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Energy Tidbits

Oct 16, 2022

Produced by: Dan Tsubouchi

Tease for LNG Canada Phase 2? Deputy PM Freeland "We Will Always be Looking at Economically Viable LNG Projects"

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. Our target is to write on 48 to 50 weekends per year and to post by noon MT on Sunday. The Sunday noon timing was because PMs said they didn't have research to read on Sundays and Sundays are a day when they start to think about the investing week ahead.

This week's memo highlights:

1. Liberals Deputy PM Freeland and Foreign Affairs Minister Joly both seemed to tease hints LNG Canada 1.8 bcf/d Phase 2 FID could be coming soon. (Click Here)

2. Increasingly difficult to see an easy off ramp for souring of US/Saudi relations before the midterms. (Click Here)

3. Germany gas storage reaches 95%, but regulator warns still need LNG imports, stable Norway imports and consumption down >20% to avoid winter gas shortages. (Click Here)

4. Must read EU Borrell speech presents gloomy outlook for Europe for 2020s. (Click Here)

5. Bakken watch, North Dakota says "*We're at a record number of producing wells (in August) but not a record production*". (Click Here)

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

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

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Natural Gas – Natural gas injection of +125 bcf, storage now -126 bcf YoY deficit

The YoY storage deficit started last winter at -282 bcf YoY at Oct 31 and is now -126 bcf YoY. The EIA reported a +125 bcf build (+126 bcf expectations) for the Oct 7 week, which was well above the 5-yr average build of +73 bcf, and above last year's injection of +118 bcf. Storage is 3.231 tcf as of Oct 7, with a narrowed YoY deficit of -126 bcf YoY vs -165 bcf YoY last week and is -221 bcf below the 5-year average vs -264 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -126 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (10/07/21)		Historical Comparisons: 5-year average (2017-21)	
Region	10/07/22	09/30/22	net change	implied flow	Bcf	% change	Bcf	% change
East	782	756	26	26	831	-5.9	856	-8.6
Midwest	952	916	36	36	993	-4.1	1,001	-4.9
Mountain	190	184	6	6	209	-9.1	211	-10.0
Pacific	249	247	2	2	251	-0.8	289	-13.8
South Central	1,058	1,003	55	55	1,075	-1.6	1,096	-3.5
Salt	253	225	28	28	268	-5.6	275	-8.0
Nonsalt	804	778	26	26	808	-0.5	821	-2.1
Total	3,231	3,106	125	125	3,357	-3.8	3,452	-6.4

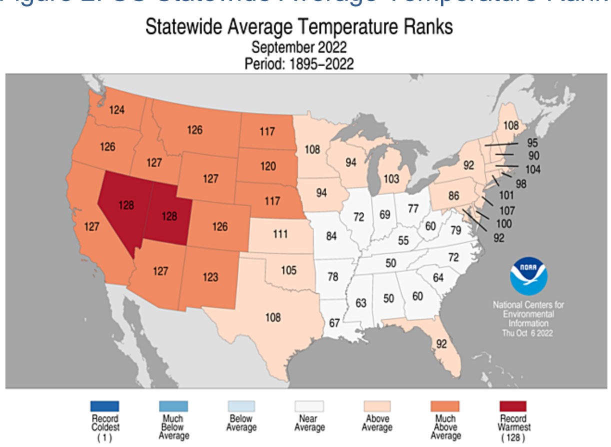
Source: EIA

Natural Gas – NOAA says hottest summer on record in the US

It was an excellent summer for weather related natural gas demand in the US. It couldn't' be better. On Thursday, NOAA issued its recap of US climate for September. September was the 5th hottest in the 128-years of recording [LINK],. And July-September was the hottest summer on record. [LINK]. Below are graphics depicting the state average temperature ranks for September and for July-Septemer.

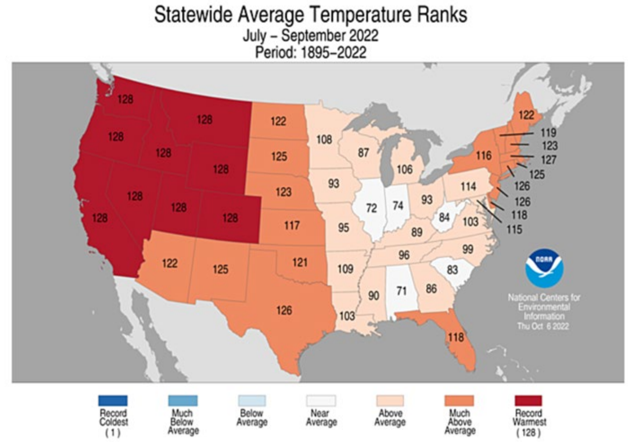
September weather recap

Figure 2: US Statewide Average Temperature Ranks September 2022



Source: NOAA

Figure 3: US Statewide Average Temperature Ranks July – September 2022



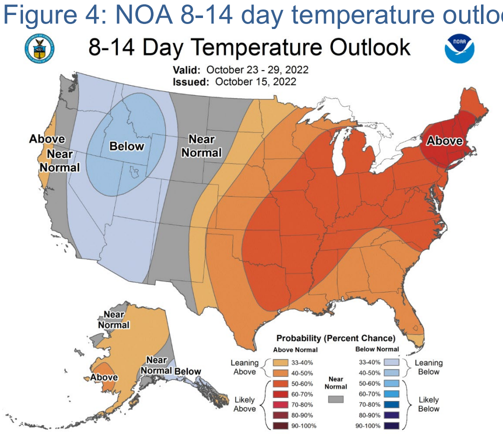
Source: NOAA

Natural Gas – NOAA's 8-14 day calls for a warm end to Oct in eastern half of US

NOAA 8-14 day temperature outlook

Weather forecasting is a tough business and longer term forecasts tend to get ignored. But it's now mid October, the start of the winter natural gas season is Nov 1, and the start of the peak natural gas demand season is only six weeks away. So its getting to where near term weather forecasts get more attention. NOAA updates its 8-14 day outlook every day and its current 8-14 day outlook [LINK] is calling for warmer than normal temperatures for the eastern half of the US, which is a major natural gas demand region.

Figure 4: NOA 8-14 day temperature outlook as of Oct 15



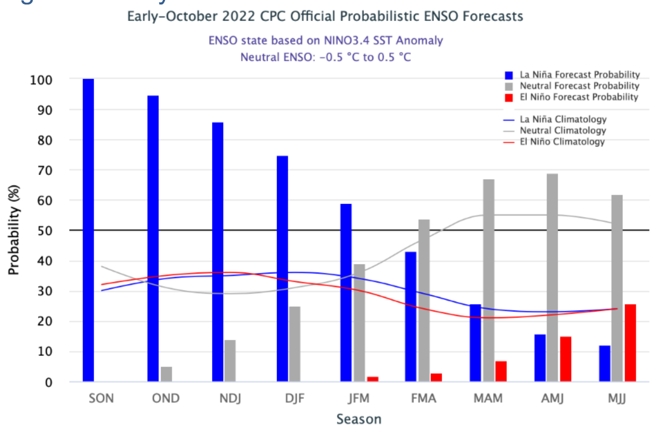
Source: NOAA

Natural Gas – Outlook also still calls for a La Nina/Neutral winter

Forecasts for La Nina winter

The start of the winter natural gas season is Nov 1, and the start of the peak natural gas demand season is only six weeks away. So its getting to where weather forecasts are getting more attention. On Thursday, NOAA posted its updated El Nino/La Nina forecast [LINK], which still calls for a La Nina/Neutral peak winter Dec/Jan/Feb. The probability is for La Nina 75%, Neutral 25%, El Nino 0%. The El Nino/La Nina forecast isn't a temperature outlook. Perhaps the key for natural gas is to not have an El Nino winter that tends to be a warmer than normal winter. Whereas La Nina witers are typically viewed to more likely to be a normal type winter, but as noted in the following item, La Nina winters can be warm.

Figure 5: Early-Oct NOAA El Nino/La Nina Outlook



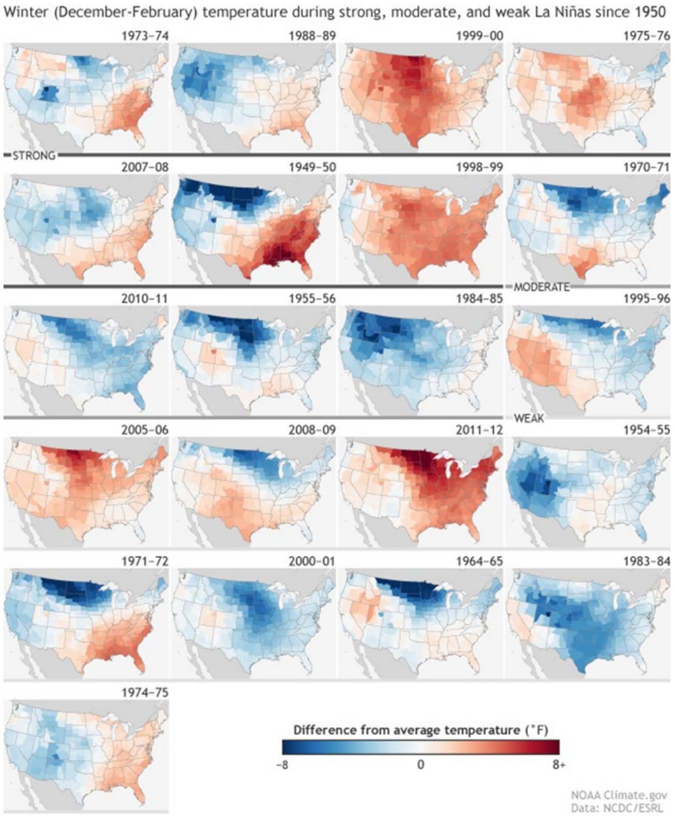
Source: CPC/IRI

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

La Nina winters are unpredictable

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.

