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Energy Tidbits

July 24, 2022

Produced by: Dan Tsubouchi

LNG Game Changer: Baker Hughes Suspended All Equipment & Services Contracts on Russian LNG Projects

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. We still believe Baker Hughes suspending all equipment and service contracts on Russian LNG projects is a game changer to LNG markets [LINK]

2. Baker Hughes expects 13.2 to 19.7 bcf/d of LNG FIDS over next 2 years, what about LNG Canada Phase 2? [LINK]

3. Nord Stream is back at 40% capacity post maintenance, but Putin warned it would be cut if the Siemens turbine isn't returned to Russia [LINK]

4. Is there a chance Germany gives in to Russia if natural gas crisis gets worse? [LINK]

5. Oilfield service companies are warning they are running out of capacity [LINK]

6. Please 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 – Natural gas injection of +32 bcf, storage now -270 bcf YoY deficit

The YoY storage deficit started the winter at -282 bcf YoY at Oct 31 and is now -270 bcf YoY. The EIA reported a +32 bcf build (+44 bcf expectations) for the July 15 week, which was the same as the 5-yr average build of +32 bcf, and below last year's injection of +36 bcf. Storage is 2.401 tcf as of July 8, increasing the YoY deficit to -270 bcf vs -252 bcf last week and is -328 bcf below the 5-year average vs -319 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -270 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (07/15/21)		Historical Comparisons: 5-year average (2017-21)	
Region	07/15/22	07/08/22	net change	implied flow	Bcf	% change	Bcf	% change
East	521	501	20	20	559	-6.8	587	-11.2
Midwest	608	586	22	22	680	-10.6	671	-9.4
Mountain	144	143	1	1	183	-21.3	172	-16.3
Pacific	253	249	4	4	247	2.4	276	-8.3
South Central	874	890	-16	-16	1,001	-12.7	1,023	-14.6
Salt	206	221	-15	-15	280	-26.4	283	-27.2
Nonsalt	669	669	0	0	721	-7.2	740	-9.6
Total	**2,401**	**2,369**	**32**	**32**	**2,671**	**-10.1**	**2,729**	**-12.0**

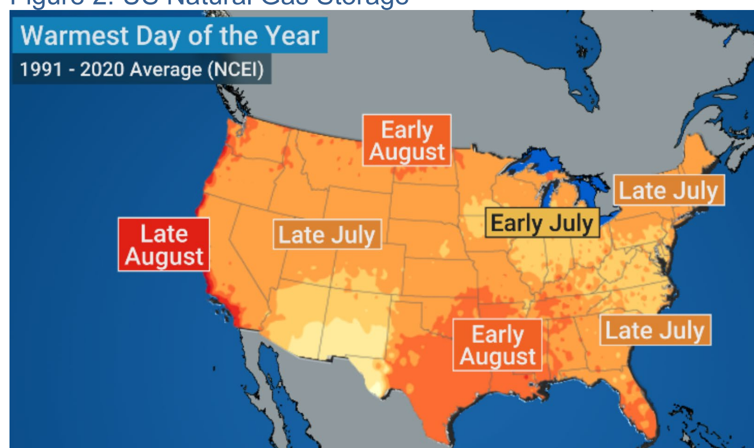
Source: EIA

Natural Gas – End of July is normally the hottest day in the year in most of the US

No surprise it was very hot in most of the US this week as the end of July is normally the time when most of the US normally has its hottest day of the year. The bad news is that that is the average and the hottest day of the year is still to come in states like Texas, Louisiana, Florida and California. Below is The Weather Channel map showing the warmest day of the year based on the 1991-2020 average temperatures. [LINK].

Late July is normally very hot

Figure 2: US Natural Gas Storage



Source: The Weather Channel

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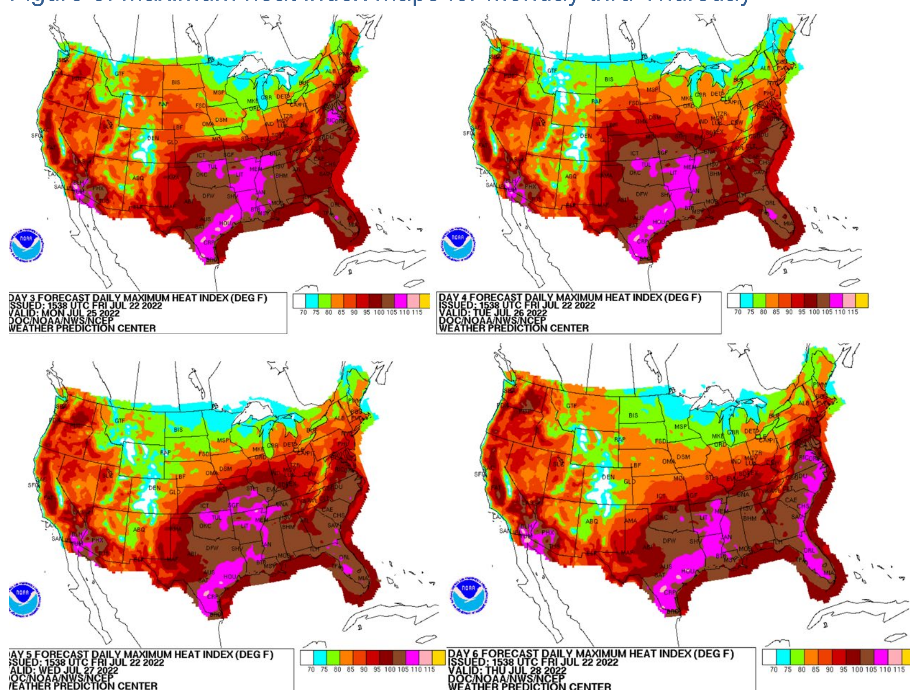
Natural Gas – Continues to be mostly hot temperatures in US

Continued hot weather in July

Anyone watching CNBC and Bloomberg TV would have heard multiple comments every day on how hot it was in many parts of the US. On Thursday, we retweeted the Weather Channel map that had the caption "*43 million of you will have highs in the triple digits today... 🌡 Many more temperature records are expected to be broken through the weekend. Catch our coverage for your city's summer forecast!"*. It looks like July will end up even warmer than expected by the NOAA July Forecast for warmer than normal temperatures (see our July 3, 2022 Energy Tidbits). On Friday, we tweeted [LINK] NOAA's National Weather Service posts daily updated Maximum Heat Index Forecasts, which call for a warm start this week Monday thru Thursday, but not as hot seen for the just ended week. Below are NOAA's maximum heat index maps for Mon thru Thurs. [LINK]

Figure 3: Maximum heat index maps for Monday thru Thursday



Source: NOAA National Weather Service

Natural Gas – Still looking for warmer than normal end to summer Aug/Sept/Oct

NOAA forecasts a hot summer/early fall

We continue to see weather forecasts supportive of strong weather driven natural gas demand. On Thurs, NOAA released its monthly update to its seasonal temperature forecasts [LINK]. NOAA is calling for above average temperatures in ASO across the US. Below are the new NOAA temperature probability maps for Aug/Sept/Oct.

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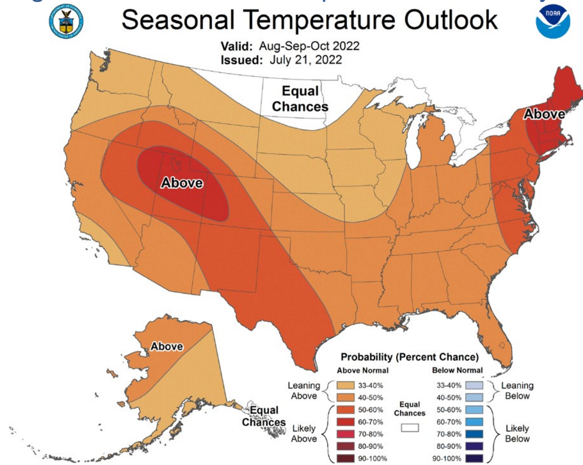
Figure 4: NOAA ASO Temperature Probability Forecast



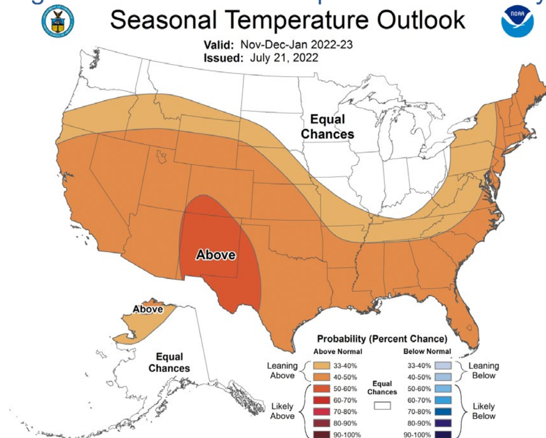
Source: NOAA

Natural Gas – Early look is for warmer than normal winter

NOAA forecasts a warm winter

Its only the end of July so it's early to look at winter, but, given the massive disruption in global natural gas/LNG markets, there will be an earlier look at winter, in particular in Europe and Asia. Winter is the biggest swing factor for natural gas every year in all parts of the world. On Thurs, NOAA updated its seasonal temperature forecasts for NDJ [LINK] and DJF [LINK]. NOAA's probability is for warmer than normal temperatures for most of the US to going into the winter (NDJ) and in the peak of winter (DJF). or both NDJ and the peak of winter DJF. Warmer temperatures throughout the winter means less demand for natural gas. Below are the new NOAA temperature probability maps for Nov/Dec/Jan and for Dec/Jan/Feb.

Figure 5: NOAA NDJ Temperature Probability Forecast



Source: NOAA

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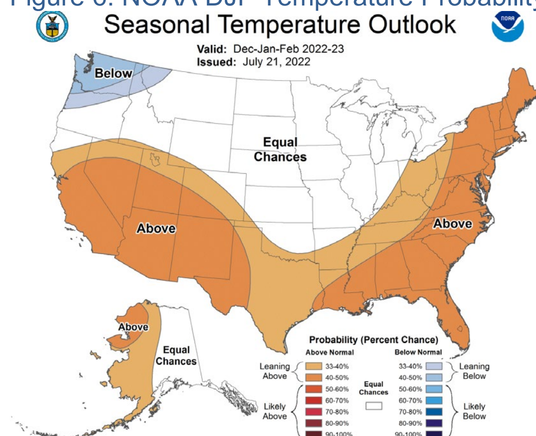
Figure 6: NOAA DJF Temperature Probability Forecast



Source: NOAA

Natural Gas – EIA, US shale/tight natural gas breaking out, now >93 bcf/d

Shale/tight gas production

EIA's updated Drilling Productivity Report July 2022 was released on Monday, and the key takeaway is that Aug is forecasted to get above 93 bcf/d, building off the growth seen in July which is estimated at 92.271 following five months of basically flat shale/tight natural gas production. The DPR [LINK] is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case July) and the next month (in this case Aug). (i) Shale/tight natural gas is breaking out, as increasing US LNG export capacity out of the Gulf Coast is driving natural gas growth in Louisiana and Texas. Feb was 91.187 bcf/d and June was 91.501 bcf/d, with July the first month over 92 bcf/d at 92.271 bcf/d and Aug the first month over 93 bcf/d at 93.019 bcf/d. The challenge for gas is that Appalachia is basically flat. And growth is linked to LNG with Haynesville at 15.478 bcf/d in Aug vs 14.291 bcf/d in Feb. Eagle Ford (a more gassy oil play) at 6.800 bcf/d in Aug vs 6.176 bcf/d in Feb. (ii) The EIA forecasts Aug at 93.019 bcf/d which is +0.748 bcf/d MoM and up +6.135 bcf/d from the Nov/19 peak of 86.884 bcf/d. (iii) This month, all basins increased except for Anadarko (-0.012 bcf/d MoM). Bakken and Niobrara showed small increases, but were basically flat MoM. The largest increases came from Haynesville (+0.217 bcf/d MoM), Appalachia (+0.207 bcf/d MoM) and Permian (+0.166 bcf/d MoM). (iv) All basins are now up YoY, with the most notable YoY increases being Permian +2.592 bcf/d YoY and Haynesville +2.065 bcf/d YoY. Total US shale/tight natural gas production is +7.093 bcf/d YoY for Aug. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So whatever the trends are for shale/tight gas are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

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Figure 7: MoM Change – Major Shale/Tight Natural Gas Production

mmcf/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Aug YoY	Aug YoY %	Aug less July
Anadarko	6,192	6,139	6,107	6,203	6,321	6,278	6,341	6,286	6,118	6,134	6,275	6,554	6,542	350	6%	-12
Appalachia	34,366	34,783	34,838	35,601	34,825	34,988	35,716	36,298	35,443	35,476	35,155	35,121	35,328	962	3%	207
Bakken	3,005	3,003	3,004	3,012	3,071	3,150	3,137	3,079	2,932	3,076	3,088	3,086	3,117	112	4%	31
Eagle Ford	5,971	5,990	5,994	5,950	6,012	6,118	6,176	6,288	6,298	6,394	6,538	6,671	6,800	829	14%	129
Haynesville	13,413	13,415	13,514	13,778	13,874	14,019	14,291	14,425	14,527	14,863	15,023	15,261	15,478	2,065	15%	217
Niobrara	5,032	5,090	5,183	5,308	5,329	5,339	5,293	5,196	5,254	5,187	5,195	5,205	5,215	183	4%	10
Permian	17,947	18,700	19,027	19,298	19,573	19,936	20,233	20,160	19,533	19,870	20,227	20,373	20,539	2,592	14%	166
Total	85,926	87,120	87,667	89,150	89,005	89,828	91,187	91,732	90,105	91,000	91,501	92,271	93,019	7,093	8%	748

Source: EIA, SAF

Natural Gas – Baker Hughes suspends all LNG equipment & services work in Russia

Baker Hughes suspends Russia LNG work

Baker Hughes reported Q2 on Wednesday. All the analysts focused on the impact of Russia on the financial results, but there didn't seem to be any real market concerns on what Baker Hughes suspension of all equipment and services contracts for LNG in Russia would mean to LNG markets. It is important to note Baker Hughes is clearly stating they have suspended work on all of their "equipment" and "services" contracts in Russia. Think about what is happening with Nord Stream and this is very similar. It's not just supplying new equipment for new LNG projects, but also servicing existing equipment in existing LNG projects. We remain surprised that this isn't a major LNG market focus. Baker Hughes LNG business is within its TPS group. In the Q2 call mgmt. said "*In TPS we have suspended work on equipment and service contracts in Russia. As a result, these projects have been removed from RPO and second-quarter revenue was impacted by roughly $160 million but with minimal impact to TPS operating margins."* And "*So at the beginning of the year, we were expecting, around $300 million of EBITDA for Russia this year and our Russian operations are generally quite accretive to our overall mix really due to the risk premium of operating there as well as some business mix primarily in TPS services as well as in some OFS product lines".*

LNG game changer, Baker Hughes stops work on 6.2 bcfd RUS LNG

We have been highlighting the Baker Hughes Russia stoppage as an LNG game changer. Our June 19, 2022 Energy Tidbits memo was titled "*Game Changer for LNG: ~6.2 bcf/d Russian LNG is at Risk with Reports Baker Hughes to Stop Providing Services/Equipment".* Here is what we wrote in our June 19 memo. "*We are still surprised that others haven't jumped on what we called the game changer to LNG – the reports Baker Hughes is stopping servicing, replacing parts, etc for in operating Russian LNG projects and will not provide gas turbines for the under construction LNG projects. This is putting at risk 3.6 bcf/d of existing LNG supply and 2.6 bcf/d of under construction LNG. It is huge or, at least we think so. Don't forget Baker Hughes is the leading global services company for LNG and is involved in almost every recent LNG project. (i) On Thursday, we tweeted [LINK] "1/2. Game Changer for #LNG. 6.2 bcfd RUS LNG is now at risk incl operating 1.3 bcfd Sakhalin-2 LNG & 2.3 bcfd Yamal LNG, and under construction 2.6 bcfd Arctic LNG-2 w/ phase 1 0.87 planned 2023 in service. #OOTT #NatGas" and [LINK] "2/2. Must read, @Kommersant reports #BakerHughes stopping service/replacement parts for existing #LNG & shipping gas turbines for Arctic LNG-2. Projects are designed for specific turbines. Urgent need for LNG FIDs ie. how about @Shell #LNGCanada Phase 2 is 1.8 bcfd. #NatGas #OOTT". Baker Hughes is reportedly stopping servicing two in-service Russian LNG projects (Sakhalin-2 and Yamal LNG) and stopping deliveries on gas turbines for the under construction Arctic LNG-2 project. Sakhalin-2 LNG in operation. Think about what is happening with Nord Stream being*

