Energy Tidbits

July 2, 2023

Produced by: Dan Tsubouchi

Vitol "*we have a sense of balance, rather than the predicted tightening of the [#Oil] market, which may yet occur later this year*"

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. Vitol's Mike Muller this morning on H2 oil markets being in balance right now rather than the predicted summer tightening *"which may occur later this year*". (Click here)

2. No word yet if Saudi Arabia will extend its one-month voluntary 1 mmb/d thru August. (Click here)

3. Big revision up to Vortexa floating oil storage on June 23 to highest levels since Oct 23, 2020, but fortunately, June 30 estimate is down to 95.99 mmb. (Click here)

4. Will US special envoy on Iran, Rob Malley, going on forced leave pause momentum to a US/Iran nuclear understanding? (Click here)

5. Alberta and BC total and Out of Control wildfires up WoW to high levels. (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 566 bcf YoY surplus

Natural Gas: +76 bcf build in US gas storage; now 566 bcf YoY surplus

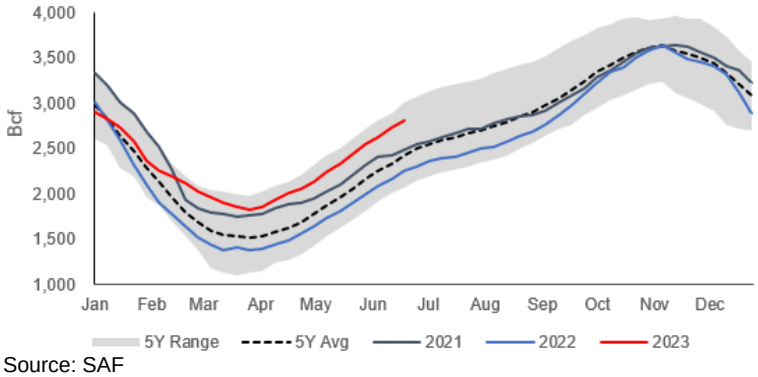
For the week of June 23, the EIA reported a +76 bcf build (above the expectations of an +82 bcf build), and a slight decrease compared to the +82 bcf build reported for the week of June 24 last year. This is down from last week's build of +95 bcf, and a big increase vs the 5-year average build of +43 bcf. Total storage is now 2.805 tcf, representing a surplus of +566 bcf YoY compared to a surplus of +571 bcf last week and is +358 bcf above the 5-year average, sdown from the +362 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 (06/23/22)		5-year average (2018-22)	
Region	06/23/23	06/16/23	net change	implied flow	Bcf	% change	Bcf	% change
East	623	599	24	24	457	36.3	507	22.9
Midwest	685	658	27	27	531	29.0	570	20.2
Mountain	165	157	8	8	133	24.1	147	12.2
Pacific	204	191	13	13	234	-12.8	256	-20.3
South Central	1,128	1,125	3	3	884	27.6	967	16.6
Salt	330	330	0	0	243	35.8	284	16.2
Nonsalt	798	794	4	4	642	24.3	683	16.8
Total	2,805	2,729	76	76	2,239	25.3	2,447	14.6

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



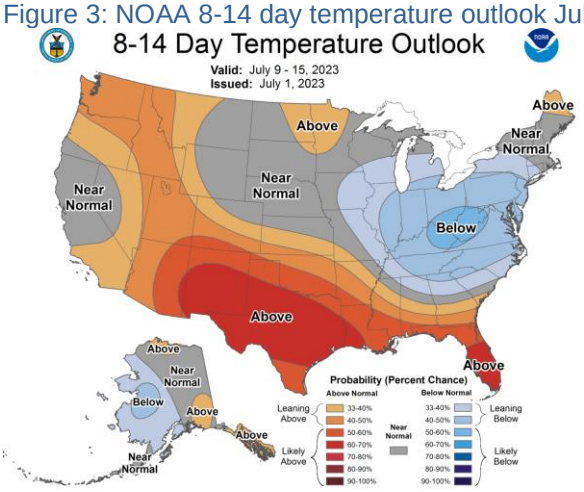
Source: SAF

NOAA 8-14 day outlook

Natural Gas: NOAA 8-14 day temperature outlook is negative to gas price tone

Mid-July is when we start to see the period for the normal hottest day of the year in some states. So the key is that we don't want to see below normal temperatures when it is normally the peak heat time. 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 July 7-15 calls for below normal temps around the Great Lakes and moving into populous east coast ie. should bring a negative tone to HH #NatGas prices. #OOTT*." Yesterday's NOAA 6-10 day [LINK] and 8-14 day outlook [LINK] is valid for July 7-15 calls for below normal temperatures in the Midwest moving into the populous east coast. It is stil expected to be hot in the deep south.

Figure 3: NOAA 8-14 day temperature outlook July 9-15



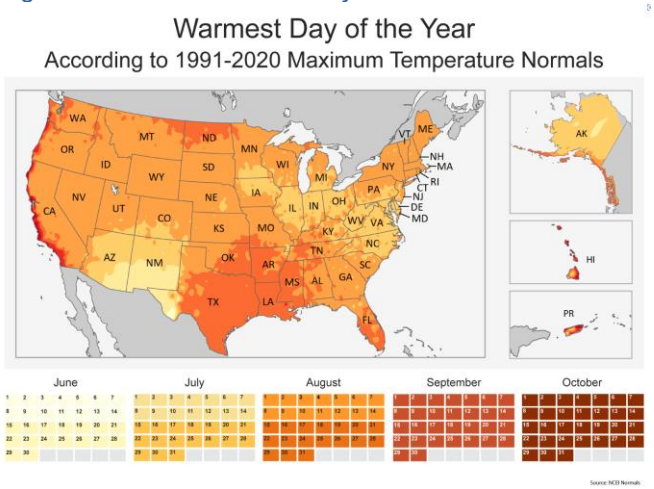
Source: NOAA

Natural Gas: NOAA's warmest day of the year across the US

Warmest day of the year across the US

Yesterday, we tweeted [LINK] "*Here's why temperature watch gets important in July ie. don't want below normal temps when it is supposed to be the hottest. @NOAA map when to expect Warmest Day of the Year. Mid July starts to see hottest day of the year in states like IL, IN, OH, WV, VA, NC. And current @NOAA 8-14 day expects below normal temps in some of these states. #OOTT #NatGas."* On Thursday, NOAA posted "*When to expect the Warmest Day of the Year*" [LINK]. Our tweet included the NOAA map, which reminds that mid-July is when we start to see the hottest day of the year in many states. It's why the temperatures are important in July as we don't' want to see below normal temps when it is supposed to be peak heat and peak summer electricity/natural gas residential/commercial demand.

Figure 4: NOAA Warmest Day of the Year



Source: NOAA

Natural Gas: US dry gas production in April +5.6 bcf/d YoY to 102.1 bcf/d

US gas production +5.6 bcf/d YoY in April

Apart from winter, the big negative to HH and AECO natural gas prices is the continued huge growth in US natural gas production. The big picture natural gas story is unchanged this month in that US natural gas supply, driven by shale/tight natural gas, continues to be up significantly YoY. On Friday, the EIA released its Natural Gas Monthly [LINK], which includes its estimated "actuals" for April's dry gas production. Key items to note are as follows: (i) April's production of 102.1 bcf/d was up +5.6 bcf/d YoY from 96.5 bcf/d in April 2022 and -0.1 bcf/d MoM from March's revised production of 102.2 bcf/d. (ii) April is marginally down vs March, but it may be due to some minor weather items like snowstorms in April in North Dakota. But we will still watch to see if that is the case in the May data. (iii) March 2023 of 102.2 bcf/d was the all-time high. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

Figure 5: US Dry Natural Gas Production

bcf/d	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan	56.0	60.0	66.0	65.3	66.8	73.4	73.6	70.6	78.7	89.4	95.1	92.8	95.3	101.8
Feb	57.2	58.8	67.0	65.4	68.4	73.8	77.3	71.5	80.4	90.0	98.1	86.2	94.5	101.9
March	57.3	61.5	65.0	65.3	68.9	74.1	73.8	73.2	81.3	90.6	94.6	92.3	95.4	102.2
Apr	57.6	62.3	64.8	66.1	70.5	75.2	73.7	73.3	81.2	91.0	92.9	93.2	96.5	102.1
May	58.0	62.4	65.0	65.9	70.2	74.1	72.9	73.3	82.1	91.7	87.8	93.0	97.7	
June	57.2	62.1	64.6	65.8	70.5	74.0	72.2	74.0	82.5	92.0	88.4	93.2	98.5	
July	58.2	62.5	66.3	67.1	72.0	74.2	72.8	74.7	84.2	92.5	89.8	93.7	98.5	
Aug	58.9	63.2	66.0	66.9	72.4	74.3	72.2	74.7	85.9	94.8	90.2	94.3	99.3	
Sept	59.1	63.1	66.4	66.8	72.4	74.7	71.7	76.0	87.3	94.7	89.5	93.6	100.5	
Oct	60.1	65.1	66.5	67.0	73.1	74.2	71.4	77.3	88.4	96.0	88.9	95.6	100.6	
Nov	60.1	65.9	66.6	67.7	72.6	73.9	72.0	79.8	89.9	96.7	92.0	97.0	101.0	
Dec	61.0	65.6	66.0	66.5	73.2	73.9	71.2	80.4	89.5	97.0	92.5	97.0	99.3	
Average	58.4	62.7	65.9	66.3	70.9	74.2	72.9	74.9	84.3	93.0	91.6	93.5	98.1	102.0
Source: EIA Natural Gas Monthly														

Source: EIA, SAF

Natural Gas: US pipeline exports to Mexico down -0.1 bcf/d MoM to 5.6 bcf/d in Apr

US pipeline exports to Mexico down MoM

The EIA Natural Gas Monthly also provides its "actuals" for gas pipeline exports to Mexico [LINK], which were 5.6 bcf/d in April, down -0.1 bcf/d MoM from 5.7 bcf/d in March and is down -0.3 bcf/d YoY from 5.9 bcf/d in April 2022. The EIA doesn't provide explanation for the MoM increase, and we expect to see volumes increase as we move into the summer. Mexico's relatively unchanged production over the past five years has created the need for increased US pipeline exports as Mexico builds out its domestic natural gas infrastructure. Below is our table of the EIA's monthly gas exports to Mexico.

Figure 6: US Pipeline Exports to Mexico

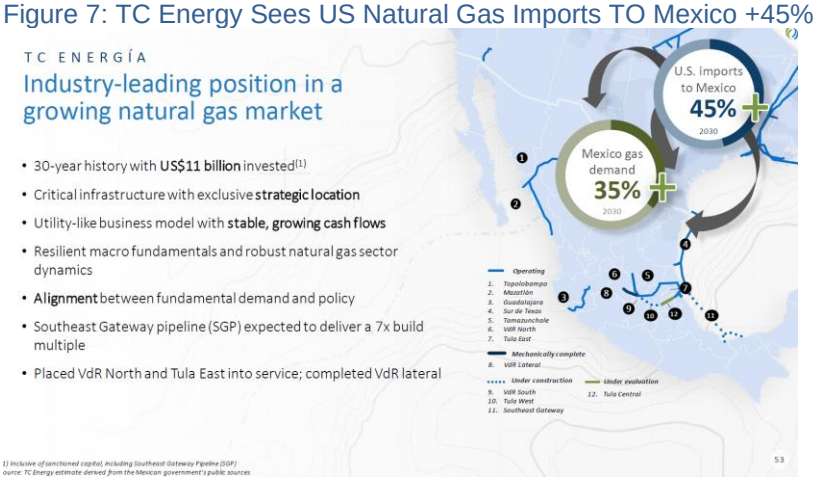
bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.7	5.2
Feb	1.8	2.3	3.5	4.0	4.5	4.8	5.4	4.9	5.5	5.4
March	1.9	2.4	3.3	4.2	4.3	4.8	5.4	5.9	5.5	5.7
Apr	1.9	2.6	3.5	3.7	4.4	4.7	4.6	6.1	5.9	5.6
May	2.0	2.8	3.7	4.0	4.4	5.0	4.7	6.2	6.0	
June	2.2	3.0	3.9	4.5	4.6	5.2	5.4	6.6	6.1	
July	2.2	3.3	4.0	4.4	4.9	5.4	5.8	6.4	6.1	
Aug	2.1	3.3	4.3	4.4	5.0	5.4	6.0	6.2	5.8	
Sept	2.2	3.3	4.1	4.2	5.0	5.4	6.1	6.0	5.6	
Oct	1.9	3.2	4.2	4.2	4.9	5.5	6.0	6.0	5.5	
Nov	1.9	3.0	4.0	4.5	4.7	5.3	5.5	5.5	5.4	
Dec	2.1	3.2	3.6	4.4	4.5	4.9	5.3	5.4	5.1	
Full Year	2.0	2.9	3.8	4.2	4.6	5.1	5.5	5.9	5.7	5.5

Source: EIA, SAF

TC Energy sees Permian natural gas +3 bcf/d to Mexico by 2030

Here is what we wrote in our Dec 4, 2022 Energy Tidbits. "*One overlooked upside to US natural gas in the 2020s is that the growth Mexico infrastructure projects are starting to kick in. Yesterday, we tweeted [LINK] "Positive for US #NatGas for 2020s. It's not just increasing #LNG exports, it's also Mexico. Mexico #NatGas demand from 9 bcfd to 12 bcfd in 2030. @TCEnergy expects MEX #NatGas pipeline imports from Permian +45% from 6 bcfd in 2022 to 9 bcfd by 2030. #OOTT." The growth in Mexico natural gas demand is a big plus to the Permian. For the last few years, every time we write on Mexico's natural gas production, we say it is still stuck below 5 bcf/d and that any increase in Mexico natural gas demand has to be met by increasing natural gas or LNG imports. For the past 5+ years, other than a few months, Mexico gas production was below 5 bcf/d. Mexico's natural gas demand growth and growing infrastructure was one of the key growth themes at TC Energy's investor day on Tuesday. Mgmt's slide deck included the below slide and mgmt said "We expect Mexican natural gas demand to increase by 3% per year across the country from 9 Bcf to 12 Bcf in 2030, with strategic government projects creating over 1 Bcf a day of incremental gas demand in the southeast alone by 2025. Now given Mexico's limited natural gas production, this increase in demand will likely be served by supplies in the U.S. and more specifically the Permian as we believe Mexican imports from the Permian are likely to increase by 45% from 6 Bcf a day in 2022 to 9 Bcf by 2030."*

Figure 7: TC Energy Sees US Natural Gas Imports TO Mexico +45% to 2030



Source: TC Energy

Natural Gas: US LNG exports up +5.6% MoM to 12.5 bcf/d in April; +13.4% YoY

US April LNG exports

As a reminder, the US LNG export data is always available one to two weeks before it is included in the EIA's Natural Gas Monthly report. Here is what we wrote in our June 25, 2023 Energy Tidbits memo. "*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." On Friday, the EIA's Natural Gas Monthly reported the same data, US LNG exports for April were 12.5 bcf/d, up +0.7 bcf/d MoM from 11.8 bcf/d in March and was up +1.5 bcf/d from 11.0 bcf/d in April 2022. The DOE LNG Monthly report includes more information on US LNG exports and our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

Figure 8: US LNG Exports

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

Source: EIA, SAF

April LNG exports were expected up from Freeport LNG restart

Here is what we wrote in our April 23, 2023 Energy Tidbits memo. "*Natural gas deliveries to Freeport LNG averaged >2 bcf/d so far in April. US LNG exports will see an increase in March and then also again in April with the restart of Freeport LNG Freeport did not get the full approval for a restart until late Feb and so natural gas deliveries only ramped up in March before returning to full levels in the beginning of April. Bloomberg regularly reports on natural gas delivers (not LNG output) to all US LNG export facilities. Bloomberg reported natural gas deliveries to Freeport hit 1.94 bcf/d on March 31 and deliveries for March averaged 1.10 bcf/d. But for April, Bloomberg reports that natural gas deliveries to Freeport LNG have averaged >2 bcf/d*."

Natural Gas: Mexico's 3rd consecutive month natural gas production above 5 bcf/d

Mexico natural gas above 5 bcf/d in May

On Monday, reported [LINK] its natural gas data for May. Pemex reported May 2023 natural gas production of 5.030 bcf/d, which was +7.0% YoY and -1.3% MoM. The big picture story for Mexico natural gas is, at least for now, still unchanged – for the past six years, Mexico natural gas production has been stuck right around 5 bcf/d, and that means any increased domestic natural gas consumption has been met by US natural gas imports. To be fair, the last three months have been the first consecutive months slightly over 5 bcf/d since Dec 2019/Jan 2020. Pemex does not provide any commentary along with its production data. Below is our ongoing table of Pemex reported monthly natural gas production.

Figure 9: Mexico Natural Gas Production

Natural Gas Production bcf/d	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	5.326	4.910	4.648	5.005	4.848	4.713	-2.8%	4.955	5.1%
Feb	5.299	4.853	4.869	4.942	4.854	4.646	-4.3%	4.979	7.2%
Mar	5.383	4.646	4.857	4.946	4.839	4.766	-1.5%	5.035	5.6%
Apr	5.334	4.869	4.816	4.827	4.671	4.740	1.5%	5.095	7.5%
May	5.299	4.827	4.841	4.460	4.730	4.702	-0.6%	5.030	7.0%
June	5.253	4.840	4.843	4.754	4.727	4.744	0.4%		
July	5.216	4.856	4.892	4.902	4.725	4.815	1.9%		
Aug	5.035	4.898	4.939	4.920	4.656	4.796	3.0%		
Sept	4.302	4.913	5.017	4.926	4.746	4.798	1.1%		
Oct	4.759	4.895	4.971	4.928	4.718	4.795	1.6%		
Nov	4.803	4.776	5.015	4.769	4.751	4.845	2.0%		
Dec	4.811	4.881	5.024	4.846	4.697	4.845	3.2%		

Source: Pemex, SAF

Long-term LNG deal

Natural Gas: Cheniere and ENN sign long-term LNG deal for 0.24 bcf/d per annum

Last week was the biggest week for new long-term LNG supply deals in a long time with four deals totalling 1.26 bcf/d. This week, there was another deal with Cheniere's 20-yr 0.24 bcf/d deal with China's ENN. Even still, there was a big slowdown in long-term LNG deals in the last year 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 are now 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. (i) On Monday, Cheniere (US) and ENN LNG (Singapore) announced that they have agreed to enter into a long-term LNG sale and purchase agreement [LINK]. The deal is set to begin in 2026, and end in 2046, with ENN LNG purchasing ~0.24 bcf/d per annum. The CEO of Cheniere, Jack Fuso, commented "*This SPA further supports China's structural shift to natural gas as a growing primary energy source, powering its economy while enabling improved environmental performance with flexible, reliable and cleaner LNG. This SPA accelerates Cheniere's commercial momentum on the SPL Expansion Project, demonstrating the market's need for additional LNG capacity, and the value of Cheniere's unique capability to tailor long-term solutions for customers worldwide".* Cheniere is currently in the process of expanding the LNG export capacity at Sabine Pass (SPL Expansion Project). The expansion will increase total production capacity by 2.63 bcf/d per annum. Cheniere is currently signing long-term LNG contracts in anticipation of the project's completion in 2026. Our Supplemental Documents package includes the Cheniere press release.