Figure 6: Winter (Dec-Feb) Temp in Strong, Moderate And Weak La Ninas 1950 - 2017



Source: CPC

Natural Gas – EIA lowers 20223 US gas production forecast

EIA lower 2023 gas production

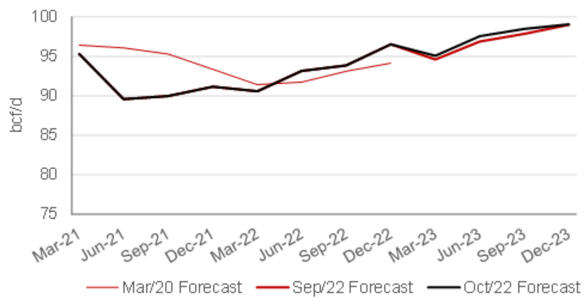
The EIA released its monthly Short Term Energy Outlook Oct 2022 [LINK]. (i) No surprise, the EIA lowered its 2023 US natural gas production forecast. This makes sense given the EIA lowered its 2023 US oil production forecast and most of the oil plays produce associated natural gas. So lower oil production should mean lower gas production. (ii) The Oct STEO forecast 2023 gas production at 99.62 bcf/d, down from Sept STEO of 100.36 bcf/d. Interestingly, the Oct STEO forecasts slightly higher Q4/22 at 99.06 bcf/d vs Sept STEO of 98.99 bcf/d. (iii) US natural gas production is expected to average 97.54 bcf/d in 2022 (97.08 bcf/d previously) and 2022 is up 3.99 bcf/d YoY. (iv) The EIA wrote *"In the first three quarters of 2022, U.S. dry natural gas production grew steadily. We forecast dry natural gas production to continue to increase, averaging 99.1 Bcf/d in 4Q22".* Our Supplemental Documents package includes excerpts form the STEO.

Figure 7: 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
Oct-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.52	93.55	95.08	97.55	98.48	99.06	97.54	99.19	99.57	99.73	100	99.62
Sep-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.52	93.55	94.6	96.87	97.85	98.99	97.08	99.65	100.51	100.59	100.67	100.36
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					
June 2021	94.79	89.68	89.83	91.15	91.35	90.53	92.26	92.63	93.26	92.18	93.13	93.48	94.31	94.81	93.93					
May 2021	94.79	89.68	89.83	91.15	91.35	90.09	90.75	91.34	92.03	91.06	91.97	92.54	93.60	94.36	93.12					
Apr 2021	94.79	89.68	89.83	91.18	91.36	90.82	90.90	91.59	92.31	91.41	92.23	92.75	93.76	94.39	93.29					
Mar 2021	94.79	89.68	89.82	91.08	91.34	90.50	91.04	91.71	92.13	91.35	91.87	92.25	93.28	93.90	92.83					
Feb 2021	94.79	89.68	89.82	90.89	91.29	90.88	90.17	90.40	90.54	90.50	89.95	90.18	91.41	92.26	90.96					
Source: EIA Short Term Energy Outlook, Updated Oct 12, 2022																				

Source: EIA STEO

Figure 8: 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 -194 bcf YoY

EIA STEO storage forecast

The EIA STEO also forecasts US gas storage. No surprise, it continues to lower its forecast higher gas storage to reflect the higher actuals seen in the past few weeks. (i) Winter 2022/23. The EIA forecasts end of summer/start of winter 2022/23 gas storage at 3.47 tcf, which is -0.194 tcf lower YoY, a narrowing of the YoY storage deficit vs -0.399 tcf lower YoY to start the summer 2022 injection season. A key reason for the narrowing of the YoY gas storage deficit has been the shut-in o the Freeport LNG facility. (ii) The EIA forecasts gas storage to end the winter 2022/23 at 1.460 tcf, which would be +0.058 tcf YoY. (iii) The EIA wrote *"despite the above-average builds, natural gas inventories at the end of the month were 3.135 tcf, which is 8%, or 280 Bcf, below the five-year average. We forecast that U.S. natural gas inventories will end the injection season (April– October) at nearly 3.5 Tcf, which would be 6% below the five-year (2017–2021) average".*

Figure 9: EIA STEO forecast US gas storage

	US Working Natural Gas in Storage (billion cubic feet)					
	Storage	2016-2023				
	Level	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	-23.6%
Oct 2022	3,471.5	3,236.3	4,012.7	776.4	3,624.5	-4.2%
Mar 2023	1,459.5	1,184.9	2,486.3	1,301.4	1,835.6	-20.5%
Oct 2023	3,822.7	3,236.3	4,012.7	776.4	3,624.5	5.5%

Source: EIA

Natural Gas – Liberals Melanie Joly teases on LNG Canada Phase 2 while in Asia

LNG Canada 1.8 bcf/d Phase 2

This week's tease on LNG Canada Phase 2 didn't come from LNG Canada or Shell, it came from the Liberal government. It looks like the Liberals want to make sure they are in on the action if (when?) LNG Canada FIDs its 1.8 bcf/d Phase 2. Canada's Foreign Affairs Minister Melanie Joly was in Asia this week and looks to have made LNG a highlight part of her discussion n Korea and Japan. On Thursday, we tweeted [LINK] "*Hmm! Is @melaniejoly teasing #LNGCanada 1.8 bcfd Phase 2 FID is coming? "We will become a major supplier of key [#LNG] energy for them, starting in 2025,""There is a lot of interest for all of us to go even further." Thx @withfilesfrom. #OOTT #NatGas.*" Her views on first LNG starting in 2025 would be consistent with Shell/LNG Canada's long stated first LNG by the middle of the decade. What always gets our attention is when CEOs or politicians feel the need or see the opportunity to add a little extra commentary. Joly could have stopped with talking about LNG Canada Phase 1 starting LNG deliveries in 2025. But she added "*there is a lot of interest for all of us to go even further*". It's hard not to takeaway that the Liberals will be onside with LNG Canada Phase 2. Canadian Press reported "*A major export terminal is set to open in 2025 in Kitimat, B.C., with Japanese and Korean companies holding a 20 per cent stake. "We will become a major supplier of key energy for them, starting in 2025," Joly said in a Thursday interview from Seoul. "There is a lot of interest for all of us to go even further."* Our Supplemental Documents package includes the Canadian Press report.

LNG Canada hasn't tempered down enthusiasm for Phase 2 FID

Here is what we wrote in our Oct 9, 2022 Energy Tidbits. "*We have to believe if LNG Canada CEO Jason Klein would try to temper down or squash the enthusiasm in media reports and also not give encouraging comments about LNG Canada if he didn't expect Shell to FID LNG Canada 1.8 bcf/d Phase 2. LNG Canada is not a public company, but we don't recall ever seeing a CEO not trying to tone down enthusiasm for something that wasn't going to happen. On Tuesday, the Financial Post's report [LINK] "LNG Canada, country's $40-billion 'second chance' at becoming a global LNG leader, takes shape" focused on the potential for LNG Canada to move on Phase 2. They wrote "Now, those same oilpatch veterans are urging Shell and its partners to quickly green-light a second phase of the project, effectively doubling the export capacity of the plant from 14 million tonnes of LNG per year in the first phase, to 28 million tonnes a year. "We had an opportunity that required us getting after* *these projects 10 to 15 years ago. We didn't for all kinds of reasons," said Tourmaline Oil Corp. chief executive and founder Mike Rose. "Fortunately, we have a second crack at it. So I'd like to see more than just LNG Canada phase one — we'd like to see both phases of LNG Canada and more projects on the West Coast." The Financial Post report closes with comments from Klein who, had to have known the focus of the story. It would have been a good opportunity for Klein to try to temper enthusiasm for the future. Rather he showcased a key advantage of LNG Canada over other global LNG projects – it's the cleanest LNG in the world. No question, it doesn't mean that FID on LNG Canada Phase 2 is a given, but, if not, it is not what most CEOs would do. The Financial Post report closed "Pointing to the company's 40-year permit to operate in Kitimat, Klein said he believes there is starting to be an acknowledgement that not all LNG projects are created equal. "The cleanest molecule is going to be the last molecule standing," Klein said. "That's one of the reasons why I feel so good about LNG Canada, because we are that clean molecule. And when people start getting really picky, whether driven by carbon price or otherwise, the cleanest LNG will be the last LNG — which right now, in the world, that's right here." Our Supplemental Documents package includes the Financial Post report.*

Natural Gas – Freeland, Liberals will always look at economically viable LNG projects

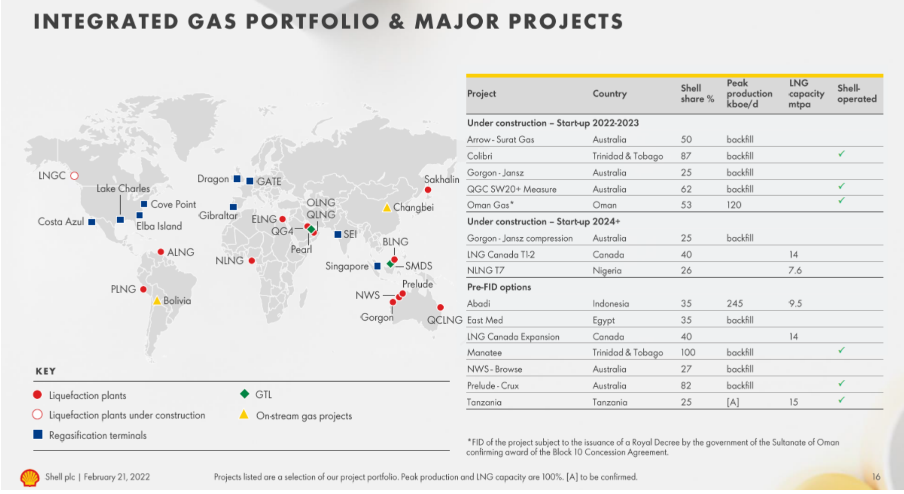
Freeland on Liberals support for LNG projects

Shell reports Q3 on Oct 27, and we have to believe a FID on LNG Canada Phase 2 is coming in the days before the release. There are just too much showcasing, hints or set up comments on LNG Canada and we just don't see the enthusiasm being set down by LNG Canada. Above we noted Foreign Minister Joly's hint on LNG Canada Phase 2. Then on Friday, we moved up the pecking order to Deputy PM/ Chrystia Freeland's comments that certainly seem to be directed at LNG Canada Phase 2. Maybe we will even see Trudeau drop a hint this week. We look at comments like Freeland's as political positioning to make sure they were seen to have already been onside for when a FID decision is made on LNG Canada Phase 2. On Friday night, we tweeted [LINK] "*Positive CA #NatGas. Liberals must want to be seen as being onside when #LNGCanada FIDs 1.8 bcfd Phase 2? @cafreeland "We will always be looking at economically viable LNG projects." LNG $ outlook way higher since 👇 02/21 tweet #Shell IRR 14-18% for its pre-FID projects. #OOTT*". On Friday, Reuters reported [LINK] "*LNG "is an important transition fuel," Freeland told reporters in Washington at the end of annual IMF and World Bank meetings. "We will always be looking at economically viable LNG projects."* Freeland did not mention LNG Canada, but Shell disclosed this summer that they were now in the FID review/analysis period for LNG Canada Phase 2 FID. And surely, she is well aware that the brownfield project is expected to have strong economics. Our Supplemental Documents package includes the Reuters report.

