphs provide this activity indicator – people in major cities are driving, but steel/manufacturing activity is down. BloombergNEF wrote "*Major cities in China, including Beijing and Shanghai, have seen their nitrous oxide (NO2) levels moving in line with seasonal averages, indicating steady increases in transportation post-Covid. • NO2 readings at China's steel hub, Tangshan, have been sliding since early March and were well below seasonal averages in April. Softer steel demand outlook and curbing of output may have led to lower NO2 levels even with Covid-19 restrictions lifted. • Similarly, in Zhengzhou,*

NO2 levels have remained below 2018-2022 five-year averages through April. Zhengzhou is home to Apple's key manufacturing hub in China. The company has been looking for alternative locations like India for iPhone manufacturing to reduce its supply chain reliance on China."

Figure 45: Air quality index (China)



Source: BloombergNEF

Oil – China monthly oil imports don't tell the full story ie. also inventory changes

Strong China oil demand in April

We were reminded on Friday that China oil consumption in April was actually better than most expected in April because China drew on inventories to fill domestic demand for refined products. Earlier this morning we tweeted [LINK] "*China monthly #Oil imports don't tell full story. @ClydeCommods: April refinery processing was really strong, a good positive demand signal. But China oil imports were weak. Rather China dipped into inventories to feed to refineries. see 👇SAF transcript.#OOTT @gulf_intel."* Our tweet included the transcript we made of the comments by Clyde Russell (Asia Commodities & Energy Columnist, Thomson Reuters) on the Gulf Intelligence PODCAST: Daily Energy Markets – May 19th. [LINK] Items in "*italics*" are SAF Group created transcript. Russell "… *we have seen some growth in [oil] imports in China. But I will say that people tend to ignore, they only look at one aspect of, one piece of the puzzle, which is what Chinese imports are doing. They were weak in April, let's be honest. They're going to recover in May. You've got to actually look at how the Chinese do things. Yes, the refinery processing was really strong in April. That's a good positive demand signal because it shows their domestic demand is really absolutely starting to rise. The Chinese didn't actually necessarily import any more. That's probably because they arranged the cargoes several months in advance and they decided to run the refineries harder than they had expected to in April. But they did dip into inventories for the first time since November 2021. That's an 18-month gap where they built inventories every month, albeit in small amounts and now they actually dipped into them. What you are actually seeing is that the Chinese can respond to domestic demand growth by dipping into inventories, they don't necessarily have to import any more. So whether they import more is always going to be a price thing. So if the price remain sort of anchored around the $75-80 a barrel, I expect the Chinese will import more. But if it goes back up to $100, then they'll dip*

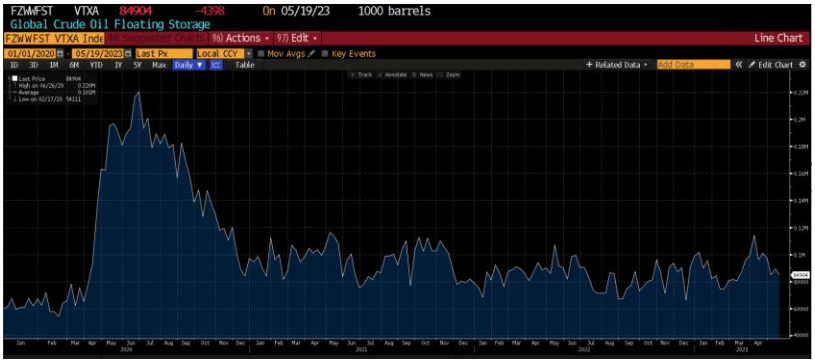
into inventories again because they will say $100 oil is not appropriate for the world's current economic conditions."

Oil – Vortexa crude oil floating storage at May 19 was 84.90 mmb, -4.40 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 May 13 at 9am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for May 19 at 84.90 mmb, which was -4.40 mmb WoW vs upwardly revised May 12 of 89.30 mmb. Note May 12 was revised +5.05 mmb vs the 84.25 mmb posted on Bloomberg as of 9am MT on May 13. (ii) Please note our tweet yesterday [LINK] on Vortexa floating storage highlighted the big -29.46 mmb drop in floating storage vs the recent Apr 7, 2023 peak. And we wrote "*See 👇table, -29.46 mmb vs 04/07, is this Iran selling floating storage, RUS oil being rerouted after floating & being transferred?"* We discuss this more in a couple items in this memo. (iii) Other the last two weeks, the prior revisions were less than 2 mmb The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am on May 13 are as follows: May 12 revised +5.05 mmb. May 5 revised +3.96 mmb. Apr 28 revised +1.86 mmb. Apr 21 revised +0.10 mmb. Apr 14 revised -0.06 mmmb. Apr 7 revised -2.00 mmb. Mar 31 revised -1.97 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 95.42 mmb, which is down vs last week's then seven-week average of 96.45mmb. (v) (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) May 19 estimate of 84.90 mmb is -135.33 mmb vs the Covid peak on June 26, 2020 of 220.34 mmb. (vii) 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. (viii) May 19 estimate of 84.90 mmb is +19.29 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) May 19 estimate of 84.90 mmb is -6.76 mmb YoY vs May 20, 2022 of 91.66 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT May 20, 9am MT May 13 and 9am MT May 6.

Figure 46: Vortexa Floating Storage posted on Bloomberg May 20 at 9am MT



Source: Bloomberg, Vortexa

Figure 47: Vortexa Estimates Posted May 20 9am MT, May 13 9am MT, May 6 9am MT

Posted May 20, 9am MT

FZWWFST VTXA Inde 94) Sug
01/01/2020 - 05/19/2023
1D 3D 1M 6M YTD 1Y 5Y

	Date	FZWWFST VT... Last Px
Fr	05/19/2023	84904
Fr	05/12/2023	89302
Fr	05/05/2023	84925
Fr	04/28/2023	97375
Fr	04/21/2023	100.845k
Fr	04/14/2023	96206
Fr	04/07/2023	114.358k
Fr	03/31/2023	99009
Fr	03/24/2023	95814
Fr	03/17/2023	86464
Fr	03/10/2023	80745

May 13, 9am MT

FZWWFST VTXA Inde 94) Sug
01/01/2020 - 05/12/2023
1D 3D 1M 6M YTD 1Y 5Y

	Date	FZWWFST VT... Last Px
Fr	05/12/2023	84249
Fr	05/05/2023	80996
Fr	04/28/2023	95522
Fr	04/21/2023	100.75k
Fr	04/14/2023	96272
Fr	04/07/2023	116.357k
Fr	03/31/2023	100.981k
Fr	03/24/2023	97478
Fr	03/17/2023	86636
Fr	03/10/2023	80804
Fr	03/03/2023	81511

May 6, 9am MT

FZWWFST VTXA Inde 94) Sug
01/01/2020 - 05/05/2023
1D 3D 1M 6M YTD 1Y 5Y

	Date	FZWWFST VT... Last Px
Fr	05/05/2023	72541
Fr	04/28/2023	93501
Fr	04/21/2023	96627
Fr	04/14/2023	95425
Fr	04/07/2023	117.039k
Fr	03/31/2023	100.406k
Fr	03/24/2023	96842
Fr	03/17/2023	86070
Fr	03/10/2023	80467
Fr	03/03/2023	81210
Fr	02/24/2023	80599

Source: Bloomberg, Vortexa

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 Europe -4.84 mmb, Other +2.90 mmb, and West Africa -2.49 mmb. Note Asia WoW was only +1.28 mmb, but that is because May 12 was revised up big +8.54 mmb vs what was posted on May 13 at 9am MT. 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 May 5 that was posted on Bloomberg at 9am MT on May 13.