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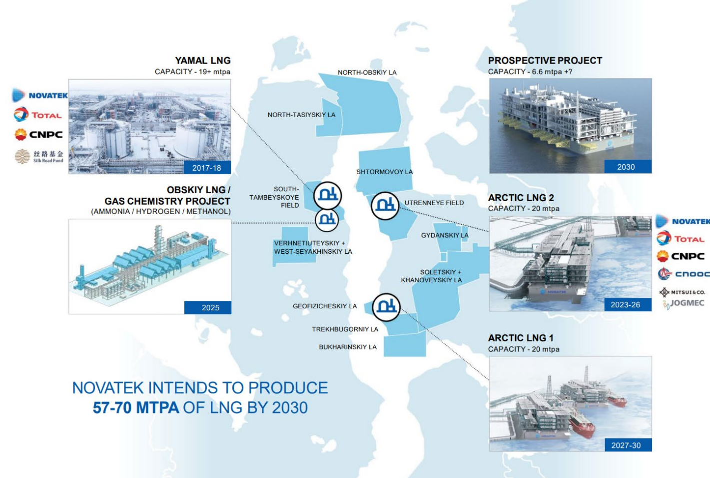
*shut down waiting on equipment repairs. The operating 3.6 bcf/d LNG will be at risk for now having Baker Hughes servicing and providing any equipment repairs/replacement. And the 2.6 bcf/d of under construction LNG can't be finished without Baker Hughes equipment. (ii) On Friday, we tweeted [LINK] "Game changer for #LNG. See 👇 Thurs thread, $BKR pullout is huge. RUS admits delays in new LNG adds, hopes no more than 1-2 yrs. Arctic LNG-2 2.6 bcfd from 3 phases, phase 1 0.87 bcfd starting in 2023, all on in 2026. Urgent need for FIDs ie. #LNGCanada Phase 2. #OOTT #NatGas." TASS reported on comments from Russia First Deputy Minister Sorokin, who admitted that the under construction 2.6 bcf/d Arctic LNG-2 would be delayed and they hoped the delay wouldn't be more than 1 to 2 years. In the Kommersant Thursday report, they noted that the Baker Hughes equipment could not be replaced. Kommersant wrote ""There is, in fact, nothing to replace this equipment now: analogues are not produced in the Russian Federation, and LNG production lines have already been designed for the LM9000". (iii) There was a good example on how nothing is every clear in Russia. And that Novatek still sees Phase 1 of Arctic LNG-2 starting on time in 2023. On Friday night, Bloomberg reported "Novatek plans to launch Arctic LNG 2 on time despite all the problems amid sanctions, Interfax reports, citing CEO Leonid Mikhelson at St. Petersburg International Economic Forum. * NOTE: Novatek holds 60% stake in the Arctic LNG 2 project with three LNG production trains with a capacity of 6.6m tons/year each. The first train was expected to start production in 2023 * Novatek has revised Arctic LNG 2 financing scheme, there are no problems with that." Our Supplemental Documents package includes the Kommersant report, the TASS Friday report, an Bloomberg's Friday night report.*

Figure 8: Novatek's LNG production platform, May 2021



Source: Novatek

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Natural Gas – Baker Hughes expects 13.2 to 19.7 bcf/d of LNG FIDS over next 2 yrs

Baker Hughes on LNG FIDs

We have noted before how Baker Hughes is the services leader in LNG projects and seems to be involved in the vast majority of LNG supply projects. And because of this participation, Baker Hughes likely has the best visibility of any company to what is coming down the pike for LNG FIDs. Anyone looking at a LNG FID has to talk to Baker Hughes as to equipment availability, cost and timing to build into their FID timing. On Wednesday, we tweeted [LINK] "*Bullish #LNG. $BKR Q2 call ongoing. @simonelli_l "we continue to expect 100 to 150 mtpa [13.2 to 19.7 bcf/d] of LNG FIDs over the next two years with additional FIDS in 2024 and 2025". Surely this includes #LNGCanada Phase 2 of 1.8 bcf/d? It's a huge plus to CAN #NatGas. #OOTT.* The quote we put is from the transcript we made of our recording of the call. Our tweet also reminded on LNG Canada Phase 2 of 1.8 bcf/d. We have been big believers that Shell will FID LNG Canada Phase 2 in H2/22.

Natural Gas – Another Asian buyer locks up long term LNG supply

Another long term LNG deal

The rush continues for LNG buyers locking up long term LNG supply as there has been 10.36 bcf/d of long-term LNG supply locked up since July 1, 2021. We say continues because it started a year ago and was well underway before Russia invaded Ukraine. But no question it has accelerated post the invasion. Our March 13, 2022 Energy Tidbits memo noted Europe's plan to move away from Russian pipeline natural gas and LNG is a global game changer for energy for at least the 2020s. We were already seeing clear signals of the bullish LNG for 2020s call since the end of June 2021 with the abrupt shift of Asian LNG buyers to long term contracts. Now, with Russia, the rush continues and from more than Asian LNG buyers. There continues to be a consistent news flow of more long-term LNG supply deals, especially for the quickest to market LNG from the US Gulf Coast. (i) On Wednesday, Cheniere Energy announced [LINK] that it has entered into a long-term LNG sale and purchase agreement (SPA) with PetroChina. Under the SPA, PetroChina has agreed to purchase up to approximately 0.24 bcf/d of LNG from Cheniere on a free-on-board basis. Deliveries under the SPA will begin in 2026, reach the full 0.24 bcf/d in 2028, and continue through 2050. Half of the total volume (0.12 bcf/d) is subject to Cheniere making a positive final investment decision to construct additional liquefaction capacity at the Corpus Christi LNG Terminal beyond the Corpus Christi Stage 3 Project. Our Supplemental Documents package includes the Cheniere release.

Asia is still well in front of Europe in securing long term LNG supply

Our March 13, 2022 Energy Tidbits memo noted that Europe LNG buyers were starting 9 months behind the wave of Asian LNG buyers who started to lock up long term LNG supply starting in July 2021. The LNG supply crunch is not a 2022 development. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG

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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 10.36 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 10.36 bcf/d of long term LNG deals since July 1, 2021. 65% 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. And as seen in the Equinor deal, major LNG supply companies like Exxon, Shell and now Equinor are locking up long term LNG supply to add to their portfolios for LNG supply to others. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

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Figure 9: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country Buyer / Seller	Volume (bcf/d)	Duration Years	Start	End
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
Sept 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	0.20	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
July 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
July 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**7.04**			
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
March 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
March 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
March 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	0.67	15.0	n.a.	n.a.
June 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
June 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
June 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.18	20.0	n.a.	n.a.
June 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
June 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
July 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
July 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**3.73**			
Total New Long Term LNG Contracts since Jul/21				**10.76**			
*Excludes Asian short term/spot deals							
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period							

Source: Company reports, SAF Group

Natural Gas – TotalEnergies targeting 2023 yr end FID for Papua LNG development

Papua LNG FEED launch

On Wednesday, TotalEnergies announced [LINK] the decision of the Papua LNG joint venture to launch the first phase of front-end engineering and design (FEED) studies for the Papua LNG project's upstream production facilities. This is a significant step towards the development and FID of the project. The project is targeting an FID around the end of 2023, and a start-up at the end of 2027. This is a project of two LNG trains of 0.355 bcf/d each for total LNG of 0.71 bcf/d. TotalEnergies stated "*The Papua LNG project is well positioned to contribute to growth in LNG supply worldwide, especially for customers in Asia seeking to decarbonize from coal to gas, in line with our strategy to lower global greenhouse gas emissions.*" Our Supplemental Documents package includes the TotalEnergies release.

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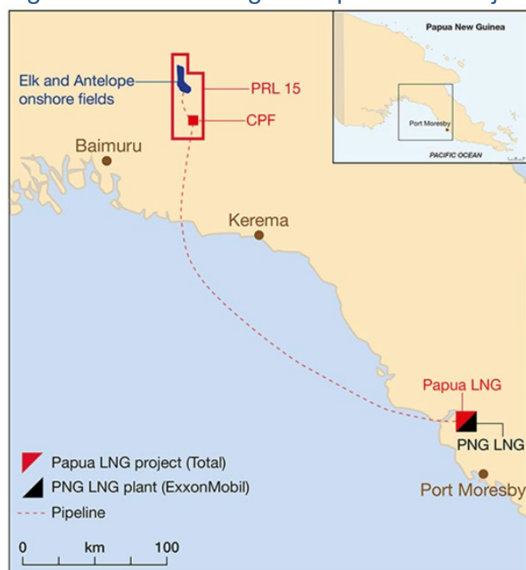
Figure 10: TotalEnergies Papua LNG Project



Source: TotalEnergies

Natural Gas – No visibility to Shell's next LNG cargo at Prelude 0.47 bcf/d FLNG

Shell Prelude FLNG 0.47 bcf/d

Yesterday we tweeted [LINK] "*Hard to see #Shell #LNG cargos at 0.47 bcf/d #PreludeFLNG for some time. Last Shell cargo was 07/06. Not even meeting so nowhere near a deal. Locking out people, so how long after a labor deal to get people back & go thru restart procedures? #OOTT #NatGas* ". Our tweet attached the union's (Offshore Alliance) Saturday Facebook post. Prior to that post, the developments were that the Union advised they were extending their industrial action until Aug 4. The Union also advised that there had been no discussions with Shell. After that notice, Shell then advised it was going to lock out the union starting July 25. that makes it hard to see how a labor deal is reached anytime soon. Then on Wednesday, Australian Review reported "*The company held a "town hall" meeting on Wednesday afternoon to advise its workers taking industrial action, including work bans and one-hour stoppages, they would not be paid at all from Monday, July 25, under a lockout. The move was taken after unions informed the energy giant they were extending their protected industrial action, which resulted in a shutdown of production at the massive floating LNG production plant, until August 4".* Then yesterday the Union's Facebook posting [LINK] started off "*Shell haven't performed an offtake from the Prelude FLNG since Wednesday 6th July and the way they are going, there is no likelihood of an offtake happening anytime soon. If Shell follow through with their threat of a lockout of Prelude crew on Monday 25th July, it will provide the Offshore Alliance and ETU the opportunity to take Employee Response Action*." From a distance, it's hard to see when there will be a labor deal and then there will be time needed to get people back on board and go thru any restart procedures. It's why think it has to be at least a month before there is the likelihood for the next LNG cargos at Shell Prelude FLNG, which has a 0.47 bcf/d capacity. Our Supplemental Documents package includes the Union July 23 Facebook posting.

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Figure 11: Shell Crux Project Overview

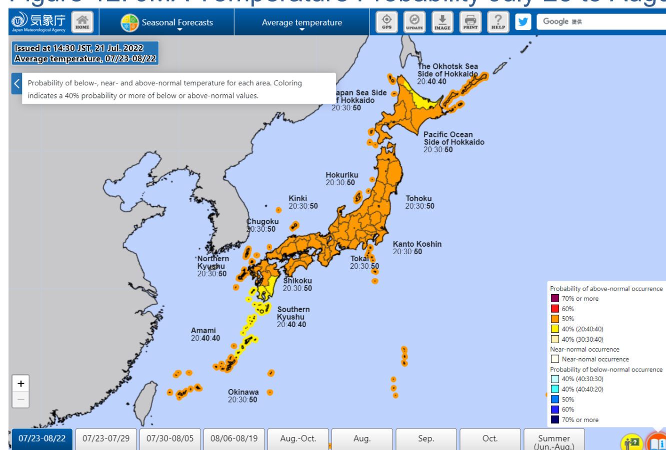
Source: Shell

Natural Gas – Japan's hot summer expected to continue

Still hot in Japan

The warm weather continues in Japan with JMA forecasting much warmer than normal temperatures through late August. Hot weather in the summer is always a positive for natural gas demand. However, Japan's ENEOS Holdings CEO stated [LINK] there have been increased orders for fuel oil from regional utilities with the jump in LNG prices. Demand for fuel oil to be used in power plants is expected to be 90% higher YoY during April-Sept in Japan. ENEOS will only be able to supply fuel oil equivalent to a 60% YoY gain due to issues with infrastructure, meaning LNG must fill this gap. The Japan Meteorological Agency posted its July 23 to August 22 weather forecast [LINK] calling for warmer than normal temperatures. This type of weather will drive some significant weather-related natural gas demand for air conditioning.

Figure 12: JMA Temperature Probability July 23 to August 22



Source: Japan Meteorology Agency

Natural Gas – Japan's LNG stocks flat WoW at 93 bcf

Japan LNG stocks flat WoW

The risk for Japan in the winter is that they need full storage and continued LNG imports to avoid natural gas outages. That's because Japan's LNG stockpiles are not huge relative to

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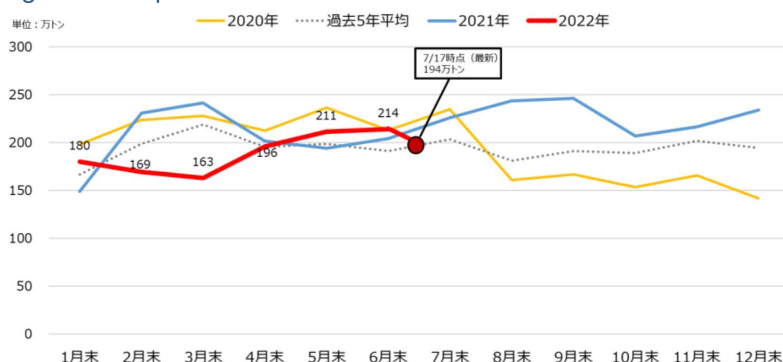
LNG imports that have ranged from 7 to 14 bcf/d since Jan 1, 2021. LNG stockpiles held by Japanese power producers have exceeded both last year's level and the 4-year average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks at July 17 were flat WoW ~93 bcf, and down from the 5-yr average of 97 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 13: Japan's LNG Stocks



Source: METI

Natural Gas – Japan LNG Imports hurt by LNG prices, but +1.7% YoY

Japan June LNG imports +1.7% YoY

No question that very high LNG prices have led to Japanese buyers holding back, where possible, on LNG imports in particular to the benefit of thermal coal. Very high LNG prcies have been a limiting factor on Japan's LNG imports. However, Japan's LNG imports are up YoY, but nowhere near the increase in thermal coal imports. On Thursday, Japan's Ministry of Finance posted its import data for June [LINK]. The MOF reported Japan's June LNG imports were 9.29 bcf/d, up 1.7% YoY and 8.92 bcf/d, up 16.3% YoY and up 4.1% MoM. Thermal coal imports for June were up 12.9% YoY. If LNG prices weren't so high, we would have expected LNG imports to be higher given the hot June and continued hot weather in Japan.. Below is our table that tracks Japan LNG import data.

Figure 14: Japan Monthly LNG Imports

bcf/d	2015	2016	2017	2018	2019	2020	2021	21/20	2022	22/21
Jan	13.06	11.22	12.85	12.79	11.69	11.63	12.48	7.3%	10.51	-15.8%
Feb	13.26	12.30	13.36	14.23	12.61	10.99	13.84	25.9%	12.19	-11.9%
Mar	12.60	12.62	12.61	12.28	11.30	11.16	11.04	-1.1%	10.07	-8.7%
Apr	10.56	10.21	10.52	8.97	9.00	8.31	7.96	-4.3%	8.92	12.0%
May	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.1%	8.92	16.3%
June	10.61	10.02	9.90	8.88	8.32	8.42	9.13	8.5%	9.29	1.7%
July	10.77	10.19	10.19	10.55	10.56	9.35	9.58	2.5%		
Aug	10.93	11.96	11.24	11.73	9.45	9.04	9.75	7.8%		
Sept	11.06	10.67	9.31	10.04	10.30	10.41	8.66	-16.8%		
Oct	9.38	9.73	9.50	10.12	9.75	9.20	7.17	-22.1%		
Nov	10.71	12.07	10.26	10.15	10.03	9.63	9.38	-2.6%		
Dec	12.51	11.69	12.31	11.23	10.54	11.96	10.89	-8.9%		

Source: Japan Ministry of Finance

Natural Gas – China's LNG imports -28.3% YoY in June

China LNG and pipeline imports

We have been warning that China's LNG imports will be less in 2022 for three key reasons - higher pipeline imports of cheaper Russian natural gas via Gazprom's Power of Siberia,

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increasing domestic natural gas production, and higher LNG prices. China customs posted China's June natural gas imports split by pipelines vs LNG. The customs data is at [LINK]. The customs data reports China June LNG imports of 7.72 bcf/d, -28.3% YoY and +10.3% MoM. And China natural gas pipeline imports of 6.2 bcf/d, +11.7% YoY and -2.89% MoM. This marks a new record for China's pipeline imports, which are primarily from Turkmenistan and Russia. Below are our running tables of China LNG and pipeline imports.