Shell highlighted strong IRRs of pre-FID LNG projects ie. LNG Canada Phase 2

Our Friday tweet referenced our Feb 21, 2022 tweet on Shell's expected IRRs for its pre-FID LNG projects that included LNG Canada Phase 2. Here is what we wrote in our Feb 27, 2022 Energy Tidbits. "*We recognize that almost no one else has been believing Shell will FID LNG Canada Phase 2 this year, but we can't help still believe this following Shell's LNG Outlook 2022 and its Integrated Business Deep Dive webcast that followed the outlook webcast. We tweeted [LINK] "Was #Shell showcasing #LNGCanada or just highlighting its positives today? @Shell* *expects average IRR of 14-18% for its pre-FID projects, which includes #LNGCanada Phase 2. #LNGCanada "is set to deliver the lowest carbon intensity in the entire industry". #OOTT #NatGas #LNG". (i) Just like we have been highlighted over the past months, this week, Shell seemed to showcase LNG Canada on multiple fronts (i) Shell now plans assuming there is an LNG supply gap in mid 2020s and that this "focuses attention" on the need for more LNG supply FIDs. So they are saying there is a clear market need for someone to step forward. (ii) In the Integrated Gas comments, mgmt said they are making good progress on LNG Canada Phase 1 construction and first LNG cargos are on track for by the middle of this decade. (iii) LNG Canada is the lowest emissions LNG project in industry. This is making the case that if there is any LNG to be done in a world of reducing emissions, it is the lowest emissions and Shell says LNG Canada is the best. Mgmt said "But the long term role of gas depends on efforts to abate emissions and develop cleaner pathways for gas. This is why we continually try to reduce the carbon intensity of our new projects. Take LNG Canada currently under construction. It will run on hydropower and is set to deliver the lowest carbon intensity in the entire industry." (iv) Shell's pre-LNG FID supply projects that includes LNG Canada have high RORs. Mgmt said "For the pre-FID projects, we have an expected average internal rate of return of between 14% and 18%, and a unit technical cost below $5/mmbtu. With most of these projects clearly having lower costs than the average in the industry. These are good numbers, but you will understand that we strive to push the IRR to the higher end and to push the unit costs down even further." There were other items showcasing LNG Canada including pictures. It just feels like Shell continues to showcase LNG Canada, which we believe keeps pointing to them wanting to FID LNG Canada Phase 2 in 2022 and sooner rather than later. Our Supplemental Documents package includes excepts from the Shell Integrated Gas slide deck and transcripts we made of some of the Shell mgmt comments."*

Figure 10: Shell Pre-FID LNG supply options – Indonesia, LNG Canada, Tanzania



Project	Country	Shell share %	Peak production kboe/d	LNG capacity mtpa	Shell-operated
Under construction – Start-up 2022-2023					
Arrow - Surat Gas	Australia	50	backfill		
Colibri	Trinidad & Tobago	87	backfill		✓
Gorgon - Jansz	Australia	25	backfill		
QGC SW20+ Measure	Australia	62	backfill		✓
Oman Gas*	Oman	53	120		✓
Under construction – Start-up 2024+					
Gorgon - Jansz compression	Australia	25	backfill		
LNG Canada T1-2	Canada	40		14	
NLNG T7	Nigeria	26		7.6	
Pre-FID options					
Abadi	Indonesia	35	245	9.5	
East Med	Egypt	35	backfill		
LNG Canada Expansion	Canada	40		14	
Manatee	Trinidad & Tobago	100	backfill		✓
NWS - Browse	Australia	27	backfill		
Prelude - Crux	Australia	82	backfill		✓
Tanzania	Tanzania	25	[A]	15	✓

*FID of the project subject to the issuance of a Royal Decree by the government of the Sultanate of Oman confirming award of the Block 10 Concession Agreement.

Source: Shell

Natural Gas – Putin warns oil and gas infra is vulnerable anywhere in the world

Putin warns on any infrastructure

On Wednesday, we tweeted [LINK] "*Putin 👇"attack on the Nord Streams has set an extremely dangerous precedent, which shows that any critical piece of transport, energy or communications infrastructure is under threat, regardless of its location, management or whether it lies on the seabed or on land". #OOTT*." The big headline out of the Putin's speech at the plenary session of the Russian Energy Week International Forum [LINK] was his warning that any critical infrastructure regardless of its location is at risk because of the international attacks on Nord Stream. Putin blames the sabotage of Nord Stream on the US despite him not specifically naming the US. Putin said "*I would like to repeat that there is solid documented evidence. These crimes were plotted and ordered by the end beneficiaries seeking instability and conflicts. And who stands behind the sabotage against the Nord Streams? Clearly, those who want to completely sever ties between Russia and the European Union, to fully undermine and crush Europe's political agency, weaken its industrial potential and seize the market. And, of course, those who – I want to stress it – have the technical capacity to organise such explosions and in fact have committed similar sabotage in the past and were caught red-handed but evaded punishment. The beneficiaries are well known."* And then his headline warning "*The attack on the Nord Streams has set an extremely dangerous precedent, which shows that any critical piece of transport, energy or communications infrastructure is under threat, regardless of its location, management or whether it lies on the seabed or on land.*" Our Supplemental Documents package includes the Putin address.

Natural Gas – Putin say Europeans are back to Middle Ages in burning wood for winter

Europe back to burning wood

We know there aren't any Putin fans, but you give him credit for some of the lines he uses to try to show the west is doing stupid things. Putin spoke at the plenary session of the Russian Energy Week International Forum. [LINK]. On Wednesday, Putin was talking about how Europe's push away from long-term oil-linked natural gas contracts have cost more than 300 billion euros in losses. He then said "*The resources that come to the European market are sold literally triple the price, as I have said, and this feeds inflation. It has already reached 10 percent in the euro zone. It is hitting ordinary Europeans as their electricity and gas bills have more than tripled over the past year. The European population is stocking up on wood for winter, like in the Middle Ages*."

Surprised Putin didn't note the UK firm clearing Cdn forest for wood pellets

Putin loves to give shots to the West on things they are doing. We would have thought his people might have pointed out the BBC investigative report that we highlighted in last week's (Oct 9, 2022) Energy Tidbits memo. Last week, we wrote "On Monday, we tweeted [LINK] "*Inconvenient Truth! Burning wood pellets fits into a clean energy plan, gets UK green subsidies to add higher emissions power. No wonder companies don't want to talk about it, especially if wood pellets come from clearing Cdn forest. Thx @joe_crowley @TimRobinsonTV #OOTT," We are surprised that the BBC's Oct 3 report didn't raise outrage from the Liberals in Canada. We didn't see any coverage of the Liberals saying they would get to the bottom of this BBC expose. BBC Panorama posted a video report [LINK] "Drax is chopping down trees and taking logs from some of the world's most precious forests to burn at its Yorkshire power station, which provides 12% of the UK's renewable energy The Green Energy Scandal Exposed is on @BBCOne at 8pm and on @BBCiPlayer [LINK]" Perhaps the tweet headline didn't say Canada, but the BBC's posted report [LNK] "Drax: UK power station owner cuts down primary forests in*

Canada. Drax, Britain's biggest power station, generates electricity by burning millions of tonnes of imported wood pellets. A company that has received billions of pounds in green energy subsidies from UK taxpayers is cutting down environmentally-important forests, a BBC Panorama investigation has found. Drax runs Britain's biggest power station, which burns millions of tonnes of imported wood pellets - which is classed as renewable energy. The BBC has discovered some of the wood comes from primary forests in Canada. The company says it only uses sawdust and waste wood."

Remember Putin's abandoning natural gas may put humans back in caves

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

Natural Gas – India September natural gas production -1.7% YoY to 3.25 bcf/d

India natural gas production -1.7% YoY

One of the key themes for India in 2021 was that India's domestic natural gas production was returning to modest growth after a decade of declining domestic natural gas production. Up until the modest growth, India's increasing natural gas consumption meant that India had to increase LNG imports. India's domestic natural gas production peaked in 2010 at 4.6 bcf/d. But for 2022, it has mostly been a period of relatively flat YoY domestic natural gas production or, in the case of September, is down slightly MoM. And if India doesn't increase domestic natural gas production, it has to import more LNG unless it tries to substitute coal or petroleum products to replace sky-high LNG prices. India's Petroleum Planning and Analysis Cell released their monthly report for September natural gas and oil statistics [LINK]. India's domestic natural gas production was down -4.89% YoY from 3.42 bcf/d in September 2021 to 3.25 bcf/d, down from 3.30 bcf/d in August. India has consistently struggled to grow domestic natural gas production with 2018-2019 production averaging 3.18 bcf/d, declining to 3.02 in 2019-2020 and averaged 2.78 bcf/d 2020-2021. Our Supplemental Documents package includes excerpts from the PPAC monthly package.

Natural Gas – India September LNG imports down -13.47% YoY to 2.69 bcf/d

India LNG imports -13.47% YoY

No surprise that, despite the flat to slightly lower India natural gas production, its September LNG imports were down. As we have been highlighting in 2022, India is viewed as an extremely price sensitive buyer and has been trying to substitute, where possible, increased use of coal and/or petroleum products for sky-high LNG prices. In prior periods of regular

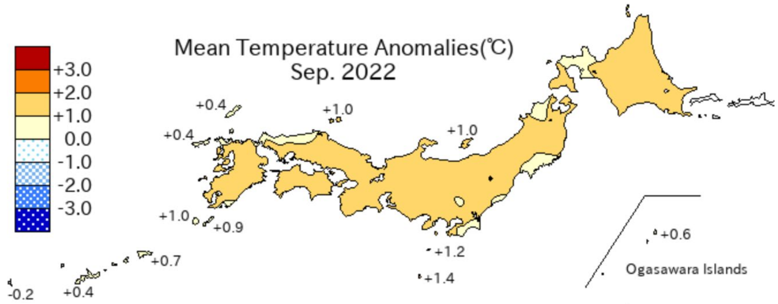
LNG prices, the lower domestic natural gas production would mean more LNG imports. September imports decreased MoM to 2.69 bcf/d and down -13.47% YoY.