Figure 48: Vortexa Floating Crude Oil Storage Weekly Changes by Region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	May 19/23	May 12/23	WoW	May 12/23	Apr 7/23	May 19 vs Apr 7
Asia	50.77	49.49	1.28	40.95	59.48	-8.71
Europe	4.34	9.18	-4.84	10.31	23.80	-19.46
Middle East	3.74	4.94	-1.20	7.70	5.91	-2.17
West Africa	5.84	8.33	-2.49	7.92	5.96	-0.12
US Gulf Coast	0.00	0.05	-0.05	0.39	3.17	-3.17
Other	20.21	17.31	2.90	16.98	16.04	4.17
Global Total	84.90	89.30	-4.40	84.25	114.36	-29.46
Vortexa crude oil floating storage posted on Bloomberg 9am MT on May 20						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil – Is it Russia/Iran floating oil that is impacting the Vortexa floating oil data?

Is it Russia and Iran floating oil?

Our May 7, 2023 Energy Tidbits memo noted how Saudi Arabia is increasing imports of Russian oil and petroleum products, Russian oil getting rerouted out of the Middle East, and Iran is reportedly selling its floating storage/very slow in transit oil at discounted prices. When we look at the Vortexa data, we have to wonder if these two factors are part of what is at play

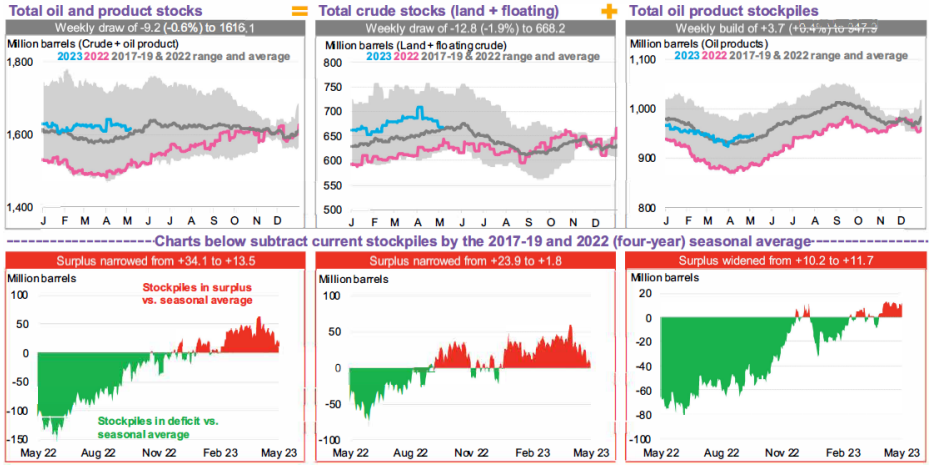
in the Vortexa data. Floating crude oil recent peak was on Apr 7 at 114.36 mmb, and May 19 is down -29.46 mmb. This includes Asia -8.71 mmb and Eurpe -19.46 mmb since Apr 7. We have to wonder if these large declines represent Russian and Iran oil being rerouted to Asia and Europe, and Iran selling down its floating storage and very slow moving oil in Asia. Note the above table shows the floating storage by region at Apr 7 and the changes vs May 19 floating storage.

Oil - BNEF: global oil and product stocks surplus narrowed WoW to 13.5 mmb

BNEF's global oil inventories

One of the negatives for oil going into 2023 was that there was expected to be surplus oil in Q1 and a building of global oil inventories. That's happened. So, a key data point to watch has been if this build turns into a draw in Q2/23. And we remind that there are weekly changes that can flip flop but the key will be to watch the trend. For those with a Bloomberg terminal we recommend flipping through BloombergNEF's "Oil Price Indicators" weekly that is released weekly on Monday, as it provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products surplus narrowed from 34.1 mmb to 13.5 mmb for the week ending May 5. Land crude oil inventories increased by +1.7 mmb WoW to 587.5 mmb, shortening the deficit to 25.0 mmb against the five-year average (2016-2019, 2022). Total crude inventories (incl. floating) decreased by –12.8 mmb WoW to 668.2 mmb, narrowing the surplus from +23.9 mmb to +1.8 mmb. Total product stocks were up by +3.7 mmb WoW to 947.9 mmb, widening the stockpile surplus against the 4-year average (2017-2019,2022) to 11.7 mmb for the May 5 week. The gas, oil, and middle distillate stocks decreased by -2.1 mmb WoW at 144.9 mmb/d, with the deficit against the four-year average widening to 17.2 mmb. Jet fuel consumption by international departures for the week of May 22 is set to decrease by -13,300 b/d WoW, while consumption by domestic passenger departures is forecast to decrease by -41,000 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 49: IEA Global Demand Forecast by OMR Report Month



Source: BloombergNEF

Oil – Bloomberg Oil Demand Monitor: "Diesel is the laggard as industry"

Bloomberg Oil Demand Monitor

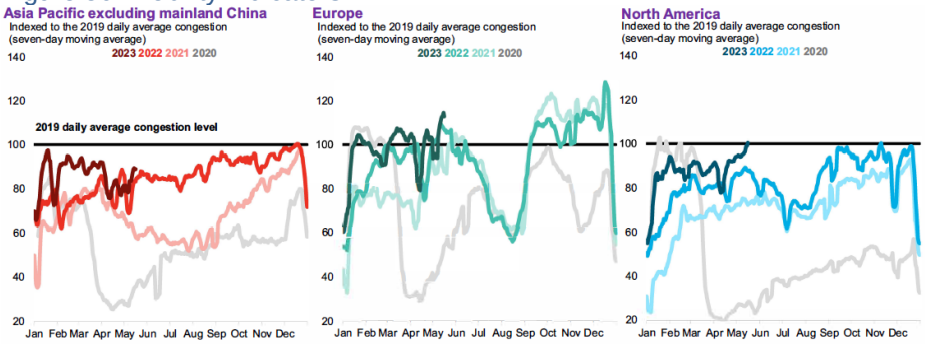
We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Oil is still set to tighten in H2/23, although demand gains are currently being limited by a decrease in the consumption of diesel. In contrast, IEA is forecasting global oil demand growth to increase +200,000 b/d to 2.2 mmb/d, with demand currently being estimated to average a record of 102.0 mmb/d/. With the forecasted growth in demand, some analysts believe that the supply of diesel could reduce the broader demand for oil.To this end, the IEA and Bloomberg commented, "*The International Energy Agency sees world fuel consumption increasing by 2.2 million barrels a day in 2023 as a post-pandemic rebound in China beats expectations. IEA Head of Oil Market Division Toril Bosoni joins Francine Lacqua; Global demand for oil rose to a record in March, driven by growth in China and the US, the Riyadh- based International Energy Forum said in an update on Thursday. China alone saw total product demand jump 1.6 million barrels a day to 16.79 million in the month, IEF said. In the US, demand rose month- on-month by 1.77 million barrels a day to 21.77 million."* We saw record levels of global demand for oil in March, which was primarily driven by the growth in US and China. China's total product demand has increased +1.6 mmb/d to 16.79 mmb/d for the month of April. Commercial airline flights at the start of this week were ~25% higher YoY, and ~5.7% 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 5 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 May 12 was up +1.0% MoM to 92.0% and up +0.2% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

