Energy Tidbits

July 16, 2023

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No Peak Oil Demand, IEA Increases 2024 Oil Demand Forecast to 103.2 mmb/d After Reducing 2023 Demand by 0.2 mmb/d

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. Headlines were IEA reduced 2023 oil demand forecast, but more than offset that by higher YoY growth for 2024 to end up with a higher oil demand forecast in 2024. (Click here)

2. Protests that shut in >350,000 b/d of Libya production on Thurs ended and production restored last night. (Click here)

3. North Dakota has record post-Covid frack crews so JJA production should be up, but needs to crank up drilling rigs to build up DUCs to maintain growth in early 2024. (Click here)

4. BloombergNEF sees 39% of needed $196 Trillion to get to Net Zero are uneconomic and need added government incentives. (Click here)

5. Over half of US offshore wind are facing delays as developers want to renegotiate to get acceptable returns. (Click here)

6. Pease follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.

7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

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Natural Gas: +49 bcf build in US gas storage; now 569 bcf YoY surplus

US gas storage 569 bcf YoY surplus

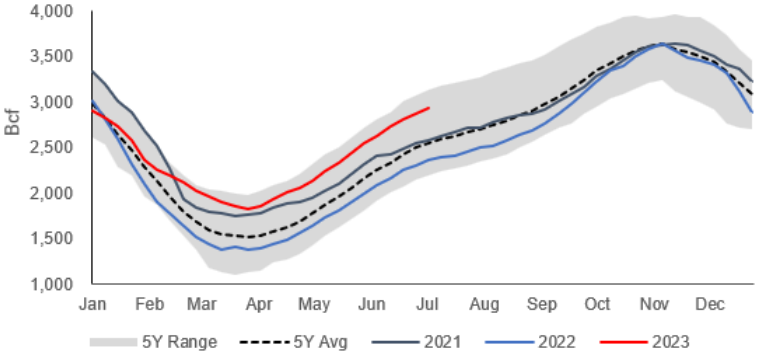
For the week of July 7, the EIA reported a +49 bcf build (just under the expectations of an +50 bcf build), and a decrease compared to the +58 bcf build reported for the week of July 8 last year. This is down from last week's build of +76 bcf, and a slight increase vs the 5-year average build of +43 bcf. Total storage is now 2.930 tcf, representing a surplus of +569 bcf YoY compared to a surplus of +579 bcf last week. Total storage is +364 bcf above the 5-year average, down from the +366 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 (07/07/22)		5-year average (2018-22)	
Region	07/07/23	06/30/23	net change	implied flow	Bcf	% change	Bcf	% change
East	653	643	10	10	498	31.1	547	19.4
Midwest	724	705	19	19	583	24.2	619	17.0
Mountain	180	173	7	7	142	26.8	158	13.9
Pacific	225	216	9	9	248	-9.3	266	-15.4
South Central	1,147	1,144 R	3	3	890	28.9	976	17.5
Salt	323	329 R	-6	-6	223	44.8	272	18.8
Nonsalt	824	816	8	8	667	23.5	704	17.0
Total	2,930	2,881 R	49	49	2,361	24.1	2,566	14.2

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



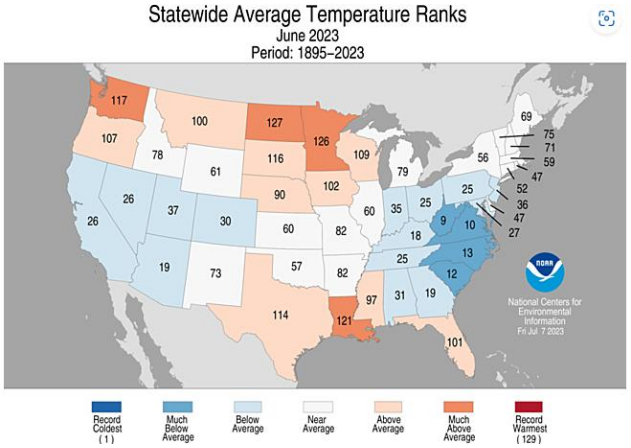
Source: EIA, SAF

Natural Gas: June was normal temperatures but cool in populous east coast

NOAA June climate recap

On Tuesday, NOAA posted its National Climate Recap for June [LINK]. June is typically the first significant month for summer temperature driven natural gas demand. Overall for the US it was the 58th warmest of the last 129 years so fairly normal temperatures. However, it wasn't as significant as it might have been if it had been consistent tempertures across the US including the populous east coast. But it was extremely hot in the norther Plains, Main, Texas, Louisiana and Florida. But very cold, by June standards, for the poplulous east coast and Great Lakes states. It was perfect leave your windows open weather and not big A/C demand. So weather in June wasn't a big driver to residential/commerical weather driven demand. Below is NOAA's by state ranking for June temperatures.

Figure 3: NOAA Statewide Average Temperature Ranks – June 2023

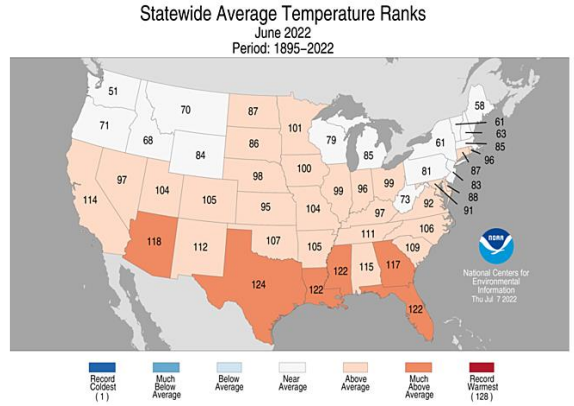


Source: NOAA

June 2022 was hot pretty well everywhere in the US

It's interesting to compare to June 2022 that was hot and hot pretty well everywhere. June 2022 was the 15th hottest June in the last 128 years. And it was extremely hot across the south of all of the US, and into most of the Midwest. And in the poplulouis NE, it was still within the top 40 hottest Junes.

Figure 4: June 2022 Statewide Average Temperature Ranks



Source: NOAA

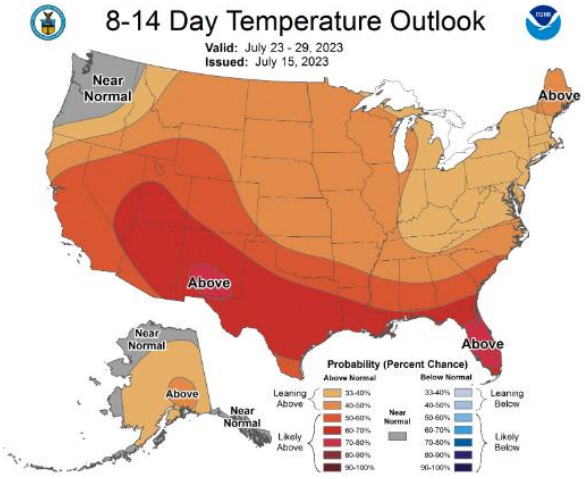
Natural Gas: NOAA 8-14 day temperature outlook stays positive to gas price tone

NOAA 8-14 day outlook

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. And for the most part, the temperatures have been hot. NOAA posts daily, around 1pm MT, an updated 6-10 day and 8-14 day temperature probability outlook. Yesterday, we tweeted [LINK] "*Continued temperature support for US #NatGas. Current @weatherchannel temp - really hot in south, hot in NE. Today's @NOAA 6-10 & 8-*

14 day temperature outlook covering July 21-29: heat wave continues in souith, and moving to above normal temp .in rest of US. #OOTT." Our tweet included the Weather Channel live temperature map as of 1pm MT and it just showed it was really hot in the south and hot most other places. Yesterday's NOAA 6-10 day [LINK] and 8-14 day outlook [LINK] is valid for July 21-29 heat wave to continue across the south and heat moving to cover the rest of the US.

Figure 5: NOAA 8-14 day temperature outlook July 23-29



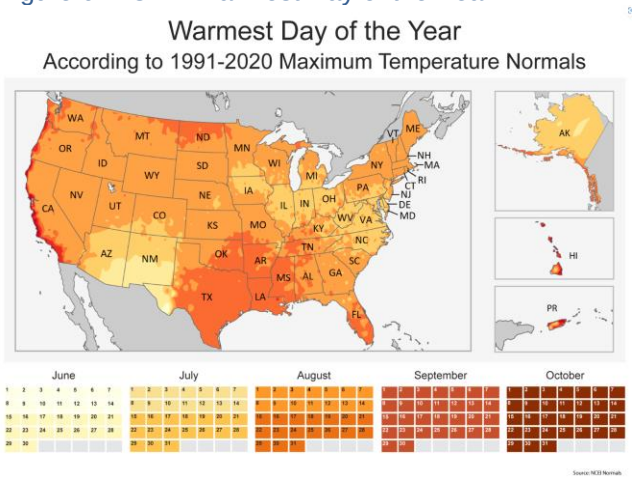
Source: NOAA

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

Normal warmest day of the year across the US

It was another week where one of the big US news stories was it was really hot in the southern part of the US. It makes sense as end of July/early Aug is normally the hottest time of the summer in the south. Here is where we wrote in last week's (July 2, 2023) Energy Tidbits memo. "*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 6: NOAA Warmest Day of the Year



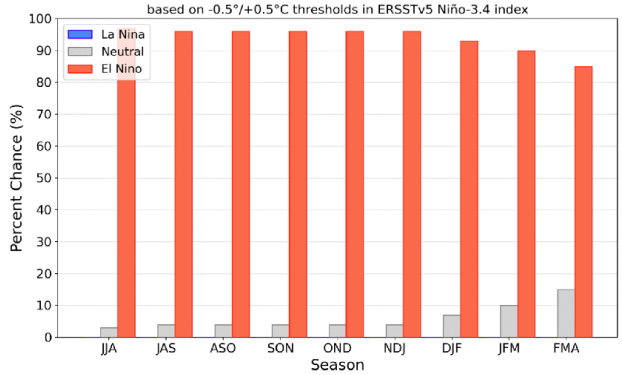
Source: NOAA

Natural Gas: NOAA sees El Nino conditions continuing thru hurricane season

El Nino conditions thru hurricane season

One of the big general news stories has been the waters have been hot in the Atlantic and the Gulf of Mexico. On Thursday, NOAA posted the updated monthly El Nino/La Nina outlook, which is issued on the 2nd Thurs of every month [LINK]. It's July and the normal peak for the Atlantic hurricane season is Aug/Sept/Oct, and NOAA continues to forecast El Nino conditions in this peak Atlantic hurricane season. NOAA provided a probabilistic forecast for meeting certain El Nino thresholds for ASO, which were 96% chance to be >0.5c, 76% chance to be >1.0c, and 37% chance to be >1.5c. Again, weather predictions are never 100% accurate, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons.

Figure 7: Forecast probability El Nino threshold >0.5c



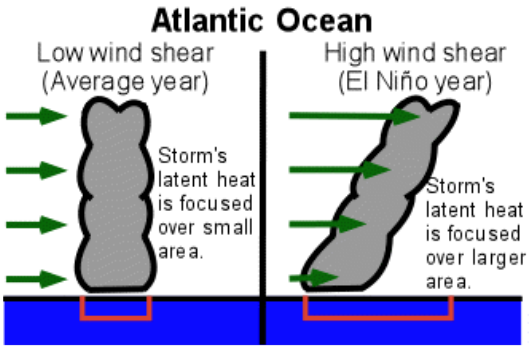
Source: NOAA

Why 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 8: Wind shear impact on hurricane/storm formation



Source: University of Illinois

Natural Gas: EIA lowers US gas production for 2023, basically no YoY growth in 2024

EIA US natural gas production forecast

There was a change from the last five months in the monthly EIA Short Term Energy Outlook for July 2023 [LINK] released on Tuesday – the EIA lowered its forecasts for US natural gas production for 2023 and 2024 and now forecasts basically no YoY growth in 2024. (i) The EIA lowered its 2023 US natural gas production to 102.35 bcf/d (was 102.70), which, on a full year average basis, gives solid YoY growth of +4.25 bcf/d. But, the big growth was in H2/22 and continuing into Q1/23. As a result, the EIA forecasts small growth after Q1/23. The EIA doesn't provide explanation for how its model works, but its model now forecasts Q3/23 of 103.01 bcf/d but that declines to 102.21 bcf/d for Q4/23. As a result, Q4/23 of 102.21 bcf/d is only up small vs Q123 of 101.95 bcf/d. So solid YoY growth on an annual basis, but very little growth from Q1/23 to Q4/23. (ii) The EIA forecasts little YoY growth in 2024. The EIA lowered its 2024 forecast to 102.40 bcf/d (was 103.00), which, on a full year average basis, is only up marginally vs 2023 forecast of 102.35 bcf/d. There isn't any explanation, but the EIA's lower forecast is in Q1/24 (revised -1.01 bcf/d), Q2/24 (revised -1.27 bcf/d) and Q3/24 (revised -0.47 bcf/d) and its Q4/24 forecast was revised +0.14 bcf/d. (iii) The EIA lowered its HH natural gas price expectations to $2.62 USD in 2023 and decreased the 2024 expectation to $3.29 USD. The EIA commented "*We expect the Henry Hub spot price will rise in the coming months as declining natural gas production narrows the existing surplus of natural gas inventories compared with the five-year average. Henry Hub prices in our forecast average more than $2.80 per million British Short-Term Energy Outlook July 2023 U.S.*

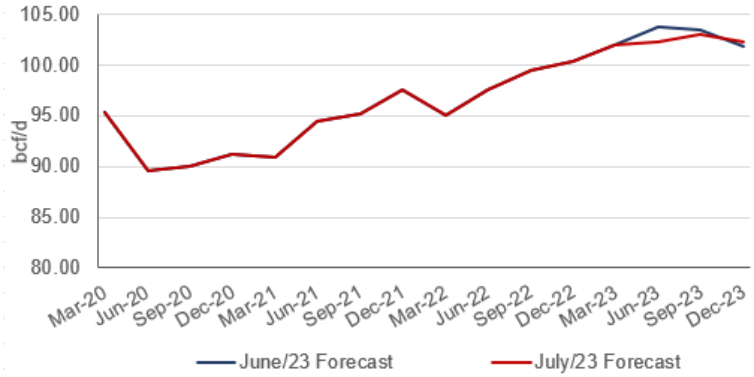
Energy Information Administration | Short-Term Energy Outlook 3 thermal units (MMBtu) in the second half of 2023 (2H23), up from about $2.40/MMBtu in the first half of the year" (iv)
Our Supplemental Documents package includes excerpts from the STEO.

Figure 9: EIA STEO Natural Gas Production Forecasts

bcf/d	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
July-2023	94.60	95.10	97.60	99.50	100.30	98.10	101.96	102.21	103.01	102.21	102.35	101.79	101.53	102.53	103.74	102.40
June-2023	94.60	95.10	97.60	99.50	100.30	98.10	102.00	103.70	103.40	101.90	102.70	102.80	102.80	103.00	103.60	103.00
May-2023	94.51	95.10	97.60	99.50	100.30	98.10	102.10	101.90	99.90	100.40	101.10	100.70	101.10	101.40	101.80	101.20
Apr-2023	94.51	95.10	97.60	99.50	100.20	98.10	101.60	100.50	100.50	100.90	100.88	101.20	101.50	101.80	101.80	101.58
Mar-2023	94.51	95.10	97.60	99.50	100.20	98.08	100.96	100.21	100.56	100.96	100.67	101.37	101.40	101.96	102.04	101.69
Feb-2023	94.57	95.10	97.60	99.50	100.10	98.10	99.90	100.00	100.30	100.90	100.30	101.20	101.60	102.00	101.90	101.70
Jan-2023	94.57	95.10	97.59	99.44	99.87	98.02	100.82	99.87	100.08	100.62	100.34	101.12	101.75	102.72	103.57	102.29
Dec-2022	93.55	95.08	97.58	99.22	100.54	98.11	99.87	99.52	100.50	101.60	100.37					
Nov-2022	93.55	95.08	97.58	99.43	100.11	98.05	99.00	99.42	99.99	100.33	99.68					
Oct-2022	93.55	95.08	97.55	98.48	99.06	97.54	99.19	99.57	99.73	100.00	99.62					
Sep-2022	93.55	94.60	96.87	97.85	98.99	97.08	99.65	100.51	100.59	100.67	100.36					
Aug-2022	93.55	94.60	96.61	97.02	98.09	96.59	98.90	100.13	100.52	100.51	100.02					
Jul-2022	93.55	94.61	95.51	96.88	97.89	96.23	98.40	99.62	100.60	101.25	99.98					

Source: EIA, STEO

Figure 10: EIA STEO Natural Gas Production Forecasts by Month



Source: EIA, STEO

EIA STEO storage forecast

Natural Gas: EIA STEO forecasts Nov 1, 2023 storage at 3.88 tcf, +0.31 tcf YoY

The EIA STEO also forecasts US gas storage. No surprise, the warmer than expected winter led to a big YoY increase in US gas storage to end winter 2022/23. April 1, 2023 gas storage was 1.926 tcf, which was +0.525 tcf YoY. For the summer 2023 refill season, the EIA forecasts storage on Nov 1, 2023 at 3.884 tcf, which is +0.315 tcf YoY. The big factor is the higher YoY US natural gas production. For winter 2023/24, the EIA forecasts gas storage to end the winter at 1.658 bcf, which would be -0.268 tcf YoY. The EIA wrote "With flat production and year-over-year growth in natural gas consumption, we expect U.S. natural gas inventories will reduce the surplus to the five-year average, which will put upward pressure on prices. Storage inventories at the end of June were 2,900 billion cubic feet (Bcf), 14% above the five-year (2018–2022) average. We expect storage inventories to end the injection season on October 31 at 7% above the five-year average."