Natural Gas – Above average Sept temperatures in Japan

Japan Sept temperatures

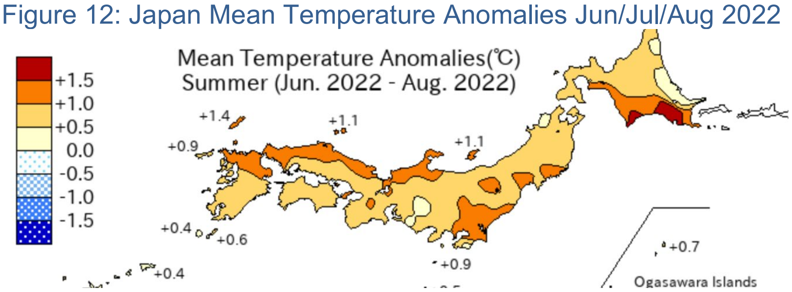
The Japan Meteorological Agency recap of Sept temperatures in Japan were that there were above normal temperatures for all of Japan, which continued a hot Jun/Jul/Aug providing a strong period of weather related electricity consumption ie. hot enough to justify air conditioning. Although as we have been highlighting, sky-high LNG prices have put Japan to try to maximize other electricity sources like coal and petroleum products. On Friday, the Japan Meteorological Agency posted its recap of Sept weather [LINK] and their mean temperature anomalies map (below) show it was warmer than normal across Japan. Their recap noted "*Monthly mean temperatures were above normal from northern to western Japan, because warm-air covered the regions*." Below are the JMA temperatures maps for Sept and for Jun/Jul/Aug.

Figure 11: Japan Mean Temperature Anomalies Sept 2022



Source: Japan Meteorological Agency

Figure 12: Japan Mean Temperature Anomalies Jun/Jul/Aug 2022



Source: Japan Meteorological Agency`

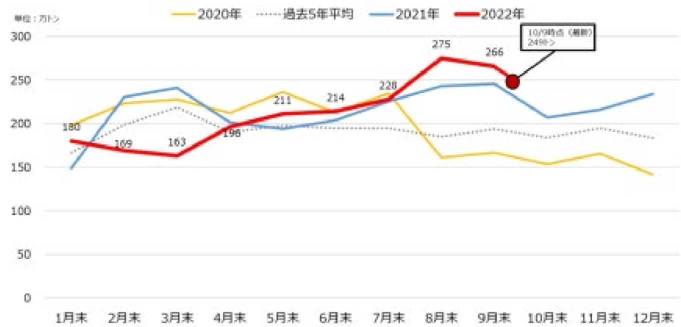
Natural Gas – Japan's LNG stocks down -7.1% from last week

Japan LNG stocks -7.1% WoW

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

Oct 9 were ~120 bcf, -7.1% WoW from 128 bcf but up from the 5-yr average of 99 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 13: Japan's LNG Stocks



Source: METI

Japan Aug LNG imports -0.4% YoY

Natural Gas – Japan LNG imports hurt by LNG prices, down -0.4% YoY

Japan was early in working to reduce natural gas consumption and has been maximizing petroleum products and coal power generation to minimize sky-high LNG prices. It has been working. Two weeks ago, Japan's Ministry of Finance posted its import data for Aug. [LINK]. The MOF reported Japan's Aug LNG imports were 9.71bcf/d, down -0.4% YoY and up 1.8% MoM. Thermal coal imports for Aug were +16.3% YoY. Below is our table that tracks Japan LNG import data.

Figure 14: Japan Monthly LNG Imports

bcf/d	2015	2016	2017	2018	2019	2020	2021	21/20	2022	22/21
Jan	13.06	11.22	12.85	12.79	11.69	11.63	12.48	7.3%	10.51	-15.8%
Feb	13.26	12.30	13.36	14.23	12.61	10.99	13.84	25.9%	12.19	-11.9%
Mar	12.60	12.62	12.61	12.28	11.30	11.16	11.04	-1.1%	10.07	-8.7%
Apr	10.56	10.21	10.52	8.97	9.00	8.31	7.96	-4.3%	8.92	12.0%
May	8.91	8.55	9.66	9.92	8.62	7.09	7.67	8.1%	8.92	16.3%
June	10.61	10.02	9.90	8.88	8.32	8.42	9.13	8.5%	9.29	1.7%
July	10.77	10.19	10.19	10.55	10.56	9.35	9.58	2.5%	9.54	-0.4%
Aug	10.93	11.96	11.24	11.73	9.45	9.04	9.75	7.8%	9.71	-0.4%
Sept	11.06	10.67	9.31	10.04	10.30	10.41	8.66	-16.8%		
Oct	9.38	9.73	9.50	10.12	9.75	9.20	7.17	-22.1%		
Nov	10.71	12.07	10.26	10.15	10.03	9.63	9.38	-2.6%		
Dec	12.51	11.69	12.31	11.23	10.54	11.96	10.89	-8.9%		

Source: Japan Ministry of Finance

Germany storage now ~95% full

Natural Gas – Germany storage is full but need mild winter, >20% savings

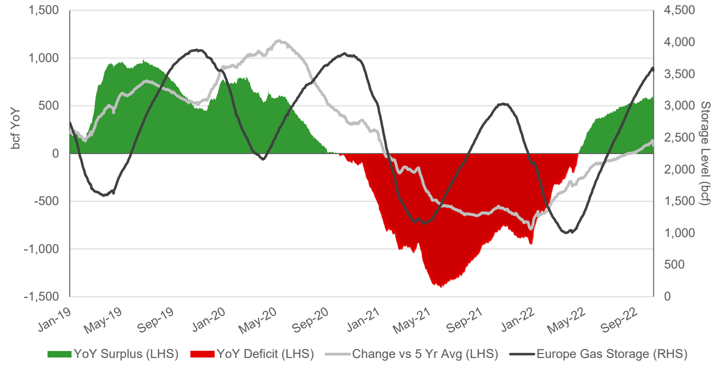
It hasn't been without a big cost to industry, but Germany gas storage reached the 95% full level really driven by big declines in industrial consumption, continued natural gas imports from Norway, and warm temperatures in Oct that mean no real heating demand for natural gas. Unfortunately, even at 100% storage fill for winter, that's not enough to cover natural gas needs even under the current big declines in industrial consumption. It needs the perfect storm to get thru winter without natural gas shortages. And if it gets thru winter, the challenge to get thru 2023 is even tougher. Yesterday morning, we tweeted [LINK] "*German storage 95% full. But @Klaus_Mueller tells @vanessadezem "In purely quantitative terms, gas volumes in the storage facilities are enough for about two cold winter months", need to* *increase #NatGas imports, stable Norway supplies, & consumption must fall by >20% #OOTT".* German energy regulator head, Klaus Mueller, is very good at tweeting updates on Germany's natural gas storage picture and he tweeted that even though gas storage reached 95%, "*full storage helps us to buffer a gas shortage*" and "*nevertheless we absolutely have to save at least 20% gas, no matter how warm or cold the winter gets'*. Our tweet referenced a Bloomberg report on emailed comments from Mueller that paint a more direct view. Bloomberg wrote "*"In purely quantitative terms, gas volumes in the storage facilities are enough for about two cold winter months," he said in an e-mailed statement * In order to avoid a gas emergency in winter, Germany needs to increase gas imports, supplies in neighboring countries must also remain stable, and consumption must fall by at least 20%, Mueller said * "On February 1, the storage level should still be at least 40%. Firstly, because it can still get very cold in February and March, and secondly because the storage facilities must also be refilled for the winter of 2023-2024," he said".* Our Supplemental Documents package includes the Bloomberg report.

Natural Gas – Europe storage is now +13.43% YoY ie. 90.43% full vs 77.00%

Europe storage now 90.43% full

It was a successful natural gas storage refill season in Europe with the continued strong LNG imports and massive industrial demand response to sky-high natural gas prices. Even with Nord Stream volumes down to zero, Europe storage continues to have increasing YoY levels. Europe gas storage began the year in a YoY deficit, but the YoY Europe storage deficit 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 13.43%. Inventories are rising all across Europe, as is normal during spring and early summer. Europe gas storage started 2020 winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr/21. Europe storage levels bottomed in late Apr/22 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 Oct 12 is at 90.43%, which is +14.57% greater than last year levels of 75.86% and are +3.13% above the 5-year average of 87.30%. Below is our graph of Europe Gas Storage Level.

Figure 15: Europe Gas Storage Level



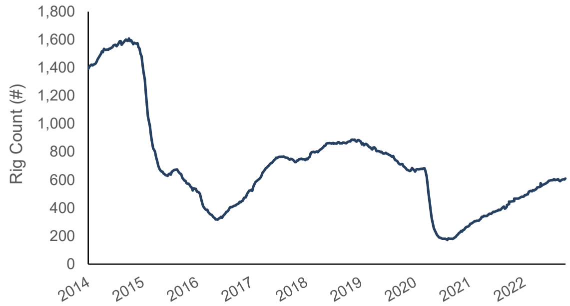
Source: Bloomberg

Oil – US oil rigs up +8 to 610 oil rigs at Oct 14

Baker Hughes released its weekly North American drilling activity data this morning. This week US oil rigs were +8 to 610 oil rigs. None of the major basins had anything more than a 1 rig change. US oil rigs hit a 14-week low of 591 five weeks ago. US oil rigs are now +431 oil rigs since the Covid Sept 17, 2020 oil rigs of 179 oil rigs. And US oil rigs are +165 oil rigs YoY. Texas was +5 rigs WoW despite Permian only being +1 and Eagle Ford +1. US gas rigs were -1 WoW to 157 gas rigs.