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

Global road traffic indicators

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 May 16, North American, European, and Asia Pacific (ex-China) traffic levels all increased WoW by +5.4%, +6.0%, and +6.3%, respectively. Traffic levels in Europe and North America are now +12.8% and + 0.4% above the 2019 average and up +5.9% and 14.3% YoY respectively. Asia Pacific (ex-China) traffic is -10.8% below the 2019 average and is +5.0% YoY. Traffic in the Asia-Pacific region has continued to increase throughout the month of May. We would be expecting to see stronger YoY driving in the US given the big drop in gasoline prices YoY. 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 50: Mobility Indicators



	Week-on-week (2019 average = 100)				Year-on-year (same week last year = 100)			
	Latest week: May 16	Δ vs. May 9	4-week MA	Δ vs. May 9	Latest week: May 16	Δ vs. May 9	4-week MA	Δ vs. May 9
Asia Pacific ex-China	89.2	+5.3 (6.3%)	82.9	+1.4 (1.7%)	105.0	-8.2 (-7.3%)	102.1	-2.9 (-2.7%)
Europe	112.8	+6.3 (6.0%)	104.6	+3.8 (3.7%)	105.9	+7.6 (7.7%)	102.5	-6.1 (-5.6%)
North America	100.4	+5.2 (5.4%)	95.6	+2.6 (2.8%)	114.3	+6.6 (6.1%)	110.0	-1.7 (-1.5%)

Source: BloombergNEF

Oil – Memorial Day holiday travel expected to reach 2017 levels

Memorial Day holiday travel

Memoria Day weekend is next weekend in the US and it is the unofficial start to the summer driving season. One of the big US market stories this week was the Home Depot outlook, but we continue to see strong US demand for services like travelling. And, for driving, there is a big YoY factor – gasoline prices are about $1/gallon cheaper YoY. So no surprise to see the AAA's May 15 2023 Memorial Day Holiday Travel Forecast [LINK] that forecasts 42.3mm Americans to travel 50 miles or more from home, which is a YoY increase of 7% from Memorial Day 2022. AAA expects to see a +5.4% increase in travelers compared to pre-covid. Memorial Day road trips are up 6% this year to 88%, a indication that the lower fuel prices at the pump are having an impact on how people choose to travel this Memorial Day. Don't forget airfares are up, yet we expect to see an increase of travelers by 11% YoY. Air travel volume, which began to rally last Thanksgiving, could be the busiest day in airports since 2005 with ~3.4 million people expected to take to the skies this Memorial Day weekend. In fact, the percentage of people traveling by air will surpass 2019 levels with 8.0% of travelers choosing air travel as their preferred mode (it was 7.5% in 2019). Our Supplemental Documents package includes the AAA release.

Oil & Natural Gas - TIPRO Texas oil natural and gas jobs up MoM in April

TIPRO April jobs update

It's been a good run for increasing jobs in the Texas oil and gas sector, but we have to wonder there is a pause coming, at least temporarily, with HH prices and oil stuck around $70. But for now, employment continues to increase in the Texas oil and gas sector. The Texas Independent Producers and Royalty Owners Association (TIPRO) updated their employment figures for the Texas upstream sector for April [LINK]. April saw an addition of ~700 jobs MoM, resulting in employment being up +9.7% YoY to 199,400 active jobs across direct oil and gas extraction and services. TIPRO wrote "*direct Texas upstream employment for April 2023 totaled 199,400, an increase of 700 jobs from March employment numbers. Texas upstream employment in April 2023 represented the addition of 17,600 positions compared to April 2022, including an increase of 1,700 jobs in oil and natural gas extraction and 15,900 jobs in the services sector.; IPRO's new employment data yet again indicated*

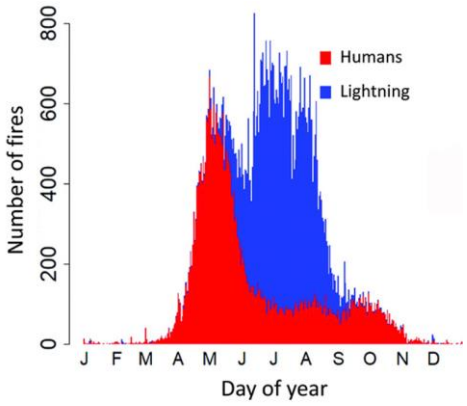
strong job postings for the Texas oil and natural gas industry during the month of April. According to the association, there were 15,127 active unique jobs postings for the Texas oil and natural gas industry in April, including 5,011 new job postings added in the month by companies. In comparison, the state of California had 5,139 unique job postings last month, followed by Louisiana (2,628), Oklahoma (2,184) and Pennsylvania (1,722). TIPRO reported a total of 64,286 unique job postings nationwide last month within the oil and natural gas sector.; TIPRO reports that oil and natural gas output is poised to see further growth this summer. New data from the U.S. Energy Information Administration (EIA) projects that U.S. oil production in June will grow by 41,000 barrels per day (b/d) and top 9.33 million b/d. In the Permian Basin, the most nation's most prolific shale oil basin, output will rise by 15,000 b/d to hit 5.71 million b/d. Oil production in the Eagle Ford Shale in South Texas is also expected to see modest gains by 2,000 b/d to total 1.108 million bpd." Our Supplemental Documents package includes the TIPRO release.

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

High wildfire risk this summer

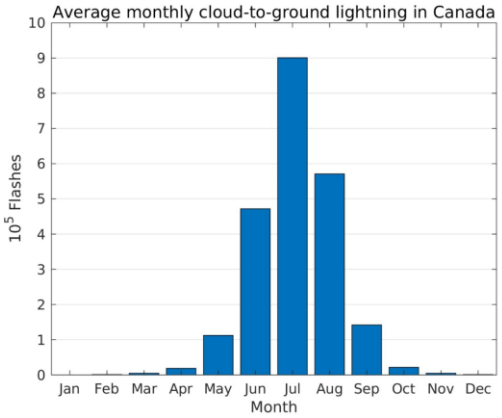
Better news this morning on the Alberta wildfire front with less wildfires and some forecast rain today that should help. But it's still very bad. The amount of shut-in oil and gas production varies daily and has been over 500,000 boe/d at times. But as long as we are seeing high number of out of control wildfires, but less than last week, there will be ongoing shut-ins of oil and natural gas production. And 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 51: Canada Wildfires Distribution Over Year



