Energy Tidbits

June 25, 2023

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Questions Are Just Starting What Happens To Putin, Russia, Ukraine, Oil, Markets, etc. Now 24-hr Prigozhin Challenge Ended

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. Questions and uncertainties are only now starting on Putin, Russia, Ukraine, oil, markets, etc post the surprise quick end to the Prigozhin/Wagner crisis. (Click here)

2. Raymond James says Delaware Basin (Permian) core inventory declining at a rapid rate and well productivity rolled over in 2022. (Click here)

3. Siemens surprise big negative warning on onshore and offshore wind raises real questions/concerns on wind generation potential. (Click here)

4. Qatar Airways CEO says "let us not fool ourself" on sustainable aviation fuel potential. (Click here)

5. Big net redemptions from Cdn balanced and equity mutual funds continues thru May. (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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US gas storage 571 bcf YoY surplus

Natural Gas – +95 bcf build in US gas storage; now 571 bcf YoY surplus

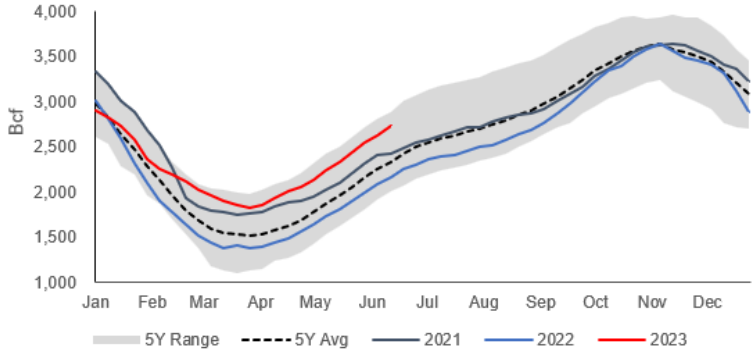
It's the middle of June so it's still natural gas injection season, at least until there is very hot weather across most of the US or some other unusual event. For the week of June 16, the EIA reported a +95 bcf build (above the expectations of an +88 bcf build), a large increase compared to the +74 bcf build reported for the week of June 17 last year. A notable increase from last week's build of +84 bcf, and a big increase vs the 5-year average build of +43 bcf. Total storage is now 2.729 tcf, representing a surplus of +571 bcf YoY compared to a surplus of +552 bcf last week and is +362 bcf above the 5-year average, up from the +353 bcf surplus last week. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Year ago (06/16/22)		5-year average (2018-22)	
Region	06/16/23	06/09/23	net change	implied flow	Bcf	% change	Bcf	% change
East	599	574	25	25	427	40.3	480	24.8
Midwest	658	632	26	26	503	30.8	542	21.4
Mountain	157	148	9	9	127	23.6	141	11.3
Pacific	191	176	15	15	230	-17.0	249	-23.3
South Central	1,125	1,105	20	20	873	28.9	954	17.9
Salt	330	324	6	6	248	33.1	286	15.4
Nonsalt	794	781	13	13	626	26.8	668	18.9
Total	2,729	2,634	95	95	2,158	26.5	2,367	15.3

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



Source: EIA, SAF

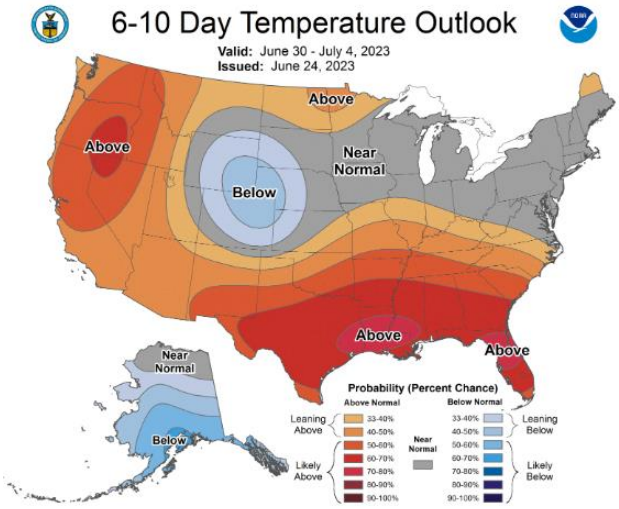
NOAA 8-14 day outlook

Natural Gas – NOAA 8-14 day temperature outlook be supportive to prices

We are now into what should be normal hot summer period from late June thru mid Sept. So the key is to have at least normal temperatures. NOAA posts daily, around 1pm MT, an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [LINK] "*Today's @NOAA 6-10 & 8-14 day temperature outlook covering June 30-July 8 calls for more of the US to have warmer than normal temperatures. Should provide for #NatGas prices, but may not drive them up. #OOTT."* Yesterday's NOAA 6-10 day [LINK] and 8-14 day outlook [LINK] is valid for June 30-July 8 calls for warm weather for most of the US except the NE US and parts of the Plains that are expected to be slightly below normal

temperatures. It could be better but, at this type of year, we would think this should be supportive of natural gas prices but may not drive them up.

Figure 3: NOAA 8-14 day temperature outlook July 2-8



Source: NOAA

Natural Gas – US LNG exports 12.5 bcf/d in April, up significantly MoM and YoY

April 2023 US LNG Exports

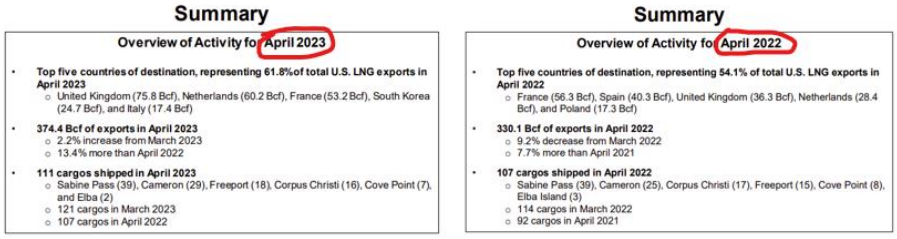
On Friday, the Department of Energy (DOE) posted its US LNG exports estimates for April [LINK] at 12.5 bcf/d, which is +0.7 bcf/d MoM and a significant increase of +1.5 bcf/d YoY. The increase was due to the return to full operations at Freeport LNG. This is a reminder that the US LNG export data is 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 Department of Energy, and the Department 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. The top 5 export markets were the UK (2.53 bcf/d), Netherlands (2.01 bcf/d), France (1.77 bcf/d), South Korea (0.82 bcf/d), and Italy (0.58 bcf/d). The DOE did not comment on the MoM or YoY increases. Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

Figure 4: DOE Monthly US LNG Exports

(bcf/d)	2016	2017	2018	2019	2020	2021	2022	2023
January	0.0	1.7	2.3	4.1	8.1	9.8	11.4	10.9
February	0.1	0.9	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
April	0.3	1.7	2.9	4.2	7.0	10.2	11.0	12.5
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	
August	0.9	1.5	3.0	4.5	3.6	9.6	9.7	
September	0.6	1.8	2.7	5.3	5.0	9.5	9.8	
October	0.1	2.6	2.9	5.7	7.2	9.7	10.0	
November	1.1	2.7	3.6	6.4	9.4	10.2	10.1	
December	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	11.7

Source: DOE, SAF

Figure 5: US LNG Exports April 2023 vs April 2022



Source: DOE

Natural Gas – 4 new long-term LNG deals for a total of 1.26 bcf/d

Long-term LNG deals

It was the biggest week for new long-term LNG supply deals in a long time. By background, there has been a significant slowdown in long-term LNG deals in since the end of H1/22 compared to the activity seen from July 1, 2021 through 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 through 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 we are seeing some very long-term out past 2050. There were four long-term LNG supply deals announced this week. (i) On Wednesday, Qatar Energy and China National Petroleum Corporation (CNPC) announced that they have agreed to enter into a long-term LNG sale and purchase agreement [LINK]. This is new record length LNG deal for Qatar Energy – it's for 27 years. The deal is set to begin in 2027 (when the NFE expansion kicks in) and end in 2054, with CNPC purchasing ~0.53 bcf/d. The chairman of CNPC, Mr. Dair Houliang, commented "*Our collaboration over the NFE project represents a major achievement and excellent practice of both CNPC and QatarEnergy in delivering on the strategic consensus of the leaders of our countries. It is another milestone in forming a strategic synergy between China's "Belt and Road" Initiative and Qatar's National Vision 2030. It lays a solid foundation for the energy cooperation between the two sides in the next three decades. From this brand-new starting point, CNPC will continue to actively discuss with QatarEnergy all-round cooperation across the hydrocarbon industry chain and other areas like green and low carbon energies, so as to build a stable, long-term, and multi-dimensional strategic partnership".* (ii) Petrobangle (Bangladesh) and Oman Trading International (OTI) have also announced that they have agreed to enter into a long-term LNG

sale and purchase agreement [LINK]. It'sa 10-yr deal that is set to begin in 2026 and end in 2036, with CNPC purchasing somewhere between ~0.07 bcf/d to ~0.20 bcf/d. (iii) Cheniere and Equinor announced that they have agreed to enter into a 15-yr long-term LNG sale and purchase agreement [LINK]. The deal is set to begin in 2027 and end in 2042, with CNPC purchasing ~0.23 bcf/d. (iv) Lastly, Venture Global LNG and Securing Energy for Europe (SEFE) have announced that they have agreed to enter into a 20-yr long-term LNG sale and purchase agreement [LINK]. The deal is set to begin in 2026 once Venture Global's CP2 project is completed, and end in 2046. SEFE has agreed to purchase ~0.30 bcf/d. This deal will make Venture Global Germany's largest LNG supplier, with a total supply of 0.56 bcf/d of 20-year offtake agreements signed. Our Supplemental Documents package includes the press release for the respective deals.

Asia was early to secure and hasn't stopped securing long term LNG supply

Asian buyers were early to secure long term LNG supply and started to lock up long term LNG supply starting in July 2021. The LNG supply crunch for the 2020s was clear before Russia invaded Ukraine. 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 15.96 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 15.96 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 6: 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
Jun 1, 2023	Bangladesh Oil	QatarEnergy	Bangladesh/Qatar	0.24	15.0	2026	2031
Jun 21, 2023	Petro Bangle	Oman	Bangledesh/Oman	0.20	10.0	2026	2036
Jun 21, 2023	CNPC	QatarEnergy	China/Quatar	0.53	27.0	2027	2054
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**10.53**			
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.
Jun 21, 2023	Equinor	Cheniere	Norway / US	0.23	15.0	2027	2042
Jun 22, 2023	SEFE	Venture Global LNG	EU//US	0.30	20.0	2026	2046
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**5.44**			
Total New Long Term LNG Contracts since Jul/21				**15.96**			

Source: SAF

Natural Gas – India May natural gas production +2.6% MoM to 3.31 bcf/d

India natural gas production down -0.17% YoY

It looks like India's domestic natural gas production is staying relatively flat after moving up from the recent 2020/21 trough. India's natural gas production peaked in 2010 at 4.6 bcf/d. Its 2018-2019 production averaged 3.18 bcf/d, declining to 3.02 in 2019-2020 and then further declined to average 2.78 bcf/d 2020-2021. But then natural gas production returned to growth in 2021-2022, but that growth has mostly stalled or is modest at best. On Thursday, India's Petroleum Planning and Analysis Cell released their monthly report for May's natural gas and oil statistics [LINK]. India's domestic natural gas production for May was 3.31 bcf/d, which is up +2.6% MoM from 3.23 bcf/d in April. On a YoY basis, natural gas production was down -0.17% from 3.32 in May 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas – India May LNG imports down -3.6% MoM to 2.54 bcf/d

India LNG imports -12.08% YoY

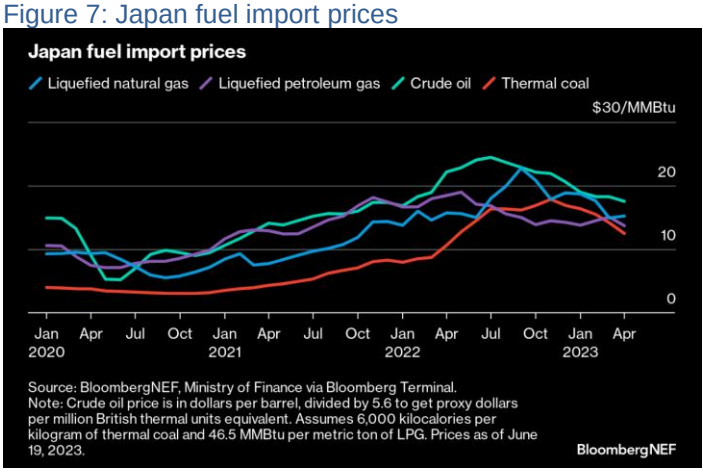
For the past several years, India has increased LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 has been the sky-high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we are seeing some modest MoM increases in India's LNG imports. On Thursday, India's Petroleum Planning and Analysis Cell released their monthly report for May's natural gas and oil statistics [LINK]. Over the past 3 years, India's LNG imports declined from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. Additionally, May's LNG imports were 2.54 bcf/d, down -3.62% MoM from 2.63 bcf/d in April and down -12.08% YoY from 2.89 bcf/d in May 2022.

Natural Gas – Japan LNG prices down but not enough to drive switch to thermal coal

Japan LNG vs thermal coal

Japan LNG prices have been weak post the warm winter but aren't yet low enough to incentivize switching from LNG to thermal coal. On Tuesday, we tweeted [LINK] "*Japan "#LNG import costs plunge as global markets loosen up, but fuel switching with coal isn't in sight" reports @BloombergNEF @olympe_mattei ie. thermal coal prices also declining for Japan so remain cheaper on BTU basis. #OOTT #natGas."* On Tuesday, BloombergNEF posted its "*Japan Fuels Quarterly: No Coal-to-Gas Switch in Sight*", which noted "*BNEF estimates that generation from spot LNG became cheaper than contracted LNG by May 2023, with a marginal generation cost of around $96 a megawatt-hour. However, the drop was not enough for an average efficiency gas-fueled power plant to produce cheaper electricity than a coal power plant of average efficiency. For more, see the Japan Power Fuel Switching Calculator (web I terminal)."* Our tweet included the below BNEF chart.

Figure 7: Japan fuel import prices



Source: BloombergNEF

Natural Gas – Forecast for very hot temperatures to end June and start Hykt in Japan

Japan's 30-day temperature forecast

It looks there should be really hot weather to end June and start July in Japan. It is hot in Asia and Japan, which is expected to continue into July. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK] and its June 22 update calls for very hot temperatures to end June and to start July It is expected to be the warmest through the northern and central regions of Japan, however the southern region is still expected to have above average temperatures. So, there should be some solid weather driven electricity demand for the rest of June and to start July. Below is the JMA's temperature probability forecast for June 24 to July 23.

Figure 8: JMA June 24-July 23 Temperature Probability Forecast

Source: Japan Meteorological Agency

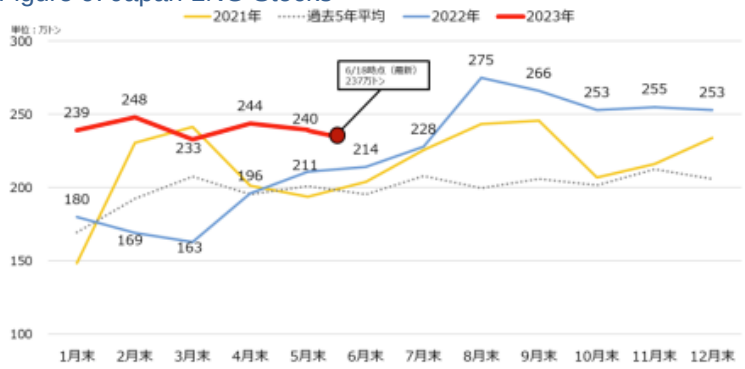
Natural Gas – Japan's LNG stocks up ~3.0% WoW to 113.8 bcf

Japan LNG stocks up ~3.0% WoW

Japan's LNG stocks have been fairly flat thru mid June and at high levels. There wasn't any major weather demand push in April/May as that is shoulder season and even warm weather doesn't drive major demand. That is especially so given Japan has been putting a push on using less electricity and natural gas ie. turn the thermostats on air condition up onto the low 80's so early June hasn't been a big driver of natural gas consumption. The hope is that the very hot weather to end June and start July will start to be a pull on LNG stocks. On

Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on June 18 were 113.8 bcf and are up ~3.0% WoW from June 11 of 110.5 bcf, but remain well above the 5-year average of 93.7 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 9: Japan LNG Stocks



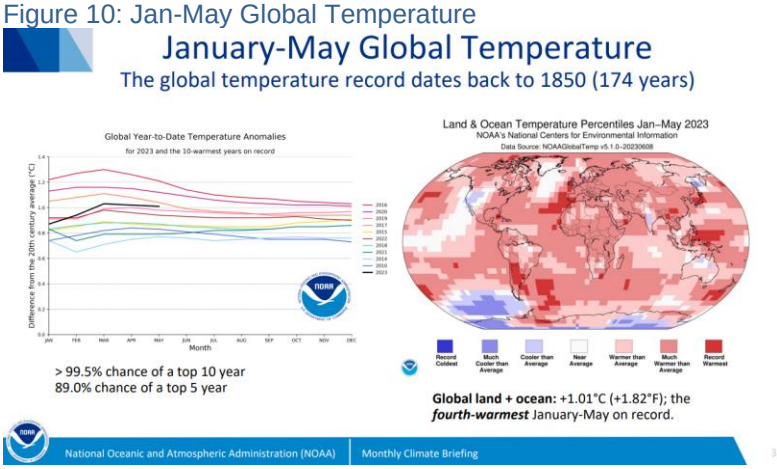
Source: METI

Natural Gas – Globe's 4th warmest Jan-May in last 174 years

Near record heat in 2023

The global LNG and natural gas story in 2023 has been the hot winter around the world and how that crashed JKM LNG and TTF natural gas prices. This winter is a reminder on how the most important factor for LNG and natural gas prices is winter weather. Last Thursday, NOAA held its "*NOAA Climate Science and Services Monthly Climate Update*" [LINK], which included its recap of YTD May 31 global temperatures. NOAA's notes that Jan-May global temperatures were the 4th warmest in the last 174 years.