US oil rigs +8 WoW

Figure 16: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – US frac spreads +4 to 295 spreads for the week ending Oct 14

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending Oct 14 on the Primary Vision network. YouTube video is at [LINK]. For the week ending Oct 14, US frac spreads at the high point in the week were +4 to 295 spreads. Here are some of his comments on the week. The increase is in line with what he has been expecting for a seasonal bump. Rossano thinks should be able to get to 300 spreads in the next week or two, and then have that for a couple weeks before the holiday slowdown. US frac spreads and drilling rigs always decline around US Thanksgiving thru Christmas. He noted that there were frac spread increases across the board, only two places that had declines but they were all small. The main move in frac spreads is shifting higher and they are in all the key areas, especially one of the big ones he has been highlighting, Appalachia

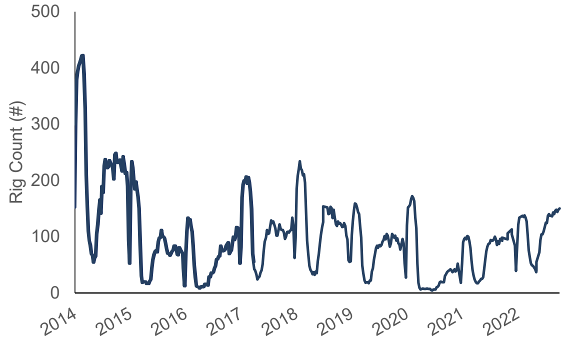
Frac spreads +4 to 295

Oil – Total Cdn rigs up +1 WoW to 216 total rigs, +48 rigs YoY

Total Cdn rigs were +1 to 216 rigs as of Oct 14, 2022. Cdn oil rigs were +2 to 150 oil rigs. Cdn gas rigs were -1 to 66 rigs. This is in line with our expectations for fairly flat rig levels in Canada until the ramp up in winter drilling season. Total rigs are now +136 vs the comparable Covid period of 80 rigs on Oct 16, 2020. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 98 and Cdn gas rigs were 70 for a total Cdn rigs of 168, meaning total Cdn oil rigs are +52 YoY to 150 oil rigs and Cdn gas rigs are -4 to 66 gas rigs.

Cdn rigs up WoW

Figure 17: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production down to 11.9 mmb/d

US oil production down WoW

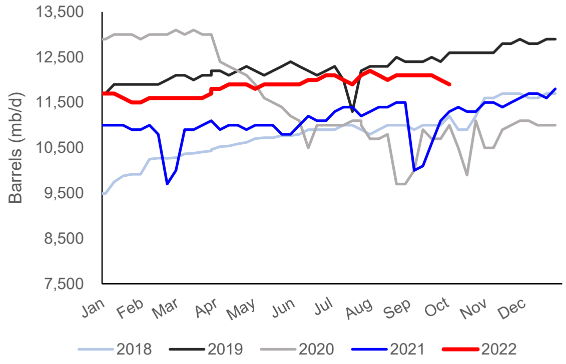
Our Oct 2, 2022 Energy Tidbits highlighted EIA Form 914 actuals for oil production in July, and how US oil production growth has been below expectations and was only +166,000 b/d from Dec 2021 thru July 2021. The EIA provides weekly estimates of US oil production, which was down to 11.9 mmb/d from 12.0 mmb/d for the week ended Oct 7. US oil production has been range bound between 11.9 to 12.1 mmb/d for the past 19 weeks. Lower 48 production was down WoW at 11.6 mmb/d this week and Alaska was flat WoW at 0.4 mmb/d. US oil production is up YoY at +0.5 mmb/d but is still down significantly at -1.2 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 18: EIA's Estimated Weekly US Oil Production

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

Source: EIA

Figure 19: US Weekly Oil Production



Source: EIA, SAF

North Dakota oil production

Oil – North Dakota Aug oil production disappoints

We recognize it's only two consecutive months, but North Dakota Aug oil production was flat to July and both were down from June. This is not what North Dakota has been expecting. On Thursday afternoon, the North Dakota Industrial Commission posted its Director's Cut, which includes August oil and natural gas production data [LINK]. The NDIC reported North Dakota August oil production was 1.073 mmb/d, which was down 3.1% YoY, and basically flat MoM vs July production of 1.070 mmb/d. North Dakota oil production will be worth watching, especially as North Dakota has seemed surprised by the July and Aug production numbers not being higher, especially given the NDIC estimated well completions were 66 in August and much higher at 74 in July. Our Supplemental Documents package includes excerpts from the Director's Cut.

Figure 20: North Dakota Oil Production By Month

(b/d)	2017	2018	2019	2020	2021	2021/2020	2022	2022/2021
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	-19.8%	1,088,613	-5.1%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	-25.4%	1,089,091	0.5%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	-22.5%	1,122,640	1.2%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	-8.0%	900,597	-19.8%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	31.3%	1,059,060	-6.1%
June	1,032,873	1,227,320	1,425,230	893,591	1,133,498	26.8%	1,096,783	-3.2%
July	1,048,099	1,269,290	1,445,934	1,042,081	1,076,594	3.3%	1,072,632	-0.4%
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	-5.0%	1,073,378	-3.1%
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	-8.9%		
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	-9.7%		
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	-5.6%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	-3.9%		

Source NDIC, NDPA

North Dakota record # of producing wells, but not record oil production

Yesterday, we tweeted [LINK] *"#Bakken. "we're at a record number of [ND] producing wells (in Aug) but not record [oil] production" says ND's Helms. He expects an increase in Sept. Jul/Aug were below June. Not a good sign if Sept/Oct don't get back to June levels. Thx @bistrib. #OOTT".* It looks like Sept will be a big test for

North Dakota oil production. It's only two months, but North Dakota oil production has disappointed in both July and Aug. But oil production in Sept and Oct better jump back up to and over June levels or else it will cause a worry on the near term growth potential, if at all. We don't understand why most ignore the local reporting by the Bismarck Tribune and Williston Herald on the monthly press conference by well regarded NDIC Director Lynn Helms following the release of the monthly North Dakota oil and gas data. They always have some added good insight and that is why we always include their insights in our North Dakota review. We recognize it may be nothing and you can't tell from two months data points, but what jumps out at us are comments from Helms in his press conference on the monthly oil data for the last two months. (i) Our Sept 16, 2022 Energy Tidbits memo highlighted the Bismarck Tribune reporting "*July oil production fell to just over 1 million barrels per day. The state's oil figures lag two months as officials collect and analyze data from energy companies. Director Lynn Helms said the Mineral Resources Department was surprised to see the decline in July when officials were anticipating to reach June's mark of 1.1 million barrels daily. Helms said the drop is likely because of fewer well completions due to a lack of available workforce."* Sounds reasonable, but our memo also referenced the NDIC then estimated well completions were only 27 in June and much higher at 74 in July. So there weren't fewer well completions. (ii) Then in his press conference on Thursday afternoon on the Aug numbers, how could we note highlight his comments that there were a record number of producing oil wells in Aug but not record oil production. The Bismarck Tribune reported [LINK]"*There was a "steady stream" of oil and gas drilling permit applications in August, he said. The drilling rig count continues to stall out in the mid-forties and is expected to do so for the rest of the year. There is a steady stream of newly completed wells, with a projection that September's numbers will continue to increase. "So we would seriously anticipate we're going to see an increase in production for the September report," he said. "... We're at a record number of producing wells (in August) but not a record production*." Helms is pretty clear he expects Sept oil production up. (iii) So maybe oil production will spring back in Sept to higher than June. But Helms has been surprised by the last two months underperfomance and that alone means we want to focus on Sept oil production. The Bakken isn't viewed as a huge growth area, but still it is viewed as growth area. We will need to North Dakota oil production in Sept and Ot at least jump back to June levels And unless we see that jump back up in oil production, we have to believe four consecutive months of data would raise concerns. It looks like September could be a big month for North Dakota oil production. Our Supplemental Documents package includes the Bismarck Tribune report.

Oil – North Dakota crude by rail down MoM to 63,073 b/d in Aug

The North Dakota Pipeline Authority posted its monthly update "*October 2022 Production & Transportation"* [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority for more detailed numbers of crude by rail out of North Dakota. The NDPA Monthly Update (graph below) report only provides rounded numbers, and these rounded numbers are not accurate enough to match the graphs. In the backup excel, the NDPA estimates crude by rail in Aug was a low of 48,073 b/d and a high of 78,073 b/d for an average of 63,073 b/d. This is below the July average of 79,469 b/d and June average of 80,222 b/d. Below is a chart from the NDPA monthly update showing the crude by

North Dakota CBR basically flat in July

rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

Figure 21: Estimated North Dakota Rail Export Volumes

Source: North Dakota Pipeline Authority

Oil – EIA lowers 2022 and 2023 US oil production forecasts

It looks like the EIA is finally reflecting what we have been seeing in the actuals for US oil production – US oil growth is less than expected in 2022. The EIA lowered its US oil production forecast for 2023 down by 280,000 b/d. The EIA posted it's Short Term Energy Outlook October on Wednesday. (i) The reality is that the EIA's actuals for US oil production have been lower than their weekly estimates and have shown there is only +166,000 b/d growth from Dec 2021 thru July 2022. We believe the EIA must now be reflecting this lower than expected growth in US oil production. (ii) The EIA forecast kept flat its US crude expectations in Q4/21, still not returning anywhere near the Q4/19 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 flat at 11.32 mmb/d but is down 0.97 mmb/d YoY from 12.29 mmb/d in 2019. (iii) The EIA lowered its oil growth momentum into 2023. Its new Q4/22 forecast is 11.99 mmb/d vs Sept STEO of 12.16 mmb/d. (iv) Oct STEO 2023 average forecast is 12.35 mmb/d, down from Sept STEO of 12.63 mmb/d, Aug STEO of 12.70 mmb/d, July STEO of 12.77 mmb/d, and June STEO of 12.97 mmb/d.