Figure 15: China LNG Imports

bcf/d	2018	2019	19/18	2020	20/19	2021	21/20	2022	21/22
Jan	8.03	10.20	27.1%	10.31	1.1%	13.15	27.6%	12.10	-8.0%
Feb	6.84	7.46	9.1%	7.26	-2.7%	9.52	31.1%	8.34	-12.4%
Mar	5.04	6.28	24.8%	6.49	3.3%	8.74	34.6%	7.17	-17.9%
Apr	5.43	7.27	34.0%	8.16	12.3%	10.77	32.0%	6.96	-35.4%
May	6.39	6.87	7.6%	8.10	18.0%	10.89	34.4%	7.64	-29.9%
June	6.31	7.25	14.9%	9.27	27.8%	10.76	16.1%	7.72	-28.3%
July	6.40	7.56	18.1%	7.79	3.1%	8.78	12.7%		
Aug	7.26	8.04	10.8%	9.23	14.8%	10.30	11.6%		
Sept	7.00	8.16	16.7%	9.17	12.4%	10.81	17.8%		
Oct	7.13	4.09	-42.6%	7.78	90.0%	9.56	22.9%		
Nov	9.59	10.42	8.7%	10.58	1.6%	11.05	4.4%		
Dec	9.75	10.01	2.7%	11.76	17.5%	11.82	0.5%		
Full Year Avg.	7.10	7.80	9.9%	8.83	13.1%	10.51	19.1%	8.32	-20.8%

Source: Bloomberg, China Customs

Figure 16: China Pipeline Imports

bcf/d	2018	2019	19/18	2020	20/19	2021	21/20	2022	22/21
Jan	4.0	5.0	24.9%	5.2	3.5%	4.9	-4.5%	5.4	8.8%
Feb	5.0	5.5	9.0%	5.7	3.8%	6.1	7.2%	6.4	3.9%
Mar	4.2	4.5	6.4%	4.2	-5.2%	4.8	12.8%	5.2	9.1%
Apr	5.5	5.0	-9.3%	4.2	-15.5%	5.5	30.1%	6.0	9.4%
May	5.1	4.8	-4.3%	4.0	-16.6%	5.1	26.2%	6.4	26.1%
Jun	5.3	4.8	-10.3%	4.1	-15.0%	5.6	37.4%	6.2	11.7%
Jul	4.7	4.7	0.0%	3.6	-23.3%	5.7	58.9%		
Aug	4.7	4.9	3.1%	5.3	7.9%	5.9	11.5%		
Sep	5.2	5.0	-4.2%	4.7	-6.0%	6.2	32.1%		
Oct	4.2	3.8	-8.1%	3.9	1.0%	5.0	28.0%		
Nov	5.1	4.7	-6.9%	4.1	-13.0%	6.1	48.9%		
Dec	4.6	4.7	3.9%	5.6	18.9%	6.2	10.7%		

Source: Bloomberg, China Customs

Natural Gas – EC proposes all countries cut natural gas consumption by 15%

EC proposes 15% cut to gas consumption

On Wednesday, the European Commission released its "*Save Gas for a Safe Winter: Commission proposes gas demand reduction plan to prepare EU for supply cuts"* that proposed "*a new legislative tool and a European Gas Demand Reduction Plan, to reduce gas use in Europe by 15% until next spring. All consumers, public administrations, households, owners of public buildings, power suppliers and industry can and should take measures to save gas. The Commission will also accelerate work on supply diversification, including joint purchasing of gas to strengthen the EU's possibility of sourcing alternative gas deliveries. The Commission is proposing a new Council Regulation on Coordinated Demand Reduction Measures for Gas, based on Article 122 of the Treaty. The new Regulation would set a target for all Member States to reduce gas demand by 15% between 1 August 2022 and 31 March 2023*." This is a proposal (voluntary) for all EC countries on the same 15%. Our Supplemental Documents package includes the EC proposal. [LINK]

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Natural Gas – Spain says no to EC call for all to cut gas natural consumption by 15%

Spain won't cut gas consumption by 15%

On Wednesday, we tweeted [LINK] "*Spain is #1 EC #LNG importer so isn't reliant on RUS #NatGas. ESP rejects Brussels' proposal to cut gas consumption by 15%: "Unlike other countries, we Spaniards have not lived beyond our means from an energy point of view". Thx @nacho_fariza @GIIGNL #OOTT [LINK]".* El Pais reported [LINK] on comments from Teresa Ribera (Minister for the Ecological Transition and responsible for energy). Ribera was clear that Spain wouldn't participate in the EC's call for all countries to cut natural gas consumption by 15% because Spain has already been paying a very high natural gas bill. Our tweet noted that Spain is also not reliant on Russia natural gas as it is the largest importer of LNG in Europe. El Pais *wrote ""We cannot assume a sacrifice on which we have not been asked for an opinion". Spain rejects Brussels' proposal to cut gas consumption by 15%: "Unlike other countries, we Spaniards have not lived beyond our means from an energy point of view". Spain goes on the attack against the latest proposal from Brussels, which proposes that all European countries cut their gas consumption by 15% until next spring, regardless of their degree of exposure to Russia. "We cannot assume a disproportionate sacrifice on which they have not even asked us for a prior opinion," said the third vice president and minister for the Ecological Transition, Teresa Ribera , in a practically monothematic press conference held hours after the European Commission revealed a plan that he does not consider "neither the most effective, nor the most efficient, nor the fairest". Whatever happens, she has said, "Spanish families are not going to suffer gas or electricity cuts in their homes." The person in charge of Energy of the Government has opted for "savings and efficiency" in gas consumption, but has assured that the Executive is not considering the hypothesis of restricting it to "any type of consumer". Spain, he stated, defends European values and will show solidarity with the rest of the Union, "but not at the expense of domestic and industrial consumers", who have been paying "a very high bill for a long time" and who "do not deserve restrictions no rationing." "Spain is a country committed to solidarity, but we have to see what is the best way to offer solidarity, which is probably more linked to the ability to use our infrastructures to support the Member States that depended on the gas that arrived by gas pipeline."*

Natural Gas – Spain is largest LNG importer in Europe

Spain doesn't need Russian gas

Our Spain tweet attached a map of Europe LNG import terminals and LNG imports in 2021 by country in Europe from the International Group of Liquefied Natural Gas Importers (GIIGNL) Annual Report 2022. The top 5 European LNG importers in 2021 were Spain at #1, followed by France, UK, Turkey and Italy. Below is the GIIGNL table of Europe LNG importers. Our Supplemental Documents package includes the GIIGNL map of all LNG import terminals.

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Figure 17: LNG imports in 2021

Market	10^6 m³ liquid	10^6 T	Global Share	Var. 2021/2020
Spain	31.34	13.82	3.7%	-10.1%
France	27.84	12.34	3.3%	-5.6%
United Kingdom	25.04	11.04	3.0%	-17.8%
Turkey	22.68	9.99	2.7%	-6.8%
Italy	15.59	6.88	1.8%	-24.1%
Netherlands	12.94	5.64	1.5%	5.8%
Portugal	9.25	4.11	1.1%	0.9%
Belgium	7.54	3.32	0.9%	3.3%
Poland	6.49	2.83	0.8%	4.7%
Greece	3.73	1.64	0.4%	-25.5%
Croatia	2.76	1.20	0.3%	#N/A
Lithuania	2.60	1.12	0.3%	-21.9%
Sweden	0.83	0.36	0.1%	1.0%
Malta	0.66	0.29	0.1%	-10.1%
Norway	0.50	0.22	0.1%	86.4%
Finland	0.47	0.20	0.1%	33.3%
Gibraltar	0.14	0.06	0.0%	29.6%
EUROPE	170.41	75.05	20.2%	-8.0%

Source: GIIGNL

Natural Gas – Nord Stream at 40% of capacity, but down to 20% if no Siemens turbine

Nord Stream risk gets cuts to 20%

Europe remains on edge as to what will happen to natural gas volumes on the Gazprom 5.3 bcf/d Nord Stream pipeline and Putin's warning that volumes will be cut to 20% of capacity if the Russia doesn't get the Siemens turbine. (i) Gazprom's annual maintenance ended as planned and natural gas deliveries restarted to Germany on July 21. Germany's energy regulator said the volumes were flowing at 40% of capacity, which is the same reduced level as pre maintenance. On Thursday, we tweeted [LINK] ""*If you extrapolate the first four hours of gas flows from #NordStream1 to the day, we end up at around 700 GWh/d & the pre-maintenance level of 40%. But in view of the missing 60% & the political instability, there is still no reason to sound the all-clear" #NatGas #OOTT*". The quote was the English translation of German energy regulator head Klaus Mueller's tweet [LNK]. (ii) Putin warned volumes would be cut to 20% of capacity. On Tuesday, we tweeted [LINK] *"#NordStream. Putin points to return to service at 2.12 bcfd (40% of 5.3 bcfd capacity) but down to 1.06 bcfd if gas turbine not returned. reduced volumes ensure EU storage doesn't get to 90% fill, he saves #NatGas nuke option until Nov/Dec. #OOTT "*. TASS reported "*If Russia does not get a turbine for Nord Stream 1 back, this route can be used to pump only 30 mln cubic meters of gas daily instead of the current 60 mln, Russian President Vladimir Putin said following the Astana Troika summit held in Tehran on Tuesday."* This would be a cut to 20% or 1.1 bcf/d. (iii) It feels like the set up for Putin's warning on a cut back to 20% is coming true. It's unclear when the Siemens turbine will be delivered to Russia. The Siemens turbine still seems stuck in Germany. And the blame is being put on Russia for creating reasons for not accepting the return of the turbine. On Friday, Gazprom tweeted "*Gazprom as repeatedly requested Siemens to provide official documents confirming the exemption from the current sanction*

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regimes imposed by Canada and the European Union for the return to Russia of the gas turbine engine repaired in Canada for the Portovaya CS, but Siemens has not yet provided them. Given the significant potential risks in case of non-compliance with all established procedures within the framework of the return of the specified engine, Gazprom has once again to make such a request to Siemens. Gazprom emphasized that the current terms of the contract did not stipulate any additional obligations of the Russian party to obtain this engine." Our Supplemental Documents package includes the TASS Putin report.

Natural Gas – Relief for EU, Russia is well on track to fill its gas storage before winter

Russia on track for its storage refill

On Thursday, Putin met with Energy Minister Nikolai Shulginov to fuel and energy preparations for the winter season. Shulginov is only below Novak for Russian energy. Even though this was about preparation in Russia, there was some good news for Europe. We tweeted [LINK] "*One relief for EU #NatGas. Russia won't have to say they can't export gas as they need it for their own storage refill. RUS is at 81% of their target storage volumes to start winter so look in good shape to get to 100%. Thx @d_khrennikova. #OOTT.*" Russia is comfortably on its way to fill its domestic gas storage for winter, which we believe eliminates a potential excuse for them to cut natural gas volumes to Europe. The Kremlin posted transcript quoted Shulginov *"I would like to make some important points regarding our preparations for the winter. First, we do not face any challenges in accumulating any type of fuel – reserve, main, or emergency fuel reserves. We will have no problem pumping gas into underground reservoirs. Today, the level of gas injection stands at 81 percent of the target figure set for November."* Our Supplemental Documents package includes the transcript of the Putin/Shulginov meeting. [LINK]

Natural Gas – Germany to allow 90% of natural gas costs to be passed to consumers

Germany rescue package for Uniper

As expected, Germany stepped in for a rescue package for Uniper, which will see Germany end up with about a 30% interest in Uniper. But as part of their announcement, Germany announced that Uniper can pass on 90% of the cost to replace the loss of supply from Gazprom natural gas. Germany will also provide relief to homeowners. But the fear that the real cost of natural gas are a big concern for Germany.

Natural Gas – Is there risk Germany gives into Russia if natural gas crisis worsens?

Will Germany give in on gas?

We have to believe Germany has discussed what they will do if Russia cuts natural gas to levels that will cause a major domestic crisis. But were surprised to see what looks to be a slip of the tongue by the Foreign Minister suggesting Germany would have to stop supporting Ukraine as they would have bigger domestic problems. She backtracked on her comments, but the reality is that Germany has to have had scenario discussions on worst case scenarios. And we can't believe she would have said what she said if it wasn't part of one of the potential. It certainly seemed to say they would go back to Russia somehow to get natural gas. On Friday, we tweeted [LINK] "*Potential big risk to #LNG #TTF prices?? Yes, likely a slip of the tongue, but surely DEU govt has had internal discussions on trade-offs if #NatGas picture becomes ugly. As Mike Tyson said everyone has a plan until they get punched in the mouth. Thx @vonderburchard. #OOTT."* Germany Foreign Minister Baerbock was on German TV [LINK]. Fortunately, Politico Europe's Ans von der Burchard tweeted out some of Baerbock's comments. [LINK] "*Big communication blunder by DE FM Baerbock."If we don't get the gas turbine, then we won't get any more gas, and then we won't be able to provide*

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any support for Ukraine at all, because then we'll be busy with popular uprisings." She immediately backtracked but damage was done." [LINK] "*Baerbock immediately said she had been "exaggerating," and she repeated this later, also stressing the high level of public support in DE for arms deliveries to Ukraine. The Foreign Ministry said it's important to listen to her full remarks for context (and they're right)."* The other big reason why it seems clear

Germany has been warning of the potential crisis ahead
We find it impossible to believe Germany hasn't been discussing and planning ofr contingencies for more severe cut off of natural gas from Russia. It's why we think Baerbock just said something she shouldn't have said and not something that hadn't been discussed around the inner cabinet. Germany has been warning on the severity. (i) Our July 3, 2022 Energy Tidbits noted the July 2 comments from Germany's Federal Network Agency head, Klaus Mueller. The FNA is the German authority responsible for gas, electricity, telecommunications, post and railways. We tweeted [LINK] "*DEU #NatGas crisis about to get ugly? Seems inevitable DEU activates its #NatGas price adjustment clause & #NordStream maintenance the timing? If so, @Klaus_Mueller "many consumers will be shocked" by #NatGas price. Much more in @jgaugele report #LNG #OOTT [LINK]".* Mueller was asked *"When will you allow energy suppliers to pass on the increased prices to consumers? You can already activate the so-called price adjustment clause."* And he replied "*Today is not the time. The prerequisite would be that we formally determine a significant reduction in the total gas import volumes. The maintenance of Nord Stream 1 will play an important role in this question."* That sounds like the price adjustment clause is about to be kicked in. Mueller than warned "*So the price of gas on the exchange has increased about sixfold since last summer. These price increases only reach consumers with a time lag. And they won't arrive one-to-one either. But we already have consumer prices doubling today. By the, what Putin is giving us with Nord Stream 1 can be tripled. And we can only guess what will happen next. Many consumers will be shocked when they receive mail from their energy supplier*." (ii) Our July 10, 2022 Energy Tidbits wrote "Yesterday, Tagesschau reported " *Federal Economics Minister Robert Habeck chose even more drastic words, warning of a "political nightmare scenario" in view of the impending failure of gas supplies from Russia. This would occur if the state had to control the allocation of gas in an acute crisis, the Greens politician told Deutschlandfunk. He had "no illusions" about what would happen then: "This will put Germany to a crucial test that we haven't had for a long time."*

Natural Gas – Europe storage is now +11.93% YoY ie. 65.21% full vs 53.28%

Europe storage now 65.21% full

We have to wonder how much industrial natural gas demand is down with the very high natural gas and LNG prices. Even with the reduced volumes on Nord Stream prior to its July 11-21 maintenance, Europe storage continues to have increasing YoY levels. Europe gas storage began the year in a YoY deficit, but the YoY Europe storage gap changed to a YoY storage surplus and it continues to build this week. Europe gas storage started the winter down 18.52% YoY and is now a YoY surplus of 11.93%. Inventories are rising all across Europe, as is normal during spring and early summer. Europe gas storage started last winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1/21. Europe storage levels bottomed in late Apr at 29%, which was the lowest level since

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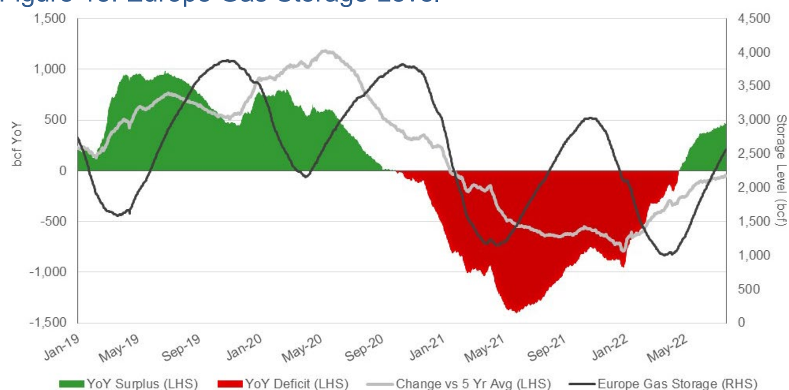
Apr 2018. This winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has turned to surplus after months of the deficit tightening. Thanks to the warm weather and US LNG, storage as of July 20 is at 65.21%, which is +11.93% greater than last year levels of 53.28% and are -1.09% below the 5-year average of 66.30%. Below is our graph of Europe Gas Storage Level.

Figure 18: Europe Gas Storage Level



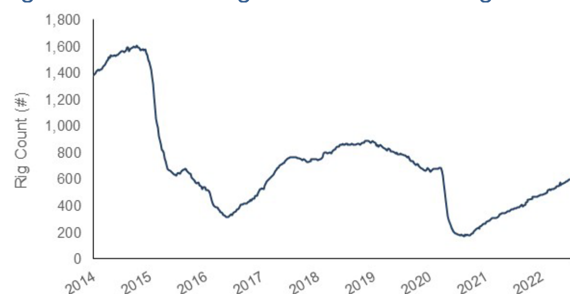
Source: Bloomberg

Oil – US oil rigs flat at 599 oil rigs at July 22

US oil rigs flat WoW

Baker Hughes released its weekly North American drilling activity data on Friday. There are still strong oil, NGLs and natural gas prices and industry has higher YoY 2022 capex budgets, but the reality is that industry needs to crank up drilling to increase the depleted inventory of DUCs. This week US oil rigs were flat at 599 oil rigs. Oil rigs are +427 off the bottom of 172 in Aug14/2020 week. Note the Permian was -2 to 346 rigs this week. The likely explanation for the low growth is the extremely hot weather in Texas. But in light of the service sector warnings on running out of capacity for high end rigs, we have to wonder if the US service sector is nearing its capacity limits. If so, it would also be a sign that US oil growth might be less than expected in 2023. The Bakken was flat at 37 rigs after no change last week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by -84 to 599 oil rigs (-12%). US gas rigs were +2 WoW at 155 rigs.

Figure 19: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

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Oil – Was the US frac spreads +11 to 290 for the week ending July 22

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending July 22 on the Primary Vision network. YouTube video is at [LINK]. For the week ending July 22, US frac spreads at the high point in the week were +11 to 290 spreads. Rossano didn't go through it on the call this week, but last week, he was surprised by the -6 week including declines in the Permian. He raised the risk that the July 15 week decline could be a pivot point if there wasn't a snap back this week. Last week, he also noted the very hot weather in Texas could have been a factor. There was a clear snap back this week. Rossano noted the move down last week could have been related to moving. He noted some of the smaller basins started to come back a bit, got an increase in the Anadarko. Rossano said the one smaller basin he wants to keep watching is the Powder River, said it would be interesting but didn't say why in his free video Looking forward, he had thought would have got to 290 right after 4th of July, so maybe won't get to the 310 he thought, but rather the 300 level.

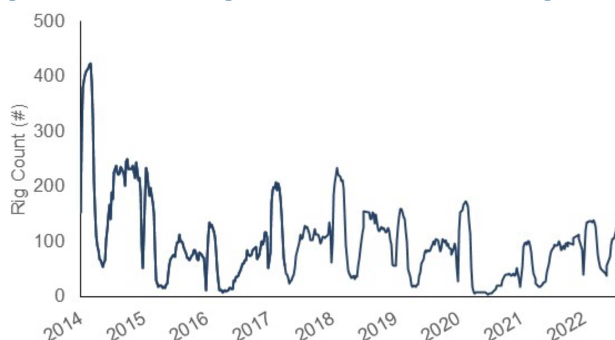
Frac spreads +11 to 290

Oil – Total Cdn rigs +4 WoW at 195 total rigs, +46 rigs YoY

Total Cdn rigs were +4 total rigs this week at 195. Cdn oil rigs were -1 at 124 rigs. Cdn gas rigs were +5 at 71 gas rigs. Total rigs are now +182 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 93 and Cdn gas rigs were 55 for a total Cdn rigs of 149, meaning total Cdn oil rigs are +31 YoY and total rigs are +46 vs 2021.