Two more long-term LNG deals

Natural Gas: Two LNG deals: Centrica/Delfin & ONEE (Morocco)/Shell

June was the biggest month for new long-term LNG supply deals in a long time with six deals totalling 1.74 bcf/d per annum. And we are seeing momentum continue in July. This week, there were two long term LNG deals. But, by background, there was a big slowdown in long-term LNG deals in the 12 months 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 in the last year have been 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 Tuesday, Centrica (UK) and Delfin Midstream (US) announced that they have signed a long-term LNG sale and purchase agreement [LINK]. The initial heads of agreement for this deal was announced on August 9th, 2022. The deal is set to begin in 2027 (when operations at the Delfin Deepwater Port commence), and end in 2042, with Centrica LNG purchasing ~0.13 bcf/d per annum. The CEO of Centrica, Chris O'Shea, commented "*Natural Gas is an essential transition fuel in the move to net zero and securing international agreements such as this are vital to the UK's energy security. As well as strengthening the trade links between the UK and US, this deal – alongside reopening Rough and our major deal with Equinor – shows that Centrica is investing heavily to future-proof the UK's energy supply and address one of the underlying causes of the energy crisis. We stand ready to invest several billion pounds in additional projects, creating thousands of new UK jobs, with the right regulatory framework.".* This agreement will provide the UK with enough energy to heat roughly 5% of its homes over the 15-year period. (ii) On Friday, Reuters reported [LINK] "*Shell will supply Morocco with an annual 0.5 billion cubic metres (bcm) of liquefied natural gas (LNG) under a 12-year deal, the North African country's energy ministry said on Friday. The deal was signed by electricity and water utility ONEE and Shell, a ministry statement said without disclosing financial terms of the transaction. The gas will be transported from Spanish ports initially, using a gas pipeline that links the two countries, until Morocco builds its own LNG terminals, the ministry said."* There was no announced start date but we assume it is in 2024 as the advantage for Morocco is that it seems like the LNG will come from Shell's portfolio supply so it can start without waiting for a new LNG project to come on line. Our Supplemental Documents package includes the Centrica 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 16.38 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 16.33 bcf/d of long-term LNG deals since July 1, 2021. 67% 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 65% 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 11: 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
Jul 5, 2023	Zhejiang Energy	Mexico Pacific Ltd	China / Mexico	0.13	20.0	2027	2047
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**10.90**			
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
Jul 14, 2023	ONEE (Morocco)	Shell	Africa/US	0.05	12.0	2024	2036
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**5.49**			
Total New Long Term LNG Contracts since Jul/21				**16.38**			

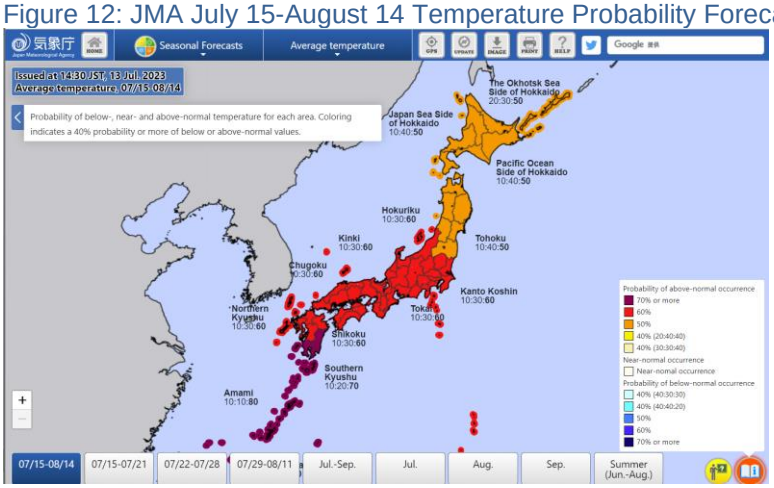
Source: SAF

Natural Gas: Forecast for hot temperatures for July in Japan

Japan's 30-day temperature forecast

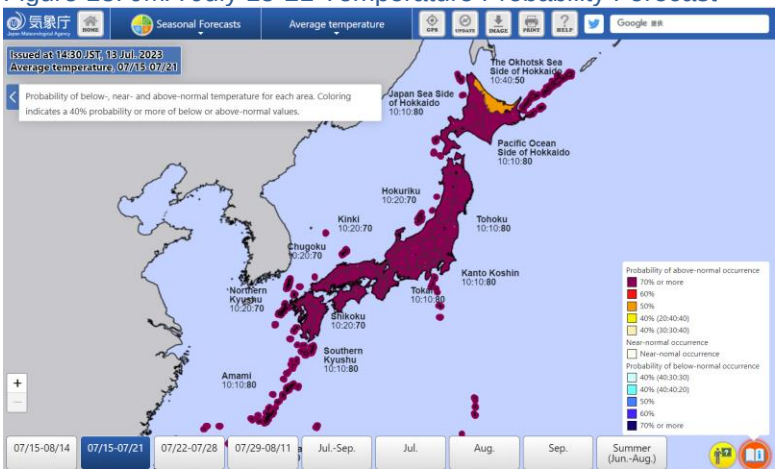
It has been really hot in Japan and it looks like the hot weather will continue through July. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The July 13 update calls for much warmer than typical temperatures for the July 15-Aug 14 period. But what the 30-day forecast map doesn't show is that it expected to be extremely hot across all of Japan for the July 15-21 period. Even with this summer's push to conserve natural gas, there should be strong demand for AC, which should also benefit natural gas consumption. Below is the JMA's 30-day temperature probability forecast for July 15 to August 14, and also its July 15-21 forecast.

Figure 12: JMA July 15-August 14 Temperature Probability Forecast



Source: Japan Meteorological Agency

Figure 13: JMA July 15-21 Temperature Probability Forecast

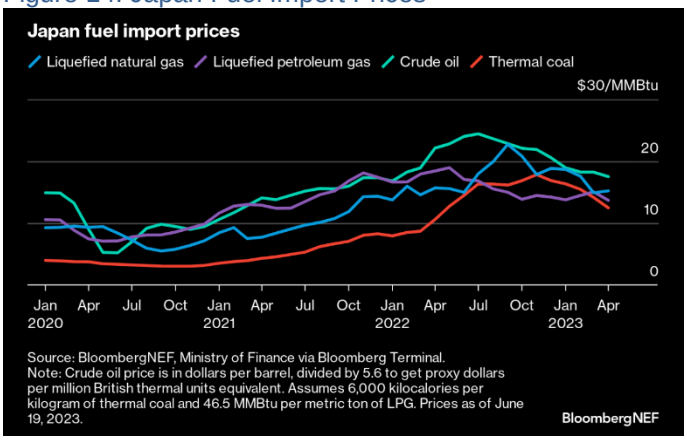


Source: Japan Meteorological Agency

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

It was another week of fairly flat Japan LNG prices, which means they haven't been low enough to drive price switching to thermal coal. Here is what we wrote in our 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 14: Japan Fuel Import Prices



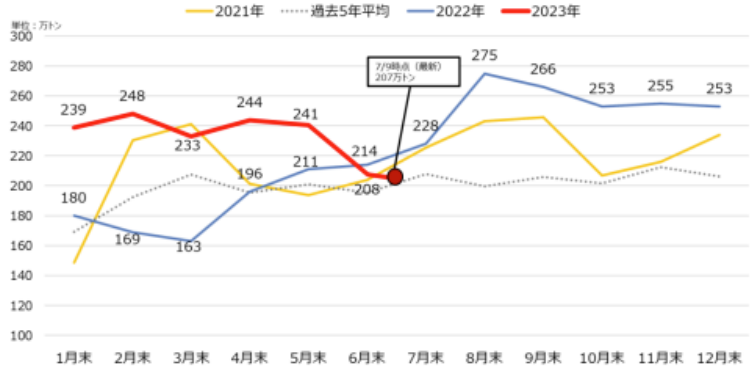
Source: BloombergNEF

Natural Gas: Japan's LNG stocks down -0.5% WoW to 99.4 bcf

Japan LNG stocks down -0.5% WoW

It looks like the combination of low May LNG imports and hot weather in Japan over the past couple weeks is continuing to help 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 in early June Japan pushed for the use of less electricity and natural gas (i.e. turn the air condition onto the low 80's), so there wasn't 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 July 9 were 99.4 bcf and are down -0.5% WoW from July 2 of 99.9 bcf, and fall just under the 5-year average of 99.9 bcf. This is the lowest Japan's LNG Stock have fell since the week of May 7. Below is the LNG stocks graph from the METI weekly report.

Figure 15: Japan LNG Stocks



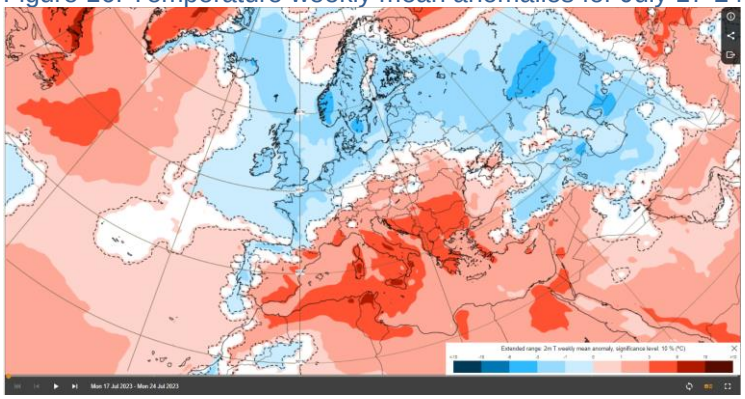
Source: METI

Natural Gas: Southern Europe heat wave to continue for another week

Southern Europe heat wave

US or Europe, the big news story is scorching high temperatures across southern US and southern Europe. Southern Europe is getting a lot of attention in US because it is the height of tourism and tourists are melting. And anyone who has been in Europe in a heat wave knows that smart energy systems means A/C isn't turned on very much. Unfortunately, the scorching hot temperatures across southern Europe are expected to continue for another week. Below is the ECMWF temperature probability map, posted yesterday, for July 17-24. [LINK]

Figure 16: Temperature weekly mean anomalies for July 17-24



Source: ECMWF

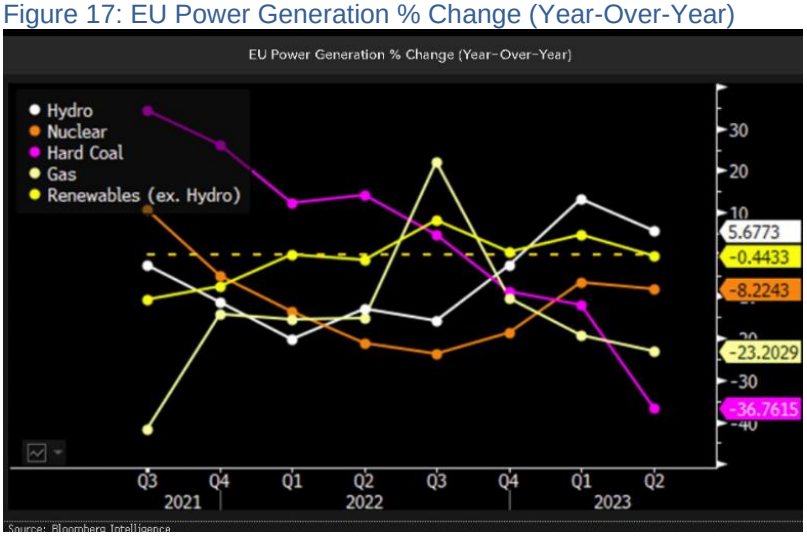
Natural Gas: Europe H1/23 power natural gas demand down 23.2% YoY

EU H1/23 power natural gas demand -23.2% YoY

There was a good reminder from Bloomberg this week on why power generation from natural gas was down 23.2% YoY – mild winter and increasing hydro generation. On Monday, we tweeted [LINK] "*EU #NatGas 1H demand -23.2% YoY. #1 factor: 1H power demand 12-16% below norm, thanks mild winter. #2 factor: Hydro generation +5.7% YoY. Equals TTF #NatGas 1H prices down 40-50% YoY. Thx @business @PatAlvarezB Joao Martins*

#OOTT." Everyone knows that it was a very warm winter in Europe, which was the big negative to demand for natural gas for power generation. But Bloomberg reminded on Monday that the other key negative to demand for natural gas for power generation was that hydro generation is up 5.7% YoY in H1/23. So it was a combination of less demand due to mild winter and more baseload hydro generation that were key factors that led to demand for natural gas for power generation being down 23.2% YoY. Below is the Bloomberg graph attached to our tweet.

Figure 17: EU Power Generation % Change (Year-Over-Year)



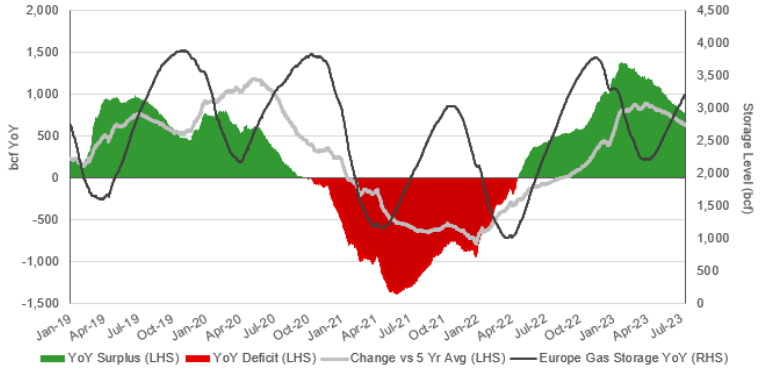
Source: Bloomberg

Natural Gas: Europe storage is now +14.69% vs 5-yr average, but within 5-yr range

Europe gas storage

The Europe natural gas storage picture this week is much the same as the last several weeks – storage is significantly higher YoY, but hot weather and relatively low natural gas prices continues to see a steady narrowing of the gas storage surplus relative to last year and the 5-year average. This week, Europe storage increased by +1.68% WoW to 80.31% on July 12. Storage is now +17.51% greater than last year levels of 62.80% and is +14.69% above the 5-year average of 65.62%. Prior to this week's +17.51% vs last year, the prior four weeks starting with the most recent has seen the YoY surplus at +18.34%, +19.12%, +19.67%, and +20.14%. Prior to this week's +14.69% above the 5-year average, the prior four weeks starting with the most recent has seen the surplus to the 5-year average were +15.24%, +15.86%, +16.40%, and +16.86%. 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 18: European Gas Storage Level



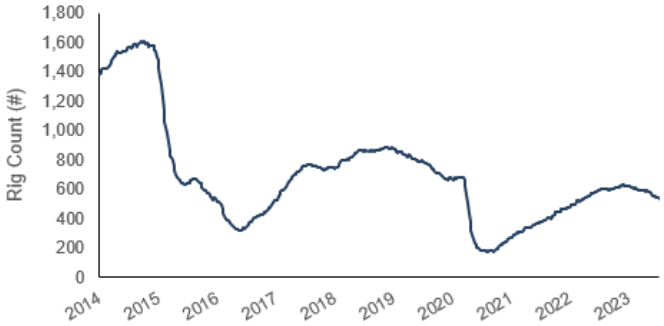
Source: Bloomberg, SAF

Oil: US oil rigs -3 WoW at 537 rigs on July 14, US gas rigs -2 WoW at 133 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 -3 rigs WoW to 537 total rigs, and -62 rigs YoY for the week of July 14. That is up +56 rigs from the 2022 low of 481 rigs in January, and +365 rigs since the 2020 low of 172 rigs on Aug 14. The decline in oil rigs is being driven by producers wanting to have visibility to oil prices of over $70/bbl before beginning to ramp up production. The Williston and "Others" increased by +1 and +2 rigs WoW to a total of 35 rigs and 76 rigs. The Permian, Cana Woodford, and the Mississippian Decreased this week by -4, -1 and -1 rigs WoW to a total of 326 rigs, 22 rigs, and 0 rigs, respectively. This Permian is now down -31 rigs from it's recent high of 357 rigs on April 28, 2023. This is the first time since April 1, 2022 the Permian has dipped under 330 rigs. Gas rigs were down -2 rigs WoW to total of 133 rigs and have now decreased -20 rigs YoY. Natural gas has seen a large recovery, with Henry Hub making a steady recovery. On a per basin basis, "Others" increased +1 rigs WoW to 30 total rigs. In contrast, Haynesville, the Permian, and Eagle Ford all decreased by -1 rig WoW to a total of 45 rigs, 0 rigs, and 11 rigs, respectively. Below is our graph of total US oil rigs.

Figure 19: Baker Hughes Total US Oil Rigs



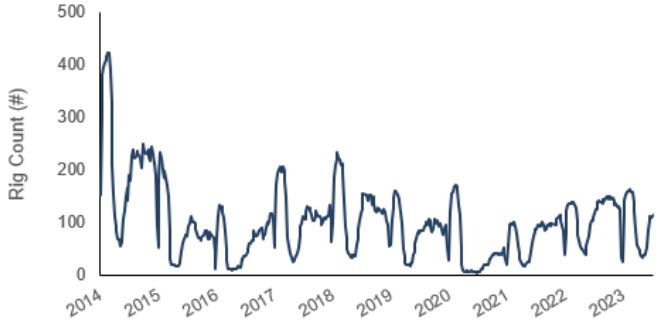
Source: Baker Hughes, SAF

Oil: Total Cdn rigs +12 WoW to 187 total rigs

Cdn total rigs up WoW

For the week of July 14, total Cdn rigs were up +12 rigs WoW to 187 rigs. This week's increase continues to be in-line with the typical post breakup trend, even in the face of wildfires which are likely holding back some rigs. Alberta and Saskatchewan were up +9 and +3 rigs WoW, to a total of 125 rigs and 38 rigs. There were no declines this week. Cdn oil rigs were up +3 WoW to 114 rigs, and Cdn gas rigs increased +9 to 73 rigs. Cdn oil rigs are down -11 rigs YoY, while gas rigs are up +7 YoY. Below is our graph of total Cdn oil rigs.

Figure 20: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates down 0.1 mmb/d to 12.3 mmb/d

US oil production down WoW

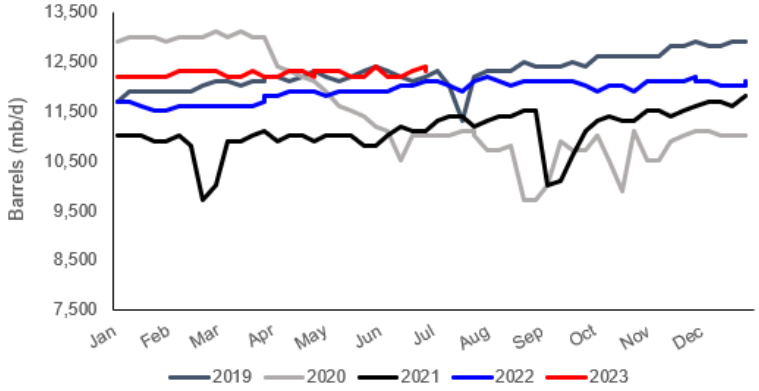
We don't make too much of a +/- change of 0.1 mmb/d to the weekly EIA oil production estimates, which was the case this week. The EIA estimates US oil production was down -0.1 mmb/d WoW at 12.3 mmb/d for the week ended July 7 [LINK]. This falls back under last week's post Covid high level of 12.4 mmb/d, which was hit twice in June. We have been highlighting how the EIA monthly "actuals" have been above 12.4 mmb/d in Jan, Feb, March and April so we have been expecting to see the weekly estimates hit 12.4 mmb/d and higher. The Lower 48 was down -0.100 mmb/d WoW to 11.9 mmb/d, and Alaska was down 0.013 mmb/d to 0.417 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 21: EIA's Estimated Weekly US Field 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	06/30	12,400
2023-Jul	07/07	12,300								

Source: EIA

Figure 22: EIA's Estimated Weekly US Oil Production



Source: EIA, SAF

EIA Form 914: US Apr actuals 12.615 mmb/d, +398,000 b/d vs weekly estimates

In our July 2, 2023 Energy Tidbits memo we wrote *"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 23: 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 24: EIA Form 914 US Oil Production vs Weekly Estimates

Source: EIA

North Dakota oil production

Oil: Wet late May kept North Dakota May oil production flat MoM at 1.134 mmb/d

On Friday, the North Dakota Industrial Commission posted its Director's Cut, which includes May's oil and natural gas production data [LINK]. North Dakota oil production in May was flat MoM at 1.134 mmb/d, which was up +7.0% YoY from 1.059 mmb/d in May 2022. In our June 19, 2023 Energy Tidbits memo, we noted North Dakota's huge estimate of completions for the month of May of 138 completions that wasn't revised this month. So, we would have expected this huge number of completions to lead to a big boost to May production relative to April. But it didn't. We watch the monthly press conference held by North Dakota Director of Mineral Resources, Lynn Helms, Ph.D., and Justin J. Kringstad, Director North Dakota Pipeline Authority on the monthly results. Helms said something that would have explained why May wasn't higher given the huge completions in May – "*so again an indication of how wet it was late May/early June*." it was very wet at the end of May. This would have impacted trucking and impacted some tie-ins. But it also leads support for why June and July should be up strong. Estimated well completions were and 51 in April, 138 in May, and 85 in June which was likely due to the warmer weather conditions in North Dakota. Our Supplemental Documents package includes excerpts from the Director's Cut.

