

Energy Tidbits

Aug 14, 2022

Produced by: Dan Tsubouchi

Saudi Aramco CEO Warns “Strained” Global Spare Oil Capacity is <2 mmb/d and “Declining Fast”

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. Saudi Aramco CEO warned this morning that global spare oil capacity is less than 2 mmb/d and declining fast [\[LINK\]](#)
2. Game changer for LNG, another Russian confirmation of massive delays to under-construction 2.6 bcf/d Arctic LNG-2 export [\[LINK\]](#)
3. More expectations that a return to JCPOA could happen very quickly [\[LINK\]](#)
4. EIA either over-estimates US oil supply or under-estimates US oil demand by 0.5 mmb/d [\[LINK\]](#)
5. IEA warns “*But with supply increasingly at risk to disruptions, another price rally cannot be excluded.*” [\[LINK\]](#)
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 +44 bcf, storage now -268 bcf YoY deficit

The YoY storage deficit started the winter at -282 bcf YoY at Oct 31 and is now -268 bcf YoY. The EIA reported a +44 bcf build (+35 bcf expectations) for the Aug 5 week, which was above the 5-yr average build of +45 bcf, and below last year’s injection of +49 bcf. Storage is 2.501 tcf as of Aug 5, decreasing the YoY deficit to -268 bcf which was the same as last week and is -338 bcf below the 5-year average vs -337 bcf below last week. Below is the EIA’s storage table from its Weekly Natural Gas Storage Report [\[LINK\]](#).

YoY storage at -268 bcf YoY deficit

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	08/05/22	07/29/22	net change	implied flow	Year ago (08/05/21)		5-year average (2017-21)	
					Bcf	% change	Bcf	% change
East	564	549	15	15	625	-9.8	647	-12.8
Midwest	663	643	20	20	738	-10.2	732	-9.4
Mountain	148	147	1	1	185	-20.0	181	-18.2
Pacific	252	253	-1	-1	241	4.6	272	-7.4
South Central	874	865	9	9	979	-10.7	1,007	-13.2
Salt	193	195	-2	-2	247	-21.9	259	-25.5
Nonsalt	681	671	10	10	731	-6.8	749	-9.1
Total	2,501	2,457	44	44	2,769	-9.7	2,839	-11.9

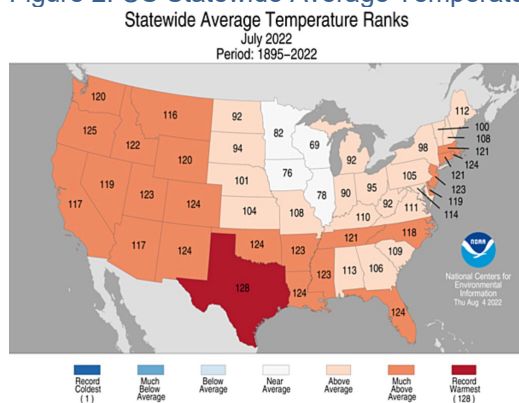
Source: EIA

Natural Gas – July was 3rd hottest in the last 18 years in US

July is a big month for weather related natural gas demand, and it was a good July with warmer than usual temperatures in the US ie. there was strong air conditioning demand. On Tuesday, NOAA posted its recap of US weather for July [\[LINK\]](#) that showed July 2022 ranked 3rd hottest in the last 18 years. Temperatures were above average in almost every state in the Lower 48. Below is the NOAA’s statewide average temperature map for July 2022.

July weather recap

Figure 2: US Statewide Average Temperature Ranks July 2022



Source: NOAA

Natural Gas – La Nina/Normal conditions continue to support hurricane forecasts

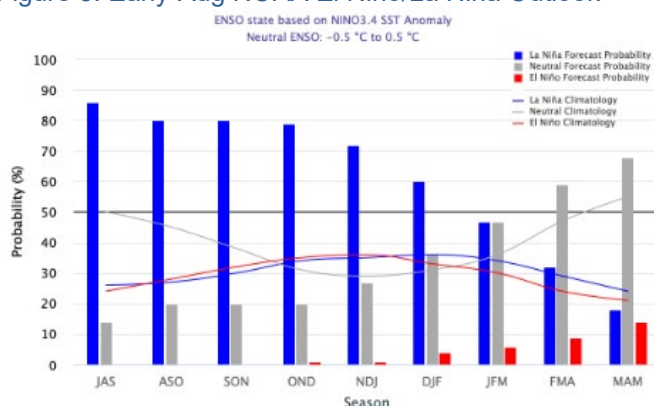
Even with the slow start to Atlantic hurricane season, all the recently updated hurricane forecasts still call for above average hurricane/tropical storm activity in 2022. The CPC/IRI EI

La Nina/Normal for key ASO hurricane season

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Nino/La Nina outlook is issued on the 2nd Thurs of every month [\[LINK\]](#). The new Aug forecast for JAS is 86% (was 60%) La Nina, 14% (was 36%) Neutral and 0% (was 1%) for El Nino conditions. The new ASO forecast is 80% (was 62%) La Nina, 20% (was 36%) Neutral and 0% (was 2%) El Nino conditions. ASO is the peak period for Atlantic hurricane season. Again, weather is never 100% the same, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Below is the CPC/IRI official ENSO forecast.

Figure 3: Early-Aug NOAA El Nino/La Nina Outlook



Source: CPC/IRI

Natural Gas – Early outlook calling for a La Nina/Neutral winter

It’s now less than 3 months away from the Nov 1 winter natral gas season. So the weather focus for natural gas will soon be turning to winter and the peak Dec/Jan/Feb. The concern is always if its an El Nino winter that bring the risk (not 100% though) of a warm winter. This new probability forecast noted above calls for a La Nina/Neutral winter and basically no expectation for El Nino conditions in DJF. Correlations are not 100% but the fear in El Nino winters is that it is warmer than normal. Whereas, La Nina winters are typically viewed more likely normal, however as noted below, La Nina winters can be warm.

Early outlook forecasts La Nina winter

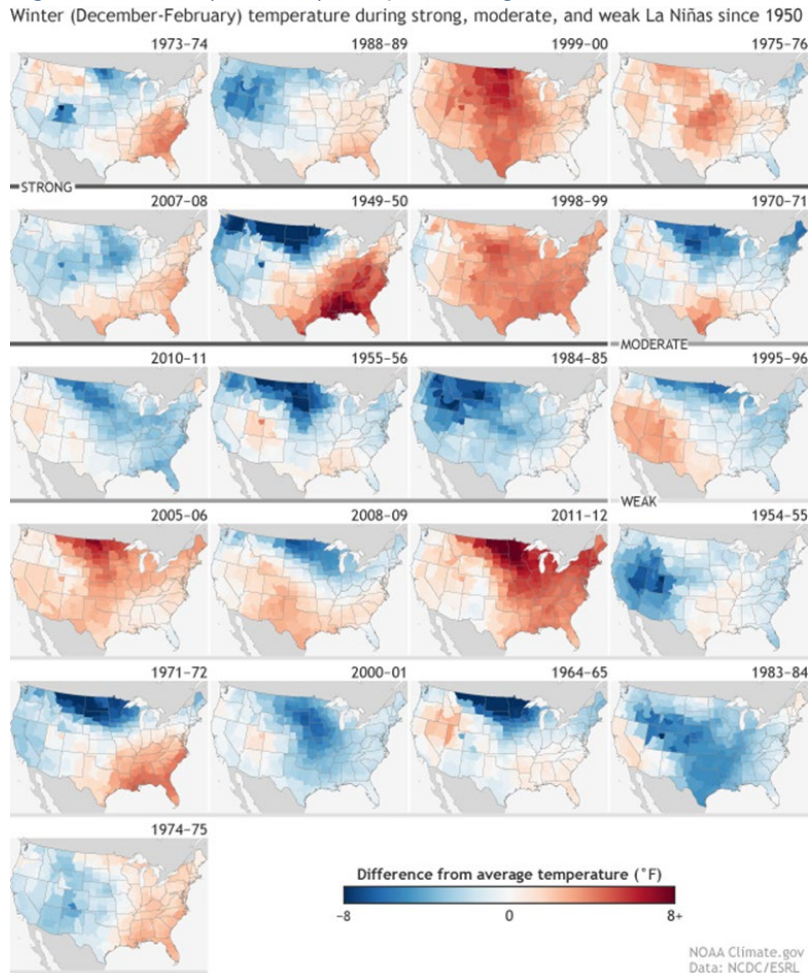
Natural Gas – But La Nina correlations to cold winters are far from 100%

La Nina winters are more often normal to colder than normal than a warmer winter. But we remind of an Oct 6, 2017 NOAA brief “Temperature patterns during every La Niña winter since 1950”, which looked at all La Nina winters from 1950 thru 2016/17, classified them as strong, moderate or weak La Ninas, and then showed the average winter (Dec thru Feb) temperature map. We checked this weekend and the link still works [\[LINK\]](#). The bottom line is that it may slightly favor a normal to colder than normal winter, but there have some been near record high temperature La Nina winters. Below is the NOAA graphic.

La Nina winters are unpredictable

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Figure 4: Winter (Dec-Feb) Temp in Strong, Moderate And Weak La Ninas 1950 - 2017



Natural Gas – EIA forecasts US gas production growth of ~4 bcf/d by year end 2023

The EIA released its monthly Short Term Energy Outlook Aug 2022 [\[LINK\]](#). The EIA increased its 2022 and 2023 forecast for US natural gas production. (i) Later in the memo, we note how the EIA’s STEO forecast for US oil continue to either over-estimate US oil supply or under-estimate US oil demand by ~0.5 mmb/d. To the extent that the variance is do to an over-estimate of US oil supply, it would also mean there is an over-estimate in their natural gas supply as some of this will be due to oil wells with associated natural gas. (ii) The EIA’s new forecast calls for ramp up in US growth from today, and it has been revised up slightly from last month’s forecast. They forecast 96.6 bcf/d in Q2/22, up 1.5 bcf/d to 98.1 bcf/d in Q4/22, and then up another 2.42 bf/d in a year to reach 101.5 bcf/d in Q4/23. That doesn’t sound unreasonable given HH gas pries, but we remind all forecast models are based on assumptions. We think the next few months of actuals will be key to determining

**U.S. gas
production +3.04
bcf/d in 2022**

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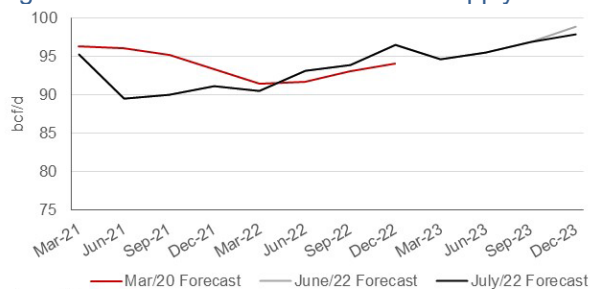
how much the US will grow its natural gas supply. We have been highlighting how US natural gas growth is only now getting back to Nov levels. The EIA's Q2/22 of 96.6 bcf/d is now above Q4/21 of 96.5 bcf/d. It's too early to assume the growth is in the bag, but we should get a better comfort level over the next few months if we start to see the ramp up in Q3/22. (iii) The EIA forecast shows US natural gas above the Q4/19 peak of 96.58 bcf/d, with Q4/22 US natural gas of 98.09 bcf/d (up 1.51 bcf/d from peak). (iv) For 2021, the EIA did not revise US natural gas production, which is flat at 93.55 bcf/d. (v) US natural gas production is expected to average 96.59 bcf/d in 2022 (96.23 bcf/d previously) and 2022 is up 3.04 bcf/d YoY. 2023 production estimates see Q1/23 production entering at 98.9 bcf/d (99.4 bcf/d previously) and exiting in Q4/23 at 100.5 bcf/d (101.3 bcf/d previously) for a 2023 average of 100.02 bcf/d. (vi) The EIA wrote "We forecast U.S. dry natural gas production to average 97.1 Bcf/d in August and 96.6 Bcf/d during all of 2022, which would be 3.0 Bcf/d (3%) more than in 2021. We expect dry natural gas production to average 100.0 Bcf/d in 2023." Our Supplemental Documents package includes excerpts from the STEO.

Figure 5: EIA STEO US Natural Gas Supply Forecasts by Forecast Month

bcf/d	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Aug-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.52	93.55	94.60	96.61	97.02	98.09	96.59	98.90	100.13	100.52	100.51	100.02
July-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.61	95.51	96.88	97.89	96.23	98.40	99.62	100.60	101.25	99.98
June-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.61	95.48	96.90	98.94	96.50	99.94	101.30	102.33	102.66	101.57
May-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.53	93.55	94.66	95.82	97.17	99.14	96.71	100.3	101.6	102.4	102.4	101.7
Apr-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.63	93.57	95.41	97.01	97.94	99.23	97.41	99.72	100.6	101.4	101.7	100.9
Mar-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.57	93.54	95.69	96.09	96.97	98.00	96.69	96.11	98.75	99.60	100.10	98.64
Feb-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.69	93.57	95.43	95.54	96.26	97.12	96.09	97.11	97.57	98.34	98.84	97.97
Jan-2022	95.29	89.59	89.99	91.14	91.50	90.59	93.15	93.89	96.33	93.49	95.94	95.55	95.96	96.69	96.04	96.71	97.13	97.89	98.45	97.55
Dec 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.01	95.59	93.32	95.22	95.35	96.1	97.21	95.97					
Nov 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.52	94.94	93.29	95.41	96.00	97.12	98.18	96.68					
Oct 2021	95.29	89.57	89.99	91.14	91.50	90.30	92.89	93.32	93.65	92.54	94.38	95.41	97.12	98.69	96.40					
Sept 2021	94.80	89.68	89.83	91.15	91.36	90.30	93.05	92.64	92.70	92.18	93.17	94.54	96.25	97.59	95.40					
Aug 2021	94.79	89.68	89.83	91.15	91.35	90.29	92.49	92.67	93.11	92.15	93.34	94.15	95.51	96.47	94.88					
July 2021	94.79	89.68	89.83	91.15	91.35	90.31	92.88	93.17	93.80	92.55	93.65	94.10	95.16	95.82	94.69					

Source: EIA STEO

Figure 6: EIA STEO US Natural Gas Supply Forecasts by Forecast Month



Source: EIA STEO

Natural Gas – EIA STEO forecasts Nov 1, 2022 storage to be down 206 bcf YoY

The EIA STEO also forecasts US gas storage. Its forecast is positive for natural gas. (i) Winter 2021/22. US gas storage started winter 2021/22 at 3.66 tcf, which was down -283 bcf YoY. But the EIA now forecasts end of winter (March 31, 2022) at 1.4 tcf, which is -395 bcf YoY and ~14% below the 5-yr average. (ii) Summer 2022. The EIA forecasts start of winter 2022/23 storage at 3.46 tcf, which is -206 bcf YoY. The start of 2022/23 winter forecast is -6% below the 5-yr average. This forecast has been increased due to the Freeport LNG shut-in. (iii) The EIA wrote "U.S. natural gas inventories ended July at 2.5 trillion cubic feet (Tcf),

EIA STEO storage forecast

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which was 12% below the 2017–2021 average. We forecast that natural gas inventories will end the 2022 injection season (end of October) at close to 3.5 Tcf, which would be 6% below the five-year average”

Figure 6: EIA STEO forecast US gas storage

	Storage Level	2016-2023				
		Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,012.7	776.4	3,624.5	10.7%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,012.7	776.4	3,624.5	5.3%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,012.7	776.4	3,624.5	-10.7%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,012.7	776.4	3,624.5	3.8%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,012.7	776.4	3,624.5	8.4%
Mar 2021	1,800.6	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,665.4	3,664.6	4,012.7	348.1	3,838.6	-4.5%
Mar 2022	1,401.5	1,184.9	2,486.3	1,301.4	1,835.6	-23.7%
Oct 2022	3,459.0	3,236.3	4,012.7	776.4	3,624.5	-4.6%
Mar 2023	1,547.2	1,184.9	2,486.3	1,301.4	1,835.6	-15.7%
Oct 2023	3,841.4	3,236.3	4,012.7	776.4	3,624.5	6.0%

Source: EIA

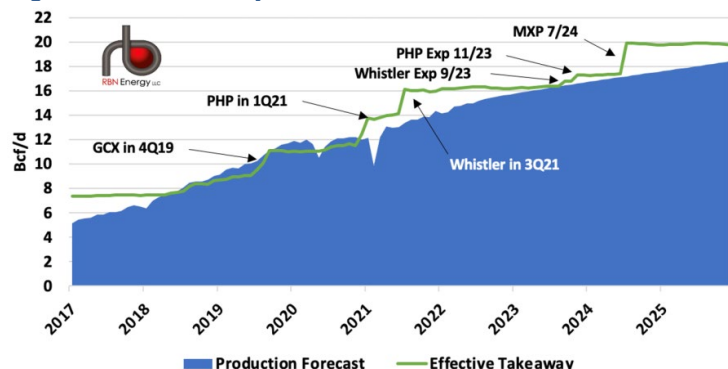
Natural Gas – RBN blog: The expansion of Permian gas infrastructure is far from over

There was a good food for thought blog from RBN on Tuesday titled “*Keep This Party Going - The Expansion Of Permian Gas Infrastructure Is Far From Over*” [\[LINK\]](#) which gives a good overview of the continued expansion of Permian gas infrastructure. In the past week, four large midstream players in the area have unveiled plans for a combined 1.3 bcf/d of new processing capacity, most of it in the gassier Delaware Basin. And that’s on top of the 11.7 bcf/d of processing that’s already been added in the Permian over the past four-and-a-half years. There are also 2.6 bcf/d of projects announced previously on the way. Production of dry natural gas in the Permian is now averaging 15.5 bcf/d, up from less than 7 bcf/d at the start of 2018. The focus of production in the Permian is crude oil, whereas associated gas has until recently been a byproduct of sorts. Handling all that raw gas has required the development of several gas processing plants and new or expanded pipelines. There is ongoing consolidation and rationalization of gas gathering and processing assets in the Permian, leading to new developments and processing plants. For example, since Enterprise announced the Navitas deal in January 2022, they have announced plans for two additional plants at Navitas’s centralized, 1 bcf/d processing complex. With natural gas production rising, the Permian may be headed for another round of serious pipeline constraints, and this could limit crude oil production growth. The chart below shows Permian’s forecast for dry gas production as well as effective takeaway capacity. The additions of the 2 bcf/d Permian Highway Pipeline in the Q1/21 and the 2 bcf/d Whistler Pipeline in Q3/21 gave Permian producers some breathing room, but the takeaway situation is likely to tighten considerably over the next year or so until the 0.500 bcf/d Whistler Expansion project comes online in September 2023 and the 0.650 bcf/d PHP Expansion follows that in November 2023. Permian production growth through the mid-2020s will depend on the timely mid-2024 completion of the 2.5 bcf/d Matterhorn Express Pipeline. The degree of takeaway constraints over the longer term will depend on how quickly production grows. If production growth ends up being more robust the Permian could be in for another rough patch. Our Supplemental Documents package include the RBN blog.