Cdn rigs +4 WoW

Figure 20: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production -0.1 mmb/d to 11.9 mmb/d

US oil production was -0.1 mmb/d to 11.9 mmb/d for the week ended July 15 after a decrease last week. Lower 48 production drove total production and was down -0.1 mmb/d from last weeks level at 11.5 mmb/d this week, with Alaska having immaterial change. US oil production is up YoY at +0.5 mmb/d, but is still down significantly at -1.2 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. Q2 reporting is about to start for the US producers and we expect to see the same messaging on capex – producers will continue with a disciplined capex program and focus on returns to shareholders.

US oil production -0.1 mmb/d WoW

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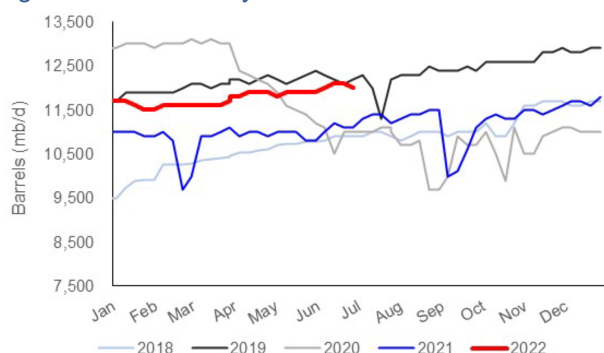
Figure 21: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2020-May	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2020-Jun	06/05	11,100	06/12	10,500	06/19	11,000	06/26	11,000		
2020-Jul	07/03	11,000	07/10	11,000	07/17	11,100	07/24	11,100	07/31	11,000
2020-Aug	08/07	10,700	08/14	10,700	08/21	10,800	08/28	9,700		
2020-Sep	09/04	10,000	09/11	10,900	09/18	10,700	09/25	10,700		
2020-Oct	10/02	11,000	10/09	10,500	10/16	9,900	10/23	11,100	10/30	10,500
2020-Nov	11/06	10,500	11/13	10,900	11/20	11,000	11/27	11,100		
2020-Dec	12/04	11,100	12/11	11,000	12/18	11,000	12/25	11,000		
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800	04/08	11,800	04/15	11,900	04/22	11,900	04/29	11,900
2022-May	05/06	11,800	05/13	11,900	05/20	11,900	05/27	11,900		
2022-Jun	06/03	11,900	06/10	12,000	06/17	12,000	06/24	12,100		
2022-Jul	07/01	12,100	07/08	12,000	07/15	11,900				

Source: EIA

Figure 22: US Weekly Oil Production



Source: EIA, SAF

Oil – North Dakota Apr oil production 1.058 mmb/d, up MoM from 0.905 mmb/d in April

North Dakota oil production

On Tuesday afternoon, the North Dakota Industrial Commission posted its Director's Cut, which includes May oil and natural gas production data [LINK]. The headline on the May numbers was that North Dakota Feb oil production was 1.058 mmb/d, which was up 17% from April 2022 production of 0.905 mmb/d. YoY production was down -6.1% from May 2021 production of 1.128 mmb/d. The MoM increase in oil production in May was due to the recovery from the two historic blizzards in April. Note the following item on the Williston Herald reporting, which indicated the Bakken was ~60,000 b/d short of production in May from the Blizzard impact, but is expected back to normal in June. The NDIC reports that well completions were up in May to 53, up from 33 in April and 65 in Dec. Note there was no NDIC Director's Cut posting for last month so we didn't have the normal data on well completions. Our Supplemental Documents package includes excerpts from the Director's Cut.

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Figure 23: North Dakota Oil Production By Month

(b/d)	2017	2018	2019	2020	2021	2021/2020	2022	2022/2021
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	-19.8%	1,088,613	-5.1%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	-25.4%	1,089,091	0.5%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	-22.5%	1,122,640	1.2%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	-8.0%	900,597	-19.8%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	31.3%	1,058,721	-6.1%
June	1,032,873	1,227,320	1,425,230	893,591	1,133,498	26.8%		
July	1,048,099	1,269,290	1,445,934	1,042,081	1,076,594	3.3%		
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	-5.0%		
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	-8.9%		
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	-9.7%		
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	-5.6%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	-3.9%		

Source NDIC, NDPA

North Dakota expects oil production +2% YoY to exit 2022 around 1.3 mmb/d

We always look to the local North Dakota oil media for extra insights on the monthly North Dakota production data based on comments at the monthly press conference on the new oil and gas production data. This week the Williston Herald [LINK] report had a number of good insights that aren't in the monthly Director's Cut report. (i) 2022 exit +2% YoY to ~1.3 mmb/d. The Williston Herald wrote ""*We anticipate that June will show a full recovery from that and that July is actually going to show a significant increase in production, so we are marching towards that maybe 2 percent production increase of rate year, which should put us in the neighborhood of 1.3 million a day by year-end. I think that's kind of what the target is for industry."* (ii) The Bakken was still about 60,000 b/d not fully recovered from April, but North Dakota expects June oil production will be a full recovery. (iii) The Williston Herald wrote "*One surprise for the May report's stats, Helms said, was the jump in inactive well counts to more than 2,400 wells. "A large part of that is we had a large group of wells on non-completed well waivers," Helms said. "And the commission had institute d a policy to allow people who had drilled new Bakken wells to leave then in a non-completed status. But that expired, because oil price is so high. (And) it expired when load limits went off in the month of May."* Our Supplemental Documents package include the Williston Herald report.

North Dakota CBR up in May

Oil – North Dakota crude by rail up MoM to 152,410 b/d in May

The North Dakota Pipeline Authority posted its monthly update "*July 2022 Production & Transportation*" [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority for more detailed numbers of crude by rail out of North Dakota. The NDPA Monthly Update (graph below) report only provides rounded numbers, and these rounded numbers are not accurate enough to match the graphs. In the backup excel, the NDPA estimates crude by rail in May was a low of 137,410 b/d and a high of 167,410 b/d for an average of ~152,410 b/d. This is down from April's low of 106,952 b/d to high of 136,952 b/d for an average of ~121,952 b/d. Note that Aprils' numbers were revised down 389 b/d. 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.

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Figure 24: Estimated North Dakota Rail Export Volumes

Source: North Dakota Pipeline Authority

Oil – EIA forecast US shale/tight oil breaking out

US shale/tight oil production

The EIA Drilling Productivity Report July 2022 [LINK] forecast for US shale/tight oil shows another increase in production from last month, indicating that shale/tight is breaking out after it was basically flat for four months. The DPR is the EIA's forecast for production for the major shale/tight oil and gas basins for the current month (in this case July) and the next month (in this case Aug). (i) The headline from the report is that US shale/tight oil was +136,000 b/d MoM to reach 9.068 mmb/d in Aug. July at 8.932 mmb/d saw a similar increase vs 8.758 mmb/d in June. (ii) The issue is that growth is basically only coming from the Permian basin, which saw the most significant increase of +78,000 b/d to help move production up from the stagnancy seen in Feb/March. The Permian Aug is 5.445 mmb/d, vs 5.134 mmb/d in Feb. Eagle Ford is also up +25,000 b/d, benefitting from its higher natural gas ratio and the pull for natural gas for US LNG exports. (iii) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Our Supplemental Documents package includes the EIA DPR.

Figure 25: MoM Change – Major Shale/Tight Oil Production

Thousand b/d	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Aug YoY	Aug YoY %	Aug less July
Anadarko	370	369	363	366	378	389	393	399	398	391	406	413	418	48	13%	5
Appalachia	129	125	118	122	120	115	113	113	111	114	124	130	133	4	3%	3
Bakken	1,139	1,139	1,131	1,137	1,146	1,184	1,192	1,172	1,169	1,172	1,178	1,173	1,192	53	5%	19
Eagle Ford	1,054	1,053	1,076	1,078	1,090	1,104	1,122	1,123	1,140	1,149	1,152	1,180	1,205	151	14%	25
Haynesville	34	34	34	34	33	33	33	33	34	35	36	37	37	3	9%	0
Niobrara	555	576	594	608	615	615	611	613	610	627	630	632	638	83	15%	6
Permian	4,756	4,773	4,826	4,886	4,960	4,996	5,134	5,138	5,055	5,131	5,232	5,367	5,445	689	14%	78
Total	8,037	8,069	8,142	8,231	8,342	8,436	8,598	8,591	8,517	8,619	8,758	8,932	9,068	1,031	13%	136

Source: EIA Drilling Productivity Report

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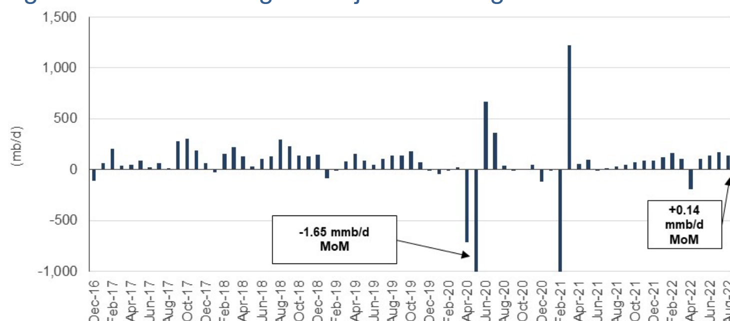
Figure 26: MoM Change – Major Shale/Tight Oil Production



Source: EIA Drilling Productivity Report

Oil – EIA DUC's worked down by 50 in June

DUCs continue to work down

We still believe a key risk to how much US oil production can grow in 2022 and 2023 is the need to increase rig counts to replenish the inventory of Drilled UnCompleted wells and the challenge for oilfield services to add capacity to increase frac spreads and completions. The biggest problem in the past with the EIA's Drilling Productivity Report [LINK] estimate of Drilled UnCompleted wells was that the data had been constantly revised and sometimes significantly. However, the DUC estimates provide a clear picture of the trend since Aug 2020, which is that DUCs continue to be worked down. It's why there is the need for drilling rigs to pick up to replenish the DUC inventory if the US is to have strong oil growth in 2022. (i) It is also important to remember that a portion of the DUCs will never be completed as there are drilled wells that don't look like they can justify the higher cost of completion. (ii) Drilled Uncompleted Wells are down another 50 MoM in June, meaning a total 4,629 DUCs were worked down since the Jun/20 peak of 8,874. The largest work downs are coming from the Permian (-1,205 YoY) and Eagle Ford (-357 YoY). With DUCs being worked down so significantly we will need to see rig counts go up to replenish DUCs in the near future. (iii) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Our Supplemental Documents package includes the EIA DPR.

Figure 27: EIA - Estimated Drilled UnCompleted Wells

Drilled UnComplete	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	June YoY	June YoY %
Anadarko	863	856	838	824	812	799	787	773	758	753	740	724	727	719	-137	-16%
Appalachia	598	595	590	588	557	537	513	565	457	473	471	497	526	527	-68	-11%
Bakken	656	619	590	566	541	516	485	464	436	426	426	429	425	424	-195	-32%
Eagle Ford	1012	954	912	869	833	796	760	685	683	653	642	612	598	597	-357	-37%
Haynesville	392	399	402	406	396	392	386	372	369	371	395	419	441	453	54	14%
Niobrara	402	373	380	379	375	372	362	354	343	331	317	320	310	311	-62	-17%
Permian	2598	2,419	2,249	1,994	1,812	1,669	1,537	1,444	1,482	1,380	1,302	1,294	1,244	1,214	-1,205	-50%
Total	6,521	6,215	5,961	5,626	5,326	5,081	4,830	4,657	4,528	4,387	4,293	4,295	4,271	4,245	-1,970	-32%

Source: EIA, SAF

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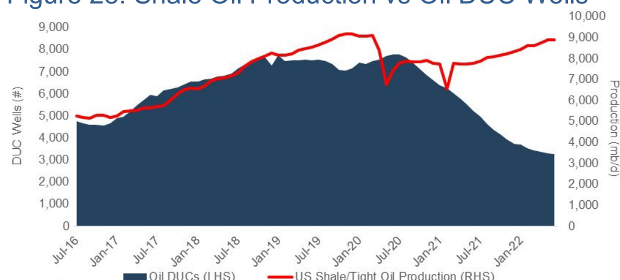
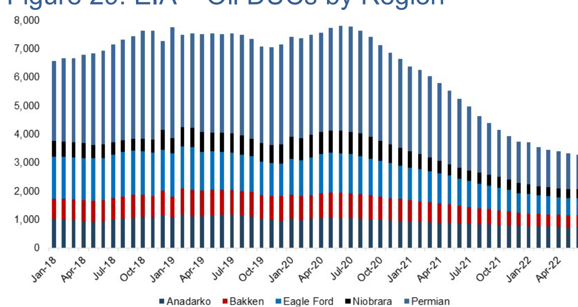
Figure 28: Shale Oil Production vs Oil DUC Wells



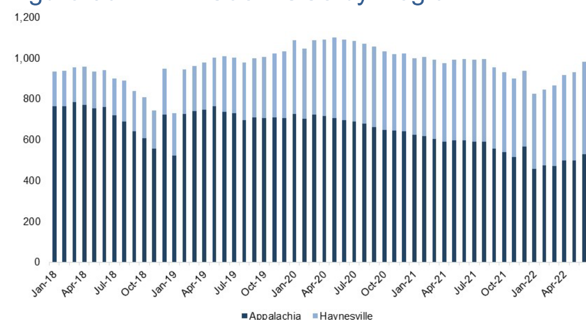
Source: EIA, SAF

Figure 29: EIA – Oil DUCs by Region



Source: EIA, SAF

Figure 30: EIA – Gas DUCs by Region



Source: EIA, SAF

Oil – Keystone 590,000 b/d pipeline returned to normal operations yesterday

Keystone Pipeline force majeure

Yesterday, we tweeted [LINK] "*Breaking: @TCEnergy announces #Keystone #Oil pipeline restored to normal operations ie. back to 590,000 b/d capacity. It was a localized power issue that was able to be restored relatively quickly. #OOTT [LINK].*" On Monday, TC Energy first announced [LINK] that a force majeure had been declared on the Keystone pipeline due to third-party damage to the power supply to a facility on the Keystone Pipeline System near Huron, South Dakota, and that the pipeline was moving oil at reduced volumes. TC did not disclose how much volumes were off on the 590,000 b/d Keystone Pipeline. After seeing the reports, we tweeted [LINK] "*Power supply interruption to @TCEnergy facility leads to majeure on 590,000 b/d #Keystone #Oil pipeline to PADD2, PADD 3. Down to undisclosed reduced*

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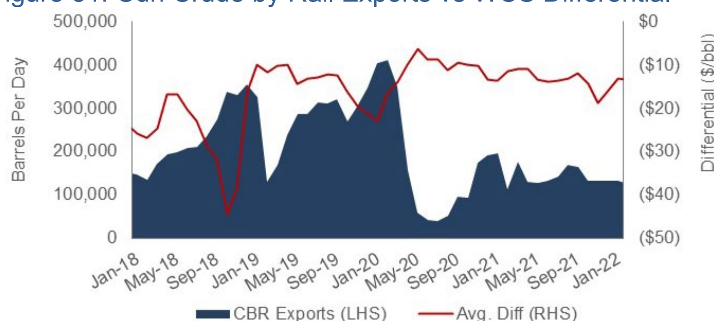
rates, no ETA for full volumes. Not a major SD power issue so hopefully get fixed or temp power (ie. diesel) quickly. #OOTT." Our tweet included the power outage map for South Dakota, which confirmed there weren't any major power outages in South Dakota and supported that the power outage was a localized issued for the power station. That gave us comfort that Keystone would likely not be a long outage. On Wednesday, they updated the release, confirming that there was no material impact to TC Energy-owned facilities during the incident, though they did not disclose the reduced rate they are operating at, or the timeline for full service restoration. On Thursday, Bloomberg released an article [LINK] which revealed the capacity impact. It stated that the 590,000 b/d pipeline's run rate had been reduced by around 15% following the incident. This impacts the section stretching from Hardisty, Canada, to Cushing, Oklahoma. And then yesterday, TC Energy advised they were back to normal operations. Our Supplemental Documents package includes the TC release and the Bloomberg article.

Oil – Cdn crude by rail exports at 173,122 b/d in May, up 35.3% YoY

Cdn crude by rail exports

The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were +28,953 b/d MoM in May to 173,122 b/d vs 144169 b/d in April [LINK]. This puts May export volumes at +45,116 b/d YoY (+35.3%) vs May 2021 of 128,006 b/d. CBR volumes are +134,255 since the July 2020 bottom of 38,867 b/d, when COVID-19-fueled capital spending reductions and lower drilling activity in Western Canada were in full effect. May WCS-WTI differentials increased to -$14.62. Normally, differential closer to $15 than $10 lead to higher CBR, so with the high WCS prices, most, if not all, Cdn heavy/medium is being moved to markets. There is also the support for declining Russia oil exports into US markets. Below is our graph of Cdn crude by rail exports compared to the WCS–WTI differential.

Figure 31: Cdn Crude by Rail Exports vs WCS Differential



Source: Canadian Energy Regulator, Bloomberg

Oil – Refinery inputs -0.321 mmb/d WoW at 16.319 mmb/d

Refinery inputs down WoW

US refineries continue to run at high capacity utilization levels in the face of very high crack spreads to pump out more gasoline and diesel and running their refineries at close to 95% capacity. The EIA crude oil input to refinery data is for the week ended July 15. This is the season that normally sees increasing processing volumes in Q2 every year, though the EIA reported crude oil inputs to refineries down -0.321 mmb/d to 16.319 mmb/d for the week ended July 15 and are +0.312 mmb/d YoY. Refinery utilization was down to 93.7%, which is +2.3% YoY. Refineries have exited the maintenance season with ramped up summer

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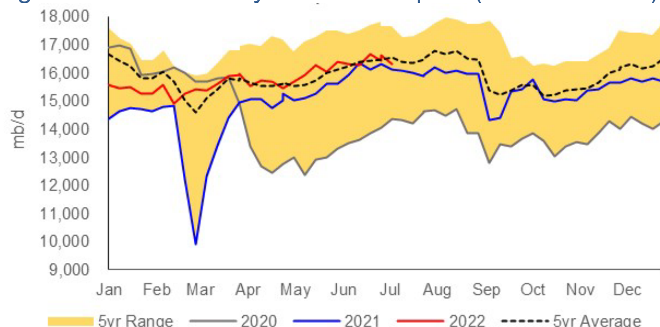
demand. Note that hurricane season in the US is here, with the official start of the season on June 1. Total products supplied (i.e., demand) Increased WoW, up 2.305 mmb/d to 21.025 mmb/d, and Motor gasoline was up 0.459 mmb/d at 8.521 mmb/d from 8.062 mmb/d last week. The 4-week average for Motor Gasoline was down -0.720 mmb/d YoY to 8.729 mmb/d. The 4-week average of Total demand was down -0.532 mmb/d YoY to 20.051 mmb/d.