Figure 10: Jan-May Global Temperature



Source: NOAA

Natural Gas – Continued warm weather expected thru July in most of Europe

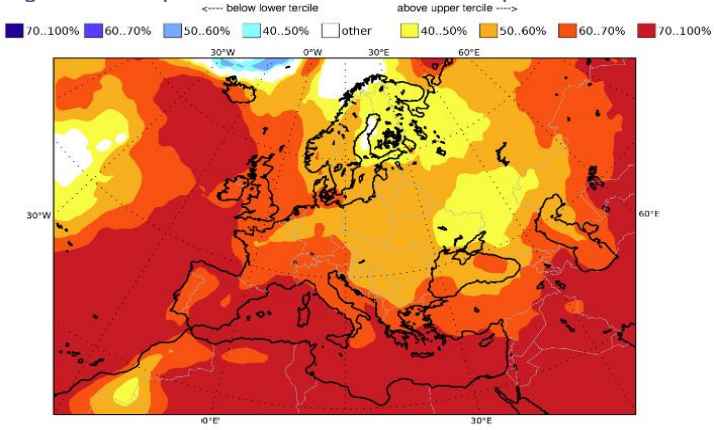
Warm July in europe

Every Monday and Thursday, the European Centre for Medium-Range Weather Forecasts updates its near-term forecasts for each of the next six weeks. The forecasts normally are released in early afternoon MT. Thursday's forecast [LINK] calls for July to stay warmer than normal for most of Europe, although not necessarily really hot. The forecast may not drive natural gas pries but should help provide support to current gas prices.

Forecasts were for a hot summer in Europe but not as hot as summer 2022

At least so far, it looks like Europe is moving more or less in line with the forecasts for this summer to be hot in Europe. Here is what we wrote in our May 14, 2023 Energy Tidbits memo. "*Europe can expect higher than usual temperatures this summer with the most recent Copernicus forecast. The Copernicus forecast are widely used in Europe as the Copernicus Climate Change Service is "is one of six thematic information services provided by the Copernicus Earth Observation Programme of the European Union." On Wednesday, Copernicus posted their monthly seasonal forecast for the summer in Europe [LINK]. On Wednesday we tweeted [LINK] "#NatGas #LNG markets hoping the new @CopernicusECMWF summer Europe forecast for a hot summer is right. #OOTT". Copernicus wrote "For temperature, the signal is for above-average seasonal values virtually across all land areas, strongest over southern and western Europe. Both the ensemble-mean anomalies and the probabilities are lower than in the May 2022 forecast for last year's European summer, in most regions." The summer refers to June/Jul/Aug, and Copernicus is highlighting this summer is expected to hot but not as hot as last summer*."

Figure 11: Copernicus C3S Seasonal Temperature Forecast for Jun/Jul/AUg



Source: Copernicus

Summer 2023 was record heat in Europe

The Copernicus new summer forecast expects a hot summer 2023 but not as hot as last summer, which was record heat. Here is what we wrote in our Sept 11, 2022 Energy Tidbits memo. *"It was record heat this summer in Europe. We have spoken to several people who traveled to the continent this summer and they all noted the high temperatures but also how their hotels had their A/C at much higher levels than normal and not just in the public areas. The problem is that they all stayed in bigger*

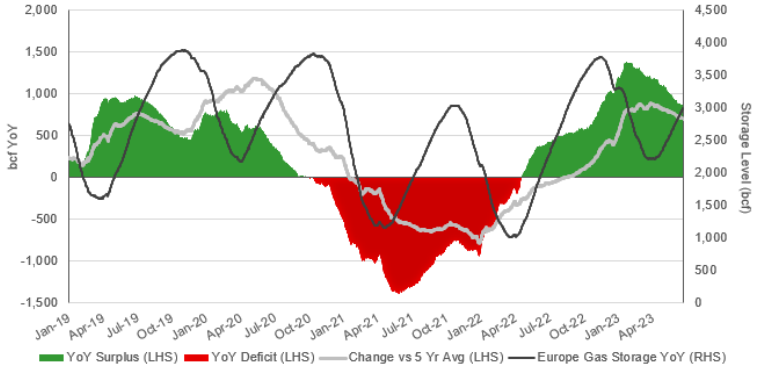
hotels that have central control of A/C so they couldn't set their rooms to lower temperatures. On Thursday, Copernicus Climate Change Services reported [LINK] "Summer 2022 Europe's hottest on record" and "The average temperature over Europe in 2022 was: • the highest on record for both August and summer (June – August) by substantial margins of 0.8°C over 2018 for August and 0.4°C over 2021 for summer".

Natural Gas – Europe storage is now +16.40% vs 5-yr average, but within 5-yr range

Europe gas storage

The big global natural gas story for Q1/23 was how mild winters in Europe and Asia were the key reason why Europe made it through winter without a natural gas shortage. And when natural gas makes it thru the winter with ease, that normally continues thru shoulder season when there isn't any real strong demand for natural gas. However with the warm weather and natural gas prices at reasonable levels, we have seen a modest but steady narrowing of the gas storage surplus on a YoY basis and vs the 5-yr average. However, this week, there was basically no change to the YoY gas storage surplus. This winter (Nov 1, 2022) began with gas storage at 94.91% capacity, +17.83% YoY and a YoY surplus of 27.02%. The mild winter kept the storage surplus high on a YoY basis. But the last 9 weeks have seen a decline in the YoY surplus and the surplus vs the 5-yr average. This week, Europe storage increased by +1.90% WoW to 75.06% on June 21. Storage is now +19.67% greater than last year levels of 55.39% and is +16.40% above the 5-year average of 58.66%. The prior four weeks, starting with the most recent has seen the YoY surplus at +19.67%, +20.14% +21.50%, and +23.53%. The prior four weeks starting with most recent has seen the surplus vs the 5-yr average at +16.40, +16.86, +17.72, and +18.18%. 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 12: European Gas Storage Level



Source: EIA, SAF

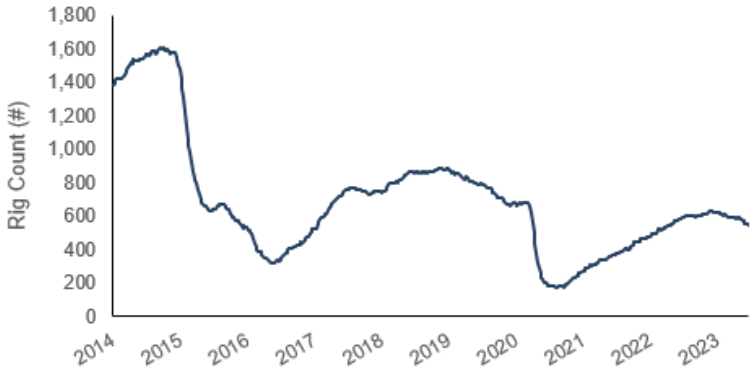
Oil – US oil rigs -6 WoW at 546 rigs on Jun 23, US gas rigs flat WoW at 130 rigs

US oil rigs down WoW

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -6 rigs WoW to 546 total rigs, and -48 rigs YoY for the week of June 23. That is up +65 from the 2022 low of 481 rigs in January, and +374 since the 2020 low of 172 rigs on Aug 14. The decline in oil rigs is being driven by lower WTI which has not sustained >$70/bbl. This reinforces the fact that US producers want visibility to more stable

and prices higher then the $60's before beginning to ramp up production. Notably, there was no increases on a per basin basis. However, the Permian and Williston decreased -2 rigs to 335 total rigs and -1 rig to 35 total rigs, respectively. It was a surprise to see US gas rigs remain flat given 10 consecutive weeks of declines, and the expected weakness for Q2 with low Henry Hub. Gas rigs remain at a total of 130 rigs. It is important to note that US gas rigs have now decreased -27 rigs YoY. On a per basin basis the Permian increased +1 rigs WoW to 6 total rights, while Haynesville decreased by -1 rigs to 50 total rigs. Below is our graph of total US oil rigs.

Figure 13: Baker Hughes Total US Oil Rigs



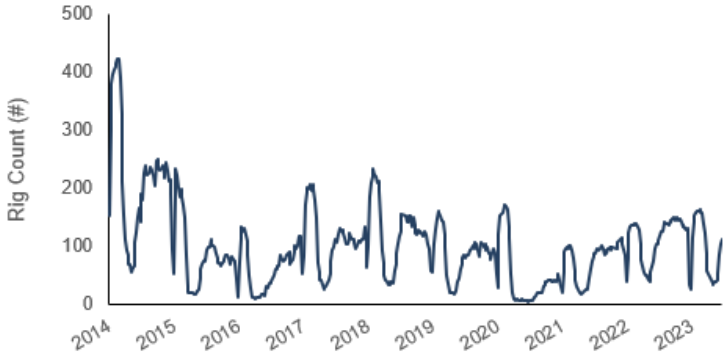
Source: Baker Hughes

Oil – Total Cdn rigs +10 WoW to 169 total rigs

Cdn total rigs up WoW

We don't hear of major impacts to Cdn rigs from the wildfires but there has to be some level of impact. Absent a big wildfire impact, we have been seeing the normal post Spring breakup increase in rigs that typically runs from early/mid May to before Xmas with the biggest increase being from in May/June/July. Over the last few years, Cdn rigs increased by around +110 rigs from the spring breakup trough to August. This year they have increased +84 rigs so far, which means we expect to still see some increases, but not necessarily huge increases. Total Cdn rigs were up +10 rigs WoW to 169 rigs for the week of June 23. Notably, Alberta, BC, and Saskatchewan were +2 rigs, +3 rigs, and +5 rigs WoW, to 110 rigs, 17 rigs, and 37 rigs, respectively. Note there was no provincial decreases this week. Cdn oil rigs were up +7 WoW to 110 rigs, and Cdn gas rigs increased +3 to 59 rigs. Cdn oil rigs are now +6 rig YoY compared to 104 rigs last year, while gas rigs are up +9 YoY from 50 rigs. Below is our graph of total Cdn oil rigs.

Figure 14: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production estimates down 0.2 mmb/d WoW to 12.2 mmb/d

US oil production decreases WoW

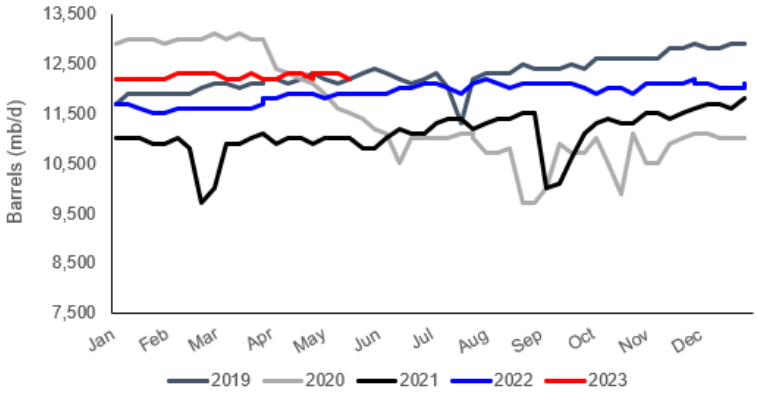
We will have to see if there is a weather reason for the 0.2 mmb/d WoW drop in the weekly US oil production data as we wouldn't have expected to see a drop back to 12.2 mmb/d given the EIA's actuals for March (see below) were 12.696 mmb/d. Perhaps there was some impact from the hot weather in Texas or maybe even the big tornadoes in parts of Texas. But it is a surprise to see a drop back to 12.2 mmb/d. For its weekly estimates, the EIA estimates US oil production decreased -0.200 mmb/d WoW at 12.2 mmb/d for the week ended June 16 [LINK]. The Lower 48 was decreased -0.200 mmb/d WoW at 11.8 mmb/d, and Alaska was up +0.003 mmb/d to 0.425 mmb/d. Over the prior 2 weeks, US oil production based on the weekly estimates, had finally broken above 12.3 mmb/d. It has remained between 12.1 mmb/d and 12.3 mmb/d since the week ended Jan 6, 2023. The first time since it touched 12.2 mmb/d since the pandemic was the 1st week of August in 2022. US oil production is up YoY at +0.200 mmb/d but is still down significantly at -0.900 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 15: EIA's Estimated Weekly US Oil Production

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

Source: EIA

Figure 16: EIA's Estimated Weekly Oil Production



Source: EIA, SAF

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

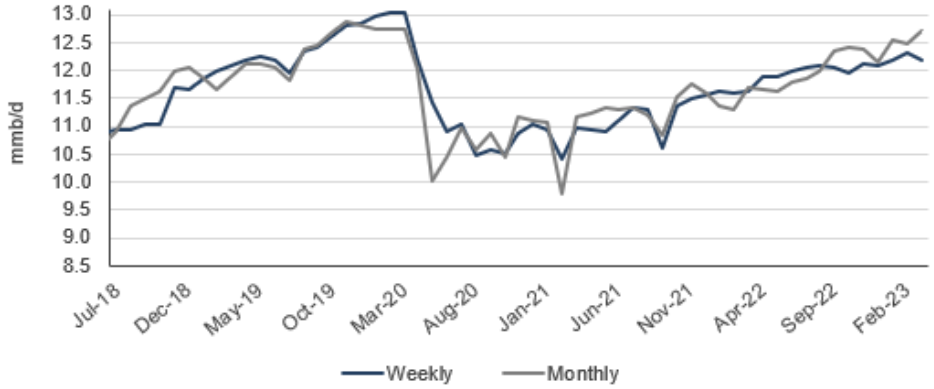
As noted above, we are surprised that the new weekly EIA estimates are down to 12.2 mmb/d given their actuals are so much higher. Here is what we wrote in our June 4, 2023 Energy Tidbits memo. "*As a reminder, the EIA's actuals for US oil production continue to be well above their weekly estimates. There is a growing difference between what the EIA looks at as "actuals" for US oil production vs the EIA's weekly estimates noted above. The actuals continue to be significantly higher than the weekly estimates. On Wednesday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for March US oil and natural gas production. (i) On Wednesday, we tweeted [LINK] "US #Oil production continues to surprise to upside. See 👇EIA excerpts. @EIAgov Form 914: Mar/23 actuals of 12.696 mmb/d is +995,000 b/d YoY vs Mar/22 of 11.701 mmb/d. Also +473,000 b/d vs EIA estimates of weekly oil production that were 12.223 mmb/d. #OOTT." The Form 914 actuals for March have March production at 12.696 mmb/d, which is +473,000 b/d vs the EIA weekly estimates. And because of this significant difference, the Form 914 March production is +995,000 b/d YoY, just shy of 1 mmb/d YoY. The actuals paint a picture of much stronger than expected US oil production."*

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

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

Source: EIA

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



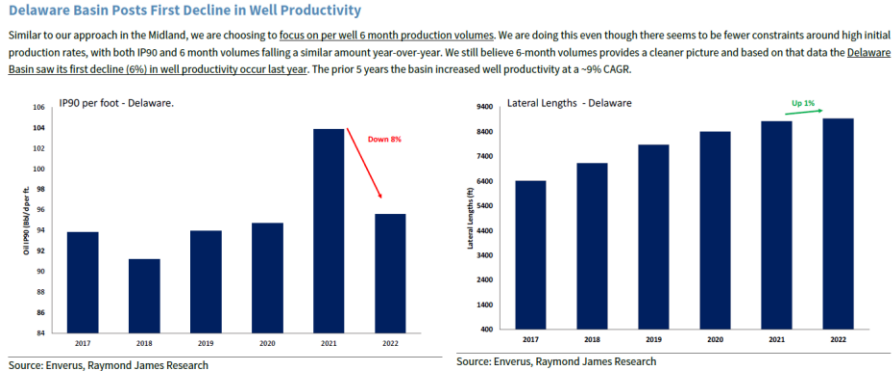
Source: EIA, SAF

Maturing Permian Delaware Basin

Oil – More Raymond James data supporting a maturing Permian Delaware Basin

Yesterday, we tweeted [LINK] "*Must read #Permian#DelawareBasin report by @RaymondJames John Freeman. "remaining core inventory (~8 yrs) continues to fall at a rapid rate" "Well productivity finally rolled over last year (down 6%), after improving at a 9% CAGR the prior 5 years" Combined with 👇06/05/23 Midland Basin report, "Permian Basin well productivity declined 3% overall last year (first decline for the basin" Maturing Permian Basin = less US supply growth potential = positive for 2020s #Oil outlook. #OOTT."* (i) On Thursday, Raymond James posted a big report "*Delaware Basin Deep Dive: Well Productivity & Remaining Core Inventory*", where they "*focus on two important topics within the Delaware Basin: 1) How much core acreage remains and 2) What are the well productivity trends in the basin."* This is the follow up report to its June 5 report "*Midland Basin Deep Dive: Well Productivity & Remaining Core Inventory".* (ii) This was a "deep dive" and the data takeaways were clear – core inventory "continues to fall at a rapid rate", and "*well productivity finally rolled over last year (down 6%), after improving at a 9% CAGR the prior 5 years*." (iv) RJ concludes "*The Delaware Basin deep-dive reveals that remaining core inventory (~8 yrs.) continues to fall at a rapid rate and robust M&A recently leaves public operators with few remaining opportunities to acquire meaningful core inventory. The gap between public (~9 yrs.) and private (~3 yrs.) operators when it comes to remaining core inventory is considerable. Going forward, we anticipate an increasing interest in non-core acreage (Tier 1 and Tier 2 inventory) that can be acquired cheaply today, but will be worth considerably more in the future when core inventory exhaustion has been reached. We anticipate private equity being the main acquirer of that non-core acreage. Well productivity finally rolled over last year (down 6%), after improving at a 9% CAGR the prior 5 years. The declining well productivity was driven primarily by a shift in well mix as the industry moved more towards full-stack development (i.e. less Wolfcamp) and secondarily a jump in the percentage of child wells (33%) drilled last year."* This is a must-read report that will have to be accessed via Raymond James.