RBN blog on Permian gas

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Figure 7: Permian Dry Gas Production Forecast



Source: RBN

Natural Gas – Delfin says its GoM FLNG can deal with hurricanes & winter weather

Later in the memo, we highlight the HOA that will see Centrica purchase 0.13 bcf/d of LNG for 15 years on a Free on Board basis at the Delfin floating LNG export facility, which will be the first FLNG in the Gulf of Mexico. We remember when we first hear of the Delfin FLNG and we wondered what about hurricane risk and some of the brutal winter weather that can hit the GoM. Delfin explains how their FLNG will be able to deal with hurricanes and winter weather. [\[LINK\]](#). Delfin writes “• *The Delfin Deepwater Port will operate as a Port under MARAD and U.S. Coast Guard authority.* • *The FLNG Vessel is an integrated berth for the visiting LNG carrier.* • *LNG carriers will be assisted by tugs and the FLNGV will have thrusters for heading control.* • *Mooring Masters / Pilots will assist the LNGC captains to conduct the approach and berthing manoeuvring.* • *Side-by-Side LNG loading operations is a well-established practice with several thousands performed between LNGC/FSRU and LNGC/FLNG.* • *Being offshore the LNG carriers can swiftly position and tender Notice-Of-Readiness before being escorted by dedicated tugs to berth along an FLNGV. Time and costs for pilotage and channel navigation congestion and delays is avoided and the collision risk absolutely minimal.* • *The FLNG Vessel and its mooring system are designed for the worst (Winter) storms that may occur on the site.* • *Should a severe hurricane approach the site, the FLNGV will disconnect and sail away and bring the facility to a calm offshore location. Upon return the Vessel reconnects and start operations.* • *Disconnectable mooring systems and operational procedures are similar as has been in use in the FPSO industry for decades.* • *Operational track record from disconnectable FPSOs in the Gulf show the impact of hurricanes on the availability is very minimal.*

Delfin's FLNG in GoM

Natural Gas – Can Mexico become a major LNG export hub for US natural gas ?

There is no question that the move to try to cut off Russia natural gas and LNG from world markets has only made a tight LNG market for the 2020s look even tighter. And this has accelerated the move to find more LNG exports among projects that weren't really on the list of planned LNG. On the list of potential projects are more Mexico LNG export projects. What makes Mexico's LNG projects different is that they aren't going to be supplied by Mexican natural gas but will be supplied by US natural gas. These projects are on the west coast of Mexico so they can avoid having to go thru the Panama Canal like existing US Gulf of Mexico

Mexico's LNG export potential

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LNG projects. On Friday, Bloomberg posted a good recap of these potential Mexico LNG projects in their report “Mexico Plans to Become an Export Hub With US-Drilled Natural Gas”. Bloomberg wrote “Although natural gas exports from Mexico are today non-existent, seeing as it produces too little of the power-plant fuel to supply even its own domestic needs, the country’s physical proximity to booming US reserves positions it well to supply American gas to hungry buyers in Europe and Asia. With US shale in mind, a total of eight liquified natural gas export projects have been proposed south of the border boasting annual combined capacity of 50.2 million tons. Some of the operations aim to come online as soon as next year. If they’re all completed, the Latin American newcomer would join a very small club of nations that ship abroad the superchilled fuel — commonly called LNG — clocking in at No. 4 behind only the US, Australia and Qatar. And unlike those other three export heavyweights, Mexico would mostly be shipping out gas that it imported in the first place.” Note 50.2 mtpa is 6.6 bcf/d. Our Supplemental Documents package includes the Bloomberg report.

Figure 8: LNG Export Projects in Mexico

LNG Export Projects in Mexico				
One project is under construction and more are on the drawing board				
Project	Location	Status	Production Capacity (mtpa)	Daily Nat Gas Use (bcf/d)
Energia Costa Azul (Phase I)	Baja California	Under Construction	3.3	0.4
Energia Costa Azul (Phase II)	Baja California	Proposed	12.4	2.0
Mexico Pacific Limited	Sonora	Proposed	14.1	1.9
Vista Pacifico LNG	Sinaloa	Proposed	4.0	0.5
Salina Cruz LNG	Oaxaca	Proposed	3.0	0.4
Amigo LNG	Sonora	Proposed	7.8	1.0
Altamira FLNG	Tamaulipas	Proposed	4.2	0.6
Lakach FLNG	Veracruz	Proposed	1.4	0.2
Total			50.2	7.0

Source: Bloomberg

Source: Bloomberg

Natural Gas – Another long term LNG deal, Centrica 15 year supply from Delfin

The rush continues for LNG buyers locking up long term LNG supply as there has been 11.15 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 Tuesday, Centrica and Delfin Midstream announced [\[LINK\]](#) the signing of a Heads of Agreement for Centrica to purchase 0.13 bcf/d of LNG for 15 years on a Free on Board basis at the Delfin Deepwater Port. This agreement is another step to facilitate a FID for the first floating LNG export facility in the United States by the end of this year, with operations expected to commence in 2026. The CEO of Delfin stated “As a modular project that can make FID in 3.5 MTPA increments, this agreement materially advances our first vessel’s path

Another long term LNG deal

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towards FID later this year". Our Supplemental Documents package includes the Centrica 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 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.

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There have been 11.15 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 11.15 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	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
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	Unipecc	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	Gurvor 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
July 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
July 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				7.30			
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.
August 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				3.86			
Total New Long Term LNG Contracts since Jul/21				11.15			
*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 – Feels like Union is hopeful for progress at Shell Prelude 0.47 bcf/d FLNG

Last week's (August 7, 2022) Energy Tidbits raised the risk for a longer term shut down of Shell's Prelude 0.47 bcf/d FLNG given the union's Aug 6 (local time) Facebook posting that was the first mention for a possible long term outage. It led to our Aug 5 tweet [\[LINK\]](#) "Hmmm! How long will #Shell's 0.47 bcf/d #PreludeFLNG be shut down by labor dispute? 1st time Offshore Alliance messaging mentions risk for a potential shutdown for months? Last #LNG cargo July 6. No analyst questions on 07/28 Q2 call. #OOTT #NatGas." Maybe it was just messaging to Shell. Because there seemed to be a softening in the Union's messaging on in their Tuesday (local time) post. We tweeted [\[LINK\]](#) "See 📌, looks like big shift in union

Shell Prelude
FLNG 0.47 bcf/d

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messaging. Potential for end to #Shell 0.47 bcf/d #PreludeFLNG labor dispute? 08/02 union 1st warning for potential lengthy shutdown. Today, some mediation progress, big change in union tone & no long term shutdown threat? #LNG #NatGas #OOTT.” The Union noted there was mediation on the weekend that reduced the outstanding bargaining claims from 7 to 3. But it is also the tone of this is very different than in their Aug 6 posting. It feels like a softening of the attack on Shell, which we have to wonder signals a surprise chance, or at least the inference their might be a potential for a nearer term deal. It really made us wonder if their Aug 6 post with the first warning of a long term outage actually a catalyst or reality check for Shell to try to get to something? As of our 7am MT news cut off, the last Union posting was from Aug 10 and didn’t say much new. Compared to the earlier posts, the attacks on Shell are tame and, importantly, there was no mention of a potential long term outage. Our Supplemental Documents package includes the Union Aug 2, 9 and 10 Facebook posts.

Figure 10: Shell Crux Project Overview



Source: Shell

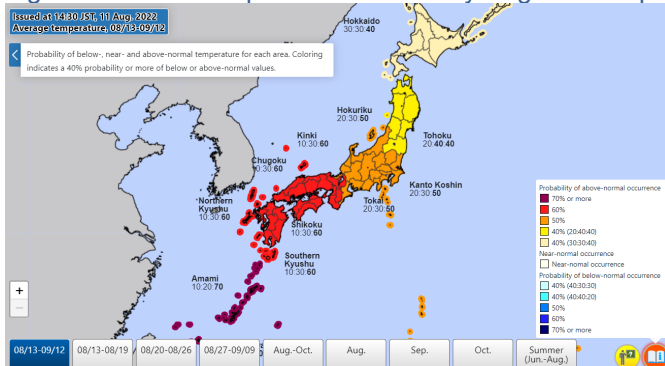
Natural Gas – Continued hot weather forecast for August in Japan

The hot weather continues in Japan with JMA forecasting warmer than normal temperatures to end August and start September. Hot weather in the summer is always a positive for power demand, but, this summer, the high cost of LNG has pushed Japan’s utilities to try to maximize fuel oil and coal for power generation. But still hot weather is positive to Japan natural gas consumption. The Japan Meteorological Agency posted its August 13 to September 12 weather forecast [\[LINK\]](#) calling for much warmer than normal temperatures. Note the below map is for the next month, but the maps for each of the next two weeks is the same all purple depicting hot weather.

Still hot in Japan

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Figure 11: JMA Temperature Probability Aug 13 to Sept 12



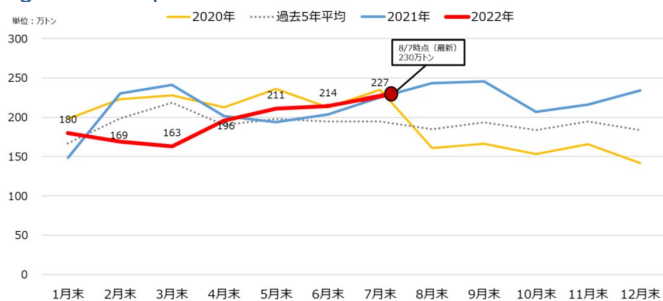
Source: Japan Meteorology Agency

Natural Gas – Japan’s LNG stocks up +1.3% from last week

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 LNG imports that have ranged from 7 to 14 bcf/d since Jan 1, 2021. A cold winter or interruption in LNG imports could easily lead to a shortage. 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 31 were ~111 bcf, +1.3% WoW from 110 bcf and up from the 5-yr average of 97 bcf. Below is the LNG stocks graph from the METI weekly report.

**Japan LNG stocks
+1.3% WoW**

Figure 12: Japan’s LNG Stocks



Source: METI

Natural Gas – Crazy high JKM LNG prices as well as European natural gas prices

Every morning, we look at Bloomberg’s LNG Wrap as it includes the prior day’s settle price for JKM LNG price (Japan Korea Marker) and Dutch TTF natural gas prices (Title Transfer Facility in Netherlands) are the two major global natural gas and LNG price indices. On Friday, we tweeted [\[LINK\]](#) “ICYMI, crazy high #NatGas #LNG prices. Thurs settle #JKM Oct contract \$51.96/mmbtu, Dutch #TTF Oct contract \$64.23/mmbtu. Hate to think the level of panic if it’s a cold start to winter and not the warm winter 21/22. Thx @SStapczynski @MessageAnnKoh. #OOTT.”

**Asian JKM LNG
prices \$64 for
Oct**

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Natural Gas – More confirmation massive delays in Russian Arctic LNG-2 volumes

We just don't get why others don't seem concerned about the what is being confirmed by Russia – Baker Hughes stopping providing equipment, parts and servicing for Russian LNG projects is leading to massive delays in the ramp up in the three phase 2.6 bcf/d Arctic LNG-2 project and puts at risk another 3.6 bcf/d of in operation Russian LNG. We have been highlighting this since our June 19, 2022 Energy Tidbits memo that was titled “*Game Changer for LNG: ~6.2 bcf/d Russian LNG is at Risk with Reports Baker Hughes to Stop Providing Services/Equipment*”. (i) Arctic LNG-2 should only add 0.47 bcf/d, not the planned 2.6 bcf/d before 2026. And there is no visibility to when any LNG above the initial 0.47 bcf/d will be on stream. The under-construction three phase Arctic LNG-2 was supposed to add 0.87 bcf/d in 2023, 0.87 bcf/d in 2024 and 0.87 bcf/d in 2025 ie. 2.6 bcf/d before 2026. On Tuesday, we saw a detailed Kommersant report and tweeted [LINK](#) “*#LNG Game Changer. RUS Arctic LNG-2 was to add 2.6 bcf/d by 26 in 3 phases. Looks like only 0.47 bcf in 23 Phase 1 as only 4/7 turbines, no idea for Phase 2/3 timing. Warns risk to LNG without \$BKR service & parts, would apply to existing 3.6 bcf/d. See 06/16 thread #NatGas #OOTT.*” (ii) 0.87 bcf/d from Arctic LNG-2 Phase 1 on stream in 2023. Last week, the TASS report said Phase 1 would be on stream in 2023, but at a revised Phase 1 capacity of 0.47 bcf/d vs the 0.87 bcf/d planned capacity. Kommersant report explains why Baker Hughes was supposed to supply 7 turbines for Phase 1 (20 overall for all three phases) and only supplied 4 so far. So that's why the capacity is 4/7 of the planned capacity. Kommersant notes that they are so far advanced along Phase 1, there is no choice but to go ahead with the 4 turbines and no ongoing service/parts. Kommersant writes “*Mr. Mikhelson clarified that for the first line of Arctic LNG-2, the issue of replacing the turbine with an electric drive is not worth it*”. (iii) Note also the big warning that there will be risk to ongoing volumes from *Phase 1 because there won't be access to ongoing service and parts. Kommersant writes “For the first line, BH was supposed to supply seven machines (some for the LNG process, some for power supply), but, according to Kommersant, it shipped only four of them, which will be used in the LNG process. At the same time, Kommersant's interlocutors emphasize that the LM9000 machine is advanced in its lineup and rather difficult to maintain, without the support of the manufacturer and in the absence of supplies of spare parts, problems with its service may arise.*” (iv) 0.87 bcf/d from Phase 2 in 2024 and 0.87 bcf/d from Phase 3 in 2025. There is no real plan on how to replace Baker Hughes turbines for phase 2 and phase 3. This would reinforce our comment from the TASS report last week that they only vaguely talked about these “may” being onstream by 2030. Kommersant says “*It is not yet clear what equipment NOVATEK will choose for the LNG process on the second and third lines of Arctic LNG-2 to replace the BH turbines. The head of NOVATEK, Leonid Mikhelson, said at SPIEF 2022 that the most important critical equipment for LNG production is the turbine. “Now we are looking, redesigning to replace the turbine with an electric drive. The most difficult issue is the turbine. We have 115 MW at Power Machines, but it is industrial. There is no 70–80 MW turbine. Electric drives were discussed with two or three manufacturers who together will make an electric drive. It will take a couple of years. Accordingly, to provide energy, it will be necessary to build a power plant for 400 MW per line, ”he said (quote from Interfax). Mr. Mikhelson clarified that for the first line of Arctic LNG-2, the issue of replacing the turbine with an electric drive is not worth it.*” (v) 3.6 bcf/d of existing Russian LNG that runs on Baker Hughes equipment is at risk from no ongoing Baker Hughes service and parts. Kommersant doesn't say anything about the in-operation 3.6 bcf/d of Russian LNG running on Baker

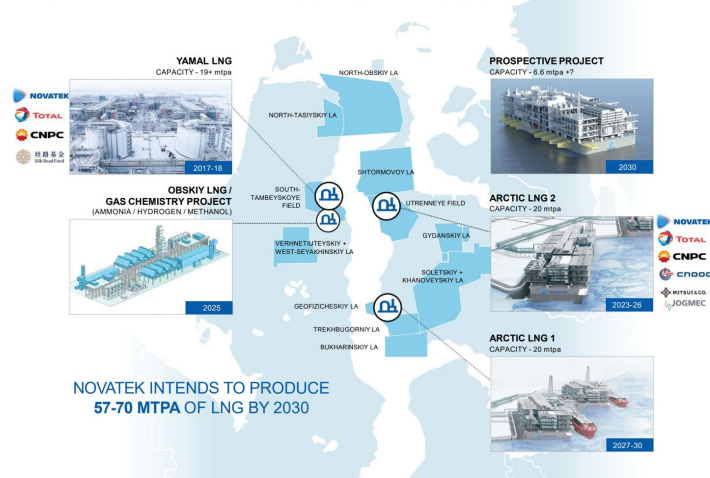
Big delays in Arctic LNG-2

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Hughes turbines, but the thesis on their concern on Arctic LNG-2 Phase 1 would apply here. Kommersant warned that they are going ahead with Phase 1, but *“At the same time, Kommersant's interlocutors emphasize that the LM9000 machine is advanced in its lineup and rather difficult to maintain, without the support of the manufacturer and in the absence of supplies of spare parts, problems with its service may arise.”* Our Supplemental Documents package includes the Kommersant report.