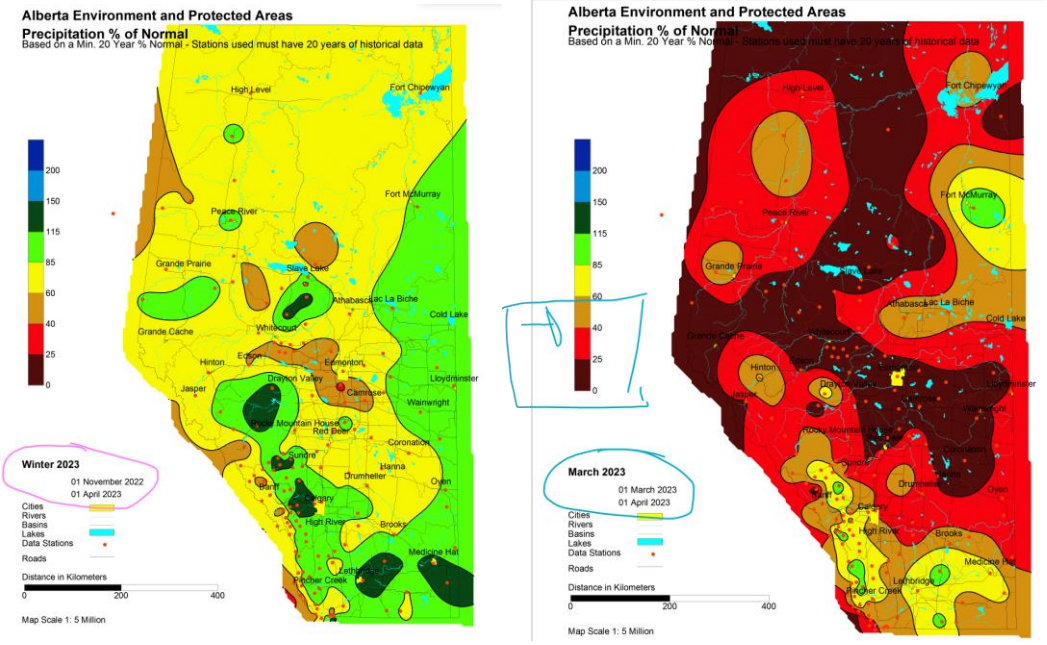
Source: Wildfire Today

Figure 52: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 53: Alberta Precipitation % of Normal for Nov 1-Mar 31, and for April



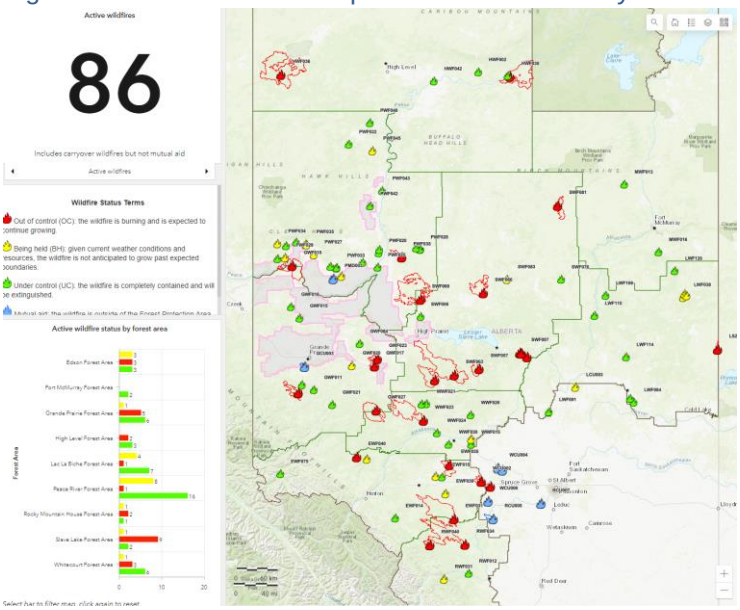
Source: Alberta Environment

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

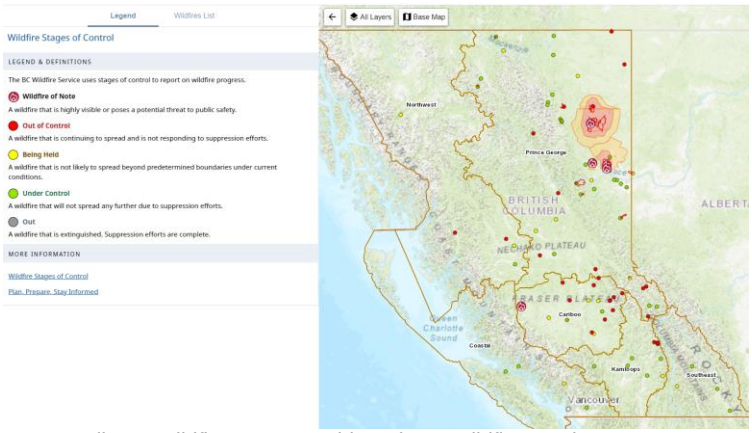
maps are interactive and open up for the information on any particular fire. Here are the wildfire maps as of 6am MT this morning.

Figure 54: Alberta wildfire map as of 6am MT on May 21



Source: Alberta Wildfire Status Dashboard

Figure 55: BC wildfire map as of 6am MT on May 20



Source: Alberta Wildfire Status Dashboard, BC Wildfire Service

Oil & Natural Gas – Two big >7 earthquakes in Pacific this week

Two big >7 earthquakes

There were two big >7 earthquakes this week but, fortunately, there were no dangerous tsunamis or major damage and loss of life. And they weren't anywhere near to impact oil and gas operations. On Friday, US News reported "*A 7.7 magnitude earthquake caused a small tsunami to wash ashore on South Pacific islands Friday. No damage has been reported, and*

the threat passed in a few hours. Waves 60 centimeters (2 feet) above tide level were measured off Lenakel, a port town in Vanuatu, the Pacific Tsunami Warning Center said. Smaller waves were measured by coastal or deep-ocean gauges elsewhere off Vanuatu and off New Caledonia and New Zealand." On Friday, Reuters reported "*An earthquake of magnitude 7.1 struck southeast of the Loyalty Islands in the French territory of New Caledonia on Saturday, the authorities said, with no danger of a tsunami. The United States Geological Survey (USGS) which reported several aftershocks around the region after the 7.1 magnitude earthquake said the quake hit at a depth of about 36 km (22.37 miles). Following the quake, Australia's meteorology bureau said there was no tsunami threat to mainland Australia, islands and territories."* Earthquakes >7 are not common. Since Jan 1, 2017, there have been 96 earthquakes >7 or about 15 per year. Below is our table of earthquakes >7 since Jan 1, 2017.

Figure 56: Earthquakes above 7.0 since Jan 1, 2017

Earthquakes With 7.0+ Magnitude								
Country	2017	2018	2019	2020	2021	2022	2023	Total
Indonesia	-	1	3	-	-	4	4	12
Japan	-	-	-	-	8	-		8
Papua New Guinea	1	2	1	1	1	1	1	8
US	-	2	1	2	1	-	-	6
Mexico	2	1	-	1	-	1	-	5
Peru	-	2	3	-	-	-	-	5
Russia	1	1	-	2	-	1	-	5
New Zealand	-	-	1	1	2	-	2	6
Vanuatu	-	-	-	-	3	1	2	6
New Caledonia	1	2	-	-	-	-	1	4
Fiji	-	2	-	-	-	-	-	2
Chile	-	-	-	-	1	1	-	2
Fiji	-	1	-	-	1	-	-	2
Philippines	1	1	-	-	-	-	-	2
Argentina	-	-	-	-	1	-	-	1
Canada	-	-	-	-	-	1	-	1
Colombia	-	-	-	-	-	1	-	1
Costa Rica	-	-	-	-	-	1	-	1
Cuba	-	-	-	1	-	-	-	1
Ecuador	-	-	1	-	-	-	-	1
El Savador	-	-	-	-	-	1	-	1
Greeece	-	-	-	1	-	-	-	1
Guatemala	-	-	-	-	-	1	-	1
Honduras	-	1	-	-	-	-	-	1
Iran	1	-	-	-	-	-	-	1
New Caledonia	-	-	-	-	1	-	-	1
Pakistan	-	-	-	-	1	-	-	1
Philippines	-	-	-	-	-	1	-	1
South Georgia Islands	-	1	-	-	-	-	-	1
South Sandwich	-	1	-	-	-	-	-	1
Turkey	-	-	-	-	1	-	2	3
Tonga	-	-	-	-	-	2	1	3
Venezuela	-	1	-	-	-	-	-	1
Total	**7**	**19**	**10**	**9**	**21**	**17**	**13**	**96**