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 16.20 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 16.20 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 10: 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
Jun 26, 2023	ENN LNG	Cheniere	Singapore / US	0.24	20.0	2026	2046
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**10.77**			
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				**16.20**			

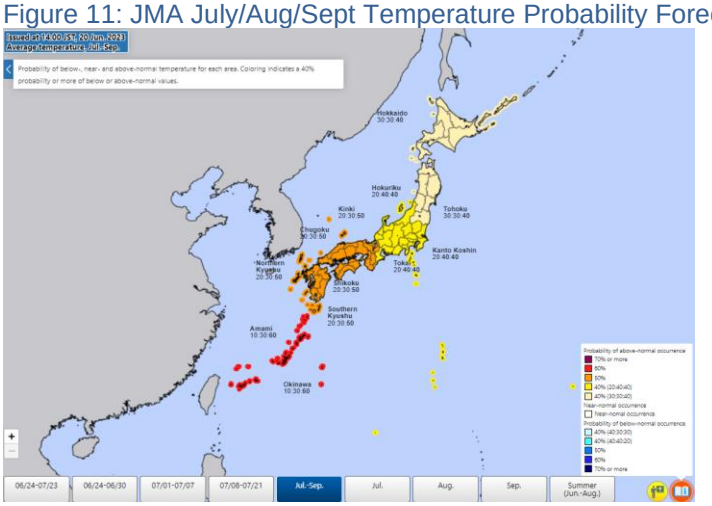
Source: SAF

Natural Gas: Above average temperatures expected in July/Aug/Sept in Japan

It looks like there should be some continued weather support for electricity for air conditioning and natural gas markets hope that comes from natural gas generation. Last Thursday June 22, the Japan Meteorological Agency [LINK] provided its temperature probability forecast for July/Aug/Sept, which calls for warmer than normal temperatures for Japan, in particular for central/southern Japan. JMA doesn't provide a JAS summary, but we checked JMA separate monthly recaps for July, Aug and Sept and it was warmer than normal across all of Japan in that period. Below is the JMA's temperature probability forecast for June-Aug.

Japan's JAS temperature forecast

Figure 11: JMA July/Aug/Sept Temperature Probability Forecast



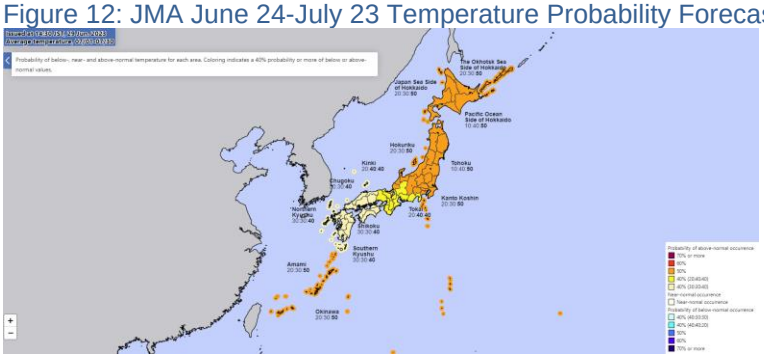
Source: JMA

Natural Gas: Forecast for warm temperatures to start July in Japan

Japan's 30-day temperature forecast

It has been hot in Japan and it looks like it will be warmer than normal for July.Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK] and its June 29 update calls for warmer than typical temperatures 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 July 1 to July 30.

Figure 12: JMA June 24-July 23 Temperature Probability Forecast



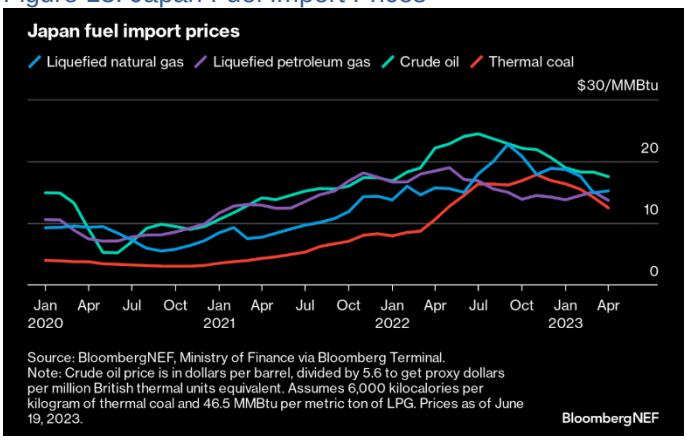
Source: Japan Meteorological Agency

It's hot but Japan LNG prices aren't low enough to drive switch to thermal coal

Japan LNG prices were up a bit this week but haven't been low enough to drive switching to thermal coal. Here is what we wrote in last week's (June 25, 2023) Energy Tidbits memo. *"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 13: Japan Fuel Import Prices



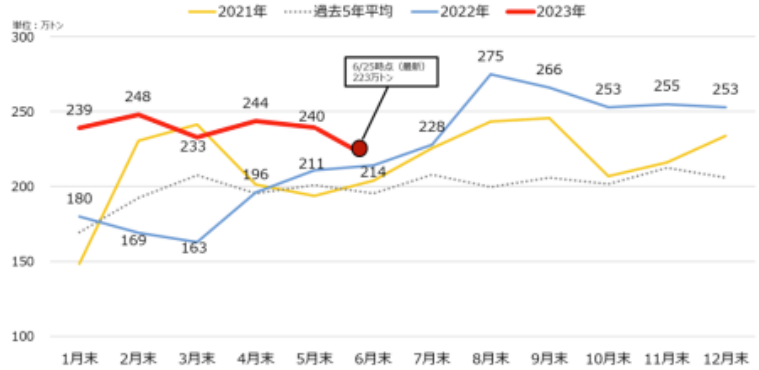
Source: BloombergNEF

Natural Gas: Japan's LNG stocks down -5.9% WoW to 107.1 bcf

Japan LNG stocks down -5.9% WoW

It looks like the hot weather in Japan over the past couple weeks is helping reduce Japan's LNG stocks. They were fairly flat thru mid June as there wasn't any major weather demand push in April/May as that is shoulder season. And even in early June 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. However, we are now seeing the really hot weather is starting to be a pull on LNG stocks. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on June 25 were 107.1 bcf and are down ~5.9% WoW from June 18 of 113.8 bcf, but remain well above the 5-year average of 93.7 bcf. This is the lowest Japan's LNG Stock have fell since the week of May 7. METI did not comment on what has caused the WoW decrease. Below is the LNG stocks graph from the METI weekly report.

Figure 14: Japan LNG Stocks



Source: METI

Natural Gas: Japan LNG Imports down to 7.14 bcf/d in May

Japan LNG imports down

On Thursday, Japan's Ministry of Finance posted its import data for May [LINK] and pointed to a material YoY decline in LNG imports. The MOF reported Japan's May LNG imports were 7.14 bcf/d, which is down -1.5% MoM from 7.25 bcf/d in April, and -19.9% YoY from 8.92 bcf/d in May 2022. Notably, May's 2023's imports of 7.14 bcf/d is the lowest LNG imports recorded for the month of May in over a decade. May's imports are only 0.05 bcf/d above the May 2020 imports levels, which was heavily impacted by Covid. This makes April and May the lowest consecutive months for LNG imports in over a decade. Japan's thermal coal imports in May were -27.4% YoY, compared to -10.8% YoY in April. Petroleum products imports were down -9.3% YoY. Below is our table that tracks Japan LNG import data.

Figure 15: Japan Monthly LNG Imports

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	12.66	13.06	11.22	12.85	12.79	11.69	11.63	12.48	10.51	-15.8%	10.56	0.5%
Feb	12.88	13.26	12.30	13.36	14.23	12.61	10.99	13.84	12.19	-11.9%	10.98	-9.9%
Mar	12.46	12.60	12.62	12.61	12.28	11.30	11.16	11.04	10.07	-8.7%	8.86	-12.0%
Apr	11.54	10.56	10.21	10.52	8.97	9.00	8.31	7.96	8.92	12.0%	7.25	-18.7%
May	10.06	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.92	16.3%	7.14	-19.9%
June	10.91	10.61	10.02	9.90	8.88	8.32	8.42	9.13	9.29	1.7%		
July	12.14	10.77	10.19	10.19	10.55	10.56	9.35	9.58	9.54	-0.4%		
Aug	10.92	10.93	11.96	11.24	11.73	9.45	9.04	9.75	9.71	-0.4%		
Sept	11.64	11.06	10.67	9.31	10.04	10.30	10.41	8.66	8.52	-1.6%		
Oct	10.75	9.38	9.73	9.50	10.12	9.75	9.20	7.17	7.88	9.9%		
Nov	11.00	10.71	12.07	10.26	10.15	10.03	9.63	9.38	8.88	-5.4%		
Dec	12.79	12.51	11.69	12.31	11.23	10.54	11.96	10.89	9.39	-13.8%		

Source: Japan Ministry of Finance, SAF

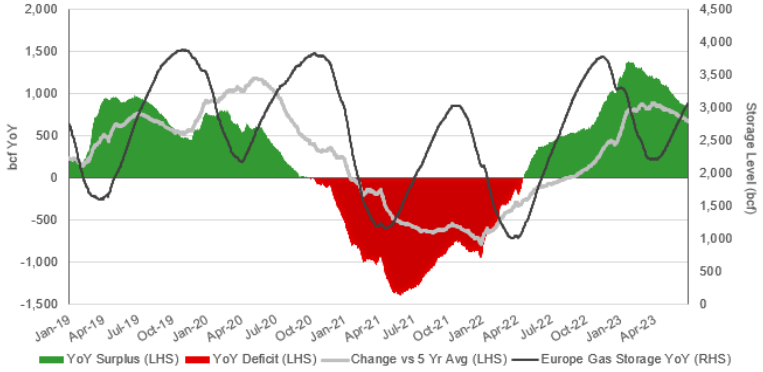
Natural Gas: Europe storage is now +15.86% vs 5-yr average, but within 5-yr range

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. This week, Europe storage increased by +1.80% WoW to 76.86% on June 28. Storage is now +19.12% greater than last year levels of 57.74% and is +15.86% above the 5-year average of 61.00%. Prior to this week's +19.12% vs last year, the prior four weeks starting with the most recent has seen the

YoY surplus at +19.67%, +20.14% +21.50%, and +23.53%. Prior to this week's +15.86% above the 5-year average, the prior four weeks starting with the most recent has seen the surplus to the 5-year average were +16.40%, +16.86%, +17.72%, and +18.18%. The current storage is within the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Figure 16: European Gas Storage Level



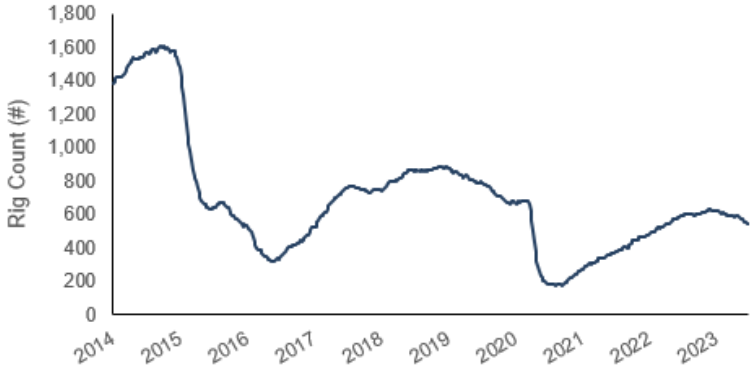
Source: EIA, SAF

Oil: US oil rigs -1 WoW at 545 rigs on Jun 30, US gas rigs -6 WoW at 124 rigs

US oil rigs down WoW

Baker Hughes released its weekly North American drilling rig data on Friday. This week total US oil rigs were down -1 rigs WoW to 545 total rigs, and -50 rigs YoY for the week of June 30. That is up +64 rigs from the 2022 low of 481 rigs in January, and +373 rigs 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 more stability and prices higher then the $60's before beginning to ramp up production. On a per basin basis, the Permian and Eagle Ford both increased by +1 rig WoW to a total of 336 rigs and 60 rigs, respectively. The Williston and "Others" Decreased this week by -1 and -2 rigs WoW to a total of 34 rigs and 72 rigs, respectively. Gas rigs were down -6 rigs WoW to total of 124 rigs and have now decreased -29 rigs YoY. Natural gas rigs was expected to drop in Q2 from when Henry Hub was in the low $2 range, and $2.70 isn't enough to change plans. On a per basin basis, Haynesville significantly decreased by -6 rigs WoW to 44 total rigs, while "Others" increased by +1 rig WoW to 27 total rigs. Below is our graph of total US oil rigs.

Figure 17: Baker Hughes Total US Oil Rigs



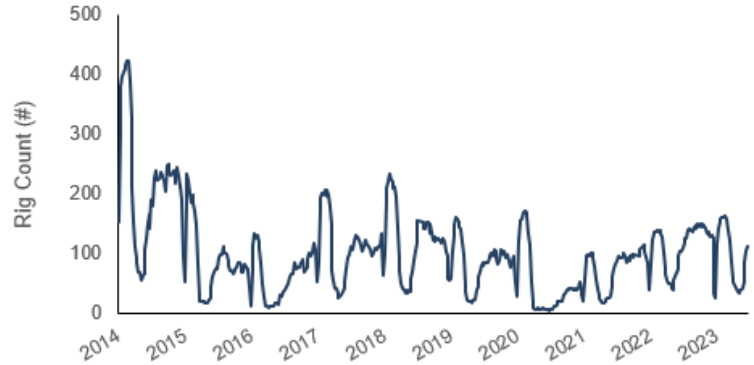
Source: Baker Hughes

Oil: Total Cdn rigs -2 WoW to 167 total rigs

Cdn total rigs down WoW

Wildfires have increased over the past two weeks and we believe this is the reason for the small decline in Cdn rigs. Total Cdn rigs were down -2 rigs WoW to 167 rigs for the week of June 30, likely due to the increasing risk of wildfires. Notably, the only change this week was Alberta -2 rigs WoW to a total of 108 rigs. Cdn oil rigs were down -1 WoW to 109 rigs, and Cdn gas rigs decreased -1 to 58 rigs. Cdn oil rigs are now flat YoY, while gas rigs are up +1 YoY from 57 rigs. Below is our graph of total Cdn oil rigs.

Figure 18: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes

Oil: US weekly oil production estimates remain flat WoW to 12.2 mmb/d

US oil production flat WoW

We don't know if there is any specific reason why US oil production, based on EIA weekly estimates, is flat. Perhaps it's the very hot weather in Texas, perhaps some of the refinery downtime has an impact but US weekly estimates continue to seem low relative to the recent actuals. The EIA estimates US oil production flat WoW at 12.2 mmb/d for the week ended June 23 [LINK]. The Lower 48 was also flat WoW at 11.8 mmb/d, and Alaska was up +0.002 mmb/d to 0.427 mmb/d. Over the prior 3 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

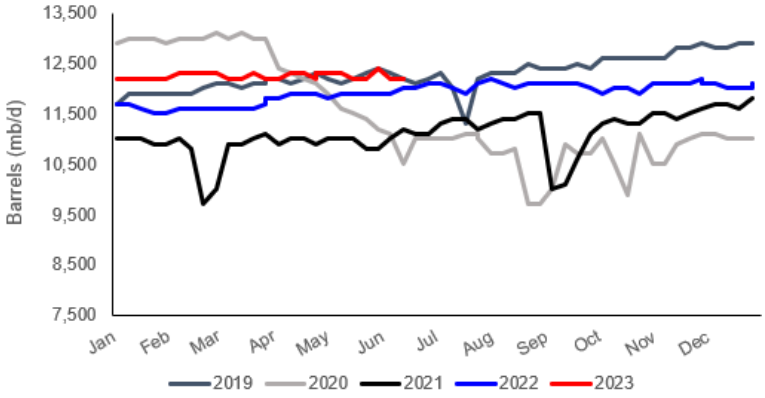
since the pandemic was the 1st week of August in 2022. US oil production is up YoY at +0.100 mmb/d but is still down significantly at -0.900 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 19: 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	06/23	12,200		

Source: EIA

Figure 20: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

Oil: EIA Form 914: US April oil actuals +398,000 b/d vs weekly estimates

EIA Form 914 April

As a reminder, the EIA's actuals for US oil production continue to be well above their weekly estimates. This the large 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 Friday, the EIA released its Form 914 data [LINK], which is the EIA's "actuals" for April US oil and natural gas production. The Form 914 actuals for April have production at 12.615 mmb/d, which is +398,000 b/d vs the EIA weekly estimates of 12.217 mmb/d. And because of this significant difference, the Form 914 April production is +947,000 b/d YoY, just shy of 1 mmb/d YoY. The actuals paint a picture of much stronger than expected US oil production.