Figure 13: Novatek's LNG production platform, May 2021

NOVATEK'S LNG Production Platform



Source: Novatek

Russia needs Baker Hughes turbines for LNG, like Siemens for Nord Stream

No one should be surprised by Russia's admission. It stands to reason that Baker Hughes stopping providing equipment and services for Russian LNG projects has to lead to massive delays. We are surprised that people haven't expected these LNG reductions. Here is what we wrote in the July 31, 2022 Energy Tidbits *“Yet no market worries about Baker Hughes turbines for Russian LNG? There is so much focus on the Siemens turbines for Nord Stream, yet there is almost zero worry about Baker Hughes suspending all LNG equipment and services work in Russia ie. including on LNG. (i) There must be some sort of non-public reason for this lack of interest. The above item notes the Manturov speech to the Duma. On July 15, TASS reported [\[LINK\]](#) “It is important here, on the one hand, to upgrade capacities by replacing foreign, exploration, drilling, offshore equipment and speeding up work on our own medium and large-tonnage LNG equipment. On the other hand, in the interests of domestic consumption, we will be able to supply all the technological piping ourselves for the entire gasification of our country,” the minister said. According to him, the timing of testing and launching mass production of large gas turbines will be accelerated. “In the interests of the Russian electric power industry, in addition to the already supplied small and medium-sized turbines, we are compressing the time for testing and entering a series of large 65 and 170 MW turbines,” Manturov said.” Manturov is specifically including high power turbines for LNG projects. (ii) Last*

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week's (July 24, 2022) Energy Tidbits was titled "LNG Game Changer: Baker Hughes Suspended All Equipment & Services Contracts on Russian LNG Projects". We wrote "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". (iii) Baker Hughes website on LNG solutions says [\[LINK\]](#) says "our expertise: supporting 450+ million tons of capacity", which is over 59 bcf/d. The two turbines noted are the LM9000 aeroderivative gas turbine (73.5 MW, 50/60 Hz) and LM6000PF+ aeroderivative gas turbine (53.8 MW, 50/60 Hz). Both would be in the same general specs as the Siemens SGT-A65. It's why we don't understand why there isn't any focus on Baker Hughes turbines for Russian LNG project. Or maybe Russia is saving that for a winter issue? Our Supplemental Documents package includes the TASS report."

LNG game changer, Baker Hughes stopped work on 6.2 bcf/d 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 bcf/d RUS LNG is now at risk incl operating 1.3 bcf/d Sakhalin-2 LNG & 2.3 bcf/d Yamal LNG, and under construction 2.6 bcf/d 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 bcf/d. #NatGas #OOTT". Baker Hughes is reportedly stopping servicing two in-service Russian LNG projects (Sakhalin-2 and Yamal LNG) and

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*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 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 bcf/d from 3 phases, phase 1 0.87 bcf/d 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, and the TASS Friday report.*

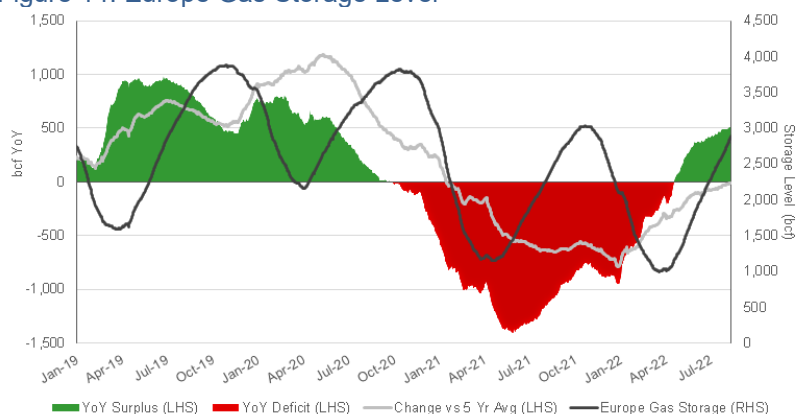
Natural Gas – Europe storage is now +12.74% YoY ie. 73.19% full vs 60.45%

It looks like the continued strong LNG imports and efforts to reduce consumption are having an impact. 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 12.74%. 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 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 Aug 10 is at 73.19%, which is +12.74% greater than last year levels of 58.07% and are +0.18% above the 5-year average of 70.71%. Below is our graph of Europe Gas Storage Level.

**Europe storage
now 70.89% full**

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Figure 14: Europe Gas Storage Level



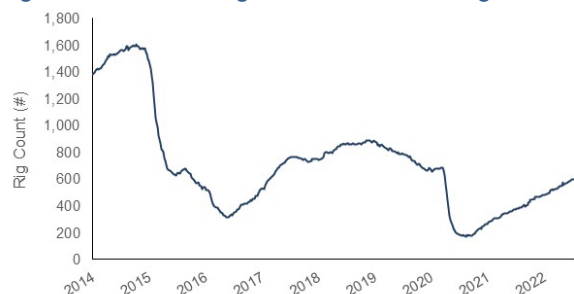
Source: Bloomberg

Oil – US oil rigs +3 at 601 oil rigs at Aug 12

Baker Hughes released its weekly North American drilling activity data on Friday. This week US oil rigs were +3 at 601 oil rigs. We will have to watch over the next week or two to see if the small pullback is related to very hot weather and summer holiday slowdowns. Oil rigs are +429 off the bottom of 172 in Aug14/2020 week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by -85 to 598 oil rigs (-13%). US gas rigs were -1 WoW at 160 rigs as HH still continues to be above \$8.

**US oil rigs +3
WoW**

Figure 15: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – Was the US frac spreads -4 to 285 spreads for the week ending Aug 12

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending Aug 12 on the Primary Vision network. YouTube video is at [LINK](#). For the week ending Aug 12, US frac spreads at the high point in the week were -4 to 285 spreads. This follows the -6 frac spreads for the week ending Aug 5. Here are some of his comments on the week. There was a small decline in the Permian. The smaller basins continue to not have much activity. He thought could have had another week of smaller decline before we get the push into September. Crude prices and rigs have stabilized, frac spreads are not going to shoot up to 315, but the trajectory is clear up to that 300 level. US oil production is at that

**Frac spreads -4 to
285**

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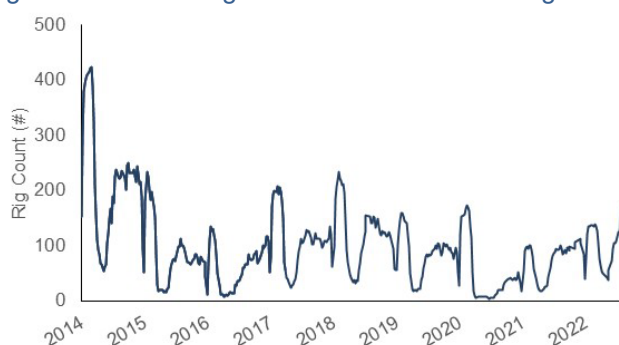
12.2 mmb/d number, but there is still a little bit of movement to the upside. He still sees 12.2 mmb/d for the 2022 exit, but could maybe get to 12.3 mmb/d.

Oil – Total Cdn rigs -2 WoW at 201 total rigs, +37 rigs YoY

Total Cdn rigs were -2 at 201 total rigs. Cdn oil rigs were -3 at 137 rigs. Cdn gas rigs were +1 at 64 gas rigs. We will also watch to see if this is just a small pause in growth for the week related to summer slowdown or if this is linked to lower oil prices. Total rigs are now +188 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 100 and Cdn gas rigs were 63 for a total Cdn rigs of 164, meaning total Cdn oil rigs are +37 YoY and total rigs are also +37 vs 2021.

Cdn rigs -2 WoW

Figure 16: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production +0.1 mmb/d at 12.2 mmb/d

US oil production was up 0.1 mmb/d to 12.2 mmb/d for the week ended Aug 5 after staying flat last week. Lower 48 production drove total production and was +0.1 mmb/d at 11.8 mmb/d this week, with Alaska having immaterial change. US oil production is up YoY at +0.9 mmb/d, but is still down significantly at -0.9 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. Increasing US oil production would be consistent with the growth in the EIA's latest Drilling Productivity Report (see our July 24, 2022 Energy Tidbits) that forecast US shale/tight oil would be +176,000 b/d MoM in July. Q2 reporting for the oilfield services companies are all saying that US producers continue to be disciplined on capex and focus on returns to shareholders.

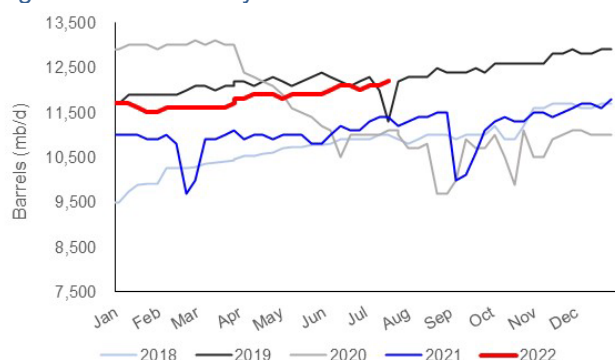
**US oil
production +0.1
mmb/d WoW**

Figure 17: 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-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	07/22	12,100	07/29	12,100
2022-Aug	08/05	12,200								

Source: EIA

Figure 18: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA lowers 2022 and 2023 oil production forecast

The EIA STEO slightly decreased its forecast for US oil production for 2022 and 2023. The EIA notes that their forecasts are subject to greater uncertainty amid the rapidly evolving conflict in Europe, production decisions of OPEC+, and the rate at which U.S. oil and natural gas producers increase drilling. (i) Please note the item that follows that has our view that the EIA is either over-estimating US oil supply or under-estimating US oil demand, or a combination thereof. (ii) Similar to our view on US natural gas growth, we also believe the first real test for growth in US oil production will be Q3/22 and to see if we start to see a ramp up in oil production. We have previously noted how the EIA’s numbers for US tight/shale oil were basically flat for months and only started to show modest growth in June. It’s why we think Q3/22 oil production will be the first real ramp up in oil production. (iii) The EIA forecast slightly raised US crude expectations in Q4/21, still not returning anywhere near the Q4/19

EIA forecasts US 2022 oil exit at 12.28 mmb/d

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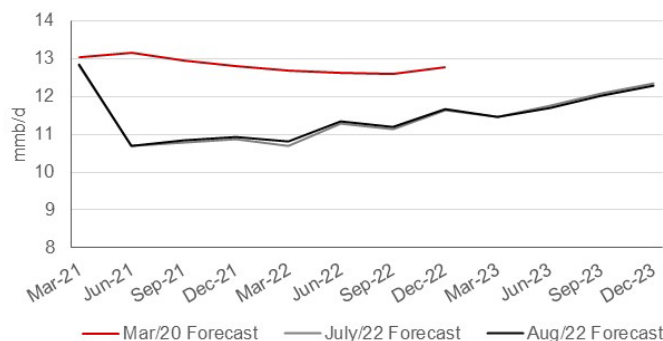
peak of 12.88 mmb/d, with Q4/21 US crude of 11.66 mmb/d (down 1.20 mmb/d from peak). Full year 2020 US oil production was adjusted upwards by 0.04 mmb/d to 11.32 mmb/d but is down 0.97 mmb/d YoY from 12.29 mmb/d in 2019. (iv) Full year 2021 was also revised upwards to 11.25 mmb/d, which is down -0.07 mmb/d YoY from 2020. (v) The EIA forecasts a shift back to YoY growth in 2022 with production averaging 11.86 mmb/d, +0.61 mmb/d YoY (was 11.91 mmb/d previously), with Q4/22 production of 12.28 mmb/d, is still down -0.43 mmb/d from Q4/19. (vi) The 2023 outlook projects crude production to begin Q1/23 at 12.39 mmb/d and close the year in Q4/23 at 13.10 mmb/d for an average of 12.70 mmb/d in 2023.

Figure 19: Estimated US Crude Oil Production By Forecast Month

(million b/d)	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Aug-2022	12.83	10.69	10.83	10.94	11.32	10.82	11.34	11.18	11.66	11.25	11.46	11.69	12.01	12.28	11.86	12.39	12.50	12.82	13.10	12.70
July-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.46	11.75	12.08	12.34	11.91	12.45	12.58	12.87	13.17	12.77
June-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.45	11.71	12.08	12.43	11.92	12.64	12.82	13.07	13.33	12.97
May-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.42	11.78	12.07	12.35	11.91	12.56	12.71	12.94	13.18	12.85
Apr-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95
Mar-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.62	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99
Feb-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.13	11.69	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60
Jan-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.12	11.54	11.16	11.58	11.7	11.88	12.05	11.8	12.26	12.33	12.46	12.58	12.41
Dec-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.11	11.63	11.18	11.67	11.72	11.91	12.09	11.85					
Nov-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.07	11.47	11.13	11.69	11.77	11.97	12.16	11.90					
Oct-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	10.98	11.13	11.02	11.54	11.64	11.78	11.96	11.73					
Sept-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.06	11.28	11.08	11.42	11.58	11.81	12.06	11.72					
Aug-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.22	11.26	11.30	11.12	11.46	11.62	11.86	12.11	11.77					
July-2021	12.75	10.81	10.81	10.90	11.31	10.70	11.20	11.17	11.34	11.10	11.54	11.72	11.95	12.20	11.85					

Source: EIA STEO

Figure 20: Estimated US Crude Oil Production By Forecast Month



Source: EIA STEO

Oil – EIA either over-estimates US supply or under-estimates US demand by 0.5 mmb/d

It looks like the EIA’s SEO monthly forecasts for US oil supply/demand continue to either overestimate US oil supply or underestimate US oil demand, or a combination thereof by about 0.5 mmb/d. This is for their 2021 historical data and also for their 2022 forecast data.

- (i) One overlooked item from the EIA monthly Short Term Energy Outlook is their monthly plug to balance out US oil supply and demand. The EIA posted its Aug STEO on Tuesday.
- (ii) The EIA provides line by line split of crude oil supply items in their monthly forecast. Lines like Lower 48 oil production, Alaska, SPR net withdrawals, etc. There is also the line item “Crude Oil Adjustment (d)”. And then a footnote “(d) Crude oil adjustment balances supply and consumption and was previously referred to as “Unaccounted for Crude Oil.” (iii) This is a monthly plug item. A positive value means that either supply is over-estimated, demand is under-estimated, or a combination of the two.
- (iv) The plug for EIA’s 2021

US forecast plug is 0.5 mmb/d

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forecasts is around 0.50 mmb/d looking back at 2021 US oil supply/demand. The plug for 2022 forecasts was just increased to 0.48 mmb/d for 2022 US oil supply/demand. (v) The interesting part is that the EIA doesn't go back to the prior year to try to zero out the plug on a look back basis. Rather, it just leaves a lookback at the prior year with a plug line item. If you look at the 2021 STEOs in Oct, Nov, Dec, they had a lookback at 2020 with a 0.41 mmb/d plug. If you look at the 2022 STEOS, the lookback at 2021 has a plug of around 0.50 mmb/d. (vi) The other trend in the last two years is that the plug for the current year (ie. the 2021 plug in 2021 STEOs, and the 2022 plug in 2022 STEOs) tends to increase as we get into Q2 of each year. For the 2022 STEOs, the plug is now up to 0.48 mmb/d for 2022 forecast. (vii) The bottom line is that the EIA historical 2021 oil forecast either over-estimated US oil supply or under-estimated US oil demand by 0.5 mmb/d, and it looks like the same factor for its current 2022 forecast. Below is the crude oil adjustment number that has been included in the EIA monthly forecasts going back to its Jan 2021 STEO and continuing to this week's Aug 2022 STEO.

Figure 21: "Crude Oil Adjustment" included in EIA STEO US oil supply/demand forecast

"Crude Oil Adjustment" Incl In EIA STEO US Oil Supply/Demand Forecast						
A positive value means supply is over-estimated or demand is under-estimated						
STEO Month	2021 STEO			2022 STEO		
	2020	2021	2022	2021	2022	2023
Jan	0.38	0.21	0.21	0.48	0.21	0.21
Feb	0.36	0.22	0.21	0.47	0.15	0.21
Mar	0.36	0.21	0.21	0.54	0.14	0.21
Apr	0.35	0.28	0.21	0.53	0.26	0.21
May	0.35	0.30	0.21	0.53	0.39	0.21
June	0.35	0.30	0.21	0.53	0.42	0.21
July	0.36	0.35	0.21	0.53	0.42	0.21
Aug	0.38	0.41	0.21	0.47	0.48	0.21
Sept	0.38	0.41	0.21			
Oct	0.41	0.45	0.21			
Nov	0.41	0.49	0.21			
Dec	0.41	0.47	0.21			

*Crude oil adjustment balances supply and consumption and was previously referred to as "Unaccounted for Crude Oil."
 Source: EIA Short Term Energy Outlook
 Prepared by SAF Group

Source: EIA STEO

Oil – DUCs do not tell the story as they don't include potential refracs

We want to highlight that the declining DUCs (Drilled UnCompleted Wells) inventory really underestimate the potential oil production adds from already drilled wells because DUCs do not include potential refracs. Potential refracs are older horizontal producing wells that will be refrac'd. On Tuesday, we tweeted [LINK](#) "DUCs inventory don't tell the full story as don't incl existing wells that will be refrac'd. Devon's #EagleFord deal incl 350 locations + 150 refrac candidates. Refrac success is now new, see 📌SAF 10/27/19 Energy Tidbits, \$CLB highlighted refac in #Bakken #EagleFord. #OOTT." We were reminded of this potential in Devon's Eagle Ford acquisition on Tuesday. Devon's announcement noted "the transaction also adds 350 repeatable drilling locations in the core of the Karnes Trough oil window along with 150 high-quality refrac candidates. This highly economic inventory positions the company's Eagle Ford assets to sustain its high-margin production and free cash flow generation for several years.". The 150 high-quality refrac candidates are likely the 1st and 2nd generation multi-stage horizontal wells that have been drilled, completed and are on

DUCs do not include potential refracs

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production or produced and are currently shut-in. These 150 refrac candidates are not considered DUCs. Our Supplemental Documents package includes excerpts from the Devon release and slide deck on the Eagle Ford acquisition.