Figure 25: North Dakota Oil Production by Month

(b/d)	2017	2018	2019	2020	2021	2022	2022/21	2023	2023/22
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	1,088,613	-5.1%	1,060,708	-2.6%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	1,089,091	0.5%	1,158,837	6.4%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	1,122,640	1.2%	1,122,693	0.0%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	900,597	-19.8%	1,133,435	25.9%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	1,059,060	-6.1%	1,133,530	7.0%
June	1,032,873	1,227,320	1,425,230	893,591	1,133,498	1,096,783	-3.2%		
July	1,048,099	1,269,290	1,445,934	1,042,081	1,076,594	1,072,632	-0.4%		
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	1,075,307	-2.9%		
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	1,121,063	0.6%		
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	1,121,754	0.9%		
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	1,098,389	-5.2%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	957,864	-16.3%		

Source: NDIC, NDPA

Record post Covid frack crews, North Dakota strong JJA production

As usual there were great additional insights from the monthly North Dakota press conference on Friday afternoon. We made a transcript of the comments by North Dakota Director, Lynn Helms, who said "*The great news is that we're at a post Covid*

record in terms of frack crews as of today – 26 frack crews. So we should really see a good surge in production over the summer as a lot of those DUC wells are completed and as they get out ahead of the drilling rig count in terms of well completions. So we're looking forward to better numbers June, July, August as things move forward'". It makes sense that with the big well completions in May and high in June and combine that with a post-Covid record in terms of frack crews that production will be up in June/July/August. Most will not realize North Dakota is at a post-Covid high in terms of frack crews unless they listen to the press conference. Please note that there looks to be a typo in the posted NDIC Director's Cut that only writes 20 frack crews so most may not pick this record high up unless they listened to the press conference. On the press conference, Helms clearly says 26 frack crews, new post Covid high. Anyone who has listened to these press conferences knows that Helms is a precise speaker. So no doubt he clear said 26 frack crews. But to support that, we went back to check the data. The NDIC Dec 2022 Director's Cut noted that frack crews had hit 20. So the 20 in the new July Director's Cut wouldn't' be a new post Covid high, which is why the clearly said 26 in the press conference points to a typo in the posted 20 in the Director's Cut. In a few of the 2021 Director's Cuts they noted that April 2020 was 25 frack crews. So the combination of the wet weather in late May plus record frac crews makes sense that North Dakota oil production should be strong in June/July/Aug

Will North Dakota production dip in late 2023/early 2024 without a rig increase

Yesterday we tweeted [LINK] "*North Dakota expects a "good surge in production over the summer" driven by post Covid record 26 frack crews. But "as they [frack crews] get ahead of the drilling rig count in terms of well completions" reminds rigs need to increase (Apr 45, May 37, Jun 37, today 36) to rebuild DUCs to avoid late 2022/early 2023 production dip? Usual great presser ND Lynn Helms, Justin Kringstad. #OOTT #Bakken."* We will want to watch to see if North Dakota drilling rigs starts to increase back to at least April levels. It's hard to disagree with North Dakota's expectation for strong production in June, July and August, and likely continuing at least in Sept. North Dakota has record frack crews at work so should see strong completions in at least July and August. And, as noted above, Helms highlighted how the record number of frack crews should *see "a lot of those DUC wells are completed".* But then Helms says "*as they get out ahead of the drilling rig count in terms of well completions."* That caught our attention as Helms had just noted drilling rigs were declining despite oil prices in the low $70s and how "*At those kind of prices, one would anticipate a little more activity than we're seeing so a little bit of a head scratcher*". The NDIC noted how rigs had dropped from 45 in April, to 43 in May, to 37 in June and were 36 today. Helms thinks that M&A is a factor it the decline in rigs. The issue will become that drilling rigs are declining at a time of record frack crews and what that does to the DUC inventory. So the concern for production levels isn't the expected increase over the next four month, but what happens in early 2024 if drilling rigs don't increase and DUCs keep getting worked down. Drilling rigs will be an item to watch.

Oil: North Dakota crude by rail down MoM to 68,422 b/d in May

North Dakota CBR down MoM in May

The North Dakota Pipeline Authority posted its monthly update "*July 2023 Production & Transportation"* [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority that provide low and high estimates for Williston crude by rail exports. The NDPA Monthly Update (graph below) report has a thick line that represents the low and high range. In the backup excel, the NDPA estimates crude by rail in May from a low of 53,422 b/d and a high of 83,422 b/d for an average of 68,422 b/d. This is large decrease from the April average of 92,519 b/d. The NDPA did not comment on the MoM changes. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

Figure 26: Estimated North Dakota Rail Export Volumes

Source: NDPA

Oil: EIA July STEO lowers 2023 US oil production forecast but increases 2024 by more

EIA STEO July oil production

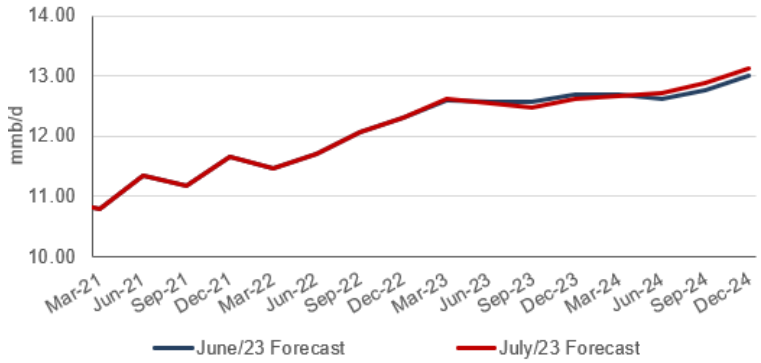
The headlines on the EIA's July Short-Term Energy Outlook [LINK] were on how it lowered its US oil production forecast in 2023 (which is true) but, for some reason, not on the fact that the EIA increased its forecast for 2024 by a greater amount. (i) The July STEO forecasts for 2023 US oil production estimated have slightly decreased vs the last STEO in June. The July STEO forecast is down -50,000 b/d to 12.56 mmb/d from the June STEO of 12.61 mmb/d. The revisions by quarter were Q1/23 +0.01 mmb/d, Q2/23 -0.01 mmb/d, Q3/23 -0.09 mmb/d, and Q4/23 exit -0.07 mmb/d. (ii) The EIA increased its 2024 oil production forecast by +80,000 b/d to 12.85 mmb/d compared to 12.77 mmb/d in the June STEO, which is a YoY increase of +0.29 mmb/d. And the EIA increased its Q4/23 forecast to 13.13 mmb/d (was 13.03 mmb/d).

Figure 27: EIA STEO US Oil Production Forecasts by Forecast Month

(million b/d)	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	Q1/24	Q2/24	Q3/24	Q4/24	2024
Jul-23	11.25	11.47	11.7	12.06	12.31	11.89	12.61	12.55	12.48	12.63	12.56	12.67	12.71	12.88	13.13	12.85
Jun-23	11.25	11.47	11.70	12.06	12.31	11.89	12.60	12.56	12.57	12.70	12.61	12.69	12.63	12.76	13.00	12.77
May-23	11.25	11.47	11.70	12.06	12.31	11.89	12.54	12.51	12.46	12.61	12.53	12.63	12.58	12.68	12.85	12.69
Apr-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.54	12.50	12.50	12.61	12.54	12.69	12.71	12.77	12.83	12.75
Mar-2023	11.24	11.47	11.70	12.06	12.30	11.88	12.31	12.43	12.48	12.54	12.44	12.58	12.58	12.64	12.71	12.63
Feb-2023	11.25	11.47	11.70	12.06	12.36	11.90	12.44	12.46	12.49	12.56	12.49	12.63	12.62	12.65	12.70	12.65
Jan-2023	11.25	11.47	11.70	12.05	12.23	11.86	12.37	12.34	12.40	12.51	12.41	12.63	12.72	12.86	13.03	12.81
Dec-2022	11.25	11.46	11.70	12.03	12.29	11.87	12.24	12.24	12.34	12.51	12.33					
Nov-2022	11.25	11.46	11.70	11.99	12.15	11.82	12.22	12.24	12.32	12.48	12.31					
Oct-2022	11.25	11.46	11.70	11.83	11.99	11.74	12.27	12.29	12.36	12.50	12.35					
Sep-2022	11.25	11.47	11.70	11.81	12.16	11.79	12.42	12.55	12.70	12.87	12.63					
Aug-2022	11.25	11.46	11.69	12.01	12.28	11.86	12.39	12.50	12.82	13.10	12.70					
Jul-2022	11.19	11.46	11.75	12.08	12.34	11.91	12.45	12.58	12.87	13.17	12.77					
Jun-2022	11.19	11.45	11.71	12.08	12.43	11.92	12.64	12.82	13.07	13.33	12.97					
May-2022	11.19	11.42	11.78	12.07	12.35	11.91	12.56	12.71	12.94	13.18	12.85					
Apr-2022	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95					
Mar-2022	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99					
Feb-2022	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60					

Source: EIA STEO

Figure 28: Estimated US Crude Oil Productions by Forecast Month



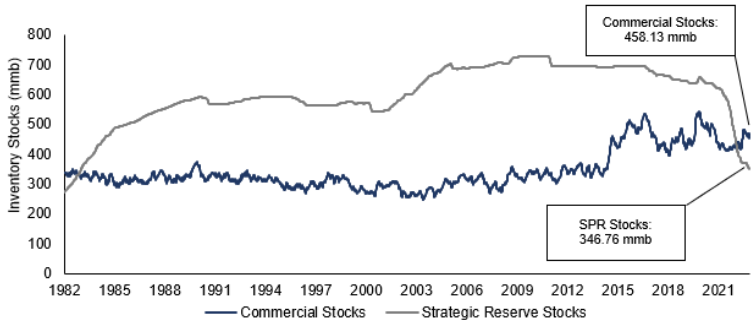
Source: EIA, STEO

US SPR reserves

Oil: US SPR reserves now -111.370 mmb lower than commercial crude oil reserves

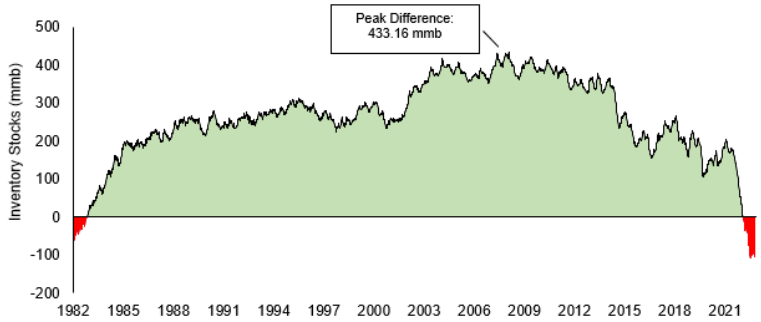
Oil in US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit narrowed this week after a build in commercial oil stocks of +5.95 mmb. The EIA's weekly oil data for July 7 [LINK] saw the SPR reserves decrease -0.401 mmb to 346.758 mmb, while commercial crude oil reserves increased +5.946 mmb 458.128 mmb. There is now a -111.370 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 29: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 30: US Oil Inventories: SPR Less Commercial



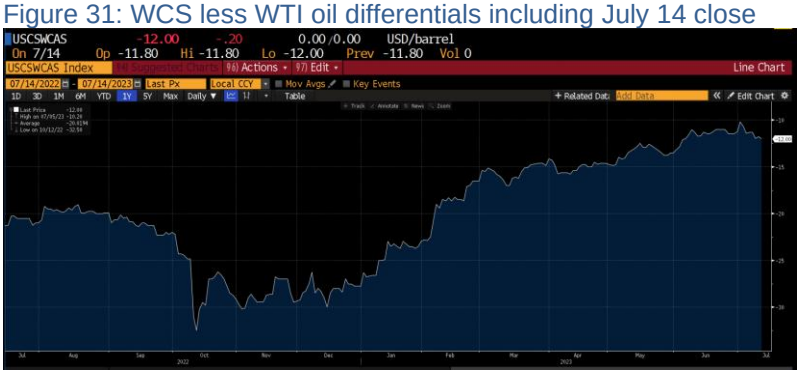
Source: EIA, SAF

Oil: Cdn oil differentials widened +$0.55 to close at $12.00 on July 14

WCS less WTI differentials

It's been a great last two months for WCS less WTI differentials that continues to see the impact of OPEC+ cuts including Saudi Arabia's extra voluntary 1 mmb/d cut for July and August. This has led to continued much narrower than normal WCS less WTI differentials for this time of year. WCS less WTI differentials widened by $0.55 to close at $12.00 on July 14. Even still this has been a great May/June/July for WCS less WTI differentials, which have narrowed when the normal season trend is to widen starting in mid-May. WCS less WTI differentials were $14.15 on March 31, which was the Friday before the Sun Apr 2 reports that OPEC+ was going to cut production effective May 1. The WCS less WTI differential was up and down but closed at $14.65 on Apr 28, then narrowed in May to 13.75 on May 26, narrowed in June to $11.25 on June 30, and have only widened to $12.00 to close on July 14. 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 $21.25 on July 14, 2022. Below is Bloomberg's current WCS–WTI differential as of July 14, 2023 close.

Figure 31: WCS less WTI oil differentials including July 14 close



Source: Bloomberg

Oil: Crack spreads at $34.99 so no reason for refiners to stop buying crude

Crack spreads up small this week

We remind that oil demand is driven by refiners and their ability to make money by processing oil and selling petroleum products. So crack spreads are a good indicator if refiners will be looking to buy more or less oil. This week, the US 321 crack spreads increased by $0.39 to close at $34.99 on July 14. It's not like the crazy high spreads of a year ago, when 321 crack spreads high that were $58.50 on June 17, 2022 and still $44.23 on July 14, 2022. But spreads are still about double the more normal range pre-Covid that was more like $15-$20. A $34.99 crack spread is a good incentive for US refiners to run hard and process as much crude as possible.

Explaining 321 crack spread

People often just say "cracks", which refers to the 321 crack spread. This is the spread or margin that refiners make from buying crude at a certain price and then selling the finished petroleum products at their respective prices. The 321 crack spread is meant to represent what a typical US refinery produces. It assumes that for every three barrels of crude oil, the refinery will produce two barrels of gasoline and one barrel of distillates. So the crack spread is based on that formula and worked back to a crack spread per barrel. Below is the current 321 crack spread, which was $34.99 as of the Friday July 14, 2023 close.

Figure 32: Cushing Crude Oil 321 Crack Spread July 14, 2013-to July 14, 2023

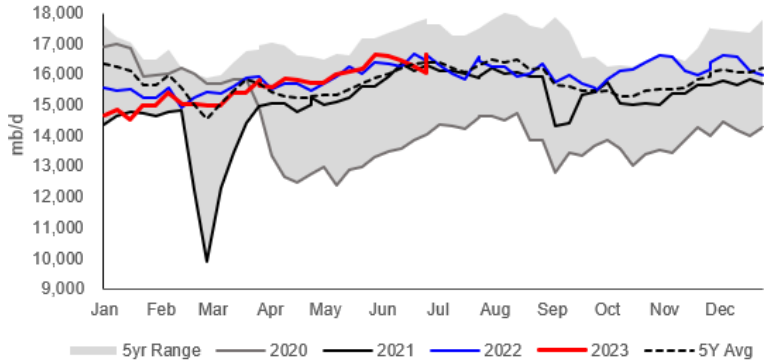
Source: Bloomberg

Oil: Refinery inputs up +0.629 mmb/d WoW to 16.659 mmb/d

Refinery inputs up +0.629 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. 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 noted above, refineries are still incentivized to process as much crude as possible. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended July 7 [LINK]. The EIA reported crude inputs to refineries were down up +0.629 mmb/d this week to 16.659 mmb/d and are up +0.019 mmb/d YoY. Refinery utilization was up +2.6% WoW to 93.7%, which -1.2% YoY. Total products supplied (i.e., demand) decreased WoW, down -2.534 mmb/d to 18.701 mmb/d, and Motor gasoline was down -0.843 mmb/d to 8.756 mmb/d from 9.599 mmb/d last week. The 4-week average for Motor Gasoline was down -0.109 mmb/d WoW to 9.259 mmb/d. The 4-week average of Total demand was down -0.427 mmb/d WoW to 20.292 mmb/d.

Figure 33: US Refinery Crude Oil Inputs



Source: EIA, SAF

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

US net oil imports

The reason why we continue to highlight this error is that no one can tell if its only the EIA allocating imports incorrectly by country or if the EIA is understating oil imports. But it's 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 up +0.599 mmb/d to 3.736 mmb/d for the July 7 week. US imports were down -1.158 mmb/d to

5.880 mmb/d. US exports were down -1.757 mmb/d to 2.144 mmb/d. The WoW increase in US oil imports was driven mostly by "Top 10". The Top 10 was down -0.589 mmb/d. Some items to note on the country data: (i) Canada was down -0.226 mmb/d to 3.385 mmb/d. (ii) Saudi Arabia was up +0.131 mmb/d to 0.444 mmb/d. (iii) Mexico was down -0.356 mmb/d to 0.526 mmb/d. (iv) Colombia was down -0.134 mmb/d to 0.153 mmb/d. (v) Iraq was up +0.012 mmb/d to 0.134 mmb/d. (vi) Ecuador was down -0.013 mmb/d to 0.144 mmb/d. (vii) Nigeria was down -0.003 mmb/d to 0.189 mmb/d.

Figure 34: US Weekly Preliminary Imports by Major Country

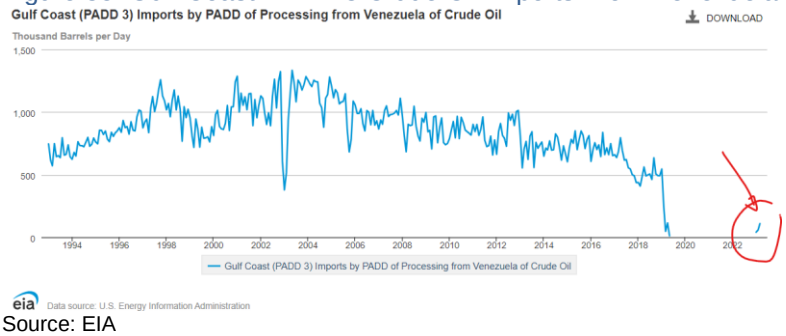
(thousand b/d)	Apr 28/23	May 5/23	May 12/23	May 19/23	May 26/23	Jun 2/23	Jun 9/23	Jun 16/23	Jun 23/23	Jun 30/23	Jul 7/23	WoW
Canada	3,526	3,269	3,592	3,707	3,589	3,504	3,339	3,570	3,776	3,611	3,385	-226
Saudi Arabia	242	381	415	212	534	66	677	146	460	313	444	131
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	706	393	676	657	913	647	845	808	758	882	526	-356
Colombia	143	47	339	214	286	127	184	148	222	287	153	-134
Iraq	148	247	174	136	114	430	252	102	216	122	134	12
Ecuador	57	145	101	71	214	218	54	203	67	157	144	-13
Nigeria	214	143	329	77	98	144	132	204	96	192	189	-3
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	5,036	4,625	5,626	5,074	5,748	5,136	5,483	5,181	5,595	5,564	4,975	-589
Others	1,360	928	1,234	776	1,469	1,264	898	980	985	1,474	905	-569
Total US	6,396	5,553	6,860	5,850	7,217	6,400	6,381	6,161	6,580	7,038	5,880	-1,158

Source: EIA, SAF

EIA shows imports from Venezuela in its monthly import data.