Source: USGS, Wikipedia

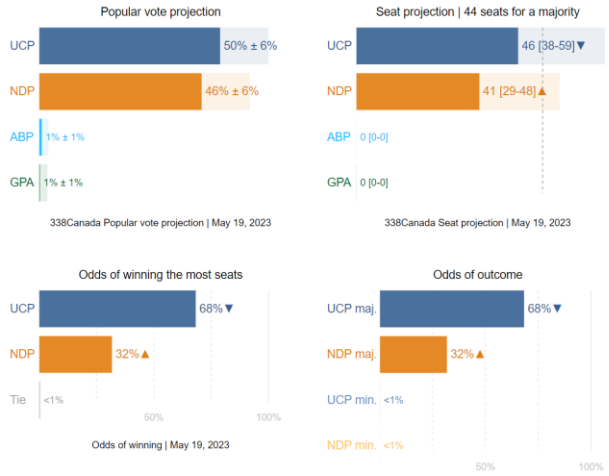
Oil & Natural Gas – Unpredictable Alberta May 29 election, UCP back in front

Alberta provincial election on May 29

The Alberta May 29 election is turning out to be like the last Super Bowl where the Chiefs and Eagles went back and forth and it came down to who had the ball last. This is what it feels like for the Alberta election – who will have the ball last. We have been saying elections are unpredictable and that is certainly true for the Alberta provincial election on May 29. This has been a 4-week sprint that kicked off on May 1. The first week saw the UCP party increase its lead driven in great part by the UCP's Day 1 announcement that there would be cuts to personal income taxes for every taxpayer. But then last week, there was a huge shift in momentum and the polls put the NDP in the lead. Well that only lasted one week and the

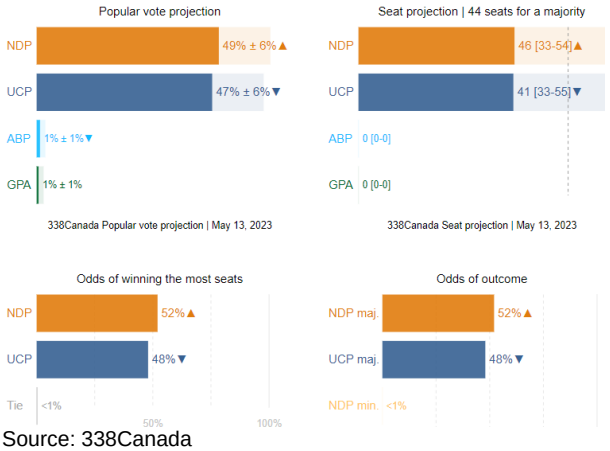
338Canada latest poll as of our 7am MT news cutoff is their May 19 poll that is another reversal and now puts the UCP back in the lead with just over 1 week to go, although the UCP lead is less than after the first week. Below are the 333Canada election projections as of May 19 and as May 13 that shows the reversal.

Figure 57: Alberta election projection as of May 19



Source: 338Canada

Figure 58: Alberta election projection as of May 13



Source: 338Canada

Oil & Natural Gas – Turkey Presidential election goes to May 28 runoff

Turkey's Presidential election was last Sunday. President Erdogan won by a good margin, but didn't get to 50% so they have moved to a May 28 runoff one-on-one election against Kemal Kilicdaroglu. Anadolu Agency (Turkey) reported that Erdogan received 49.40%, Kilicdaroglu 44.96% and Sinan Ogan 5.2%. Ogan is dropped in the May 28 run off. The

Turkey's Presidential election May 28

expectation is that Erdogan should pull off the win and the market reaction on Monday was negative on that expectation.

Energy Transition – G7 leaders reality check on the energy transition

G7 Leaders Communique

It's hard for anyone, even on the pro-climate change side, to read the G7 Leaders Communique and not see the G7 leaders having a reality check on the Energy Transition, which means increased focus on energy security and oil and natural gas will be needed for longer than the aspirations of climate change side. (i) Yesterday morning, we tweeted [LINK] "*Bullish for #Oil #NatGas for 2020s. G7 Leaders "holistically addressing ENERGY SECURITY, the climate crisis & geopolitical risks". Potential gas market shortfalls were provoked, not caused, by RUS/UKR. "accelerating the decarbonization of our energy sector" reminds of #BigOil push to reduce their carbon intensity. And more, see 👇excerpts Leaders Communique #OOTT."* Our tweet says "and more" as there was a lot more clear indications of this reality check. No question, there is a pulling back of the direct attacks on fossil fuels and the focus on getting rid of fossil fuels. But also some political speak on reality that energy security is critical, focus should be on decarbonizing energy, clean energy should be affordable, etc. (ii) Here are a few of the big picture views. (iii) Pg 1 on we are determined to work together and with others to section. "*preserve the planet by accelerating the decarbonization of our energy sector"*. Note accelerating decarbonization sounds like a line right out of Exxon or Chevron playbook to make their energy less carbon intensive. (iv) Pg 3 Opening paragraph in global economy, finance and sustainable development section. "*In striving for strong, sustainable, balanced and inclusive growth, we are committed to a stability- and growth-oriented macroeconomic policy mix that supports medium-term fiscal sustainability and price stability"*. (v) Pg 18. Opening paragraph on climate change section. "*We are steadfast in our commitment to the Paris agreement, keeping a limit of 1.5°C global temperature rise within reach through scaled up action in this critical decade, halting and reversing biodiversity loss by 2030, and ensuring energy security, whilst leveraging synergies and recognizing the interdependent nature of these challenges*." (vi) Pg 15. Opening paragraph on energy section. "*We commit to holistically addressing energy security, the climate crisis, and geopolitical risks*". Note the elevation of energy security. (vii) Pg 16. In energy section "*In this context, we stress the important role that increased deliveries of LNG can play, and acknowledge that investment in the sector can be appropriate in response to the current crisis and to address potential gas market shortfalls provoked by the crisis. In the exceptional circumstance of accelerating the phase out of our dependency on Russian energy, publicly supported investment in the gas sector can be appropriate as a temporary response, subject to clearly defined national circumstances, if implemented in a manner consistent with our climate objectives without creating lock-in effects, for example by ensuring that projects are integrated into national strategies for the development of low-carbon and renewable hydrogen.*" Note potential gas market shortfalls were provoked not caused by Russia/Ukraine. This is the point we have highlighted since Russia/Ukraine, the energy crisis was already in place before Russia/Ukraine. The G7 leaders don't say it directly, rather they say the potential natural gas shortage was "provoked" by Russia/Ukraine like they are trying to get the readers to think it was "caused" by Russia/Ukraine. (viii) Pg 18. Opening paragraph on clean energy economy. "*we are determined to increase our efforts and, in particular, will pursue secure, resilient, affordable, and sustainable clean energy supply chains, including those for critical minerals and clean energy technologies*." Note increasing efforts on affordable clean energy. (ix) These are some of the big picture reality check

comments. There is much more in the G7 Leaders Communique. Our Supplemental Documents package includes excerpts from the 40-pg communique.