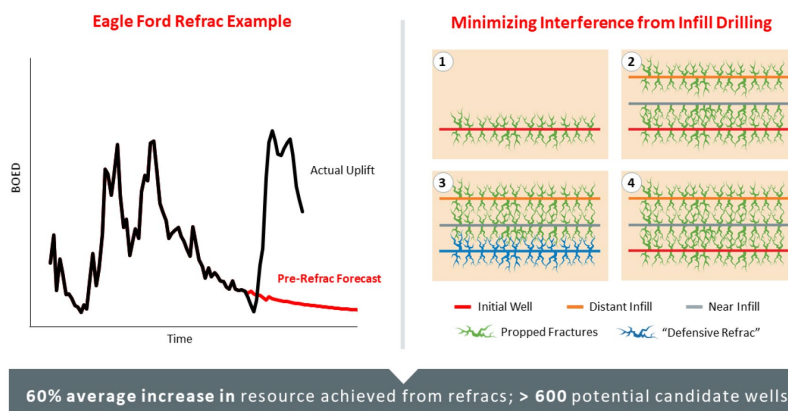
Core Labs highlighted Eagle Ford & Bakken refrac success in 2019

Devon's highlighting refract potential shouldn't surprise, especially in the Karnes Trough part of the oil leg. Karnes County has always been considered the prime Eagle Ford oil area. And refrac success in the Eagle Ford (and Bakken) is not new. Here is what we wrote in our Oct 27, 2019 Energy Tidbits. *"We were a little surprised that Core Labs Q3 call comments on refracking didn't get any traction. Perhaps its because the impact of refracking success won't really show up for years to come, But Core Labs had bullish comments on the industry refrack success in Eagle Ford and Bakken. We don't expect refrack success will lead to growth in these plays, but it should reduce mid term declines by increasing rate and recovery on old 1st and likely 2nd generation fracked wells. Mgmt said "Moving now to Production Enhancement. Core's Production Enhancement energetics team partnered with one of the world's largest independent E&P companies to develop a breakthrough perforating solution for their mechanically isolated recompletion programs in both the Eagle Ford and Bakken formations onshore U.S. This technology helped the operator minimize risk, improve recovery from existing wells and optimize their return on investment." "The operator has reported the ability to complete double the number of stages per day over conventional perforating techniques. The E&P company has also seen consistent and reliable frac -- fracs from stage to stage and well to well along with encouraging production results. Core's refrac technology breathes new life into the large fleet of older existing wells that were originally under-stimulated. High-quality reservoir rock and the intervals between the original stages can now be tapped, increasing oil recovery and significantly without the expense of drilling and completing an additional well." With respect to the significance to industry, it really doesn't matter who is the company, But we believe the "one of the world's largest independent E&P companies" refers to ConocoPhillips. In theory, it could be big companies who in both plays like EOG Resources, Marathon Oil, but we think its Conoco even though Conoco has stated clearly Bakken is in plateau production and Eagle Ford is in late stage growth (see our Aug 4, 2019 Energy Tidbits on Conoco's Q2 call). Conoco's regular investor presentations do not mention refracking success, but Conoco held a Feb 19, 2019 "Shale Oil Technical Teach In" that had the below refrack Eagle Ford slide*

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Figure 22: Conoco Eagle Ford Refrack

▶ Traditional E&P Technologies: Refracs to Add Resources & Minimize Interference



Source: ConocoPhillips

Oil - BLM agrees to pause (halt?) some Colorado oil/gas lease sales

We have seen reports call this a “pause” but we tend to see it as likely a halt on oil and gas lease sales on certain federal lands in Colorado. The Trump administration opened up these lands for oil and gas leases. But the environmental groups sued to keep the lands closed, and now the Biden Administration has reached an agreement that will see no oil and gas lease sales for at least two years. Our expectation that there won't be any lease sales during the remaining 2 ½ years of the Biden Administration. On Friday, the Center for Biological Diversity announced “*Legal Agreement Blocks Oil, Gas Leasing on 2.2 Million Acres in Colorado*” [\[LINK\]](#). The Center wrote “*Conservation groups and the U.S. Bureau of Land Management have finalized a legal agreement that will prevent new oil and gas leasing across 2.2 million acres of southwestern Colorado until the agency supplements its environmental analysis and releases an amended plan for lands in the area.*” “*The agreement requires the Bureau to analyze potential harms to the climate from fossil fuel extraction in the Uncompahgre Field Office planning area and to evaluate at least one alternative that reduces oil and gas leasing. This revision process for the Uncompahgre resource management plan is expected to take two years.*” “*The agreement resolves a lawsuit filed in 2020 by the conservation groups challenging the Bureau’s refusal to analyze climate damage and harm to the threatened sage grouse from fossil fuel development and the agency’s failure to consider a management alternative that allows for no new fossil fuel leasing.*” Our Supplemental Documents package includes the Center’s press release.

Pause on some Colorado federal oil and gas lands

Oil – Trans Mountain announces new President & CEO – Dawn Farrell

On Wednesday, Trans Mountain announced the appointment of Dawn Farrell as President & CEO and a member of the board. They said “*Mrs. Farrell brings over 35 years’ experience in the energy business, having held various senior level positions, including most recently President and CEO of TransAlta Corporation where she led the company’s unprecedented transition away from coal-fired electrical generation. This was one of the most significant carbon emissions reduction achievements in Canada’s effort to address climate change.*”

Trans Mountain new CEO

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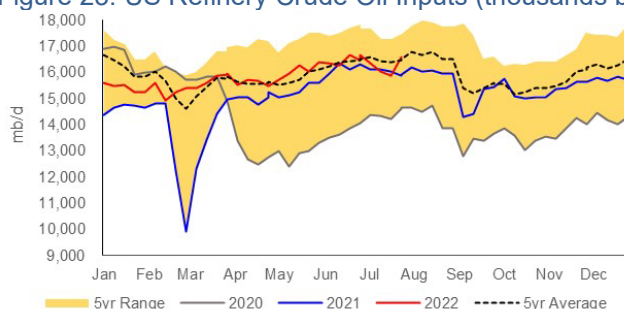
Perhaps it's because her background isn't in the pipeline business, or in the oil and gas sector, we were surprised her appointment didn't get more headlines. Her appointment is significant in energy business as she is the first woman to be CEO of a major Canadian pipeline company. Our Supplemental Documents package includes the Trans Mountain announcement.

Oil – Refinery inputs +0.728 mmb/d WoW at 16.581 mmb/d

The EIA crude oil input to refinery data is for the week ended Aug 5. This is the season that normally sees increasing processing volumes in Q2 every year, and the EIA reported crude oil inputs to refineries up 0.728 mmb/d to 16.581 mmb/d for the week ended Aug 5 and are +0.384 mmb/d YoY. Refinery utilization was up to 94.3%, which is +2.5% YoY. 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) decreased WoW, down -0.475 mmb/d to 19.474 mmb/d, and Motor gasoline was up 0.582 mmb/d at 9.123 mmb/d from 8.541 mmb/d last week. The 4-week average for Motor Gasoline was down -0.599 mmb/d YoY to 8.857 mmb/d. The 4-week average of Total demand was down -0.491 mmb/d YoY to 20.106 mmb/d.

**Refinery inputs up
WoW**

Figure 23: US Refinery Crude Oil Inputs (thousands b/d)



Oil – US “net” oil imports up 0.231 mmb/d WoW at 4.061 mmb/d

US “NET” imports were up 0.231 mmb/d to 4.061 mmb/d for the Aug 5 week. US imports were down -1.171 mmb/d to 6.171 mmb/d. US exports were down -1.402 mmb/d to 2.110 mmb/d. The WoW decrease in US oil imports was driven by US's Top 10 imports by country which were down by -0.784 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by 0.322 mmb/d to 3.351 mmb/d. (ii) Saudi Arabia was down -0.088 mmb/d to 0.412 mmb/d this week. (iii) Colombia was down -0.154 at 0.174 mmb/d. (iv) Ecuador was down -0.031 mmb/d at 0.212 mmb/d. (v) Iraq was down -0.188 mmb/d to 0.181 mmb/d. (vi) Mexico was down -0.105 mmb/d to 0.710 mmb/d.

**US “net” oil
imports up
WoW**

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Figure 24: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	May 27/22	June 3/22	June 10/22	June 17/22	June 24/22	July 1/22	July 8/22	July 15/22	July 22/22	July 29/22	Aug 5/22	WoW
Canada	3444	3603	3394	3344	2887	3803	3827	3481	3308	3,673	3,351	-322
Saudi Arabia	345	349	681	760	701	398	634	242	516	500	412	-88
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	747	711	608	374	743	702	610	877	639	815	710	-105
Colombia	215	143	292	228	215	213	213	405	150	328	174	-154
Iraq	326	196	555	100	76	362	302	454	165	369	181	-188
Ecuador	48	259	227	124	59	142	149	57	150	243	212	-31
Nigeria	193	194	181	43	201	171	79	136	143	57	161	104
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	5,318	5,455	5,938	4,973	4,882	5,791	5,814	5,652	5,071	5,985	5,201	-784
Others	900	699	1,047	1,253	1,116	1,048	861	867	1,093	1,357	970	-387
Total US	6,218	6,154	6,985	6,226	5,998	6,839	6,675	6,519	6,164	7,342	6,171	-1,171

Source: EIA, SAF

Oil – Colombia Pres Petro's tax plan sees huge hit in effective tax rate on oil & gas

New Colombia President Petro assumed office last weekend and no surprise his planned tax bill would see a big hit to oil and gas and mining if enacted as proposed. This has not yet been passed. On Thursday, we tweeted [LINK](#) "Huge hit coming on #Oil #NatGas #Mining Co's if new CO Pres Petro tax reform enacted. @ANDI_Colombia @BruceMacMaster estimate effective tax rate would jump from 53% to 87%. There are other hits noted in the @anjaralop report. #OOTT." ANDI is the National Business Association of Colombia. Bloomberg reported on comments by its head, Bruce Mac Master at a business conference. Bloomberg wrote "The tax reform aims to boost 2023 tax revenue by the equivalent of 1.7% of gross domestic product. The tax bill also includes a proposal that halts deductions for royalty payments, which means higher costs for commodity companies. Speaking at business association ANDI's annual event in Cartagena, it's head Bruce Mac Master cautioned that tax increases may lead companies to reconsider investing in Colombia. The group calculates that the effective tax rate for mining and hydrocarbon companies would jump to 87% if the tax bill passes in its current form, from 53% this year." Our Supplemental Documents package includes the Bloomberg report.

Colombia
Petro's tax plan

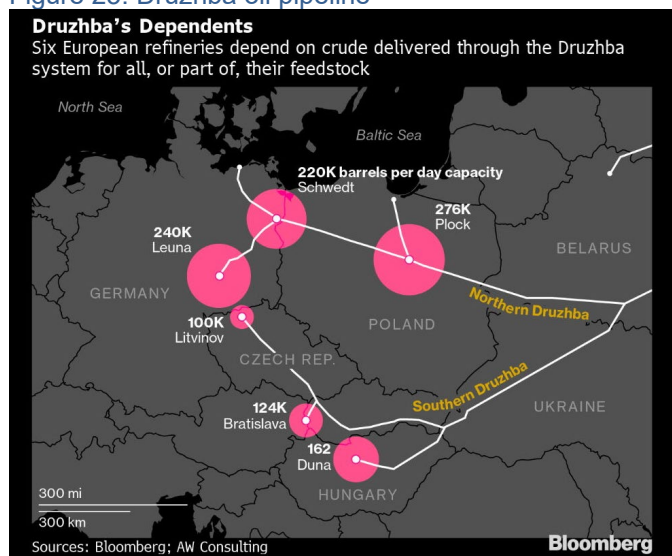
Oil – Druzhba southern line oil volumes stopped and restarted in a week

The market didn't hear the big oil news until early Tuesday morning that shipments on the southern leg of the Druzhba oil pipeline were halted on Aug 4. The southern leg ships oil thru Ukraine to Hungary, Slovakia and the Czech Republic. These oil deliveries had been exempted from the EU sanctions as there really isn't any reasonable alternative to replace this oil supply. The deliveries were halted because of EU sanctions didn't permit the payment to be received by Ukraine. No surprise, there was huge panic and ultimately payments were facilitated by Hungary, Slovakia and Czech Republic and oil volumes resumed on Wed/Thurs. Our Tuesday morning tweet [LINK](#) included the below map "Who doesn't love a great map. #Oil transport halted Aug 4 on southern leg of Transneft Druzhba oil pipeline that transits thru Ukraine to refineries 162 mbd in Hungary, 124 mbd in Slovakia, 100 mbd in Czech Rep. Brent flipped \$2 on news, now \$98. Thx @business @ja_herron. #OOTT."

Druzhba
southern leg
shipments
resumed

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Figure 25: Druzhba oil pipeline



Source: Bloomberg

Oil – EIA forecasts increasing OPEC surplus capacity in 2023??

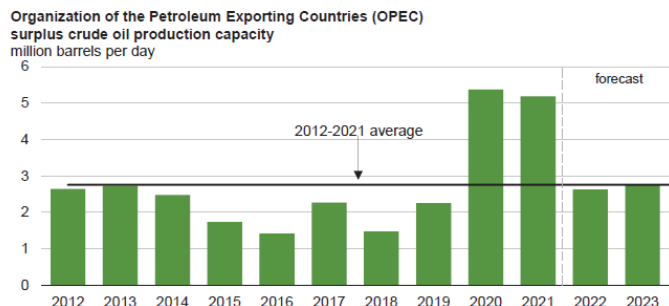
Does anyone but the EIA expect OPEC surplus capacity to be more in 2023 when there is an increasing call on OPEC? We like to go through the EIA Short Term Energy Outlook numbers and one item that jumped out at us was their view on OPEC spare capacity. It seems like the EIA is different than pretty well everyone else, including OPEC, as the EIA sees increasing OPEC spare capacity in 2023 despite an increasing call on OPEC oil production in 2023. We tweeted [LINK](#) "Hmmm! #EIA STEO fcasts increasing YoY OPEC spare capacity in 23 after call on #OPEC is +0.56 mmbd YoY in 23? ie. Wonder what OPEC members account for this assumed #OPEC YoY increase in #Oil capacity of ~0.7 mmbd YoY in 2023? #OOTT."

There is no write up discussion of OPEC spare capacity in the EIA STEO. But the EIA seems to forecast increased OPEC (not OPEC+) capacity of ~0.75 mmb/d YoY in 2023. The EIA forecasts increased OPEC production in 2023, which means an increased call on OPEC in 2023 of +0.56 mmb/d YoY. EIA forecasts OPEC production of 34.53 mmb/d in 2023, vs 33.97 mmb/d in 2022. Total world production of 100.12 mmb/d in 2022 less non-OPEC of 66.15. Total world production of 101.33 mmb/d less non-OPEC of 66.80 mmb/d. We would have expected to see this increasing call on OPEC production result in a forecast of less OPEC surplus capacity in 2023 vs 2022. That isn't the case. Rather, the EIA forecasts OPEC surplus capacity increases from ~2.6 to ~2.8 mmb/d. That looks to be increased OPEC surplus capacity of ~0.2 mmb/d. There isn't an exact number, but below is their graph. Add the two together and the EIA seems to be calling for an increase in OPEC capacity of ~0.70 mmb/d or so. 0.56 mmb/d plus 0.1 to 0.2 mmb/d, so round it down to 0.70 mmb/d. Below are excerpts from the EIA STEO.

EIA on OPEC surplus capacity

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Figure 26: EIA Forecast OPEC Surplus Capacity



Note: Black line represents 2012-2021 average (2.8 million barrels per day).
Source: U.S. Energy Information Administration, Short-Term Energy Outlook, August 2022



Source: EIA STEO August 2022

Figure 27: EIA Forecast Global Oil Production

Table 3a. International Petroleum and Other Liquids Production, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - August 2022

	2021				2022				2023				Year		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2021	2022	2023
Production (million barrels per day) (a)															
OECD	30.21	30.79	31.11	32.22	31.66	32.13	32.84	33.56	33.82	33.93	34.12	34.70	31.09	32.55	34.14
U.S. (50 States)	17.74	19.11	19.00	19.90	19.44	20.18	20.55	21.05	21.11	21.26	21.55	21.97	18.94	20.31	21.48
Canada	5.62	5.37	5.49	5.68	5.66	5.71	5.74	5.85	5.92	5.88	5.90	5.91	5.54	5.74	5.90
Mexico	1.93	1.95	1.90	1.92	1.91	1.89	1.89	1.86	1.90	1.87	1.83	1.79	1.92	1.89	1.85
Other OECD	4.92	4.37	4.73	4.71	4.65	4.34	4.66	4.79	4.88	4.92	4.84	5.02	4.68	4.61	4.91
Non-OECD	62.58	63.99	65.62	66.13	67.21	66.98	68.38	67.68	66.91	67.33	67.52	67.01	64.59	67.57	67.19
OPEC	30.34	30.88	32.28	33.10	33.75	33.77	34.11	34.23	34.58	34.53	34.53	34.51	31.66	33.97	34.54
Crude Oil Portion	25.08	25.49	26.84	27.67	28.19	28.34	28.63	28.71	29.02	29.10	29.05	28.99	26.28	28.47	29.04
Other Liquids (b)	5.26	5.39	5.44	5.44	5.56	5.43	5.48	5.52	5.56	5.43	5.48	5.52	5.38	5.50	5.50
Eurasia	13.42	13.66	13.63	14.27	14.39	13.43	13.92	13.48	12.66	12.33	12.27	12.27	13.75	13.80	12.38
China	4.99	5.03	5.01	4.93	5.18	5.19	5.14	5.18	5.22	5.25	5.24	5.28	4.99	5.17	5.25
Other Non-OECD	13.82	14.42	14.70	13.82	13.90	14.59	15.21	14.78	14.45	15.22	15.48	14.94	14.19	14.62	15.03
Total World Production	92.79	94.79	96.73	98.35	98.87	99.11	101.21	101.24	100.72	101.26	101.64	101.71	95.68	100.12	101.33
Non-OPEC Production	62.45	63.91	64.45	65.24	65.13	65.34	67.10	67.01	66.14	66.73	67.11	67.19	64.02	66.15	66.80

Source: EIA STEO August 2022

Oil – OPEC MOMR, reduced oil demand forecast for 2022 and 2023

On Wednesday, OPEC released its Monthly Oil Market Report at 6am MT. (i) The overall takeaway from the OPEC MOMR Aug is a negative to oil. OPEC reduced its 2022 demand growth by 260,000 b/d for the full year average, and reduced the Q4/22 demand to 102.22 mmb/d (was 102.77). OPEC sees a narrowing of the OECD “crude oil only” stocks at June 30 to a deficit of 135 mmb vs 2015-2019 average down from a deficit of 177 mmb at May 31. (ii) For 2021, full year average demand was unchanged at 96.92 mmb/d and +5.73 mmb/d YoY. 2021 remains down -3.28 mmb/d vs pre-covid 2019 of 100.10 mmb/d. (iii) Oil demand growth in 2022 was revised down -260,000 b/d to +3.10 mmb/d YoY. 2022 demand average was changed to 100.03 mmb/d, down -0.17 mmb/d from pre-covid 2019 of 100.20 mmb/d. Revisions normally refer to the prior month’s forecast. The big decrease to demand comes to end of 2022. OPEC oil demand by quarter is Q1/22 at 99.36 mmb/d (was 99.33), Q2/22 at 98.56 mmb/d (was 98.33), Q3/22 at 99.93 mmb/d (was 100.65), and Q4/22 at 102.22 mmb/d (was 102.77). (iv) Oil demand growth forecast was unchanged at +2.70 mmb/d, but demand was lowered due to 2022 reduction because there will be a lower base going into 2023. Aug

OPEC MOMR

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OPEC forecasts 2023 demand at 102.72 mmb/d (was 102.99). Major YoY growth areas are: China +0.74 mmb/d YoY to 15.86 mmb/d, Other Asia +0.36 mmb/d, Middle East +0.31 mmb/d, India +0.24 mmb/d YoY. Their summary comment on 2023 oil demand is “*In 2023, expectations for healthy global economic growth, combined with expected improvements in the containment of COVID-19 in China, are expected to boost consumption of oil.*” (v) There was immaterial change to non-OPEC supply growth for 2022, now +2.15 mmb/d at 65.60 mmb/d. Key YoY non-OPEC growth areas for 2022 are US +1.20 mmb/d (was +1.28), Canada +0.19 mmb/d (unchanged), Brazil +0.15 mmb/d (unchanged), China +0.15 mmb/d (unchanged), and Guyana +0.11 mmb/d (wasn't disclosed last month). (vi) - Lookback at May commercial oil stocks was revised up +11 mmb to 2,691 mmb, vs July MOMR had May at 2,680 mmb. Our Supplemental Documents package includes excerpts from the OPEC MOMR.