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



Source: EIA

Oil – US "net" oil imports down -0.891 mmb/d WoW at 2.760 mmb/d

US "NET" imports were down -0.891 mmb/d to 2.760 mmb/d for the July 15 week. US imports were down -0.156 mmb/d to 6.519 mmb/d. US exports were up +0.735 mmb/d to 3.759 mmb/d. The WoW increase in US oil imports was driven by US's Top 10 imports by country which were down by -0.162 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by -0.346 mmb/d to 3.481 mmb/d. (ii) Saudi Arabia was down -0.392 mmb/d to 0.242 mmb/d this week. (iii) Colombia was up 0.192 at 0.405 mmb/d. (iv) Ecuador was down 0.092 mmb/d at 0.057 mmb/d. (v) Iraq was up 0.152 mmb/d to 0.454 mmb/d. (vi) Mexico was up 0.267 mmb/d to 0.877 mmb/d.

US "net" oil imports down WoW

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	May 6/22	May 13/22	May 20/22	May 27/22	June 3/22	June 10/22	June 17/22	June 24/22	July 1/22	July 8/22	July 15/22	WoW
Canada	3,284	3588	3498	3444	3603	3394	3344	2887	3803	3827	3481	-346
Saudi Arabia	306	420	588	345	349	681	760	701	398	634	242	-392
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	693	832	872	747	711	608	374	743	702	610	877	267
Colombia	276	365	218	215	143	292	228	215	213	213	405	192
Iraq	326	242	282	326	196	555	100	76	362	302	454	152
Ecuador	351	43	250	48	259	227	124	59	142	149	57	-92
Nigeria	136	127	39	193	194	181	43	201	171	79	136	57
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	5,372	5,617	5,747	5,318	5,455	5,938	4,973	4,882	5,791	5,814	5,652	-162
Others	897	951	739	900	699	1,047	1,253	1,116	1,048	861	867	6
Total US	6,269	6,568	6,486	6,218	6,154	6,985	6,226	5,998	6,839	6,675	6,519	-156

Source: EIA, SAF

Oil – Norway June oil production of 1.298 mmb/d, down -20.2% MoM

The Norwegian Petroleum Directorate released its June production figures [LINK] of 1.298 mmb/d of oil, which is -22.2% YoY and -20.2% MoM from May of 1.626 mmb/d. June production was down (-0.002 mmb/d) from the forecast amount of 1.300 mmb/d. The NPD does not provide any explanations for the MoM changes. The theme for Norway through

Norway oil production

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2021 was that Norway oil production returned to growth because of the Johan Sverdrup oil field, and tax breaks from the government allowing increased capex in the energy sector. Norway oil production was still expected up modestly in 2022.

Figure 34: Norway June 2022 production

		Oil	Sum liquid	Gas	Total
		mill bbl/d	mill bbl/d	MSm³ /d	MSm³ o.e/d
Production	**June 2022**	**1,298**	**1,529**	**334,2**	**0,577**
Forecast for	June 2022	1,300	1,528	333,4	0,576
Deviation from forecast	June 2022	-0,002	0,001	0,8	0,001
Deviation from forecast in %	June 2022	-0,2 %	0,1 %	0,2 %	0,2 %
Production	June 2021	1,669	1,844	261,7	0,555
Deviation from	June 2021	-0,371	-0,315	72,5	0,022
Deviation in % from	June 2021	-22,2 %	-17,1 %	27,7 %	4,0 %
Production	May 2022	1,626	1,804	324,1	0,611
Deviation from	May 2022	-0,328	-0,275	10,1	-0,034
Deviation in % from	May 2022	-20,2 %	-15,2 %	3,1 %	-5,6 %

Source: Norwegian Petroleum Directorate

Oil – Russia says won't sell to countries who try to set price caps

Russia on oil price caps

No surprise, Russia has come out saying they won't sell oil who try to put a price cap on Russian oil. What isn't clear is will they sell natural gas or LNG to any countries who try to put price caps on Russian oil? Yesterday, Bloomberg reported on comments from Russia's central bank Governor Elvira Nabiullina. Bloomberg reported "*Moscow has been trying to create its own oil benchmark more than a decade, but its ambitions have intensified since the invasion of Ukraine. If the G-7 were to go ahead with its plan to curb Russian oil revenue with a price cap, that would lead a spike in global prices, Nabiullina said. "As far as I can understand, we will not supply oil to countries that would impose such price limits," Nabiullina said. "We will re-direct our crude and oil products to those nations that are ready to cooperate with us."*

Oil – Did Houthis March missile attack do more damage than let on at Saudi refinery?

Did Houthis missile attack do more damage?

We were surprised that no one else seem to wonder what was going on with the JODI data for Saudi Arabia in May. There was a big plug that escaped attention. We tweeted [LINK] "*Hmmm! Wonder why big plug # to reconcile the +4.84 mmb MoM increase in @JODI_Data for Saudi #Oil inventory at May 31 vs MoM changes in production, oil used for electricity, oil input to refineries & exports? Maybe revision to March refinery oil from March missile attack? #OOTT.*" When we see the JODI data, we do a reconciliation of the monthly changes. There is a plug of +4.142 mmb (~134,000 b/d) in May. What can it be? The options are: production was higher than previously reported, direct use for electricity was less than previously reported, refinery intakes were less than previously reported, or exports were less than previously reported. So it could just be a little bit of each in March or April. Or it could be something funny? The one that makes the most sense is if the refinery intake of crude oil in March was less than previously reported in the JODI data. And, if so, wonder if the missile attack on Saudi Aramco refinery in March may have caused more damage than they let on. The JODI data shows crude input to refineries was -271,000 b/d in Feb, +267,000 b/d in March, -235,000 b/d in April, and today reported at +211,000 b/d in May. Maybe the missile attack in March did more damage to the refinery. Recall they had the missile attacks on

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refineries in March. So we previously noted we were surprised by the March data being +267,000 b/d. Here is what we wrote in the June 26, 2022 Energy Tidbits "*Oil input to refineries was down -235,000 b/d MoM to 2.538 mmb/d. We were surprised last month, when oil input to refineries in March was +267,000 b/d MoM. We had wondered if oil input to refineries would be down in March given the confirmed missile attack on the Riyadh refinery. There is no explanation for the -235,000 b/d MoM decrease in April, but we suspect that, at least some of this decline, was due to partial maintenance of the 550,000 b/d Ras Tanura refinery which continued through mid-April*." Plus maybe the reason for importing more Russia fuel oil is because of less Saudi refinery output. Then, we had last week's Reuters report. In the July 17, 2024 Energy Tidbits, we wrote ""*It is still the peak season, but it looks like Saudi Arabia will be using of its own oil for electricity as it importing more Russian fuel oil for electricity generation. This also allows helps Russia maintain exports. On Thursday, Reuters reported [LINK] "Saudi Arabia, the world's largest oil exporter, more than doubled the amount of Russian fuel oil it imported in the second quarter to feed power stations to meet summer cooling demand and free up the kingdom's own crude for export, data showed and traders said. Russia has been selling fuel at discounted prices after international sanctions over its invasion of Ukraine left it with fewer buyers. Moscow calls the war in Ukraine a "special military operation". The increased sales of fuel oil, used in power generation, to Saudi Arabia show the challenge that U.S. President Joe Biden faces as his administration seeks to isolate Russia and cut its energy export revenues." "Data obtained by Reuters through Refinitiv Eikon ship tracking showed Saudi Arabia imported 647,000 tonnes (48,000 barrels per day) of fuel oil from Russia via Russian and Estonian ports in April-June this year. That was up from 320,000 tonnes in the same period a year ago."*

Oil – Saudi used 582,000 b/d of oil for electricity generation in May

Saudi summer oil use for electricity

For the last several years, we have highlighted this reminder that Saudi Arabia uses more than twice as much oil for electricity in the summer vs the winter. This means that increased production in the summer months doesn't mean increased oil exports. The ramp up really cranks up in May, June, July and August. The JODI data for Saudi Arabia oil supply and demand for May was updated on Monday. Saudi used more oil for electricity in May vs April. This is attributed to the warmer temperatures experienced throughout May. May saw varying temperatures that were at or above average for most of the month. May was 582,000 b/d (vs May 2021 of 451,000 b/d) and April was 397,000 b/d (vs April 2021 of 407,000 b/d). May was above the latest 5 yr average of 465,000 b/d. Below are the AccuWeather Temp maps for Riyadh for May, June, and July MTD. Careful they are different scales but look for oil for electricity to increase as we move further into peak season. We believe the Saudi use of oil for electricity would have been even higher but for the increased imports of Russian fuel oil noted in the July 17, 2022 Energy Tidbits.

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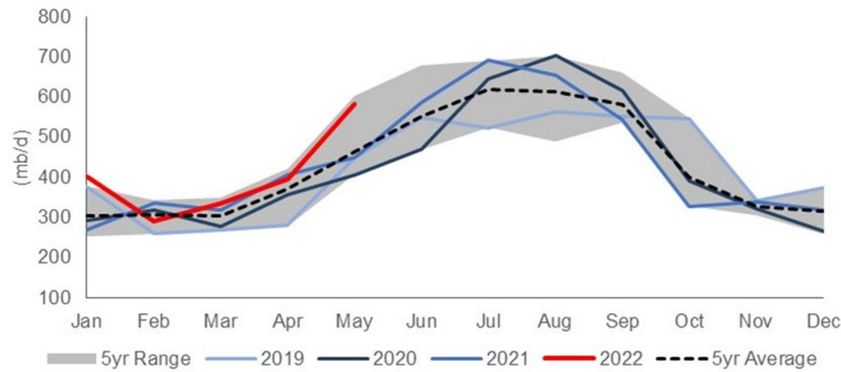
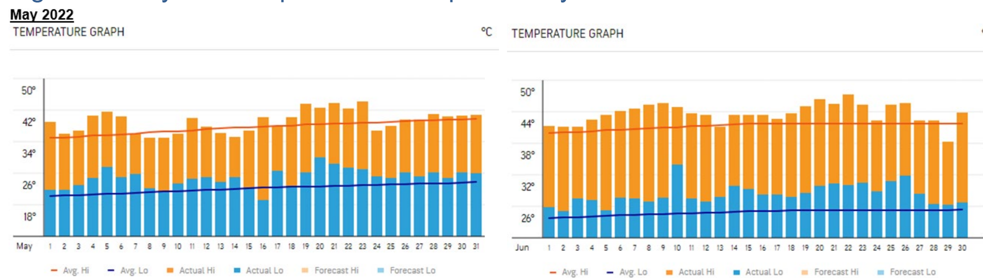
Figure 35: Saudi Arabia Direct Use of Crude Oil For Electric Generation



Source: JODI

Figure 36: Riyadh Temperature Recaps for May and June



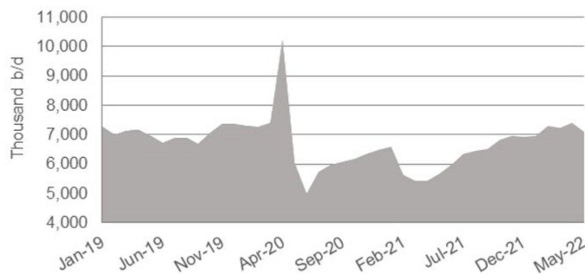
Source: AccuWeather

Oil – Saudi oil exports dropped to 4-mth low of 7.050 mmb/d in May

Saudi oil export data for May

The big headline from the JODI data for Saudi Arabia's oil production, export, oil used for electricity, refinery intake, and inventories were on the oil export data. Saudi oil exports in May were 7,050 mmb/d, which was a four month low, down MoM from 7.382 mmb/d in April.

Figure 37: Saudi Arabia oil exports



Source: JODI

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Oil – Saudi could export oil from inventories if they wanted to help Biden

One of the other JODI data for Saudi Arabia that didn't seem to get any attention is how Saudi oil inventories are at the highest levels since Oct 2020. Saudi oil inventory was +4.842 mmb MoM to 144.421 mmb at May 31, the highest level since 144.659 mmb on Oct 31, 2020. As noted above, we don't think this was by design, but Saudi oil inventories at May 31 were 144.421 mmb, which is the highest level since Oct 2020. And at that level, it could give Saudi the option to release some oil from inventory if they wanted to help Biden. Inventories were built in May from 139.5 mmb in April to 144.4 mmb May. As noted above, the MoM changes in production, oil used for electricity, oil input into refineries and exports should, in theory, led to inventories being +22,000 b/d for May or +0.682 mmb for the month of May. Yet the JODI reported inventory is +4.842 mmb MoM for May so a plug of 4.142 mmb (134,000 b/d) in May to correct April or March.

Saudi oil inventory data

Figure 38: Saudi Arabia Crude Oil Inventories (million barrels)

Source: JODI

Oil – Saudi keeps reminding it's not an oil supply issue, it's a lack of refining issue

It looks like Saudi Arabia is making sure oil markets know that they don't see the US gasoline price crunch as an oil supply problem, rather it's a lack of refining capacity problem. (i) Last week's (July 17, 2022) highlighted the Arab News interview with Saudi Arabia Minister of State for Foreign Affairs Adel Al-Jubeir the day after the Biden/MBS meeting. Arab News posted an interview and a 2+ min clip of his comments on oil markets n their July 16 report "*INTERVIEW: Adel Al-Jubeir on why Biden's Saudi visit is a success, and US commitment to Kingdom's security"* [LINK]. We created a transcript and tweeted [LINK] "*Ouch. Saudi reminds US it has gasoline shortage, not crude oil. "With regards to the price of #Gasoline in the US, that's really a function of a lack of refining capacity ...So increasing crude #Oil supplies to the US is not going to alleviate that problem." Thx @NoorNugali #OOTT."* (ii) On Tuesday, Saudi Foreign Minister Prince Faisal jumped in with the same commentary – Saudi Arabia doesn't see a lack of oil supply, it's a lack of refining capacity. Arab News reported Faisal's comments at the Arab News Japan Roundtable on July 19 in Tokyo. Arab News reported "*The minister also went on to reveal parts of what went on during the recent visit of US President Joe Biden to Jeddah, and reiterated the kingdom's commitment to stablizing energy markets. The Saudi foreign minister said at the panel: "We don't see a lack of oil in the market, there is a lack of refining capacity."*

Saudi says it's a lack of refining issue

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Oil – Saudi also makes it clear Russia is a key partner in OPEC+

Saudi supports Russia in OPEC+

One of the other key Saudi Arabia messages to oil markets post the Biden/MBS meeting is that the US shouldn't expect Saudi Arabia to abandon its relationship with Russia and that Russia is a key partner in OPEC+. (i) On Tuesday, we tweeted [LINK] "*Another post #Biden/#MBS reminder from Saudi "we don't see a lack of #Oil in the market, there is a lack of refining capacity". Also don't expect them to abandon Russia as "RUS is an integral part of #OPEC+". KSA Al-Jubeir on Sat, Foreign Minister Prince Faisal today. #OOTT*." The other key part of the Arab News reporting on Prince Faisal's comments in Tokyo were on Russia. Arab News reported '*He added: "Russia is an integral part of OPEC+. Without OPEC+ cooperation as a collective it would be impossible to properly ensure adequate oil supplies*." (ii) On Thursday, MBS and Putin spoke via phone. Bloomberg reported "*Russia's President Vladimir Putin and Saudi Crown Prince Mohammed bin Salman discussed continued cooperation within OPEC+ in a phone call on Thursday, according to a statement from the Kremlin. "It was emphasized that a further coordination within OPEC+ is important," according to the statement. "It was noted with satisfaction that member states are consistently meeting their obligations to support the necessary balance and stability in the global energy market." The phone call between Russia's president and the de-facto Saudi leader comes less than two weeks before the Organization of Petroleum Exporting Countries and its allies meet to discuss production strategy. Those talks could determine whether the group delivers additional oil, as requested by US President Joe Biden earlier this month in a visit to the Middle Eastern kingdom."*

Oil – Iran says its now technically capable of building a nuclear bomb

Iran's status on nuclear capability

Last Sunday after our news cut off, we tweeted [LINK] *"Is this a challenge to @IsraeliPM Lapid (see 👇) or warning to #Biden to give in on #JCPOA? "Khamenei adviser says Tehran 'capable of building nuclear bomb" report @Jerusalem_Post @Reuters. Either way should add #Oil risk premium? #OOTT".* We don't't think it was a coincidence that, following Lapid's strong warning against Iran continuing to work on its nuclear program, Iran came out with what we thought was either a challenge to Israel or a warning to Biden that he had to give in if he wants to get the JCPOA done. Iran is saying they are now capable of building a nuclear bomb. We say also to Biden because Iran can see Biden still hasn't been prepared to walk away from the potential of a JCPOA. The Jerusalem Post reported [LINK] "*Tehran is technically capable of making a nuclear bomb but has yet to decide whether to build it, a senior adviser to Iran's Supreme Leader Ali Khamenei told Al Jazeera's Arabic service on Sunday. Tehran will also directly respond against Israel should its security be targeted, the report says citing the advisor. "In a few days we were able to enrich uranium up to 60% and we can easily produce 90% enriched uranium ... Iran has the technical means to produce a nuclear bomb but there has been no decision by Iran to build one," Kamal Kharrazi said.".* Our Supplemental Documents package includes the Jerusalem Post report.