Energy Transition – Macron '*We must not make new [Green] rule changes*"

Macron wants no new Green regulations

We probably shouldn't have been surprised that there was almost zero western English media coverage of France President Macron's major May 11 speech "*Accelerating our industrial reconquest*" [LINK]. Macron highlighted the need for France to reindustrialize and also there shouldn't be anymore new Green regulations. Note he did not say for how long for no more new Green regulations. (i) there are many many items in the Macron speech. We only note a few of the items. (ii) Macron's speech reminded of his major FT Oct 30, 2021 FT interview on the eve of COP26 in the UK, where he warned that the energy policies of the west were going to lead to higher oil and gas prices in the 2020s. (iii) Macron's speech is about the need to industrialize as its move to deindustrialize has hurt France. Macron said "*What we have discovered to our cost is that it is dragging the whole economy down because when the industry leaves, the services attached to it leave and the administrations that remain to hold a territory leave with it. So industry has an economically and territorially structuring role*." And "*Without industry, we cannot succeed in our ecological transition. The battle for climate and biodiversity cannot succeed with a strategy of deindustrialization. What for? Because, in fact, we import products that we do not choose and therefore we import models that are perhaps less demanding than us in terms of climate and that are more detrimental to biodiversity. It is also not a good solution. That is the situation."* (iii) Macron doesn't specifically say this, but it seems like he is putting energy security as the key priority and not reducing emissions as the first priority. The priority of this speech is that France needs to reindustrialize as its move to deindustrialize has hurt Frances economy and competitiveness. Macron notes that can reindustrialize "*respectful of climate and biodiveristy objectiives*" (iv) Macron sounds like Big Oil in that if France stays being a buyer and not their own provider, all they will be doing is buying from countries that don't have the same emissions standards/laws. This is the same as what Big Oil says how they are continuing to reduce emissions of their oil and gas but that isn't the case in many countries. (v) The push to industrialize includes for the Green transition. Macron said "*we do not just want to be a green market, but to produce green on our soil".* (vi) But the big Green shock is his call for more no more new Green regulations, but he doesn't say for how long. Macron said "*Basically, I think what we are doing and what we have to step up is to assume the fact that we do not just want to be a green market, but to produce green on our soil. And so we have already passed a lot of regulations in Europe, more than all the neighbors. We are ahead, in regulatory terms, of the Americans, the Chinese or any other power in the world. We have set ourselves the 2050 2030 objectives to decarbonize, reduce phytos, etc. I call for a European regulatory pause. Now we have to execute. We must not make new rule changes because we will lose all the players. So we need stability. Now, we must speed up deployments because otherwise, the risk we run is basically to be the best bidder in terms of regulation and the lowest in terms of funding. So we are compensating for that. But that was the lag we had after the American IRA. So the first point of resynchronization and coherence at European level. We're going to fight for it. We implement what we have decided, but we stop adding more every day."* There is much more in the speech. Our Supplemental Documents package includes the Macron speech.

10/30/21, Macron warned mid/long term fossil fuel prices will cost more & more

Here is what we wrote on Macron's Oct 30, 2021 warning on the eve of COP26 and before Russia/Ukraine. "*Its more than annoying that we finally see political and business leaders acknowledge the Energy Transition will take longer, be a bumpy road and have higher energy costs. One of our tweets yesterday was a reply [LINK] "Yes. Its unfortunate G7 leaders knew they wouldn't get commitment to #NetZero if they told people they really didn't have a plan on how to get there without causing a self inflicted energy crisis for the 2020s, hopefully not longer than that." We think its too late, for the most part, to see these new confessions – this time by France's Macron. These political leaders and also business leaders drove thru the push to the Energy Transition in 2019, 2020 and the first part of 2021 and now we see some start to warn that this isn't going to be pretty. They didn't have a plan on how to execute this and certainly didn't have (and still don't have) an idea of how much it will cost. Although some like Macron are admitting it means higher energy prices for years to come. As we put in or tweet, hopefully its no more than a decade. Our first tweet yesterday morning [LINK] was on the FT's report "Macron warns of threat to global economy from energy crisis" [LINK]. Macron's concern on current energy prices got all the attention. However, the part that is getting less attention is what Macron said on fossil fuel prices. Our tweet was "Oops, #Macron on #EnergyTransition "ironic, because we are building a system where in the medium & long term fossil energy will cost more & more, that's what we want to [to fight climate change]". 2020s will be very good for #Oil #NatGas prices. Great report @labboudles #OOTT." Note Macron is saying medum and long term, he is not just talking about the energy crisis this winter. This is an acknowledgement that is acknowledging what our thesis has been, even before Covid, that the 2020s will be a period of stronger for longer oil and natural gas prices. FT posted the full report without subscription and there is more in it such as more natural gas supply is needed. Our Supplemental Documents package includes the FT report. "*

11/09/21, Macron wanted a "credible strategy" on CO2 emissions in Europe

And post COP26, Macron came out with a major national speech that included his warning that Europe needs a credible strategy on CO2 emission in Europe. Here is what we wrote in our Nov 14, 2021 Energy Tidbits memo. "*No one should be surprised to see France President Macron take a more realistic approach to the Energy Transition. On Tuesday, Macron made a national speech [LINK] that was focused on the pandemic and how France is emerging. However, what caught our attention was the last sentence iun a speech that wasn't focused at all on energy and the energy transition. Its why, we tweeted [LINK] "Does #Macron hope can avoid yrs of energy crisis/high prices if a realistic #EnergyTransition. "We will be able to build a credible strategy for reducing our CO2 emissions, compatible with our industrial & technological sovereignty" @EmmanuelMacron #OOTT." It is important to remember that Macron takes a leadership role in Europe next year with the French presidency of the Council of the European Union. So Macron closes his speech with a view of what he wants to accomplish with the EU. And the last line in the speech is a "credible strategy" for reducing CO2 emissions. This sounds like a clear view that Europe needs something that is realistic and credible. He concluded his speech "But France will not be strong alone. With the European Union: ➔ We need to better*

protect our external borders. ➜ We will continue to rebuild a relationship of peace, stability and growth with Africa. ➜ We will be able to better regulate the digital giants. ➜ We will be able to build a credible strategy for reducing our CO2 emissions, compatible with our industrial and technological sovereignty."