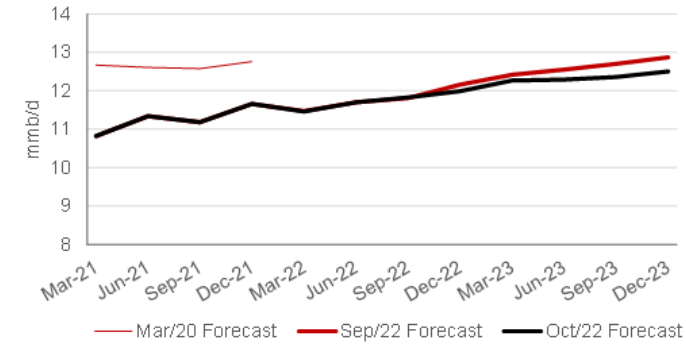
EIA forecasts US 2022 oil exit at 11.99 mmb/d

Figure 22: 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
Oct-2022	12.83	10.69	10.83	10.94	11.32	10.82	11.34	11.18	11.66	11.25	11.46	11.70	11.83	11.99	11.74	12.27	12.29	12.36	12.50	12.35
Sep-2022	12.83	10.69	10.83	10.94	11.32	10.82	11.34	11.18	11.66	11.25	11.47	11.70	11.81	12.16	11.79	12.42	12.55	12.70	12.87	12.63
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	11.70	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					
June 2021	12.75	10.81	10.81	10.90	11.31	10.70	11.04	11.17	11.38	11.08	11.55	11.67	11.88	12.05	11.79					
May 2021	12.75	10.81	10.81	10.90	11.31	10.65	10.97	11.12	11.34	11.02	11.51	11.68	11.96	12.21	11.84					
Apr 2021	12.75	10.81	10.81	10.90	11.31	10.75	10.93	11.13	11.35	11.04	11.54	11.74	11.99	12.18	11.86					
Mar 2021	12.75	10.81	10.81	10.87	11.31	10.79	11.06	11.27	11.46	11.15	11.67	11.84	12.16	12.41	12.02					
Feb 2021	12.75	10.81	10.81	10.89	11.31	10.98	10.91	11.00	11.18	11.02	11.30	11.38	11.61	11.83	11.53					
Source: EIA Short Term Energy Outlook, Updated Oct 12 , 2022																				

Source: EIA STEO

Figure 23: Estimated US Crude Oil Production By Forecast Month



Source: EIA STEO

EIA Form 914 July oil production is only +166,000 b/d vs Dec 2021 exit

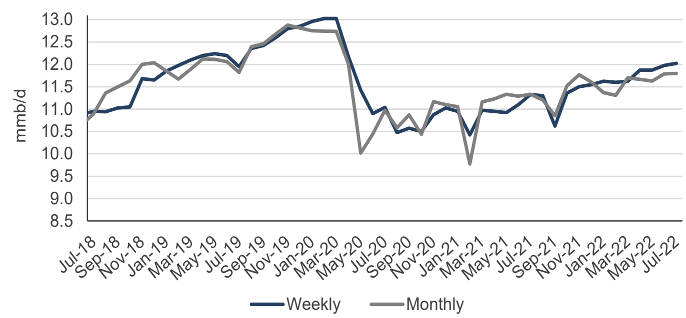
Here is what we wrote in our Oct 2, 2022 Energy Tidbits. "*US oil production is viewed as a key global oil supply growth, but to date, the growth in 2022 has been less than expected. There are two key takeaways from the EIA's look back at July actual oil production – July is only +166,000 b/d vs the Dec 2021 exit and was -230,000 b/d below the weekly estimates. The EIA released its Form 914 data [LINK] on Friday, which is the EIA's "actuals" for July US oil and natural gas production. (i) Form 914 estimates total US oil production is up 0.022 mmb/d MoM to 11.800 mmb/d in July. The actuals for July were >200,000 b/d lower than the EIA's weekly estimates that worked out to just over 12.030 mmb/d. (ii) One of the growing questions has been how much US oil will grow in 2022. July actuals at 11.800 mmb/d is only +166,000 b/d more than the year end Dec 2021 average of 11.634 mmb/d.*"

Figure 24: EIA Form 914 US Oil Production

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	11,369	11,316	11,701	11,668	11,629	11,788	11,800					
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,869	11,673	11,913	12,149	12,154	12,218	11,902	12,486	12,590	12,809	13,000	12,978
2018	10,001	10,281	10,467	10,500	10,435	10,641	10,897	11,392	11,443	11,509	11,886	11,945
2017	8,875	9,110	9,166	9,101	9,185	9,111	9,247	9,250	9,517	9,669	10,085	9,983
2016	9,202	9,066	9,101	8,874	8,835	8,676	8,662	8,690	8,544	8,804	8,903	8,816

Source: EIA

Figure 25: EIA Form 914 US Oil Production vs Weekly Estimate



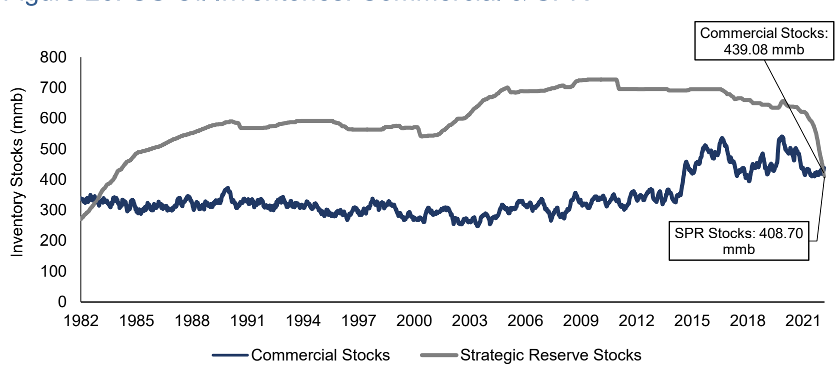
Source: EIA

Oil – US SPR reserves continue to go lower than commercial crude oil reserves

SPR reserves keep going lower

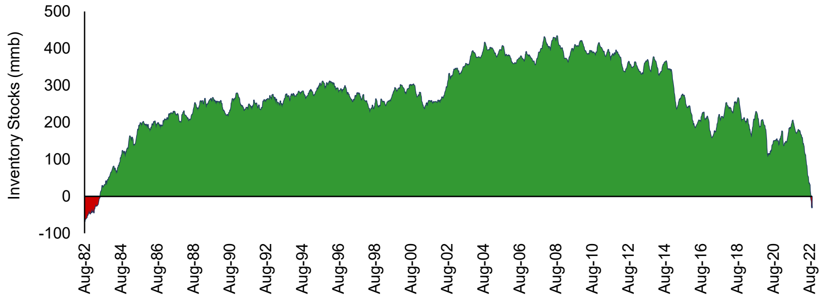
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, and and the deficit continues to widen each week. The EIA's new weekly oil data for Oct 7 has SPR reserves at 408.70 mmb vs commercial crude oil reserves at 439.08 mmb. The below graph highlights the difference between commercial and SPR stockpiles.

Figure 26: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 27: US Oil Inventories: SPR less commercial



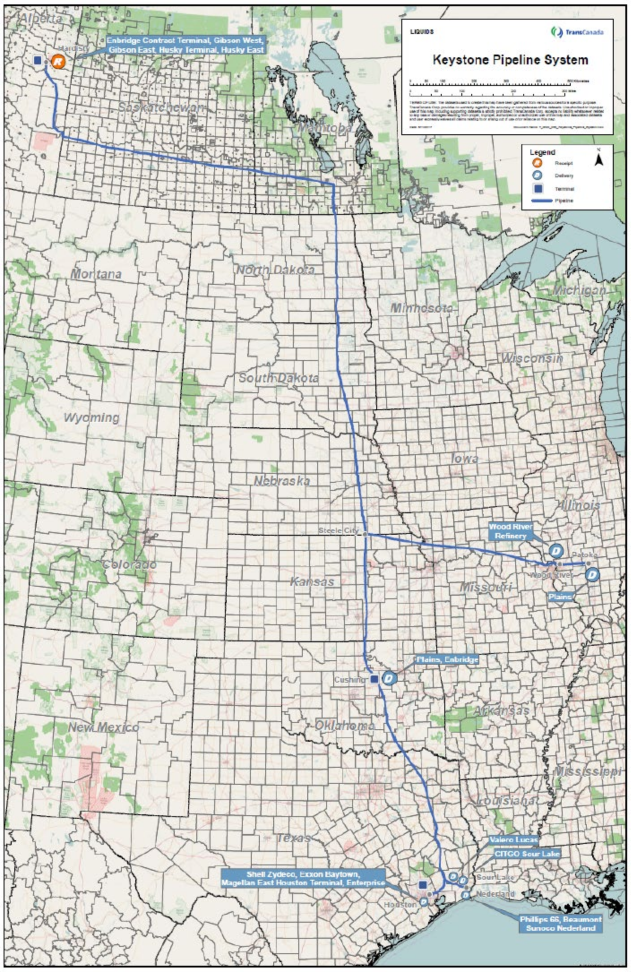
Source: EIA

Oil – Keystone to boost capacity, at least temporarily, by 110,000 b/d in Nov

Keystone adding 110,000 b/d capacity in Nov

Bloomberg confirmed the boost to Keystone capacity is temporary ie. only Nov and Dec. Last week's (Oct 9, 2022) Energy Tidbits memo said "*It looks like an overlooked tidbit from TC Energy Q2 release/call on July 28 is coming true – Keystone is add capacity in Nov, reportedly increasing capacity by 110,000 b/d to take capacity to ~720,000 b/d. Hopefully, this temporary boost to capacity can withstand any tests such that it could turn into a permanent capacity addition. We just do not know at this time if it will be permanent. But we don't think TC Energy would test to this level if they didn't think it could be a permanent change.* On Thursday, Argus reported [LINK] "*TC Energy's Keystone Pipeline system will be able to handle up to an additional 110,000 b/d of crude starting in early November, according to a notification sent to shippers. The notification seen by Argus indicates shippers will have room to ship as much as 720,000 b/d of crude on the system starting around 7 November, up from the 610,000 b/d reported in July.*" We didn't know if the test of higher capacity was one or two months, but, on Wednesday, Bloomberg confirmed it was a two-month test, writing "*-- TC Energy plans to initiate a temporary increase in flow rate on segments of the Keystone Pipeline System from November, according to an emailed statement. * Higher flows will last through December, testing the system's operational performance and reliability * Upon completion of test, TC Energy will lower flow rate to current system throughput of 622k b/d * Co. declined to say how much flows will be raised.*" We do not believe TC Energy would be doing this two-month test unless they were trying to determine where they can take capacity to based on the current pipeline capabilities.

Figure 28: Keystone Pipeline System



Source: TC Energy

Oil – Cdn oil differentials widened again this week

No surprise, Cdn WCS oil prices continue to underperform, which means there has been a widening of the WCS/WTI differential. BP's 430,000 b/d Whiting refinery and BP's 160,000 b/d Toledo refinery going down have led to a widening of the WCS/WTI differential. The differential widened this week from $24.85 last Friday, hitting $32.50 on Wed, before closing at $29.50 on Friday. This more than double the year ago differential of $14.35 on Oct 14, 2021.