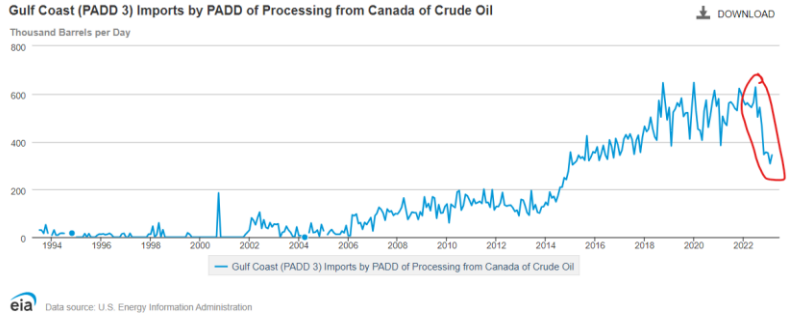
Here is what we wrote in our May 7, 2023 Energy Tidbits memo. *"Last week's (Apr 30, 2023) Energy Tidbits memo highlighted our Apr 29 tweet [LINK] that Chevron's start of Venezuela oil imports into the Gulf Coast is likely impacting Cdn WCS less WTI differentials and how Venezuela oil into the Gulf Coast 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 35: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 36: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Oil: Pemex's offline 100,000 b/d expected back on in early Aug

Pemex platform explosion

As of our 7am MT news cut off, we have not seen any more current Pemex update on the level of production restored since their 5:47pm MT tweet on July 8. (i) Last week's (July 9, 2023) Energy Tidbits memo wrote "*Earlier this morning, we tweeted [LINK] "#Pemex says still 100,000 b/d offline as of last night ie. 600,000 b/d back on of the halted 700,000 bpd. There are too many fires, accidents at @Pemex operations. Let's hope they use this tragedy of two workers people dying to put safety to #1 priority. #OOTT." Early Friday morning, there was an explosion and fire at an offshore platform that reportedly killed two workers and there is still worker missing in addition to the injured. It led to a peak of 700,000 b/d of oil shut-in and an undisclosed (probably around 0.6 bcf/d) amount of natural gas shut-in. Our tweet included the Pemex tweet [LINK] that said "From the Quesqui field in #Huimanguillo , Tabasco, the General Director of #PEMEX , Eng. @OctavioRomero_O, reports today on the fire yesterday in Cantarell. The injured colleagues are stable and the search for the missing person continues. Regarding production, the incident reflected a loss of 700,000 barrels because practically all the wells in the area were closed, however, until a few moments ago, 600,000 barrels had already been recovered." We would assume that this would also mean almost all the natural gas is back onstream but we haven't seen any comments on natural gas. Pemex did not say when or if the remaining production will be back onstream. This is only one platform in the producing complex but it is effectively destroyed so we won't be surprised to see the remaining production offline for some time.* (ii) Rather the only production restoration update came from a July 11 Reuters report "*Exclusive: Mexico's Pemex to lose*

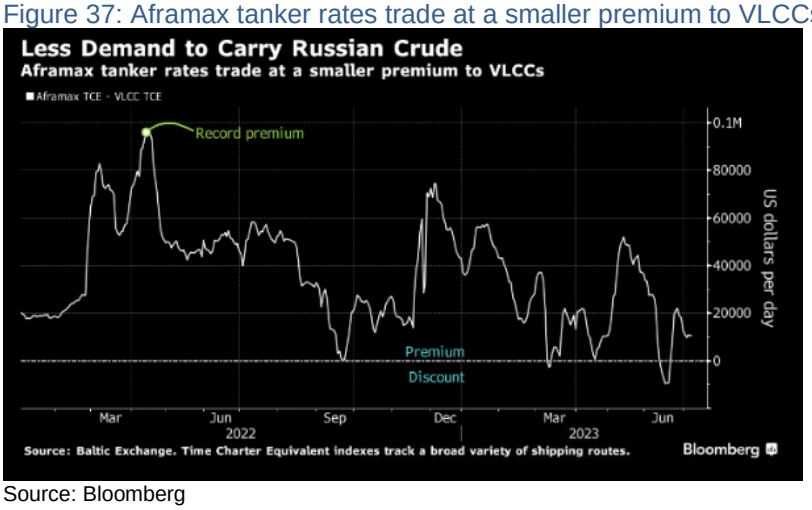
some 100,000 bpd of crude this month after fire -source" [LINK]. Reuters reported "*Mexico's state oil company Petroleos Mexicanos will see its crude output reduced by some 100,000 barrels per day (bpd) until the beginning of August after a massive fire on Friday at an offshore platform, a top company source said."* And "*"We are short of a little less than 100,000 barrels (per day). We expect that by the first days of August we will recover all the crude," he said*." Our Supplemental Documents package includes the Reuters report.

Oil: Less demand to carry Russian crude or Russia cutting crude for exports?

Aframax tanker rates

On Monday, we tweeted [LINK] "*Finally? Is this a forward Indicator that Russia is actually cutting #Oil exports in August?? Aframax tanker rates going down! ie. less Aframax tankers needed to move Russian oil. Thx @business Sophie Caronello. #OOTT."* On Monday, Bloomberg posted the below graph titled "*Less Demand to Carry Russian Crude: Aframax tanker rates trade at a smaller premium to VLCCs*". Bloomberg wrote "*Rates for smaller oil tankers known as Aframaxes are trading at a narrower premium to those for Very Large Crude Carriers as demand for Russia's crude wanes. More Aframax ships than VLCCs joined the dark fleet to carry Russian crude after Moscow's invasion of Ukraine in February 2022, leaving fewer of these vessels available for the rest of the world and pushing up freight rates. Saudi Arabia and Russia have pledged to extend crude supply cuts into August*." When we saw the headline "*Less Demand to Carry Russian Crude*", we had to wonder if it's also an indicator that Russia is actually cutting oil exports as their recent announcement to cut oil exports by 500,000 b/d. Below is the Bloomberg graph that we attached to our tweet.

Figure 37: Aframax tanker rates trade at a smaller premium to VLCCs



Source: Bloomberg

Oil: OPEC Secondary Sources estimate Russia June was down 488,000 b/d vs Feb

Russia cut 488,000 b/d from Feb

We recognize that markets want to somehow see some real market response before believing that Russia has cut its oil production and oil exports. But, at least from OPEC's MOMR Secondary Sources, it looks like they have cut their 500,000 b/d production in June. On Friday, we retweeted an Amena Bakr (Chief OPEC Correspondent & Deputy Bureau Chief, Energy Intelligence) tweet [LINK] "*According to OPEC's secondary sources average, Russia cut 488k in June out of the 500k promised. 98% compliance. #OOTT #opec #Russia*". OPEC doesn't publish the individual estimates by secondary sources, but Amena Bakr

posted the estimates in the below table. The average of the secondary sources was that Russia's June 2023 production was down 488,000 b/d vs February 2023. Below is the table from the Amena Bakr tweet.

Figure 38: OPEC Secondary Sources For Russia's voluntary cut in June

Russia's Voluntary in June (kbd)

Source	February 23	June 23	Cut
EI	Average: 9,949	9,507	-442
Argus		9,450	-499
IHS		9,418	-531
Platts		9,420	-529
Rystad		9,455	-494
Wood Mackenzie		9,514	-435
Average		9,461	-488

According to the assessment of the secondary sources, Russia has achieved 488 kbd cut in June from February production level, which represents 98% of the announced voluntary cut of 500 kbd.

Source: Energy Intelligence

Oil: OPEC MOMR: neutral to slightly positive with OPEC's 1st look at 2024 demand

OPEC Monthly Oil Market Report

On Thursday, OPEC released its Monthly Oil Market Report. (i) We thought the overall takeaway from the data and forecasts was neutral to slightly positive. OPEC increased its demand forecast for 2023, but that was due to increasing Q1/Q2 demand which slightly reduced Q4 to end the year. Global oil stocks deficit as of May 31 are basically unchanged vs the 5-yr and 2015-2019 average. But OPEC introduces its 2024 forecast that includes demand forecast +2.25 mmb/d YoY to 104.25 mmb/d. (ii) 2023 average demand slightly increased to 102.0 mmb/d (was 101.91), which is +2.44 mmb/d YoY. The increase is driven by OPEC increasing its Q2/23 demand Q2/23 is increased to 101.22 mmb/d (was 100.80), while it made small decreases to Q3/23 and Q4/23. Q4/23 is decreased to 103.21 mmb/d (was 103.25), which is +1.26 mmb/d QoQ. (iii) China demand forecast for 2023 was increased to 15.77 mmb/d (was 15.70 mmb/d) and the increase is due to increasing its Q2/23 for China to 15.96 mmb/d (was 15.56 mmb/d). OPEC lowered its China Q4/23 to 16.11 mmb/d (was 16.16 mmb/d). (iv) OPEC introduced its 2024 demand forecast of +2.25 mmb/d YoY to 104.25 mmb/d. Different from the IEA who forecast peak demand for OECD was in 2023, OPEC sees modest +0.26 mmb/d YoY demand growth to 46.27 mmb/d for OECD. Non-OECD is forecast +1.99 mmb/d YoY to 57.98 mmb/d with the largest growth being China +0.58 mmb/d YoY to 16.35 mmb/d. Middle East +0.38 mmb/d YoY to 9.05 mmb/d. Other Asia non-OECD +0.31 mmb/d YoY to 9.66 mmb/d. India +0.22 mmb/d YoY to 5.60 mmb. (v) Non-OPEC supply was basically unchanged for 2023 at +1.41 mmb/d YoY (was +1.43) and full year average of 67.14 mmb/d (was 67.17). For its first look at 2024, OPEC forecasts non-OPEC supply at +1.39 mmb/d YoY to 68.53 mmb/d. Key YoY non-OPEC growth areas for 2024 are US +0.68 mmb/d, Canada +0.22 mmb/d, Guyana +0.15 mmb/d, Brazil +0.12 mmb/d, Norway +0.09 mmb/d and Kazakhstan +0.08 mmb/d. (vi) OPEC Secondary Sources for June were +91,000 b/d MoM to 28.189 mmb/d. For the OPEC10 quota countries, July MOMR has them at 23.512 mmb/d in June, which is +23,000 b/d MoM from 23.489 mmb/d in May. (vii) Direct Communications (what the OPEC countries report). There were a few items to note vs what countries directly reported vs Secondary Sources estimates: Libya says it produced 1.186 mmb/d in June vs Secondary Sources of 1.156 mmb/d. We normally reference the Libya NOC tweets/Facebook posts that have consistently said production has been marginally over 1.2 mmb/d. Venezuela says it produced 796,000 b/d in June. Iraq says

it produced 3.985 mmb/d vs Secondary Sources of 4.181 mmb/d. Finally, Nigeria says it produced 1.249 mmb/d compared to the 1.298 mmb/d reported by Secondary Sources. Our Supplemental Documents package includes excerpts from the July OPEC MOMR.

Oil: IEA OMR: No Peak Oil Demand, 2024 demand increased to 103.2 mmb/d

IEA Oil Market Report

There is no sign, at least in their forecasts, that the IEA is forecasting peak oil demand. On Thursday, the IEA released its monthly Oil Market Report for July at 2am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) The headlines were on the IEA cutting its 2023 oil demand forecast by 220,000 b/d. That is true, but the IEA also increased its 2024 oil demand forecast by more so that its new 2024 oil demand forecast of 103.2 mmb/d is +0.1 mmb/d than its June OMR. So we call that a wash. (ii) However, we have the same concern as last month and wonder if the IEA oil demand forecast for 2024 is too low. When the June OMR was released, we tweeted [LINK] "*Key question from @IEA OMR? What led to the -2 mmbd QoQ drop in @IEA fcst demand from Q4/23 to Q3/24? Probably 2x normal pre-Covid QoQ drop. If Q1/24 is low, then it subsequent quarters likely low. Also calling peak #Oil demand in OECD. #OOTT".* The July OMR only had a slight change and the IEA forecasts demand to drop QoQ by 1.9 mmb/d from Q4/23 to Q1/24. The normal seasonal pattern for oil demand is that Q1 is a little lower than the preceding Q4, but we don't recall ever seeing this big of a QoQ drop. We reviewed older pre-Covid OMR reports and the normal QoQ drop was generally below 1 mmb/d. Now, the IEA forecasts oil to bounce right back up in Q2, Q3 and Q4. IEA forecasts Q1/24 demand 101.4 mmb/d, Q2/24 demand is 102.6 mmb/d, Q3/24 demand is 104.3 mmb/d, and Q4/24 demand is 104.5 mmb/d. We don't see precedent for this large of a QoQ decline. For perspective, the EIA issued its Short Term Energy Outlook July on Tues, and they show Q1/24 oil demand to be +0.49 mmb/d QoQ vs Q4/23. In Thursday's OPEC MOMR, OPEC forecasts Q1/24 demand to be +0.43 mmb/d QoQ vs Q4/23. (iii) There were immaterial changes to the IEA"s 2023 non-OPEC YoY supply growth, it was to +2.0 mmb/d YoY to 67.3 mmb/d (was +1.9 mmb/d YoY to 67.2 mmb/d). (iv) Immaterial increases to 2024 non-OPEC supply, up to +1.2 mmb/d YoY to 68.5 mmb/d (was +1.1 mmb/d YoY to 68.3 mmb/d). The IEA wrote "*The United States continues to dominate non-OPEC+ supply increases, but gains are set to ease from 1.9 mb/d to 1.2 mb/d in 2024 as growth halves in the US shale patch*." (v) Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 39: IEA Global Demand Forecast by OMR Report

mmb/d	2021	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023	23-22	Q1/24	Q2/24	Q3/24	Q4/24	2024	24-23
July 23	97.7	99.9	100.5	101.4	103.1	103.3	102.1	2.2	101.4	102.6	104.3	104.5	103.2	1.1
June 23	97.7	99.9	100.5	101.6	103.4	103.5	102.3	2.4	101.5	102.5	104.1	104.4	103.1	0.8
May 23	97.7	99.9	100.5	101.3	103.0	103.1	102.0	2.1						
Apr 23	97.7	99.9	100.4	101.2	103.1	103.0	101.9	2.0						
Mar 23	97.7	99.9	100.7	101.3	101.9	101.9	101.5	1.6						
Feb 23	97.7	100.0	100.1	101.1	102.9	103.5	101.9	1.9						
Jan 23	97.7	99.9	99.6	100.8	102.9	103.5	101.7	1.8						
Dec 22	97.7	99.9	99.7	100.6	102.7	103.4	101.6	1.7						
Nov 22	97.7	99.8	99.6	100.5	102.3	103.0	101.4	1.6						
Oct 22	97.7	99.6	99.5	100.4	102.1	102.9	101.3	1.7						
Sep 22	97.7	99.7	100.2	101.0	102.6	103.3	101.8	2.1						
Aug-22	97.6	99.7	100.3	101.1	102.5	103.3	101.8	2.1						
July 22	97.5	99.2	99.8	100.8	102.0	102.7	101.3	2.1						
June 22	97.5	99.4	100.5	101.1	101.9	102.7	101.6	2.2						

Source: IEA, Bloomberg, SAF

Kurdistan oil still shut in

Oil: Erdogan says Kurdistan/Iraq internal issues are holding up oil exports thru Turkey

It feels like a bit of a he said/she said as to who and what is holding up the resumption of Iraq and Kurdistan oil exports via Turkey out of the Ceyhan oil export port. (i) Turkey says its Iraq and Kurdistan internal issues holding it up. On Wednesday, we tweeted [LINK] "*Erdogan says holdup of Iraq/Kurdistan #Oil via Turkey is not Turkey's fault. Turkey is waiting for them to resolve their internal matters. Erdogan "we endorse the opening of pipelines because it is a win-win deal. Let them win and let us win too". Thx @KarwanFaidhiDri #OOTT*." Our tweet included a Rudaw (Kurdistan news) report [LINK], who wrote "*Turkish President Recep Tayyip Erdogan on Wednesday said that the suspension of Kurdistan Region's oil exports is because of problems between Baghdad and Erbil, and Turkey takes no issue with the exports. "We do not have an issue in receiving oil from Iraq. This issue is sourced from tensions between the federal government of Iraq and northern Iraq. My relevant friends are holding meetings in this regard," Erdogan told Rudaw's Zinar Shino during a press conference in Vilnius. He said that Ankara is waiting for Baghdad and Erbil to resolve their internal matters, and then Turkey will act. "We endorse the opening of pipelines because it is a win-win deal. Let them win and let us win too," he added."* (ii) Iraq said it was waiting on Turkey. Last week's (July 9, 2023) Energy Tidbits memo wrote "*On Friday, we tweeted [LINK] "Months, not weeks before Kurdistan/Iraq oil exports resumed via Turkey? Iraq oil minister Ghani: waiting on Turkey's assessment of damage & repair (read $$$ needed) to pipeline that was damaged by earthquake & caused a leak. Ghani says 475,000 bpd. Thx @dan_murphy! #OOTT." We don't think it was a matter of translation but Ghani said they are waiting for Turkey to tell the impact and repair needed to fix the pipeline that was damaged in the earthquake early this year. The CNBC translator seemed clear that it was the pipeline that got damaged and not the Ceyhan port facilities as Turkey has previously said. In other words, Iraq is waiting for Turkey to tell them how much it will cost to restore operations. And we still haven't seen any reports that Turkey is planning to get this settled soon. It just seems Iraq is in a wait and hope situation. Our tweet included the transcript we made of comments by Iraq Oil Minister Hayyan Abdul Ghani, via CNBC translator, with Dan Murphy (CNBC) on July 7, 2023. [LINK] Items in "italics" are SAF Group created transcript. Ghani "As you know, the negotiations are ongoing with Turkey and will start again. And through the port and the amount of petrol that's supposed to be exported this pipe could reach 475,000 barrels. Two weeks ago, especially two days before EID, we received a delegation from our brothers in Turkey. And we had negotiations and talks with them what is the way to return to export. And they explained there is a problem – a damage in the pipeline. And this happened because of the last earthquake. The damage caused a leak of oil and now they are assessing the amount of damage to repair and to start exporting again. We asked the Turkish side to send a technical delegation from Iraq to know the damage and how to fix it. And God willing, we are waiting for the results from that Turkish side."* (iii) Our worry is that there is more to Erdogan's position but he just hasn't said so in this press conference. Rather, as noted below, Turkey has previously raised the issue of damage to Ceyhan. Our Supplemental Documents package includes the Rudaw report.

Turkey previously raised the Ceyhan damage post the earthquake

Here is what we wrote in last week's (July 9, 2023) Energy Tidbits memo. "*We were surprised by the Iraq oil minister saying Turkey's damage was to a pipeline given that we had only previously heard that the damage issue was at the Ceyhan export port.*

This has been the key reason Turkey has given on 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 40: Ceyhan terminal in Turkey

Source: TankerTrackers

Oil: Libya's El Feel and Sharara oil fields shut down by protests but then restarted

El Feel Sharara oil fields have restarted

As of our 7am MT news cut off, the latest news in a crazy week for Libya oil was yesterday. On Thursday, Bloomberg reported that protests shut down Libya's 70,000 b/d El Feel opil field and then, on Friday, that protests had also shut down the 300,000 b/d Sharara oil field. These two fields are in SW Libya. But then yesterday afternoon, we weeted [LINK] "*Breaking! "Libya's Sharara oil field is gradually resuming production after protesters that shut the facility earlier this week left, a person familiar with the matter said. Output is likely to be fully restored over the next 24 hours" reports @business Hatem Mohareb. #OOTT".* And then we saw reports the El Feel oil field was also being restarted. So in a matter of a few days, the oil fields were shut down and then restored.