Figure 21: EIA Form 914 US Oil Production (thousands b/d)

(thousands b/d)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	12,568	12,532	12,717	12,615								
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 22: EIA Form 914 US Oil Production vs Weekly Estimates

Source: EIA, SAF

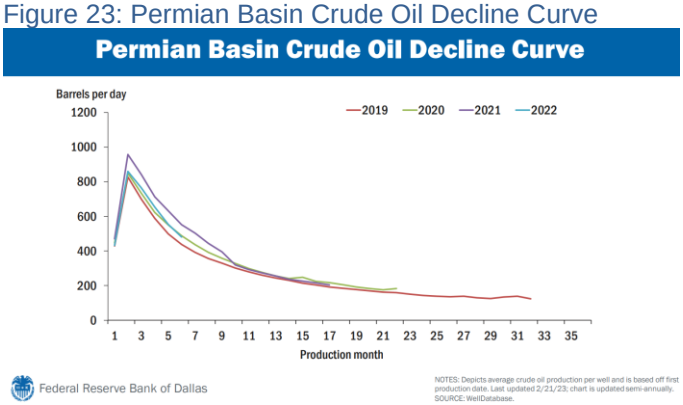
Oil: Dallas Fed, lower productivity Permian 2022 wells than 2021 and 2020 wells

Lower productivity Permian wells

Last Sunday night, we tweeted [LINK] "*ICYMI. @DallasFed #PermianBasin crude #Oil decline curve. Fits maturing Permian thesis ie. industry generally drilled their best wells in 2020/21 when cash flows were squeezed. 2022 wells. Less than 2021 wells. Start little higher vs 2020 but cross over lower ~6 mths. #OOTT."* The Dallas Fed posts a quarterly Energy Slide Show, and the current release was on June 2. [LINK] There were two key charts that reminded that the Permian is maturing and there needs to be a big pickup in drilling. (i) Last Sunday night, we tweeted [LINK] "*ICYMI. @DallasFed #PermianBasin crude #Oil decline curve. Fits maturing Permian thesis ie. industry generally drilled their best wells in 2020/21 when cash flows were squeezed. 2022 wells. Less than 2021 wells. Start little higher vs 2020 but cross over lower ~6 mths. #OOTT."* The Dallas Fed well data reminds that Permian well productivity is less in 2022 vs 2021, and 2022 wells are looking like going to be less than 2020. This doesn't mean Permian can't grow, it just means industry has drilled more of its best wells and more wells will be needed to get the same level of production. This was also the theme of the recent Raymond James deep dive reports – well productivity in the Permian tipped over in 2022. Our tweet included the below Dallas Fed Permian Basin crude oil decline curves. It fits the concept that industry drilled their best wells in 2020 and 2021 when things were tough. The 2022 wells are less than the 2021 wells. The 2022 wells start off a little better than 2020 but cross back over to less than 2020 after 6 months so look like they will be less. Note they only update the graph semi-annually and the last update was 2/21/23. (ii) There were two other charts (also below) that reinforced that the Permian needs to crank up their drilling to build up DUCs . And it reinforces that industry is drilling its best plays assuming the Permian is the best play. Note how the Permian DUCs are going lower whereas the Other Basins DUCs are staying flat. And that makes sense given the Permian

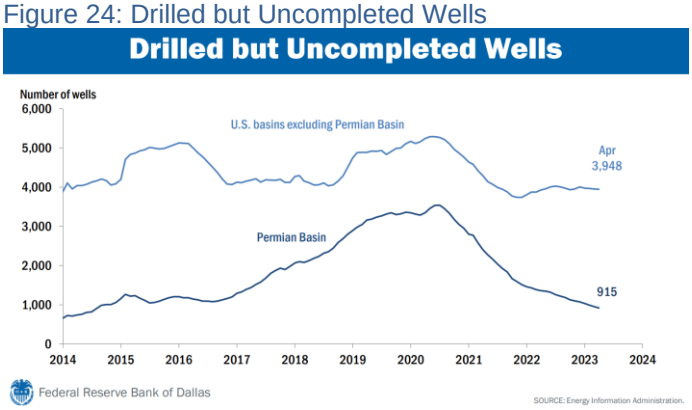
completions keep increasing but not so for other basins. Industry is focusing on the Permian comes out in these slides.

Figure 23: Permian Basin Crude Oil Decline Curve



Source: Dallas Fed

Figure 24: Drilled but Uncompleted Wells



Source: Dallas Fed

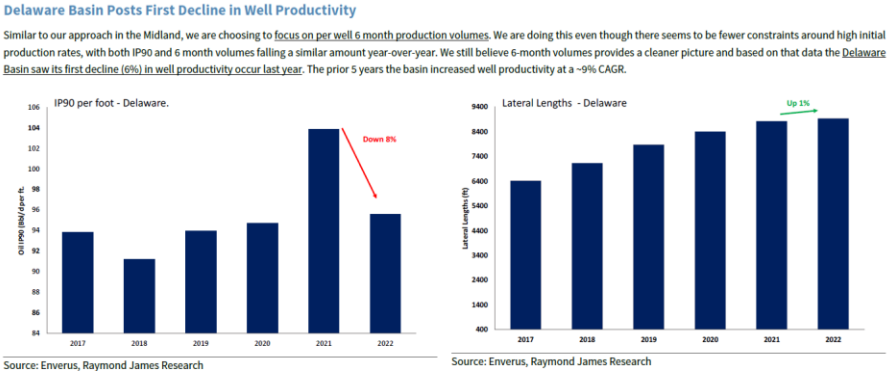
Figure 25: Well Completions by Basin

Source: Dallas Fed

Raymond James data shows Permian well productivity rolled over in 2022

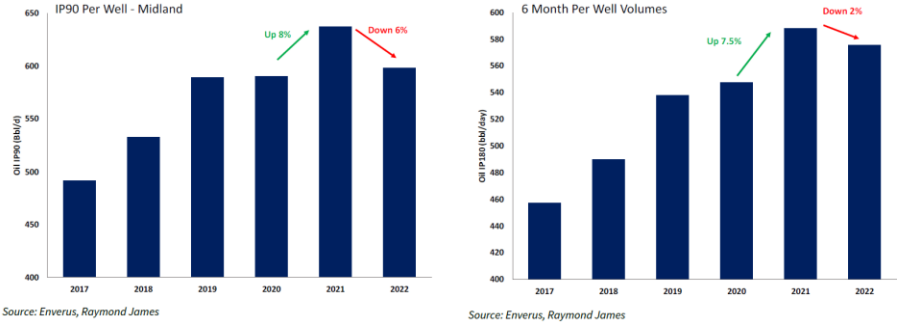
Last week's (June 25, 2023) Energy Tidbits memo highlighted the Raymond James data that has showed well productivity in both the Delaware and Midland Basins in the Permian were lower in 2022. (i) Delaware Basin. On June 24, we tweeted Yesterday, we tweeted [LINK] "*Must read #Permian#DelawareBasin report 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."* (ii) Midland Basin. On June 5, 2e tweeted [LINK] "*Must read #Permian #MidlandBasin report by @RaymondJames John Freeman. Core inventory dwindling at a rapid rate. Well productivity has finally rolled over (albeit at a slower rate than many would have expected). Bodes well for the macro outlook [positive for #Oil] with Midland Basin supply growth likely diminished. #OOTT.* RJ wrote "*Well productivity has finally rolled over (albeit at slower rate than many would have expected*)." RJ also said "*We can say with some certainty that for the first time we had per-well productivity slide in the Midland Basin.* (iii) Permian Basin. The Permian Basin includes the Delaware and Midland Basins. Our June 24 tweet 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."*

Figure 26: Delaware Basin posts first decline in well productivity



Source: Raymond James

Figure 27: Midland Basin: IP90 Per Well, 6 Month Per Well Volumes



Source: Raymond James

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. On June 24, 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 Dallas Fed charts and the Raymond James Delaware Basin and Midland Basin deep dives line up with our concern on why we see it is difficult to see the math for sustained continued strong growth in the Permian. 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 our 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*

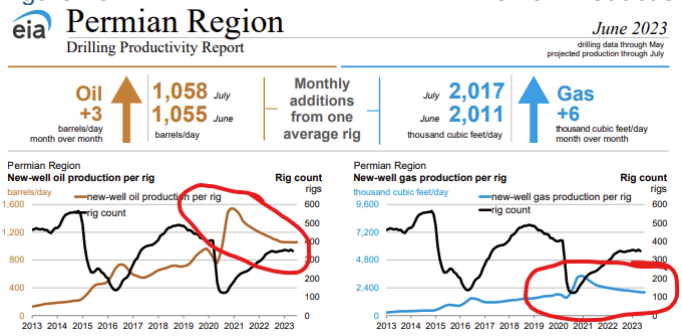
production is forecast in June or July, absent a big fall off the cliff, it isn't the key data point from the EIA's DPR. Our position is unchanged – we have trouble seeing how the math works for sustained Permian oil growth in the 2020s based on the level of DUCs and oil rigs. Note that the EIA made 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 28: 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					

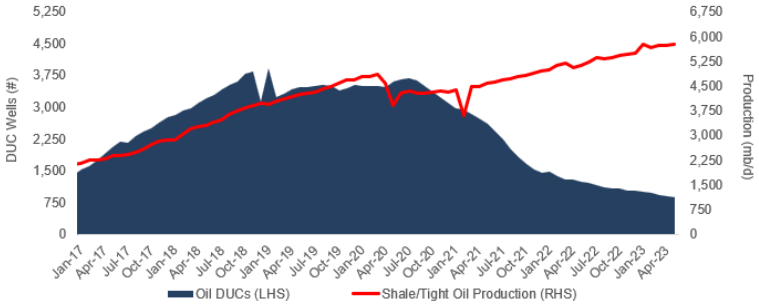
Source: EIA, SAF

Figure 29: Permian: EIA's Permian new-well-oil Production Per Rig



Source: EIA

Figure 30: EIA Estimated Drilled UnCompleted Wells vs Permian Oil Production



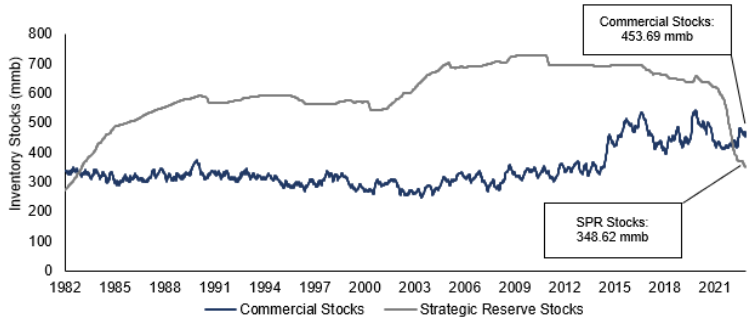
Source: EIA, SAF

Oil: US SPR reserves now –105.073 mmb lower than commercial crude oil reserves

US SPR reserves

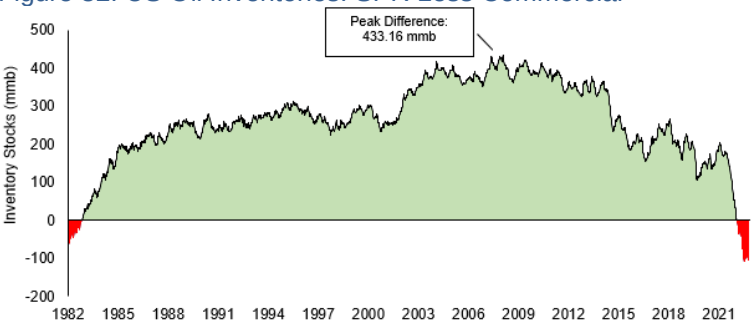
Oil in US Strategic Petroleum Reserves (SPR) continues to move further below total US commercial crude oil reserves. SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit narrowed this week after a draw in commercial oil stocks of -9.60 mmb. The EIA's weekly oil data for June 23 [LINK] saw the SPR reserves decrease -1.351 mmb to 348.617 mmb, while commercial crude oil reserves decreased -9.603 mmb 453.690 mmb. There is now a -105.073 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 31: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 32: US Oil Inventories: SPR Less Commercial



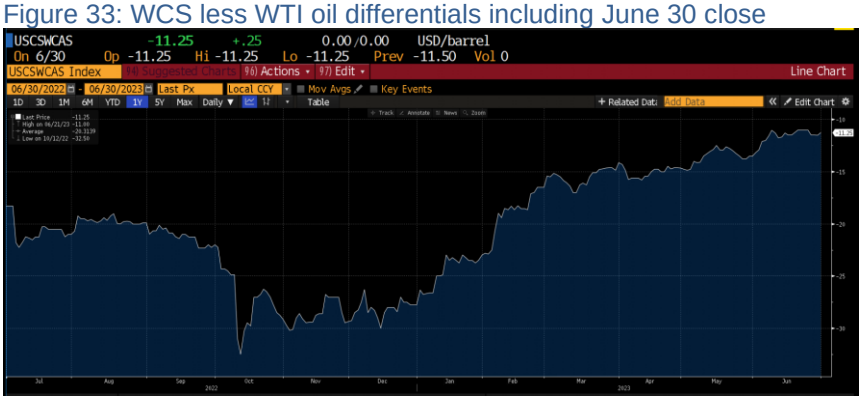
Source: EIA, SAF

Oil: Cdn oil differentials widened by $0.25 to close at $11.25 on June 30

WCS less WTI differentials

WCS less WTI differentials widened by $0.25 to close at $11.25 on June 30. It was a great Q2 for WCS less WTI differentials that normally widenfrom mid May thru June. This year, there have been a number of factors that led to narrower WCS less WTI differentials in mid-May thru the end of June such as Alberta wildfires, Enbridge's recent toll lowering, OPEC+ cuts that stared on May 1 and higher than expected oil sands maintenance. WCS less WTI differentials since early May and are not acting like the normal widening of WCS-WTI differentials that happens 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, and have be around that levels since then closing at $11.25 on June 30. 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 $18.25 on June 30, 2022. Below is Bloomberg's current WCS–WTI differential as of June 30, 2023 close.

Figure 33: WCS less WTI oil differentials including June 30 close

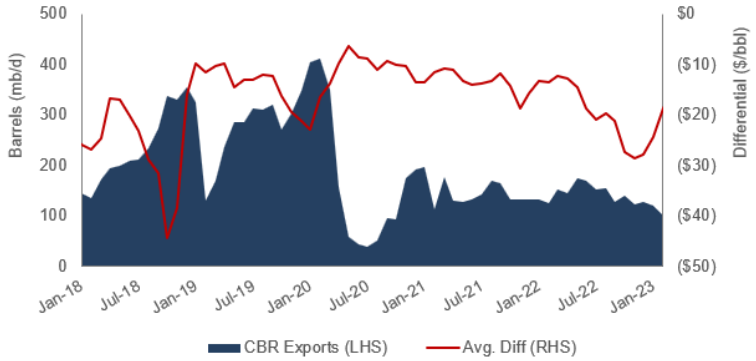


Source: Bloomberg

Oil: Cdn crude by rail exports at 80,612 b/d in April, down -44.1% YoY

The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were down -17,205 b/d MoM to 80,612 b/d in April vs the 97,817 b/d in March [LINK]. This puts export volumes at -63,557 b/d YoY (-44.1%) vs April 2022 of 144,169 b/d. CBR volumes are +41,745 b/d since the Covid low of 38,867 b/d in July 2020. The CER doesn't provide any explanation for the MoM changes but There haven't been the same level of export pipeline constraints as in prior years and there was oil sands maintenance in April. Below is our graph of Cdn crude by rail exports compared to the WCS–WTI differential.

Figure 34: Cdn Crude By Rail Exports vs WCS Differential



Source: Canadian Energy Regulator, Bloomberg

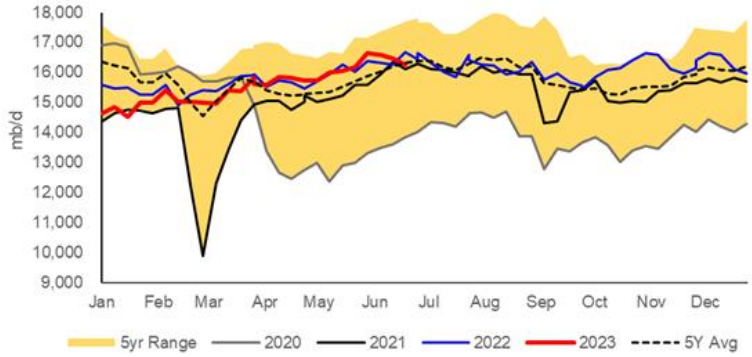
Oil: Refinery inputs down -0.216 mmb/d WoW to 16.254 mmb/d

Refinery inputs down -0.216 mmb/d WoW

There have been some unplanned refinery downtimes in the past two weeks that have disrupted the normal seasonal move of increasing crude oil input into US refineries. 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 23 [LINK]. The EIA reported crude oil inputs to refineries were down -0.216 mmb/d for the week ended June 23 to 16.254 mmb/d and are down -0.412 mmb/d YoY. Refinery utilization was down -0.9% to 92.2%, which -2.8% YoY. Total products supplied (i.e., demand) decreased WoW, down -0.619 mmb/d to 20.306 mmb/d, and Motor gasoline was down -0.069 mmb/d to 9.306 mmb/d from 9.375 mmb/d last week. The 4-week average for Motor Gasoline was up +0.052 mmb/d WoW to 9.273 mmb/d. The 4-week average of Total demand was up +0.168 mmb/d WoW to 20.215 mmb/d.

Figure 35: US Refinery Crude Oil Inputs



Source: EIA, SAF

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

US net oil imports

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 -0.376 mmb/d to 1.242 mmb/d for the June 23 week. US imports were up +0.419 mmb/d to 6.580 mmb/d. US exports were up +0.795 mmb/d to 5.338 mmb/d. The WoW decrease in US oil imports was driven mostly by "Top 10". The Top 10 was up +0.414 mmb/d. Some items to note on the country data: (i) Canada was up +0.206 mmb/d to 3.776 mmb/d. (ii) Saudi Arabia was up +0.314 mmb/d to 0.460 mmb/d. (iii) Mexico was down -0.050 mmb/d to 0.758 mmb/d. (iv) Colombia was up +0.074 mmb/d to 0.222 mmb/d. (v) Iraq was up +0.114 mmb/d to 0.216 mmb/d. (vi) Ecuador was down -0.136 mmb/d to 0.067 mmb/d. (vii) Nigeria was down -0.108 mmb/d to 0.096 mmb/d.