Oil – IEA OMR: Oil demand forecasts revised upwards for 2022 and 2023

On Thursday, the IEA released its monthly Oil Market Report for July at 2am MT. They only release very limited public info, but Bloomberg provided tables and added color from the report. So big thanks, as usual, to the Bloomberg team. On Thursday morning, we tweeted [\[LINK\]](#) “*Brent #Oil +\$1.42 to \$98.22 since @IEA OMR released 2am MT. #IEA increased oil demand for 2022 to 99.7 mmbd (was 99.2) and 2023 to 101.8 mmbd (was 101.3). "But with supply increasingly at risk to disruptions, another price rally cannot be excluded." #OOTT*”. (i) The oil price response from this IEA OMR was positive. The chatter leading up to the release were expectations for reducing demand forecast from both the IEA and OPEC, but the IEA increased its oil demand forecast. (ii) EIA's oil demand forecast was +0.5 mmb/d MoM for both 2022 and 2023. IEA's 2023 forecast was raised to 101.8 mmb/d which is still +2.1 mmb/d YoY and above pre-Covid 2019 of 100.4 mmb/d. The 2022 demand forecast was increased to 99.7 mmb/d, still below pre-covid levels. (iii) Non-OPEC supply growth for 2023 was revised upwards +0.7 mmb/d to 66.3 mmb/d. 2022 non-OPEC supply was unchanged at 65.5 mmb/d, which is +1.8 mmb/d YoY. On the overall global supply theme, the IEA stated, “*The outlook for world oil supply has been revised upward, with more limited declines in Russian supply than previously forecast. While Russia's exports of crude and oil products to Europe, the US, Japan and Korea have fallen by nearly 2.2 mb/d since the start of the war, the rerouting of flows to India, China, Türkiye and others, along with seasonally higher Russian domestic demand has mitigated upstream losses. By July, Russian oil production was only 310 kb/d below pre-war levels while total oil exports were down just 580 kb/d. The EU embargo on Russian crude and product imports that comes into full effect in February 2023 is expected to result in further declines, as some 1 mb/d of products and 1.3 mb/d of crude would have to find new homes*”. (iv) The EIA estimates 3.74 mmb/d of spare capacity, but it includes Nigeria 0.25 mmb/d, Libya 0.52 mmb/d and Kazakhstan 0.23 mmb/d. All three have question marks and Kazakhstan is at the whim of Russia not cutting off export lines. But the IEA recognizes it's really just Saudi and UAE that has any spare capacity. Bloomberg reported on comments from IEA's head of oil market division “*They're worried about spare capacity -- it's basically only Saudi Arabia and the UAE that are holding any substantial amount of spare capacity*”. said Bosoni”. The IEA estimates spare capacity of 1.39 mmb/d at Saudi Arabia, 0.84 mmb/d at UAE, 0.52 mmb/d at Libya, 0.25 mmb/d at Nigeria, 0.23 mmb/d at Kazakhstan, and 0.21 mmb/d at Iraq. (v) The IEA commentary on OECD stocks still looks positive, but shows modest builds in May and June helped by SPR releases. The IEA wrote, “*Global observed inventories fell by a marginal 5 mb in June, with a*

IEA Oil Market Report

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drawdown in both OECD and non-OECD stocks partially offset by an increase in oil on water. OECD total industry stocks increased by 6.2 mb, to 2 681 mb but remained 292.1 mb below the five-year average. Government stocks released to the market totalled 33.8 mb in June, the largest drawdown since March.” Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 28: IEA Global Demand Forecast By OMR Report Month

mmb/d	2020	2021	21-20	Q1/22	Q2/22	Q3/22	Q4/22	2022	22-21	Q1/23	Q2/23	Q3/23	Q4/23	2023	23-22
Aug-22	91.0	97.5	6.5	99.4	98.5	100	100.8	99.7	2.2	100.3	101.1	102.5	103.3	101.8	2.1
July-22	91.0	97.5	6.5	99.3	97.8	99.4	100.2	99.2	1.7	99.8	100.8	102	102.7	101.3	2.1
June-22	91.0	97.5	6.5	99.3	98.2	99.8	100.4	99.4	1.9	100.5	101.1	101.9	102.7	101.6	2.2
May-22	91.0	97.5	6.5	98.8	98.2	100	100.4	99.4	1.9						
Apr-22	91.0	97.5	6.5	98.5	98.3	100.1	100.5	99.4	1.9						
Mar-22	91.0	97.5	6.5	99	98.8	100.2	100.6	99.6	2.1						
Feb-22	91.0	97.4	6.4	98.9	100.1	101.7	101.6	100.6	3.2						
Jan-22	91.0	96.4	5.4	97.8	99.3	100.9	100.8	99.7	3.3						
Dec-21	91.0	96.2	5.2	97.9	99.1	100.8	100.3	99.5	3.3						
Nov-21	91.0	96.3	5.3	98.5	99.2	100.6	100.3	99.7	3.4						
Oct 21	91.0	96.3	5.3	98.6	99.1	100.5	100.2	99.6	3.3						
Sep 21	91.0	96.2	5.2	98.2	98.9	100.3	100.7	99.5	3.3						
Aug 21	91.0	96.2	5.2	98.0	98.8	100.1	100.2	99.3	3.1						
July 21	91.0	96.4	5.4	98.2	98.7	100.3	100.6	99.5	3.1						

Source: IEA, SAF

Oil – Aramco CEO says global spare oil capacity is <2 mmb/d & declining fast

Earlier this morning, we tweeted [\[LINK\]](#) “Buckle Up! Available #Oil capacity is declining fast. EU sanctions on RUS #Oil start in Dec. @ArgusMedia reports #Aramco CEO Nasser said “describing “strained” global spare capacity of less than 2mn b/d and “declining fast.” Oil looks good for Q4. Thx Ruxandra Jordache #OOTT.” There is a huge question mark on where near term (next 3 to 9 months) increased global oil supply will come to meet still recovering oil demand and the December kick in of EU sanctions on Russian oil. Later in the memo, we noted RBC Helima Croft’s comments on these EU sanctions. Yes, US oil supply continues to modestly increase, but Aramco CEO Nasser reminds of our big concern – there isn’t much global spare oil capacity. And Nasser says that is less than 2 mmb/d and is declining fast. No surprise, earlier this morning, Saudi Aramco reported blow out Q2 results. Aramco holds its analyst call tomorrow, but held a media call this morning. There is no replay of the media call. But we reviewed as many reports of CEO Nasser’s comments. Argus Media was the only one we saw that highlighted Nasser’s comments on global spare capacity. Argus reported “But he flagged supply-side constraints.”Ongoing investment in our industry is essential — both to help ensure markets remain well supplied and to facilitate an orderly energy transition,” he said, describing “strained” global spare capacity of less than 2mn b/d and “declining fast.” Our Supplemental Documents package includes the Argus report.

Global spare oil capacity is <2 mmb/d

Oil – Aramco CEO reassures on Saudi’s maximum sustainable capacity

The other key message Saudi Aramco CEO Nasser wanted to get out this morning was to reassure the world on Saudi’s maximum sustainable capacity of 12 mmb/d and its growth plans to increase to 13 mmb/d by 2027. (i) Saudi current 12 mmb/d MSC. There was some careful wording in his answer that we believe reinforces that it may take a few months and capital to bring the current 12 mmb/d capacity on-stream. Nasser said “Our commitment is, any time we have been asked [by the Saudi government]... to go to our maximum sustained capacity, which is currently 12mn b/d, we’ll be able to bring this on the stream quickly and

Saudi maximum sustainable capacity

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sustainably.” (ii) Going to 13 mmb/d MSC by 2027. Argus reported “Nasser said Aramco is “progressing very well” with plans to raise capacity from 12mn b/d to 13mn b/d by 2027. “In 2025, we should go to 12.3mn b/d, in 2026 we should go to 12.7[mn b/d],” he said. He expects a 75,000 b/d increase from the Dammam field, a 300,000 b/d addition from Marjan, 250,000 b/d from Berri and 600,000 b/d from Zuluf. Beyond 2027, Nasser said there should be a 700,000 b/d hike from the Safaniyah field.”

Was this to counter the Arab News questioning Saudi’s production capacity?

We can’t help believe that Nasser wanting to get the message out on Saudi’s maximum sustainable capacity to counter the chatter that came out following a very surprising Arab News July 25 report that raised a lot of doubts on MSC. Here is what we wrote in our July 31, 2022 Energy Tidbits. “Oil - Very bullish report, surprising admissions on Saudi Arabia’s production capacity. On Monday, we were surprised to see the Arab News report “Secret or reality: can Aramco produce 15 million barrels a day?” [\[LINK\]](#) (i) We tweeted [\[LINK\]](#) “Must read. Hard not to be very bullish #Oil on reality for #Aramco to MAINTAIN & increase production. Yes can produce 11-12 mmb/d but need massive investments & above all more reservoir management, Ghawar 3.8 mmbd of MSC is in decline, economics not there for new fields #OOTT.” Our tweet did not do justice to the fact that there was so much more in the report including a number of frank statements that question the economics and potential for added oil production barrels. (ii) This is very bullish for oil. We think it reinforces that the view that markets shouldn’t expect Saudi Arabia to produce on a sustainable basis much more than 11 mmb/d. This will be their quota in August. Their current maximum sustainable capacity is ~12 mmb/d. (iii) It reminds Saudi Arabia always wants to keep 1 to 2 mmb/d of spare capacity. So if the current MSP is ~12 mmb/d, it is telling the market the most they will produce is ~11 mm/d, or basically the August quota. Mahdi writes “The Kingdom took on its shoulders the responsibility of keeping between 1 and 2 million barrels a day of oil as spare capacity”. (iv) We were surprised by this comment on just maintaining the spare capacity as I don’t recall seeing it before. But it is normal oil operations. It costs money to maintain capacity. Mahdi writes “This idle capacity isn’t free. It comes at a cost. There is an economic cost of not selling that oil, and there is a financial cost in the form of capex and opex to keep these wells and the surface facilities ready to pump this crude at any time.” (v) It was very surprising to see the admission that the massive Ghawar oil field is in decline. This is what many oil watchers believe but it isn’t something we have heard from Saudi Arabia. And this alone brings into question Saudi’s ~12 mmb/d MSC. Mahdi wrote “I think the world now can say goodbye to the 15-million-barrels-a-day scenario. Many of these increments have already been developed to maintain Aramco’s 12 million MSC. Khurais 300,000 and 250,000 are history now. As for Berri’s increment, it is coming online over the next two years. Now we will rely on Zuluf and Safaniyah to hit the 13 million barrels a day target and to compensate for the declines in older fields such as Abqaiq and Ghawar.” (vi) And to get to produce 11 or 12 mmb/d requires massive investments. We are concerned that many assume that Saudi Aramco’s stated MSC of ~12 mmb/d is there ready to be called up. But that isn’t reality and Mahdi reminds that this requires massive investments. Mahdi writes “I don’t doubt the ability of Aramco to produce at 11 or 12 million barrels a day because I didn’t get my information from the officials who smile at the media

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but from those who were against seeing the company producing at that level. Aramco can do it but it will require more work for petroleum engineers who don't want to walk the extra mile and it will need massive investments and above all more reservoir management.” As an aside, we have to believe there will be changes at some levels in Aramco with the multiple digs at Aramco. (vii) For the increase from ~12 mmb/d to 13 mmb/d MSC, this was surprising as he basically says that the key oil fields that have been assumed to add production aren't economic to bring on. This is another surprising statement. “First, there are tens of fields that are still not developed. There are more than 100 discovered fields but the majority if not all of production is coming from less than 25 of them. Yes all these undeveloped fields are giant but when combined can add something between 500,000 and 1 million barrels a day extra. However, the economics for bringing them online is still not there, not until the big fields are on decline.” (viii) Note the part of the new fields that does look solid is the 250,000 b/d from the Neutral Zone fields. These are 500,000 b/d split 50/50 Saudi/Kuwait. Mahdi wrote “Second, observers tend to forget that Saudi Arabia shares massive resources in the partitioned zone with Kuwait. Khafji network of offshore fields can produce up to 300,000 barrels a day, while onshore fields in Wafra are able to add 200,000 barrels a day. Saudi Arabia was trying for years through Chevron to implement a steam flooding program that can unlock at least 5 billion barrels extra of heavy oil from Wafra. The steam injection project was undergoing until the two countries halted production from the entire zone between 2014 and 2015. With operations resuming normally in the zone, the prospect for seeing more oil from Wafra and Khafji is high.” (ix) This is supposed to be a reassuring comment, but we have trouble buying into the thesis that Saudi can free up 1 mmb/d of oil for export markets by 2030 by substituting natural gas for oil in its power plants and by adding renewables. Maybe so, but it won't be cheap given it will be driven by renewable that has been so far behind and unconventional natural gas. (x) This is an excellent report to read and one that we believe is very bullish for oil for the 2020s. Our Supplemental Documents package includes the Arab News report.”

Can Saudi have ~12 mmb/d MSC if Ghawar is in decline?

Here is another item from our July 31, 2022 Energy Tidbits. “Long time oil followers remember the peak oil supply focus of the early 2000's that was made famous by Matt Simmons and his book *Twilight in the Desert* referring to his analysis that Saudi Arabia's big oil fields, in particular Ghawar, was in decline. The Arab News admission that Ghawar is declining is not a surprise to many oil watchers, but nothing we have seen admitted by Saudi Aramco. This is huge because if Ghawar is declining, we have to wonder how can Saudi Aramco have ~12 mmb/d MSC? Our tweet included the below table from the Saudi Aramco IPO registration document that showed 2018 data splitting out Saudi Aramco's 12 mmb/d of MSC. Ghawar is the largest component at 3.8 mmb/d or 32% of Saudi Aramco's 12 mmb/d MSC. We checked their 2021 financial disclosure and could not see an updated split of the 12 mmb/d MSC by oil field.”

Figure 29: Saudi Aramco MSC by oil field

Table 14: Key characteristics of certain of the Company's principal oil fields by reserves listed as at 31 December 2018G

	Liquids Reserves ⁽¹⁾ (mmbbl)	Combined Reserves (mmboe)	MSC (mmbpd)
Ghawar	48,254	58,319	3.800
Khurais	20,100	21,402	1.450
Safaniyah	33,664	34,029	1.300
Shaybah	13,617	14,864	1.000
Zuluf	30,417	31,313	0.825
Other	80,718	96,963	3.625
Total	226,770	256,890	12.000

Source: Company.

Source: Saudi Aramco

Arab News is owned by MBS brother

Here is one other item from our July 31, 2022 Energy Tidbits. *"One of the reasons why we believe people should pay attention to the Arab News report is its ownership – it is reportedly owned by a brother of MBS and we do not believe this report, given its controversy, would not be published if MBS wasn't onside. We tweeted [\[LINK\]](#) "what makes the #Aramco story even more interesting. Note ownership of Arab News. @Wikipedia "At least as of May 2019, Arab News was owned by Prince Turki bin Salman Al Saud, the brother of the ruling Crown Prince of Saudi Arabia Muhammad bin Salman (aka MBS)." #OOTT." Wikipedia writes [\[LINK\]](#) "Arab News is an English-language daily newspaper published in Saudi Arabia. It is published from Riyadh. The target audiences of the paper which is published in broadsheet are businessmen, executives and diplomats.[4][5] At least as of May 2019, Arab News was owned by Prince Turki bin Salman Al Saud, the brother of the ruling Crown Prince of Saudi Arabia Muhammad bin Salman (aka MBS)."*

Oil – JCPOA, US State Dept new messaging seems to support positive indicators

It seems like most are now expecting a return to the JCPOA. And this week could see some positive indicators. We follow the daily US State Dept and White House briefings, and the Thursday State Department comments would seem to reinforce the EU comments that the negotiations last week in Vienna were successful, at least from the US side. And that there were some sort of gives, likely on both sides. On Thursday, the US State Department transcript notes US State Dept spokesperson Patel saying *"We and the Europeans have made quite clear that we are prepared to immediately conclude and implement the deal we negotiated in Vienna for a mutual return to the full implementation of the JCPOA. But for that to happen, Iran needs to decide to drop their additional demands that go beyond the JCPOA. Ultimately, the choice is theirs"*. Patel saying Implement the deal we negotiated in Vienna is different than the prior US State Dept stances. The US seems to be saying negotiated something last week and they will go with that. This is different than the standard US lines. The US has always said return to the JCPOA and that there was a deal on the table for months that they have been waiting for Iran to accept. Here is a pre-Vienna example on July 25, so well ahead of Vienna. US State Department transcript notes Ned Price saying *"I will let the Iranians air publicly what it is they are referring to with that. The fact is that we have made*

JCPOA indicators could be this week

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a political decision. We made a political decision early on in this administration. In fact, it was a political decision that the then-candidate Biden articulated on the campaign trail; that is to say, that if Iran were to re-enter the JCPOA, we would do the same. After months of painstaking discussions, there is an agreement that has been on the table, an agreement that essentially hammers out the logistics and the details of doing so. The fact is we made that decision a long time ago. The Iranians, if they are serious about a mutual return to compliance - which they may not be - it is - the onus is now on them to take that deal.”