07/03, Haftar warned need new sharing of oil revenues by Aug

The shut down of El Feel and Sharara were not attributed to Haftar. But Haftar warned last week of the risk for oil fields to be shut down. Here is what we wrote in last week's (July 9, 2023) Energy Tidbits memo. "*On Tuesday, we tweeted [LINK] "Haftar is back! So increased risk to Libya's stable #Oil production of ~1.2 mmb/d for months. Haftar says need new fair distribution of oil revenues with eastern Libya by Aug or "the Libyan people will be on time to claim their legitimate right for wealth". Follows 👇06/25 tweet Eastern Libya head Hammad warned could halt oil exports unless get their fair share. #OOTT." Markets shouldn't be surprised that Haftar has*

come out with his warning that there needs to be a new sharing of oil revenues with eastern Liibya as he follows the head of the eastern Libya parliament's warning from two weeks ago that they would halt oil exports without a fair sharing of oil revenues. Haftar had a similar warning that there needs to be a new revenue sharing but added one other issue – it needs to be done in July. On Tuesday, the Libya Observer (Tripoli based) reported [LINK] "Rogue military commander Khalifa Haftar has demanded that the mechanism for distributing the country's wealth and oil revenues be reconsidered, threatening to take action if a plan in this regard is not ready by August. Addressing an audience of military and security figures on Monday, Haftar demanded that a high committee be formed to arrange a financial audit that distributes the revenues equitably. In case of any delay in establishing the relevant committee, "the Libyan people will be on time to claim their legitimate right for wealth," he said." Our Supplemental Documents package includes the Libya Observer report.

06/25/23: Eastern Libya threatens oil exports without proper revenue sharing

Above, we noted how Haftar's warning is a followup to the head of eastern Libya parliament warning three weeks ago. Here is what we wrote in our 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."*

Oil: Libya NOC last production report was oil production was at ~1.2 mmb/d on July 7

Last Libya oil update was ~1.2 mmb/d

As of our 7am MT news cut off, we have not seen any production update from the Libya National Oil Corporation with this week's El Feel/Sharara oil field shut downs and now being restored. Our last two Energy Tidbits memo noted how the NOC had resumed giving production updates as it seemed like they wanted to reassure outsiders who would be concerned by the threats by Haftar and eastern Libya to disrupt oil exports as impacting Libya's current oil production. The latest update was on July 7 on the NOC Facebook [LINK]. The Google Translate version was "*Crude oil production reached one million and 207 thousand barrels per day, and condensate production reached 50 thousand barrels per day during the past 24 hours."* Libya oil production has been steady at ~1.2 mmb/d for the past several months.

Figure 41: SAF Group compiled Libya Ports & Terminals

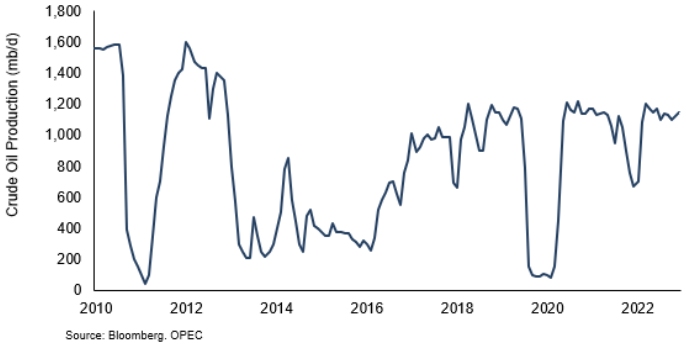
Source: SAF, Bloomberg, HFI Reearch

Oil: The last Libya east vs west fight took oil production to almost zero

Risk of a Libya east vs west conflict

This week's shut in and return of the El Feel and Sharara oil fields is a reminder that there is ongoing risk to Libya's oil production. Especially as there is still no visibility to when the national election will be held. The eastern Libya threats to cut off oil exports without a fair sharing of oil revenues is not a new issue. It was one of the key reasons for the east vs west fighting and conflict that took Libya oil production to almost zero a few years ago. The conflict ended with the promise of a national election on Dec 24, 2021, which would also lead to a resolve over the fair sharing of oil revenues between east and west Libya. The promise of the election led to a restoration of production. The national election never happened and there is still no date for the election, which is why the eastern Libya threat to halt oil exports without a fair sharing of oil revenues is being watched.

Figure 42: Libya oil production Starting July 1, 2010



Source: Bloomberg, OPEC

Oil: No Covid updates this week on Chinese state media

No Covid reporting

We are still somewhat surprised to see no reporting on Covid given it was forecast to peak at the end of June. But, as of our 7am MT news cut off, we haven't seen any updates from state media (Global Times and Xinhua) and the South China Morning Post on an update on Covid cases for the second week. The last reports were pointing to less Covid cases and

there have been no reports on hospitalizations. The only virus reports this week were on some more Monkeypox cases. As a reminder, China had expected Covid cases to peak 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."*.

Oil: Are Chinese consumers tapped or just being cautious on spending their savings?

Are Chinese consumers just being cautious?

We recognize markets have been disappointed with the China recovery including the Chinese consumer. (i) But after listening to the Gulf Intelligence daily podcast on Wednesday, we tweeted [LINK] "*Hmmm! Are Chinese consumers tapped out or just being cautious? 👇 @sean_evers reminds Chinese didn't come out of Covid with a free check from Govt, so have to decide if and when to spend savings. Are 3 consecutive up weeks in domestic air a signal consumers gaining confidence to start dipping into savings? ie. a steady, modest spending increase is ahead? #OOTT #Oil."* (ii) We wonder if the question is are the Chinese consumers tapped out or are they being more cautious on how and when they spend. And that this cautiousness is why we haven't seen the Chinese consumer jump in with two feet when Covid restrictions were removed in Dec. (iii) Part of the reason why Chinese consumers had a start and retreat was the fear of the potential wave of new Covid that caused a pull back in mobility including domestic air travel. That wave was supposed to peak at the end of June with cases up to 60 million per week. IT certainly seemed the Chinese consumer pulled back with the Covid threat. But that fervor died in early June and it didn't seem to happen and we didn't see any reports of hospitalization problems. So it seemed like any Covid cases were less than expected and there wasn't any big hospitalization risk. (iv) So as noted in the next item in the scheduled domestic flights, there have been three consecutive WoW increases in scheduled domestic flights. Not huge but increases. And we didn't see the post national holiday drop off like seen in the May Day national holiday. So it looks like some recovery. Yet it is still way less than expected at the end March. (v) But perhaps the Chinese consumer apparent reaction to Covid worries and why the Chinese consumer hasn't gone in with two feet was best explained by Gulf Intelligence's Sean Evers. He didn't specifically say this but, when he said the comments, it seemed to give a reason why Chinese consumers have been cautious as opposed to tapped out. Evers reminded a big difference is that Chinese people didn't get big Covid bonuses so have had to rely on their savings. And when we heard that, we thought maybe it's caution and not likely tapped out. There is a massive difference in how people spend if they are

spending out of savings vs spending bonus money gifted to them (kind of like lottery money). (vi) Here is the transcript we made of Evers comments. At 29:30 min mark, Evers "*The difference between the China post Covid picture and the west, US Europe, is that China, Chinese consumers not coming out of Covid with a free check from the government. And so savings are being treasured for the uncertain future*." (vii) Chinese are known to be big savers. But the assessment should have been yes they have big savings out of Covid, but they are savings and not a Covid windfall from the govt. And savings don't get blown out. (viii) The test will come over the coming weeks. But if Chinese consumers have been cautious and not tapped out, then it also means that any recovery is likely to be a slower steady recovery and not a big jump up. If the Chinese believe the worst is over for Covid deaths/major sickness and they see China returning to some more consistent growth helped by modestly increasing govt support, then we should see some sort of steady, but modest, increase in Chinese consumer activity.

Jamie Dimon: US consumers $1 Trillion excess money will be spent in 2023

The above reminder was that Chinese consumers didn't get any bonus money from the government as opposed to what happened in the US, Canada and other western nations to aid in the post Covid recovery. So the Chinese have had to look at when do they spend their own savings because they didn't have bonus money from the government. On Thursday, Business Insider posted a story of quotes from JP Morgan CEO Jamie Dimon interview with The Economist. [LINK]. The interview is under subscription. One of Dimon's quotes was on the US consumer running thru their excess money this year. Dimon said "*Consumers have money, they have $1 trillion more in their checking accounts. It's been coming down, and we think sometime around the end of the year that excess money will be spent."*

Oil: 3rd consecutive WoW increase in China scheduled domestic flights

China scheduled domestic flights

On Wednesday, we tweeted [LINK] *"#Oil Positive. China Scheduled domestic flights +2.4% WoW to 99,904. 3rd consecutive WoW increase. Flights didn't drop off post travel for Dragon Boat national holiday Jun 22-24 travel like what happened post May Day national holiday. Thx @BloombergNEF Claudio Lubis. #OOTT."* (i) BloombergNEF posted its Aviation Indicators Weekly on July 12. (ii) Positive indicator from China's scheduled domestic flights for the July 4-10 week, which were +2.4% WoW to 99,904 flights. Flights increased +3.4% WoW for June 20-26 week as expected for the 3-day national holiday Dragon Boat Festival on June 22/23/24. But, different than what happened after the recent 5-day May Day holiday, flights didn't drop immediately back down. Rather scheduled domestic flights were +1.9% WoW to 97,572 flights for June 27-July 3 week, and this week +2.4% WoW to 99,904 flights. This is a positive. Domestic scheduled flights are still a long way to go to what was expected at the end of March but, we have now seen three consecutive WoW increases since mid-April, which seems to suggest some confidence of Chinese consumers to spend some of their savings. (iii) China scheduled domestic flights +2.4% WoW to 99,904 flights for Jul 4-10 week vs 97,572 flights for June 27-July 3 week, and 95,724 flights for June 20-26 week. Domestic flights arenow up for the 3rd consecutive week and didn't have a dip back down after the recent 3-day national holiday Dragon Boat Festiva on June 22/23/24. It looks like it there is a steady increase is happening. (iv) We don't have the data before Jan 5, 2022 but we assume 99,904 flights is the highest since the Covid crash. Last week, we checked back on Bloomberg and it looks like the first Aviation Indicators Weekly report was Jan 5, 2022, but

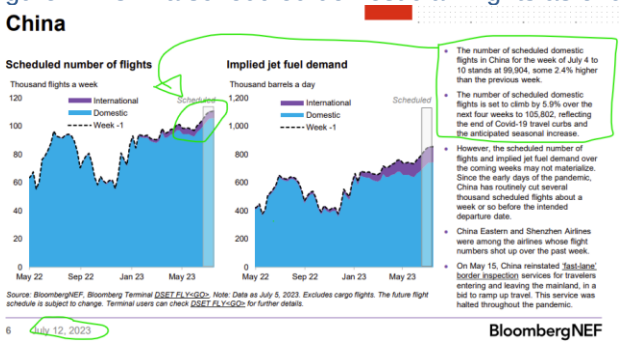
they didn't have separate China graph until months later. (v) So positive as there are two up weeks following the Dragon Boat Festival up week. But still less than what was expected 3 ½ months ago. Scheduled flights for July 4-10 at 99,904 flights are still -16.2% vs what was scheduled on March 28 for the then next 4-weeks (ie. April) of 119,180 flights. But flights are at highs, and well above the prior high of 97,087 flights for the May Day Holiday travel. (vi) Today's number of scheduled domestic flights for the next four weeks is set to increase by +5.9% "over" the next four weeks to reach 105,802 flights. Despite flights being up 7,336 flights over the past three weeks, this isn't much higher than the last three weekly reports that had their respective then 4-week lookahead flights at 104,972 flights, 104,691 flights and 104,501 flights. This week's 4-week lookahead of 105,802 flights is also still -11.2% below the 4-week scheduled on March 28 for the end of April that was 119,180 domestic scheduled flights. The big jump up in April never happened. (vii) So it looks positive for this week. Flights were up for the recent Dragon Boat Festival national holiday but didn't dip down post holiday as they did after the May Day Holiday. Rather, there were two more consecutive weeks of WoW increases. It looks like a steady increase is happening and hopefully signals that Chinese consumers have more faith the worst of Covid is behind them and that the modestly increasing govt support points to a slow but relatively consistent recovery. Our tweet included the BloombergNEF charts from July 12 and March 28, and our listing of WoW changes from the prior BloombergNEF reports.

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

Jul 4-10: +2.4% WoW to 99,904 flights
Jun 27-Jul 3: +1.9% WoW to 97,572 flights
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 to 88,166
Mar 7-13 week: -0.8% WoW to 88,675
Feb 27-Mar 3 week: -2.6% WoW to 89,430
Feb 21-27 week: +0.0% WoW to 91,828
Feb 14-20 week -0.5% WoW to 91,561
Feb 7-13 week -0.7% WoW to 92,007
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW to 83,500
Jan 17-23 week +7% WoW to 91,959
Jan 10-16 week +20% WoW to 85,910
Jan 3-9 week: -5.3% WoW to 71,642
Dec 27-Jan 2 week: -5.6% WoW to 75,652

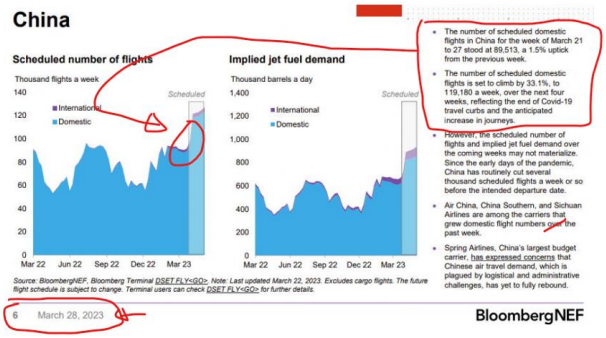
Source: BloombergNEF

Figure 44: China scheduled domestic air flights as of July 12



Source: BloombergNEF

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



Source: BloombergNEF

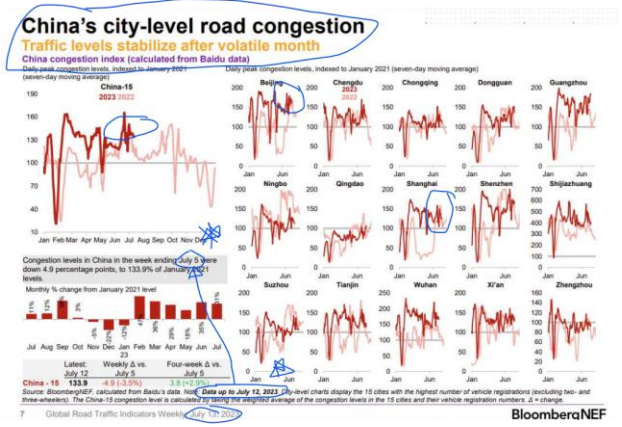
Oil: Baidu China city-level road congestion likely impacted by summer holidays

China city-level traffic congestion

The Baidu China city-level road congestion was down WoW, but we think it is likely due to the start of the main summer holidays. On Thursday, we tweeted [LINK] "*China Baidu city-level road congestion -4.9% WoW to 133.9% of Jan 2021 levels. But likely linked to July start of summer holiday season. ie City-level congestion in big cities (ie. Beijing, Shanghai) was up WoW last week but down WoW this week. Other holiday support, 👇07/12 tweet, 3rd consecutive WoW increase in scheduled domestic flights ie. Chinese are flying domestically on holiday. Thx @BloombergNEF #OOTT."* BloombergNEF posted its Global Road Traffic Indicators July 13 report, which includes the China Baidu city-level road congestion data for week ended July 12. Please note there is a typo that we have circled. This is for the Baidu data for the week ended July 12 as it says in the source, but the grey shaded box says July 5. We checked vs last week's report and the data is updated for July 12 so the grey shaded box is a typo. BNEF's headline was "*Traffic levels stabilize after volatile month.* For the week ended July 12, 2023, Baidu data for China city-level road congestion was -4.9% to 133.9% of Jan 2021 levels. It won't be viewed as a big negative as July is the beginning of summer holiday season and so the city-level traffic should be less in big cities like Beijing and Shanghai. Bloomberg didn't provide the specific Baidu numbers for each city for the week ended July 12 data, but it looks like the graphs for Beijing and Shanghai both were up WoW last week but down WoW this week. Plus when looking at the city data for July 2022, almost

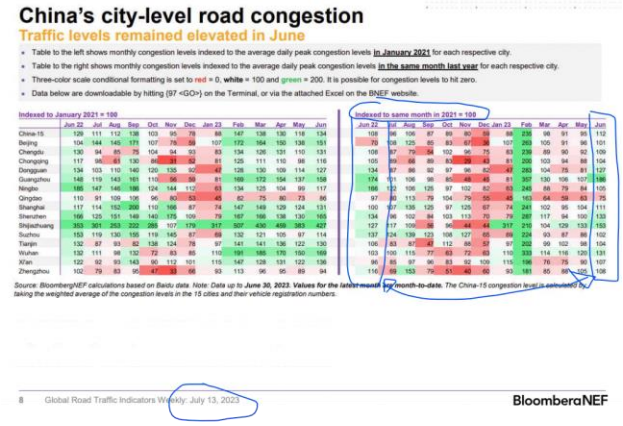
every city had lower city-level road congestion in July 2022 vs June 2022. The other support for that it is likely due to the start of the July summer holiday is that, as noted above, yesterday, we saw the 3rd consecutive WoW increases in scheduled domestic flights ie. people are flying within China. Note Bloomberg did not provide the specific by city numbers for July. So the latest by city detailed numbers are for June, which are unchanged from what I wrote last week. "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 was 112 vs Covid impacted June 2022 indexed at 108. So up YoY. However, there are only 7 of the top 15 cities that are up YoY. Note this is indexed to June 2021 and not June 2020." Our tweet included the below graph and table from the BloombergNEF Global Road Traffic Indicators July 13 weekly report.

Figure 46: China city-level road congestion for the week ended July 12



Source: BloombergNEF

Figure 47: China city-level road congestion for the week ended July 12.