Figure 36: US Weekly Preliminary Imports by Major Country

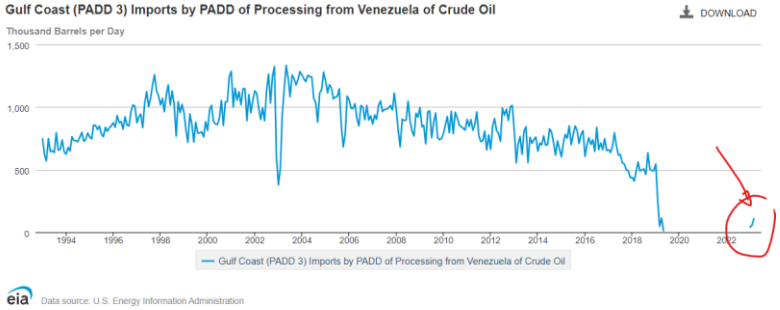
(thousand b/d)	Apr 14/23	Apr 21/23	Apr 28/23	May 5/23	May 12/23	May 19/23	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	Jun 23/23	WoW
Canada	3,519	3,327	3,526	3,269	3,592	3,707	3,589	3,504	3,339	3,570	3,776	206
Saudi Arabia	339	393	242	381	415	212	534	66	677	146	460	314
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	615	728	706	393	676	657	913	647	845	808	758	-50
Colombia	303	143	143	47	339	214	286	127	184	148	222	74
Iraq	180	222	148	247	174	136	114	430	252	102	216	114
Ecuador	131	36	57	145	101	71	214	218	54	203	67	-136
Nigeria	112	104	214	143	329	77	98	144	132	204	96	-108
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	5,199	4,953	5,036	4,625	5,626	5,074	5,748	5,136	5,483	5,181	5,595	414
Others	1,095	1,423	1,360	928	1,234	776	1,469	1,264	898	980	985	5
Total US	6,294	6,376	6,396	5,553	6,860	5,850	7,217	6,400	6,381	6,161	6,580	419

Source: EIA, SAF

EIA shows imports from Venezuela in its monthly import data.

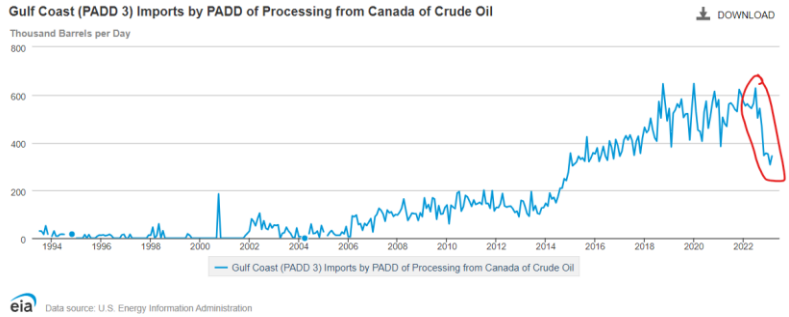
Here is what we wrote in our May 7, 2023 Energy Tidbits memo. *"Last week's (Apr 30, 2023) Energy Tidbits memo highlighted our Apr 29 tweet [LINK] that Chevron's start of Venezuela oil imports into the Gulf Coast is likely impacting Cdn WCS less WTI differentials and how Venezuela oil into the Gulf Coast 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 37: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 38: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil: Pemex oil production including partner volumes slightly above 1.6 mmb/d

Pemex May oil production

On Monday, Pemex reported [LINK] its data for May. Pemex's May oil production, including partners, was 1.611 mmb/. This represents a change of -4.7% YoY and +0.2% MoM. Excluding partner production, Pemex interest April production was 1.591 mmb/d. Pemex does not provide any color to the numbers. The story remains the same – Mexico (Pemex) oil production is stuck around 1.6 mmb/d. Pemex has been unable to grow Mexico oil production, which means that any increase in Pemex Mexico refineries will result in less Mexico oil for export including to the US Gulf Coast. Below is our table tracking Pemex oil production.

Figure 39: Pemex (Incl Partners) Mexico Oil Production

Oil Production (thousand b/d	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	2,259	2,020	1,909	1,623	1,724	1,651	1,705	1,584	-7.1%
Feb	2,214	2,016	1,876	1,701	1,729	1,669	1,684	1,582	-6.1%
Mar	2,217	2,018	1,846	1,691	1,745	1,697	1,696	1,597	-5.8%
Apr	2,177	2,012	1,868	1,675	1,703	1,693	1,686	1,608	-4.6%
May	2,174	2,020	1,850	1,663	1,633	1,688	1,690	1,611	-4.7%
June	2,178	2,008	1,828	1,671	1,605	1,698	1,702		
July	2,157	1,986	1,823	1,671	1,595	1,701	1,707		
Aug	2,144	1,930	1,798	1,683	1,632	1,657	1,691		
Sept	2,113	1,730	1,808	1,705	1,643	1,709	1,685		
Oct	2,103	1,902	1,747	1,655	1,627	1,692	1,698		
Nov	2,072	1,867	1,697	1,696	1,633	1,691	1,706		
Dec	2,035	1,873	1,710	1,706	1,650	1,694	1,576		

Source: Pemex

Oil: Mexico exports 1.087 mmb/d of oil in May +12.6% YoY

Pemex May oil exports

There have been a number of unplanned minor refinery outages, which has freed up a little more Mexico oil for export. Please note that we continue to expect Mexico oil exports to decline in H2/23 as they start up their new 340,000 b/d Olmeca (formerly known as Dos Bocas) refinery. On Monday, Pemex reported [LINK] its natural gas data for May, which were 1.087 mmb/d, +12.6% YoY and +9.9% MoM. This was the first time Mexico exports over 1 mmb/d since September 2022. Oil exports can normally vary +/- 1.0 mmb/d, but changes in export volumes can be impacted by varying production levels of petroleum products. Mexico oil exports in the US were 0.752 mmb/d in May, which is up +1.6% YoY, and +31.0% MoM. Pemex did not comment on what caused the MoM increases. Below is our table of the Pemex oil export data.

Figure 40: Pemex Mexico Oil Exports

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	1,119	1,085	1,107	1,071	1,260	979	832	980	17.8%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	925	949	2.6%
Mar	1,062	1,001	1,176	1,150	1,144	925	905	971	7.3%
Apr	1,081	1,017	1,266	1,023	1,179	923	1,024	989	-3.4%
May	1,204	958	1,222	1,205	1,062	1,031	965	1,087	12.6%
June	1,098	1,157	1,110	995	1,114	1,106	1,029		
July	1,146	1,255	1,156	1,079	1,051	1,173	1,062		
Aug	1,261	1,114	1,181	1,082	1,190	1,099	915		
Sept	1,425	1,159	1,206	995	1,023	983	1,022		
Oct	1,312	1,342	1,027	963	908	935	971		
Nov	1,273	1,388	1,135	1,114	1,171	1,025	893		
Dec	1,115	1,401	1,198	1,115	1,243	1,037	900		

Source: Pemex

Oil: No surprise, Guyana not interested in joining OPEC

Guyana goes it alone on oil

On Tuesday morning, we tweeted [LINK] "*Surely no one expected Guyana to want to join #OPEC. On joining #OPEC, Guyana VP "this is not something we are interested in." Guyana just starting #Oil revenues hasn't had decades of benefits. It's like why would developing countries take on same Net Zero commitments as wealthy west countries. #OOTT."* When we saw the reports that OPEC invited Guyana to join OPEC, we thought that even if there was an invite, there would be zero reason for Guyana to accept. We see no reason for Guyana to give up its fairway of unfettered, absent market conditions, for growth to 1 mmb/d to join any OPEC commitments. And this is especially so considering Guyana had effectively zero oil production a few years ago and hasn't had the advantage of decades of oil production and oil revenues. Guyana is a poor country. Our tweet used the analogy of it being like why would developing countries take on the same NetZero commitments as the wealthy west. Guyana quickly confirmed that it was not interested in joining OPEC. OPEC also put out a press release [LINK] saying "*in view of recent reports about Guyana being invited to become a Member of OPEC, while the Organization recognizes that Guyana is an emerging player in the international oil market with significant potential, OPEC has not invited Guyana to become a Member of the Organization."* Our Supplemental Documents package includes the Guyana Chronicle report.

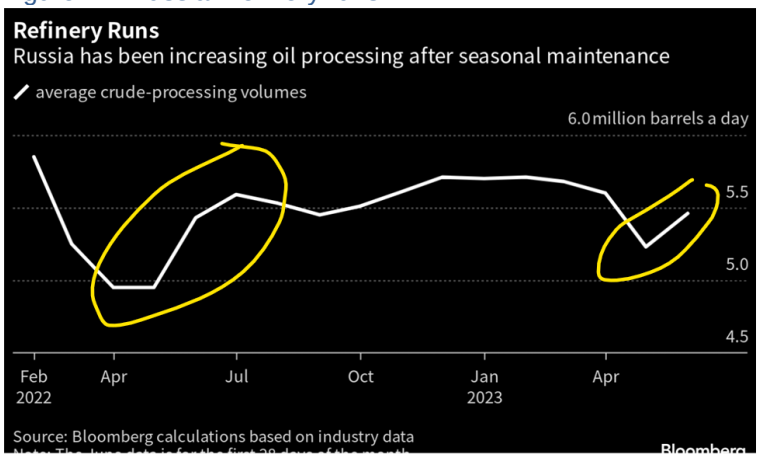
Oil: Russian refineries processed +230,000 b/d oil MoM in June

Russia refineries process +230,000 b/d MoM

The caveat to any of the look ahead on Russia is, as noted previously, the uncertainty what happens to Russia overall from what will emerge, one way or another, post the Wagner crisis. 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 Friday, we tweeted [LINK] "*Russian refineries process more crude oil = less oil for export. @ja_herron update: Russia refineries came out of seasonal maintenance and processed +230,000 b/d MoM more in June. #OOTT."* Bloomberg wrote "*Russia's oil refineries raised crude-processing rates this month after completing spring maintenance, providing market watchers with more data to appraise the nation's output goal. Primary processing rates averaged 5.46 million barrels a day over the June 1-28 period, according to a person familiar with the matter. That's about 230,000 barrels a day, or 4.4%, higher than the average rate in May."* Our tweet included the below Bloomberg graph. Note that this is

the same seasonal increase as seen in 2022 and there should be more room to increase refinery crude processing.

Figure 41: Russian refinery runs

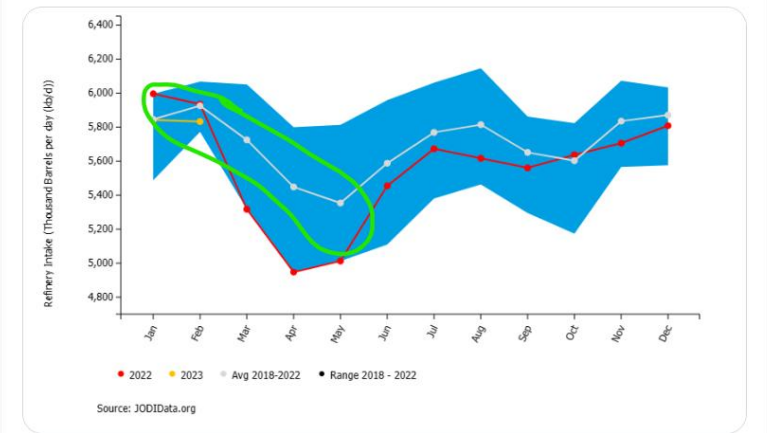


Source: Bloomberg

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 42: Crude oil input into Russian refineries



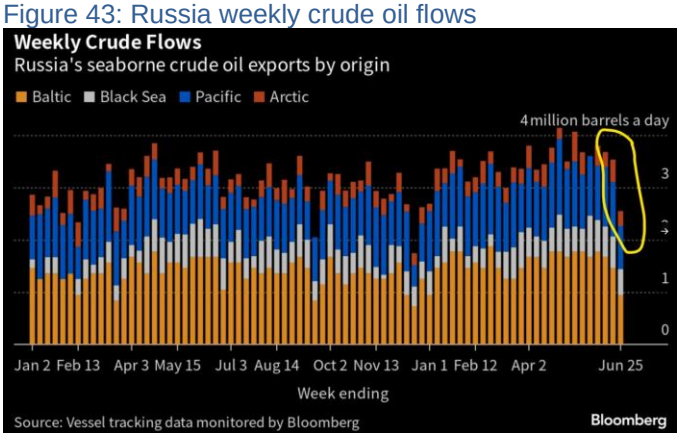
Source: JODI

Russian oil flows down 1 mmb/d

Oil: Bloomberg, Russian oil flows down ~1 mmb/d WoW in June 25 week

Markets have been waiting to see if Russia will finally deliver on its 500,000 b/d cuts. It looks like they have done so for the week ended June 25 but Bloomberg thinks the big 997,000 b/d WoW cut in oil loadings will bounce right back. On Tuesday, we tweeted [LINK] "*Flows of Russian #Oil -997,000 b/d WoW to 2.55 mmb/d. @JLeeEnergy: should see pop back up as 521,000 b/d was maintenance related at Primorsk and >200,000 b/d from Kozmino. But likely some decline is linked to @ja_herron report RUS refineries processed ~115,000 b/d more in June 21 week. #OOTT."* Bloomberg reported on its vessel tracking data and highlighted the 997,000 b/d WoW drop in Russia crude oil shipments for the week ending June 25. That is a huge decrease but Bloomberg highlighted that it sees a lot fo this coming right back as it believes a big part of the declline was due to maintenance at export ports. Bloomberg wrote "*Russia's seaborne crude oil flows to international markets slumped last week but maintenance work, rather than output cuts, is the most likely cause. Crude flows through Russian ports fell by about 980,000 barrels a day in the week to June 25. Lower shipments were seen from all regions, but hardest hit was the Baltic, where fewer than half the normal number of tankers were loaded at Primorsk. The port accounted for more than half of the week-on-week drop in the country's total seaborne crude exports. Crude shipments through Primorsk dropped in exactly the same way during the same week last year and the pattern can also be seen in both 2020 and 2021, albeit a week earlier. In all three years, shipments rebounded the following week. There was a gap in the loading program for the port, with no cargoes due to complete loading between June 21 and June 25, indicating that the drop in flows was planned. The program then reverts to its more normal pattern of at least one cargo completing loading each day for the rest of the month. There was also a big drop in shipments from the Pacific, where flows were down week-on-week by more than 200,000 barrels a day. A slump in shipments from Kozmino was partly offset by an increase in the flow from Sakhalin Island. But it's unlikely that this reflects an output cut either. Exports from Pacific ports command higher prices than those from the west of the country and shipping times to key markets in China and India are shorter, making cuts to flows from Kozmino unlikely. A gap in the Kozmino loading program suggests the dip in flows from the port will also be temporary."* Our Supplemental Documents package includes the Bloomberg report.

Figure 43: Russia weekly crude oil flows



Source: Bloomberg

Bloomberg didn't say any of WoW Russia oil flows drop to refinery runs up

Bloomberg's report highlights the theme of the WoW reduction in Russian oil flows being temporary. Their report highlighted Primorsk and Kozmino export ports but Bloomberg also noted these would total a 835,000 b/d WoW decline of the 997,000 WoW decline. In a lengthy report, Bloomberg only made a brief mention of increasing refinery runs but did not specifically attribute any of the WoW decrease to refinery runs. Bloomberg wrote "*Meanwhile, Russian refineries raised crude processing rates to the highest level since April in the week to June 21, as the nation's downstream maintenance season nears its end."* Our tweet noted "*But likely some decline is linked to @ja_herron report RUS refineries processed ~115,000 b/d more in June 21 week".* So even though they didn't specifically say par to the 997,000 b/d WoW decline was due to increased refinery runs, it looks like the math suggests there was some facto.

Oil: Waiting on Saudi decision to extend 1 mmb/d voluntary cuts to Aug

Saudi voluntary 1 mmb/d cut

As of our 7am MT news cut off, we have not seen any confirmation if Saudi Arabia will or will not continue its one-month voluntary 1 mmb/d cut in July for another month or longer. However, the market seems to be pricing in an extension into August ie. If not, then look for oil to be weaker. OPEC holds its 8th OPEC International Seminar on July 5/6 in Vienna. This is not an OPEC policy meeting, rather a seminar with many of the world's major oil participants. So it is expected that any confirmation from Saudi Arabia is likely to come in the coming days.

Oil: Saudi Aramco CEO sees oil demand growth >2 mmb/d in 2023

Aramco sees oil demand >2 mmb/d in 2023

On Monday, Saudi Aramco CEO Nasser spoke at the Energy Asia conference in Malaysia. [LINK]. We tweeted on his speech [LINK] and noted "*Headlines #Aramco CEO Nasser speech: #Oil Demand growth >2 mmbd in 23."* No question, the headlines on his speech were on this oil demand call of more than 2 mmb/d in 2023. Our tweet included the transcript

of his speech, which said "*Let me first say a few words about the current energy market environment, which has been complicated by the conflict in Ukraine. Overall, we believe that oil market fundamentals remain generally sound for the rest of the year. Despite the recession risks in several OECD countries, the economies of developing countries – especially China and India – are driving healthy oil demand growth of more than 2 million barrels per day this year. This is high by historical standards. And although China is facing some economic headwinds, the transport and petrochemical sectors are still showing signs of demand growth. So we are optimistic about the market's prospects for the rest of the year. And once the broader global economy starts to recover, supply-demand balances will likely tighten further."* Our Supplemental Documents package includes the Saudi Aramco CEO speech.