Israel reminds its threshold on Iran's nuclear efforts is very different than US

We have to believe Iran's comments were at least in part motivated by Israel PM's comments on Iran in his joint press conference with Biden. Here is what we wrote in last week's (July 17, 2022) Energy Tidbits. We wrote "*While we don't think most appreciate the different positions from Israel vs others like the US on what they can't live with for Iran's nuclear program, we have no doubt Iran listens and hears this different position. However, we worry that others interpret similar words as having the*

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same message but we see a totally different position. We thought there was a clear differentiating message from interim Israel Prime Minister Lapid speak at the short Biden/Lapid press conference on Thursday. And Lapid is not playing any political game and not saying something standing beside Biden and then talking differently when he is away from Biden. We tweeted [LINK] "Note @IsraeliPM Lapid "only thing that will stop Iran is knowing that, if they CONTINUE TO DEVELOP their nuclear program, the free world will use force". Vs @POTUS "never obtains a nuclear weapon". #Oil risk premium? #OOTT." Lapid's red line is not to stop Iran from getting a nuclear weapon or becoming nuclear capable. Rather Lapid is warning on Iran "continue to develop" ie. can't go any further on development. We think Lapid spoke clearly and forcefully. And his clarity on Iran has to make us think there is increasing risk to something is going to happen against Iran. Certainly a bigger risk if no JCPOA soon. And we still think a risk if a JCPOA at least to the same type of mysterious fires, explosions, assassinations that have happened in the past couple years. And Lapid clearly says diplomacy won't work. So it's all about stopping Iran to continue to work on nuclear development. This is different than the US and others who worry about enrichment levels and not allowing Iran to obtain or develop or get to a nuclear ready stage. And if there is this risk, then our tweet asks shouldn't there be some sort of risk premium in oil? That is, unless everyone believes Israel is bluffing. And Lapid also reinforced that Israel reserves the right to act freely on this subject of Iran's nuclear program."

Oil – US still won't walk away from JCPOA even with Iran getting closer to nuclear

US still won't walk away from JCPOA chance

As noted above, last Sunday Iran noted its advancement on its nuclear capability. Recall it was five months ago that the US warned the time was running out for the JCPOA or else Iran's work on its nuclear program would be too far advanced. We would have expected Iran's nuclear update would have either placed a greater sense of urgency or it's now too late view from the US. Recall that Biden was clear in his Israel press conference that he was still focusing on a return to the JCPOA and the JCPOA was the best way to stop Iran from getting a nuclear weapon. Even in the face of the Iran update, the Biden Administration maintained its same position on the JCPOA – they aren't walking away, it's in Iran's court, the conditions have been on the table for months for a mutual return to the JCPOA. It seemed like the US ignored the Iran nuclear update. On Thursday, US State Department spokesperson Price reiterated the US position "*let me say that the United States and our partners within the P5+1 are committed to the course of a mutual return to compliance with the JCPOA, but the key adjective there is "mutual." To date, we have not seen any indication that Iran is ready or willing at this stage to return to the JCPOA. As I said before, a deal has been on the table for months now. If Iran wanted to avail itself of that deal, it has had any number of opportunities - in Vienna, in Doha, through our partners in the Middle East, through our partners in the EU. Iran, again, to date has chosen not to do so."* And "*We are fully prepared to return to mutual compliance with the JCPOA. I think it is probably more appropriate to focus on our overarching goal rather than the tactic to get there. We continue to believe that diplomacy is the most durable approach to contain Iran's nuclear program. We continue to believe that within that diplomatic rubric, a mutual return to compliance with the JCPOA is the most effective, is the most feasible option that has been within reach for quite some time now: to reapply those stringent limits on Iran's nuclear program, to reimpose the most stringent*

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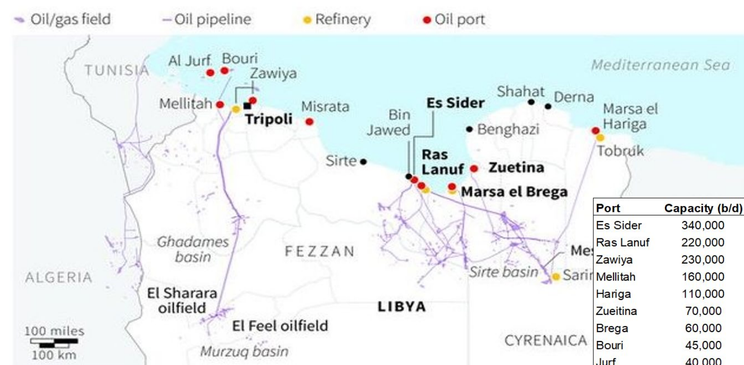
verification and monitoring regime ever peacefully negotiated, and, in the case of Iran, to see to it that appropriate sanctions relief is applied if Iran once again curtails its nuclear activity."

Oil – Libya back to 860,000 b/d, but violence increasing around Tripoli

Libya at 860,000 b/d

It's good news/bad news in Libya this week. On Friday, the Libya National Oil Corporation announced [LINK] "*The National Oil Corporation (NOC) and its companies achieved a relative increase in oil production, with current production reaching 860,000 barrels per day, while the pre-reopening production rate was 560,000 barrels per day. The NOC is striving to increase production and bring it back to its normal rates of 1.2 million barrels per day in two weeks."* The fear remains that any recovery in oil production will be short lived. There has been increasing fighting in and around Tripoli. We haven't seen reports from today, but as of Saturday night, the Libya Observer [LINK] reported that the death toll of Tripoli clashes has reached 16 persons. The Libya Observer wrote "*The Libyan Ministry of Health said that the number of deaths following Tripoli clashes that took place on Thursday and Friday reached 16 people and injuries reached 52. The Ministry of Health said that all of the injured people are receiving medical treatment in public sector hospitals in Tripoli.Tripoli saw heavy clashes between Special Deterrence Force (SDF) and Presidential Security Guard because the latter attacked an SDF senior leader named Essam Harous."*

Figure 39: Libya Ports, Major oilfields and Terminals map



Port	Capacity (b/d)
Es Sider	340,000
Ras Lanuf	220,000
Zawiya	230,000
Mellitah	160,000
Hariga	110,000
Zueitina	70,000
Brega	60,000
Bouri	45,000
Jurf	40,000

Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Oil – China's oil imports fall 10.6% YoY to 9.7 mmb/d in June

China preliminary oil imports

The impact of Covid restrictions is less this year than last, but still a factor holding back China oil consumption as evidenced by the lower refinery runs. But there is an added factor driving China oil imports now – availability of abundant cheap Russian oil. Though imports were down slightly in June, China is in the driver's seat for buying oil right now with access to heavily discounted Russian oil and sanctioned Iran and Venezuela oil. China imported the equivalent of 9.7 mmb/d in June which was down 10.6% from June 2021. The decrease was driven by Russia, which dipped from record 1.99 mmb/d in May to 1.72 mmb/d in June. Bloomberg reported [LINK] on Wednesday *"China raised its June imports of coal and gas from Russia compared to the previous month, but cut back on its purchases of crude oil, according to customs data released on Wednesday. The increases in coal and gas came despite a broader slump in China's imports of the two fuels due to sky-high international*

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prices and elevated domestic production. China's total crude purchases also fell in June as the economy struggled to shake off its Covid-induced torpor. China is purchasing more energy from its strategic ally, often at discounted rates, as other buyers shun Russian goods as punishment for its invasion of Ukraine. In the three months through the end of May, China had spent $18.9 billion on Russian oil, gas and coal, almost double the amount of a year earlier." Our Supplemental Documents package includes the Bloomberg article.

China crude imports from Russia dip from record to 1.72 mmb/d in June
On Tuesday, Bloomberg reported [LINK] China's imports of Russian oil dipped in June from record in May. Russian imports were down 11% MoM at 1.72 mmb/d from 1.99 mmb/d in May. Saudi oil imports were below Russia at 1.20 mmb/d, down 35% from 1.85 mmb/d in May. Imports from Iraq were down 32% at 0.76 mmb/d from 1.11 mmb/d. Malaysia imports were up 21% at 0.63 mmb/d from May and Brazil was down 10% from 0.52 mmb/d to 0.47 mmb/d in June. The US delivered just 0.67 mmb/d of crude to China in June. Our Supplemental Documents package includes the Bloomberg report.

Oil – Japan increasing fuel oil imports as much as possible due to high LNG prices

Japan's increasing fuel oil imports

Earlier we noted how very high LNG prices were impacting Japan's LNG imports and noted how this has led to strong YoY increases in Japan's thermal coal imports. This week, we saw reports that very high LNG prices are also leading utilities to maximize fuel oil imports. On Wednesday, Bloomberg reported "*Japan's ENEOS Holdings has received increased orders for fuel oil from regional utilities after liquefied natural gas prices jumped, CEO Tsutomu Sugimori said at a briefing in Tokyo on Wednesday. * Demand for fuel oil to be used in power plants is expected to be 90% higher y/y during April-Sept. * However, ENEOS will only be able to supply fuel oil equivalent to a 60% y/y gain due to issues with infrastructure."*

Oil – BNEF: global product and oil stocks deficit narrowed

BNEF's global oil inventories

For those with a Bloomberg terminal we recommend flipping thru BloombergNEF's "Oil Price Indicators" weekly that comes out on Mondays as it provides good charts depicting near-term global oil demand and supply indicators. The trends were negative for oil this week. The global oil and products stockpile deficit narrowed for crude and products from 91.3 mmb to 75.8 mmb. The stockpile deficit against the five-year average (2015-19) narrowed from 61.6 mmb to 54.8 mmb. Total crude inventories decreased by 0.8% to 640.5 mmb, including global floating inventories. Product stocks were up 1.7% WoW with the stockpile deficit against the 3-year average narrowing from 10.0mmb to 5.1 mmb. Gas oil and middle distillate stocks have Narrowed against their three-year average deficit (2017-2019) from 34.9 mmb to 34.1 mmb. Jet fuel consumption by international departures increased by 22,200 b/d WoW while consumption by domestic passenger departures decreased by 15,200 b/d. The global mobility index dropped over the past week, decreasing by 1.8% in the week to July 13. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

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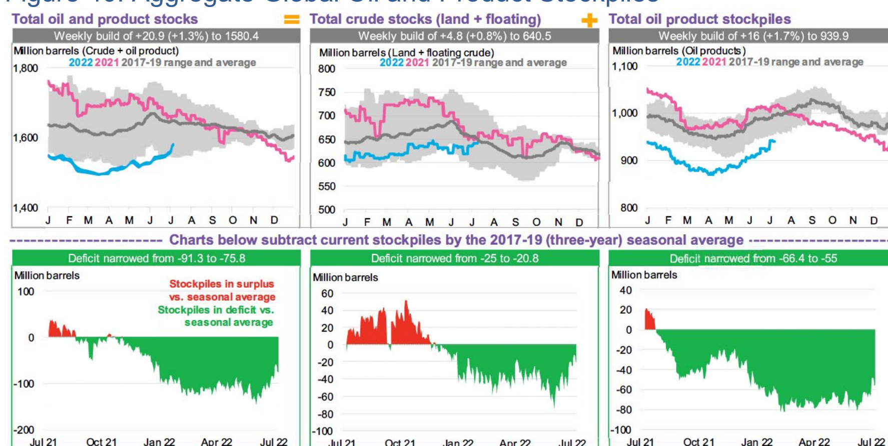
Figure 40: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Oil – Vortexa crude oil floating storage 78.94 mmb as of July 22, -6.31 mmb WoW

Vortexa crude oil floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of Noon 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 today are compared to the prior weeks Vortexa estimates posted on Bloomberg on July 16 at 2pm MT. (i) As of Noon MT yesterday, Bloomberg has posted Vortexa crude oil floating storage estimate as of July 22 was 78.94 mmb, which is -6.31 mmb WoW vs revised up July 15 of 85.25 mmb. Note July 15 of 85.25 mmb was revised +6.85 mmb vs the 78.40 mmb posted on Bloomberg as of 2pm MT on July 16. (ii) Note that the last six weeks were all revised up vs the data posted last week. The upward revisions were +6.85 mmb to July 15, +3.23 mmb to July 8, +1.70 mmb to July 1, +3.27 mmb to June 24, +3.47 mmb to June 17, and +0.75 mmb to June 10. Even still, crude oil floating storage is +/- 90 mmb instead of the +/- 100 mmb level that was seen two months ago. (iii) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (iv) July 22 estimate of 78.94 mmb is -143.84 mmb vs June 26, 2020 peak of 222.78 mmb. (v) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in late March/ thru late June 2020 as Covid started to have a huge impact. July 22 estimate of 78.94 mmb is +28.15 mmb vs pre-Covid of 50.79 mmb on July 22, 2019. July 22 estimate of 78.94 mmb is -10.82 mmb YoY vs 89.76 mmb on July 23, 2021. (vi) Below are the last several weeks of estimates made as of yesterday noon MT, July 16 at 2pm MT, and July 9 at noon MT.

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Figure 41: Vortexa Floating Storage as of July 23 posted on Bloomberg Noon MT yesterday

Source: Bloomberg, Vortexa

Figure 42: Vortexa Estimates Posted July 23 noon MT, July 16 2pm MT, & July 9 noon MT

Posted July 21, noon MT

FZWWFST VTXA Inde | 07/21/2019 - 07/22/2022

	Date	Last Px
Fr	07/22/2022	78939
Fr	07/15/2022	85254
Fr	07/08/2022	91919
Fr	07/01/2022	92209
Fr	06/24/2022	91266
Fr	06/17/2022	101.914k
Fr	06/10/2022	100.055k
Fr	06/03/2022	85570
Fr	05/27/2022	94962
Fr	05/20/2022	95161
Fr	05/13/2022	108.167k

Posted July 16, 2pm MT

FZWWFST VTXA Inde | 07/14/2019 - 07/15/2022

	Date	Last Px
Fr	07/15/2022	78398
Fr	07/08/2022	88687
Fr	07/01/2022	90512
Fr	06/24/2022	87995
Fr	06/17/2022	98441
Fr	06/10/2022	99311
Fr	06/03/2022	88065
Fr	05/27/2022	97476
Fr	05/20/2022	97121
Fr	05/13/2022	111.462k
Fr	05/06/2022	96728

Posted July 9, noon MT

FZWWFST VTXA Inde | 07/07/2019 - 07/08/2022

	Date	Last Px
Fr	07/08/2022	78183
Fr	07/01/2022	93395
Fr	06/24/2022	87214
Fr	06/17/2022	98475
Fr	06/10/2022	97636
Fr	06/03/2022	87377
Fr	05/27/2022	96332
Fr	05/20/2022	95807
Fr	05/13/2022	110.171k
Fr	05/06/2022	94790
Fr	04/29/2022	100.197k

Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: US, UK Lag behind Asia's Gasoline Recovery

Bloomberg's Oil Demand Monitor

We recommend reading the Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The headline this week was that Gasoline demand is remaining sub-par in the US and UK with high retail prices denting the appeal of long summer vacation trips while other parts of the world, including India and China, show a more robust post-pandemic recovery in road fuel consumption. US demand rose in the week ended July 15 though it still trailed 2019 levels by about 8%. The total number of vehicles miles traveled in the US in May, though higher than the prior two years, didn't surpass 2019 levels, government estimates show. Sales of diesel and gasoline combined in the UK in the week ended July 17 were 12% less than a baseline level set in early 2020. It was also observed that car usage across Great Britain is 5% less than pre-pandemic times, while the volume of trucks and vans is higher -- a nod to the work-from-home and on line-delivery culture. Road fuel demand in India and China is recovering fast. India's total oil products

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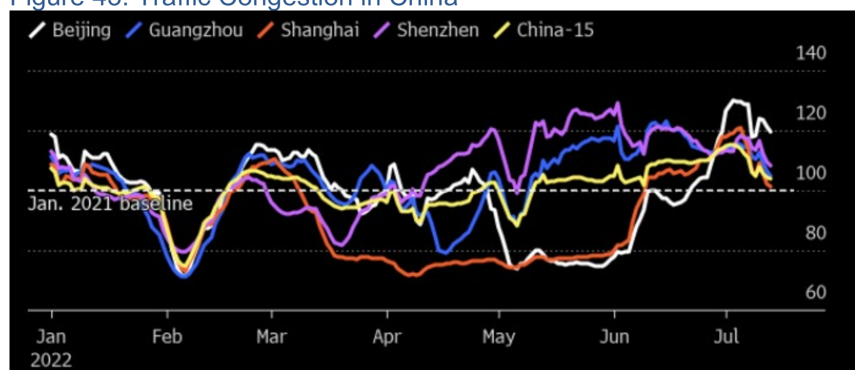
consumption in June was 5.6% higher than June 2019. China's apparent gasoline demand rose back above pre-virus levels last month as the nation eased restrictions. Demand for gasoline climbed to around 3 million barrels a day in June, which was 7.4% higher than in June 2019. Average traffic congestion in 15 Chinese cities with the highest vehicle registrations has now been above a January 2021 baseline since early May. However, several cities have shown a dip in congestion in recent days, including Shenzhen where new lockdowns have been implemented. The global airline industry is still not yet back to normal, with recent weekly and monthly data showing that jet fuel consumption remains below pre-pandemic levels by 12% in the US, 18% in India, 19% in France, 7% in Portugal and 19% in Italy. The biggest hole in the global market is the lack of international flights to and from China. In some locations around the world, such as London, a recent upswing in passenger flow has been so rapid that airports and airlines have struggled to cope with the number of customers and baggage, after running down staff levels during the pandemic. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 43: Traffic Congestion in China



Source: Bloomberg

Oil – US gasoline demand below 2020 levels

US gasoline demand below 2020 levels

On Thursday, we tweeted [LINK] "*Negative #Oil story today. "US #Gasoline demand remains below where it was this time two years ago as historically high prices keep more drivers off the road than Covid-19 did in the summer of 2020" reports @business Chunzi Xu. #OOTT.*" Bloomberg reported "*US gasoline demand remains below where it was this time two years ago as historically high prices keep more drivers off the road than Covid-19 did in the summer of 2020. A small week-over-week rebound in demand last week was not enough to top the same period in 2020. On a seasonal four-week rolling average -- which smooths out weekly fluctuations -- consumption is just above the same time two years ago, but below every other year going back to 2000, according to data from the US Energy Information Administration." "Stalling demand in the middle of summer suggests the recent drop in pump prices has not been enough to entice drivers back on the road. The summer months are when demand tends to be more elastic than the rest of the year, and it appears more people are doing away with road trips in 2022.*"

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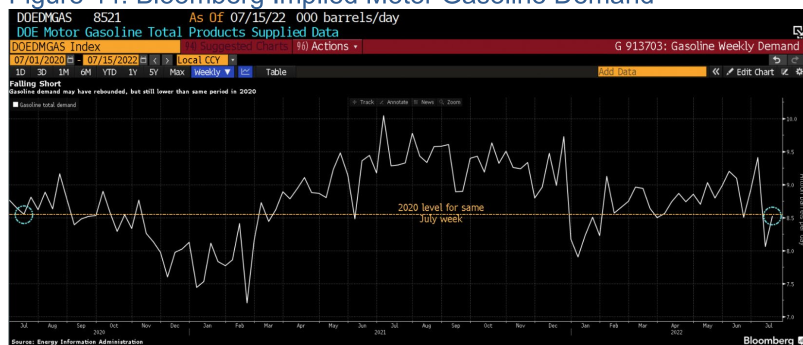
Figure 44: Bloomberg Implied Motor Gasoline Demand



Source: Bloomberg

Oil – US 321 crack spreads are down big in last 6 weeks

Crack spreads still high

After seeing the above Bloomberg comment on gasoline demand, on Thursday, we tweeted [LINK] "*321 crack spread is still >$33 so big profits (and incentives) for US refiners to keep consuming #Oil, running refineries at high volume and cranking out #Gasoline, #Diesel, etc. But weakening crack spread is another indicator for risk to near term demand response. #OOTT.*" The 321 crack spread closed up on Thursday at $36.49, and on Friday at $37.51. But the graph shows how the 321 crack spread was $49.69 on July 1 and was over $60 on June 6. Pre covid, the 321 crack spread was approximately $20 in June/July 2019.