Source: BloombergNEF

Oil: China adds ~110 million barrels to oil storage in YTD May 31

China adds ~110 mmb to oil storage

One of the big oil stories in 2023 has been how China has been ramping up its oil imports taking advantage of discounted Iran and Russian crude oil. And it looks like this means they have added almost 110 million barrels to oil storage levels. On Tuesday, we tweeted [LINK] "*China ramps up #Oil in storage as imports exceed consumption. See 👇SAF transcript. "based on official data about 714,000 b/d were put away" into storage in YTD May 31, Victor Yang to @sean_evers. Usual great @gulf_intel podcast. #OOTT."* On the Gulf Intelligence daily podcast [LINK], Victor Yang (Senior Analyst JLC Network Technology) was in dialogue with Sean Evers (Founder, Managing Partner Gulf Intelligence), when Yang highlighted the buildup of China oil stocks based on official data. We made a transcript "At 8:05 min mark, Yang "…. *But the country's [China] oil demand, particularly crude oil demand, has actually been growing quite fast. Say in the first five months, it grew by about 6.2% and considering."* Evers *"year on year*?" Yang "*Yes. Considering its economic growth, it's quite fast. And the country actually still put away some crude in the first five months. Kind of reason was because the concerns about energy security among these geopolitical concerns. So but we are looking at"* Evers "*are you saying Victor the first half there was a lot of oil imports but not necessarily consumption. The oil imports were high but the oil was not consumed domestically*?" Yang "*Well, based on official data about 714,000 barrels per day were put away".* Evers "*put away, being put into storage*?" Yang "*Yes, storage. And so the country continued to store crude this year."*

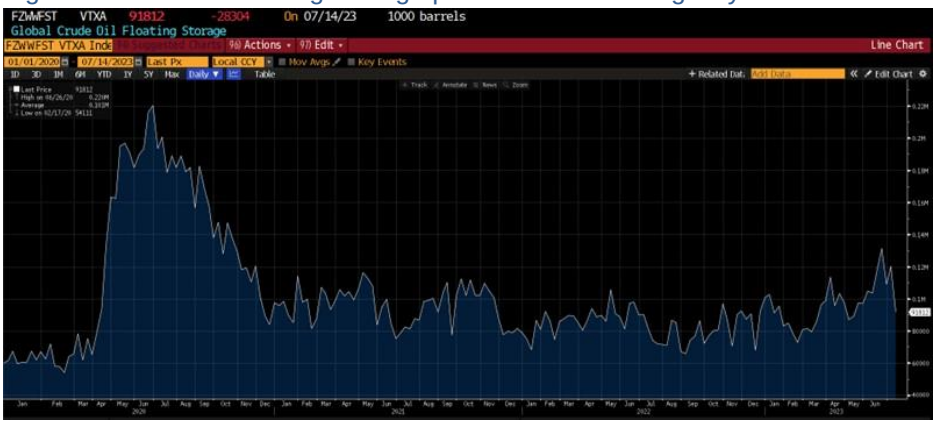
Oil: Vortexa crude oil floating storage at July 15 was 91.81 mmb, -28.31 mmb WoW

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 July 8 at 9am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for July 14 at 91.81 mmb, which is -28.31 mmb WoW vs hugely upwardly revised July 7 of 120.12 mmb. Note July 7 of 120.12 mmb was revised +20.68 mmb vs 99.44 mmb posted on Bloomberg as of 9am MT on July 8. (ii) Note there was only a small revision to the very high June 23 of 131.36 mmb (revised up from 130.93 mm). This was the highest level of floating oil storage since the pandemic year when Oct 23, 2020 was 137.61 mmb. This week was back below 100 mmb for the first time since May 26, so the impacts of Saudi extra 1 mmb/d cuts and Russia starting to comply are will keep floating storage back below 100 mmb. (iii) There was a huge +20.68 mmb revision to July 7, and June 30 was revised up +5.52 mmb. The rest of the revisions were less than +/- 1 mmb other than June 16 revised +3.01 mmb. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on July 8 are as follows: July 7 revised +20.68 mmb. June 30 revised +5.52 mmb. June 23 revised +0.43 mmb. June 16 revised +3.01 mmb. June 9 revised -0.93 mmb. June 2 revised -0.84 mmb. May 26 revised -0.87 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 111.08 mmb vs last week's then seven-week average of 107.96 mmb. The huge revision to July 7 was the key reason. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis. For example, when most report on the Vortexa data on Monday morning, they will be reporting on different estimates. 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 around 9am MT) to provide a fair comparison. (vi) (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) July 14 estimate of 91.81 mmb is -128.50 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (viii) July 14 estimate of 91.81 mmb is +26.20 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) July 14 estimate of 91.81 mmb is +17.66 mmb YoY vs July 15, 2022 of 74.15 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT July 15, 9am MT July 8, and 9am MT July 1.

Figure 48: Vortexa Floating Storage posted on Bloomberg July 15 at 9am MT



Source: Bloomberg, Vortexa

Figure 49: Vortexa Estimates Posted July 15 9am MT, July 8 9am MT, July 1 9am MT

Posted July 15, 9am MT

FZWWFST VTXA Inde

01/01/2020 - 07/14/2023

Date	FZWWFST VT... Last Px
Fr 07/14/2023	91812
Fr 07/07/2023	120.116k
Fr 06/30/2023	108.96k
Fr 06/23/2023	131.36k
Fr 06/16/2023	117.121k
Fr 06/09/2023	103.513k
Fr 06/02/2023	104.661k
Fr 05/26/2023	96984
Fr 05/19/2023	97614
Fr 05/12/2023	88952
Fr 05/05/2023	87044

July 8, 9am MT

FZWWFST VTXA Inde

01/01/2020 - 07/07/2023

Date	FZWWFST VT... Last Px
Fr 07/07/2023	99442
Fr 06/30/2023	103.443k
Fr 06/23/2023	130.932k
Fr 06/16/2023	114.11k
Fr 06/09/2023	104.427k
Fr 06/02/2023	105.497k
Fr 05/26/2023	97846
Fr 05/19/2023	99661
Fr 05/12/2023	90067
Fr 05/05/2023	88280
Fr 04/28/2023	97478

July 1, 9am MT

FZWWFST VTXA Inde

01/01/2020 - 06/30/2023

Date	FZWWFST VT... Last Px
Fr 06/30/2023	95990
Fr 06/23/2023	131.649k
Fr 06/16/2023	112.894k
Fr 06/09/2023	101.962k
Fr 06/02/2023	103.91k
Fr 05/26/2023	97206
Fr 05/19/2023	97374
Fr 05/12/2023	87365
Fr 05/05/2023	85040
Fr 04/28/2023	97959
Fr 04/21/2023	101.58k

Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

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

Vortexa floating storage by region

US Gulf Coast. We then back into the "Other" or rest of world. (i) As noted above, there wa a huge upwardly revision to July 7 of +20.68 mmb. The major area for the upward revision was the huge revision to the July 7 estimates for Asia, which was revised +15.13 mmb to 69.66 mmb (was 54.53 mmb). This is back to the 70.73 mmb for the June 23, 2023 week. And way above the YTD average of ~53 mmb. (ii) Other July 7 revisions. Other was revised +2.89 mmb to 27.50 mmb. West Africa was revised +2.62 mmb to 11.34 mmb. (iii) With the huge upward revision to July 7, There were big WoW changes. Asia was -21.53 mmb WoW to 48.13 mmb. Other was -16.38 mmb WoW to 11.12 mmb. Middle East was +5.47 mmb WoW to 11.18 mmb. West Africa was +3.93 mmb WoW to 15.27 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 July 7 that was posted on Bloomberg at 9am MT on July 8.

Figure 50: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	July 14/23	July 7/23	WoW	July 7/23	June 23/23	July 14 vs June 23
Asia	48.13	69.66	-21.53	54.53	70.73	-22.60
Europe	4.56	4.78	-0.22	4.58	6.33	-1.77
Middle East	11.18	5.71	5.47	5.81	13.76	-2.58
West Africa	15.27	11.34	3.93	8.72	12.43	2.84
US Gulf Coast	1.55	1.13	0.42	1.19	1.21	0.34
Other	11.12	27.50	-16.38	24.61	26.90	-15.78
Global Total	91.81	120.12	-28.31	99.44	131.36	-39.55
Vortexa crude oil floating storage posted on Bloomberg 9am MT on July 15						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil: Delta Airlines CEO "It's going to be a strong Q4. There is no question about it"

Delta Airlines see a strong Q4

We were watching CNBC Squawk Box on Thursday morning when Delta Airlines CEO Ed Bastian came on to talk about the just released Q2 results, which well exceeded expectations. We like the TV interviews as CEOs tend to give a little more off the cuff color than on the earnings calls. Bastian was asked about the strong Q2 and strong summer air travel and if he will see much of the typical seasonal slowdown in air travel after Labor Day. We tweeted [LINK] a video clip of Bastian's comments and wrote "*No sign of the strength in air travel rolling over post Labor Day. will be seasonal impact but @Delta CEO Bastian sees more of the same ie.still stronger than normal . #OOTT #JetFuel."* We made a transcript of video clip where Bastian says "*We'll see some seasonality. There is no question as kids go back to school particularly in the NE. we'll start to see a little bit of the seasonal patterns start to reappear. But I think it's going to be more of the same. I think the international business is going to continue, what we can tell, stay really strong. It's going to be a long summer to Europe. We're going to be flying the summer schedule longer and hotter than anything we've ever flown. So September, October, great times to go to Europe. I think the corporate demand for travel is going to start to pick up a bit more. We're hearing that from corporate travel managers as offices are starting to return back. And employees, companies are staring to mandate back to the office. That's the real driver. It's not that people are afraid to fly or corporates are using virtual. It's that the offices aren't open. And as the offices continue to open, I think we'll see some steady improvement there. And this new hybrid work pattern that we see, that's not going away so potentially any weekend can be a long weekend. So if you put it all together, I think we'll see some of seasonal patterns reappear but it's going to a strong Q4. There is no question about it*." One other comment that caught our attention from

the Q2 call was on how "*the consumer is in good financial shape*" and "*we see a significant gap between the supply that is in place. And what demand could sustain and we expect this gap will remain for an extended period of time.*"

Bastian says avoided issues by reducing schedules this summer

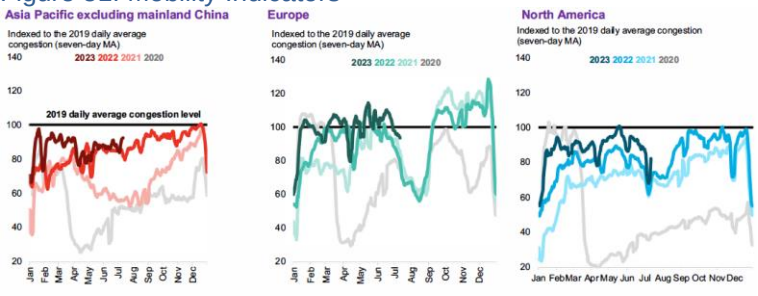
On the CNBC interview, Delta CEO Bastian said "*when you think about the 4th of July holiday, this team delivered over 21,000 flights for our customers, less than 100 cancellations throughout that entire 5-day period*." He was confident that industry will be able to manage this summer better than last summer. He said "*We are. Clearly we are. We'll give last summer a stat I used with our board recently. Last Memorial Day when things really started to pop a year ago, the airline had over 800 cancellations through that long weekend. This Memorial Day holiday weekend, we had 8."* "I *think the important thing for our industry is that we stay within our capabilities." "Remember last quarter we were talking about Delta proactively pulled its schedule down this summer by 3% to give us some breathing space for that*".

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 July 11, Asia Pacific (ex-China) and North American traffic levels increase by +10.3% and +13.4% WoW, respectively. While Europe's traffic level decrease -2.3% WoW. Traffic levels in Europe, North America, and Asia Pacific (ex-China) traffic are -6.4%, -17.9% and -7.7% below the 2019 average and are +17.3%, +18.0% and +13.2%YoY, respectively. It is important to note that Canada and the US both had holidays last week. Traffic in Europe had been steadily increasing in June, but has since dropped off in July. NA and Asia Pacific (ex-China) have been steadily increase over the last week. It its worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 51: Mobility Indicators



Week-on-week (2019 average = 100)	Latest week: Jul 11	Δ vs. Jul 4	4-week MA	Δ vs. Jul 4
Asia Pacific ex-China	92.3	+8.6 (10.3%)	88.8	+1.6 (1.9%)
Europe	93.6	-2.2 (-2.3%)	100.2	-3.6 (-3.4%)
North America	82.1	+9.7 (13.4%)	83.4	-2.7 (-3.1%)

Year-on-year (same week last year = 100)	Latest week: Jul 11	Δ vs. Jul 4	4-week MA	Δ vs. Jul 4
Asia Pacific ex-China	113.2	+15.3 (15.6%)	105.5	+3.2 (+3.2%)
Europe	117.3	+6.8 (6.1%)	113.8	+2.8 (+2.5%)
North America	118.0	+8.4 (7.7%)	113.4	+1.5 (+1.4%)

Source: BloombergNEF

Above-average hurricane activity

Oil & Natural Gas: Klotzbach ups Atlantic hurricane forecast to above average activity

Last Thursday, Phil Klotzbach and his team at Colorado State University posted an updated forecast for the 2023 Atlantic hurricane season [LINK].. The new forecast increases their expectation to an above average hurricane season vs their June 1 forecast that was for a near-average hurricane season. They now estimate there will be 18 named storms this season, with 9 having the potential to become a hurricane. The forecast commented "*We have increased our forecast and now call for an above-average Atlantic basin hurricane season in 2023, although uncertainty with this outlook is larger than normal. While we continue to anticipate a robust El Niño for the peak of the Atlantic hurricane season, most of the tropical and subtropical Atlantic now has record warm sea surface temperatures. El Niño increases vertical wind shear in the Caribbean and tropical Atlantic, but the extreme anomalous warmth in the tropical and subtropical Atlantic may counteract some of the typical El Niño-driven increase in vertical wind shear. The probability of U.S. major hurricane landfall is estimated to be above the long-period average."* Our Supplemental Documents package includes excerpts from the update July 6 Klotzbach forecast.

Figure 52: Klotzbach updated 2023 Atlantic Hurricane Forecast

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2023

Forecast Parameter and 1991-2020 Average (in parentheses)	Issue Date 13 April 2023	Issue Date 1 June 2023	Issue Date 6 July 2023	Observed Thru 5 July 2023	Remainder of Season Forecast
Named Storms (NS) (14.4)	13	15	18	4	14
Named Storm Days (NSD) (69.4)	55	60	90	11.50	78.50
Hurricanes (H) (7.2)	6	7	9	0	9
Hurricane Days (HD) (27.0)	25	30	35	0	35
Major Hurricanes (MH) (3.2)	2	3	4	0	4
Major Hurricane Days (MHD) (7.4)	5	7	9	0	9
Accumulated Cyclone Energy (ACE) (123)	100	125	160	10	150
ACE West of 60°W (73)	55	70	82	4	78
Net Tropical Cyclone Activity (NTC) (135%)	105	135	170	11	159

Source: Colorado State University

BC and Alberta Wildfires

Oil & Natural Gas: BC wildfires up 68% this week, Alberta roughly flat

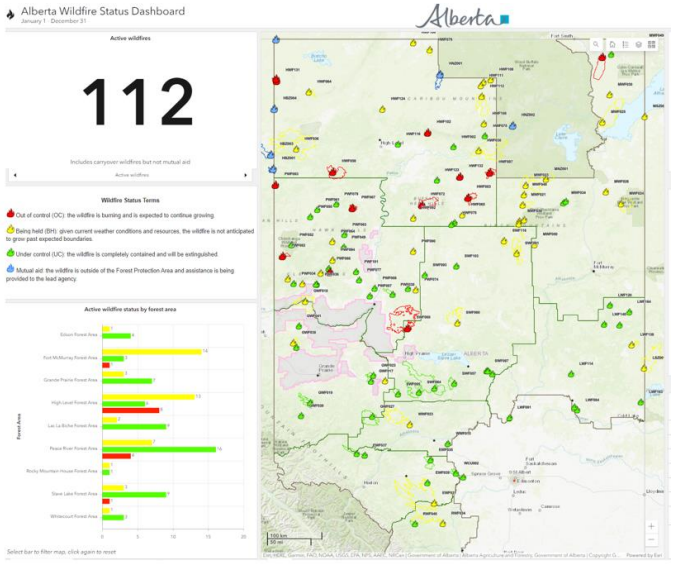
It's been another bad week for BC with massive increases in wildfires and Out of Control wildfires this week and both keep increasing every day. Alberta wildfires have been roughly flat this week. It is inevitable that this massive increase will have a huge impact on people including evacuations. And there will inevitably be some impacts on business as the priority in BC will be in allocating all possible resources to getting people to safety, protecting homes and businesses. The day-to-day business workings will inevitably have some impact, the question is how much. Last night, we tweeted [LINK] "*Wildfire update last 24 hrs. BC: 7pm 07/15: 372 fires incl 249 Out of Control. 7am 07/15: 376 fires incl 241 OOC. 7pm 07/14: 369 fires incl 237 OOC. AB: 7pm 07/15: 112 fires incl 14 OOC. 7am 07/15: 114 fires incl 15 OOC 7pm 07/14: 114 fires incl 15 OOC. Stay safe! #OOTT #NatGas."* For perspective BC's total wildfires are up 68% WoW and Out of Control fires are up 73% WoW. Alberta's total wildfires are up 2% Wow and Out of Control fires are down 13% WoW.

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

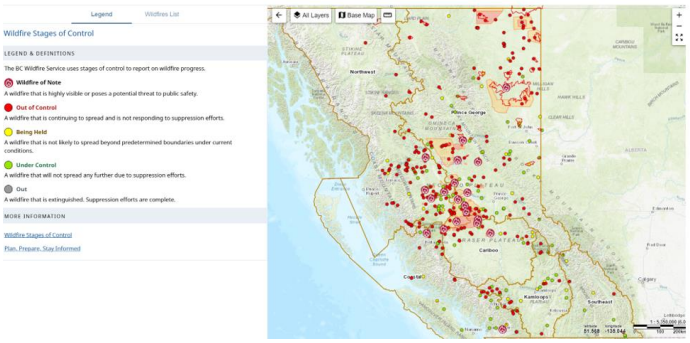
maps are interactive and open up for the information on any particular fire. Here are the wildfire maps as of 7pm MT last night and, for BC, also for 9am MT this morning, and the BC Wildfire Service wildfire statistics as of 9am MT this morning.

Figure 53: Alberta wildfire map as of 7pm MT on July 15



Source: Alberta Wildfire Status Dashboard

Figure 54: BC wildfire map as of 7pm MT on July 15



Source: BC Wildfire Service

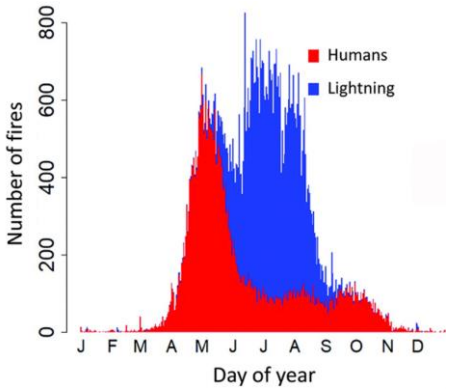
Oil & Natural Gas: Peak Cdn wildfire season is normally Jul/Aug & lightning is #1

Wildfire peak is normally July Aug

The BC Wildfire Service statistics remind how the vast majority of wildfires are caused by lightning. BC divides the causes of the 372 active wildfires: 315 or 84.7% caused by lightning, 21 or 5.6% caused by people, and 36 or 9.7% with unknown causes. In peak wildfires season (right now) lightning strikes are the major cause of wildfires. 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 because of the smoke drifting into the US. It's

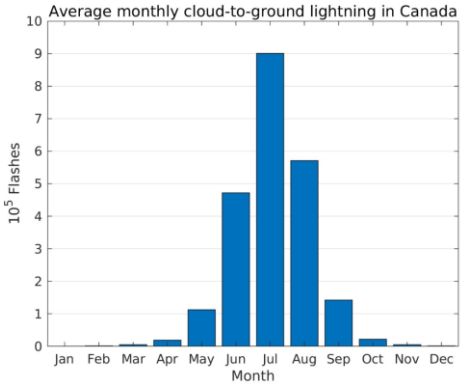
a reminder that wildfires are not just a western Canada. It's always better to see less wildfires. But we remind that wildfire season is just starting. Unfortunately, we have to remind that wildfire season peak isn't normally until July/Aug. (i) On May 9, we tweeted [LINK] *"#Wildfire season is, unfortunately, 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) The problem that we have been warning is that it was extremely dry in the west this winter and in the spring. 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. We checked yesterday and the June precipitation isn't yet posted. Below are Nov 1 thru Apr 30 and for the month of May maps showing precipitation % of normal. It's been dry.