Oil – China’s oil imports fall 4% YoY to 8.8 mmb/d in July

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 8.8 mmb/d in July which was down 4% from June 2021.

China oil imports

Oil – US says India is refining Russian crude and shipping the distillates to US

No one should be surprised by the reports that India has been processing Russian crude and shipping some of the refined products to the US. Last night, Bloomberg reported that the US has informed India that it has been processing Russian crude and shipping the resultant distillates to US customers. Bloomberg reported on comments from India’s Reserve Bank of India deputy governor, Michael Patra, yesterday. Bloomberg said it was in his speech. We reviewed the posted RBI speech transcript and there was no mention of this. But we did find interesting demographic detail in the speech that we highlight later in the memo. Bloomberg wrote *“In his speech, Patra said that the US treasury department has informed the Indian authorities of Russian oil being processed into inputs for plastic manufacture in India and exported to the US. He narrated this incident as an example of how ‘topsy turvy’ the world has become in the wake of the Russian-Ukraine war and how the ‘war works in strange ways’.* *“You know that there are sanctions against people who are buying Russian oil. It turns out that an Indian ship met a Russian tanker mid-sea, picked up oil, came to a port in Gujarat, it was processed in that port and converted into a distillate that is used in the manufacture of single-use plastic,”* said Patra. *The twist in the story was how the refined output ended up in the United States despite US sanctions barring import of Russian-origin energy products into the country. “The refined output was put back on the ship, and it set sail without a destination; in the midseas, it received a destination, so it rechartered its course and went to New York and handed its stuff,”* said Patra.” Our Supplemental Documents package includes the Bloomberg report.

India shipping processed Russian oil to US?

Oil – IEA highlighted natural gas to oil switching, but it was also gasoline & jet fuel

Earlier, we highlighted the IEA’s Oil Market Report. The headlines on the IEA increasing its oil demand forecast was the IEA writing *“Soaring oil use for power generation and gas-to-oil switching are boosting demand. In this Report, we have raised our estimates for 2022 global demand growth by 380 kb/d, to 2.1 mb/d. Gains mask relative weakness in other sectors, and a slowdown in growth from 5.1 mb/d at the start of the year to less than 100 kb/d by 4Q22”.* The IEA’s comment that the “gains mask relative weakness in other sectors” seemed to infer the IEA was reducing its motor gasoline and/or jet fuel consumption forecasts. The IEA doesn’t post the by product demand splits for free, but, fortunately, Bloomberg reported the split. We

IEA demand increases by product

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tweeted [LINK](#) "It's not just "soaring oil use for power generation and gas-to-oil switching are boosting demand", @IEA also increased motor gasoline & jet fuel demand MoM. Brent #Oil +\$1.54 to \$98.34 since #IEAOMR at 2am MT. Thx @JWittels. #OOTT." Bloomberg provided the below table. Versus the July OMR, the Aug OMR forecasts higher motor gasoline 2022 demand of 86,000 b/d to 25.846 mmb/d, and higher jet fuel & kerosene 2022 demand of 48,000 b/d to 6.095 mmb/d.

Figure 30: IEA 2022 Product Demand Forecast, July OMR vs Aug OMR

Product	2022 (July OMR)	2022 (August OMR)	Revision
LPG & Ethane	14368	14321	-47
Naphtha	6809	6831	22
Motor Gasoline	25846	25932	86
Jet Fuel & Kerosene	6095	6143	48
Gas/Diesel Oil	27849	28077	228
Residual Fuel Oil	6247	6395	148
Other Products	11967	11997	30
Total Products	99181	99695	514

Source: Bloomberg

Oil – Oil analysts, Croft & Sen, warn oil market to be very tight in Dec

Two respected oil analysts, RBC's Helima Croft and Energy Aspects Amrita Sen, on TV this week and both highlight the same view on the near term timing for oil strength – in Nov/Dec.

(i) Amrita Sen on Bloomberg on Monday. We tweeted [LINK](#) "See [📄 transcript](#). @ea_amrita on next 2 mths vs after Nov. Headline will be she thinks #Oil prices can continue to weaken in near term. But after Nov, "the market is going to tighten up very, very quickly. So we still maintain forecast of over \$120 for Brent". #OOTT." We created a transcript of her key comment "...in terms of where prices should be, I think, in the near term, we can continue to weaken. We've got seasonally refinery maintenance coming up, this is always a weak period for crude. I'm not expecting to see a sudden increase in prices, but, come the winter, particularly after November. First of November, the SPR stops. First of December, Russia, the European embargo on Russian embargo starts as well. You've got the China Party Congress, which should allow, we believe, at least some easing in Covid restrictions. The market is going to tighten up very, very quickly. So we still maintain forecast of over \$120 for Brent." (ii) Helima Croft on CNBC on Thursday. We tweeted [LINK](#) "ICYMI. Usual clear insights from @CroftHelima. #Oil, not seeing wholesale demand destruction, where will supply come from when EU RUS sanctions kick in & SPR release 1 mmb/d is over? #NatGas, will EU risk economic dislocation this winter to support Ukraine? #OOTT." Croft reminded that the EU sanctions on Russian oil start in December and that will mean there is about 2 million b/d looking for alternative markets and said "But we have not seen any signs of wholesale demand destruction. Yes, China is soft, but we have not seen a significant fall off. For example, in gasoline demand here. So the question is do you have enough supply. Again, as I look out at the back half, the last quarter of this year, we're going to have this SPR release, a million barrel a day SPR release, that winds down in October. These Russian energy sanctions, they hit in December. OPEC does not have additional barrels to put on the market to plug this type of gap. So I do think we should be particularly focused on what happens with these sanctions when the US SPR release winds down". Our

Oil to tighten up
in Dec

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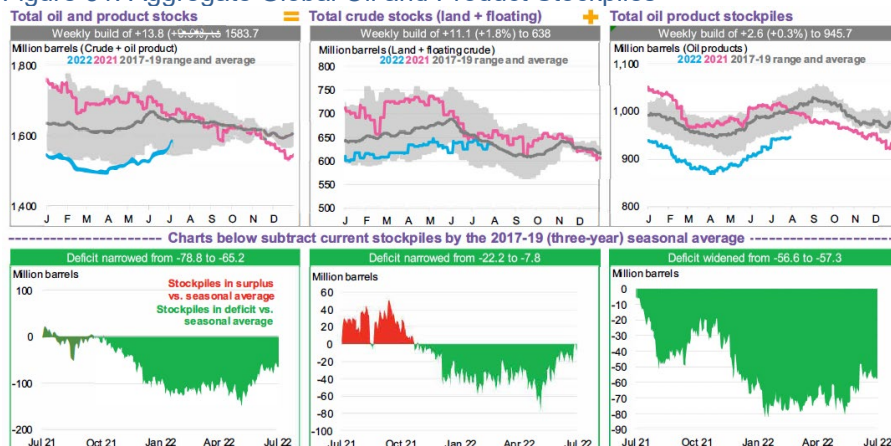
Supplemental Documents package includes the fuller transcript we made of Croft's comments.

Oil – BNEF: global oil and product stocks deficit narrowed

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 global oil and products stockpile deficit narrowed for crude and products from 78.8 mmb to 65.2 mmb. The stockpile deficit against the five-year average (2015-19) narrowed from 56.8 mmb to 53.9 mmb. Total crude inventories increased by 1.8% WoW to 638.0 mmb, including global floating inventories. Product stocks were up 0.3% WoW with the stockpile deficit against the 3-year average widening from 56.6 to 57.3 mmb. Gas oil and middle distillate stocks have widened against their three-year average deficit (2017-2019) from 38.7 mmb to 39.6 mmb. Jet fuel consumption by international departures decreased by 3,400 b/d WoW while consumption by domestic passenger departures increased by 4,800 b/d. The global mobility index increased over the past week, up 1.7% in the week to Aug 4. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

BNEF's global oil inventories

Figure 31: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Oil – Vortexa crude oil floating storage 106.91 mmb as of Aug 12, +14.59 mmb WoW

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 on the new estimates are compared to the prior weeks Vortexa estimates posted on Bloomberg on Aug 6 at noon MT. (i) As of Noon MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Aug 12 was 106.91 mmb, which is +14.59 mmb WoW vs revised down Aug 5 of 92.32 mmb. Note Aug 5 of 92.32 mmb was revised -5.40 mmb vs the 97.72 mmb posted on Bloomberg as of noon MT on Aug 6. (ii) Note that the last several weeks, other than the July 15 week, were all revised lower.

Vortexa crude oil floating storage

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Whereas the prior two weeks data all had upward revisions. Here are the revisions compared to the floating storage posted on Bloomberg at noon MT on Aug 6. The revisions were -5.40 mmb to Aug 5, -4.03 mmb to July 29, -1.78 mmb to July 22, +0.85 mmb to July 15, -2.53 to July 8, -2.54 to July 1, -3.84 to June 24, and -4.91 mmb to July 17. (iii) With the revisions, other than the new Aug 12 data, crude oil floating storage is back to more like +/- 90 mmb vs more like +/- 95 mmb last week. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) Aug 12 estimate of 106.91 mmb is -115.66 mmb vs June 26, 2020 peak of 222.57 mmb. (vi) 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. Aug 12 estimate of 106.91 mmb is +60.00 mmb vs pre-Covid of 46.91 mmb on Aug 12, 2019. Aug 12 estimate of 106.91 mmb is +2.37 mmb YoY vs 104.54 mmb on Aug 13, 2021. (vii) Below are the last several weeks of estimates made as of yesterday noon MT, Aug 6 at noon MT, and July 30 at noon MT.

Figure 32: Vortexa Floating Storage as of Aug 12 posted on Bloomberg Noon MT yesterday



Source: Bloomberg, Vortexa

Figure 33: Vortexa Estimates Posted Aug 13 noon MT, Aug 6 noon MT, July 30 noon MT

Posted Aug 13, noon MT					Aug 6, noon MT					July 30, noon MT							
ID	3D	1M	6M	YTD	1Y	ID	3D	1M	6M	YTD	1Y	ID	3D	1M	6M	YTD	1Y
Fr	08/12/2022					Fr	08/05/2022					Fr	07/29/2022				
					106.908k						97720						78861
Fr	08/05/2022				92319	Fr	07/29/2022				95816	Fr	07/22/2022				85128
Fr	07/29/2022				91794	Fr	07/22/2022				87022	Fr	07/15/2022				87534
Fr	07/22/2022				85237	Fr	07/15/2022				86619	Fr	07/08/2022				92763
Fr	07/15/2022				87468	Fr	07/08/2022				96039	Fr	07/01/2022				95352
Fr	07/08/2022				93508	Fr	07/01/2022				96794	Fr	06/24/2022				94533
Fr	07/01/2022				94246	Fr	06/24/2022				96394	Fr	06/17/2022				104.531k
Fr	06/24/2022				92554	Fr	06/17/2022				106.642k	Fr	06/10/2022				103.166k
Fr	06/17/2022				101.729k	Fr	06/10/2022				103.827k	Fr	06/03/2022				85334
Fr	06/10/2022				98995	Fr	06/03/2022				86967	Fr	05/27/2022				96018
Fr	06/03/2022				82782	Fr	05/27/2022				97566	Fr	05/20/2022				97847

Source: Bloomberg, Vortexa

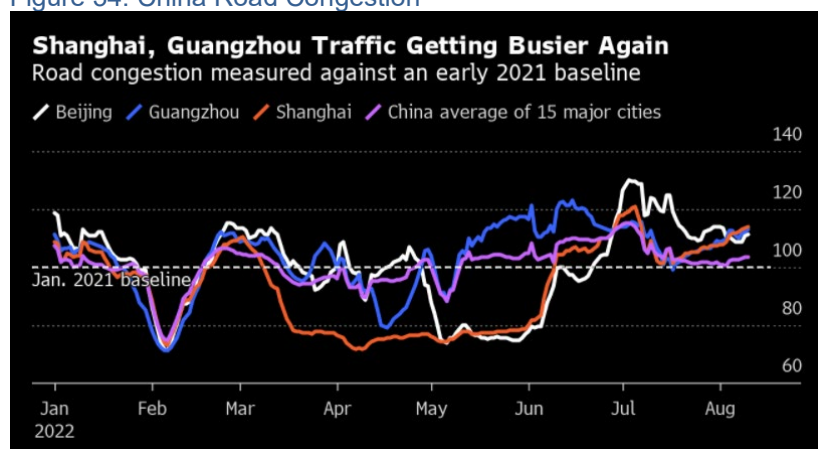
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Oil – Bloomberg Oil Demand Monitor: Airline Activity Picking Up in China

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 China is picking up in airline activity while global seat capacity on planes still lags pre-Covid era by 14%. Jet fuel consumption has long been the weakest pillar in oil demand since the coronavirus pandemic began, and the marked absence of international travel to and from major Chinese cities has been the biggest hole in that market. Seat capacity for North East Asia in the week starting Aug 8 was 19% less than the same week of 2019 compared to 45% in May. That 14% deficit is similar to a 13% dip from 2019 levels. Overall European capacity edged down by 0.1% week-on-week, and is 12.5% below where it was in the same week of 2019. The global situation, measuring all airline seats, has steadily improved this year, and now lags the pre-pandemic week by about 14%. Turning to road fuels, the mainstay of the oil market, summer vacations have sucked activity out of city centers and high retail prices appear to be reining in consumption. The IEA sees little chance of the OPEC+ alliance adding much more oil to the market in coming months, and expects a looming natural-gas supply crunch in Europe will spur more demand-switching to oil-based fuels such as diesel. Gasoline demand in the U.S. bounced back above 9 mmb/d in the week ended Aug 5 following controversy over an abnormally low level the prior week. A seven-day moving average of 15 Chinese cities with the highest number of cars shows congestion was about 3% higher than an early-2021 baseline as of Aug 8. That measure had fallen 12% below the baseline in early May when Shanghai was in lockdown, before soaring to +15% in the first few days of July. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Bloomberg's Oil Demand Monitor

Figure 34: China Road Congestion



Source: Bloomberg

Oil – EIA explains its data is not how much gasoline is sold at gas stations

It looks like the flak the EIA took (not justified in our opinion) led them to post a blog to explain their weekly gasoline supplied data. (i) We don't think it's the EIA's fault that most took their gasoline supplied data as representing retail gasoline sales at gas stations. We noted our views in last week's (Aug 7, 2022) Energy Tidbits. (ii) On Wednesday, the EIA posted a blog "*EIA's Weekly Petroleum Status Report provides a snapshot of petroleum balances*" [\[LINK\]](#) says clearly their numbers are not what people buy at gas stations in the

EIA explains its gasoline numbers

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case of gasoline. The EIA writes “*In our WPSR, we do not estimate the ultimate consumption of petroleum products by consumers. Instead, we estimate the movement of products through the wholesale distribution system before they reach the ultimate point of sale, such as retail stations. We use product supplied as a proxy for consumption, which is calculated as follows: product supplied = production + imports - stock change – exports*”. (iii) What caught our attention was the EIA explaining their estimates. Their estimates are made up of estimates and samples, it’s not actual data. For example, they note they sample 1/3 for their weekly of those surveyed for their monthly report. The EIA said they “*collect data from about 1,200 respondents across the primary petroleum supply chain. The weekly survey respondents are a sample selected from more than 3,000 respondents who report on our monthly surveys for data published in our Petroleum Supply Monthly (PSM)*.” We recommend reading the blog. Our Supplemental Documents package includes the EIA blog.