Oil: Will US Malley's "leave" advance or pause potential US/Iran nuclear understanding

US/Iran nuclear understanding

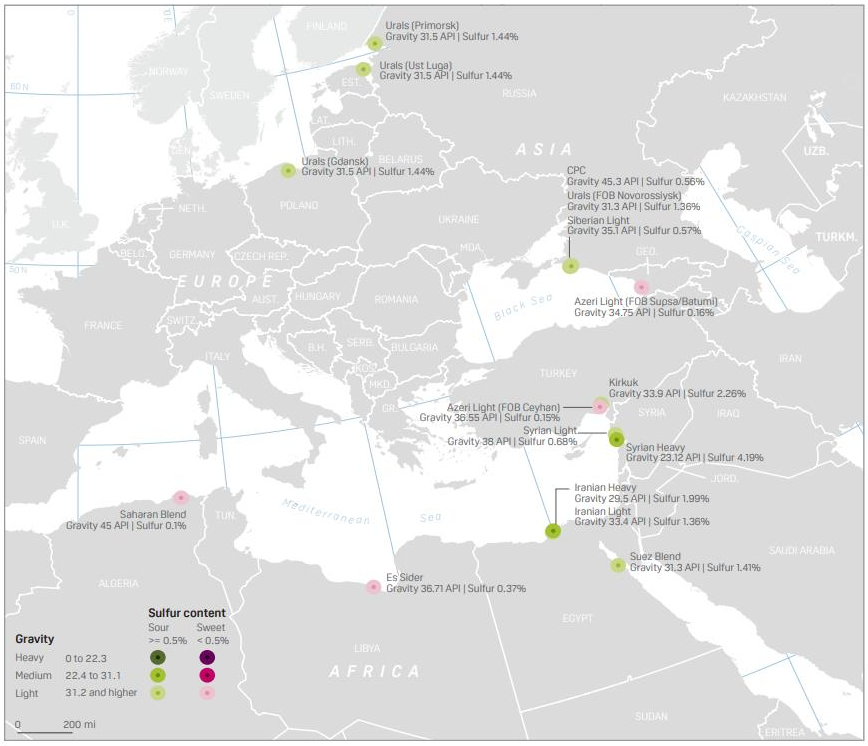
We were a little surprised, up until Thursday night to have seen no noteworthy reports on any potential advancement towards a US/Iran "understanding" on nuclear and sanctions relief. But, it became clear why on Thursday night and clearer on Friday with the reports that the US Special Envoy on Iran Rob Malley was put on leave pending the results of an investigation to possible mishandling of classified information. Malley has been the point person for the US on the JCPOA. At the Thursday afternoon State Dept press briefing, Matthew Miller wouldn't be specific on Malley's participation but would only say he was still the special envoy. But then the reports came out such as CNN that wrote "*Malley, the US special envoy on Iran, has been placed on leave without pay, which occurred after his security clearance was suspended earlier this year amid an investigation into his handling of classified material, multiple sources told CNN. A US official said that Malley's clearance was suspended amid a State Department diplomatic security investigation into the possible mishandling of classified information. Another source familiar with the matter said he was placed on unpaid leave on Thursday afternoon. "I have been informed that my security clearance is under review. I have not been provided any further information, but I expect the investigation to be resolved favorably and soon. In the meantime, I am on leave," Malley told CNN. For a period of time following the State Department investigation, Malley remained on the job but was not allowed to access classified information, said the US official, who requested anonymity while discussing a sensitive matter."* The question will be if Malley's leave means there is a pause to movement on an Iran/US understanding or if somehow those above him decide to push ahead even faster.

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 44: Platts Specifications Guide Europe and Africa Crude Oil



Source: S&P Global Platts

Source: Platts

Oil: Still no indicators for an imminent restart of Kurdistan/Iraq oil exports thru Turkey

Kurdistan oil still shut in

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) following Iraq/Kurdistan meetings with Turkey two weeks ago. Rather, it is still unclear when the oil exports will resume. No question Kurdistan is the hurt party in this holdup as Iraq continues to deliver its OPEC+ quota thru its primary exports terminals in Southern Iraq whereby Kurdistan oil remains trapped without the northern pipeline access via Turkey.

Turkey raised the Ceyhan damage post the earthquake

There are complex political issues between the parties, but Turkey has also given its infrastructure issues that have held up a resumption of exports. Our 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 45: Ceyhan terminal in Turkey

Source: TankerTrackers

Oil: Libya NOC confirms oil production stable at ~1.2 mmb/d

Libya oil production stable at 1.2 mmb/d

We aren't really surprised that we saw the first Libya National Oil Corporation oil production update in weeks given the news last Sunday morning that the east Libya rival PM threatened to shut down oil sites in the east without a proper share of revenue. On Monday, the Libya NOC tweeted [LINK] "*Crude oil production reached 1 million 206 thousand barrels per day, and condensate production reached 57 thousand barrels per day during the past 24 hours."* Libya's oil production has been pretty stable around 1.2 mmb/d for the past several months. But we suspect the reason for the first oil production update in weeks is because of last Sunday's news. Here is what we wrote in last week's (June 25, 2023) Energy Tidbits memo. "*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."

Figure 46: Libya Ports, Major oilfields and Terminals map

Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Vitol 's Mike Muller on oil markets in H2

Oil: Vitol Asia Head sees a balanced oil market, not yet the predicted tightening

Earlier this morning, we tweeted [LINK] ""*So as such, I think we have a sense of balance, rather than the predicted tightening of the [#Oil] market, which may yet occur later this year" @vitolnews @michaelwmuller. not getting bullish vibes from leading indicators for oil (petrochemical, China construction/steel, shipping). See 👇SAF transcript. #OOTT @sean_evers @CrystolEnergy."* Mike Muller is Head Vitol Asia and was on the Gulf Intelligence Daily Energy Markets podcast this morning and sees a market that is balanced right now and one that, for a number of reasons, hasn't yet seen the expected Q3 seasonal tightening. And he sees some of the key leading oil indicators in line with the market right now being balanced rather than the predicted tightening "*which may yet occur later this year*." Below is the transcript we created of Muller's comments.

Vitol's Mike Muller on H2 oil markets

SAF Group created transcript of comments by Mike Muller (Head, Vitol Asia) and Christof Ruhl (Senior Research Scholar Center on Global Energy Policy, Columbia University) with host Sean Evers (Founder, Managing Partner Gulf Intelligence) on Gulf Intelligence Daily Energy Markets podcast on July 2, 2023. [LINK]. Items in "*italics*" are SAF Group created transcript. Evers asking Muller on his oil market read given big events (recent OPEC+ cuts including Saudi's extra cuts and Russian events over June) really haven't shaken up oil markets off $75 Brent. Muller "I *would say the outcome of the OPEC+ meeting whereby Saudi Arabia took a unilateral move to take extra production off the market in month of July came at a time where the experts in the market were expecting a phase during the calendar year where there was going to be a tightening of the supply/demand balance anyway. And, as such, there was going to be a tailwind for those that wish to see prices supported. For that extra volume to be taken off the market therefore just added to that tailwind. But, of course, the reason it was done was the general overtones of a softer economic global picture. Fueled not least by concerns around Chinese demand or*

rather disappointing lack thereof. And as such, I think there 's your explanation why markets generally held at more or less the levels where they were at before the OPEC+ meeting, mid 70s. Yes, there was an excursion down to the low $70s but, on the whole, what we have here is a relative period here of flat price stability on Brent crude oil and OPEC basket prices. There is a lot more that can be said about global movement of other goods And if you look at certain leading indicators that the oil market tends to take a cue from. The petrochemical sector for example still doesn't look to be healthy. The Chinese construction sector is not underpinning certain markets that are energy intensive. And if you look at shipping markets, those are not giving you particularly bullish vibes at the moment also. So as such, I think we have a sense of balance, rather than the predicted tightening of the market, which may yet occur later this year."

Oil: Vitol CEO calls for peak oil demand about 2030

Vitol CEO on peak oil demand

Vitol CEO Russell Hardy participated on a panel at this week's Energy Asia conference. We couldn't find any video clips of his comments. But CNBC reported [LINK] on his key comments calling for peak oil demand "*about 2030*". CNBC wrote "*Commodities trading firm Vitol is less bullish, predicting that demand for crude will peak in 2030 — two years later than the IEA's forecast. "We got it peaking in about 2030 and a gradual decline out to 2040 … And then [a] rapid decline thereafter as the EV fleet and energy transition takes over," Vitol CEO, Russell Hardy, said during a panel discussion."*

Oil: OPEC sees peak oil demand in 2045, world "*need more, not less oil*".

OPEC on peak oil demand

OPEC Secretary General Haitham Al Ghais also spoke at Energy Asia and he reiterated OPEC's view on peak oil demand – it isn't until 2045. Al Ghais said "*Every data-based forecast that I have seen shows that oil is irreplaceable for the foreseeable future. In our WOO, we see global oil demand rising to 110 million barrels a day by 2045, and oil still making up about 29% of the energy mix by then. A massive energy expansion is required as we see the global economy more than doubling in size, and the world's population reaching 9.5 billion by 2045. Moreover, as we all know, there remains a critical need to bring modern energy services to those billions that continue to go without basic energy access in many parts of the world."* And "*Over the period to 2030, however, it is expected that another half a billion people will move into cities across the world as the global economy continues to expand. Being in Malaysia, and to put this in an understandable context, this urbanization drive will require the addition of approximately 50 new Kuala Lumpurs. It goes without saying therefore that the world will therefore need more, not less oil, alongside the need to continually reduce emissions."* Our Supplemental Documents package includes the Al Ghais speech.

Oil: China's general Covid update implies Beijing cases down WoW in Jun 19-25 week

China's general Covid reporting

We aren't certain how to interpret the Global Times (China state media) June 29 update on infectious diseases including Covid. We wish it was specific but we just end up with more questions on what are they saying. Global Times reported "*A total of 2,869 cases of 19 infectious diseases were reported from June 19 to 25 in Beijing with the majority of them being cases of coronavirus, authorities said on Thursday. The number of infections has seen a decline compared with the previous week, despite a significant increase in the influx of*

people from all over the country during the just-concluded Dragon Boat Festival." The update infers Covid cases in Beijing are down WoW and are likely something over 1,500 cases. Global Times also reported "*Many people in China have contracted a second COVID infection in recent weeks, with Beijing reporting over 10,000 cases from May 1 to 7*." What isn't clear to us is if the Beijing cases for the June 19-25 week include those who had a second Covid infection. Plus a >1,500 cases in Beijing just seems too low relative to their Covid Model that predicted Covid cases were likely to peak at ~65 million cases per week around the end of June. Our Supplemental Documents package includes the Global Times report.

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 +3.4% WoW, not clear if only a holiday bump?

China scheduled domestic flights

On Tuesday, we tweeted [LINK] "*China holiday travel impact? Scheduled domestic flights +3.4% WoW to 95,724 for Jun 20-26 wk. BUT have to see if this is a temporary boost over Dragon Boat Holiday Jun 22-24, like temp boost over Apr 24-May 3 May Day Holiday. Thx @BloombergNEF Claudio Lubis #OOTT."* There was a modest +3.4% WoW increase in scheduled domestic flights but that only puts flights back to pre 5-day May Day Holiday levels. But we have to be careful to see if this +3.4% WoW increase was only due to another national holiday travel – the Dragon Boat Festival holiday on June 22/23/24, and if this bump is temporary. Recall there was a bump up for May Day holiday but that was temporary and it went right back down to pre May Day Holiday levels. China scheduled domestic flights are still well below what was expected at the end of March. On Tuesday, BloombergNEF posted its Aviation Indicators weekly June 28, 2023. China scheduled domestic flights +3.4% WoW to 95,724 flights for June 20-26 week vs 92,568 flights for June 13-20 week. Note: have to watch if this was a temporary boost for China's national holiday, Dragon Boat Festival, on June 22, 23, 24. As seen during the recent 5-day May Day Holiday on Apr 29-May 3, there was a temporary boost and that didn't last. Also note that the scheduled domestic flights for June 20-26 at 95,724 flights is -19.7% 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 late April, pre May Day holiday levels. Today's number of scheduled domestic flights for the next four weeks is set to increase by +9.4% "over" the next four weeks to reach 104,691 flights. Despite flights being up WoW, this is basically changed than last week's then 4-week scheduled domestic flights of 104,501 flights. Again, this 104,691 flights is still -12.2% 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 gave up the May Day holiday bump, and are now back to the pre May Day holiday level. The question to watch over the next two weeks is if this +3.4% WoW increase is due to the Dragon Boat Festival national holiday on June 22, 23, 24 and if flights go back down like they did after the May Day holiday. And 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 47: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

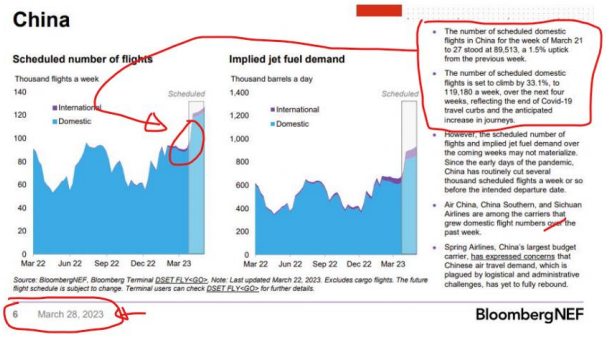
Jun 20-26: +3.4% WoW to 95,724 flights
Jun 13-19: -0.9% WoW to 92,568
June 6-12: -1.2% WoW to 93,328
May 30-Jun 5: +0.2% WoW to 94,486
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +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 48: China scheduled domestic air flights as of June 28

Source: BloombergNEF

Figure 49: China scheduled domestic air flights as of March 28



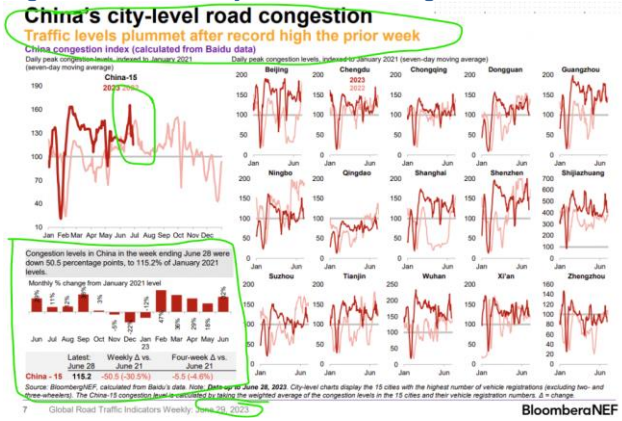
Source: BloombergNEF

China city traffic congestion

Oil: Big crash in Baidu China cities road congestion likely due to national holiday

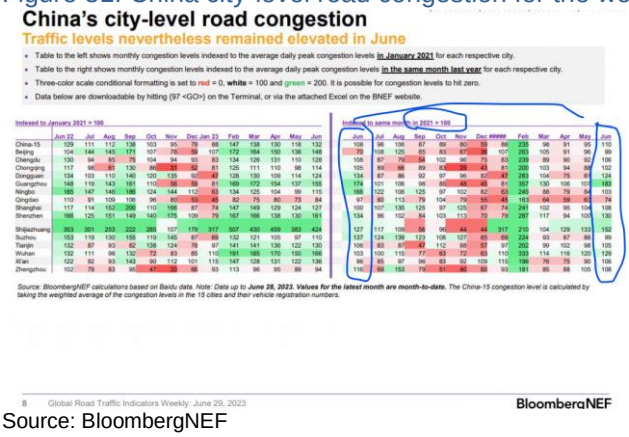
Last week's (June 25, 2023) Energy Tidbits memo wrote "*One question mark that we wonder how plays out in next week's report is that the annual Dragon Boat Festival national holidays were Thurs June 22 thru Sat June 24, so it kicks in after this Baidu June 21 week data. We would expect that any national holiday has an impact on city-level traffic*." It looks like the Dragon Boat Festival national holiday had a huge impact on city-level road congestion. On Thursday, we tweeted [LINK] "*Headline China city-level road congestion "plummet" for Jun 28 week. BUT likely due to Dragon Boat 3-day Jun 22-24 national holiday. Recall 👇05/11 tweet, city traffic rebounded post 5-day May Day holiday. Still not a broad city traffic pickup as top 15 city congestion is still only up small YoY vs Covid restricted Jun 2022, and only 6 of top 15 cities up YoY. #OOTT."* Our tweet referenced the BloombergNEF Global Road Traffic Indicators June 29 report, which includes the China Baidu city-level road congestion data for week ended June 28. The BloombergNEF headline was a big negative "*Traffic levels plummet after record high the prior week*" BUT, as noted last week, it looks like the 3-day Dragon Boat Festival national holiday on June 22-24 had an impact. We should reserve judgement for this week's data with the holiday and recalling that traffic had a big drop for the recent 5-day May Day national holiday and then recovered right after. For the week ended June 28, 2023, Baidu data for China city-level road congestion was -50.5% to 115.2% of Jan 2021 levels. Note that China's top 15 cities, in aggregate, are still up small YoY vs June 2022 when China still had Covid restrictions. Indexed to June 2021, June 2023 is 11- vs June 2022 indexed at 108. So up YoY. However, there are only 6 of the top 15 cities that are up YoY. Note this is indexed to June 2021 and not June 2020. But even if this week's data is affected by the Dragon Boat Festival national holiday, there still wasn't a broad recovery in all cities vs the Covid restricted June 2022 city wide congestion. This week, there are only 6 of top 15 cities up YoY, vs last week (week ending June 21) had 10 of top 15 cities up YoY, but then week ending June 14 only had 6 of top 15 cities up YoY. Our tweet referenced our prior tweet that noted how Baidu China city-level traffic congestion immediately picked up after the May Day Holiday and we expect to see some big pick up in next week's Baidu data. Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators June 29 weekly report.