Figure 19: Delaware Basin posts first decline in well productivity



Source: Raymond James

1st decline in Permian Basin well productivity

Our tweet yesterday also noted "*Combined with 👇06/05/23 Midland Basin report, "Permian Basin well productivity declined 3% overall last year (first decline for the basin". Maturing Permian Basin = less US supply growth potential = positive for 2020s #Oil outlook."* Raymond James also gave its overall Permian Basin conclusions when looking at the combined Midland and Delaware Basin data. Here is what Raymond James wrote "*Overall Permian Basin Closing Thoughts. After concluding our Midland and Delaware Basin deep-dive reports, we have some closing thoughts on the Permian Basin overall. We finally seem to have reached the productivity tipping point, after what has been an incredible stretch of performance gains over the prior decade plus. ● Permian Basin well productivity declined 3% overall last year (first decline for the basin) ● Shift to full-stack development hurt overall numbers in both basins and was the biggest factor overall ● The boom in private activity put downward pressure on productivity, especially in the Delaware ● 56% of drilling in the Permian is on core acreage ● Public E&Ps control the vast majority (~85%) of remaining core acreage within the Permian ● PXD controls the highest amount of remaining core Permian inventory (17%), followed by COP and OXY (both at ~11%) ● Only 1 private operator (Endeavor) controls an above-average amount of remaining Permian core inventory ● No single metric we've found has a higher correlation (R2 0.89) with E&P valuation than core inventory life."*

Delaware + Midland Basin are ~5.1 mmb/d, only behind Saudi and Russia

One of the key reasons why we highlighted the Raymond James Delaware Basin and Midland Basin deep dives is they are hugely significant on a global oil production basis. Yesterday, we tweeted [LINK] "*Reminder why a maturing Permian Basin (Delaware + Midland) is positive for #Oil in 2020s, it is the 3rd largest #Oil producer in the world, only behind Saudi Arabia and Russia. @RaymondJames John Freeman estimates Delaware Basin at 2.7 mmb/d and Midland Basin at 2.4 mmb/d #OOTT."*

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

The Raymond James Delaware Basin and Midland Basin deep dives were on the producing well data and analysis of core vs non-core acreage. RJ did not get into

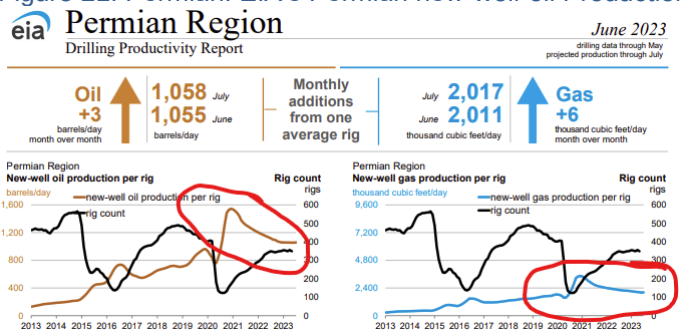
items like level of DUCs and drilling rigs. Our concern on the assumption that there will be sustained continued growth in the Permian is based on the level of drilling rigs and DUCs. Here is what we wrote in last week's (June 18, 2023) Energy Tidbits memo. "*Oil – Hard to see the math for sustained Permian growth based on the DUCs 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 June or July, 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 the May DPR. However, that still doesn't make any real difference to the overall math problem. Permian DUCs are at the roughly the same levels as Aug/Sept 2014. Yet Permian rigs are 61% of Aug/Sept 2014, and production is 3.44 times higher than Aug/Sept 2014. There is no question fracking/completions are multiples better than 2014. But if we use the EIA June 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 about 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 20: Permian DUCs vs Rigs and Production

	DUCs	Oil Rigs	Gas Rigs	Oil mmb/d	Gas bcf/d
May 2023	880	341	5	5.75	22.7
Aug 2014	902	560	5	1.67	6.0
May 2023 as % Aug 2014	98%	61%	100%	344%	379%
Sept 2014	981	560	5	1.67	5.8
May 2023 as % of Sept 2014	90%	61%	100%	344%	392%
* Rigs are approx for month					

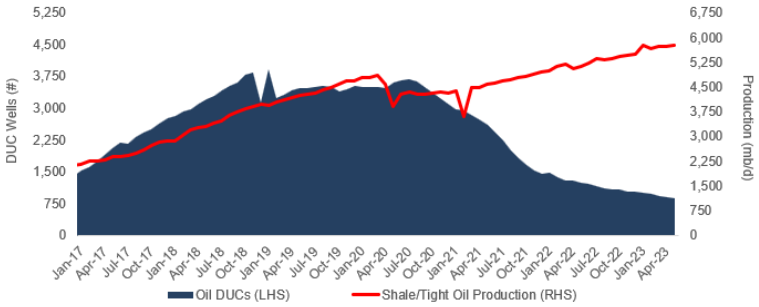
Source: EIA, SAF

Figure 21: Permian: EIA's Permian new-well-oil Production Per Rig



Source: EIA

Figure 22: EIA Estimated Drilled UnCompleted Wells vs Permian Oil Production



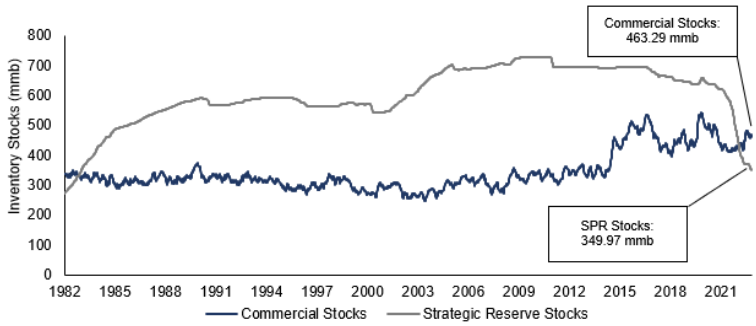
Source: EIA, SAF

Oil - US SPR reserves now –115.437 mmb lower than commercial crude oil reserves

US SPR reserves

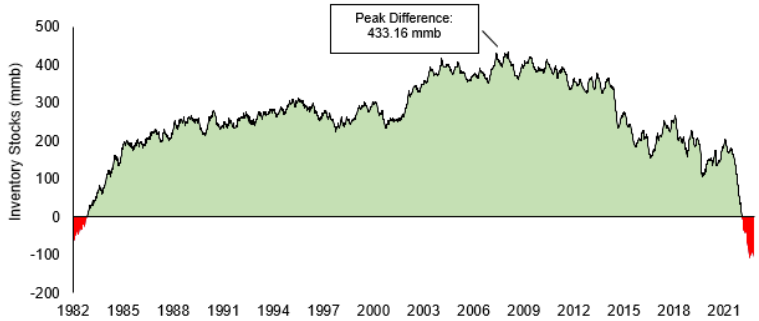
Oil in US Strategic Petroleum Reserves (SPR) continues to move further below total US commercial crude oil reserves. SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit narrowed this week after a draw in commercial oil stocks of -3.83 mmb. The EIA's weekly oil data for June 16 [LINK] saw the SPR reserves decrease -1.719 mmb to 349.968 mmb, while commercial crude oil reserves decreased -3.831 mmb 463.293 mmb. There is now a -113.325 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 23: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 24: US Oil Inventories: SPR Less Commercial



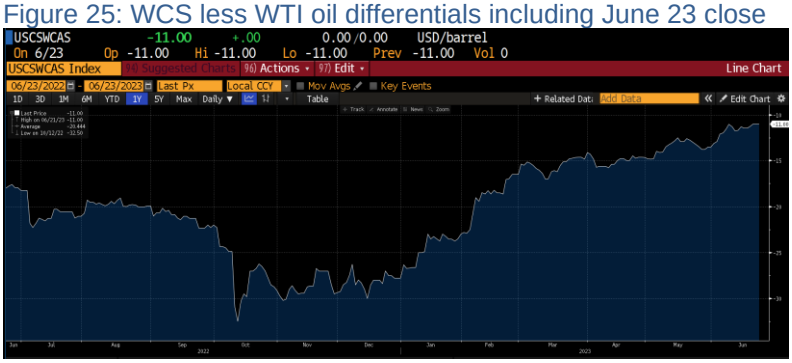
Source: EIA, SAF

Oil – Cdn oil differentials narrowed $0.45 to close at $11.00 on June 23

WCS less WTI differentials

WCS less WTI differentials widened by $0.45 to close at $11.00 on June 23. It's hard to determine exactly what led to the narrowing but likely some impact from OPEC+ cuts that started in early May, concern on Alberta wildfires, Enbridge's recent toll lowering and other items. WCS less WTI differentials have narrowed since Alberta wildfires started to hit hard in early May. And are not acting like the normal widening of WCS-WTI differentials every May/June. WCS less WTI differentials were $14.15 on March 31, which was the Friday before the Sun Apr 2 reports that OPEC+ was going to cut production effective May 1. The WCS less WTI differential widened to $15.40 on Apr 13, and then narrowed to $14.65 on Apr 28, then to $14.15/b on May 5, then to $12.85/b on May 12, then to $12.80/b on May 19, widened to $13.75 on May 26, narrowed to $12.90 as of June 2, $11.30 on June 9, then basically unchanged at $11.45 on June 16 and now down to $11.00 on June 23. This is contrary to the normal seasonal trend for WCS less WTI differentials that normally widen starting in mid-May. For perspective, a year ago, the WCS-WTI differentials last year were $18.00 on June 23, 2022. Below is Bloomberg's current WCS–WTI differential as of June 23, 2023 close

Figure 25: WCS less WTI oil differentials including June 23 close



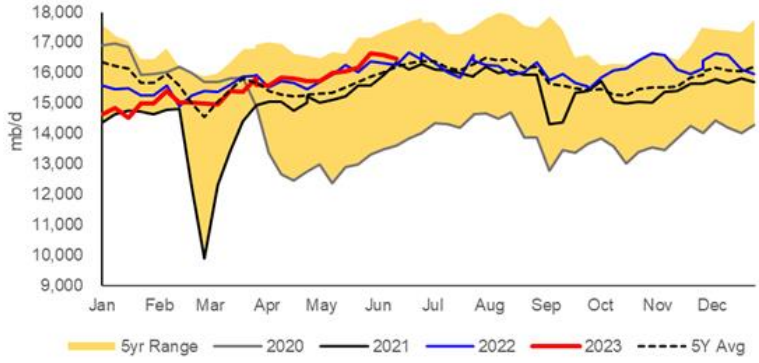
Source: Bloomberg

Oil - Refinery inputs down -0.116 mmb/d WoW to 16.470 mmb/d

Refinery inputs down -0.116 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. This ensures they are producing the key petroleum products at the right time of year. We'll normally see refineries come out of turnarounds in late March/early April to start their ramp up in refining of summer blend fuels, which typically peaks in Aug/early Sept. And given the solid crack spreads, refineries are still incentivized to process as much crude as possible, which is why we look at this week's small decline as most likely being from a refinery being impacted and not a market trend. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended June 16 [LINK]. The EIA reported crude oil inputs to refineries were down -0.116 mmb/d for the week ended June 16 to 16.470 mmb/d and are up +0.207 mmb/d YoY. Refinery utilization was down -0.6% to 93.1%, which -0.9% YoY. Total products supplied (i.e., demand) increased WoW, up +0.517 mmb/d to 20.925 mmb/d, and Motor gasoline was up +0.182 mmb/d to 9.375 mmb/d from 9.193 mmb/d last week. The 4-week average for Motor Gasoline was down -0.015 mmb/d WoW to 9.221 mmb/d. The 4-week average of Total demand was up +0.163 mmb/d WoW to 19.999 mmb/d.

Figure 26: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

US net oil imports

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

We continue to iterate the same commentary as the last several weeks that something doesn't look quite right in the EIA weekly oil imports by country data. It looks like something is off in the EIA's estimates of weekly oil imports by country data but, the reason we highlight this is that we just don't know if the total US crude oil imports are wrong or if it's just that the EIA has incorrectly allocated import volumes to the wrong country. Perhaps this is part of the reason for the big weekly plug in its estimates. (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 -1.493 mmb/d to 1.618 mmb/d for the June 16 week. US imports were down -0.220 mmb/d to 6.161 mmb/d. US exports were up +1.273 mmb/d to 4.543 mmb/d. The WoW decrease in US oil imports was driven mostly by "Top 10". The Top 10 was down -0.302 mmb/d. Some items to note on the country data: (i) Canada was up +0.231 mmb/d to 3.570 mmb/d. (ii) Saudi Arabia was down -0.531 mmb/d to 0.146 mmb/d. (iii) Mexico was down -0.037 mmb/d to 0.808 mmb/d. (iv) Colombia was down -0.036 mmb/d to 0.148 mmb/d. (v) Iraq was down -0.150 mmb/d to 0.102 mmb/d. (vi) Ecuador was up +0.149 mmb/d to 0.203 mmb/d. (vii) Nigeria was up +0.072 mmb/d to 0.204 mmb/d.

Figure 27: US Weekly Preliminary Imports by Major Country

(thousand b/d)	Apr 7/23	Apr 14/23	Apr 21/23	Apr 28/23	May 5/23	May 12/23	May 19/23	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	WoW
Canada	3,590	3,519	3,327	3,526	3,269	3,592	3,707	3,589	3,504	3,339	3,570	231
Saudi Arabia	376	339	393	242	381	415	212	534	66	677	146	-531
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	450	615	728	706	393	676	657	913	647	845	808	-37
Colombia	159	303	143	143	47	339	214	286	127	184	148	-36
Iraq	241	180	222	148	247	174	136	114	430	252	102	-150
Ecuador	242	131	36	57	145	101	71	214	218	54	203	149
Nigeria	236	112	104	214	143	329	77	98	144	132	204	72
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	5,294	5,199	4,953	5,036	4,625	5,626	5,074	5,748	5,136	5,483	5,181	-302
Others	899	1,095	1,423	1,360	928	1,234	776	1,469	1,264	898	980	82
Total US	6,193	6,294	6,376	6,396	5,553	6,860	5,850	7,217	6,400	6,381	6,161	-220

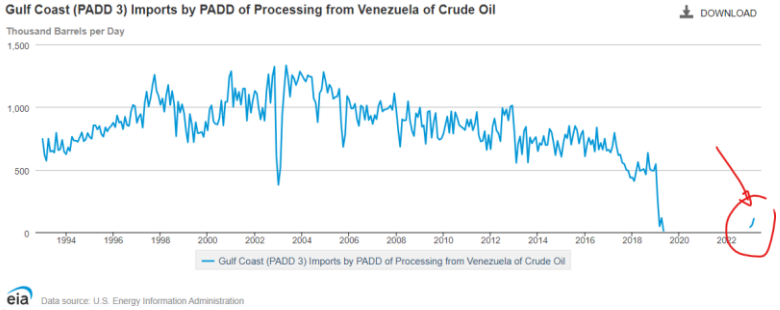
Source: EIA, SAF

EIA shows imports from Venezuela in its monthly import data.

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

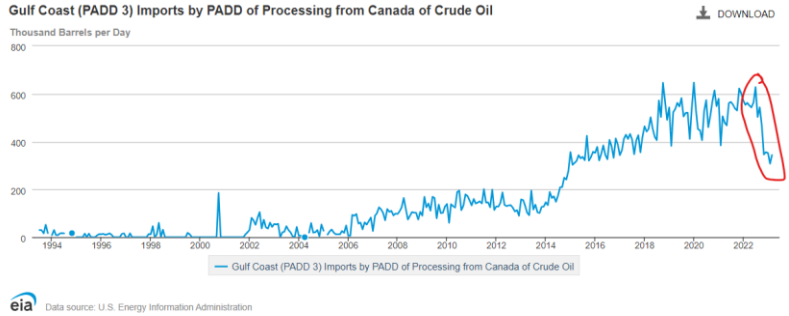
oil. Conversely, if Venezuela increases, it will mean more Venezuela crude to the Gulf Coast and less need/increased pressure on Cdn differentials. It's hard to see form the graph but we pointed to the first Venezuela oil imports into the Gulf Coast in about 3 ½ years were 40,000 b/d in Jan and 58,000 b/d in Feb, and this will be higher in March."

Figure 28: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 29: GULF Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil – Norway May oil production of 1.772 mmb/d, down ~1.8% MoM

Norway oil production down MoM

On Tuesday, the Norwegian Petroleum Directorate released its May production figures [LINK]. It reported oil production of 1.772 mmb/d for May, down ~1.8% MoM from 1.804 mmb/d in April, and +8.4% YoY from 1.635 mmb/d in May 2022. May's production actuals came in 1.3% (0.022 mmb/d) above the forecast volumes of 1.750 mmb/d. Note that April's production was revised down in the May report to 1.804 mmb/d from 1.816 mmb/d in the April report. The NPD does not provide any explanations for the MoM changes. The theme for Norway through 2022 was that Norway oil production returned to growth because of the Johan Sverdrup oil field, and tax breaks from the government allowing increased capex in the energy sector. Norway oil production is expected to be up modestly in 202

Figure 30: Norway May 2023 Production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm³/day	Total MSm³ o.e/day
Production	**May 2023**	**1.772**	**2.010**	**274**	**0.594**
Forecast for	May 2023	1.750	1.947	295.9	0.605
Deviation from forecast		0.022	0.063	-21.9	-0.011
Deviation from forecaset in %		1.3 %	3.2 %	-7.4 %	-1.8 %
Production	April 2023	1.804	2.050	339.8	0.666
Deviation from	April 2023	-0.032	-0.040	-65.8	-0.072
Deviation in % from	April 2023	-1.8 %	-2 %	-19.4 %	-10.8 %
Production	May 2022	1.635	1.813	324.1	0.612
Deviation from	May 2022	0.137	0.197	-50.1	-0.018
Deviation in % from	May 2022	8.4 %	10.9 %	-15.5 %	-2.9 %

Source: Norwegian Petroleum Directorate

Oil – Huge list of questions & uncertainties on Russia/Putin post 24-hr Wagner crisis

Prigozhin's Wagner Group crisis over <24 hrs

It's going to be a very busy Sunday afternoon for analysts and traders to try to figure out what happens in Russia, Ukraine and markets following the peaceful resolve of the 24-hr Prigozhin/Wanger crisis. Good thing they have teams of bodies to attack it. It's not something one person has capacity to have the answers to the many questions and uncertainties that will take days, weeks, months to settle out. And now, there will always be a wonder what is percolating below the surface now that Putin's reputation of being feared and obeyed by all has been hit. We suspect people could list 20 or 30 key questions, but here are a few. How will this change Putin's inner circle? What changes to Russia's war efforts with Ukraine? How quickly does the Wagner Group forces get back to fighting in Ukraine? What happens to Wagner Group efforts in Africa where Prigozhin reportedly gets the most compensation? If there was a cash component to a deal, where does Putin look for more revenue? Does this impact Russia's cheating on its oil quotas? How does this change what Putin does in the run up to the March 2024 elections? Does this raise more fears on what a cornered Putin will do? What does the west do, do they increase risk of unpredictable Putin actions if they try to hammer Russia harder on sanctions now that he is weak? Is there a way for Putin to find an exit? Does it increase the potential for a Ukraine settlement? Does Zelensky try to go for more now that Putin is weaker? The list can go on and on.