Cdn oil differentials hit this week

Figure 29: WCS/WTI oil differential

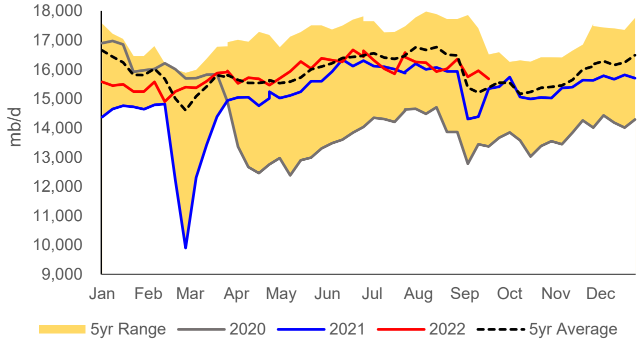
Source: EIA, Bloomberg

Oil – Refinery inputs -0.279 mmb/d WoW to 15.683 mmb/d

Refinery inputs down WoW

Sept and Oct are normally seasonal periods that see the trend to lower crude oil inputs to refineries as they do turnarounds to produce more winter blends. There can be up weeks, but the general trend is down as we saw this week. On Thursday, the EIA released its estimated crude oil input to refinery data for the week ended Oct 7. The EIA reported crude oil inputs to refineries down -0.279 mmb/d WoW to 15.683 mm/d, which is +0.622 mmb/d YoY from 15.061 mmb/d for the week ended Oct 8, 2021. Note last year's week ended Oct 15, refineries continued to recover from the impacts of Covid and Hurricane Ida Total products supplied (i.e., demand) decreased -1.560 mmb/d WoW to 19.271 mmb/d. Motor gasoline was down -1.189 mmb/d WoW to 8.276 mmb/d. The 4-week average for Motor Gasoline supplied was down -0.505 mmb/d to 8.722 mmb/d.

Figure 30: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – US "net" oil imports up 1.795 mmb/d WoW at 3.191 mmb/d

US "net" oil imports up WoW

US "NET" imports were up 1.795 mmb/d to 3.191 mmb/d for the Oct 7 week. US imports were up 0.116 mmb/d to 6.063 mmb/d. US exports were down -1.679 mmb/d to 2.872 mmb/d. The WoW increase in US oil imports was driven by US's "Others" imports by country which were up by 0.273 mmb/d while Top 10 fell. Some items to note on the by country data. (i) Canada was up immaterially this week by 0.002 mmb/d to 3.300 mmb/d. (ii) Saudi Arabia was down 0.028 mmb/d to 0.370 mmb/d this week. (iii) Colombia was down -0.118 at

0.242 mmb/d. (iv) Ecuador was down 0.067 mmb/d at 0.136 mmb/d. (v) Iraq was down 0.166 mmb/d to 0.109 mmb/d. (vi) Mexico was up 0.220 mmb/d to 0.759 mmb/d.

Figure 31: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Aug 5/22	Aug 12/22	Aug 19/22	Aug 26/22	Sep 2/22	Sep 9/22	Sep 16/22	Sep 23/22	Sep 30/22	Oct 7/22	WoW
Canada	3,351	3,455	3,834	3,093	3,538	2,937	3,868	3,775	3,298	3,300	2
Saudi Arabia	412	244	247	330	423	425	489	422	398	370	-28
Venezuela	0	0	0	0	0	0	0	0	0	0	0
Mexico	710	661	503	440	965	484	855	598	539	759	220
Colombia	174	214	143	289	261	288	212	72	360	242	-118
Iraq	181	163	225	401	222	343	120	202	275	109	-166
Ecuador	212	36	278	231	144	199	319	191	203	136	-67
Nigeria	161	253	72	137	2	232	0	0	0	0	0
Kuwait	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0
Top 10	5,201	5,026	5,302	4,921	5,555	4,908	5,863	5,260	5,073	4,916	-157
Others	970	1,106	869	1,035	1,224	884	1,084	1,189	874	1,147	273
Total US	6,171	6,132	6,171	5,956	6,779	5,792	6,947	6,449	5,947	6,063	116

Source: EIA

Oil – Looks like no Pemex damage from Tropical Storm Karl

Tropical Storm Karl

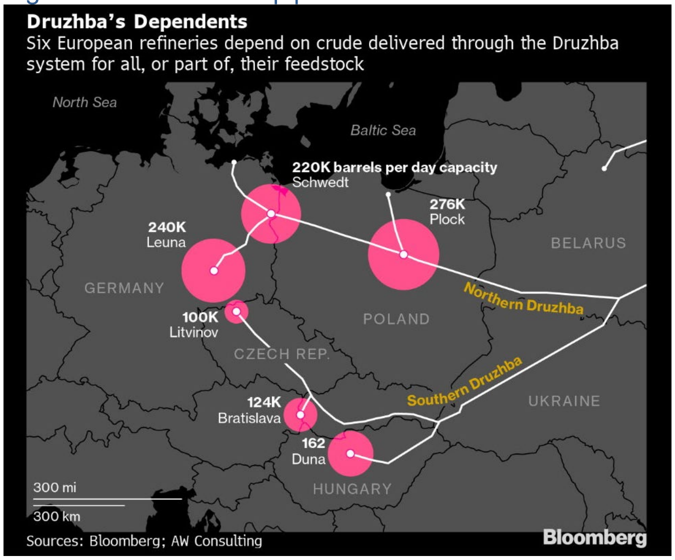
On Friday morning, we tweeted [LINK] *"#TropicalStormKarl not currently feared to have caused any damage, looks to have passed slightly north of major #Pemex offshore oil fields, but some offshore terminals & onshore facilities/refineries may be in its pat Decreasing wind speed, will watch how much water dumped. #OOTT*." As of our 7am MT news cut off, Karl has passed thru the onshore facilities below tropical storm strength and we have not seen any reports of damage to Pemex's offshore oil fields or onshore facilities including the being completed Dos Bocas oil refinery. Our tweet included an except from Pemex's Oct 14 morning update on weather and status of each facilities, which shows which facilities were suspended during the storm. Our Supplemental Documents package includes the Pemex posts attachments to our Friday morning tweet.

Oil – Druzhba oil to Germany was restored yesterday, no signs of 3rd party interference

Druzhba oil restored to Germany

Yesterday, Pern reported [LINK] "*On Saturday, PERN technical services restored the full functionality of the pipeline thread damaged a few days ago, which supplies crude oil to the company's German customers. Currently, deliveries are carried out using both pipelines of the Western Section. The causes that led to the unsealing are being investigated*." On Wednesday PERN reported [LINK] "*After removing most of the debris from the area near the oil pipeline damaged yesterday, PERN technical services located the site of the spill. From the first findings and from the method of deformation of the pipeline, it appears that at the moment there are no signs of interference by third parties. However, detailed analyzes are underway, the aim of which is to determine the cause of the incident and repair the bus so that the pressing of raw material starts as soon as possible."* PERN has not made any other formal updates on potential third party interference. So, with the caveat "at the moment", PERN is putting out a view that no signs of third party interference. Our Supplemental Documents package includes the PERN releases.

Figure 32: Druzhba oil pipeline



Source: Bloomberg

Oil – Putin won't sell oil to price cap countries, US thinks he will sell oil at cheap prices

Putin: won't sell oil to price cap countries

US seems to believe Putin will not shut in oil production, but will sell oil as long Russia is making a modest profit on oil sales. It is for this reason that it seems many, not just Russia, believe the US/EU plan for a price cap for oil is likely to backfire on the US/EU. (i) Putin reiterated what Novak said last week, Russia will not sell oil to any companies agreeing to a price cap. Putin said "*I am here to say one thing: Russia will not act contrary to common sense or underwrite someone else's prosperity. We are not going to supply energy to the countries that introduce price caps. I want to tell those who prefer con jobs and shameless blackmail to business partnerships and market mechanisms – we have been living in this political paradigm for decades now – you should know that we will not do anything that disadvantages us*." (ii) But the US believes Russia should want to continue to keep selling oil under a price cap because a $60 oil price is still profitable to Russia. Their logic is that Russia should want to sell oil at a modest profit rather than shut it in. Basically, they believe Russia will sell oil rather than shut it in. On Wednesday, Reuters reported [LINK] "*Yellen said that Russia has been willing to produce and sell oil in the $60 range over the past five to seven years. "So certainly a price in that range would be sufficient to feel that Russia could profitably produce and sell oil," Yellen said, adding that Russia's cost of production was "low*."

Oil – OPEC MOMR, lowering of demand forecasts with continued downside in China

OPEC MOMR

On Wednesday, OPEC released its Monthly Oil Market Report at 6 am MT. Oil was down Wednesday morning with a negative takeaway from reduced demand forecasts even though OPEC Security General warned this. Reminder that on Friday, Energy Intelligence Group interviewed OPEC Secretary General Haitham al-Ghais *"I think we will be showing a reduction in our demand growth forecast for 2022 and 2023. This is in line with the views ... [of] a potential global slowdown in the economy."* (i) The headlines from the MOMR is negative with the reduction in oil demand forecasts for 2022 and 2023. A small narrowing of the OECD stocks deficit of crude oil and products relative to the 2015-2019 average is positive. (ii) YoY demand growth lowered for 2022 at +2.64 mmb/d to 99.67 mmb/d, and for 2023 at +2.34 mmb/d to 102.02 mmb/d. 2023 is above pre-Covid 2019 of 100.20 mmb/d. (iii) China demand. These reports are normally carefully drafted so we always wonder why they change words. OPEC is probably no different than most and doesn't know what Xi will do on Covid Zero policy. The Oct MOMR continued the uncertainty on a post Covid recovery. In Oct MOMR, they write "*Global oil demand growth in 2022 is revised down by 0.5 mb/d to reflect the recent macroeconomic trends and oil demand developments in various regions. These developments include the extension of China's zero-COVID-19 restrictions in some regions, economic challenges in OECD Europe, and inflationary pressures in other key economies, which have weighed on oil demand, especially in 2H22*". In the Sept MOMR, they write "*In 2023, expectations for healthy global economic growth, combined with anticipated improvements in the containment of COVID-19 in China, are expected to boost oil consumption*". (iv) Non-OPEC supply. Immaterial changes to YoY growth for 2022 of +1.93 mmb/d to 65.60 mmb/d (was +2.11 mmb/d to 65.78 mmb/d, and for 2023 of +1.53 mmb/d (was +1.73) to 67.13 mmb/d (was 67.51 mmb/d). (v) OPEC Secondary Sources for Sept +146,000 b/d MoM to 29.767 mmb/d. For OPEC10 (the countries in the quota), they produced 25.339 mmb/d in Sep, well below the quota of 26.753 mmb/d. (vi) One difference in Direct Communications (what the OPEC countries report) is that Saudi says it produced 11.041 mmb/d, which is right in line with their quota of 11.030 mmb/d for Sep. (vii) OECD inventories at Aug 31, small narrowing of deficit "crude only" stocks -133 mmb (vs July -144), product stocks -140 mmb (vs July -127) below 2015-2019 average. Our Supplemental Documents package includes excerpts from the OPEC MOMR Oct.