Figure 50: China city-level road congestion for the week ended June 28



Source: BloombergNEF

Figure 51: China city-level road congestion for the week ended June 28



Source: BloombergNEF

Chinese steelmakers warns on H2 outlook

Oil: Bloomberg "*China Steelmakers Issue Stark Warning About 2ⁿ Half Outlook*"

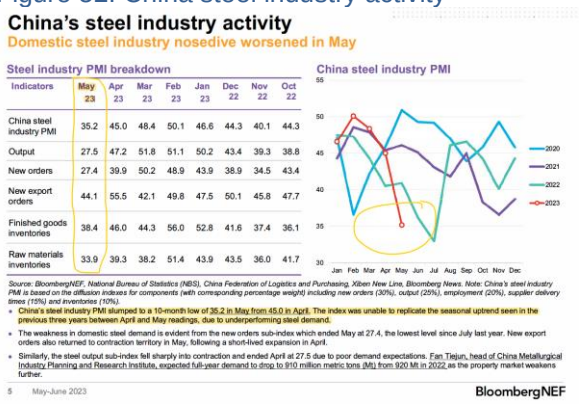
Many look at China's steel industry as a key leading indicator for China's domestic economy and the steel outlook continues to be weak. More confirmation this week that China's steel industry is far from recovered and that it will continue to be tough for the steel industry in H2/23. On Friday, we tweeted [LINK] ""*Continued negative China industry indicators. Its leading steelmakers warn on very challenging H2 as demand disappoints, profitability lags, and pressure to cut costs mounts, report @business. See 👇06/23 tweet ALL China steel indicators worse in May. #OOTT*". Our tweet linked to the Bloomberg report [LINK] "*China Steelmakers Issue Stark Warning About Second-Half Outlook China's leading steelmakers warned the industry faces a very challenging second half as demand disappoints, profitability lags, and pressure to cut costs mounts in the world's top producer. Representatives from China Baowu Steel Group Co., Ansteel Group Co., Hesteel Co. and Hunan Iron & Steel Group Co. said they are "not optimistic" about the coming six months, the China Iron & Steel Association said after the four companies attended a meeting organized by the industry body this week. "The peak inflection point for steel demand has emerged, while the problems of insufficient end-user consumption, and ongoing thin margins are particularly prominent," the CISA said in a statement, citing the quartet of companies. Mills in China — which account for more than half of global steel production and are the largest importers of iron ore — have struggled this year as the nation's recovery has stalled while a property crisis dragged on."*

China steel industry indicators crashed in May

Our above tweet linked to our June 23 tweet. Here is what we wrote in last week's (June 25, 2023) Energy Tidbits memo. "*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*

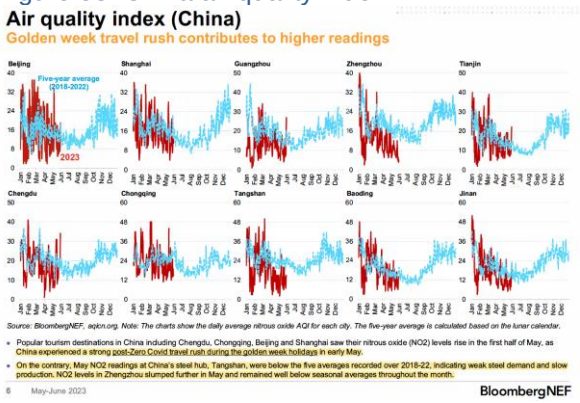
all the China steel industry activity indicators were down and way worse in the last few months. China steeling industry PMI has declined from 50.1 in Feb to 48.4 in Mar to 45.0 in Apr and now way down to 35.2 in May. China steel output indicators crashed from 51.8 in Mar to 47.2 in Apr and now way down 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 52: China steel industry activity



Source: BloombergNEF

Figure 53: China air quality index



Source: BloombergNEF

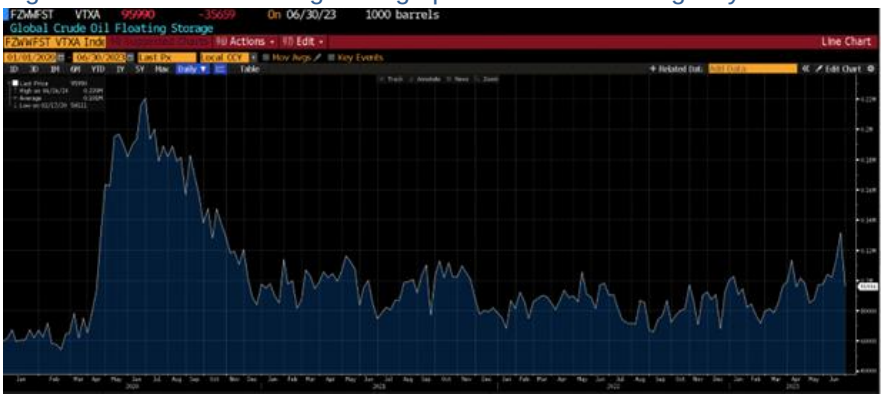
Oil: Vortexa crude oil floating storage at July 1 was 95.99 mmb, -35.63 mmb WoW

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 30 at 95.99 mmb, which is -35.63 mmb WoW vs the huge upwardly revised June 23 of 131.62 mmb. Note June 23 of 131.62 mmb was revised +11.29 mmb vs 120.33 mmb posted on Bloomberg as of 9am MT on June 24. (ii) June 23 was already high, but we believe if the markets had heard 131.62 mmb, oil would have been down on Monday. The 131.62 mmb is the highest level of floating oil storage since the pandemic year when Oct 23, 2020 was 137.58 mmb. (iii) Other than the huge upward revision to June 23, 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 24 are as follows: June 23 revised +11.29 mmb. June 16 revised +1.52 mmb. June 9 revised -1.51 mmb. June 2 revised -1.36 mmb. May 26 revised -1.11 mmb. May 19 revised -1.54 mmb. May 12 revised -0.77 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 105.85 mmb vs last week's then seven-week average of 103.68 mmb. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison (ie Saturday mornings). (vi) Note the below graph now goes back to Jan 1, 2020 and not just three years as floating storage in Apr 2020 had started to reflect the Covid impact. (vii) June 23 estimate of 95.99 mmb is -124.32 mmb vs the Covid peak on June 26, 2020 of 220.31 mmb. (viii) June 30 estimate of 95.99 mmb is +30.38 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ixi) June 30 estimated of 95.99 mmb is +5.51 mmb YoY vs July 1, 2022 of 90.48 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT July 1, 9am MT June 24, and 9am MT June 10.

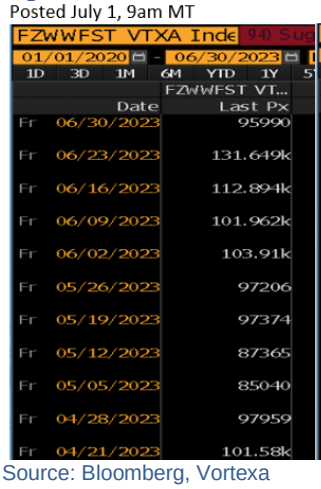
Figure 54: Vortexa Floating Storage posted on Bloomberg July 1 at 9am MT



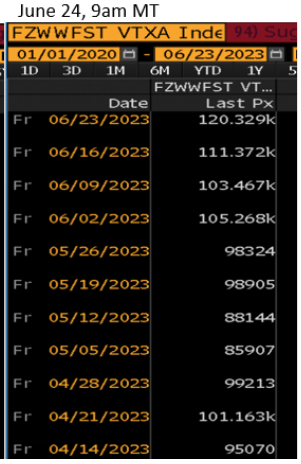
Source: Bloomberg, Vortexa

Figure 55: Vortexa Estimates Posted July 1 9am MT, Jun 24 9am MT, Jun 17 9am MT

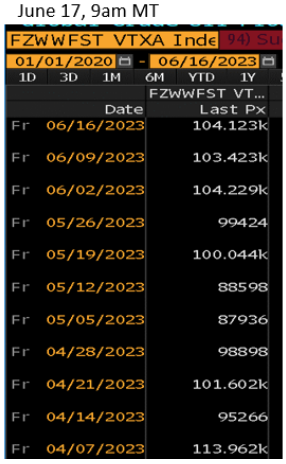
Posted July 1, 9am MT



June 24, 9am MT



June 17, 9am MT



Source: Bloomberg, Vortexa

Vortexa floating storage by region

Oil: Vortexa crude oil floating storage WoW changes by regions, Asia back down

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. (i) There were some big revisions to some of the areas for the June 23 estimates. Asia was revised up from 62.57 mmb to 70.32 mmb. West Africa was revised up from 5.76 mmb to 13.89 mmb. Other was revised down from 34.23 mmb to 26.87 mmb. (ii) The revised Asia June 23 of 70.32 mmb is the higher in Asia since May 13, 2022 of 79.10 mmb. Even before the big revision up to June 23, last week's (June 25, 2023) Energy Tidbits memo wrote "*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.*" This week's June 30, 2023 Asia estimate of 51.26 mmb is more in line with what would be expected. (iii) Vs the revised June 23 estimates, the largest WoW changes were in Asia -19.06 mmb, Middle East -8.29 mmb, and West Africa -6.21 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 23 that was posted on Bloomberg at 9am MT on June 24.

Figure 56: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	June 30/23	June 23/23	WoW	June 23/23	Apr 7/23	June 30 vs Apr 7
Asia	51.26	70.32	-19.06	62.57	60.72	-9.46
Europe	9.14	6.62	2.52	6.96	24.51	-15.37
Middle East	4.41	12.7	-8.29	9.50	4.97	-0.56
West Africa	7.68	13.89	-6.21	5.76	8.14	-0.46
US Gulf Coast	0.79	1.22	-0.43	1.31	3.09	-2.30
Other	22.71	26.87	-4.16	34.23	12.20	10.51
Global Total	95.99	131.62	-35.63	120.33	113.63	-17.64
Vortexa crude oil floating storage posted on Bloomberg 9am MT on July 1						
Source: Vortexa, Bloomberg						

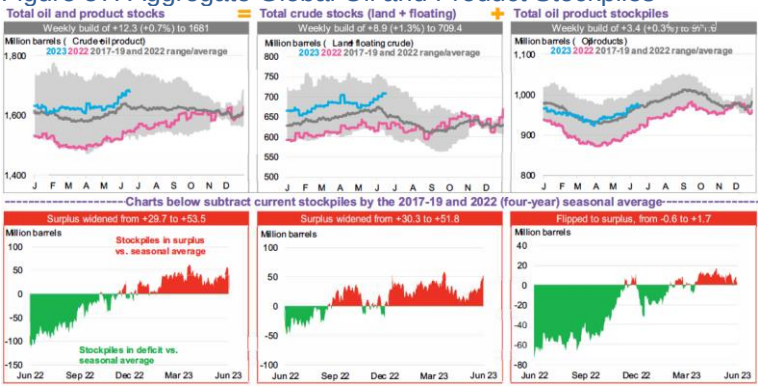
Source: Bloomberg, Vortexa

Oil: BNEF: global oil and product stocks surplus widened WoW to 53.5 mmb

Global oil and product stocks

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending June 16, which is a week earlier than the EIA US oil inventory data that is for the week ending June 23. So the BloombergNEF global oil stocks data won't include the US crude oil inventory draw of 9.6 mmb for the week ending June 23. On Monday, BloombergNEF posted its "Oil Price Indicators" weekly, which provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products surplus significantly widened from 29.7 mmb to 53.5 mmb for the week ending June 16. Land crude oil inventories increased by +0.4 mmb WoW to 597.4 mmb, narrowing the deficit to -7.2 mmb against the five-year average (2016-2019, 2022). Total crude inventories (incl. floating) increased by +8.9 mmb WoW to 709.4 mmb, widening the surplus from +30.3 mmb to +51.8 mmb. Total product stocks were up by +3.4 mmb WoW to 971.6 mmb, flipping the stockpile deficit to a surplus of +1.7 mmb against the 4-year average (2017-2019,2022) for the June 16 week. The gas, oil, and middle distillate stocks decreased by -0.5 mmb WoW to 150.9 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 +66,300 b/d WoW, while consumption by domestic passenger departures is forecast to decrease by +40,400 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 57: Aggregate Global Oil and Product Stockpiles



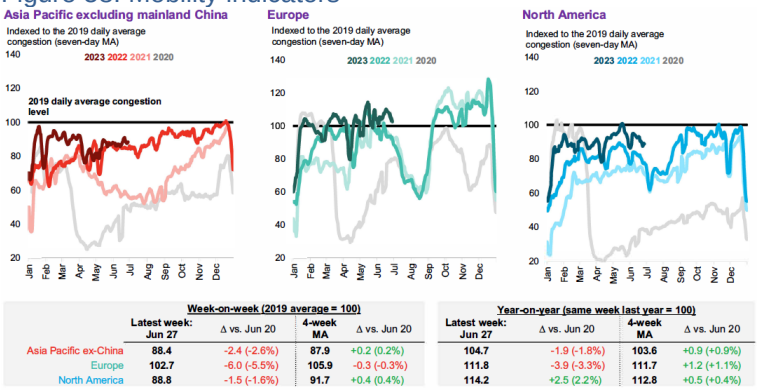
Source: BloombergNEF

Oil: TomTom mobility indicators: EU, Asia Pacific, and 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 i.e. mobility indicators like TomTom. For week ending June 20, European, Asia Pacific (ex-China), and North American traffic levels decreased by -5.5%, -2.6%, and -1.6%, respectively. Traffic levels in Europe are now +2.7% above the 2019 average and up +11.8% YoY. North America and Asia Pacific (ex-China) traffic are -11.2% and -11.6% below the 2019 average and are +14.2% and +4.7%YoY, respectively. Traffic in Europe has been steadily increasing in June, but is now beginning to drop off. NA and Asia Pacific (ex-China) are continuing to decrease. 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 58: Mobility indicators



Week-on-week (2019 average = 100)

	Latest week: Jun 27	Δ vs. Jun 20	4-week MA	Δ vs. Jun 20
Asia Pacific ex-China	88.4	-2.4 (-2.6%)	87.9	+0.2 (0.2%)
Europe	102.7	-6.0 (-5.5%)	105.9	-0.3 (-0.3%)
North America	88.8	-1.5 (-1.6%)	91.7	+0.4 (0.4%)

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

	Latest week: Jun 27	Δ vs. Jun 20	4-week MA	Δ vs. Jun 20
Asia Pacific ex-China	104.7	-1.9 (-1.8%)	103.6	+0.9 (+0.9%)
Europe	111.8	-3.9 (-3.3%)	111.7	+1.2 (+1.1%)
North America	114.2	+2.5 (2.2%)	112.8	+0.5 (+0.4%)

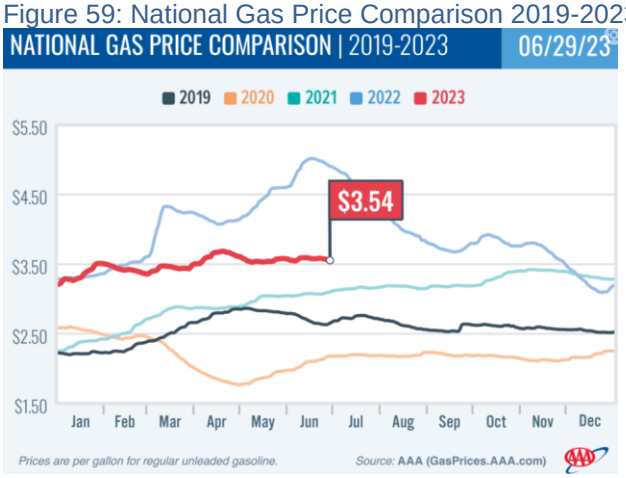
Source: BloombergNEF

Oil: AAA forecasts record breaking US travel volumes over 4th of July

Record breaking 4h of July travel

No surprise, the AAA forecast "*Record-Breaking Travel Volumes Expected July 4th Weekend. Number of Americans traveling by car and air over the holiday projected to be highest on record."* [LINK]. We say no surprise because gasoline prices are down big YoY and US consumers have been spending and flying even with the much higher air fares. AAA wrote "*AAA projects 50.7 million Americans will travel 50 miles or more from home this Independence Day weekend*, setting a new record for the holiday. Domestic travel over the long weekend will increase by 2.1 million people compared to 2022. This year's projection surpasses the previous July 4th weekend record set in 2019 of 49 million travelers."* And "*This July 4th weekend is expected to set a new record for the number of Americans traveling by car for the holiday. AAA expects 43.2 million people will drive to their destinations, an increase of 2.4% over 2022 and 4% higher than 2019. This summer, gas prices are well below what they were one year ago. The national average for a gallon of regular was $4.80 on July 4th, 2022. Gas prices have remained steady the past couple of months, with the national average hovering around $3.50 to $3.60 a gallon, thanks to the lower cost of oil. Air travel is also expected to set a new record. AAA projects 4.17 million Americans will fly to their destinations Independence Day weekend, an increase of 11.2% over 2022 and 6.6% over 2019. The previous July 4th weekend air travel record of 3.91 million travelers was set in 2019. The share of air travelers in the overall holiday forecast this year is an impressive 8.2% – the highest percentage in nearly 20 years. Other modes of transportation are also on the rise this year. AAA expects 3.36 million people will travel by bus, cruise, or train over the long weekend, an increase of 24% over last year. While more travelers are turning to these modes this year, the number is not expected to surpass 2019's total of 3.54 million."* Below is the AAA national gas price comparison as of the close on June 29. Our Supplemental Documents package includes the AAA forecast.