Figure 45: Bloomberg 321 Crack Spread

Source: Bloomberg

Explaining 321 crack spread

We have included this item in our Energy Tidbits, explaining 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.

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Oil – US airlines q2 calls: not yet seeing airfares & recession fears hit demand

Airline insights from Q2 reporting

Many of the US airlines started reporting Q2 results this week. There was no surprise that they delivered strong results in Q2 with the first real quarter of open air travel. But our focus was on the headwinds they see from the rising airfares at a time of people being hit by big inflationary cost pressures (ie. food, gasoline) and fears of a recession. We were surprised that these headwinds didn't seem to hit the US airlines views of the next quarter or two. All the airlines are cutting near term capacity but the lower capacity levels in Q3 are driven by the airlines cutting down flights due to the stress of under capacity (pilots, ground crew, security, etc) to meet the post Covid demand. Even though the capacity cuts are not due to demand, it still affects oil consumption as there will be less flights. However, it does make a difference to the perspective for oil consumption if the lower capacity is driven by lower demand (higher fares, people feeling impact of inflation, fears of recession) or by cut backs in flights because the airlines don't have the infrastructure to support the demand for air travel

American Airlines – Not seeing airfare prices impact near term demand

On Thursday, American Airlines released their Q2/22 results [LINK] and held its Q2 call. (i) They reported a 12.2% revenue increase over the same period in 2019, despite flying 8.5% less capacity. We tweeted [LINK] *"Another airline cutting back flights. It is to deal with the lack of capacity across the air flying supply chain, but does impact #Oil demand. American Airlines. Q2/22 capacity at 8.5% below pre-Covid Q2/19. Guidance for Q3/22 capacity is 8-10% below pre-Covid Q3/19. #OOTT"*. American Airlines also expects its third-quarter total revenue to be 10% to 12% higher versus Q3/19 on 8% to 10% lower capacity. They were sure to emphasize that the lower volume in Q3 vs Q2 is capacity driven, not airfare price and economy slowdown related. Mgmt stated "*Well. Let me let me start by saying, we're actually really encouraged by demand and the demand for our product has been under a high and a like in a historical way, that continues. And indeed the way demand is coming back is both really encouraging and somewhat different than what was there before from my earlier commentary. But really what you see when you go from 2Q to 3Q, is first of all, just a change in capacity production, we're taking a more conservative view of just how we sizing airlines of the resources we have for Robert's comments, that impacts a lot of it and then beyond that really them there's a wide range that we have and unit revenue production because we're really encouraged by the trends that we see.*" (ii) American Airlines mgmt does not see demand elasticity being affected by high airfares in the near-term. Following the earnings call, we tweeted [LINK] *"US airlines cutting H2/22 capacity is not airfare, recession related, it's lack of infrastructure to support demand. $AAL asked any concerns as fares go up, what effect that might have on elasticity going forward?" Mgmt "no, we don't spend a lot of time worrying about it". #OOTT"*.

Alaskan Airlines – Strong demand thru Sept, but warn of risk of high airfares

United held its Q2/22 earnings call on Thursday. (i) The overall message was generally the same as seen by American and United. Demand is very strong and bookings thru Sept are strong. But one difference is that they raised the risk of high airfares on demand. (ii) Mgmt highlighted Q2 success stating, "*We are in a period of record-breaking demand" "June especially was a phenomenal month, as revenue surpassed 1 billion, the highest monthly revenue recorded in our history and we*

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achieved this our capacity still below 2019 levels." (iii) Alaskan is also reducing capacity due lack of staffing, infrastructure, etc. Mgmt said "*Speaking of capacity, this spring we made adjustments to give us the necessary breathing room to get back to running a reliable operation, which is a requirement before we attempt to more aggressively grow. The primary driver of the schedule pull down was lower output of new pilots from training versus what we needed." "We expect third quarter capacity to be down 5% to 8% versus 2019, and full your capacity to be down 8% to 9%.*" (iv) They maintained a bullish outlook for Aug/Sept, but they raised the potential risk of higher fares impacting demand, but so far, it hasn't been a factor. Mgmt said "*Because if June, volumes are indicative of what we will see going forward, we all need to revise our internal forecasts upward. Looking ahead, we are well positioned to produce another solid financial quarter. Undoubtedly, we are in an exceptional demand period and the moderated capacity outlook sets a strong backdrop for our revenue performance, considering current trends, which I'll expand on in a minute, we expect third quarter revenues to be up 16% to 19% on capacity that is down 5% to 8% versus 2019. This implies unit revenues up approximately 26%, flat sequentially versus the second quarter but a strong result on slightly higher capacity. With that guidance provided I do want to offer more color on the trends, we're seeing today, which affected into these estimates. For clarity, demand remains very strong, lease demand continues to sit, well above 2019 levels, while our business channels have now recovered fully revenue wise. While corporate business travel volumes have been a little choppy, we do expect these volumes to continue to recover from their approximate 75% to 80% levels today. That said we do recognize that there are significant pressures on consumers, including rising interest rates, high oil prices and inflation, which if persists are likely to put downward pressure on-demand and therefore pricing from where we are today, as we enter the fall.*"

United Airlines – Post Covid travel recovery offsets more than demand impacts
United held its Q2/22 earnings call on Thursday. (i) United lowered its forecast for capacity due to the "ecosystem". Mgmt said "*First to address the challenges posed by commercial aviation ecosystem that is straining to handle the number of planes operating today, we've elected to keep United Airlines smaller and overstaffed in order to give us more buffer against these external constraints that we just can't control, we'll also continue to prioritize reliability by overstaffing until the entire aviation infrastructure returns to normal. But it means that there will be cost pressures until that catches up and we can return to traditional utilization and staffing. In addition, as Andrew described, we now expect full year 2023 capacity to be up no more than approximately 8% versus 2019, down from the original United Next goal of 20%.*" (iii) United also says that the post Covid demand recovery more than offsets any impact from higher fuel prices/airfares and recession fears. Mgmt said "*The second macro trend is, of course, fuel price. At current fuel prices, United's fuel bill would be $9 billion higher than 2019. What it's worth for building our long-term plans assuming that this is the new normal for fuel prices. The good news is the rising fuel costs or something that affects all airlines and at least for United, we've seen this largely become a pass-through expense today. And finally there's the question about what's going to happen with demand. We continue to see strong demand, and one thing that is unique for United not a particularly and aviation in general. Is that we're*

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still probably in the sixth or seventh inning other COVID recovery. So there are two macro demand trends re-session versus continuing COVID recovery, working across purposes. And for now, at least the COVID recovery trend is at least canceling out arguably exceeding the economic headwinds. So, where did that leave us? As we look to the future. Clearly all three looming risk industry infrastructure constraints significantly higher fuel prices, and economic slowdown. Bias toward reducing capacity over the next 6 to 18 months." In the Q&A, mgmt. highlighted their bullish outlook for demand even as they move from summer vacation travel. They said "*We're almost two-thirds through the booking curve here for the quarter. So we have a lot of visibility into what we're looking at. And I think the first biggest thing I would say is we do see the acceleration on our international network across the board, which is great to see. Second, I'll really point out Asia, Asia's leading the way, I think we're bringing net back in a way that it comes back more profitable than where we were in 2019. And for me, that's absolutely critical to close in the margin gap that we had historically international versus domestic by bringing back Asia equal to the rest of it or in fact maybe even better. The other thing I would tell you, as we go into September, which I think everybody is looking towards this pivotal moment where we switch from less leisure focus demand to more business-focused demand and as we go into the September month, I can tell you all of our curves are better than they were before, July and August, and even June. So, as we approach September, we approach. It better booked with better yields. And so we remain, really bullish and optimistic.*"

Oil – Petroleum products supply cut by low Rhine River levels

Rhine River supply disruptions

It's a bad summer in Europe with the focus to totally change supply chains to eliminate Russia, and this is happening in a very hot temperature Europe and low river levels. The rivers in Europe have a significant role in transporting goods including oil and petroleum products. One of the Europe energy stories this week is low river levels is cutting back the capacity of river shipments, including petroleum products. (i) On Tuesday, we Tweeted [LINK] *"Another Germany energy price hit. @JWittels reports #RhineRiver low water levels cut #Diesel #Gasoline barge loads by 70% south of Kaub (~halfway point). Alternative transport, if available, is very $$$ ie. rail tank cars or long distance tanker trucks. Thx @EIAgov for map #OOTT"*. Bloomberg reported [LINK] that barges loaded in Amsterdam, which can usually haul 2.5k tons, are restricted currently to taking on 750 tons if planning to sail to destinations beyond Kaub. They could potentially fall close to the level at which barges can no longer safely transit Kaub. An estimated 200k-300k b/d of gasoil/diesel is transported up the Rhine from ARA to Germany, with an additional 50k b/d going to Switzerland. Furthermore, an estimated 50k-150k b/d of gasoline is transported down the Rhine from Germany to ARA. (ii) On Friday, we saw a good example of the impact. Bloomberg reported "*Switzerland will tap its strategic fuel stocks as logistical bottlenecks disrupt the supply of fuels to the land-locked country. Dwindling water levels on Europe's Rhine river following a prolonged drought, coupled with disruptions to cross-border rail services, are curbing the delivery of petroleum products, the country's government said Friday. To ensure supply, the government will release about 245,000 cubic meters -- about 1.5 million barrels -- of fuel from its strategic stocks until September. That equates to about 25% of monthly sales and will take the inventories to 6.5% below mandated levels, it said in a statement."* Our Supplemental Documents package includes the two Bloomberg reports.

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Oil – June truck tonnage rose 2.7% MoM, up 7.9% YoY

It still seems like record diesel prices haven't had an material impact on truck tonnage volumes. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for June on Tuesday [LINK]. June observed a 2.7% increase MoM from May, after rising 0.3% last month. Chief Economist Bob Costello noted, *"June's jump tells me a couple of things: first, the transition in the freight market from spot back to contract continues. ATA's tonnage index is dominated by contract freight, so while the spot market has slowed as freight softens, contract carriers are backfilling those losses with loads from shippers reducing spot market exposure. Essentially, the market is transitioning back to pre-pandemic shares of contract versus spot market."* The index is up 7.9% YoY from June 2021. This was the tenth straight year-over-year gain and the largest since June 2018. Trucking serves as a barometer of the U.S. economy, representing 72.5% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 10.23 billion tons of freight in 2020. Motor carriers collected $732.3 billion, or 80.4% of total revenue earned by all transport modes. Our Supplemental Documents package includes excerpts from the ATA report.

Truck tonnage index +2.7% MoM in June

Figure 46: Truck Tonnage Index

Source: ATA

Oil & Natural Gas – Oilfield services co's warn running out of capacity

We believe there is increasing risk to some of the growth forecasts for US oil and natural gas production in 2023. The big theme from the Q2 reporting from the big oilfield service companies this week is that they are running out of capacity. Halliburton. ON Tuesday, we tweeted [LINK] "*Buckle up. Limiting factor for US #Oil #NatGas growth in 2023 is service sector is tapped out. #Halliburton CEO "The market remains all but sold out. Supply chain bottlenecks, even for diesel fleets, make it almost impossible to add incremental capacity this year". #OOTT*". Schlumberger. On Friday, we tweeted [LINK] "*Another key factor driving 2020s #Oil #NatGas supply crunch - service sector capacity. $SLB CEO highlights "more specifically the tightening service supply capacity, both in NAM and increasingly in international markets." #OOTT.*"

Service sector running out of capacity

Oil & Natural Gas – Oil field services companies have underinvested for several years

One of the big themes from Halliburton and Schlumberger Q2 calls this week was the lack of surplus capacity in oil and gas services sector. No one should be surprised as the oil and gas

Oil field services capacity limits

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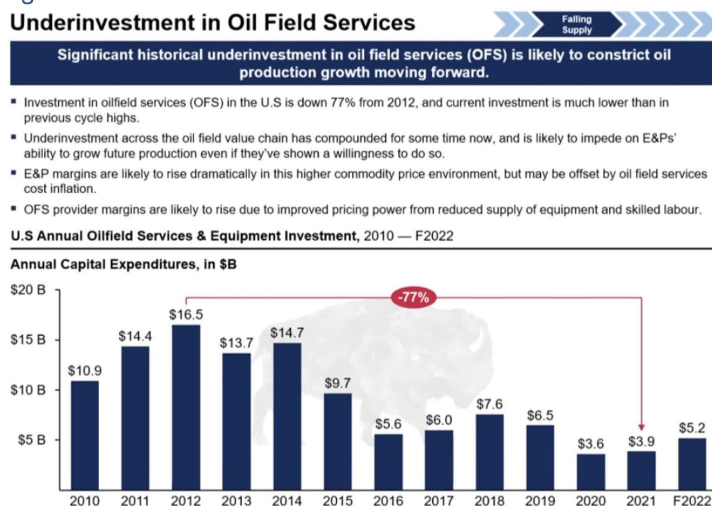
service sector is much like the oil and gas producers – there has been a lack of investment capital over the past several years. So the service sector basically becoming tapped out today is really the result of the past several years of massive underinvestment. There was a great reminder graph sent to us by Josh Young (Founder, Bison Interests) when he replied to our Schlumberger tweet on the tightening service sector capacity. Young tweeted [LINK] "*Oilfield services capacity is limited and underinvested, a bullish tailwind for #oil. $slb CEO just talked about this, and @BisonInterests has been highlighting this in recent oil macro updates [LINK] _6SY (9 min 40 seconds in).*"

Figure 47: Underinvestment in Oil Field Services



Source: Bison Interests

Oil & Natural Gas – Will new EPA regulations lead to Permian production declines?

Will EPA hit the Permian?

On Thursday, we tweeted [LINK] "*Hugely bullish for #Oil #LNG #NatGas prices in 2020s if @EPA adds regs that lead to Permian #Oil #NatGas production decline. Add that to MBS said Saudi oil capacity peaks at 13 mmbd in 2027 & sanctions mean RUS doesn't go back to prior levels. Thx @jendlouhyhc. #OOTT.*" There was what could be a potentially huge development with the reports that the EPA is looking at new proposals to cut smog that the API said has "*the potential for increased operating expenses, decreased federal leasing revenues, permitting delays and decreased oil and natural gas production in the nation's most productive basin.*" If the EPA puts in these new regulations that end up leading to Permian oil decline, this would be huge for oil. Think of what is going on with the biggest 3 oil producers. This would mean Biden is tring to limit or reduce Permian, which means limit or reduce US oil production, which then means limit or reduce US exports of oil and LNG. MBS came out last week and said that after Saudi increases "capacity" to 13 mmb/d from current 12.2 mmb/d, they can't take capacity any higher therefrom. Russia, recall that long before Ukraine, Russia had said most of their reserves weren't economic without high prices. Most had believed Russia really couldn't grow. This would be extremely bullish for oil and LNG for the 2020s. Below are the EIA's Permian oil and natural gas production growth graphs. Our Supplemental Documents package includes the Bloomberg report.