Figure 55: Canada Wildfires Distribution Over Year



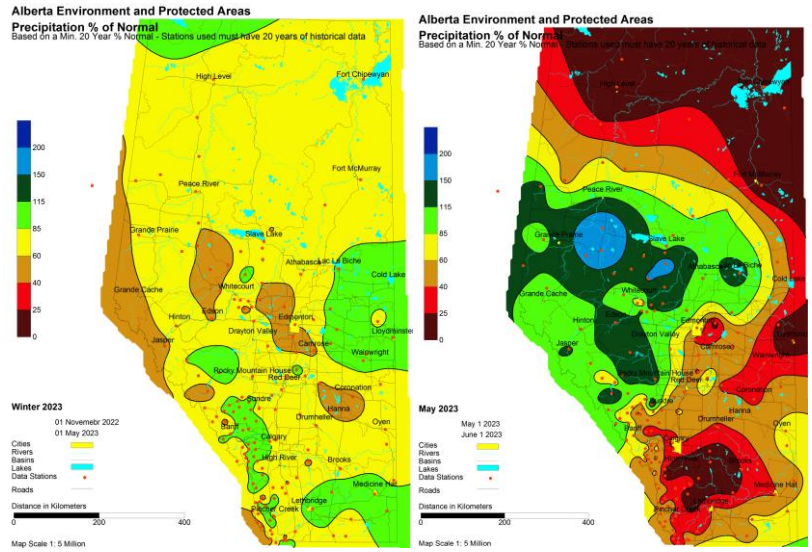
Source: Wildfire Today

Figure 56: Average monthly cloud-to-ground lightning in Canada



Source: Canada Environment and Natural Resources

Figure 57: Alberta Precipitation % of Normal for Nov 1-Apr 30, and for May



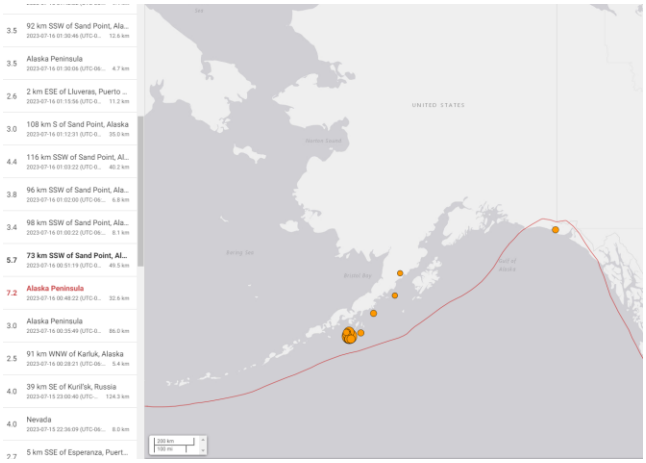
Source: Alberta Environment

Oil & Natural Gas: Tsunami warning cancelled post 7.2 earthquake off Alaska

There was a big 7.2 earthquake off the coast of far west Alaska yesterday and the initial tsunami warning was cancelled last night. It's still early but, as of our 7am MT news cut off, we checked sources like Anchorage Daily News and have not seen any reports of damage. It was far off to the west so hopefully, there wasn't impact. We did see videos on Twitter this morning showing big waves in to parts of Alaska. It's early but so far so good.

7.2 earthquake offshore Alaska

Figure 58: 7.2 earthquake offshore Alaska on July 15



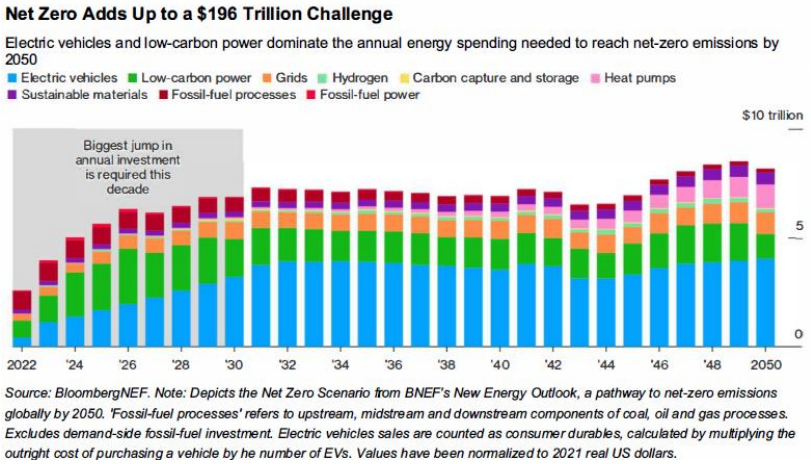
Source: BloombergNEF

Energy Transition: BNEF 39% of $196T Net Zero scenario investments aren't economic

BNEF $196 Trillion to get to Net Zero

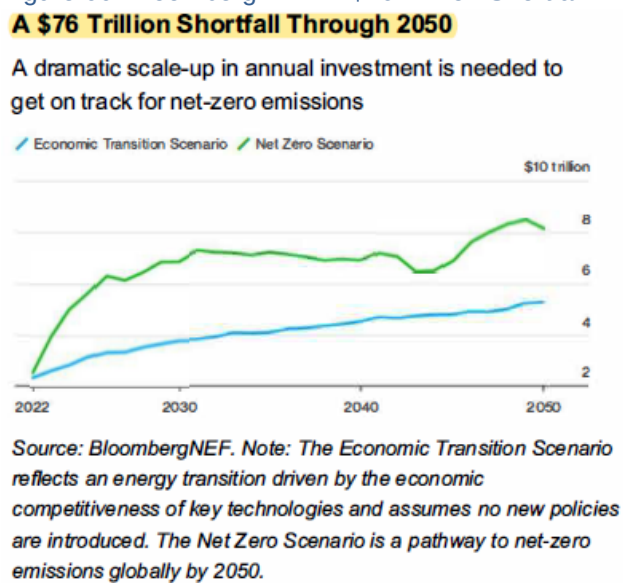
For years, we have been highlighting our concern that the western leaders set a Net Zero plan with 2030 targets without having the technology or economic actions to get there, while aggressively trying to cut fossil fuels. So there end up creating a gap on how to power the world on a reliable, affordable and available basis and set up a decade of higher energy prices and potential energy crisis. The headline on last week's BloombergNEF report and forecast was that it will take $196 trillion of investments to get to Net Zero. On July 3, BloomberNEF posted its report "*Make-or-Break Decade for $196 Trillion Climate Challenge" estimates $196 trillion to get to Net Zero*." This is a BloombergNEF forecast and not a western government forecast but recall what we have seen over the years, the governments have been reluctant to tell their countries how many trillions will be needed for the energy transition as all that means is that energy will inevitably have to be more expensive over the mid and long term. Or they don't want citizens to believe it isn't attainable. When we red the report, what jumped out at us was that BloombergNEF sees this huge and growing gap of not having economic and technological solutions to meet Net Zero aspirations. We tweeted [LINK] "*Headline: BNEF $196 Trillion investment to get to #NetZero. BUT $76T of $196T isn't economically competitive. Without new policy incentives, risk being $21T short of Net Zero pathway by 2030 & $76T by 2050. #Oil #NatGas will be needed for longer! Thx @BloombergNEF Nilushi Karunaratne #OOTT."* We thought the most important part of the BloombergNEF forecast is that $76 trillion of the $196 trillion investment isn't economic so will need additional policymaker incentives. In other words, if economics are going to drive investment, there is no way to get there. Why this is important is that it means that this $76 trillion investment won't happen until there is policymaker support. Which inevitably means, at a minimum, delays. If not some project cancellations. This is the big problem with the Net Zero movement – they don't have the technology or economics to get there. So governments have to kick in a lot more to get it done. And they have to do it on a timely basis ie. now. And as noted in the below offshore wind item, there are already clear examples that this isn't happening fast enough and that there are major project delays. Offshore wind, we have been highlighting how offshore wind OEMs are saying they aren't making the returns. That is getting translated into projects that were approved and supposed to be moving ahead in a stall. As the projects are increasingly looking to renegotiate their deals to make the projects economics. Our Supplemental Documents package includes the BloombergNEF report.

Figure 59: BloombergNEF: Net Zero Adds Up to a $196 Trillion Challenge



Source: BloombergNEF

Figure 60: BloombergNEF: A $76 Trillion Shortfall Through 2050



Source: BloombergNEF

Energy Transition: Kerry using UN $2.5-4.5T/yr to 2050 as the cost for clean energy

Kerry on cost of energy transition

On Thursday, Special Presidential Envoy for Climate John Kerry appeared before a House Foreign Affairs sub Committee meeting. We watched to the 2 hr 45 min replay [LINK]. (i) The headlines from his testimony were on his private plane denials. But the Kerry comments that caught our attention were on the cost to American taxpayers for the energy transition. We tweeted [LINK] "*Hmmm! @RepTimBurchett asks what is cost to Americans of climate push.#Kerry using UN's fcast for #NetZero to cost $2.5-$4.5T/yr to 2050. Sounds huge but only ~1/2 of 👇@BloombergNEF est $196T. Note Kerry's reply. private investment is not spending. If he was inferring private $$ don't flow thru to cost taxpayers, Burchett reminds it will be like adding a tax on a can of beer. #EnergyTransition is happening. But it will just cost more, take longer & be a rocky road. #NatGas will be needed for longer. #OOTT."* (ii) We weren't surprised that Kerry didn't reference a US forecast. We still believe the reason why the Biden Admin doesn't want to have a formal finished forecast is that they don't want to be forced to say how many $trillions it will cost. Rather Kerry referenced a UN forecast that sounds big but, using the mid point, is only half of what BloombergNEF estimates at $196 Trillion [see above item]. Kerry references the UN forecast of $2.5 to $4.5 trillion a year. We don't know when the UN made this forecast but, based on the latest EU forecast for way more money for the energy transition, we assume the UN forecast is at least a couple years old. (iii) Burchett's question was how much this would cost American taxpayers. Kerry highlighted that private investment isn't spending as if to imply if the private sector spends the money, It's not a cost to Americans ie. it doesn't go thru to the consumer. That seemed to be the way Burchett interpreted the Kerry response. And we like Burchett's reminder to Kerry that if there are added costs, how can they not flow to more cost to taxpayers. He did this by his response "*but you understand though that when they invest, money just doesn't appear*." Kerry "*No, you're absolutely correct*". Burchett "*I was always in the state legislature and somebody said lets just put another nickel on a can of beer. And I said they're just going to pass that on to your constituents. So I hope you understand that*."

Transcript of Burchett/Kerry exchange

Our tweet included the transcript we made of the Burchett/Kerry exchange. SAF Group created transcript of comments by Congressman Burchett and Special Climate Envoy Kerry at the House Foreign Affairs Committee meeting on July 13, 2023. [LINK] Items in *"italics*" are SAF Group created transcript. At 2:07:50 min mark, Burchett "*Sir, you are unelected, you're non-Senate confirmed, bureaucrat basically. Can you tell me what the cost of some of these climate agreements that you've got the American taxpayers in, how much is this going to cost them?"* Then after a Kerry answer that didn't answer the question, Burchett follows up "*can you just tell me how much it's going to cost us. Surely there's some sort of economic projections*." Kerry "….. *you're right. The UN finance analysis suggests that it will cost trillions of dollars. Maybe $2.5 to $4.5 trillion a year between now and 2050 to actually effect the full transition to a clean energy economy. But that's not spending. Most of it is calculating private sector funding that will invest in these new technologies and in these new economic opportunities. For instance, we have to build out a grid, competent, with smart grid so we can balance the distribution of energy in certain places*. " Burchett "*but you understand though that when they invest, money just doesn't appear*." Kerry "*No, you're absolutely correct*". Burchett "*I was always in the state legislature and somebody said lets just put another nickel on a can of beer. And*

I said they're just going to pass that on to your constituents. So I hope you understand that."

Energy Transition: EU needs another $760b every year for green shift

One of the reasons why we think the UN forecast has to be at least a couple years is that all we are seeing from all forecasts is that the energy transition is going to cost a lot more than expected. A good example was the latest EU view that they need another $763 billion per year for the green transition. Here is what we wrote in last week's (July 9, 2023) Energy Tidbits memo. *"Another to add to their voice, but not in a direct way, that the energy transition isn't working anywhere near their aspirations is the EU. But indicating they need a lot more money every year is an admission that they are nowhere near their energy transition plan. On Thursday, we tweeted [LINK] "Big OOPS! EU must invest an additional €700b PER YEAR for green shift & shut out cheap Russian fossil fuels reports @johnainger @AlbertoNardelli. Reinforces #EnergyTransition will take way longer, cost way more & be rocky road. And #Oil #NatGas #Coal will be needed for longer. Thx @johnainger @AlbertoNardelli. #OOTT." Bloomberg reported Europe says it needs an additional $763 billion per year for the green transition and that most needs to come from private money! That seems like a pretty clear admission that their energy transition plan isn't working. Bloomberg wrote "The European Union must invest an additional €700 billion ($763 billion) a year if it's to green the economy and shut out cheap Russian fossil fuels, according to a draft report from the bloc's executive arm. Most of that figure will have to be privately sourced, the European Commission said in the draft seen by Bloomberg News. The vast sum — significantly higher than that proposed by Commission President Ursula von der Leyen less than two years ago — underlines the escalating costs of reaching net zero goals. "The green transition requires unprecedented investments," the commission said in its so-called Strategic Foresight report, which is still subject to change before publication Wednesday. "The full costs and consequences of the climate and biodiversity crisis are unknown". Note that the Bloomberg reporting was accurate. We checked the final 2023 Strategic Foresight Report website Q&A [LINK] and it said "The increasing pressure to ensure sufficient private and public funding for sustainability: the green transition requires unprecedented investments. Overall, additional investments of about EUR 620 billion annually will be needed to meet the objectives of the Green Deal and of our REPowerEU plan, with an additional EUR 92 billion needed to address the objectives of the Net-Zero Industry Act over the 2023-2030 period." Our Supplemental Documents package includes the Bloomberg report*."

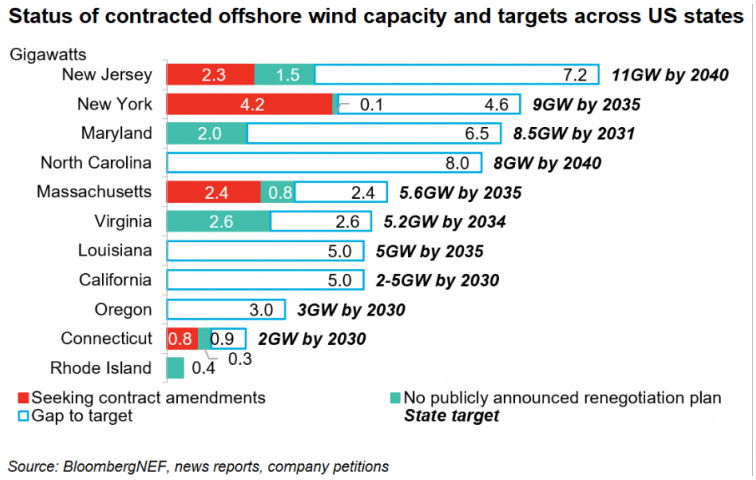
Energy Transition: Over ½ of US offshore wind projects face delays

Over ½ of US offshore wind projects delayed

Wind generation and the big offshore wind projects are key to the Energy Transition. And no question, over the past few years there have been a number of major offshore wind projects announced including offshore the US east coast. But it isn't enough to have a project announced, the project has to get done and done on time. There have been some offshore wind project cancellations and project developers leaving projects. And there are also many offshore projects in delay limbo as the project developers seek to renegotiate the deals to get satisfactory returns due to big cost increases. These projects are in limbo. We have been reporting on this lack of returns to OEMs and project developers. In the, BloombergNEF

estimates that more than half of all offshore wind projects are now delayed and there could be more projects delays on top of that. On Monday, we tweeted [LINK] "*Over 1/2 of US #OffshoreWind face delays as "developers such as Avangrid, Shell-Ocean Winds, BP-Equinor & Orsted-Eversource have cited deteriorating economics due to rising costs in trying to renegotiate or cancel contracts" reports @atinjai. #NatGas power will be needed for longer. #OOTT."* Our tweet included the below BloombergNEF graph and wrote "*New York state has a target to add 9 gigawatts of cumulative offshore wind capacity by 2035 and contracted 4.36GW of projects in its two concluded solicitations. But renegotiation attempts mean that 95% of the contracted capacity is at risk of delays. Neighboring Massachusetts sees 75% of contracted capacities being delayed by renegotiation attempts. In Connecticut it's 73%. New Jersey, which is targeting of 11GW, risks delays to 60% of its contracted pipeline. About 9.7GW of US offshore wind projects, or just over half of the 17.8GW total contracted, face delays, and more projects may soon face the same fate. Developers such as Avangrid, Shell-Ocean Winds, BP-Equinor and Orsted-Eversource have cited deteriorating economics due to rising costs in trying to renegotiate or cancel contracts."* Our Supplemental Documents package includes the BloombergNEF report..