Energy Transition – Elon expects autonomous Ubers to be '*gigantic*' for Tesla

Autonomous Uber for Tesla

The CNBC David Faber Tuesday one-on-one interview with Elon Musk was must watch TV and there were so many soundbites that received a lot of attention. But we would have thought the biggest valuation factor, autonomous vehicles, would have got more attention. Elon sees this as *"gigantic*". On Wednesday, we tweeted [LINK] "O*vershadowed by controversial items was @elonmusk on #RoboTaxi #AutonomousUber. "this is gigantic ... instead of effectively having 25% margins, it might be 70% or more. The free cash flow associated with that is actually truly a staggering amount" DYK Tesla buyers automatically agreed to revenue share. Great @davidfaber interview. See 👇SAF Group transcript #OOTT #EV."* This is clearly where Musk sees the "*gigantic*" value creation in Tesla. And, if he is right, it's hard to argue with him turning the auto industry upside down by getting to 70% or more margins. Our Supplemental Documents package includes the transcript we made of this exchange that was attached to our tweet.

Tesla's car sales agreement includes Tesla's right to this gigantic revenue

Our tweet on Musk's "gigantic' potential of autonomous Uber included the comments "*DYK Tesla buyers automatically agreed to revenue share*'. We don't have a broad direct sample size of Tesla owners but it seems like many may not be aware of what Musk says is standard in the sales contract that Tesla has the right to revenue sharing in what Musk says will be gigantic. And we have to wonder if the sharing is 70 Tesla, 30 Tesla owner. Musk says they haven't decided, but threw out a 70/30 split. Here is an excerpt we made of the transcript on how this has been in Tesla car sale agreements. "Faber "*Who's making the money from that? I assume that's the value add you're talking about. Is it a revenue share? Do you have this model*?" Musk "*Yes*" Faber "*planned out specifically for how it would look"* Musk "*Yeah, it's been in the Tesla terms and conditions for quite a long time".* Faber "*so it has*". Musk "*Yes. The owner of the car would make some amount. Who knows what it will be, perhaps, it could be a 50/50 split or 70/30, I don't know. But if you buy a Tesla car, it can only be used in the Tesla network. It cannot be used in someone else's network. So that means if the car is able to be used five times as much, Tesla is likely to make basically two or three times the original value, sale value of the car, in robotaxi revenue. This is gigantic. It will be like selling cars for software margins. Because in fact, it is software. So instead of effectively having 25% margins, it might be 70% or more. The free cash flow associated with that is actually truly a staggering amount*. "

Capital Markets – Seems like still a Warren Buffett effect, at least on Japanese stocks

Warren Buffett effect

We aren't in the category of the Warren Buffett fanatics who think everything he says is gospel and he touches turns to gold. But we really respect what he has accomplished and continues to accomplish over the decades. It's amazing when someone can be considered to be on the top of his game over many decades. So we couldn't help tweet a Warren Buffett shout-out on Thursday, when we saw the below Bloomberg TV chart on how foreigners are

loving Japanese stocks. We tweeted [LINK] "*The #WarrenBuffett effect is still working. @business "foreigners loving Japanese stocks. positive flows into equities for 7th straight week". Last 5 weeks were since #WarrenBuffett made his positive comments on Japanese trading houses in his @BeckyQuick Apr 12 interview in Japan. #OOTT."* Buffett was in Japan in early April and there was big investor attention to the CNBC Becky Quick interview with Buffett and Greg Abel on April 12, where he made positive comments about the Japanese trading houses. We have to believe this got a lot of attention from investors around the world. Was it coincidental or did people follow? Given his following, we suspect a good portion of this was people following Warren Buffett into Japanese stocks.

Figure 59: Positive flows into Japanese equities for 7th straight week

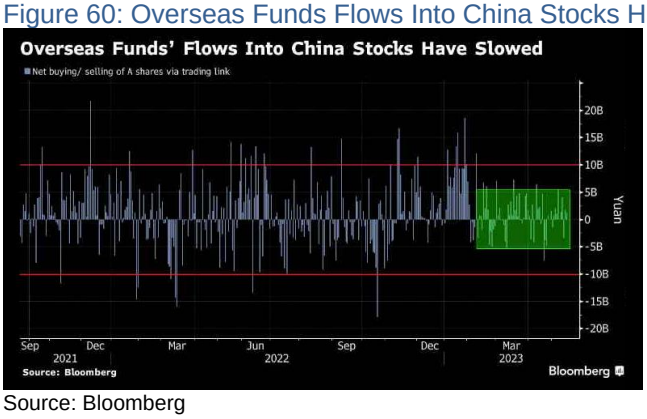
Source: Bloomberg

Capital Markets – Overseas funds flows into China stocks have slowed

Overseas funds flows into China

On Wednesday evening, we were watching the Bloomberg Asia and China Open and couldn't help notice the different view of investors to China vs what we are seeing above in Japan. Investors are retreating from China with negative funds flow into China and declining liquidity. More investors see a stalling/disappointing China recovery. We tweeted [LINK] "*Sell in May and go away seems to be what is happening with investor capital flows into China. Three charts from @business tonight. #Oil markets hope @IEA OMR is right "Our forecast for world oil demand growth for 2023 has been revised up to 2.2 mb/d in this Report, with China's rebound even stronger than previously expected." #OOTT."* Below is one of the three charts attached to our tweet. Our Supplemental Documents package includes the three Bloomberg charts.

Figure 60: Overseas Funds Flows Into China Stocks Have Slowed



Source: Bloomberg

Capital Markets – BlackRock, Tesla and want workers back in the office

Remote working

It may not be what remote workers want, but there is an increasing push from major corporations, at least in the US, for workers to get back in the office. This was in the news because of two of the biggest US companies calling for that this week. (i) On Tuesday, Bloomberg reported "*BlackRock Inc. is calling employees back to offices at least four days a week, telling staff that the firm has found benefits from working together in person after the pandemic. The new policy will take effect Sept. 11, with flexibility to work from home one day a week, Chief Operating Officer Rob Goldstein and Caroline Heller, global head of human resources, said Tuesday in a memo to staff. "Career development happens in teaching moments between team members, and it is accelerated during market-moving moments, when we step up and get into the mix," the executives wrote. "All of this requires us to be together in the office."* (ii) The big attention on ending remote working came from CNBC David Faber's interview with Elon Musk on Tuesday. The Musk quotes that got the most attention were "*It's a productivity issue but it's also a moral issue. You also get off the god damn moral high horse with the work from home bullshit. Because they're asking everyone else to not work from home while they do. It's wrong*." And "*The laptop class living in la la land, okay. But as I said, the you can't but look at the cars are people working from home here, of course not. So people were building cars, servicing the cars, building houses, fixing houses, making the food making all the things that people consume. It's messed up to assume that yes they have to go to work but you don't. How is that that is it's not just a productivity thing. I think it's morally wrong*.". Our Supplemental Documents package includes the transcript of the Faber/Musk exchange on remote working.

Elon Musk is clear, productivity is better when working in person

We recognize that remote workers don't think remote working is to blame, but we continue to be surprised that companies just don't come out, like Elon Musk, and say remote working a key contributor to the decline in US productivity. The Bloomberg reporting on the BlackRock memo to staff on bck to the office only included snippets from the memo. So we don't know if the memo said clearly this was to improve productivity. Rather the snippets talk more holistically about finding benefits from working together in person. But if they didn't say so in the memo, why didn't BlackRock just come out and say working in-person leads to increased productivity.

This is in contrast to Elon Musk who was clear that people are more productive working in-person. Musk said "*Look, I I'm a big believer that people are more productive when they're in person*."

Why don't more say labor productivity is linked to remote working?