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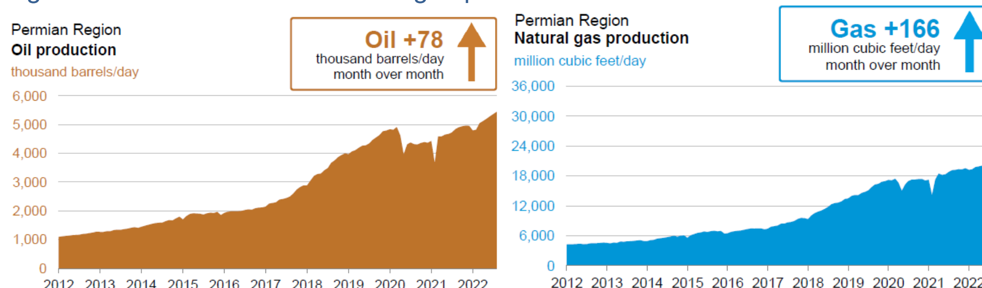
Figure 48: Permian oil and natural gas production



Source: EIA

Oil & Natural Gas – Gina McCarthy warned of inventive use of regulations at EPA

On Thursday, we tweeted [LINK] "*Permian/EPA risk. #Oil #NatGas sector was warned @EPA would be "creative". See 👇 @JustinWorland report @ginamccarthy46 said Admin "needs to get "creative" & find novel ways to galvanize the energy transition. That includes inventive use of regulations at places like EPA, #OOTT."* One of the reasons we are concerned of the risk that the EPA could be adding new regulations that could impact the Permian is that Biden's national climate advisor, Gina McCarthy, warned that this is exactly what the Biden administration would be doing. On June 30, Time posted its report "*'We Have to Be Creative.' How the Biden Administration Is Responding to the SCOTUS Climate Setback*" [LINK] on its interview with Gina McCarthy. *McCarthy clearly warned the EPA would be inventive n their use of regulations. Time wrote "To meet the White House's goals, she said, the Administration needs to get "creative" and find novel ways to galvanize the energy transition. That includes inventive use of regulations at places like EPA, as well as the Administration's engagement with the private sector, use of its own purchasing power, and use of the Defense Production Act to accelerate the production of domestic clean energy technology, she says. "It can't just be about using regulations or using Congress to fix this; to actually continue accelerating, we have to be creative," she said, one of at least ten times she used the word creative in the course of the conversation*." Our Supplemental Documents package include the Time report.

Inventive use of regulations at EPA

Oil & Natural Gas – Never thought I'd see Bonterra founder/CEO George Fink retire

I thought it was a surprise announcement to see Bonterra announce founder/CEO George Fink was retiring as CEO, but will stay on the board. I know George is in his early 80s, but I just always assumed he would be keep building Bonterra. The BNE announcement said "*George Fink is recognized in the Western Canadian oil patch as a visionary. He is also a very gentle and generous individual. Bonterra is his greatest legacy and his role in the active management of the Company will be missed. The Board appreciates and thanks George for his efforts and support "on the CEO transition, and we look forward to working with him on the Board going forward."* No question George has been a great CEO, but he is an even better person, which is why I tweeted [LINK] "*George Fink retires as $BNE CEO. what do you consider your greatest achievement? George "being able to help people in need, whether it be because of health, advancing careers, being poor, addictions or building up confidence" Great CEO, even better person*." My tweet attached a short Feb 10, 2016

Bonterra CEO George Fink retires

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interview with George (Feature: C-Suite Energy Executive – Chairperson of the Year – George Fink – Bonterra Energy) that included that response. Our Supplemental Documents package includes the Feb 2016 interview. [LINK]

Oil & Natural Gas – TIPRO Texas oil natural and gas jobs up 6,100 MoM

TIPRO June jobs update

No surprise that the high oil, natural gas and NGLs prices continue to drive activity from drilling thru production and that is resulting in continued increase in oil and gas employment. The Texas Independent Producers and Royalty Owners Association (TIPRO) updated their employment figures for the Texas upstream sector for June [LINK]. The release noted that employment for June totalled 194,900 marking an increase of 6,100 jobs from the revised May numbers. This increase comes after a slight decrease in May, following 12 straight months of increases. The release stated, *"Texas upstream employment for June 2022 totaled 194,900, an increase of 6,100 jobs from May numbers, subject to revisions. Texas upstream employment in June 2022 represented an increase of 31,000 positions compared to June 2021, including an increase of 8,300 in oil and natural gas extraction and 22,700 jobs in the services sector."* There has been strong job posting data for June in upstream, midstream, and downstream sectors, showing a continued demand for talent in the Texas oil and natural gas industry. From the release *"TIPRO once again noted strong job posting data for upstream, midstream and downstream sectors for the month of June. According to the association, there were 12,391 active unique jobs postings for the Texas oil and natural gas industry in June, an increase of 6 percent compared to May numbers."* Our Supplemental Documents package includes the TIPRO release.

Oil & Natural Gas – sector/play/market insights from Q2 calls

Sector insights from Q2 calls

We are just starting to get into Q2 calls and we expect to see a ramp up this week. As usual, the oil and gas services companies are first to report and we typically get some of the best macro insights from the services, pipelines, refineries and utilities. This is our favorite time each time of each quarter as it is quarterly reporting and this is when we get the best insights into a range of oil and gas themes/trends, sectors and plays. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts, or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks. Plus, we tend to get the best E&P sector insights from services, pipelines, refineries, and utilities

Halliburton – Very tight US market for services

Halliburton held its Q1 call on Tuesday. (i) Mgmt was sure to highlight the that the US services sector is close to maximum capacity. Following the release, we tweeted [LINK] *"Limiting factor for US #Oil #NatGas production growth. $HAL Q2 "In North America, I expect Halliburton to uniquely maximize value in this strong, steadily growing, and all but sold-out market."* Service sector is almost tapped out. #OOTT". On the call, CEO Miller commented further on the services sector. We tweeted [LINK] *"#Halliburton Q2 call on right now. Q&A, CEO Miller just said in North America, "see tighter 23 than we see in 22". limiting factor for US #Oil #NatGas production growth in 2023 will be services sector. #OOTT"*. He went on to say "*The market remains all but sold out. Supply chain bottlenecks, even for diesel fleets, make it almost impossible to add incremental capacity this year."* (ii) Mgmt went on to comment

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about the effect that long term underinvestment has had on oil supply. We also tweeted [LINK] "*tightness around oil supply is not something that's resolved quickly after 7, 8 years of underinvestment" "i am equally excited about the duration. This is multiples of years. it was a decade in the making, it's many years in the undoing in terms of producing" $HAL CEO. #OOTT*". (iii) Mgmt remains very bullish on oil through the 2020s. Mgmt said "*I expect the international markets will experience multiple years of growth, and I am confident that Halliburton is positioned to benefit more from this multi-year upcycle than ever before. In North America, I expect Halliburton to uniquely maximize value in this strong, steadily growing, and all but sold-out market.*"

Schlumberger – 2020's supply crunch with tight service sector capacity
Schlumberger held its Q1 call on Friday. (i) In their key macro messages, mgmt highlighted that energy security and urgency to establish more diverse and reliable sources of oil and gas has become increasingly apparent through the year. This is counteracting the near term concerns of global economic slowdown. Following the call, we tweeted [LINK] *"Fear indicator for 2020s supply crunch. ".. combination of energy security, favorable break-even prices and the urgency to grow #Oil and #NatGas production capacity... we are witnessing a decoupling of upstream spending from near-term demand volatility" $SLB CEO Le Peuch. #OOTT"*. (ii) This was another call which highlighted tight service sector capacity. We also tweeted [LINK] "*Another key factor driving 2020s #Oil #NatGas supply crunch - service sector capacity. $SLB CEO highlights "more specifically the tightening service supply capacity, both in NAM and increasingly in international markets." #OOTT*". (iii) On industry sentiment, mgmt said "*So we have seen an inflection in sentiment of our customers, both national oil companies, international oil companies and international independents to respond to that call and turning and accelerating investments. And rotating their investments internationally. So this is certainly a multi legs, I would call it multi phase, both oil and gas positive on balance for awhile."* (iv) Mgmt was also asked if APF Palliser JV is still for sale, and did not give straight answer. Rather, mgmt said they are quite happy with performance of Palliser, generating great cash flows, and making the most of it for the moment. It seemed to infer they are still not getting their price but are happy to get the cash flow while waiting to sell.

Energy Transition – Natural gas also saving the day in California electricity

Natural gas is key peaking power

On Thursday, Bloomberg tweeted [LINK] the below graph saying "*Another important market chart: Friday July 15 was the first day that batteries delivered more instantaneous energy to California's grid than nuclear power. Tuesday July 19 was the second day."* We recognize that this wasn't the focus of the tweet and separate Bloomberg news report, but the item that jumps out from that graph is that it's a good think California has natural gas for power and that provides almost all the peaking power even after including battery storage. Natural gas may not get any attention, but it clearly provides almost all the peaking power requirements. Bloomberg wrote "*I have read a lot of these assessments, but something struck me about 2022: batteries. California's grid operator now says that batteries comprise 6% of the state's maximum on-peak capacity. I went back through its assessments since 2017, when batteries first appeared, to see the change. Batteries were 0.1% of summer on-peak capacity in 2017, meaning their contributions today are 60-fold greater." "On July 15, California's battery fleet*

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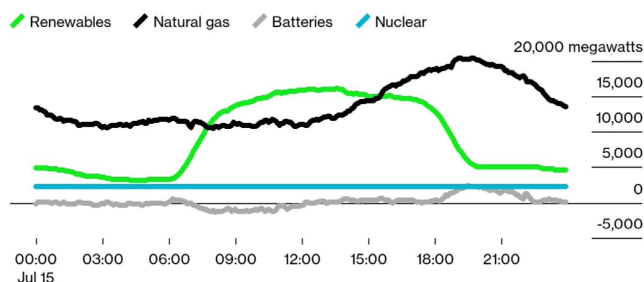
charged during the morning. Beginning around 6 p.m., solar generation began dropping and batteries, in turn, began rapidly delivering electricity to the grid. From 7:25 to 7:55, batteries supplied more to the grid than the Diablo Canyon nuclear plant This event was a first for California, but as with so many thingsin the state's energy sector, it is almost certain to happen many more times. (In fact, batteries surpassed nuclear again on Tuesday.) There will be more batteries next year, whereas the nuclear fleet is not going to grow any time soon."

Figure 49: California electricity generation by source July 15, 2022



Source: Bloomberg

Energy Transition – Buttigieg: most Americans cannot easily afford an EV

Buttigieg on EVs

There doesn't' seem to be much doubt that the Biden Administration must see Transportation Secretary Pete Buttigieg as the best defender of policy as they keep sending him out for media appearances. But we like his appearances because he also doesn't try to hide the obvious that may not be consistent with Biden policy. He made one of these points this week saying that most Americans can easily afford an EV. One of the big points from the Administration is that EVs are affordable and tend to pull out the Chevy Bolt as the example. But Buttigieg seemed to speak more to the reality that move EVs are way more expensive than ICE vehicles. On Tuesday, Buttigieg testified before a House transportation committee meeting "Implementing the Infrastructure Investment Jobs Act" [LINK]. We created the following transcript of part of his exchange with Rep Scott Perry. Rep Scott Perry "*… the price of a EV is about $55 thousand … so it's closer to about $60 thousand. There's about $20 thousand more than a gas driven passenger car … if they could afford the electric vehicle and plug it in, we're talking about another 90, 100 dollars a month in electric costs… what are the Administration and you are doing, other than subsidizing, other than subsidizing to lower the costs. They're either paying more for gas, 80%, or paying more for electricity to the tune of essentially doubling their electricity bill….. what do you plan to do other than subsidies? " Buttigieg "I* want to be clear. Nobody I know, certainly not me, thinks that all or even most Americans can easily afford electric vehicles". [note Buttigieg then went on to question the $55 number quoting sticker prices of American made EVs like the Bolt, and some pickups.]"

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Cadillac introduces Cadillac Celestiq EV
Too bad, this wasn't rolled out before the Buttigieg committee meeting, otherwise the Republicans could have asked about the new Cadillac Celestiq EV that was rolled out on Thursday. GM is targeting the first model to the 2025 model. To be fair, this EV will only be for a small number of drivers. This will a low volume output car and will be hand-built. There is no MSRP yet, but the car publications seem to believe something around US$300,000 as a MSRP for a base model. At $300,000 per EV, it won't have many buyers.

Figure 50: Cadillac Celestiq EV

Source: Cadillac Canada

Capital Markets – "*Ivy League endowments brace for losses with PE values tumbling*"
On Tuesday, Bloomberg warned that big allocation of Ivy League endowment funds to private equity was likely to lead bad results, especially compared to prior years. We tweeted [LINK] ""*Ivy League Endowments Brace for Losses With PE Values Tumbling" reports @JanetLorin. The other challenge for these big college endowment funds as hey try to recover form these losses is that most can't/don't invest in #Oil #NatGas for #ESG reasons. Thx @JanetLorin. #OOTT.* Bloomberg highlighted the % of endowment in private equity was Notre Dame 46%, Michigan 42%, Princeton 42%, Penn 36%, Northwestern 36% and Harvard 34%. Our tweet noted that one of the reasons for the weak performance is that most of these endowments don't/can't invest in oil and gas, which has been the best performing sector. Bloomberg wrote "*Princeton, Harvard and Yale generated robust returns for their endowments in recent years, fueled in part by billions of dollars of investments in private equity and venture capital. That golden era appears to be over, at least for now. College endowments across the US are likely to report losses for the fiscal year ended June 30 as valuations for startups and other closely held companies deflate, following a sharp decline in public markets and the end of cheap leverage."* Our Supplemental Documents package includes the Bloomberg report.

PE values hitting endowment funds

Demographics – 25% of 25-34 US adults live in multigenerational households
Rising student debt and housing costs are having an impact on young adults and their ability to move out of their parents' homes. A study by Pew Research Center [LINK] revealed that a quarter of U.S. adults ages 25 to 34 resided in a multigenerational family household in 2021, up from 9% in 1971. The growth in multigenerational living tripled among young adults without a bachelor's degree, compared with doubling among young adults with at least a bachelor's degree. By 2021, 31% of young adults who had not finished college were in a multigenerational arrangement, compared with 16% who had completed at least a bachelor's

Multi-generational households more common

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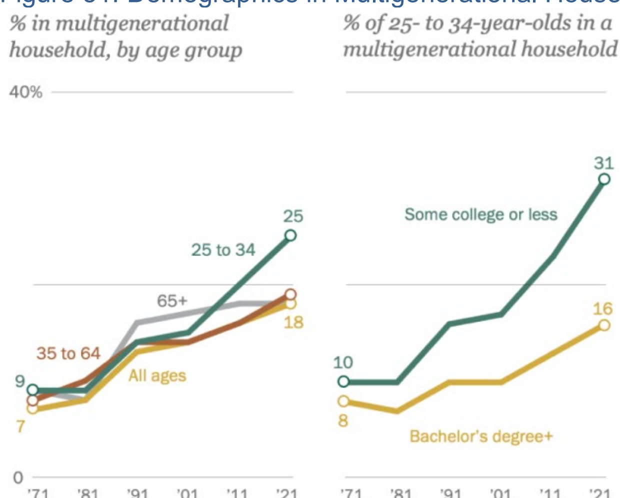
degree. Our Supplemental Documents package includes excerpts from the Pew Research article.

Figure 51: Demographics in Multigenerational Households



Source: ATA

Twitter – Look for our first comments on energy items on Twitter every day

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.

@Energy_Tidbits on Twitter

LinkedIn – Look for quick energy items from me 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].

Look for energy items on LinkedIn

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.

Brooke Henderson birdies 18 to win LPGA Major, Evian Championship

Canadian golf fans had some cliff hanging viewing this morning but it ended on a great note. We have a 7am MT news cut off but editing this at 8:50am MT as Brooke Henderson just birdied 18 to win the Amundi Evian Championship in France by one stroke over Sophia Schubert who had just missed her birdie on 18 in the group

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ahead. We had the golf on all morning and it was a grind as Brooke didn't have her best including a 4-putt. But she ended with a birdie to be even on the day and -17 for the tournament. Brooke was -3 on Saturday follow 64's (-7 each day on Thursday and Friday so entered today at -17. The Evian is one of the LPGA's five majors. Prior to today, Brooke had 11 wins on the LPGA tour including one major, the Women's PGA Championship in 2016. Her best prior finish in the Evian was T9 in 2016.

Toronto Blue Jays score 28 runs against the Boston Red Sox

How could we not highlight the Toronto Blue Jays set a new record scoring 28 runs in their 28-5 win over the Boston Red Sox on Friday. It included an 11 run 5th inning. The Red Sox used seven pitchers, but only the 7th (Yolmer Sanchez) is a position play. Sanchez pitched the 9th and only gave up one run. Major League Baseball gets criticized for the length of the games. The average game length this year is 3 hrs 5 minutes, and the Blue Jays game was 3 hrs 49 minutes.

Not seeing as many motorhomes on the TransCanada to Banff

This is far from a scientific traffic analysis, but one thing that jumps out at me on my weekly drives to and from Calgary/Canmore are that there just doesn't seem to be as many motorhomes on the road this year. Rather, it seems like almost every one is a fifth wheel travel trailer. The comment from a Canmore friend with a fifth wheel travel trailer is that is much better on gasoline. And when there are motorhomes, they don't seem the really big motorhomes. Rather they are the smaller motorhomes like in the picture below.

Figure 52: Fifth Wheel Travel Trailer, Motorhome

Source: SAF Group, RV CampingWorld

Ukraine resistance reminded of the classic Red Dawn movie from 1984

One of the items we forgot to write up in late April was how some Ukrainian fights would paint "Wolverines" on a destroyed Russian tank. And the Wolverines was in honor of the classic Red Dawn movie (1984) starring Patrick Swayze, Charlie Sheen, C. Thomas Howell, Lea Thompson and Jennifer Grey as the Colorado teens fighting against the invasion of the US by the Soviet Union backed Latin American troops. Wolverines was the name of the local high school football team and they painted Wolverines on any of the destroyed tanks. We were reminded of this when we saw Red Dawn being played on one of the cable news channels. Red Dawn opens with a series of headlines "*Soviet Union suffers worst wheat harvest in 55 years. Labor and*

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food riots in Poland. Soviet troops invade. Cuba and Nicaragua reach troop strength goals of 500,000. El Salvador and Honduras fall. Greens Party gains control of West German parliament. Demands withdrawal of nuclear weapons from European soil. Mexico plunged into revolution. NATO dissolves. United States stands alone." Maybe this was one of Biden's favorite movies and a reason why he has fought hard to keep NATO united in its fight against the Russia.

Figure 53: Russian tank in Ukraine, Tank in Red Dawn movie

Source: NY Post, Red Dawn

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