Figure 61: Status of contracted offshore wind capacity and targets across US states



Source: BloombergNEF

Energy Transition: TotalEnergies "carbon-free system will be more expensive"

LCOE or full system costs

There was a great reminder last Saturday from La Tribune of an overlooked part of the energy transition – the discussion of LCOE (levelized cost of energy produced) vs full system costs. LCOE are more or less the marginal cost of added electricity at the source level. We wish we had more than high school French so we could fully appreciate what you don't normally see in a public panel among CEOs like what looks to have happened last Saturday on at the Les Recontres Economiques in Aix de Provence. But even we can understand ce n'est pas vrai. Et je pense qu'll fait dire la veritee. The video clips show some passionate comments from TotalEnergies CEO on the reality check of the cost of electricity under the push to get rid of fossil fuels and his concern that people forget that there is an all-in cost to support intermittent renewable energy. (i) LCOE vs full system costs. The La Tribune story is

a good reminder of the part that is most overlooked by the renewable energy side – there is a full system cost to take into account. La Tribune wrote "*LCOE or full system costs? This ties in with the famous debate on the indicator to be used to measure the cost of each energy. Should we focus on the costs of energy sources alone, calculated among others by the LCOE ("levelized cost of energy produced", an indicator of the Lazard bank), or the full system costs involved in each new unit of energy production? One thing is certain: widely used to demonstrate the competitiveness of solar and wind, LCOE does not actually integrate the system costs associated with each technology, such as batteries, hydraulic storage, or the hydrogen loop. Nor those induced by the transmission and distribution network, which will have to be adapted if we change the production model. It is for this reason that, in its calculation methods on the energy mix in 2050, the French electricity transmission system operator RTE examines costs in a bottom-up analysis including the generation, flexibility and network chain, and taking into account load rates, rather than the LCOE. And believes that these additional costs will be "higher in scenarios with a very high share of renewable energy".* (ii) Pouyanne's big picture concern is linked to the full system cost. Pouyanne said ""*When you take a complete system, unless you agree to keep a lot of fossils, it will cost more than today. [...] Don't tell people that because the sun is free, it's not going to be expensive, it's not true! [...] The system will be increasingly complex to manipulate*". He reportedly noted that the intermittent nature means there will be the need for storage and "*However, "we are far from it," said Patrick Pouyanné, since no competitive technology today makes it possible to store electricity on a large scale."* (iii) There wasn't the direct quote but MacGregor acknowledged one of the big concerns on moving to big renewable energy – increasing grid instability. La Tribune wrote "*Moreover, even if renewable energies increase instability in electricity networks, "gas plants, running on carbon-free gas, will play a massive role [to remedy it, editor's note]," she replied to the boss of TotalEnergies, who did not hesitate to call her "Madame Soleil".* (iv) But MacGregor says the instability can be taken care of by natural gas plants running on hydrogen. Our reminder continues to be hydrogen is not an energy source, it is a carrier of energy generated by a source whether it be natural gas, renewable energy, etc. Pouyanne wasn't impressed. La Tribune wrote "*But "if you want to make electricity with hydrogen and biogas, it's expensive!" immediately opposed the boss of TotalEnergies."* (v) Lastly the headlines on Twitter on the exchange were on offshore wind and how the economics don't work at the prices being paid for offshore rights. On Monday, we tweeted [LINK] "*Ouch! #TotalEnergies CEO Pouyanne wants true all-in cost of offshore wind known. Go to 3min mark Engie CEO MacGregor speaks, Pouyanne jumps in with his ce n'est pas vrai on offshore wind. Didn't go over well with MacGregor. [LINK] #OOTT #EnergyTransition."* La Tribune wrote "*But "if you want to make electricity with hydrogen and biogas, it's expensive!" immediately opposed the boss of TotalEnergies. Which also did not fail to tackle the conditions in which were won the last tenders on offshore wind by EDF, at less than 50 euros per megawatt hour (MWh). "If you make an investment, you probably don't take 50 euros per MWh as a hypothesis, but probably much more. We do not invest in offshore wind in Europe at 50 euros per MWh, that's not true! ", he assumed, under the tense laughter of Catherine MacGregor, who pointed the finger at the CEO of EDF, Luc Rémont".* If you look at the video, tense laughter is a good description. Our Supplemental Documents package includes La Tribune report.

LCOE vs full system costs reminds of oil & gas finding vs all-in onstream costs

When we hear the full focus Here is what we wrote in last week's (July 9, 2023) Energy Tidbits memo. *"New Shell CEO Wael Sawan continues to ruffle the feathers of the climate change side with his straight talk on the reality that the energy transition aspirations aren't ready to replace oil and natural gas as envisioned unless the world wants to have energy crisis and chaos. Sawan*

Energy Transition: UK warns energy transition doesn't happen overnight

UK warns on the energy transition

On Tuesday, US climate envoy John Kerry and UK Energy Security and Net Zero Secretary Grant Shapps convened the Climate Finance Mobilisation Forum in Windsor. No surprise Kerry kept to the company line on climate, but Shapps warned on the energy transition doesn't happen overnight. (i) The BBC reported [LINK] on comments by both on the recent Shell CEO Sawan July 5 comments ""*What would be dangerous and irresponsible is cutting oil and gas production so that the cost of living, as we saw last year, starts to shoot up again*." (ii) It's interesting to see the difference. And to some degree, understandable. If you are an energy and resources rich country like the US or Canada, it is a very different position than countries that are energy importers. Kind of like the difference approach to Net Zero as rich countries vs poor. Or any situation of have's with a totally different view vs the have not's. (iii) Kerry comments: BBC wrote "*Energy firms have been criticised for backtracking on climate change pledges. Senator Kerry told the BBC said that any changes to these promises were "moving in the wrong direction". His comments came on the sidelines of a meeting of net zero financiers and philanthropists ahead of President Biden's meeting with King Charles in Windsor. Mr Kerry said any backtracking was "unnecessary" and "dangerous". "What we need are company chief executives, looking to the future and investing in that future and accelerating the transition to that future," he said. "Look, in the last few days, we've had scientists say this is terrifying , we have scientists saying we are in uncharted territory.*" (iv) Shapps comments are 180 difference. We tweeted [LINK] *"Latest to have reality check. UK warns #EnergyTransition "doesn't just happen overnight, in fact it's idiotic to suggest you can" "if you tried to, you simply impoverish people & tell people they can no longer drive & they can no longer heat their homes" UK's @grantshapps re 👇07/09 Shell CEO #Oil #NatGas cutting. @ClimateEnvoy has a different view. #Oil #NatGas will be needed for longer. #OOTT."* Here is what the BBC wrote "*At the same event as Mr Kerry was speaking, the Energy Security and Net Zero Secretary, Grant Shapps, was broadly supportive of the Shell chief executive's stance, saying: "There always has to be a transition… but it doesn't just happen overnight, in fact it's idiotic to suggest you can. "If you tried to, you simply impoverish people and tell people they can no longer drive and they can no longer heat their homes*". Our Supplemental Documents package includes the BBC report.

Shell "dangerous & irresponsible is cutting oil & gas production

Here is what we wrote in last week's (July 9, 2023) Energy Tidbits memo. *"New Shell CEO Wael Sawan continues to ruffle the feathers of the climate change side with his straight talk on the reality that the energy transition aspirations aren't ready to replace oil and natural gas as envisioned unless the world wants to have energy crisis and chaos. Sawan continues to speak out on the reality that trying to force out oil and natural gas without a replacement will be extremely negative to the world's economies. On Wednesday, we tweeted [LINK] "#Oil#NatGas#LNG will be needed for longer. "What would be dangerous and irresponsible is cutting oil and gas*

production so that the cost of living, as we saw last year, starts to shoot up again" @Shell CEO Sawan. Thx @BBCSimonJack. #OOTT [LINK]." We couldn't find any video but the BBC interviewed Shell CEO Sawan and their report was titled "Oil giant Shell warns cutting production 'dangerous' [LINK]. The BBC wrote "Wael Sawan insisted that the world still "desperately needs oil and gas" as moves to renewable energy were not happening fast enough to replace it. He warned increased demand from China and a cold winter in Europe could push energy prices and bills higher again. Mr Sawan angered climate scientists who said Shell's plan to continue current oil production until 2030 was wrong. Professor Emily Shuckburgh, a climate scientist at the University of Cambridge, said firms such as Shell should focus on accelerating the green transition "rather than trying to suggest the most vulnerable in society are in any way best served by prolonging our use of oil and gas". Mr Sawan told the BBC: "I respectfully disagree." He added: "What would be dangerous and irresponsible is cutting oil and gas production so that the cost of living, as we saw last year, starts to shoot up again." There was more in the BBC report. Our Supplemental Documents package includes the BBC report."

Putin: abandoning natural gas may put humans back in caves

After seeing Shapps warning, we couldn't help remember Putin's classic comments from Nov 2019. On Nov 20, 2019, we tweeted [LINK] "*How could i not note Putin's comments "discarding the purest hydrocarbon like gas seems utterly bizarre", re the complete abandonment of hydrocarbons "it seems to me that the human race may find itself again in caves". Hope not*!" Putin had a lengthy Q&A at the Russian Investment Forum on Nov 20 [LINK]. And he jumped in on the potential abandonment of natural gas. Putin said "I*n this sense, neglecting a pure hydrocarbon such as natural gas is, in my opinion, uncalled for, because it is the purest hydrocarbon out there. When ideas like this are promoted, it sounds like humanity will once again end up in caves, but this time because it will consume nothing, if all energy is reduced to zero, or if we rely solely on solar energy or wind energy or tidal energy. Today's technology is such that without hydrocarbons, nuclear energy or hydropower, humanity will not be able to survive or preserve its civilisation. This must be taken seriously or, as people say, in an adult-like manner."*

Energy Transition: How could we not note the Spanish minister's bike ride?

Spain's ecological transition minister

Sometimes we just have to scratch our head and wonder how a politician cannot realize they will get busted on something like seen this week by Teresa Ribera, Spain's Minster for Ecological Transition. Especially if the ecological transition minister gets caught on greenwashing. On Tuesday, we couldn't help tweet [LINK] "*Busted! Also humor for the day. Spainish minister travel logistics to NATO. "she gets the private jet, gets the car a little bit, gets on the bike to ride in. the virtue signaling in today's politicians - infuriating" @FerroTV as @tomkeene breaks up. #OOTT #EnergyTransition."* Our tweet included the video of Bloomberg's Jon Ferro and Tom Keene talking about the video. To be fair, she was actually going to a climate summit on July 10 in Valladolid, Spain and not NATO that we was on the screen so we put NATO in our tweet. But the events were the same: Ribera flew a private jet to get there, then road in a car, before getting out 100 metres before the venue so she can get out and be seen arriving at the climate summit on a bicycle escorted by a couple of vehicles in front and behind.

Figure 62: Spain Minister Ribera arriving at climate summit

Source: Libertad Digita

Capital Markets: Low building permits today = strong Toronto housing prices to come

Substantially stronger Toronto housing market

There was a great example of the difference in how a market strategist vs a businessman views the same data. On BNNBloomberg Morning Markets on Wed, a strategist raised concerns or warned Barry Fenton (CEO of Lanterra Developments, a large Toronto condo developer) on the data that show building permits over the last 12-months are down almost 65 bps where traditionally, on a 12-month period, grows by about 1% and that is seeing his industry contract. Fenton didn't disagree with the data but then warned that means there are going to be substantially higher prices in a few years. We made a transcript of Fenton's response "*I am not a numbers guy like you, but I can tell you that the supply/demand issue is here. The fact is, it is true there's less people going out to build today. It's because we, as developers, aren't 100% sure what the final costing is going to be. We hate building product, or selling product four year ago, and delivering it back to the market in three years later and not making a lot of money. That formulation doesn't work. But I can tell you that we can look at the numbers and say housing starts are down. It is, for sure. But that just tells me that our housing market is going to be substantially stronger in price over the next three years. So people are going to want to continue to buy assets. So I don't look at all the we're down a quarter percent or we're down half a percent on permits. That's not what's driving it.*" Fenton just reminded of the basic supply and demand of a product. Ouch!

Capital Markets: Coeur d' Alene, Kelowna & Whitefish hit WSJ's list

Coeur d'Alene, Kelowna and Whitefish

We continue to be surprised when we hear people who aren't aware of all the really wealthy people who live in, at least part of the time, in Jackson Hole, Wyoming. The WSJ posted an report earlier today "*Jackson Hole, Wyoming, Isn't the Only Remote Western Locale With Trophy Homes and Big Views. Here Are Five Alternatives*." [LINK]. On Jackson Hole, the WSJ writes "*Nestled near the Grand Tetons and Yellowstone National Park, the town of Jackson, Wyoming—whose population of around 11,000 resides in an area of less than 3 square miles—has become one of the most expensive places to buy real estate in the entire U.S. Local records have fallen over the past year; the single-family home average list price at the end of 2022 was $7.6 million (a figure that has tripled since 2019, when the average price of a single-family home was $2.6 million). And for the first time in the town's history, the average single-family home sale price topped $5 million in March."* Then the focus of the report is the WSJ saying here are five alternative areas that "*offer luxury real estate with many of Jackson Hole's charms and benefits but at more reasonable prices*." The five include three popular second home destinations for Calgarians. Coeur d'Alene, Kelowna,

and Whitefish. The others are Moab (Utah) and Suncadia-Cle Elum (Washington). Our Supplemental Documents package includes the WSJ report.

Demographics: Jamie Dimon, remote workers aren't guaranteed a job at JP Morgan

Jamie Dimon on remote working

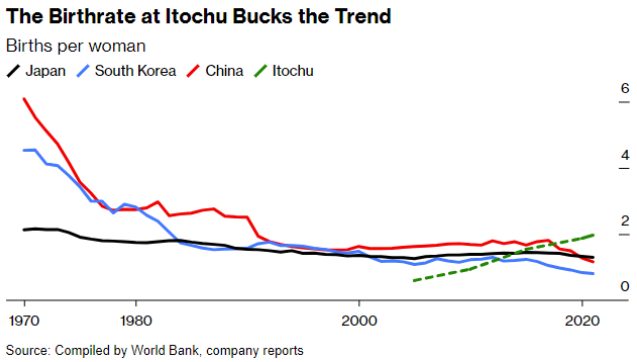
On Thursday, Business Insider reported [LINK] on 12 of JP Morgan CEO Jamie Dimon's quotes from his interview with The Economist. If you have heard Dimon speak before on remote working, you won't be surprised by his quote on why he sees people should be in the office. Dimon said ""*It doesn't work for younger kids in apprenticeships. It doesn't really work for creativity and spontaneity. It doesn't really work for management teams. There are real flaws. To the extent it works, I'm okay with it. If it doesn't work, I don't mind getting rid of it. We're not going to make that decision because we're pandering to employees — that is not the way to build a great company. So count me as a skeptic." (Dimon was sharing his view on working from home.)"* But we don't recall seeing his view on people who want to remote work because they want to avoid long drive commutes. Dimon said "*I completely understand why someone doesn't want to commute an hour and a half every day, totally got it. Doesn't mean they have to have a job here either*." Our Supplemental Documents package includes the Business Insider report.

Demographics: Increasing birth rate at Itochu

Jamie Dimon on remote working

The big story in Asia and many other parts of the world are declining birth rates. So it was interesting to see the Bloomberg report "*A Japanese Company Bans Late-Night Work. A Baby Boom Soon Follows*". Bloomberg highlights how Itochu reduced its work hour requirements/expectations with a view to increasing productivity but has seen a big increase in birth rates among its female employees. We think working less time provides employees with a better set up to have and raise kids while working, but we have to believe there are other factors at play such as having good incomes. Regardless, birth rates are up significantly versus Asia. Bloomberg wrote "*When Masahiro Okafuji became chief executive officer of Itochu Corp. in 2010, he made improving productivity a top priority so the company could compete against bigger rivals in Japan. His approach was counterintuitive. Working in the office after 8 p.m. would be banned, and there would be no more overtime —with rare exceptions. Security guards and human resources staff would scout Itochu's office building in Tokyo, telling people to go home. Those clinging to their desk were told to come in early the next day to get their work done—and get paid extra. The tough love worked. A decade later, the company—whose businesses range from the FamilyMart convenience store chain to metals trading—reported a more than fivefold jump in profit per employee from 2010 to 2021 as surging commodities prices and a weak yen buoyed its bottom line. What also changed, to the surprise of Itochu's management, is that more female employees took maternity leave, had kids and came back to work. "We set out to boost productivity but had no idea it would have an impact on the birthrate," says Fumihiko Kobayashi, Itochu's executive vice president".* Below is the graph from the Bloomberg report. Our Supplemental Documents package includes the Bloomberg report.

Figure 63: Birthrate at Itochu Bucks the Trend



Source: Bloomberg

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

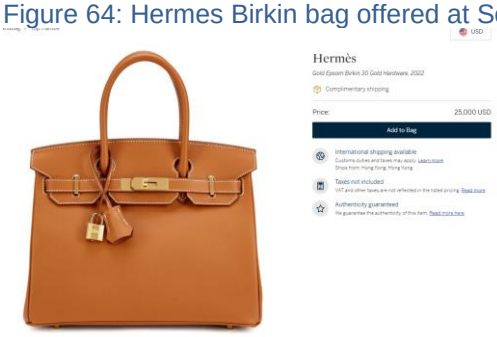
During our weekly review of items for Energy Tidbits, we come across a number of miscellaneous facts and figures that are more general in nature and often comment on sports and Calgary items.

Jane Birkin passed away at age of 76

In overnight news, London born actress, singer, style icon Jane Birkin passed away in her home in France at the age of 76. She may not be known by who she is, but her name is well known to any age women into fashion. Hermes purses are among the most expensive and collectible in the fashion world and their classic is the Birkin bag, named after Jane Birkin. Sothebys wrote "*The Hermès Birkin bag is a symbol of luxury and exclusivity in the world of fashion. The iconic Birkin bag story began in 1984 when actress and singer Jane Birkin met Hermès CEO Jean-Louis Dumas on a flight from Paris to London. During their conversation, Birkin expressed her need for a functional yet stylish bag, which led to the creation of the now-famous Birkin bag. The Birkin bag's innovative design at the time features two rolled handles, a flap top, clou "feet," and a lock closure. This practical and elegant design has continued to capture the hearts of Hermès collectors and . The Birkin is meticulously crafted by*

expert trained artisans who spend a minimum of 18 hours on each piece. A single artisan creates and assembles the entire bag versus more modern assembly line manufacturing. Each Birkin bag carries a unique code indicating the year it was made, the workshop where it was crafted, and the artisan responsible for its creation." Sothebys currently offers this classic color bag for US$25,000 but provides free shipping. But older baby boomers will know her for her 1969 classic song with Serge Gainsbourge "Je t'aime … moi non plus" that made it to #1 on the UK charts but was also banned from many radio stations around the world for what was then considered sexually explicit content.

Figure 64: Hermes Birkin bag offered at Sothebys

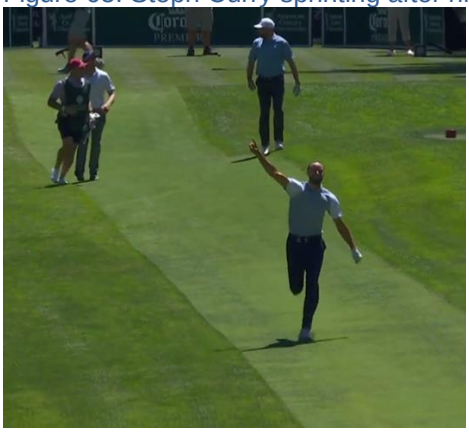


Source: Daily Mail

Best hole-in-One celebration - Steph Curry yesterday at ACC Championship

The American Century Celebrity Golf Championship is this weekend at Lake Tahoe. Going into today's final round, NBA basketball star Stephen Curry is in the lead. And yesterday had a hole-in-One with had the best celebration. Normally, when someone gets an Ace, there rest in the group will turn around and give high-fives. But Curry took off in a sprint to the green, throwing his hat off, his golfing glove off and hit the flat and looped on the green. It's worth a look at the video [LINK]

Figure 65: Steph Curry sprinting after his hole-in-One

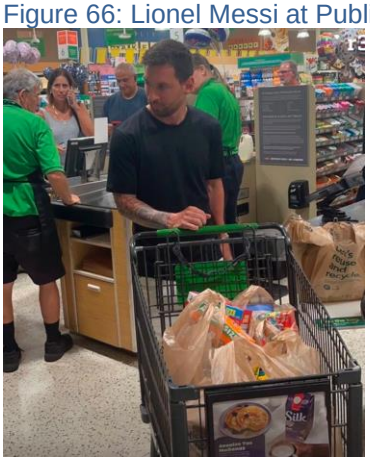


Source: NBC Sports

Lionel Messi jumped right into the US, getting Lucky Charms at grocery store

It must be a relief for Lionel Messi to not have to worry about getting swamped by people when he goes anywhere like he would in Europe. But he did get spotted grocery shopping at the Publix grocery store in Miami. Reportedly, no one recognized Messi and his family until he reached the checkout, and then a few people asked for pictures before he went to the car. But of course, people had to zoom in on his grocery cart and the one item they identified was a box of Lucky Charms cereal, we assume for their two young boys.

Figure 66: Lionel Messi at Publix grocery store in Miami



Source: Daily Mail