Prigozhin's Wagner Group armed rebellion dissolved peacefully within 24 hrs

We have to believe no one expected to go to bed last night with the news that Wagner Group head, Prigozhin, had cut a deal via Belarus President Lukashenka that would see no charges against him or his troops, is moving to Belarus, his troops being offered deals to join the military, and called off his march on Moscowin less than 24 hours. But that's what happened. And Putin backed off his position against those in the armed rebellion. Based on the Kommersant and TASS reports, the status as of our 7am MT cut off appears to be: (i) Kremlin says. No charges against Prigozhin, going to Belarus in some sort of exile. No charges against Wagner troops. This was big surprise given Putin's Saturday morning address on going after the armed rebellion. (ii) The only apparent reasons for Prigozhin backing off are his video clip on not wanting to have Russians killing on either side. (iii) Kremlin noted that

some of the Wagner forces may sign contracts with the military. (iv) Russian troops are returning to the Ukraine front. Our Supplemental Documents package includes the Kommersant, TASS and Belarus reports on the deal ending and also the Kommersant transcript of Putin's Saturday morning address.

Was it money that made the deal happen so quickly?

Last night, we were surprised by the cable news coverage on Prigozhin leaving and no one mentioning or wondering if the reason what he cut a money deal with Putin whereby Prigozhin gets to walk away with any of his accumulated wealth and maybe even some extra. We haven't see any specific estimates of Prigozhin's wealth but the reports are consistent that he has made a ton of money for his Wagner troop support for Putin in places like Libya. Earlier this morning, we tweeted [LINK] "*Money talks? Not getting much coverage, but note Belarus statement "on the table is an absolutely profitable and acceptable option for resolving the situation, with security guarantees for the fighters of the Wagner PMC." Did Prigozhin & his troops get paid? If so, would seem to put this 24-hr crisis to bed. But lots of questions on Putin's position, Ukraine war next steps, military leadership, etc. especially with March 2024 election less than a year away. #OOTT."* We didn't see this Belarus reporting quote in TASS reporting, although Kommersant (Russia news) picked it up and used the same absolutely profitable quote. Perhaps the most interesting/telling statement was by Belarus President Lukashenka who negotiated the deal with Prigozhin. Belaurus press service reported on Telegram "*At the moment, on the table is an absolutely profitable and acceptable option for resolving the situation, with security guarantees for the fighters of the Wagner PMC*." Absolutely profitable seems to infer money talks. Did Progzhin get his money and perhaps more to live in Belarus? Did the Wagner Group troops, who are troops for hire, just get a much better deal? We just have to believe Lukashenka didn't use absolutely profitable unless money was somehow involved. And, as we put in our tweet, we would expect a money deal makes it more likely the crisis is put to bed. Lastly, there will be speculation on what happens to Prigozhin, the one thing we would assume that he will do is stay away from windows!

Should we have expected Putin to get to a quick deal?

We probably should have looked for Putin to try to put a quick end to this potential crisis. The last thing he wanted to do was be exposed for long as not being the strongman that everyone fears and obeys. Plus, our tweet mentioned the reminder that the Russian presidential elections are less than a year away in March 2024.

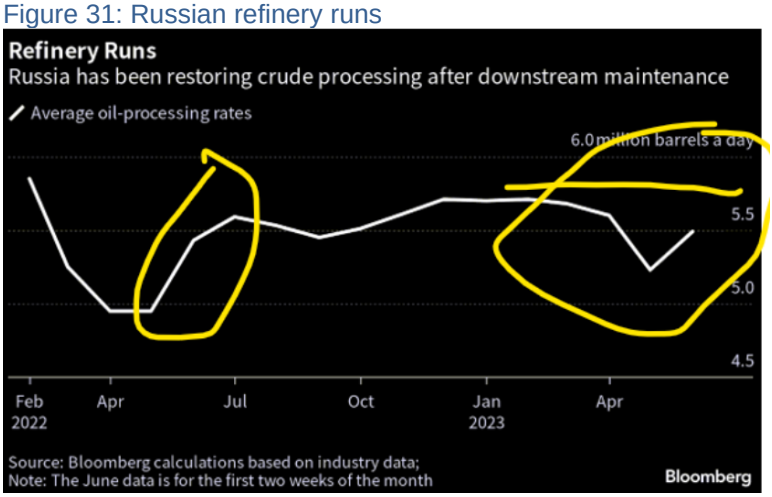
Oil – Russian refineries coming out of maintenance, processing more crude

The caveat to any of the look ahead on Russia is, as noted above, the uncertainty what happens to Russia overall from what will emerge, one way or another, from the Wagner group head's movement. Putting that aside, it isn't any longer an overlooked theme as we are now seeing regular reporting on how Russian refineries have finished up spring turnarounds, which means increasing refinery runs and more crude oil being processed. And if Russian refineries are processing more Russian crude oil, then it means there should be less Russian crude oil available for export. On Monday, we tweeted [LINK] "*More RUS refinery processing = less oil for export. Russian refineries increase crude #Oil processing*

Russia refineries process +194,000 b/d WoW

+194,000 bpd WoW for June 14 week. Tracking to normal seasonal Jun/Jul/Aug pattern for increasing RUS refinery runs following turnarouds that see oil intake -500,000 bpd from Feb thru May. Thx @ja_herron. #OOTT." Bloomberg reported "*Russian refineries have raised their crude-processing volumes to highest levels in nine weeks as the nation's downstream maintenance season is nearing an end. Russia's refining facilities processed 5.49 million barrels a day in the week ending June 14, according to a person familiar with the matter. That's nearly 194,000 barrels a day more than the week before and the country's highest processing rate since the second half of April, historical data show."* Our Supplemental Documents package includes the Bloomberg report.

Figure 31: Russian refinery runs



Source: Bloomberg

Russian refineries seasonal maintenance is ending in Jue, less oil for export

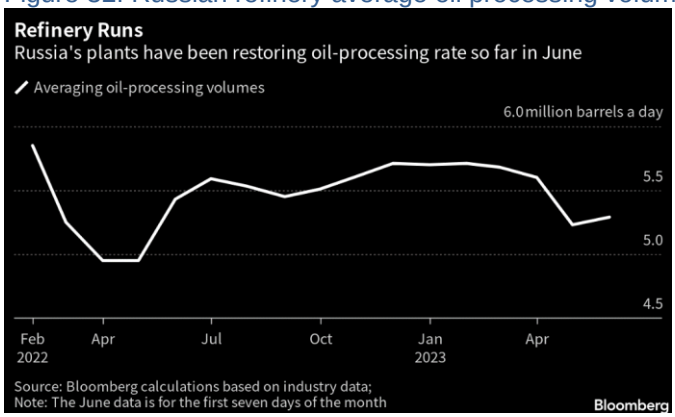
Here is what we wrote in last week's (June 18, 2023) Energy Tidbits memo on Russia Energy Minister Shulginov's comments on Russian refineries ending maintenance. "*One of the overlooked themes over the past few months was how Russian refineries are no different than other countries and normal seasonal maintenance where refineries use less crude oil, which frees up oil supply for exports. On Friday, we tweeted [LINK] "RUS refineries out of maintenance = less #Oil for exports. "Russia's refinery runs are increasing as the nation's biggest facilities complete seasonal maintenance, Energy Minister Nikolai Shulginov said in an interview with state-run Rossiya 24" reports @ja_herron. See 👇05/27 tweet, normal seasonal RUS maintenance reduces refineries intake by ~500,000 b/d Feb thru May. #OOTT." Bloomberg reported on comments by Russia Energy Minister Sulginov "Russia's refinery runs are increasing as the nation's biggest facilities complete seasonal maintenance, Energy Minister Nikolai Shulginov said in an interview with state-run Rossiya 24." We could not find the report on Rossiya 24 website. But we did find a lengthy Izvestia interview with Shulginov also on Thursday. Shulginov did not provide any details on how many more barrels of oil will be refined but he did reiterate that refineries have increased their processing*

volumes. Izvestia wrote "At the end of June, repairs at the main refineries are already being completed."

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

Here is what we wrote in our June 11, 2023 Energy Tidbits memo. "*It's only the first week of June, but we are seeing data to support the expectation for Russian oil refineries to come out of seasonal maintenance and increase crude oil processing, which means that there should be less oil for export. On Friday, we tweeted [LINK] "Less Russian #Oil available for export. @ja_herron reports peak of RUS refinery maintenance has passed. Refined +94,000 b/d this wk to 5.29 mmb/d. See 👇05/27 tweet: fits normal seasonal timing for increasing RUS refinery runs, which means less oil for export. #OOTT." The data came from a Bloomberg Friday report that wrote "Russia's oil refineries have been accelerating their crude-processing rates, offering further evidence that the peak of spring maintenance has now passed. Primary processing rates averaged 5.29 million barrels a day in the first week of June, according to a person familiar with the matter. That's more than 94,000 barrels a day higher than in prior seven days, when nation's refineries started to ramp up. Russia's crude supplies to domestic refineries, along with seaborne exports, remain the key gauges for oil market observers seeking clues to the nation's production after the government classified output data following Western sanctions." Below is the Bloomberg graph."*

Figure 32: Russian refinery average oil processing volumes



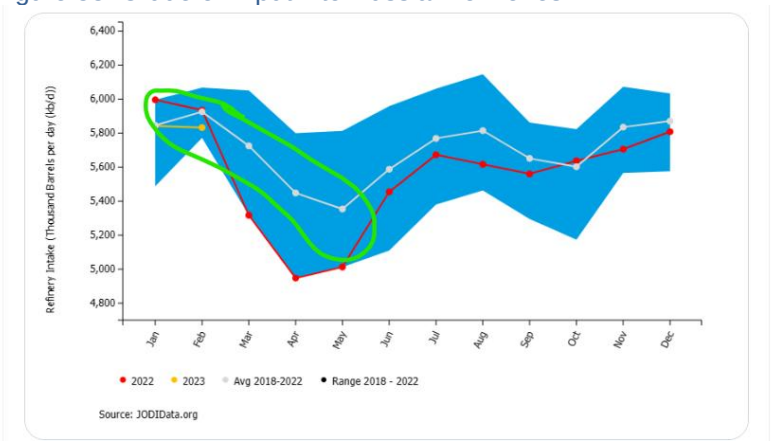
Source: Bloomberg

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

Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*One of the big negatives for oil markets has been the view that more Russian oil crude has been hitting export markets and the generally accepted cause is that Russia hasn't delivered on stated plan to cut 500,000 b/d beginning in March. However, there is another reason why more Russia oil would have hit export markets in March/April/May – it's the season when Russian refineries process less crude due to refinery maintenance. So less crude processed by refineries frees up more oil for export. Yesterday, we tweeted [LINK] "Should see RUS #oil production cuts hit*

Jun/Jul/Aug physical markets & why cuts hasn't hit exports yet. Normal seasonal pattern of RUS refinery turnarounds reduce oil intake by ~500,000 b/d from Feb thru May. Thx @JODI_Data. #OOTT." Nothing is normal in Russia post its invasion of Ukraine, but the normal seasonal pattern of Russian refineries is that they reduce crude oil inputs in March, April and May, and this is down over 500,000 b/d in this period in the normal seasonal trend. Below is the JODI graph attached to our tweet."

Figure 33: Crude oil input into Russian refineries



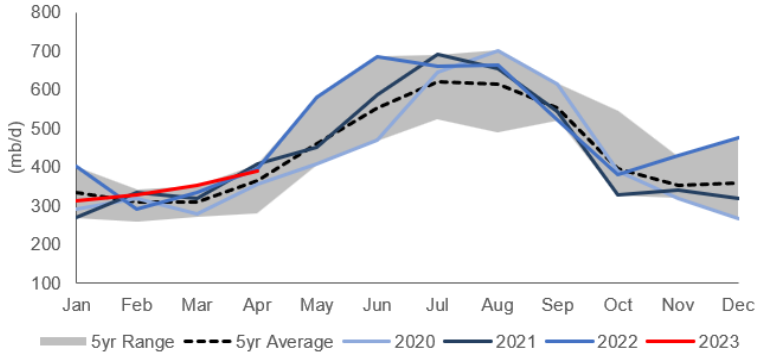
Source: JODI

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

Saudi oil use for electricity up in April

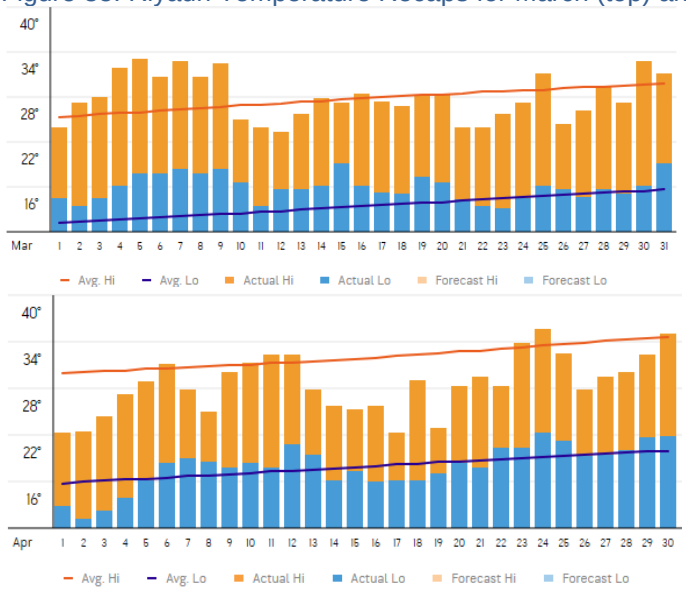
The key seasonal theme for Saudi oil exports is that, all things being equal, Saudi can export more oil in winter months as it uses less oil for electricity and, conversely, it would have less oil exports in summer months as it uses more oil for electricity ie. air conditioning. With April marking the beginning of spring and the weather starting to get even warmer, it was no surprise that Saudi oil use for electricity continues to seasonally ramp up. 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. The JODI data for Saudi Arabia oil supply and demand for April [LINK] was updated on Monday. Saudi used more oil for electricity in April vs March. The increased electricity usage was primarily driven by daily temperatures being at or above the average high throughout most of the month. It is important to note that April experienced warmer temperatures than March and warmer weather means more air conditioning/electricity demand. Oil used for electricity generation in April was 389,000 b/d (vs April 2022 of 397,000 b/d) and March was 354,000 b/d (vs March 2022 of 335,000 b/d). Below are the AccuWeather Temp maps for Riyadh for April and March..

Figure 34: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI, SAF

Figure 35: Riyadh Temperature Recaps for March (top) and April (bottom)



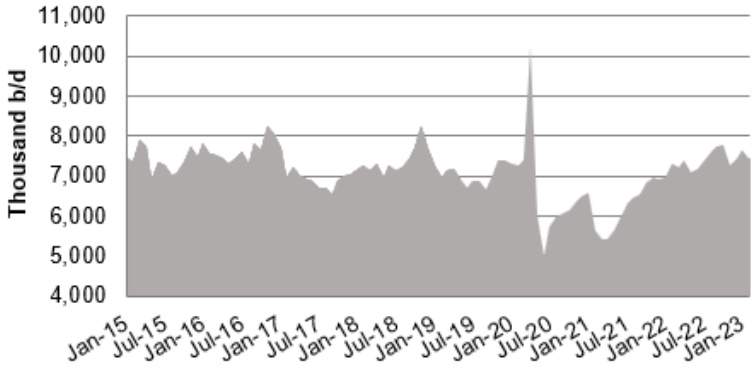
Source: AccuWeather

Oil – Saudi oil exports down -207,000 b/d to 7.316 mmb/d in April

The JODI data notes Saudi oil exports in April were down -207,000 b/d MoM to 7.316 mmb/d despite production being basically flat (-3,000 b/d MoM), refinery intake being down -42,000 b/d MoM and only a +35,000 b/d increase in direct use for electricity. In theory, Saudi oil exports should have been relative flat MoM. But they were down MoM and this helped lead to the industry build.

Saudi oil exports down -207,000 b/d MoM

Figure 36: Saudi Arabia Oil Exports (mb/d)



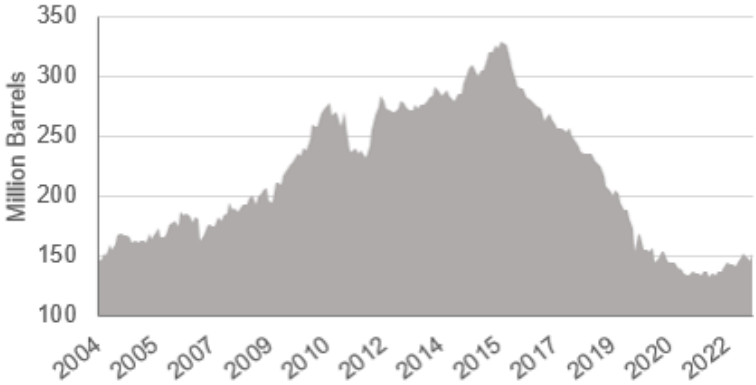
Source: JODI, SAF

Saudi oil inventory data

Oil – Expected Saudi oil inventories up more than +1.977 mmb MoM in April

We have to wonder if there were inventory correction or just missing barrels or unexplained items from Russian crude oil imports/exports in the JODI data. JODI data shows inventories were +1.977 mmb MoM, or +66,000 b/d MoM. Looking at the basic components, we would have expected a build closer to +6.330 mmb MoM or +211,000 b/d MoM. The basic components contributing to the +211,000 b/d MoM were oil exports -207,000 b/d MoM, oil intakes into refineries -42,000 b/d MoM, offset by increasing direct use for electricity +35,000 b/d MoM and lower production -3,000 b/d MoM. So there is a missing use of 145,000 b/d somewhere assuming the oil inventory numbers are correct. Our first thought was perhaps it was a correction to prior months data such as March that had a big MoM draw of- 4.492 mmb or -145,000 b/d MoM. But we will have to dig into the data to try to figure out if it's imports of Russian crude oil and/or products that is causing the big plug number. For example, we have to figure out if the use of oil for electricity was only Saudi oil and any Russian oil. It makes sense that Saudi oil intake to refineries was down if any of the increased imports of Russian petroleum products was used domestically and not just re-exported.

Figure 37: Saudi Arabia Oil Inventories (mb/d)



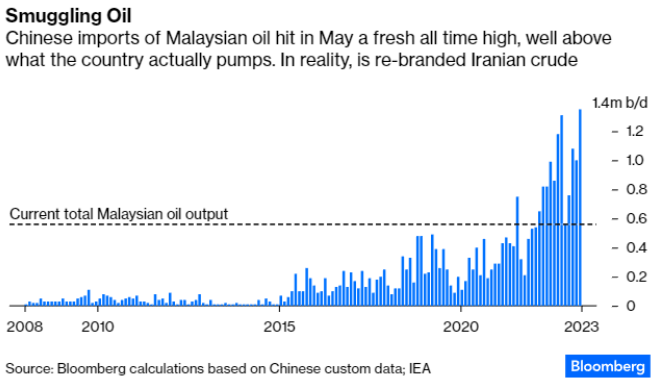
Source: JODI, SAF

Oil – Iran oil is also getting to China as Malaysian oil

Malaysia oil is Iran oil

There was the reminder this week of how Iran oil is getting indirectly to China. On Tuesday, China released its customs import data for May, which included its crude oil import by country splits. Bloomberg reported the oil imports by country data and it reinforced how Iran oil is getting indirectly to China via Malaysia. China imported 1.35 mmb/d of oil from Malaysia in May and Bloomberg also reminded that Malaysia's total oil production is still approx. 0.5 mmb/d. All the reports are that these extra barrels are likely from Iran.