Figure 59: National Gas Price Comparison 2019-2023



Source: AAA

Asian Pacific air traffic in May

Oil: Asia Pacific airlines May air traffic results show weaker air cargo volume

On Wednesday, the Association of Asia Pacific Airlines released its May traffic results [LINK] which is comprised of aggregate data across a total of 40 Asia Pacific airline carriers. (i) On Thursday, we tweeted [LINK] *"Asia Pacific air data. @AAPAirlines for 40 Asian airlines. "Trade tensions are likely to weigh down on cargo markets for some time to come ... air travel demand is expected to demonstrate resilience" Air cargo continues weak, -7.0% YoY in May. International passengers +193.2% YoY BUT only 68.5% of May 2019. #OOTT"* (ii) Air travel. International passenger air travel on the 40 airlines is up big YoY, but still well below 2019 levels. The AAPA reports preliminary May travel figures "*The region's carriers registered a 193.2% year-on-year increase in the number of international passengers carried to 21.4 million in May. As a percentage of the corresponding month in 2019, demand averaged 68.5%"* (iii) Air cargo is weaker, which is an indicator for the global economy. The AAPA wrote "*subdued demand conditions, driven by weak business confidence levels adversely impacted air cargo markets. In freight tonne kilometres (FTK) terms, air cargo demand fell by 7.0% year-on-year in May. Offered capacity rose by 6.0%, leading to an 8.5 percentage point decline in the average international freight load factor to 60.1% for the month."* (iv) AAPA's Director General, Mr. Subhas Menon, commented *"Trade tensions are likely to weigh down on cargo markets for some time to come whereas air travel demand is expected to demonstrate resilience in spite of the headwinds in the external environment; "Overall, the outlook for the airlines remains positive, with the recent moderation in oil prices providing some relief to operating expenditure even though the industry will continue to face inflationary cost pressures".*

Figure 60: APAA Preliminary International Air Traffic Data

International	May-23	May-22	% Change
Passengers (Thousand)	21,387	7,294	+ 193.2%
RPK (Million)	78,326	29,843	+ 162.5%
ASK (Million)	100,522	41,429	+ 142.6%
Passenger Load Factor	77.9%	72.0%	+ 5.9 pp
FTK (Million)	5,175	5,567	- 7.0%
FATK (Million)	8,604	8,116	+ 6.0%
Freight Load Factor	60.1%	68.6%	- 8.5 pp

Source: APAA

Oil & Natural Gas: TIPRO Texas oil natural and gas jobs up MoM in May

TIPRO May jobs update

It's been a good run for increasing jobs in the Texas oil and gas sector, but we have to wonder there is a pause coming, at least temporarily, with low HH prices and WTI not maintaining >$70. But for now, employment continues to increase in the Texas oil and gas sector. The Texas Independent Producers and Royalty Owners Association (TIPRO) updated their employment figures for the Texas upstream sector for May [LINK]. May saw a significant increase of ~6,900 jobs MoM, resulting in employment being up +12.3% YoY to 206,000 active jobs across direct oil and gas extraction and services. TIPRO wrote "*direct Texas upstream employment for May 2023 totaled 206,000, an increase of 6,900 jobs from adjusted April employment numbers. Texas upstream employment in May 2023 represented the addition of 22,700 positions compared to May 2022, including an increase of 2,700 jobs in oil and natural gas extraction and 20,000 jobs in the services sector; TIPRO's new employment data yet again indicated strong job postings for the Texas oil and natural gas industry during the month of May. According to the association, there were 13,779 active unique jobs postings for the Texas oil and natural gas industry in May, including 4,366 new job postings added during the month by companies. In comparison, the state of California had 5,100 unique job postings last month, followed by Louisiana (2,390), Oklahoma (2,037) and Pennsylvania (1,649). TIPRO reported a total of 61,442 unique job postings nationwide last month within the oil and natural gas sector; TIPRO reports that oil and natural gas output is poised to see further growth this summer, though monthly production gains are narrowing from increases recorded earlier this year. New data from the U.S. Energy Information Administration (EIA) projects that U.S. crude oil production in July will rise to 9.375 million barrels per day (b/d), up 8,000 b/d from June. In the Permian Basin, the most nation's most prolific shale oil basin, regional output will increase by 1,000 b/d to hit 5.76 million b/d next month, forecasts EIA experts. Domestic natural gas production in the United States also will climb and reach 97.3 billion cubic feet per day (bcf/d) in July, according to the latest EIA estimates. This in part will be driven by production gains from the Permian, where natural gas production is expected to grow to 22.878 bcf/d and in the Haynesville, where natural gas production will total 16.6 bcf/d"* Our Supplemental Documents package includes the TIPRO release.

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

Wildfires up in Alberta and BC

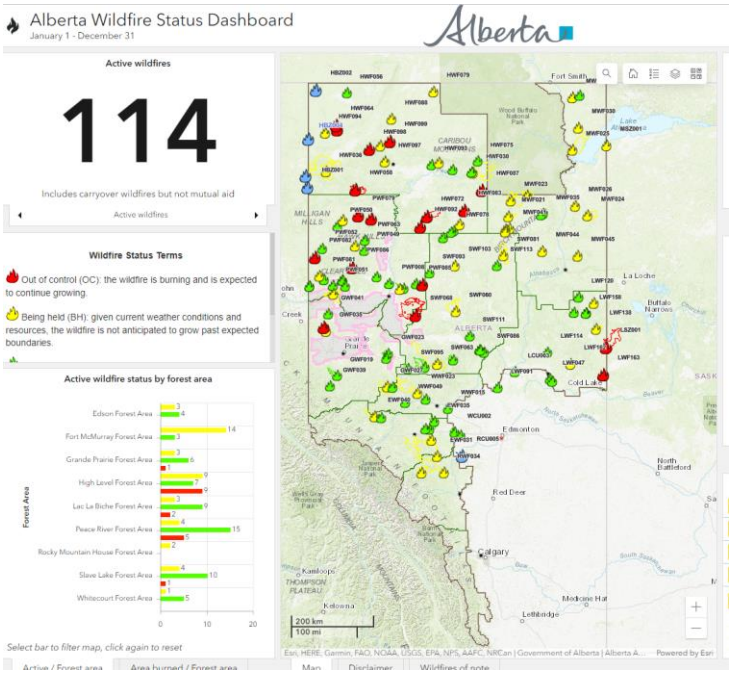
Bad week for wildfires with increasing wildfires in both Alberta and BC this week. Total wildfires in Alberta increased from 91 to 114 WoW including Out of Control wildfires

increasing from 14 to 17 WoW as of 7pm MT July 1. Total wildfires in BC increased from 90 to 104 WoW including Out of Control wildfires from 46 to 51 WoW as of 7pm MT July 1.

Links to Alberta and BC wildfire status maps

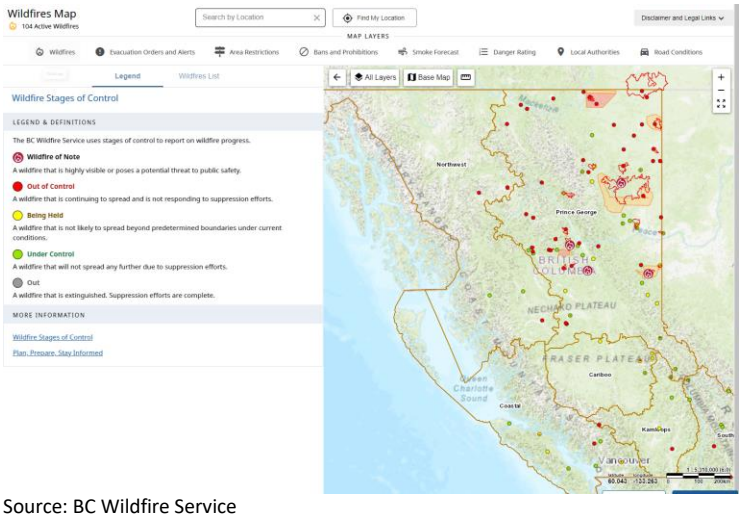
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [LINK] and the BC Active Wildfires interactive map [LINK]. Please note these links have changed over the past few years. Both maps are interactive and open up for the information on any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

Figure 61: Alberta wildfire map as of 7pm MT on July 1



Source: Alberta Wildfire Status Dashboard

Figure 62: BC wildfire map as of 7pm MT on July 1



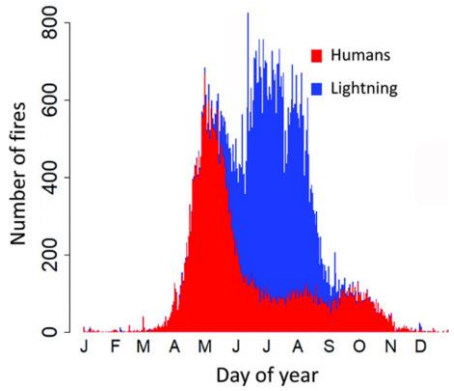
Source: BC Wildfire Service

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

Wildfire peak is normally July Aug

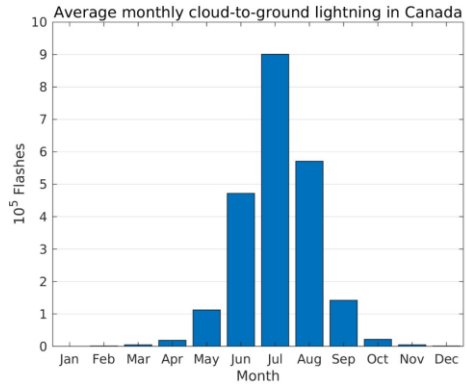
We don't track wildfires data outside Alberta/BC as our focus is on the oil and gas sector but, the big Canada story this year has been wildfires in eastern Canada. It's a reminder that wildfires are not just a western Canada. It's always better to see less wildfires. But we remind that wildfire season 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 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 63: Canada Wildfires Distribution Over Year



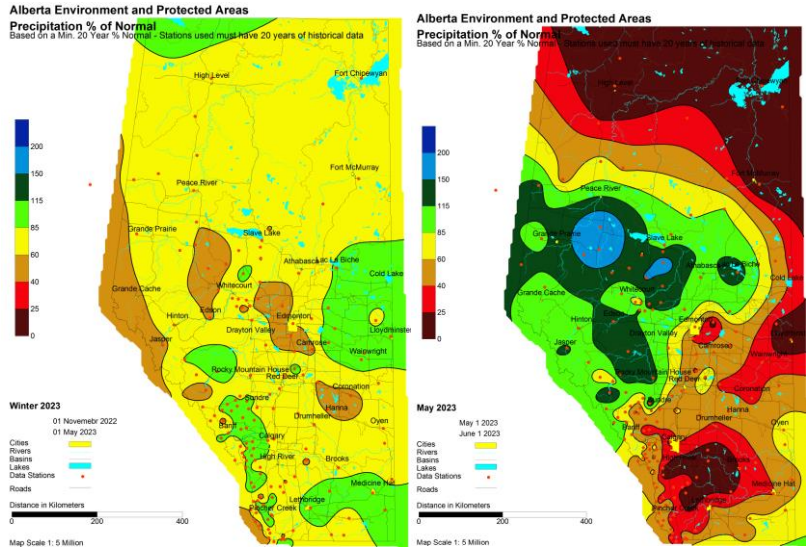
Source: Wildfire Today

Figure 64: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 65: Alberta Precipitation % of Normal for Nov 1-Apr 30, and for Mayl



Source: Alberta Environment

Oil & Natural Gas: El Nino tends to increase hurricane activity off west Mexico

El Nino and west Mexico

Nothing imminent on the Atlantic side for potential tropical storms and hurricanes risk to the Gulf of Mexico and east coast of the US. We don't normally report on tropical storms and hurricanes on the Pacific side because there isn't any major oil, natural gas and LNG infrastructure. That will change in a few years when Mexico starts up LNG export facilities. But one Pacific hurricane items caught our attention and reminded of the increasing risk to hurricanes in El Nino years. On Friday, we tweeted [LINK] "*Two hurricanes at same time near #Cabo in June. Not common to see two at same time in peak ASO, let alone at start of hurricane season. Strong may tend to lower hurricane activity in Atlantic Basin, but tends to increase hurricane activity on west coast of Mexico."* Yesterday, we corrected the typo that said "strong" instead of "El Nino" tends to lower hurricane activity in Atlantic Basin, but ends to increase hurricane activity on west coast of Mexico. We have been travelling regularly to Los Cabos for the past 19 years and don't ever recall seeing two hurricanes close to Cabo in June.

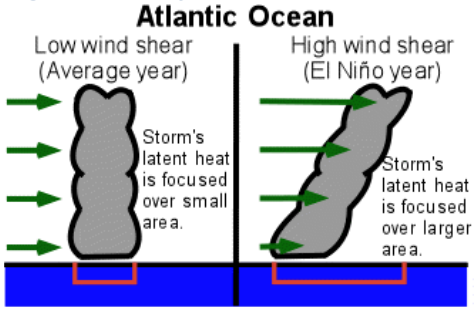
Figure 66: Eastern Pacific storm activity June 30

Source: NOAA

El Nino years tend to be low Atlantic hurricane years

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

Figure 67: Early-March NOAA El Nino/La Nina Outlook



Source: University of Illinois

Energy Transition: No media coverage on UAE COP28 President designate speech

COP28 President designate speech

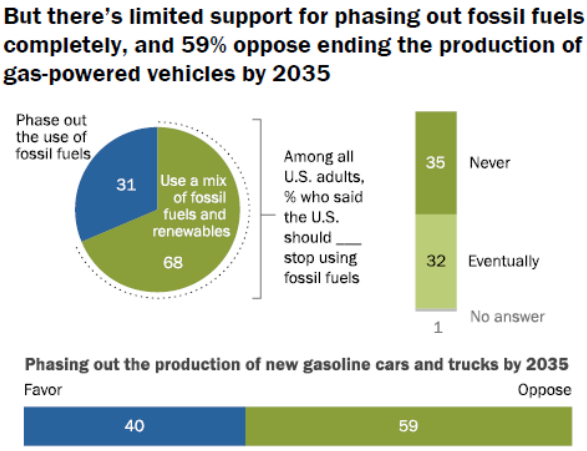
Maybe there was some but very little western media coverage of a major speech by COP28 President Designate Dr. Sultan Al Jaber's speech at Energy Asia on Tuesday. The lack of western coverage is why, last night, we tweeted [LINK] *"ICYMI. No media coverage on #COP28 Pres Designate speech. West didn't want to hear: "discuss sustainable energy pathways" "systematically decarbonize our current energy system" "ensuring energy always remains accessible, secure & affordable" "renewable energy alone will not be sufficient" "must ensure they [hydrocarbons] are the least carbon intensive" "can turn the climate challenge into a unique opportunity for building sustainable economic growth" See 👇SAF Group transcript. #Oil#NatGas#LNG will be needed for way longer. #OOTT."* Our tweet included the transcript we made of most of his speech but the messages were clear, but not what the climate side wanted to hear ie. Why there was little if any coverage. Al Jaber talks about decarbonizing but not getting rid of our current energy system [read fossil fuels]. Making hydrocarbons the least carbon intensive, not getting rid of them. Ensuring the energy system is accessible, secure and affordable should be an acceptable message, but the western leaders know that means can't get rid of hydrocarbons. Needless to say, Al Jaber's message won't deter western leaders push to Net Zero, but hopefully it at least helps make a smoother energy transition than what appears to be unfolding. Our Supplemental Documents package includes the transcript we made of Al Jaber's speech.

Energy Transition: Americans want to keep fossil fuels in their climate change push

Americans on climate change

On Thursday, we tweeted [LINK] "*Will #Biden listen? Yes, Americans in favor of climate change action, prioritizing #Wind, #Solar. BUT Americans don't want to phase out ICE vehicles & fossil fuels, see #EnergyTransition likely leading to unexpected problems, risk to grid reliability & higher costs. Good @pewresearch survey to flip thru. #OOTT #NatGas."* (i) On Wednesday, Pew Research posted its 80+ page survey "*Majorities of Americans Prioritize Renewable Energy, Back Steps to Address Climate Change*". [LINK]. When you look thru the 80+ pages (it's an easy read with lots of graphics) and put the one-sided Democrat or Republican views and look at the total views, we think the takeaway for anyone is that Americans do favor taking climate change action like prioritizing wind and solar, BUT don't want to go all-in on it as they worry about energy security and higher costs ie. They don't want to phase out ICE vehicles or fossil fuels. (ii) A good example is most favor working to reduce climate change and develop wind/solar, BUT most don't support phasing out fossil fuels or ICE vehicles. Note the support for phasing out ICE vehicles has dropped and is 7i% lower than it was two years ago. (ii) 2/3 of Americans believe it should be a mix of fossil fuels and renewables. (iii) 2/3 of Americans see unexpected problems from an energy transition. (iv) More Americans think an energy transition would have a more negative than positive impact on consumer prices. (v) There are many other items in the survey. Our Supplemental Documents package includes excerpts from the survey.

Figure 68: Americans on Phasing out fossil fuels or ICE vehicles



Source: Pew Research

Energy Transition: Are Volkswagen disappointing EV sales a pause or shift down?

Volkswagen's disappointing EV sales

No one can dispute that EV sales have been very strong and continue grow at fast rates. But there are signs that not everyone is selling EVs as per their plans especially those that don't keep cutting EV prices like Tesla. Volkswagen is a good example especially one that has been aggressive in its shift to EVs. So the question is if their disappointing EV sales are just a pause (ie. A timing issue) or is it a shift down in their EV sales expectations. The reason why we wonder if it's a shift down is the Volkwagen comment that one of the reasons for the disappointing sales is "*reduced subsidies*". Price is no question an issue and the concern will be how long and how high can subsidies last if they are a key to hitting sales expectations. Or can Volkswagen follow Tesla's lead and aggressively cut prices to hit their sales figures. If not, it would seem to point to a shift down in EV sales expectations. On Friday, we tweeted [LINK] "*WOW! Is this a pause or a shift down in their #EV sales curve? @MustReadMustoe reports "'Strong customer reluctance' forces Volkswagen to slash electric vehicle production." "Volkswagen UK said: "The Volkswagen brand, like other car manufacturers, is currently seeing softening demand for electric cars. Reasons for this include: reduced subsidies, higher inflation and recent longer delivery times due to the shortage of parts." #OOTT [LINK]."* We referenced a Telegraph Friday report *"'Strong customer reluctance' forces Volkswagen to slash electric vehicle production"*, which included some direct comments from Volkswagen. Telegraph wrote "*Volkswagen is to cut electric car production at one of its biggest factories after "strong customer reluctance" led to far lower sales than expected. The business is pausing work on electric models for six weeks at its plant in Emden, northwest Germany, and will lay off 300 of the 1,500 workers involved in making them. The company blamed lower subsidies for buyers of the cars across Europe and higher inflation for a drop in consumer interest. Demand for electric vehicles is running 30pc below the company's forecasts. Manfred Wullf, head of the Emden plant, said: "We are experiencing strong customer reluctance in the electric vehicle sector.""* And "*Volkswagen UK said: "The Volkswagen brand, like other car manufacturers, is currently seeing softening demand for electric cars. Reasons for this include: reduced subsidies, higher inflation and*

recent longer delivery times due to the shortage of parts.". Our Supplemental Documents package includes the Telegraph report.