Difference between gasoline retail sales vs gasoline supplied to gas stations

As noted above, we don’t think the criticism on the EIA was fair just because most interpreted their gasoline product supplied data as being gasoline sales at gas stations. Here is what we wrote in last week’s (Aug 7, 2022 Energy Tidbits. “*We remind that we have to be careful to not read too much into two data points that are interpreted to be the same but are different. In this case, it’s the difference between the EIA “motor gasoline product supplied” vs how much gasoline drivers are buying at the pump. (i) The controversy started with this week’s EIA Weekly Petroleum Status Report [\[LINK\]](#) and its sentence “Over the past four weeks, motor gasoline product supplied averaged 8.6 million barrels a day, down by 8.8% from the same period last year.” This is for the week ending July 29, 2022. The headlines then immediately jumped out on how this was even below the same period in 2020. And how this was interpreted as Americans are now driving less than they were in the same period during Covid. And we saw commentators on the business channels coming up with reasons such as increasing mileage efficiency of cars. (ii) The jumping to the conclusion of less driving than in 2020 is based on the reader assuming “product supplied” is the same as how much gasoline is being bought at the pump. When they are different numbers. The EIA product supplied is the amount of gasoline that is supplied to the gas stations ie. how much the gas stations are buying to put in their tanks at their gas station. (iii) The EIA product supplied is not the same as how much gasoline drivers are pumping into their cars. Most, including us, reference Gas Buddy estimates of how gasoline drivers are buying at the pump ie. how much gasoline we buy when we fill up our cars. Over time, these two different data points should work out to be the same ie. how much gasoline is supplied to the gas stations vs how much gasoline is sold by the gas stations. But, there will be periods when they are different. (iv) As of our 7am MT news cut off, we have not seen the Gas Buddy detail for the week ending July 31. But last Sunday, Gas Buddy Guy, Patrick DeHaan tweeted [\[LINK\]](#) “According to GasBuddy data, weekly US gasoline demand reached the highest level of 2022 for the week of 7/24, rising 2.0% from the prior week and was 3.0% above the rolling four week average, to 9.52mbpd.” There is only a partial overlap to the EIA data, but the estimated retail sales of gasoline is strong and the opposite direction as the motor gasoline supplied to gas stations. (v) Is this possible? Yes. One possible explanation is that gas station owners see the declining oil price and are holding off, as much as possible, buying*

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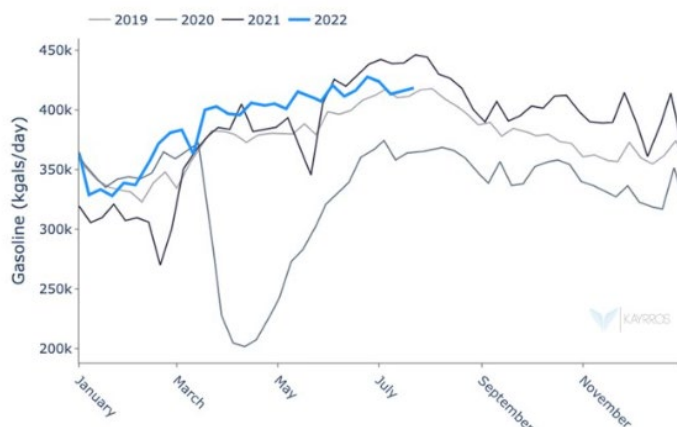
motor gasoline as they expect the prices to go lower ie. why buy higher priced gasoline that has to be resold to drivers. (vi) We are in the camp that finds it hard to believe Americans are driving less in Aug 2022 than in the first Covid summer in Aug 2020. However, we also believe that gasoline prices, even if down \$1, are holding back some US driving or changing driving habits. This brings up the question if this is a turning point or is there just a lot more demand to come back if gasoline prices stay below \$4/gallon?? And it's also why we the EIA motor gasoline product supplied data over the next couple reporting weeks will be closely scrutinized. "

Oil – US gasoline consumption YoY deficit widening, but still well above 2020

Last weekend, Kayrros stepped in to provide their US gasoline data views to help clear up the confusion on US gasoline consumption following the EIA data last week. Kayrros released a good chart of on-road gasoline consumption in the US, and it showed that while the YoY deficit is widening, demand is still well above 2020 levels. On Monday, we tweeted [\[LINK\]](#) "Widening YoY deficit gap in US on-road gasoline consumption, but far above 2020 levels. Good @Kayrros graph "measures actual miles traveled and end-user consumption by US motorists, as opposed to deliveries into secondary storage as reported in US @EIAgov weekly surveys" #OOTT". Our Supplemental Documents package includes excerpts from the Kayrros Weekly Roundup.

Gasoline consumption falls YoY

Figure 35: US On Road Gasoline Consumption



Source: Kayrros

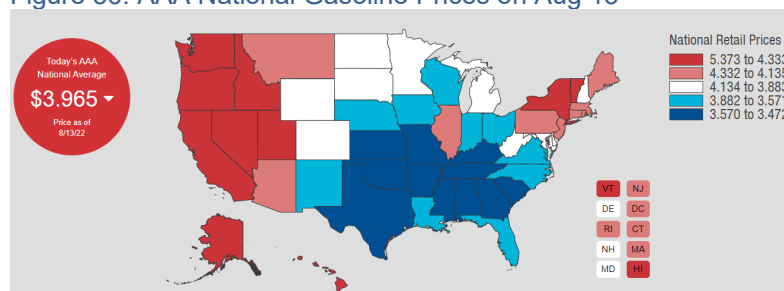
Oil – US national average gasoline prices <\$4, will I get more driving?

It was impossible to miss the AAA nationwide gasoline prices dropping below \$4 on Thursday with all the Administration highlighting the AAA national average gasoline prices dipping below \$4 to \$3.99 on Thursday. Yesterday, it was \$3.97. On Thursday, we tweeted [\[LINK\]](#) "Will US national average #Gasoline prices below \$4 get more people on the road? @AAAnews says now \$3.99. down \$0.69 in last month, up \$0.80 vs yr ago. But #Diesel still tight at \$5.08, down \$0.56 in last mth, but up \$1.79 vs yr ago. #OOTT." It will be interesting to see how the last couple of weeks driving turns out with gasoline prices now below \$4. Below is the AAA price map as of yesterday. [\[LINK\]](#)

US gasoline prices <\$4

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Figure 36: AAA National Gasoline Prices on Aug 13



Source: AAA

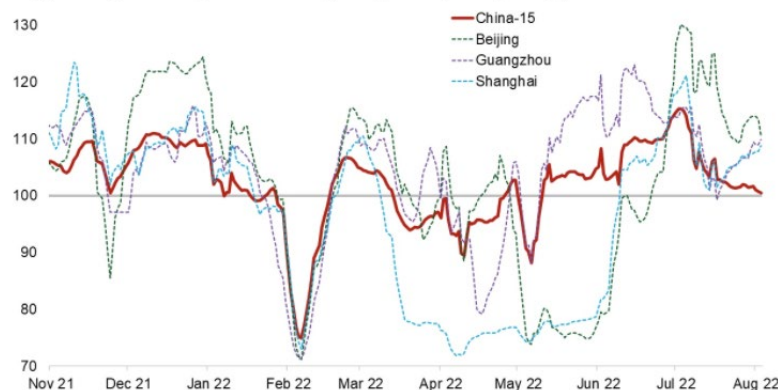
Oil – Continued road traffic weakness in China

Note that this Bloomberg report seems inconsistent with its Oil Demand Monitor noted above. On Tuesday, Bloomberg posted a report titled “China’s Traffic Downturn Shows No Sign of Stopping”. Road traffic levels in China have now fallen for five consecutive weeks, as the re-emergence of Covid-19 cases compounded a weakening national economy in July. China’s congestion index dropped by 1.5% WoW in the seven days to August 3, demonstrated in the graph below. Bloomberg also noted that Europe is similarly bearish, with weekly traffic levels down 6.9%. Our Supplemental Documents package includes excerpts from the Bloomberg report.

Continued road traffic downturn in China

Figure 37: China-15 Congestion Index

Daily peak congestion levels, indexed to January 2021 (seven-day moving average)



Source: BloombergNEF

Oil – Not worth the risk to barge Jet Fuel on low, but still okay Rhine River levels

It’s been a perfect storm for Putin in his squeezing Europe energy in response to EU sanctions. It’s been very hot and very low water levels in key waterways like the Rhine River. (i) Our July 24, 2022 Energy Tidbits how low Rhine River water levels was already cutting back barge loads. On July 17, 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 [\[LINK\]](#)

Jet fuel barging down Rhine River

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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) The Rhine River water levels have only gone lower, and are projected even lower for the next few days. On Friday morning, we tweeted [\[LINK\]](#) "Rhine river at Kaub forecast to hit key 15.75 inches (40 cm) today and down to almost nothing at 13.4 inches (34 cm) on Tues. No wonder fuel, coal barges is impassable. that's about the minimum depth for rafters down the Elbow River in Calgary. Thx @JWittels for link. #OOTT." Our tweet included the link to Germany's Rhine River water level forecast at the key Kaub point. Barge shipping is pretty amazing when you think that the critical level is considered only at 15.75 inches. And it is forecast to go to 13.4 inches on Tuesday. That's about the critical level to stop people rafting down Calgary's Elbow River. (iii) The Rhine River at Kaub hadn't reached the point of preventing fuel barges. However, jet fuel barging for the Frankfurt airport had already stopped as it was considered too risky. On Friday, we tweeted [\[LINK\]](#) ""last thing we now need is an accident on the river Rhine & an extension of the closure due to retrieving a barge or, even worse, a contamination" says #Lufthansa. Rhine River levels still okay, but why take the risk to barge #JetFuel to @Airport_FRA? Thx @beatrice_okelly. #OOTT." Argus reported that Lufthansa had cancelled jet fuels for risk even though water levels were still high enough for shipping. It makes sense, they didn't want to risk a barge grounding or a leak/spill with the low, but passable water levels. (iv) the forecast worsened since our Friday tweet. On Saturday, we tweeted [\[LINK\]](#) "An even worse forecast for Rhine River water levels at Kaub. Yesterday was 34 cm (13.4 inch) for Tues am, today 30 cm (11.8 inch). Forecast for Wed am is 29 cm (11.4 inch). #JetFuel barging already stopped, other #PetroleumProducts has to follow. #OOTT Thx @JWittels for link." Below is the German The Federal Waterways and Shipping Administration waters levels [\[LINK\]](#) that was attached to our Saturday tweet. Our Supplemental Documents package includes the Argus report.

Figure 38: Water levels & forecasts at gauges relevant to shipping as of 5am MT Aug 13

Water levels & forecasts at gauges relevant to shipping											
Level KAUB		forecast					appraisal				
Level	watch	Fri	Today	Today	Sun	Mon	Mon	Tuesday	Wed.	Thursday	Fri
HSW / GIW		08/12/22	08/13/22	08/13/22	14.08.22	08/15/22	08/15/22	08/16/22	08/17/22	08/18/22	08/19/22
KAUB		-- (-)	-- (-)	--	36	31	--	30	29	--	--
640 / 78		-- (-)	-- (-)	--	36	31	--	30	29	--	--
	01:00:00	-- (-)	-- (-)	--	36	31	--	30	29	--	--
	03:00:00	-- (-)	-- (-)	--	36	31	--	30	29	--	--
	05:00:00	42 (-5)	36 (-6)	--	36	31	--	30	29	--	--
	07:00:00	-- (-)	-- (-)	36	36	30	--	30	29	--	--
	09:00:00	-- (-)	-- (-)	36	35	--	30	30	--	--	--
	11:00:00	-- (-)	-- (-)	36	35	--	30	30	--	--	--
	13:00:00	42 (-3)	37 (-5)	37	34	--	30	30	--	--	--
	15:00:00	-- (-)	-- (-)	37	34	--	30	30	--	--	--
	17:00:00	-- (-)	-- (-)	37	33	--	30	30	--	--	--
	19:00:00	-- (-)	-- (-)	37	33	--	30	30	--	--	--
	21:00:00	38 (-8th)	-- (-)	37	32	--	30	30	--	--	--
	23:00:00	-- (-)	-- (-)	37	32	--	30	29	--	--	--

Source: The Federal Waterways and Shipping Administration

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Figure 39: Rhine River noting Kaub



Source: U.S. Energy Information Administration

Source: EIA

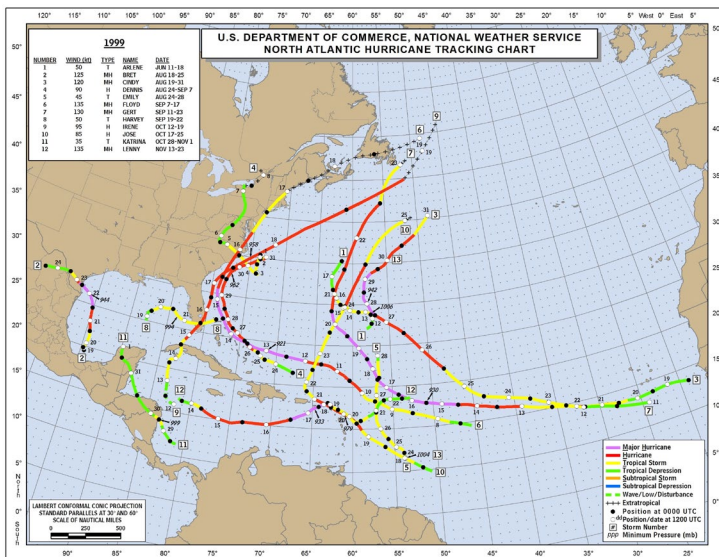
Oil & Natural Gas – Klotzbach reminds 1999 hurricane season was all after mid Aug

Last week's (Aug 7, 2022) Energy Tidbits memo highlighted how it's been really quiet on the Atlantic hurricane season front despite all forecast calling for above normal hurricane activity this year. On Thursday, hurricane forecaster Phillip Klotzbach tweeted [LINK](#) "No Atlantic named storms since #Colin weakened to a tropical depression on July 2nd, and none forecast for the next 5 days per National #Hurricane Center. The last time that the Atlantic had no named storm activity between July 3 and August 16 was 1999." And [LINK](#) "1999 ended up as an hyperactive Atlantic #hurricane season." We tweeted a reply to Klotzbach. Our tweet was [LINK](#) "And your mentor, dr. gray's recap of 1999 was an exception outbreak occurred during the latter part of Aug and four tropical cyclones occur (Bret, Cindy, Dennis & Emily) formed within a six day period. Thx @philklotzbach. #OOTT [LINK](#)." Dr. William Gray was one of the most respected hurricane forecasters and Klotzbach worked for him before taking over after Gray retired. Our tweet included excerpts from Gray's recap of the 1999 hurricane season such as "an exception outbreak of tropical cyclone activity of tropical cyclone activity occurred during the latter part of August. Four tropical cyclones (Bret, Cindy, Dennis and Emily) formed with a six-day period. All of the 1999 Caribbean hurricane activity came during October and November: most Caribbean basin hurricane activity typically occurs in August and September." Below is the NOAA 1999 hurricane path map that was attached to the Klotzbach tweet. Our Supplemental Documents package includes excerpt from the Dr. Gray recap of 1999 hurricane season.

1999 hurricane season was after mid Aug

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Figure 40: NOAA 1999 Atlantic hurricane map



Source: NOAA

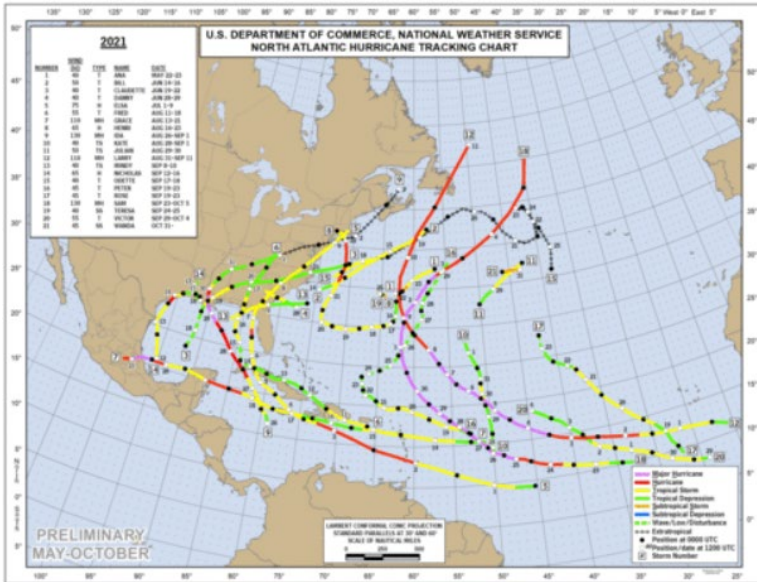
Oil & Natural Gas – Puerto Rico tends to be a good marker for GoM hurricane risk

Last Sunday, there were a number of tweets highlighting NOAA’s August 7 5-day model that shown a tropical wave off the west coast of Africa that had a five day projects of moving west towards the Caribbean. The message was maybe some hurricane activity might be coming to the US Gulf of Mexico. We recognize was very, very early but when we saw the NOAA forecast, we thought it was most likely slightly too far north to have a high expectation of coming into the GoM. Based on the development this week, it looks to be the case. But seeing the messaging, last Sunday night, we tweeted [\[LINK\]](#) “Forecasting Atlantic hurricane paths is impossible even for experts. But hurricane risk to GoM #Oil #NatGas #LNG #Refinery tends to increase if hurricanes are south of Puerto Rico. See 📌 excerpt SAF Group Dec 5, 2021 Energy Tidbits [\[LINK\]](#) #OOTT”. Here is what we wrote in the Dec 5, 2021 Energy Tidbits “Is normally not a perfect correlation but the 2021 Atlantic hurricane season was for the early indicator for risk to the GoM oil and gas being if the tropical storm/hurricane hits north of Puerto Rico or not. This year, all the storms/hurricanes that were north of Puerto Rico went into the Atlantic and all that were south of Puerto Rico went into the GoM. Below is NOAA’s 2021 tracking map.”

Hurricane risk GOM vs Atlantic

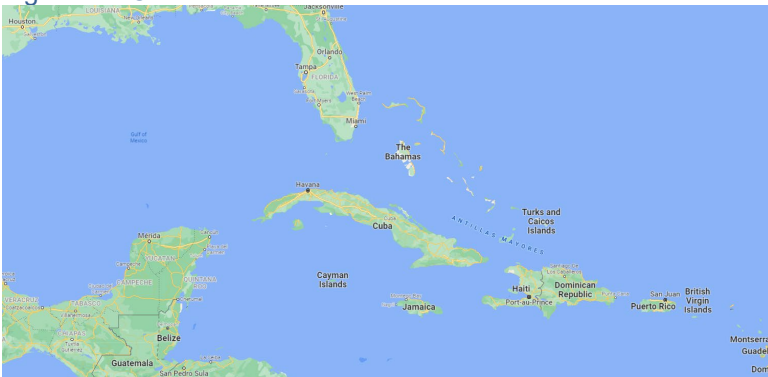
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Figure 41: North Atlantic Storm Tracking Map in 2021



Source: National Hurricane Center

Figure 42: Caribbean Sea



Source: Google Maps

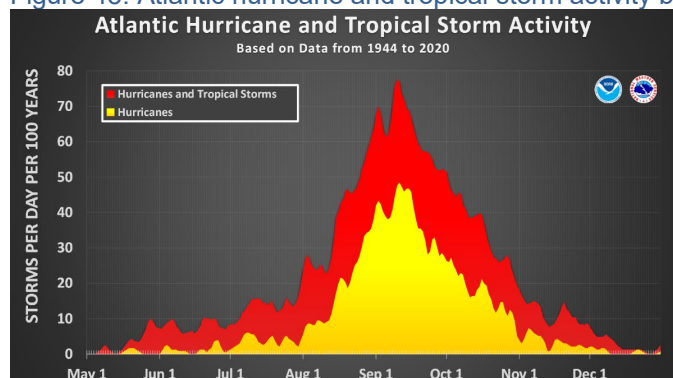
Oil & Natural Gas – Atlantic hurricane activity normally ramps up in mid-Aug

We have been highlighting that it’s been really quiet on the Atlantic hurricane season front despite all forecast calling for above normal hurricane activity this year. But the lack of activity to date isn’t unusual. There can always be hurricane activity at any time of the season. But, as a norm, normally, hurricane and tropical storm activity starts to ramp up in mid August to a peak in mid September and continuing active thru mid October. Below is NOAA’s graph showing the distribution of Atlantic hurricanes and tropical storms based on data from 1944 to 2020. [\[LINK\]](#)

Atlantic hurricane seasonality

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Figure 43: Atlantic hurricane and tropical storm activity by month



Source: NOAA

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

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.