Figure 38: China imports of oil labelled as Malaysian oil



Source: Bloomberg

Rebranding one country's oil as another country's happens more and more

The rebranding of Iran oil as Malaysia oil is not unique. Rebranding oil from one country as another country's oil has become common over the past year driven by the need to rebrand Russian oil. Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*Everyone knows or hears how more Russian crude oil and petroleum products are going into Saudi Arabia and UAE, and then end up being reexported as UAE. But it is always good to hear that directly from people who own/control storage tanks in Fujairah (UAE) and are doing it. Let's be clear, it isn't against the law. It's just what happens to Russian crude and petroleum products to reduce the revenue to Russia while maintaining the supply into global oil markets. One of our must listen-to daily webcasts is the Gulf Intelligence Daily Energy Markets podcast. On Thursday, Tony Quinn (Operating Partner, Prostar Capital & CEO Tankbank International) gave the insight on Russia flows into UAE and out as rebranded UAE based on what he sees as an owner/controller of storage tanks at Fujairah. Fujairah is the major Middle East crude oil and petroleum products storage hub. On Thursday, we tweeted [LINK] "Big Russian #Oil #PetroleumProducts flows into UAE (Fujairah), blended that changes certificate of origin & "moved to all sorts of strange places you would never expect to be exported to" says @TankchatTony to @FrankKaneDubai @gulf_intel. See 👇SAF Group transcript #OOTT." Our tweet included the transcript we made. SAF Group created transcript of comments by Tony Quinn (Operating Partner, Prostar Capital & CEO Tankbank International) with host Frank Kane (Editor-at-Large, Arabian Gulf Business Insights) on Gulf Intelligence PODCAST: Daily Energy*

Markets May 25th. [LINK] Items in "italics" are SAF Group created transcript. At 18:10 min mark, Quinn "I have to be careful what I say because I get in trouble here, but the oil [Russian oil] is still flowing. I'm sitting amongst 11 terminals here [Their terminals in Fujairah] and probably 50% of them are full of Russian product. So, it's still moving….. But I think in general, I'm seeing more flows. I'm seeing more traders taking Russian flows directly into here. We have seen product moving here to all sorts of strange places that you would never expect to be exported to. So there are big movements particularly out of this part of the Gulf of Russian crude. It's all being diverted. We have a different customer base. Whereas we used to bunker the Kuwaitis, now we're unloading the Russians." At 20:15 min mark, Kane asking if some the product diverting elsewhere, some of it must be Russian ending up in Europe. Quinn "…. offloading of product here or any terminal in the world, you have to remember that, once they blend that product, the certificate of origin changes. So you're suddenly dealing with a product that has a new origin. So If that's here, it suddenly become a UAE product wherever it was before. So all of those things happen. So looking at the flows, you really don't know where it comes from."

Oil – EU's Mora meets with Iran to discuss way forward on the JCPOA

EU/Iran meet on JCPOA

It was fairly quiet this week on the return to a nuclear understanding between US and Iran. However, there was the return of face-to-face meetings between Iran and Enrique Mora (the EU's point person for the JCPOA). On Wednesday, Mora tweeted [LINK] "*Intense talks yesterday and today with Vice Minister @Bagheri_Kani in Doha on a range of difficult bilateral, regional and international issues, including the way forward on the JCPOA. Good exchange on the Gulf (EU strategy, new @EUSR_Gulf Irán/KSA agreement)."* And, then on Thursday, Mora tweeted [LINK] "*For the EU, #JCPOA is the best possible , if not the only, framework to address the legitimate non-proliferation concerns of the international community on the Iranian nuclear program."*

Figure 39: EU's Mora meets with Iran on June 21

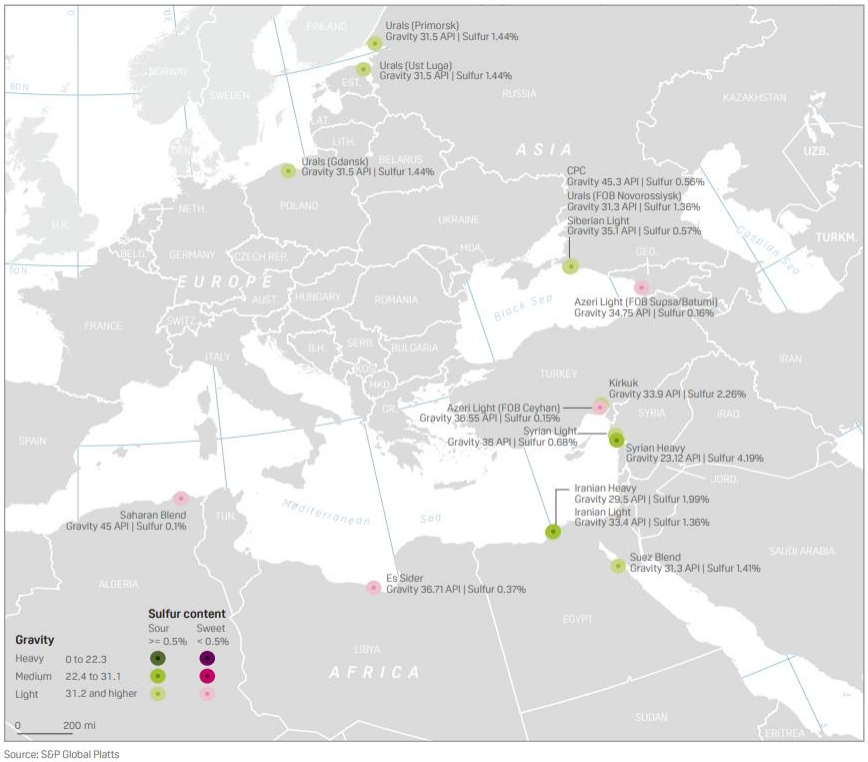
Source: EU's Enrique Mora

Iran oil would be a crude quality replacement for RUS Urals crude to Europe

We remind that one of the winners if Iran can export oil to the west will be Europe. And, in this case, Iran should have a willing buyer in Europe as they keep Last

Sunday morning, we tweeted [LINK] "*Iran's oil would be good crude oil quality replacement for Russia Urals crude to Europe IF any US/Iran nuclear understanding lets Iran oil hit Europe markets. Also should mean Iran doesn't have to sell at discount. See 👇03/09/22 tweet. #OOTT."* We also remind that Iran's oil would be a plus to Europe as it's crude quality is similar to the major Russian crude to Europe. Here is what we wrote in our March 13, 2022 Energy Tidbits memo. "*On Wednesday, we tweeted [LINK] on a good reminder from the Gulf Intelligence daily Podcast [LINK] that Iran's crude oil quality would be a good replacement for Russian Urals crude oil to Europe. We tweeted "#JCPOA. Good reminder from @gulf_intel podcast. Matt Stanley @starfuels reminds Iran light matches API and H2S very well and is a good substitute RUS Urals. See below @SPGlobalPlatts crude specs map. #OOTT". Our tweet included the below Platts map that noted crude qualities for Russia were Urals (Primorsk) 31.5 API 1.44% H2S, Urals (Ust Luga) 31.5 API 1.44% H2S, and Urals Gdansk 31.5 API 1.44% H2S, which compares to Iranian Light 33.4 API 1.36% H2S*."

Figure 40: Platts Specifications Guide Europe and Africa Crude Oil



Source: Platts

Oil – No resolve between Iraq and Turkey when to resume oil exports

As of 7am MT news cut off, we have not seen any updated reports, including from Kurdistan news, of any other updates on a potential restart to Kurdistan and Iraq oil exports via Ceyhan

Turkey and Iraq to meet

(Turkey) following last week's Iraq/Kurdistan meetings with Turkey. Rather, it is still unclear when the oil exports will resume. The latest update was from Bloomberg on Thursday. "*Iraqi Oil Flows Through Turkey Unlikely to Start This Week. Iraqi oil flows through Turkey's Mediterranean port of Ceyhan are unlikely to start this week, according to people familiar with the matter. * Tuesday's talks between Turkish President Recep Tayyip Erdogan and Masrour Barzani, the prime minister of the semi-autonomous Kurdish government in Iraq, in Ankara yielded no tangible results, the people say * Talks over legal and technical aspects will continue with both Iraqi and Kurdish officials."*

Turkey raised the Ceyhan damage post the earthquake

Last week's (June 18, 2023) Energy Tidbits memo highlighted the Rudaw report that noted that "*Turkey wants to inspect and rehabilitate the port tubes that might have been damaged following February's earthquake."* The earthquake damage at Ceyhan is not a new excuse. On Feb 7, we retweeted two Feb 7 tweets from TankerTrackers.com. The first [LINK] wrote "*Satellite imagery captured today by @planet now shows what appears to be two ruptured oil storage tanks at the Ceyhan terminal in Turkey. These tanks are fed with oil that derives from northern Iraq. Each one of these tanks can store a million barrels. #OOTT.".* The tweet included the below images. The second tweet was "*we anticipate that there may be more damage than meets the eye; particularly with the empty storage tanks. Also, future aftershocks may continue to create additional ruptures in the coming weeks and months. Our latest export figures will be published on Thursday*."

Figure 41: Ceyhan terminal in Turkey

Source: TankerTrackers

Oil – Eastern Libya threatens oil exports from the east without proper revenue sharing

Eastern Libya threatens oil exports

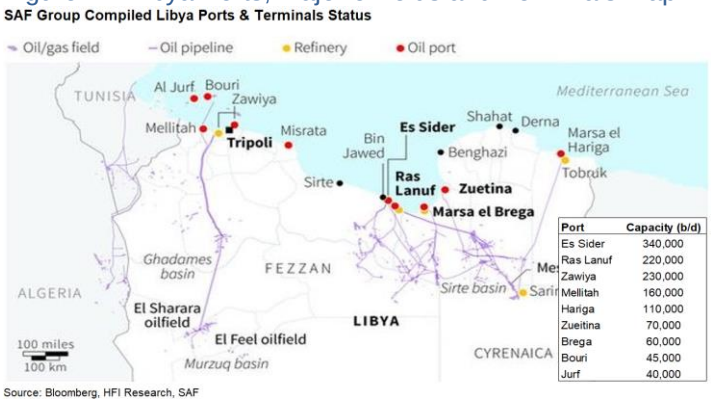
Earlier this morning, we tweeted [LINK] "*Risk to Libya's stable #Oil production that's been ~1.2 mmb/d for months? Looks like back to Eastern LIbya not believing getting their fair share of oil revenues. Eastern Libya govt head Osama Hammad warns could halt oil exports & declare force majeure. #OOTT. [LINK]."* Yesterday, the Libya Observer (Tripoli based) report "*New oil crisis looming as rival PM threatens to shut down oil sites in the east".* It looks like Eastern Libya is still not happy with the oil revenue sharing and are warning that they need this resolved or else they could shut down oil exports in the east. Libya Observer wrote "*Osama Hammad, who is heading the rival government in the east, warned on Saturday to take action and halt oil and gas operations in the main oil sites east of the country.*

Hammad accused the National Oil Corporation (NOC) of siding with the UN- recognized Government of National Unity based in Tripoli and giving it access to "seize" $16 billion in oil revenues. He warned to halt export operations and declare force majeure in response." Our Supplemental Documents package includes the Libya Observer report.

Libya oil production has been stable at ~1.2 mmb/d for months

Libya National Oil Corporation hasn't been providing the weekly updates to oil production that it was up until May but the message for the past several months has been one of stable oil production. Here is what we wrote in our June 4, 2023 Energy Tidbits "*We have to give the Libya National Oil Corporation credit that it's been able to keep oil production pretty stable right around 1.2 mmb/d for the past several months. The Libya National Corporation tends to post a short oil production update on its Twitter [LINK] and Facebook [LINK]. They didn't post an update last week, but they did on Friday June 2 and the Google Translate was "Crude oil production reached 1.214 million barrels per day, and condensate production reached 53 thousand barrels per day during the past 24 hours*."

Figure 42: Libya Ports, Major oilfields and Terminals map



Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Oil – No new China Covid reporting, peak still expected in June

No new China Covid reporting

As of our 7am MT news cut off, we have not seen any new Chinese state media (Global Times, People's Daily & Xinhua) reports on Covid for the past week. So no reporting from state media. The only Covid reporting was on the declassified US intelligence report to Congress that said the US "*has no information, however, indicating that any WIV genetic engineering work has involved SARS-CoV-2, a close progenitor, or a backbone virus that is closely-related enough to have been the source of the pandemic."* China had previously predicted the peak of the current Covid wave would be the end of June but we just aren't seeing reports out of China of a big drain on hospitalizations or deaths, even downplayed reports.

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

Here is what we wrote in our May 28, 2023 Energy Tidbits memo. "*On Monday, China admitted there is a new wave of Covid that their predictive model calls for a*

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

Reminder these are predictive models that might be wrong

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

Oil – China scheduled domestic flights are back down to Apr 11-17 levels

China scheduled domestic flights

Chinese domestic air travel mobility indicators continue to point to a stalling China recovery in China domestic scheduled flights has continued into June. China scheduled domestic flights have given back the early May gains and are back to Apr 11-17 levels. On Tuesday, we tweeted [LINK] "*China's stalling recovery. 2nd consecutive WoW decline in scheduled domestic flights, -0.9% WoW to 92,568. Given up May Day Holiday increase and more, now back to Apr 11-17 levels. Thx @BloombergNEF Claudio Lubis. #OOTT."* This week's BloombergNEF Aviation Indicators weekly report (June 20) update of scheduled China domestic flights was a continued negative indicator for China recovery from BloombergNEF

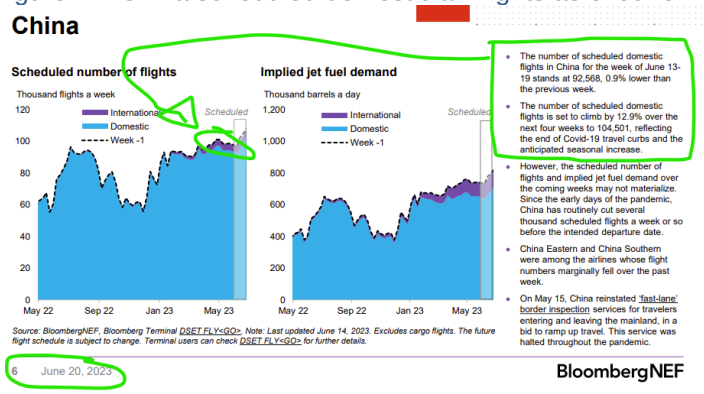
scheduled domestic flights in China, and a little worse message than last week, which was worse than the prior three weeks, China scheduled domestic flights keep taking steps backwards. China scheduled domestic flights were -0.9% WoW to 92,568 flights for June 13-20 week vs 93,328 flights for June 6-12 weeks. The recent 5-day May Day Holiday was Apr 29-May 3 that saw scheduled domestic flights to over 97,000 flights.Note scheduled domestic flights for June 13-20 at 92,568 is -22.3% vs what was scheduled on March 28 for the then next 4-weeks ie. April) of 119,180 flights. Rather, domestic scheduled flights are back to April 11-17 levels. Today's number of scheduled domestic flights for the next four weeks is set to increase by +12.9% "over" the next four weeks to reach 104,501 flights. Despite, the scheduled flights being down WoW again, this is higher than last week's then 4-week forecast for 103,217 flights. Again, this 104,501 flights is still -12.3% below the 4-week scheduled on March 28 for the end of April that was 119,180 domestic scheduled flights. This is still saying the big jump up in scheduled domestic flights for April didn't happen . China scheduled domestic flights have now given up the May Day bump and are now back to April 11-17 levels. At best, the scheduled next four weeks is up , but nowhere near what was expected on March 28.Our tweet included the BloombergNEF charts from June 20 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

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

Jun 13-19: -0.9% WoW to 92,568 flights
June 6-12: -1.2% WoW to 93,328 flights
May 30-Jun 5: +0.2% WoW to 94,486 flights
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW to 94,138
Apr 11-17: +0.7% WoW to 92,231
Apr 3-10: -4.2% WoW to 91,567
Mar 28-apr 3: +6.8% WoW to 95,624
Mar 21-27: +1.5% WoW to 89,513
Mar 14-20: -0.6% WoW
Mar 7-13 week: -0.8% WoW
Feb 27-Mar 3 week: -2.6% WoW
Feb 21-27 week: +0.0% WoW (note this was +0.01%)
Feb 14-20 week -0.5% WoW
Feb 7-13 week -0.7% WoW
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW
Jan 17-23 week +7% WoW
Jan 10-16 week +20% WoW

Source: BloombergNEF

Figure 44: China scheduled domestic air flights as of June 20



Source: BloombergNEF

Figure 45: China scheduled domestic air flights as of March 28

Source: BloombergNEF

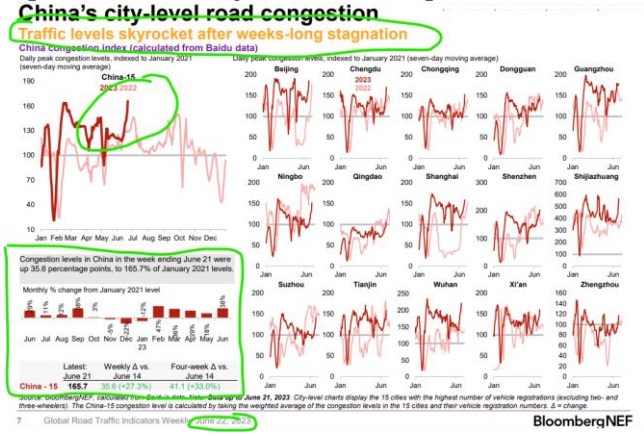
Oil – Baidu China 10 of top 15 cities road congestion now up YoY vs Covid restrictions

China city traffic congestion

It was a better (stronger) week for China's city-level road congestion, but there is still room to go. On Thursday, we tweeted [LINK] "*Better but room to go. China Baidu city-level road congestion "skyrocket after weeks long stagnation". Big up week. BUT see 👇 @BloombergNEF top 15 cities table. Top 15 cities. Indexed to 06/21. 06/23 is 116, up YoY vs Covid restricted 06/22 of 108. 10 of top 15 cities up YoY, last week was 6 of top 15. So better, but would have expected much higher vs year ago Covid restricted traffic. #OOTT.*" Our tweet referenced the BloombergNEF Global Road Traffic Indicators June 22 report. City-level congestion is better but still a way room to go. Good jump up in China city-level road congestion for week ended June 21, 2023. Baidu data +35.6% to 165.7% of Jan 2021 levels. Plus China's top 15 cities are now back up YoY vs June 2022 when China still had Covid restrictions. Indexed to June 2021, June 2023 is now 116 vs June 2022 indexed at 108. So up YoY. There are 10 of the top 15 cities now up YoY. Note this is indexed to June 2021 and not June 2020. So better vs the Covid restricted June 2022, but still not broad recovery in traffic. Note that last week, there were only 6 of top 15 cities up YoY. It's only one week,

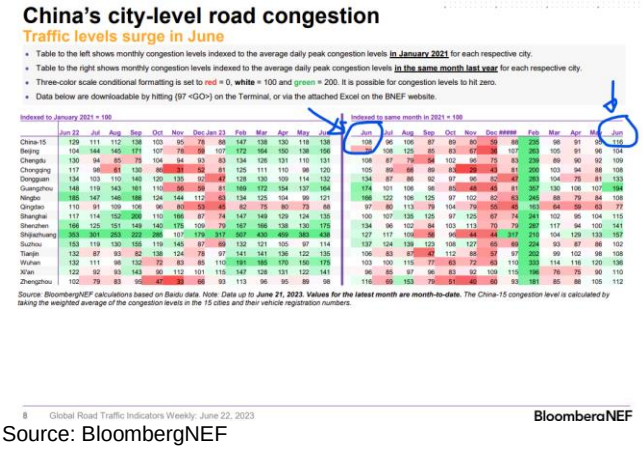
but a better week with 10 of top 15 cities now up YoY. One question mark that we wonder how plays out in next week's report is that the annual Dragon Boat Festival national holidays were Thurs June 22 thru Sat June 24, so it kicks in after this Baidu June 21 week data. We would expect that any national holiday has an impact on city-level traffic. Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators June 22 weekly report.