We just don't see the blame game highlighting lesser US non-farm labor productivity with remote working. Last week's (May 14, 2023) Energy Tidbits memo noted the continued the US non-farm labor productivity numbers for Q1/23. We wrote "*One of the monthly economic data that caught our eye this week was nonfarm labor productivity for Q1/23. It's a data point that has caught our attention for the past couple years as we keep watching it get worse. It's one of those data points that, in theory, should be getting better with technology, education, etc. Last Sunday night, we tweeted [LINK] "ICYMI from Thurs morning. US nonfarm labor productivity in Q1/23 was -0.9% YoY. 1st time, 4-quarter change has remained negative for 5 consecutive quarters since data started in Q1/48. #OOTT." The US Bureau of Labor Statistics presents the data, but doesn't get into analysis of the Why. But they wrote [LINK] "From the same quarter a year ago, nonfarm business sector labor productivity decreased 0.9 percent, reflecting a 1.3-percent increase in output and a 2.3-percent increase in hours worked. (See table A1.) The 0.9-percent productivity decline is the first time the four-quarter change series has remained negative for five consecutive quarters; this series begins in the first quarter of 1948." And "Labor productivity, or output per hour, is calculated by dividing an index of real output by an index of hours worked by all persons, including employees, proprietors, and unpaid family workers. During the current business cycle, starting in the fourth quarter of 2019, labor productivity has grown at an annual rate of 1.1 percent, reflecting a 1.9-percent rate of growth in output and a 0.8-percent rate of growth in hours worked during the business cycle. The 1.1-percent rate of productivity growth in the current business cycle thus far is a historically low productivity growth rate; no other previous business cycle had lower productivity growth, except for the brief six-quarter cycle from 1980 Q1 to 1981 Q3, which exhibited 1.0 percent growth."*

Demographics – Warren Buffett "*you can always tell someone to go to hell tomorrow*"

Warren Buffett wisdom

Maybe we should have put a new category Wisdom instead of putting this in the Demographics. But there was a great piece of wisdom from the 5+hrs of Berkshire Hathaway annual meeting on May 6 - "*You can always tell someone to go to hell tomorrow*". That is great advice especially in today's world of hit reply!. We are sure everyone either has done an immediate reply that theyu wish they hadn't sent or seen a good example of one that shouldn't have been sent. Last Sunday night, we tweeted [LINK] "*Good advice from #WarrenBuffett at last week's AGM. "you can always tell someone to go to hell tomorrow" "you haven't lost the option". See 👇transcript. #OOTT".* Our tweet included the transcript we made of Buffett's comments. [LINK] Items in "*italics*" are SAF Group created transcript
At 3hr 26 min mark, Buffett *"It's not that complicated, but I will give you a couple lessons. Tom Murphy, the first time I met him, he said two things to me. He said you can always tell someone to go to hell tomorrow. Well that was great advice then, think about great advice it is when can you sit down on a computer and screw your life up forever by telling someone to go to hell or something else in 30 seconds and you can't erase it. You haven't lost the option. He said praise my name, criticize my category. What makes more sense than*

that. Who do you like to criticize as you've always done. You don't need to vilify anybody to make your point on subjects of discussion."

Demographics – Macron, France lags "*because we work less than our neighbours*"

Macron say French work less

We suspect most will put France at the bottom of the list for ranking worker levels for western economies. But for those who don't have it near the bottom, President Macron highlighted how France's GDP lags Germany because the French work less. Macron also hit out specifically at young people. Earlier, we highlighted Macron's May 11 speech "*Accelerating our industrial reconquest*". [LINK] Macron said "*What does our country need to do? To continue to be competitive on capital, labor, innovation, to continue to be reliable and clear on its strategy and to increase the quantity of labor. It is in this strategy that the pension reform is inscribed, I say this by assuming it in a very clear and very quiet way. If the France has deindustrialized and has a weakness compared to its neighbours, and the 10 GDP gap with Germany, it is because we work less than our neighbours in the life cycle, it is because there are fewer young people who are in employment, it is because we work less in key ages, and it is because we work less time*."

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.

Cdn Corey Connors in the hunt for PGA Championship

It's going to be another day watching golf for Cdn golf fans. Can't help but be amazed when you watch best golfers in the world compete at a major. In particular how they scamble to make a par after brutal tee shots. Situations like amateurs always seem to end up with a double bogey. It was a great afternoon of watching golf for Canadian golf fans with Cdn start golfer, on top or a shot off the lead all day. Connors ended the third round in tied for 2nd place, one short of the lead of Brooks Koepka. Just look at the leaderboard for the company Connors is in going into the final round. Koepka 1st, Connors & Hovland T2, Bryson DeChambeau 4, Justin Rose and Scottie Scheffler T5, and Rory McIlroy 7.

Figure 61: PGA Championship Leaderboard going into final round, MT for tee times

POS	↑↓	PLAYER	SCORE	TODAY	THRU
1	↑5	Brooks Koepka	-6	-	12:30 PM
T2	↓1	Viktor Hovland	-5	-	12:30 PM
T2	↓1	Corey Conners	-5	-	12:20 PM
4	-	Bryson DeChambeau	-3	-	12:20 PM
T5	↑3	Justin Rose	-2	-	12:10 PM
T5	↓4	Scottie Scheffler	-2	-	12:10 PM
7	↑3	Rory McIlroy	-1	-	12:00 PM

Source: ESPN

Maurice, "The Rocket" Richard passed away on May 27, 2000

Just like Wayne Gretzky made #99 famous and a number that kids wanted to wear on their hockey sweaters, the big number for kids to want in 50s and 60s was #9. That was due to two of NHL all time greats wearing #9 – Maurice, The Rocket, Richard for the Montreal Canadians and Gordie, Mr. Hockey, Howe. We were listening to hockey talk yesterday and a caller reminded that the Rocket passed away on May 27, 2000 at the age of 78. The Rocket was the first player in NHL history to score 50 goals in one season and he did that in 50 games in 1944-45. He was also the first to reach 500 goals. When he retired in 1960, he was the all-time leading goal score with 544 goals with his last goal on March 20, 1960. No surprise, that record was broken by Gordie Howe, who scored his 545th goal on Nov 10, 1963, and then went on to score his final goal, #801, on April 6, 1980. And no surprise, Howe's record was broker by Wayne Gretzky with his 802nd goal on March 23, 1994. Gretzky ended his career with his last goal, #894, on March 29, 1999. No one thought Gretzky's all time goal scoring would be touched, but Alexander Ovechkin is within a couple of years of beating that. Ovechkin will start the 2023/24 season at the age of 38, but hasn't really slowed down in his goal scoring with 42 in the finished 2022/23 season and 50 in the 2021/22 season.

Colorado man stopped for DUI claims his dog was driving

Can't help laugh at the Springfield (Colorado) Police Facebook posting last Sunday [LINK] "*DUI ARREST. On 05/13/23 around 1130 pm Springfield Police conducted a traffic stop on a vehicle traveling at 52 miles per hour in a posted 30 mile per hour zone near 7th and Main St. The driver attempted to switch places with his dog who was in the passenger seat, as the SPD officer approached and watched the entire process. The male party then exited the passenger side of the vehicle and claimed he was not driving. The male party showed clear signs of intoxication and when asked about his alcohol consumption the male party ran from the Officer. The male party was apprehended quickly within about 20 yards of the vehicle.*"