Sector insights
from Q2 calls

Canacol – Still analyzing the yet to be approved Colombia tax reform

Canacol held its Q2 call on Friday. Earlier in the memo, we noted the ANDI head comments on the big hit to oil and gas and mining companies if new Colombia President Petro's income tax reform is passed as envisioned. No surprise, mgmt. was asked *"Have you estimated the impact of a hypothetical improvement of the Colombian tax reform? The government expected to change the royalty compensation in P&L and exports? What do you expect?"* As we noted, the income tax reform bill has not been passed. In the Q&A, mgmt. replied *"Yes, we're still analyzing the impact of the yet approved reform."*

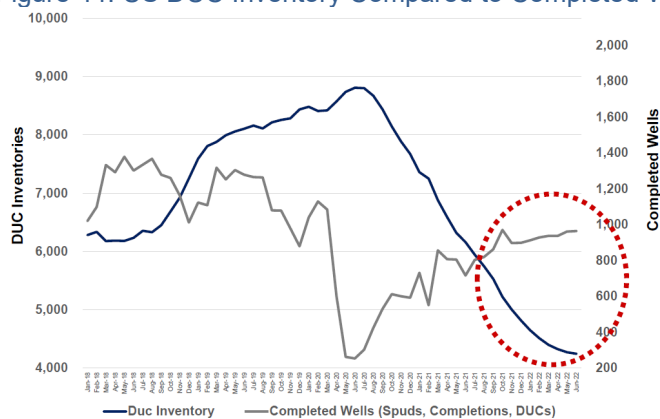
Independence Contract Drilling – Seeing depleted DUC inventory

Independence Contract Drilling presented at ENERCOM 2022 on Monday in Denver. (i) More US drilling indicators are pointing to the likelihood that US oil growth isn't likely to be as bullish as many may expect. High drilling rigs are basically fully utilized, and drillers have to move to upgrade rigs to meet demand. This is the theme we saw with service companies including Precision in the Q2 calls. The super spec rigs are basically all spoken for and producers either have to use a lesser rig or wait for drillers to upgrade rigs to super spec quality. Independence wrote *"extremely tight Pad-Optimal, Super-Spec market driving rapidly improving dayrates, margins and utilization"*. (ii) Independence also highlighted the *"depleted drilled-but-uncompleted (DUC) inventories"*. They stated, *"decreasing DUC inventories should drive incremental drilling activity"*. That is from a drillers perspective, but the other

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way of looking at it is that the US needs to crank up DUCs or else it will hold back future oil growth.

Figure 44: US DUC Inventory Compared to Completed Wells



Source: Independence Contract Drilling

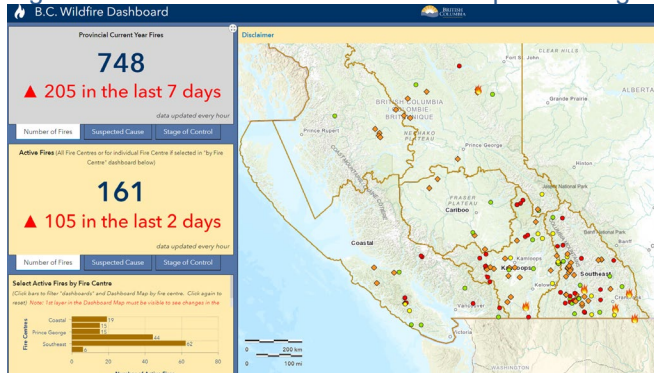
Oil & Natural Gas – Big pickup in BC wildfires this week

We will put the 1st ten minutes of the CTV National News a few times a day after the Friday market close but didn't hear any reports of the big increase in BC wildfires. But there has been a big pickup in BC wildfires this week, it seems like most in southern BC. Yesterday afternoon, we tweeted [\[LINK\]](#) "Didn't realize there was the big pickup in BC wildfires in the last few days until stepped onto our balcony in #Canmore and can smell smoke in the air. Hope everyone stays safe!" It's often been worse, and sometimes there will be the ashes on the balcony. But, given the lack of news coverage, we were surprised to go to the BC Wildfire Dashboard with its live status map [\[LINK\]](#) as of 3pm MT Saturday to see that 205 of the 748 fires in BC this season have been in the last seven days, and 105 of the 161 active fires were in the last two days. Last week's (Aug 7, 2022) Energy Tidbits memo reminded that Alberta and BC are still in the midst of the peak wildfire season. Below is the BC wildfires map as of Sat 3pm MT, and the Wildfire Today graph of wildfires in Canada by month [\[LINK\]](#).

Big increase in BC wildfires

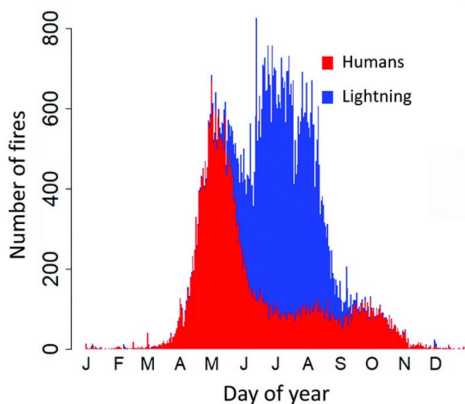
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Figure 45: BC Wildfire Dashboard as of 3pm MT Aug 13



Source: BC Wildfire Dashboard

Figure 46: Canada Wildfires Distribution Over Year



Source: Wildfire Today

Energy Transition – API warns Pelosi on Inflation Reduction Act negative impacts

We don't think anyone expected it to be work but, on Thursday ahead of the Friday House vote on the Inflation Reduction Act, the API and a long list of other energy groups sent a brief letter to Speaker Pelosi and ranking Republican McCarthy expressing their opposition to the Inflation Reduction Act (IRA). The bill was passed and being sent to Biden's desk for signing into law early this week. With the backdrop of high energy prices, inflation and other items, the API wrote "there are several specific policies included in the IRA which are particularly troubling and deserve re-consideration. We would like to draw your attention to three such provisions: 1. The IRA imposes a new corporate minimum tax, increasing taxes on Americans by more than \$300 billion over the next 10 years. As President Obama noted in 2009, "the last thing you want to do is raise taxes in the middle of a recession." 2. The IRA imposes an \$11.7 billion tax on crude oil and petroleum products. At a time of record-high energy prices, Congress should not add additional costs on American energy companies competing globally. 3. The IRA imposes additional constraints on the ability of companies to develop and produce the energy that Americans need to fuel our economy and strengthen our energy security. This includes increased fees on domestic production and the

Inflation Reduction Act

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establishment of a new \$6.3 billion natural gas tax. Finally, the IRA fails to address permitting reform, which is desperately needed and is essential to effectively deliver affordable, reliable energy to consumers in a growing economy.” Our Supplemental Documents package includes the API letter including the list of other signees thereto.

Energy Transition – Will an attack on Ukraine nuclear plant impact nuclear’s revival?

One of our big concerns for Ukraine is that their nuclear power plants have become pawns in the Russia/Ukraine war. The Russians using these captured nuclear power plants as shields is scary as to what could happen in a counterattack. This fear was raised by UN Secretary General Guterres and we would have to believe would impact the nuclear revival. We have trouble calling it a conflict as that doesn’t do justice to Ukrainians. On Monday, ABC news reported *“The prospect of a nuclear catastrophe spurred growing international alarm Monday after shelling hit a Russian-controlled power plant in Ukraine that is almost twice the size of Chernobyl. United Nations Secretary-General Antonio Guterres called for international inspectors to be given access to the sprawling nuclear site as fears of a disaster grew after the weekend strikes left the plant damaged but still operational. “Any attack to a nuclear plant is a suicidal thing,” he said Monday in Tokyo after a ceremony in Hiroshima to commemorate the 77th anniversary of the world’s first atomic bombing.”*

Ukraine nuclear power plants

Capital Markets – Calgary, Vancouver, Toronto in Top 10 liveability global cities

The Economist posted their Global Liveability Index 2022 this week based on survey data collected from Feb 14 to Mar 13, 2021. On Monday, we tweeted [\[LINK\]](#) *“ICYMI, Canada is only country with 3 cities in top 10 cities in @TheEIU #GlobalLiveabilityIndex2022 with #Calgary 3rd, #Vancouver 5th, #Toronto 8th. i have been fortunate to live in all three of these great cities of the world.”* Below, we created a table of the top 10 and bottom 10 cities. Another thing that jumped out at us in the list of the bottom 10 is that half of them are major cities in key oil, natural gas or LNG exporting countries such as Algeria, Libya, Nigeria, Papua New Guinea and Venezuela. The Economist noted the key findings as: *“• EIU’s Liveability Index has risen sharply in the 2022 survey (conducted between February 14th and March 13th). Scores for culture and environment, healthcare and education have improved on the back of covid-19 curbs being eased. However, the global average score remains below pre-pandemic levels. • A rollback of covid-19 restrictions has translated into liveability rankings resembling those seen before the pandemic. Vienna (Austria) tops the rankings in 2022, as it did in 2019 and 2018. • Russia’s invasion of Ukraine on February 24th has forced us to exclude Kiev (Ukraine) from our survey. The conflict has influenced rankings for Moscow and St Petersburg (Russia). Both cities record a fall in scores owing to increased instability, censorship, imposition of Western sanctions and corporates withdrawing their operations from the country. • Eastern European cities slip in the rankings amid increased geopolitical risks. If the cost-of-living crisis were to trigger further discord in international ties or domestic politics, stability scores would be likely to slide further for such cities next year. • Western European and Canadian cities dominate the top of our rankings. Life is almost back to normal in these cities on account of high covid-19 vaccination rates and the easing of restrictions. Copenhagen (Denmark) has moved up 13 places from its position 12 months ago, to second, and Zurich (Switzerland) now shares third place with Calgary (Canada), which has risen from 18th position. • Damascus (Syria) and Tripoli (Libya) continue to languish at the bottom of the list—along with Lagos (Nigeria)—as they face social unrest, terrorism and conflict. However, most of the cities in the bottom ten have improved their*

3 Canadian cities in top 10 most liveable

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scores compared with last year, as pandemic-induced pressures have eased.” Our Supplemental Documents package includes excerpts from the index.

Figure 47: The Global Liveability Index 2022

Ranking	Top 10 Best	Top 10 Worst
1	Vienna, Australia	Tehran, Iran
2	Copenhagen, Denmark	Douala, Cameroon
3	Zurich, Switzerland	Harare, Zimbabwe
4	Calgary, Canada	Dhaka, Bangladesh
5	Vancouver, Canada	Port Moresby, PNG
6	Geneva, Switzerland	Karachi, Pakistan
7	Frankfurt, Germany	Algiers, Algeria
8	Toronto, Canada	Tripoli, Libya
9	Amsterdam, Netherlands	Lagos, Nigeria
10	Osaka, Japan	Lagos, Nigeria
10	Melbourne, Australia	Damascus, Syria

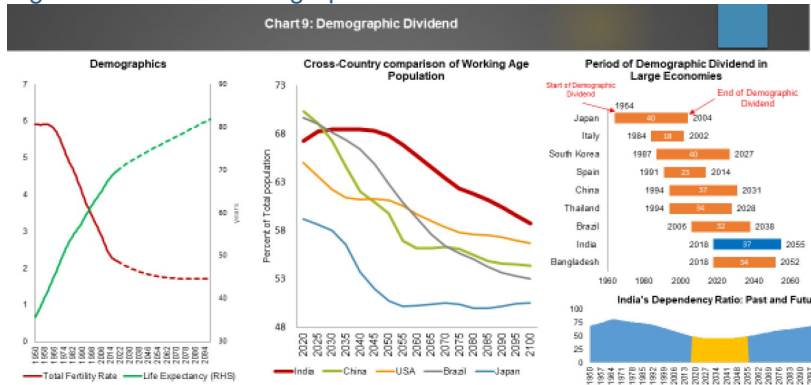
Source: The Economist

Demographics – India’s working age population ratio grows thru 2045

As noted earlier, we revised the Reserve Bank of India speech and found some excellent demographic reminders of India’s economic advantage for the 2020s and 2030s – it’s young population. Last night, we tweeted [\[LINK\]](#) “India’s demographics advantage for growth. Yes fertility rate fell to 2.0 for 1st time, but India’s working-age population to the total population ratio will increase till 2045, even exceeding that of China by 2030. India’s economic growth = increased #LNG #Oil imports. #OOTT.” The one demographic negative is that India’s fertility rate fell to 2.0 for the 1st time, when 2.1 is viewed as the fertility rate needed to keep production from declining. But there were two other positive demographic reminders. “India’s population at 1.38 billion is the world’s youngest at 28.4 years. By 2023 (that is next year), India will be the most populous country in the world.” “A comparison of the ratio India’s working-age7 population (WAP) to the total population with that of other countries, viz., China, Brazil, USA, and Japan, shows that India stands at an advantageous position. The working-age populations of these countries have started declining already while India’s WAP ratio will increase till 2045, even exceeding that of China by 2030.” Our Supplemental Documents package includes the fuller comments on demographics.

India’s demographic advantage

Figure 48: India’s Demographic Divident



Source: RBI

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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.

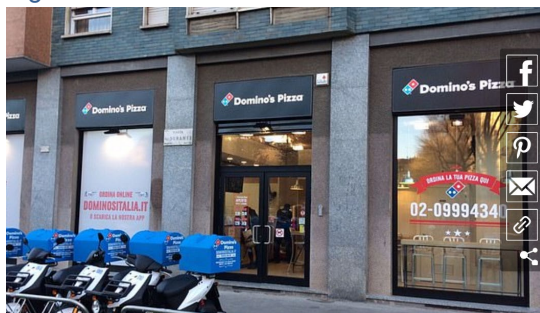
Big day for Cdn PGA players in cut down to top 70 for next FedEx Cup round

It will be a big golf watching today for Canadian golf supporters. The ultimate winner of the FedEx Cup on the PGA tour will get \$18 million as the winner's purse, up from \$15 million last year. Today is the final round of the 1st leg of the FedEx playoffs that will see the top 70 in FedEx points move onto next weekend's BMW Championship. Going into the final round, we have four Canadians in the projected top 70 – Corey Connors at 33, Mackenzie Hughes at 49, Adam Hadwin at 58 and Taylor Pendrith at 68. Just outside the projected top 70 is Adam Svensson at 81.

Domino's closes last Italy store, wasn't this inevitable?

We never even realized Domino's had gone into Italy with bold plans to open up several hundred pizza shops. The first Domino's was opened in 2015 and then ended up opening up another 28 pizza shops. This week, Domino's closed its last pizza shop. It's hard to see who made the decision to go into Italy and compete for pizza. Maybe they figured they figured they had a better chance competing in the north of Italy. You have to give Domino's credit, they look to have had some good locations such as the one pictured below right at the Piazza Francesco Durante in Milan. But the inevitable happened – it didn't work. It would be like if we heard Sushi-Q, who say they are "one of the leading pioneers of sushi grab-and-go cuisine in Canada" said they were moving in to compete in Japan.

Figure 49: Domino's Pizza at Piazza Francesco Durante, Milan



Source: Daily Mail

Goodfood's commercial take off on Bob Ross, PBS Joy of Painting

Doubt many of all ages, including many baby boomers, will immediately draw the takeoff of the new goodfood.ca commercial "The Joy of Dinner with Goodfood" that we saw at least twice this weekend on CTV national news. Saw this commercial on Friday. But for those who watched PBS in the 80s will immediately see the Goodfood commercial takeoff on PBS painter, Bob Ross, from the Joy of Painting. It was an instructional painting show on PBS. And Bob was recognizable for a couple of physical items – his big hair and very calm, soft speaking manner. The Goodfood commercial is a play on his show. The Joy of Painting ran on PBS from 1983 thru 1994. Bob Ross passed away at the young age of 53 in 1995. Here is a link to a Season 10 episode [\[LINK\]](#).

Figure 50: Goodfood commercial and Bob Ross Joy of Painting



Source: Goodfood, Joy of Painting 1990

Did Buffalo Bills rookie punter Araiza just made the roster with his 1st punt?

Just in case you missed it, here is the [\[LINK\]](#) to Buffalo Bills rookie punter Matt Araiza's massive punt in yesterday's pre-season game vs the Indianapolis Colts. It's only NFL pre-season and only the 1st week of pre-season games. So it's early, but we have to believe Buffalo Bills 6th round pick, punter Matt Araiza, may have cemented his spot on the regular season roster with his first punt in the pre-season. The ball was on the Bills 18 yard line, Araiza punt looked to be >70 yards in the air, way further the returner the expected so made it to the Colts end zone for a touchback.

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Surprised haven't seen may Europe river cruise cancellations

We were watching BBC News yesterday and one of the reports were on Italy's Po River and how its flow is 10% of normal levels and water levels about 2 metres below normal. And the commentary was that the low water levels is an issue for all Europe's rivers. One item that we have been following as an indicator is Europe River cruise cancellations. The major lines have been warning that there will be itinerary adjustments but so far, we haven't seen widespread cancellations. But it is interesting to see what adjustments are happening. Viking River Cruises hasn't posted any updates since its Aug 3 advisory [\[LINK\]](#) for the Rhine and Danube River cruises. And, as we know, the water levels have significantly deteriorated since then. On Aug 3, Viking warned *"The Rhine and Danube Rivers are currently experiencing unusually low water levels, and our nautical team is monitoring the situation minute-by-minute. To varying degrees, these low water levels will affect select river itineraries. Guests and their Travel Advisors will continue to be notified directly by Viking Customer Relations if we think that their itinerary might be impacted. Viking has two key advantages with regard to handling water level disruptions." "Second, we strategically launch sister ships on the same itinerary, but sailing in opposite directions. In the event of low (or high) water, this tactic allows us to implement a ship swap that is typically seamless for guests – both they and their luggage are able to be transferred to their exact, identical stateroom on a sister ship that was purposefully sailing on the other half of the river in preparation for such a disruption."*

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