Figure 46: China city-level road congestion for the week ended June 21



Source: BloombergNEF

Figure 47: China city-level road congestion for the week ended June 21



Source: BloombergNEF

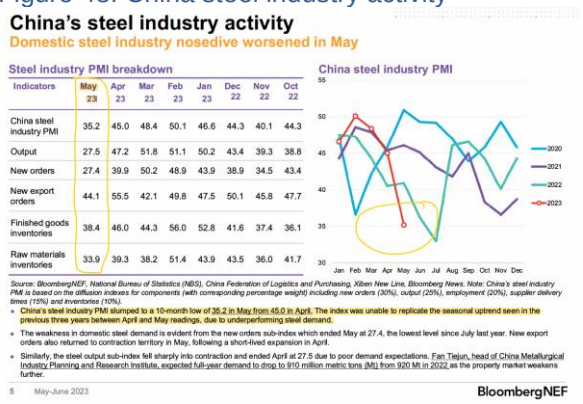
Oil – China steel industry indicators crashed in May

China crashing steel indicators

We saw some good China industrial activity indicator data on Friday morning and tweeted [LINK] "*ALL China steel indicators keep getting worse in May. China steel industry PMI hits 10-mth low in May. Steel output indicator 27.5 in May vs 51.8 in March. NO2 emissions in China steel hubs below norms ie. less activity. Thx @BloombergNEF. #OOTT.*"
BloombergNEF posted its "*Industrial Metals Monthly: China's Stimulus in Focus*". It jumped

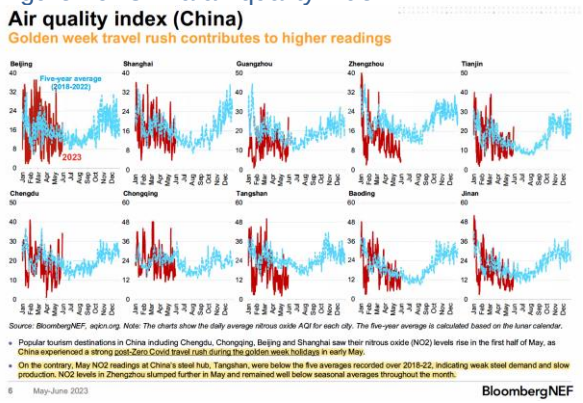
out that all the China steel industry activity indicators were down and way worse in the last few months. China steeling industry PMI has declined from 50.1 in Feb to 48.4 in Mar to 45.0 in Apr and now way down to 35.2 in May. China steel output indicators crashed from 51.8 in Mar to 47.2 in Apr and now way down to 27.5 in May. It was impossible to not see the crashing China steel industry indicators in May. Our tweet also included our regularly referenced China air quality index that noted how NO2 emissions were up in cities driven by eople driving, but NO2 emissions in industrial centers, like steel, still had NO2 emissions below prior averages.

Figure 48: China steel industry activity



Source: BloombergNEF

Figure 49: China air quality index



Source: BloombergNEF

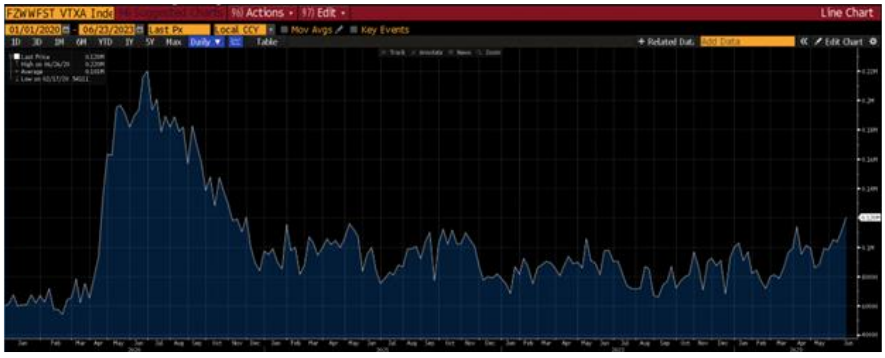
Oil – Vortexa crude oil floating storage at June 24 was 120.33 mmb, +8.96 mmb WoW

Vortexa floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on June 17 at 9am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for June 23 at 120.33 mmb,

which is +8.96 mmb vs the big upwardly revised June 16 of 111.37 mmb. Note June 16 of 111.37 mmb was revised +7.25 mmb vs 104.12 mmb posted on Bloomberg as of 9am MT on June 17. (ii) Other than the big upward revision to June 16, all of the other revisions for the prior seven weeks were modest. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on June 17 are as follows: June 16 revised +7.25 mmb. June 9 revised +0.05 mmb. June 2 revised +1.04 mmb. May 26 revised -1.08 mmb. May 19 revised -1.13 mmb. May 12 revised -0.46 mmb. May 5 revised -2.04 mmb. (iii) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 103.69 mmb, which is up big vs last week's then seven-week average of 98.26 mmb. The big jump up is from adding a big week with 120.33 mmb for June 23 into the average and dropping a small week of 85.91 mmb for May 5 from the 7-week averages. (iv) 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 (ie Saturday mornings). (v) 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. (vi) June 23 estimate of 120.33 mmb is -99.62 mmb vs the Covid peak on June 26, 2020 of 219.95 mmb. (vii) June 23 estimate of 120.33 mmb is +54.72 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (viii) June 23 estimate of 120.33 mmb is +30.16 mmb YoY vs June 24, 2022 of 90.71 mmb. (ix) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT June 24, 9am MT June 17, and 9am MT June 10.

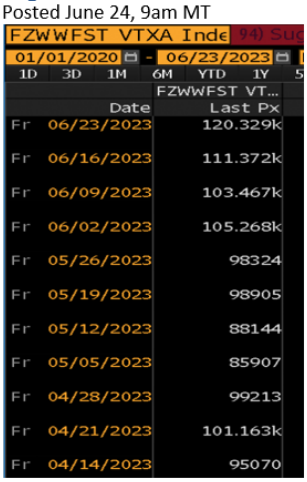
Figure 50: Vortexa Floating Storage posted on Bloomberg June 24 at 9am MT



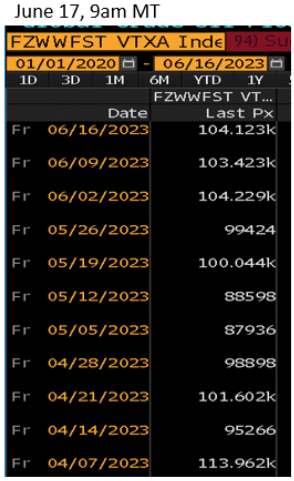
Source: Bloomberg, Vortexa

Figure 51: Vortexa Estimates Posted Jun 24 9am MT, Jun 17 9am MT, Jun 10 9am MT

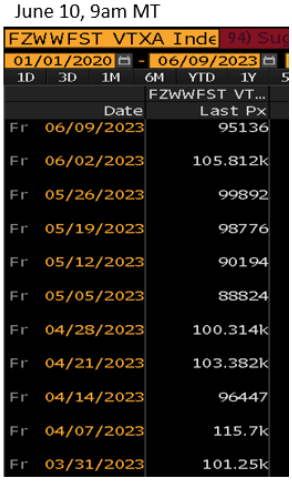
Posted June 24, 9am MT



June 17, 9am MT



June 10, 9am MT



Source: Bloomberg, Vortexa

Oil – Vortexa crude oil floating storage WoW changes by regions, want to watch Asia

Vortexa floating storage by region

Bloomberg also posts the Vortexa crude oil floating storage in the key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. The largest WoW changes were in Asia +14.28 mmb WoW and Other -7.23 mmb WoW. There will be an eye on Asia floating oil storage to see if this will come back down. This week at 62.57 mmb is only the 2nd week that Asia is over 60 mmb in the past year, with the only other time being 64.06 mmb on Jan 6, 2023. A more typical week would be closer to 50 mmb with the YTD average at 52 mmb. In Sep/Oct/Nov 2021, Asia floating storage was in the 70s and up to 87 mmb. Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for June 16 that was posted on Bloomberg at 9am MT on June 17.

Figure 52: Vortexa crude oil floating by region

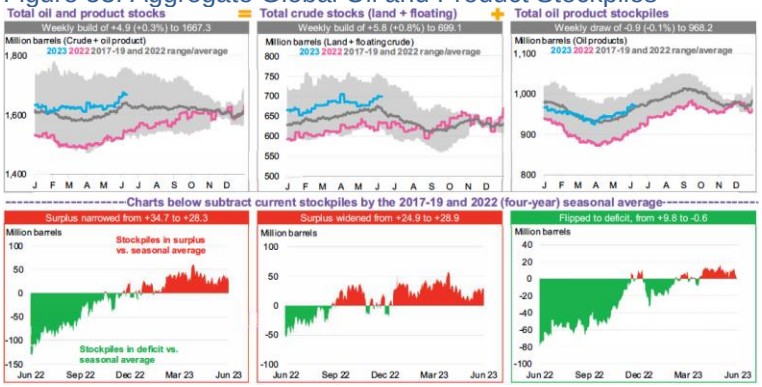
Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	June 23/23	June 16/23	WoW	June 16/23	Apr 7/23	June 23 vs Apr 7
Asia	62.57	48.29	14.28	44.96	58.78	3.79
Europe	6.96	8.08	-1.12	7.54	23.82	-16.86
Middle East	9.50	8.03	1.47	9.14	4.97	4.53
West Africa	5.76	4.61	1.15	2.76	5.94	-0.18
US Gulf Coast	1.31	0.90	0.41	0.90	3.17	-1.86
Other	34.23	41.46	-7.23	38.82	17.21	17.02
Global Total	120.33	111.37	8.96	104.12	113.89	6.44
Vortexa crude oil floating storage posted on Bloomberg 9am MT on June 24						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil – BNEF: global oil and product stocks surplus narrowed WoW to 28.3 mmb

One of the negatives for oil going into 2023 was that there was expected to be surplus oil in Q1 and a building of global oil inventories. That's happened. So, a key data point to watch has been if this build turns into a draw over Q2/23 and certainly into Q3/23. 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 34.7 mmb to 28.3 mmb for the week ending June 9. Land crude oil inventories increased by 8.0 mmb WoW to 597.0 mmb, narrowing the deficit to -14.3 mmb against the five-year average (2016-2019, 2022). Total crude inventories (incl. floating) increased by +5.8 mmb WoW to 699.1 mmb, widening the surplus from +24.9 mmb to +28.9 mmb. Total product stocks were down by -0.9 mmb WoW to 968.2 mmb, flipping the stockpile surplus to a deficit of against the 4-year average (2017-2019,2022) to -0.6 mmb for the June 9 week. The gas, oil, and middle distillate stocks increased by +0.3 mmb WoW at 151.4 mmb/d, with the deficit against the four-year average widening to -14.1 mmb. Jet fuel consumption by international departures for the week of June 19 is set to increase by +61,000 b/d WoW, while consumption by domestic passenger departures is forecast to decrease by +43,100 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 53: Aggregate Global Oil and Product Stockpiles



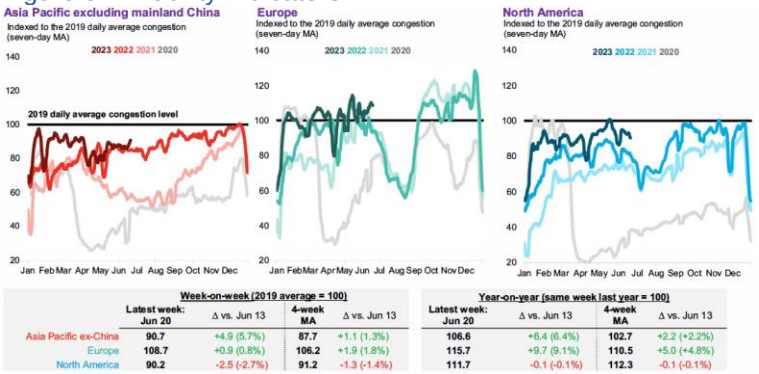
Source: BloombergNEF

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

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 June 20, European and Asia Pacific (ex-China) traffic levels increased by +0.8% and 5.7% respectively, while North American decreased WoW by +2.7%. Traffic levels in Europe are now +8.7% above the 2019 average and up +15.7% YoY. North America and Asia Pacific (ex-China) traffic are -9.8% and -9.3% below the 2019 average and are +11.7% and +6.6%YoY, respectively. Traffic in Europe has been steadily increasing in June, while NA and Asia Pacific (ex-China) have taken a downturn. 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 54: Mobility Indicators



Week-on-week (2019 average = 100)

	Latest week: Jun 20	Δ vs. Jun 13	4-week MA	Δ vs. Jun 13
Asia Pacific ex-China	90.7	+4.9 (5.7%)	87.7	+1.1 (1.3%)
Europe	108.7	+0.9 (0.8%)	106.2	+1.9 (1.8%)
North America	90.2	-2.5 (-2.7%)	91.2	-1.3 (-1.4%)

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

	Latest week: Jun 20	Δ vs. Jun 13	4-week MA	Δ vs. Jun 13
Asia Pacific ex-China	106.6	+6.4 (6.4%)	102.7	+2.2 (+2.2%)
Europe	115.7	+9.7 (9.1%)	110.5	+5.0 (+4.8%)
North America	111.7	-0.1 (-0.1%)	112.3	-0.1 (-0.1%)

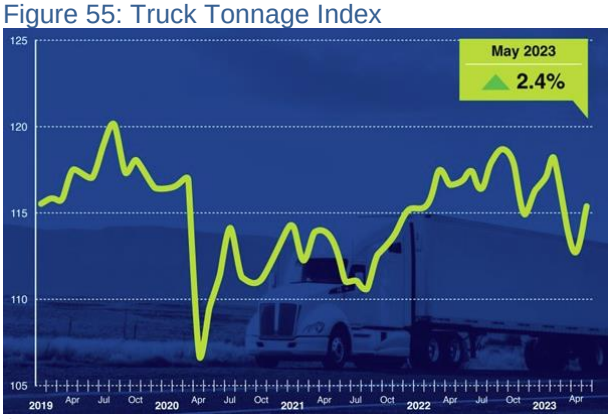
Source: BloombergNEF

Oil – Truck tonnage index in May is down 1.3% YoY

Truck tonnage index -1.3% YoY MoM in May

We look to items like truck tonnage for indicators on the US economy and the May truck tonnage is in line with the expectations for a slowing US economy. Truck tonnage increased +2.4% MoM, but is down -1.3% YoY in May, resulting in a total YTD decline of -1.5% since the start of 2023. This follows 2022's cumulative growth of 3.4% which was the largest single year increase observed since 2018. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for May on Tuesday [LINK]. Chief Economist Bob Costello noted, *"The 2.4 percent gain didn't erase the 4.5 percent total drop the previous two months. Additionally, tonnage continues to contract from year earlier levels as retail sales remain soft, manufacturing production continues to fall from a year ago, and housing starts contract from 2022 levels."* Trucking serves as a barometer of the U.S. economy, representing 72.2% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 10.93 billion tons of freight in 2021. Motor carriers collected $875.5 billion, or 80.8% of total revenue earned by all transport modes, equating to roughly 3.6% of total U.S. GDP in 2021. Our Supplemental Documents package includes the ATA release.

Figure 55: Truck Tonnage Index



Source: ATA

Oil & Natural Gas – Dallas Fed Survey, oil & gas activity unchanged in Q2

Dallas Fed quarterly energy Survey

One of our favorite quarterly reports is the Dallas Fed quarterly energy survey posted this week [LINK]. The survey provides a good window into what the US oil and gas sector is thinking about prices, activities, and issues. (i) It is important to remember that the data for this survey was collected June 7-15 from a total of 152 firms, 101 E&P and 51 oilfield services. We suspect the views would be a little more negative for oil and a little more positive for natural gas based on prices now vs the. For most of the June 7-15 survey WTI was mostly above $70 but fell below to end the period. Henry Hub was between $2.10 to $2.20 for the survey period. (ii) The main headline was "*Activity in the oil and gas sector was unchanged in second quarter 2023, according to oil and gas executives responding to the Dallas Fed Energy Survey. The business activity index—the survey's broadest measure of conditions facing Eleventh District energy firms—edged down to zero in the second quarter from 2.1 in the first."* (iii) The rising costs theme continued for the 10th consecutive quarter, but "*the rate of cost increases slowed*". (iv) Lower WTI price expectations for year end 2023. This survey average is $77.48 vs $79.64 in the Q1 survey. (v) Lower Henry Hub price expectations for year end 2023. This survey $2.97 vs $3.43 in Q1 survey. (vi) Continued drilling & completion cost pressures on small E&P. 65% of large E&P expect no change or lower D&C costs at year end 2023 vs year end 2022, which is the direct opposite of 68% of small E&P expect slightly or significantly higher D&C costs at year end 2023 vs year end 2022. (vii) Looking ahead to balance of 2023, 62% of respondents expect tighter credit conditions to impact business plans thru the balance of 2023. Our Supplemental Documents package includes excerpts from the Dallas Fed survey.