Energy Transition: Renewable generation growth covered 84% of growth in electricity

Renewables growth in generation

Just like no one can deny EV sales growth continues to be at very high rates, solar and wind generation capacity continues at strong rates. But it's also hard to deny that renewables have the realistic potential to replace fossil fuels generation in the coming decades. Rather renewables generation capacity additions are growing at record rates, but growth in actual renewable generation isn't even covering the growth in global electrical generation. If record renewable capacity additions don't result in renewable generation covering growth in electricity generation, it still leaves the huge base of electricity generation that needs to be covered by generation other than wind and solar. This year, the Energy Institute took over the role over authorship of BP's world Statistical Review of World Energy. On Tuesday, we tweeted [LINK] *"Is 2020s energy supply crunch inevitable? Record renewables CAPACITY growth, but renewables only covered 83.8% of growth in electricity generation in 2022. #IMF delays in achieving Paris goals "increase the risk of a disorderly transition & serious disruptions to energy supply.." Thx @EnergyInstitute @GitaGopinath #OOTT #NatGas."* Our tweet included excerpts from the Energy Institute tables that show the increase in renewable generation in 2022 only covered 83.8% of the growth in electricity generation in 2022. And this was despite the Energy Institute highlighting there was record growth in adding renewable capacity. Our Supplemental Documents package includes the renewables excerpts from the Energy Institute report.

Energy Transition: IMF raises risk of disorderly transition/disruptions to energy supply

IMF warning on energy transition

Our Tuesday tweet, noted in the above item, also referred to IMF First Deputy Managing Director Gita Gopinath's speech on Monday. [LINK]. Gopinath didn't say that the energy transition wouldn't work or wasn't working according to plan and timelines or that fossil fuels need to be kept for longer. Rather she warned about the negatives from delays in achieving Paris goals. She calls it "*delays in achieving Paris Agreement goals*", we call it the energy transition isn't work to aspirations and timelines. Regardless, the impact in not hitting the energy transition goals would be a big negative to the world. Gopinath said "*The increasing physical and transition risks from climate change are also likely to amplify short-term fluctuations in inflation and output.[6] Delays in achieving Paris Agreement goals increase the risk of a disorderly transition and serious disruptions to energy supply, which could boost inflation sharply and create more difficult tradeoffs for central banks.[7]."* Our Supplemental Documents package includes the Gopinath's speech.

Energy Transition: Aramco CEO's reality check on energy transition

Aramco CEO on energy transition

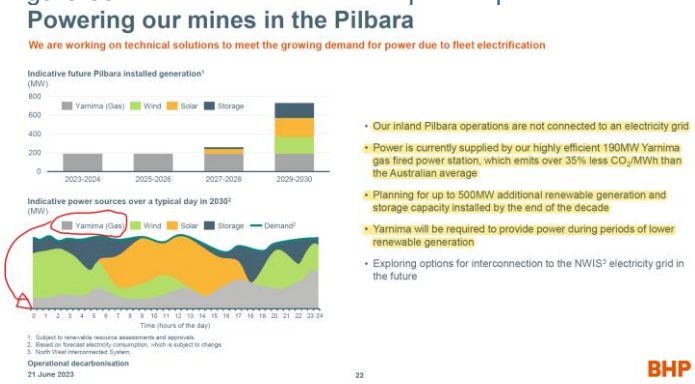
Earlier in the memo, we highlighted Saudi Aramco CEO Nasser's speech and how the headlines on his speech were that he sees oil demand growth of more than 2 mmb/d in 2023 and green hydrogen costs $200-$400 boe equivalent. But he also had a big reminder or warning on the energy transition. On Monday, we tweeted [LINK] "*Reality check on #EnergyTransition. Headlines #Aramco CEO Nasser speech: #Oil Demand growth >2 mmbd in 23. #GreenHydrogen costs $200-400 per barrel equivalent. Overlooked. IF more pragmatic, orderly & inclusive transition, "that should encourage different forms of energy to run in parallel while scaling up alternatives to DO MORE". Do more = existing energy continues indefinitely and renewables only reduce a portion of existing + expected growth in*

fossil fuels demand. Good example is 👇06/20/23 BHP Net Zero adds 500MW #Solar/#Wind/#Battery capacity ON TOP of existing 190MW #NatGas capacity. #Oil #NatGas will be needed for way longer. #OOTT." Nasser comments are a reminder on the reality of the energy transition. It was naively assumed that adding renewables or adding EVs meant they would effectively immediately replace fossil fuels or ICE vehicles in the energy supply/consumption mix. That just isn't reality. Aramco CEO says "*The one silver lining is a growing realization that to address energy security and affordability as well as environmental sustainability, global transition policies must be more pragmatic, orderly, and inclusive. That should encourage different forms of energy to run in parallel while scaling up alternatives to do more. With intensified global efforts, led by our industry, to further reduce the carbon footprint of conventional energy*." This is the reality that adding renewable energy doesn't replace existing energy supply in its entirety. It only covers a fraction. Rather what we are seeing is that, as Nasser says, have to run energy in parallel while scaling up alternatives to do more. Note he says "*more"*, not replace. And he doesn't get into the warning that you have to add multiples more capacity of renewable (due to intermittency, even with battery storage) to replace a portion (but not far from all) of the exiting energy supply. Our tweet referenced this is what BHP showed in its Net Zero plan to power its mines.

Solar/wind/battery can't really fully replace natural gas for BHP mining

HP gave an excellent example on how adding 500MW of solar, wind and battery can't fully replace 190MW of natural gas in powering its mines in the Pilbara. Here is what we wrote in our June 25, 2023 Energy Tidbits memo. "*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 69: BHP's decarbonisation plan to power their mines in the Pilbara



Source: BHP

Hail damages solar farm

Energy Transition: Nebraska solar farm hammered by baseball-sized hail

As of our 7am MT news cut off, we have not seen any status update from the Nebraska Public Power District on its 5.2MW Scottsbluff (Nebraska) solar farm ie. How long will it be shut down following the Tuesday hailstorm. On Thursday, we tweeted [LINK] "*No update from @NPPDnews on 5.2MW Scottsbluff (Nebraska) solar farm hammered by reported baseball sized hail. To be fair, baseball sized hail would destroy a lot more than solar panels. @fema hail risk map, Scottsbluff is on west side of Neb. #Coal likely to fill in. #OOTT."* The Cowboy State Daily reported [LINK] "*Baseball-sized hail took out a solar farm in Scottsbluff, Nebraska, on Friday. The hail shattered most of the panels on the 5.2-megawatt solar project, sparing an odd panel like missing teeth in a white smile. ……. Kevin Spencer, Scottsbluff city manager, told Cowboy State Daily the Nebraska Public Power District, which owns the solar farm, is still assessing the damage, but it's going to need some repairs. "Just by looking at it, it looks destroyed to me," Spencer said. Spencer said there's more to a solar farm than just the panels, and so some of the equipment at the farm might have survived the storm. He said he was previously told the panels were hail proof, but that might have meant hail up to a certain size."* Our tweet included the below pictures that showed Scottsbluff was hammered hard by what was reported as baseball sized hail. We don't think there is any takeaway for solar farms in general from the Scottsbluff event because we don't think any solar panels are uilt baseball sized hail. Although we wonder what happens with more common ping pong ball sized hail?

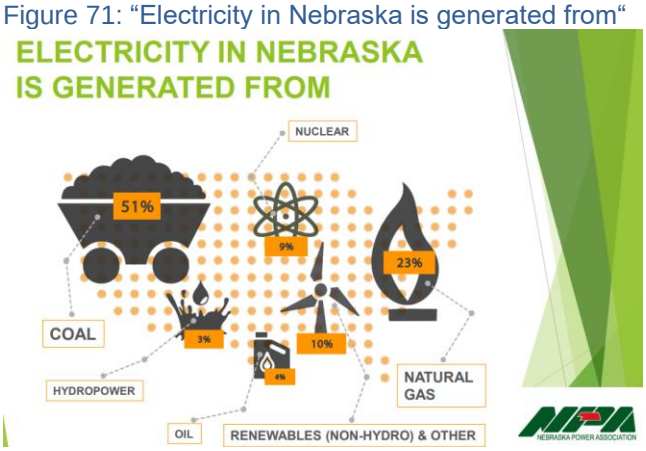
Figure 70: NPPD Scottsbluff solar farm hail damage

Source: Matt Larsen

Expect coal is the likely fill in for Scottsbluff solar

Solar is only a small part of the Nebraska energy mix, But our tweet on Scottsbluff noted that coal is the likely fill fuel for any solar generation downtime at Scottsbluff. The primary fuel for Nebraska electricity generation is coal at 51%, followed by natural gas at 23%. Below is the Nebraska Power Association "Electricity in Nebraska is generated from ". [LINK]

Figure 71: "Electricity in Nebraska is generated from"



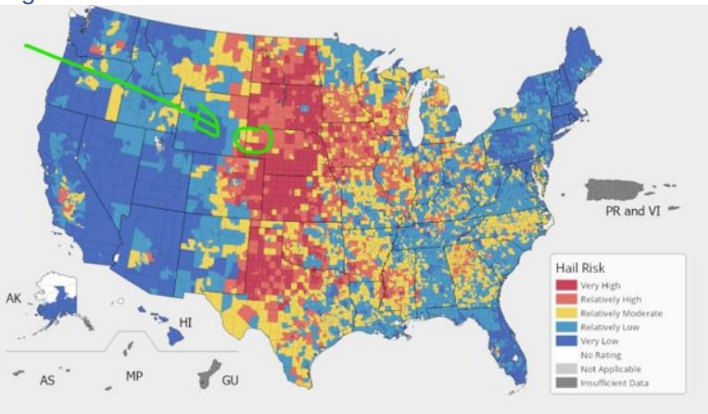
Source: Nebraska Power Association

Nebraska is mostly a relatively high hail risk corridor

Our Scottsbluff tweet also included FEMA's National Risk Index for hail inlcuding FEMA's hail risk map of the US that shows the "very high" and "relatively high" risk

areas for hail are in a corridor that covers most of including Nebraska. Scottsbluff is on the very side of Nebraska so is in a lower Hail risk part of Nebraska. FEMA notes that its risk levels are relative risk levels for hail when compared to the rest of the US. to the rest of the US. Below is the FEMA map. [LINK].

Figure 72: FEMA National Risk Index – Hail



Source: FEMA

Capital Markets – 1st net outflow of foreigner interest in Japan stocks since Buffett

Foreigner outflow in Japanese stocks

The Nikkei was +1.2% this week, but it was interesting to see Bloomberg report that it was the first net outflow of foreigner interest in Japanese stocks in 13 weeks ie. The first net outflow since Warren Buffett's big CNBC interview from Japan on April 12. Prior to this week, we have been highlighting how Buffett's positive comments on Japan on April 12 was the catalyst for foreigner interest in Japanese stocks and the outperformance in Japanese stock markets. The Nikkei is +19% since April 11.

Figure 73: Foreigner interest in Japanese stocks

Source: Bloomberg

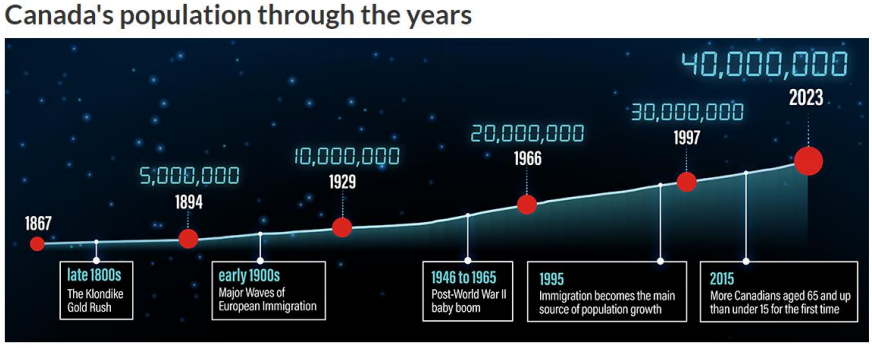
Demographics: Canada population hits 40 million mark

Canada now 40 million people

Immigration post-Covid continues to drive big population growth in Canada. Statistics Canada reported [LINK] "*As of June 16, 2023, there are now 40 million Canadians*!" And "*Canada's population is currently growing at a record-setting pace. In 2022, the number of Canadians rose by 1,050,110. This marks the first time in Canadian history that our*

population grew by over 1 million people in a single year, and the highest annual population growth rate (+2.7%) on record since 1957 (+3.3%).”

Figure 74: Canada’s population through the years



Source: Statistics Canada

US army recruiting

Demographics: US army recruiting shortage continues, shrinkflation to hit troops

Anyone who lived in the US in the early 70s probably knew many in the US military, or just served in the US military or, if you were in college, knew ROTC students. It seemed that many weren’t drafted but had enlisted. The draft ended in Jan 1973 as the Vietnam War was coming to an end. But the parents of these young military men were of age to have mostly served in WWII, whose parents had also mostly served in WWI. But, the US military was strong and had plenty of men who were serving. That isn’t the case today and there is an increasing shortage of recruits into the US military. On Friday, WSJ report “*The Military Recruiting Crisis: Even Veterans Don’t Want Their Families to Join*” [LINK]. The WSJ wrote *“The U.S. Army in 2022 had its toughest recruiting year since the advent of the all-volunteer military in 1973 and missed its goal by 25%. This year, it expects to end up about 15,000 short of its target of 65,000 recruits. The Navy expects to fall short by as many as 10,000 of its goal of nearly 38,000 recruits this year, and the Air Force has said it is anticipating coming in at 3,000 below its goal of nearly 27,000. The Marine Corps met its target last year of sending 33,000 to boot camp, and expects to meet its goals this year, but its leaders described recruitment as challenging. Only 9% of young people ages 16-21 said last year they would consider military service, down from 13% before the pandemic, according to Pentagon data.”* The WSJ also wrote “*The lowest-ranking troops make less than $2,000 a month, although pay is bolstered by benefits including healthcare, food and housing, leaving them few out-of-pocket expenses.’* We put “shrinkflation”: in the header as that is the first thought that came to mind when we read the WSJ “*Last year, the Army’s top officer, Gen. James McConville, told reporters the service was prepared to eliminate redundancies in the Army’s key fighting units, which are called brigade combat teams. The Army would maintain the number of the units by reducing the personnel in each of them, a restructuring that was prompted by the recruiting crunch, according to one defense official.*’ Our Supplemental Documents package includes the WSJ report.

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.

Shout out to Terry Dunfield, interim TFC coach

Toronto FC have had a brutal year so there was no surprise that they fired their head coach, Bob Bradley. The interim replacement and also on the shortlist for permanent replacement is 41-yr old Terry Dunfield. I have to state my bias as i have been a fan of Terry given his career as a former Canadian international midfielder who played for TFC and his hometown Vancouver Whitecaps before retiring. And prior to playing in Canada, started his career in the UK including playing with one of the storied English Premier League teams – Manchester City. I always find it fascinating to hear how someone went from Vancouver to the Manchester City youth academy and then to the big club. Sports is like anything, having real experience gives someone an edge and have to believe the experience of being on a big club gives that extra to Terry, hopefully as TFC looks to a permanent head coach. I have had the opportunity to meet Terry as he happens to be brother to our SAF Group founder and CEO, Ryan Dunfield. Unfortunately, Terry lost his 1st game yesterday to Real Salt Lake 0-1 but TFC missed an open net that would have given them the lead and changed the tenor of the game.

Cdn PGA stars, Taylor Pendrith & Adam Hadwin, in the hunt for a win today

Its going to be a big golf watching for Cdn golf fans today with the final round of the 2023 Rocket Mortgage Classic in Detroit. This is a very crowded leaderboard with 10 golfers within 4 shots of the lead. It will be another day of going low to win. Rickie Foiwler is in the lead at -20. But our two Cdn PGA stars, Taylor Pendrith and Adam Hadwin are right on his heels and will be in the final group with him. Adam Hadwin is 2nd at -19, and Taylor Hendrith is 3rd at -18. There are two at -17 including Monday qualifier Peter Kuest. And there are five golfers at -16. Pendrith will be in the final group for the 2nd year in a row. Last year he finished T2 at the 2022 Rocket Mortgage

Classic. Last year, he was tied with Tony Finau going into the final round but finished T2 five strokes behind as he shot a par 72 in the final round vs Finau's 67.

Big income tax saving for Raptors Fred VanVleet free agent move to Houston

The biggest contract so far during NBA Free Agency has been the three-year $130 million deal that Toronto Raptors point guard Fred VanVleet got by signing with the Houston Rockets. VanVleet gets a huge income tax saving by moving from Ontario to Texas. The combined federal + provincial marginal income tax rate in Ontario is 53.53%. Texas does not have a state income tax so the PWC estimated top marginal income tax rate for Americans earning over $539,901is 37% so VanVleet gets a 16.53% income tax saving, which should be $7.13 million per year or $21.39 million over the three-year contract.

New Toronto Maple Leaf Ryan Reaves on the pressure playing in Toronto

It may have been the lowest contract per year in NHL free agency, but new Toronto Maple Leafs winger, Ryan Reaves, had the best line of any free agents. Reaves has been in the NHL since 2010-2011 season, played 828 games with 59 goals. He doesn't have big penalty minutes but is well known as being one of the tough guys in the league. Reaves is from Winnipeg but this is his first time playing for a Cdn NHL Team. TSN asks about diving into the middle of the pressure in playing in Canada and in particular by signing with the Leafs. Reaves replies "*Yeah, you know I will just beat somebody up and all the pressure is over"*. New Toronto GM Brad Treliving said "*There is a presence to Ryan. It's not about fighting and all the rest of it. But I just felt that both on the ice and in our room and around our team, we need a little bit more noise and Ryan brings that*".

July 1 is Bobby Bonilla Day

Former baseball star, Bobby Bonilla, last played for the New York Mets in 1999 and retired after playing for the St. Louis Cardinals in 2001 but July 1 is known in MLB as Bobby Bonilla Day. It's because every July 1 thru 2035, Bonilla receives a check for $1.193 million as a result of the Mets negotiated buyout of the remaining $5.9 million on his contract in 2000. The Fed Funds rate reached 6.5% in May 2000. But the Mets negotiated buy-out was to pay Bonilla $1.193 million every July 1 starting on July 1, 2011 thru July 1, 2035. The buyout also included a negotiated 8% interest. One aside for the New York Mets is that the New York Mets ownership was reported invested in a Bernie Madoff that was promising double digit returns.