Oil & Natural Gas – More wildfires this week in both Alberta and BC

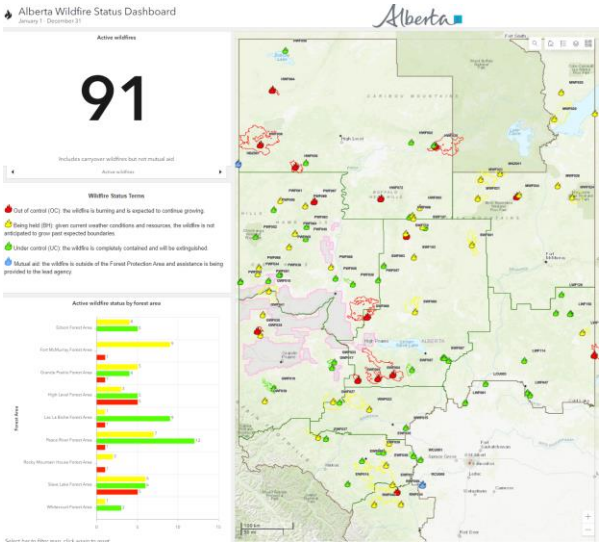
Wildfires up in Alberta and BC

Wildfires are still a big issue in Alberta and an increasing issue in BC. A month ago on May 21, there were 86 total wildfires in Alberta. That dropped to 51 on May 27, then up to 57 on June 3, 76 on June 10, down small to 74 on June 17 but jumped back up to 91 on June 24. The positive is that Out of Control wildfires dropped from 20 to 14 WoW. Total wildfires in BC increased from 82 to 90 as of June 24. WE didn't report on Out of Control numbers last week, but there are now 46 Out of Control wildfires.

Links to Alberta and BC wildfire status maps

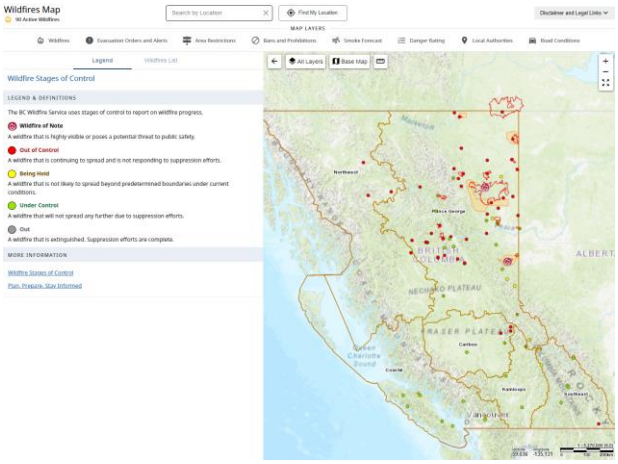
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [LINK] and the BC Active Wildfires interactive map [LINK]. Please note these links have changed over the past few years. Both maps are interactive and open up for the information on any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

Figure 56: Alberta wildfire map as of 7pm MT on June 24



Source: Alberta Wildfire Status Dashboard

Figure 57: BC wildfire map as of 7pm MT on June 24



Source: BC Wildfire Service

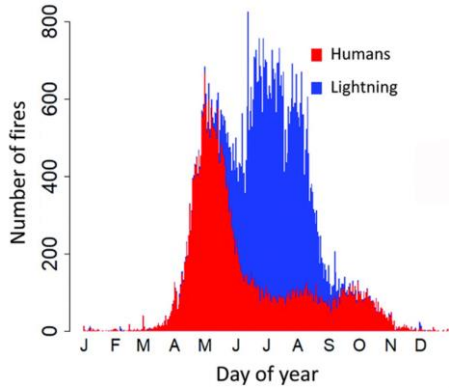
Oil & Natural Gas – Peak Cdn wildfire season is normally Jul/Aug

We don't track wildfires data outside Alberta/BC as our focus is on the oil and gas sector but, the big Canada story this year has been wildfires in eastern Canada. It's a reminder that wildfires are not just a western Canada. It's always better to see less wildfires. But we remind that wildfire season is just starting. Unfortunately, we have to remind that wildfire season peak isn't normally until July/Aug. (i) On May 9, we tweeted [LINK] *"#Wildfire season is, unfortunately, only just starting with normal peak Jul/Aug. See 👇excerpts. SAF 06/13/21*

Wildfire peak is normally July Aug

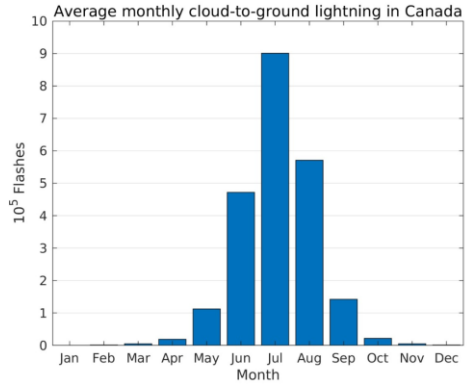
Energy Tidbits re distribution of wildfires by month in Canada. SAF 05/07/23 Energy Tidbits re heightened 2023 risk with very low precipitation in Nov 1-Mar 31 & Apr. Hope everyone can be safe! #OOTT." (ii) Our tweet included two graphs from our June 13, 2021 Energy Tidbits memo that shows the normal 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. Note we have updated the precipitation maps for the end of May. Below are Nov 1 thru Apr 30 and for the month of May maps showing precipitation % of normal. It's been dry.

Figure 58: Canada Wildfires Distribution Over Year



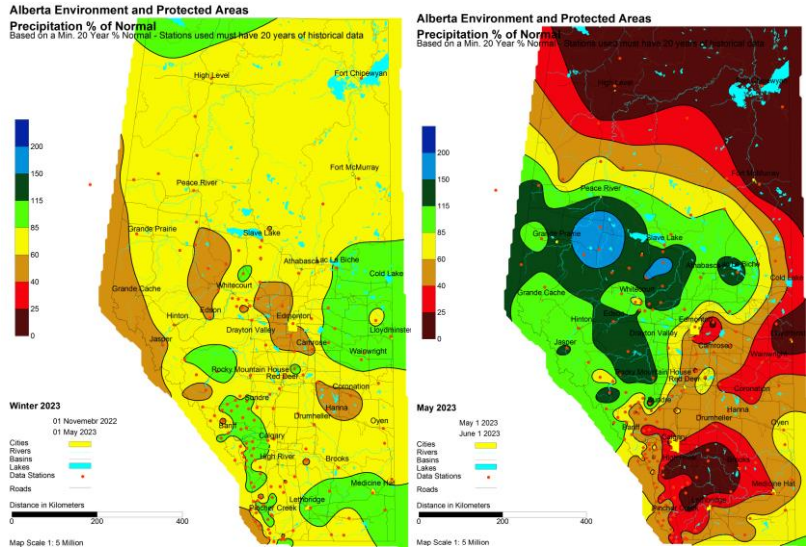
Source: Wildfire Today

Figure 59: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 60: Alberta Precipitation % of Normal for Nov 1-Apr 30, and for Mayl



Source: Alberta Environment

Oil & Natural Gas – Tropical Storm Bret dissipated yesterday, wind shear a factor

Wind shear and hurricanes

Yesterday morning, we tweeted [LINK] "*Tropical Storm Bret forecast to dissipate. There are always hurricanes storms, but 👇 @accuweather Alex DaSilva reminds wind shear can be critical factor in causing storms to dissipate. See 👇 @ATMS_Illinois prior reminder that El Nino years tend to bring more wind shear. #OOTT.*" Yesterday morning, the National Hurricane Center's forecast for Tropical Storm Bret was that it would drop down to Tropical Depression level and dissipate yesterday ie. go away. AccuWeather's report on that NHC update include the reminder on wind shear. AccuWeather wrote [LINK] "*The storm's position in the Caribbean Sea will continue to play a significant role in its intensity potential given the expansive zone of increased wind shear. The feature will continue to move westward across the Caribbean Sea to start the weekend. Wind shear can be a critical factor for a tropical system's organization and intensity. Wind shear, or disruptive winds, is the change in direction and increases in the speed of breezes across the surface of the Earth and at different altitudes in the atmosphere. "Think of tropical storms and hurricanes as a neat, tall stack of pancakes. Strong vertical wind shear can cause some pancakes to be displaced, and the stack could fall over," explained AccuWeather Meteorologist Alex DaSilva.*" There are always going to be hurricanes and tropical storms but AccuWeather reminds that wind shear can be a "critical factor" for tropical storm organization. Our tweet also included the below item that we have carried for years on how El Nino years tend to have more wind shear and therefore tend to have lesser hurricane activity. Our Supplemental Documents package includes the AccuWeather update from yesterday morning.

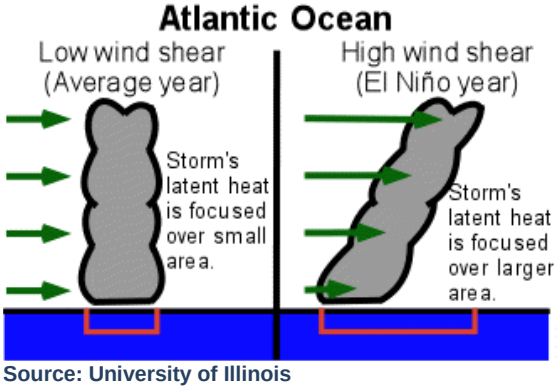
Figure 61: Strong wind shear = unfavorable storm development

Source: AccuWeather

El Nino years tend to be low Atlantic hurricane years

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

Figure 62: Early-March NOAA El Nino/La Nina Outlook



Source: University of Illinois

Energy Transition – Siemens warning raises negatives to wind generation outlook

Negative wind generation outlook

Wind OEMs have been having a tough time but, even still, the Siemens Energy warning on its onshore and offshore wind was way worse than expected. Siemens is one of the global leaders in wind generation so it's clear problems with both onshore and offshore wind was viewed as raising negatives to the overall wind generation outlook. And, given how important wind generation is to the Energy Transition aspirations, this just adds another negative to the Energy Transition. (i) On Thursday night, we tweeted [LINK] "*WOW! Big hit to wind generation aspirations in #EnergyTransition. Even worse than expected vs @SiemensGamesa 👇02/06/23 warning. 06/22/23: "Following the substantial increase in failure rates of wind turbine components .... initiated an extended technical review of Siemens Gamesa's installed fleet and product designs." "... the technical review suggests that in order to reach the targeted product quality of certain Onshore platforms, significantly higher costs will be incurred than previously assumed." "We are also reviewing assumptions critical to the existing business plans given productivity improvements are not materializing to the extent previously expected. Offshore. "In addition, we continue to experience ramp up challenges in Offshore." #NatGas power generation will be needed for longer. #OOTT*." (ii) Our tweet included the Siemens Gamesa release that raised huge negatives on onshore wind and offshore wind. (iii) Huge issues in Onshore wind – Siemens update on its onshore was clear and brutal. Siemens wrote "*Following the substantial increase in failure rates of wind turbine components, the board of Siemens Gamesa initiated an extended technical review of Siemens Gamesa's installed fleet and product designs. The current status of the technical review suggests that in order to reach the targeted product quality of certain Onshore platforms, significantly higher costs will be incurred than previously assumed. Potential quality related measures and the associated costs are currently under evaluation and are likely to be in excess of 1 bn Euro. We are also reviewing assumptions critical to the existing business plans given productivity improvements are not materializing to the extent previously expected."* (iv) No idea if they can make it a profitable business. The Siemens warning is blunt and investors had no choice but to take Siemens at its word the admission that critical assumptions to their business plan are not materializing. And they can't hit the targeted product quality for onshore with incurring "*significantly higher*" costs. (v) Continuing challenges in Offshore. Big offshore wind projects are still at the early stages of development but offshore wind is viewed as the big growth area for wind generation. Siemens also had a blunt, but shorter, warning on its offshore wind. Siemens wrote "*In addition, we continue to experience ramp up challenges in Offshore."* Our Supplemental Documents package includes the Siemens release. [LINK]

Siemens shares hammered, other wind OEMs also down on industry concerns

The market was clearly shocked by how bad Siemens onshore and offshore wind is doing and the lack of any visibility on how they can make this a profitable quality business. Siemens Energy shares were down 37% on Friday. Investors clearly had questions/concerns that some of the Siemens onshore and offshore problems will impact other wind OEMs. Another of the global wind OEMs is Vestas Wind Systems and their shares were down 7% on Friday.

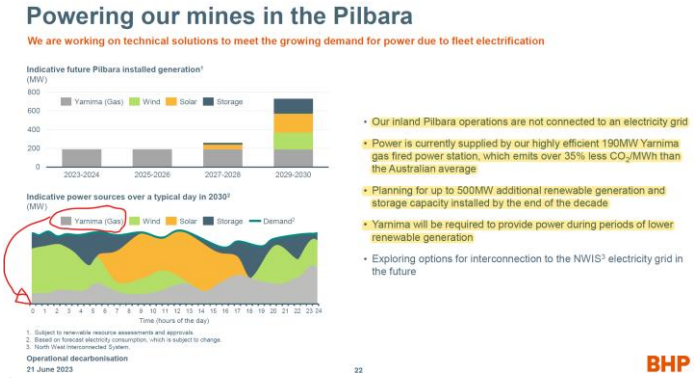
Energy Transition – Solar/wind/battery can't really replace natural gas for BHP mining

BHP on solar, wind, battery combo for mining

On Wednesday morning local time, BHP posted its "*Operational decarbonisation*" update. One of their slides was on how they will be moving to change how they power the mines in

the Pilbara from being powered by natural gas to being powered by solar, wind, battery storage and still needing natural gas. It is also a big reminder that for businesses that want to have power 24/7, they can't do it just with solar, wind and battery storage. They will need natural gas. So they will keep their existing 190MW natural gas generation and add 500MW of additional renewable generation from solar, wind and battery storage. Because of intermittency, their generation capacity will increase from 190MW to 690MW. On Tuesday night, we tweeted [LINK] "*Math of #RenewableEnergy replacing #NatGas. #BHP currently powers mines in the Pilbara with 190MW of #NatGas power capacity. can be replaced by 500MW of #Solar/#Wind/#Battery capacity PLUS keep the existing 190MW #NatGas to fill in gaps from renewables. #OOTT."* Our tweet included the below BHP slide, which detailed how they plan to power their mines in the Pilbara under its decarbonisation plan. BHP wrote "*Our inland Pilbara operations are not connected to an electricity grid. Power is currently supplied by our highly efficient 190MW Yarnima gas fired power station, which emits over 35% less CO 2 /MWh than the Australian average. Planning for up to 500MW additional renewable generation and storage capacity installed by the end of the decade. Yarnima will be required to provide power during periods of lower renewable generation."*

Figure 63: BHP's decarbonisation plan to power their mines in the Pilbara



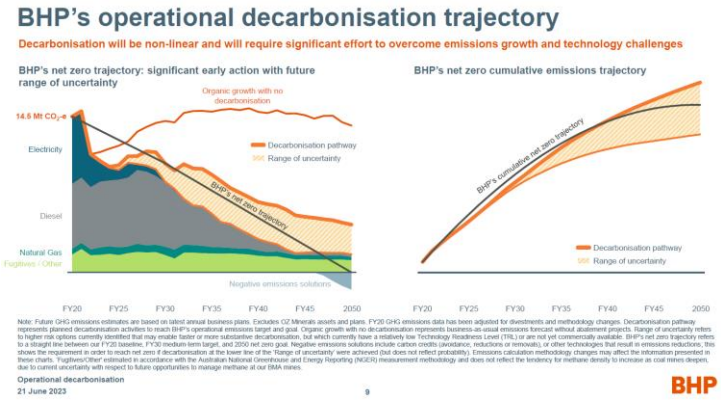
Source: BHP

Energy Transition – BHP's "range of uncertainty" to get to Net Zero

BHP range of uncertainty on Net Zero+

It was interesting to see the criticism that BHP's operational decarbonisation trajectory graphs included a "range of uncertainty" to their Net Zero trajectory. And BHP wrote "*Decarbonisation will be non-linear and will require significant effort to overcome emissions growth and technology challenges".* Basically, BHP didn't have all the specific answers (technologies identified) as to how they would get to their net zero trajectory because their below graph had the range of uncertainty. We think it's impressive that they have identified as many specifics as they did in their update. But, at least, BHP was direct in showing a shaded area that is a range of uncertainty to reflect unidentified as of yet actions and technologies to get to net zero. Below is the BHP operational decarbonisation trajectory graph.

Figure 64: BHP's "range of uncertainty" get to its Net Zero plans



Source: BHP

05/16/21: Kerry said at best they had a plan to get 50% of emissions cuts

It was interesting to see the criticism that BHP didn't have all the specific answers (technologies identified) as to how they would get to their emissions targets because their below graph had an unidentified wedge. We think it's impressive that they have identified as many specifics as they did in their update. But, at least, BHP was direct in showing a shaded area that is an range of uncertainty to reflect unidentified as of yet actions. This is very different than what the western leaders did. They set the western economies on a Net Zero obligation knowing full well they had no idea of what or how would get them all the way or anywhere close to Net Zero. They knew this long before Russia invaded Ukraine, but have used Ukraine as an excuse for being behind. The western leaders had a big plug in their math to get to Net Zero but didn't tell anyone before undertaking Net Zero. We highlighted this over two years ago in our May 16, 2021 Energy Tidbits, when we wrote "*We recognize that the Energy Transition is going to happen, but we just wish that the politicians would at least warn people that its going to take longer, be bumpy and be more expensive for energy. People have to understand the Energy Transition is not a plan, its an aspiration and governments do not know how it will be accomplished. No one expects them to have a 100% plan, but the reality is that, at best, they have a 50% plan. Could you imagine committing to any project delivery not know how 50% of the project will be accomplished? We say 50% at best because the reality is that politicians tend to overestimate the positive. This is what US Special Presidential Envoy for Climate said a month ago at the Biden global leaders climate summit – 50% of the planned emissions cuts will have to come from technologies not yet developed. Earlier this morning the Guardian reported [LINK] on Kerry's comments in the UK. After seeing the Guardian report, we tweeted [LINK] "#JohnKerry "I am told by scientists that 50% of the reductions we have to make to get to net zero are going to come from technologies that we don't yet have. That's just a reality". This means other reality is will need #NatGas #Oil for longer. #OTTT" His comments on the reality check and that governments are setting real targets without knowing how it will accomplish is a reality check that the demise of natural gas and oil won't be as fast as the Energy Transition aspirations."*

Energy Transition – Net Zero won't like Shell CEO blunt talk on clean energy investing

Shell CEO on clean energy investing

It may not be what the Net Zero side wants to hear but it was rare to see such blunt talk on why a major company is backing away from a clean energy push as we saw from Shell's relatively new CEO, Wael Sawan, in his FT interview. It wasn't so much that he explained his thoughts on backing away from some of Shell's prior clean energy/energy transition priorities, it was how he explained it. There can be no doubt on what Sawan sees as his priorities. On Monday, we tweeted [LINK] "*WOW! Direct CEO messaging for a change! @Shell CEO Sawan "The answer cannot be, 'I am going to invest [in clean energy projects] and have poor returns and that's going to vindicate my conscience'. That's wrong." ". . . but we are at risk when we confuse the concept of caring about people, with the decisiveness around how do we actually allocate capital." and more in great @thomas_m_wilson interview. #OOTT #energytransition."* Here are some of the FT comments. *"Ultimately what we need to do is to be able to generate long-term value for our shareholders," Sawan told the FT. "The answer cannot be, 'I am going to invest [in clean energy projects] and have poor returns and that's going to vindicate my conscience'. That's wrong." "In the past few years we have been testing different models and different concepts," Sawan said. "As we grow in confidence in some, like in biofuels and EV charging, we'll look to go further. In others where we have seen significant headwinds, like in consumer home energy retailing, we are taking a pause and reflecting." "The strength of our company is the level of engagement we have with staff . . . but we are at risk when we confuse the concept of caring about people, with the decisiveness around how do we actually allocate capital."* Our Supplemental Documents package includes the FT report.

Energy Transition – Qatar Airways "let us not fool ourself" on sustainable aviation fuel

Qatar Airways CEO on SAF

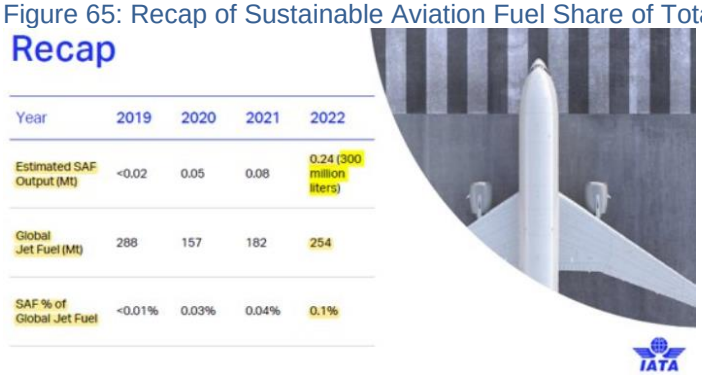
On Monday, we tweeted [LINK] "*Blunt reality check comments on Sustainable Aviation Fuel from @qatarairways CEO. Being pushed to get SAF into airplanes, SAF is "exorbitantly expensive & unavailable". Paying 4x the cost to have SAF "what do you expect". Are 2050 targets achievable? "No ..... I don't think so, Let us not fool ourself". See 👇06/06/23 tweet, SAF is 0.1% of jet fuel use now. Great interview @GuyJohnsonTV. #OOTT #EnergyTransition."* Bloomberg interviewed CEOs at the Paris Air Show including Qatar Airways CEO Akbar Al Baker on June 19. Al Baker's comments were clear – the ramp up in sustainable aviation fuel targets for the aviation industry are not achievable, SAF is exorbitantly expensive and unavailable. Our tweet included a transcript of Al Baker's comments with Bloomberg's We created a transcript of his comments with Bloomberg's Guy Johnson from the Bloomberg clip. [LINK]. Items in "*Italics*" are SAF Group created transcript At 3:15 min mark, after talking about supply chain issues impacting aircraft and engine supply at a time where business is back to 2019 levels and high fares being a supply and demand basic, Al Baker "*I think fares are going to stay high. Also keep in mind that the oil prices are high. We are now being pushed to get SAF* [Sustainable Aviation Fuel] *into our airplanes. Again, which is exorbitantly expensive and unavailable So all this is a factor that is increasing the cost of the value that you have to pay to travel."* Johnson "*So the move to SAF is going to be inflationary so you think?"* Al Baker "*Absolutely. If you are paying four times the price of Avgas to have SAF, what do you expect?"* Johnson "*And do you think the 2050 targets are looking achievable at this point?"* Al Baker "*No. I don't think so. Please explain to me one SAF manufacturer undertaking that they will be able to fill in the demand of 2050. I don't think so. Let us not fool ourself. First let us see from them, from Shell, ExxonMobil, TotalEnergies,*

all these people, ask them what is the volume they will [xxx?} produce? And they will never give you an answer."

IATA Sustainable Aviation Fuel has a challenging, long road ahead

Here is what we wrote in our June 11, 2023 Energy Tidbits memo on the International Air Transport Association's recent forecast for SAF. "*It didn't get much attention in all the IATA and airline CEO comments coming out of the IATA AGM but, we couldn't help note the data and forecasts for Sustainable Aviation Fuel (SAF) penetration of total jet fuel to 2030. It reinforces that it will take a lot longer than expected to decarbonize the airline industry ie. this part of the energy transition will take a very long time. (i) On Tuesday, we tweeted [LINK] "Challenge and will take a very long time to decarbonize airline industry. @IATA Sustainable Aviation Fuel update. SAF to provide 62% of carbon mitigation by 2050. SAF tripled in 2022, BUT only to 0.1% of jet fuel use. IATA says SAF of 24 mm tonnes in 2030 IF 30% of renewable fuel production. achieving 30% "is not a given". 24 mm is 9.4% of 2022 jet fuel consumption. #OOTT". (ii) On Tuesday, the IATA (International Air Transport Association) issued a press release and provided a slide deck at its AGM on the outlook for Sustainable Aviation Fuel. (iii) It's a good example of the challenge for a hard to decarbonize airline industry. IATA said SAF is being counted on to provide 62% of the airline industry's carbon mitigation goals for 2050. (iv) As a reminder, SAF is one of the renewable energy fuels along with items like renewable diesel and naptha. (v) SAF is on a huge rate of growth, but that is basically from zero. SAF tripled in 2022 but IATA highlights that was to 0.1% of total jet fuel consumption. The IATA says SAF "output set to rise exponentially again in 2023". (vi) For growth to 2030, the IATA says "If renewable energy production reaches 69 billion liters by 2028 as estimated, the trajectory to 100 billion liters (80 million tonnes) by 2030 would be on track. If just 30% of that produced SAF, the industry could achieve 30 billion liters (24 million tonnes) of SAF production by 2030." IF SAF gets to 24 million tonnes, that would equal to 9.4% of 2022 jet fuel consumption of 256 million tonnes. That is 2022 levels and does not assume the expected continued growth in jet fuel consumption to 2030. So the actual percentage should be significantly less than 9.4%. (vii) Note the IATA has a big qualifier on this forecast to 2030 and highlights their assumption that SAF is 30% of total renewable fuel generation is not guaranteed. The IATA wrote "Achieving the necessary SAF percentage output from these new and expanding facilities is not a given. But with governments the world-over agreeing at ICAO to a long-term aspirational goal (LTAG) of net zero by 2050, they now share accountability for aviation's decarbonization." (viii) The Energy Transition is happening including the decarbonization of the airline industry, but the reality is that both will take a lot longer, cost a lot more and be a bumpy/rocky road. We have highlighted this theme for years as it means energy markets will not change as quickly as the aspirations and that means there will a much longer need for oil and natural gas."*

Figure 65: Recap of Sustainable Aviation Fuel Share of Total Jet Fuel



Source: IATA

Capital Markets – IFIC: Equity and balanced funds see more net redemptions in May

IFIC Cdn mutual fund data

One of the big Cdn equity stories in 2022 continues to play out in 2023 – the continued net redemptions from active managed Cdn balanced and equity mutual funds. This flipped in Q2/22 from massive net sales into balanced and equity mutual funds to massive net redemptions in balanced and equity mutual funds. The bleeding isn't as great as in 2022 but the net redemptions continue month after month. On Thursday, we tweeted [LINK["*Continued @ific balanced & equity mutual funds net sales/redemptions in 2022 continues thru May 2023. YTD May 31/23 net REDEMPTIONS $24.44b. YTD May 31/22 net SALES $8.52b. YoY diff is $32.96b. See 👇01/26/23 tweet, YoY difference in 2022 was $138.9b! #OOTT."* On Wednesday afternoon, IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for May. IFIC reported net redemptions for mutual funds balanced funds were $3.807b in May (vs $3.941b in Apr and $4.167b in Mar). IFIC also reported net redemptions for mutual funds equity funds were $2.170b in May (vs net redemptions of $2.782b in Apr and $1.982b in Mar). This brought YTD May 31/23 net redemptions to $24.44b out of balanced and equity mutual funds, which compares to YTD May 31/22 net sales of $8.52b for a YoY difference of $32.96b. Note that Q2/22 was when it flipped from net sales into the massive net redemptions to end 2022. Last year net redemptions in balanced and equity funds totalled $38.47b, which was a massive YoY crashing of $138.92b vs 2021 that saw net sales in balanced funds and equity funds of $100.45b. May's data brings YTD net sales to a total of $8.6b, which is a drastic change from the YTD net sales of $7.5b reported in May 2022. Our Supplemental Documents package includes the IFIC release.

Figure 66: Cdn Mutual Fund Net Sales/Net Redemptions ($ Millions)

Mutual Fund Net Sales/Net Redemptions ($ Millions)*

Asset Class	May 2023	Apr. 2023	May 2022	YTD 2023	YTD 2022
Long-term Funds					
Balanced	(3,807)	(3,941)	(5,347)	(17,260)	1,017
Equity	(2,170)	(2,782)	(969)	(7,180)	7,504
Bond	639	853	(882)	7,816	(2,950)
Specialty	274	279	59	1,689	903
Total Long-term Funds	(5,064)	(5,590)	(7,140)	(14,936)	6,474
Total Money Market Funds	1,252	992	775	6,361	971
Total	(3,812)	(4,599)	(6,364)	(8,574)	7,445

Source: IFIC

There were massive redemptions in Cdn active equity/balanced funds in 2022

2023 is not off to a good start for Cdn balanced and equity funds, but 2022 was brutal. Here is what we wrote in our Jan 29, 2023 Energy Tidbits memo. "*One of the big Cdn equity stories in 2022 continued to play out in the final month of the year – the massive net redemptions from active Cdn equity fund manager's balanced and equity mutual funds in 2022, which is a huge change from the massive net sales into balanced and equity mutual funds in 2021. On Thursday, we tweeted [LINK] "WOW! @IFIC balanced & equity mutual funds net sales/redemptions data for 2022. YTD 12/31/22 net REDEMPTIONS of $38.5b. YTD 12/31/21 net SALES $100.4b. YoY diff is -$138.9b!! Makes #Oil #NatGas stocks big outperformance vs TSX and oil prices even more impressive. #OOTT." On Tuesday the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for Dec. IFIC reported net redemptions for mutual funds balanced funds were $4.97b (vs $5.07b in Nov and $5.66b in Oct) and YTD Dec 31 of $29.99b. IFIC reported net redemptions for mutual funds equity funds were $3.08b in Dec (vs $3.01b in Nov and $1.89b in Oct) and YTD Dec 31 of $8.48b. The change vs 2021 is huge and has widened since the Nov update. YTD Dec 31, net redemptions in balanced funds and equity funds was $38.47b, which is a YoY crashing of $138.92b vs YTD Dec 31, 2021 that saw net sales in balanced funds and equity funds of $100.45b.*"

Figure 67: Cdn Mutual Fund Net Sales/Net Redemptions ($ Millions)\

Mutual Fund Net Sales/Net Redemptions ($ Millions)*

Asset Class	Dec. 2022	Nov. 2022	Dec. 2021	2022	2021
Long-term Funds					
Balanced	(4,969)	(5,066)	1,628	(29,999)	63,346
Equity	(3,080)	(3,014)	462	(8,480)	37,102
Bond	(2,254)	(1,104)	(1,276)	(13,790)	14,530
Specialty	(37)	(10)	415	1,166	6,010
Total Long-term Funds	(10,340)	(9,194)	1,229	(51,103)	120,988
Total Money Market Funds	1,642	551	185	7,026	(7,414)
Total	(8,698)	(8,643)	1,415	(44,077)	113,574

Source: IFIC

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.

Terry Fox passed away on June 28, 1981

Probably have to be a baby boomer age to remember one of the most amazing and emotional Canadian sports stories of all time – the Terry Fox Marathon of Hope in 1980. It may not have had much national attention, when he dipped his right leg into the Atlantic Ocean on April 12, 1980 near St. John's Newfoundland. Terry had his right leg amputated so this was his prosthetic leg. The Marathon of Hope was that he would run a marathon a day across Canada and raise the equivalent of one dollar for every of the 24 million Canadians. There wasn't much publicity, but it really seemed to pick up once he got to Quebec and, by the time, he got to Ontario, it was the big national news story every day. He was finding he was exhausted in late August as he was running in Northern Ontario. He stopped on Sept 1 just outside Thunder Bay and had to go to the hospital. On Sept 2, he announced that his cancer had returned and he was forced to end the Marathon of Hope after 143 days and 3,339 miles. Sadly, he passed away on June 28, 1981. We have to believe it was almost impossible for anyone who saw the Marathon to not contribute and continue contributing to this date. It was a moving, impactful event in Canada.

Figure 68: Terry Fox Running In Sault Ste Marie

Source: Sudbury Star

Will take years to restock Javelin/Stinger missiles used to support Ukraine

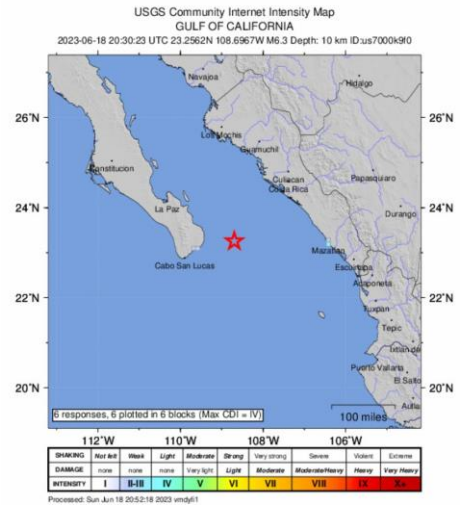
Kudos to the US for helping Ukraine on the likely their biggest need – missiles to fight Russia tanks and aircraft. On Tuesday, we tweeted [LINK] "*h/t to* 🇺🇸 *for* 🇺🇦 *continued key weapons defense support. Not as specific as* 👇*12/06/22 tweet, but @RaytheonTech CEO today "We're going thru our war stocks, call it Stinger anti-aircraft missiles, Javelin anti-tank missiles, 155mm artillery shells, we're going thru those munitions at a rate none of us expected. It will take us years to restock the US and our NATO allies inventory. "* Raytheon CEO Greg Hayes was on CNBC and he noted how it will take years to restock the used munitions (Stingers, Javelins, 155 mm artillery shells) that the US has used to supply Ukraine. Hayes also said "*to date.*

We have seem about $2b related to Ukraine restocking. We expect another $3b or so this year. But there is probably a multiple of that that we will see over the next 3 or 4 years." Hayes wasn't as specific as he was in December on the months or years of missiles. Here is what we wrote in our Dec 11, 2022 Energy Tidbits memo. "*On Tuesday morning, Raytheon CEO Hayes was on CNBC Squawk Box and he said some amazing stats on how many missiles have been delivered to the Ukraine. Hayes noted how all the weapons delivered to the Ukraine were being done so out of current inventory and that they were drawing down inventory much faster. The levels are huge relative to current production rates. We tweeted [LINK] "h/t to US for UA key weapons defence support. "... we've gone thru in the 1st 10 mths of the war, 5 yrs worth of Javelin anti-tank missiles and we've gone thru 13 yrs worth of Stinger [surface-to-air missiles] production" @RaytheonTech CEO to @andrewrsorkin." And he concluded "it's going to take us some time to catch up." We hate to think where Ukraine would be without the US stepping up on Javelins and Stinger missiles*."

Didn't really feel 6.3 earthquake 110 km east of San Jose del Cabo

Last Sunday afternoon, we tweeted [LINK] "*30 min ago, a good sized 6.3 earthquake in Gulf of California, about 100 km east of San Jose del Cabo. Felt a little something as we stook up to leave from lunch at the One & Only Palmilla*". There was a 6.3 earthquake just east of San Jose del Cabo in the Gulf of California/Sea of Cortez. We had just finished lunch, stood up and thought there was a little something, but nothing big. And then checked the USGS after getting home. Would have thought there would be more felt at 110 km away from a 6.3. The below USGS map notes Cabo San Lucas. San Jose del Cabo is a sister city that is 32 km from Cabo San Lucas and, collectively along with the corridor of hotels/condos/homes in between the two, re known as Los Cabos.

Figure 69: 6.3 earthquake 110 km from San Jose del Cabo on June 18



Source: USGS

30C temperature difference between Calgary vs San Jose del Cabo in summer

It was on June 20 about 1:30pm PT so, in theory, one day before the start of summer on June 21 but, after hearing how cold it was in Calgary, couldn't help tweet [LINK] "*Not unusual to see a 30C temperature difference between San Jose del Cabo vs Calgary. But that is in the winter and not on June 20. Car registered 38C just now after driving back from #FloraFarms*." Winter will regularly see swings of 30C and more, but don't recall ever seeing a difference of 30C in summer. Calgary was 7C and San Jose del Cabo was 38C. The heat wave in Texas is also over most of Mexico as 38C is well above the norm.

Looked like a duct tape repair job on an airplane nose in San Jose del Cabo

After the above two items and this item, feel like this should be renamed a Mexico travel section. But was flying back from San Jose del Cabo to Calgary on Thursday afternoon and couldn't help tweet [LINK] "*duct tape is great but glad this wasn't our plane getting the duct tape repair to the nose*". Our tweet included a short 15-second clip taken while waiting to board our Westjet flight. The were applying a lot of duct tape to the nose of an US commercial aircraft about to make its return flight. The duct tape job was about two feet in height and probably a couple feet in length. All the US and Cdn airlines fly down, and then do a turnaround back after an hour and a half.

Figure 70: Duct tape repair job in San Jose del Cabo

Source: SAF Group

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