Oil – IEA OMR: Global demand revised downward, another OECD stock build

IEA Oil Market Report

On Thursday, the IEA released its monthly Oil Market Report for Oct at 2am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) 2022 oil demand growth reduced by 60,000 b/d to 99.6 mmb/d in 2022 and 0.470 mmb/d to 101.3 mmb/d in 2023. (ii) 2022 is still below pre-Covid of 100.4 mmb/d in 2019. (ii) China demand drops in addition to risks in European and developing economies. The EIA wrote "*our revisions are underpinned by further downgrades to global GDP growth expectations from major institutions, with recession now expected in several European countries and risks increasing for emerging and developing economies*". Oct OMR has China 2022 at 14.8 mmb/d, down 0.2 mmb/d vs Sept OMR of 15.0 mmb/d. IEA writes "*Asia will account for 96% of next year's expected 1.7m b/d global oil demand growth, the International Energy Agency said in its monthly Oil Market Report. Gradual rebound in Chinese activity is single biggest part of next year's demand gains, contributing 810k b/d.*" (iii) Q3/22 refinery runs came in lower than expected and EIA wrote *"our forecasts for 4Q22 and 2023 have been revised down by 340 kb/d and 720 kb/d, respectively, following demand downgrades and OPEC+ production cuts. Runs are now expected to increase by 2.2 mb/d in 2022 and 1.2 mb/d next year."* (iv) Non-OPEC supply YOY growth is unchanged for both 2022 and 2023. Oct OMR non-OPEC supply is +1.8 mmb/d to 65.5 mmb/d for 2022, and +0.7 mmb/d to 66.2 mmb/d for 2023. (v) Immaterial changes to call on OPEC for 2022 at 28.8 mmb/d (unchanged) and for 2023 at 29.8 mmb/d (was 30.1). (vi) OPEC Aug production was +680,000 b/d to 29.72 mmb/d led by Libya +80,000 b/d MoM, Saudi +70,000 b/d, UAE +40,000 b/d MoM and Venezuela +60,000 b/d MoM. Nigeria was -100,000 b/d MoM to 0.98 mmb/d and below Angola of 1.18 mmb/d. (vii)

Saudi of 11.03 mmb/d for Aug is below what OPEC MOMR reported as Direct Communications from Saudi of 11.041 mmb/d. (viii) The EIA highlighted OPEC+ cuts as a key catalyst to tip the worlds economy. IEA wrote "*The OPEC+ bloc's plan to sharply curtail oil supplies to the market has derailed the growth trajectory of oil supply through the remainder of this year and next, with the resulting higher price levels exacerbating market volatility and heightening energy security concerns. Benchmark crude oil prices spiked by around $14/bbl from a September low and Brent once again flirted with triple digits. With unrelenting inflationary pressures and interest rate hikes taking their toll, higher oil prices may prove the tipping point for a global economy already on the brink of recession*." (ix) Refinery throughput was cut into 2023, resulting in a net draw in products. The EIA wrote "*Refinery runs will rise by less than previously forecast as OPEC+ curbs push up feedstock costs at a time when the global economy is fragile.* (x) OECD crude oil inventories on August 31 were 243.0 mmb below the five-year average vs 274.9 mmb at July 31. Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 33: 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
Oct 22	91.0	97.7	6.7	99.4	98.5	100.0	100.6	99.6	1.9	99.5	100.4	102.1	102.9	101.3	1.7
Sep 22	91.0	97.7	6.7	99.5	98.4	99.9	100.9	99.7	2.0	100.2	101.0	102.6	103.3	101.8	2.1
Aug-22	91.0	97.6	6.6	99.4	98.5	100.0	100.8	99.7	2.1	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	102.0	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	100.0	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	99.0	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						

Source: IEA, SAF

Oil – Aramco CEO oil "*demand will continue to grow to 2030 and beyond*"

Aramco peak oil demand sometime after 2030

Last week's (Oct 2, 2022) Energy Tidbits memo noted Saudi Aramco CEO Nasser's comments on how the lack of surplus capacity and that Saudi Arabia can get to its 12 mmb/d maximum sustainable capacity in 30 days. The Energy Intelligence Group posted the full interview with Nasser and it included a number of other oil and energy insights. (i) Saudi Arabia doesn't see peak oil demand until sometime after 2030. Nasser's demand is a good example to try to see what he said. We saw reports last week that he thought demand would increase until 2030 (ie. Peak oil demand was 2030), and that wasn't what he said. Nasser said "*For us, what we believe is that demand will continue to grow to 2030 and beyond. And that's where we made the decision, as I said, in 2020, to expand our capacity to 13 million b/d. If you think about it today, alternatives, solar, wind, only contribute 2% to the primary industry, 10% in electric power, electric cars 2% of the total global fleet. So, alternatives are not ready yet. Until they are ready, we need to work in parallel*." (ii) Thinks Europe can get thru on oil, but more difficult for natural gas and LNG. Nasser was asked how prepared Europe was for the embargoes. Nasser replied "*Crude oil, it's a fungible commodity. It will be shifting. The issue, I think, for Europe is gas and LNG because there is no spare capacity available. These are all in long-term contracts. As you drop supply coming from Russia, no one else really can step up and meet the additional demand. So, it is going to be a major* *issue for Europe when it comes to gas and LNG. For crude oil, you know, these are markets and you know the right price crude will be shifting from one location to the other*." (iii) Saudi's natural gas development is to allow them to stop burning oil for electricity and for turning into blue hydrogen for export. Nasser said "*We are going to export hydrogen, blue hydrogen. So, our priority, you know, we are expanding our gas by close to 60% over the next eight years, which is significant growth in gas, and this is to satisfy local demand and eliminate liquid burning in the kingdom. We have close to a million barrels liquid burning in the kingdom. It will improve the economics, in terms of using gas*." Our Supplemental Documents package includes the EIG interview.

Oil – Hard to see an easy off ramp for the escalating US vs Saudi conflict

US/Saudi relationship crumbling

One of the big oil stories for the 2020s has to be how the US/ Saudi relationship seems to be crumbling before our eyes. The Biden/Saudi relationship started off negative based on Biden's election comments on Saudi Arabia and MBS. But Biden's June trip to Saudi Arabia and meeting with MBS seemed to be Biden's olive branch. But that went with the OPEC+ 2 mmb/d cut. We have a 7am MT news cut off so it's ahead of the Sunday political talk shows, but we expect the increasing US rhetoric against Saudi Arabia will be one of the major speaking points. We had a number of tweets of the various he said/she said, but the simple recap is OPEC surprised with a 2 mmb/d cut (real or not) vs expectations of 1 mmb/d, US says Saudi forced the bigger cut to side with Russia, Saudi posts a statement that OPEC decision was based on technical reasons not political reasons, Biden says will look at ways to come back against Saudi Arabia. Everyone has a view on who will give in first or if no one will give in. Our concern is that it is becoming increasingly difficult to see an easy off ramp for either the US or Saudi Arabia that allows both sides to save face. Biden has spoken of trying to find a way out for Putin to end Ukraine and save face and power, but hasn't taken that view for Saudi Arabia. Everyone knows that this stance was part of the Midterms politics, but we have to wonder if Biden thought it would get to this level. Unfortunately, for Biden given his name calling of MBS during his election run, unless Biden assumes there will be an overthrow of MBS, we find it hard to believe MBS will cave in. We find it hard to see an easy off ramp in the run up to the midterms. And we are increasingly of the view that, combined with Biden's previous comments on MBS, it looks like the US/Saudi relationship has changed. If so, it is a positive to oil prices for the 2020s.

No one should be surprised MBS doesn't just give in to Biden

On Tuesday, we tweeted [LINK] "*save yourself time if you are wondering how Saudi will respond to #Biden reevaluating the US/KSA relationship. see 👇#MBS addressed this specific issue "Go for it!". positive for #Oil. OOTT*." Our tweet included a link to The Atlantic's March 3 interview with MBS. Here is what we wrote in our March 6, 2022 Energy Tidbits memo. "*The Atlantic's March 3 report "Absolute Power" [LINK] based on its interviews Saudi crown prince Mohammed bin Salman got some good headlines. MBS says their "aim is to keep it and strengthen it" talking about their long historical relationship with the US. The headlines were on his Biden comments and warning to not interfere in Saudi domestic issues. The Atlantic wrote "We asked whether Biden misunderstands something about him. "Simply, I do not care," he replied. Alienating the Saudi monarchy, he suggested, would harm Biden's position. "It's up to him to think about the interests of America." He gave a shrug. "Go for it." For now, MBS's main request to the outside world, and especially the United States,* *is the usual request of misbehaving autocrats—namely, to stay out of his internal affairs. "We don't have the right to lecture you in America," he said. "The same goes the other way." Saudi affairs are for Saudis. "You don't have the right to interfere in our interior issues." It reminds that no one should expect the Saudi's to bend over in anyway to the US on oil. The problem for Biden and the Democrats is that it's difficult to reverse their view on MBS. We look at it as another of the situations where Biden and the Democrats like to have a villain to make sure they can get people onside their views. But by doing so, it makes it difficult for Biden to back track in a public way. It's like now with the oil companies, they really can't say anything positive about them or ask them to help without looking very weak. They made the oil companies the villains to sell energy transition for so long. How can they go back and say something good. They made MBS out to be a huge villain, Biden's team making it clear that Biden wouldn't meet or talk with MBS, only the King, they pulled out a Patriot missile defense system from Saudi Arabia, and have supposedly not given in to Saudi's request for more Patriot missiles to replace the shot missiles. So no surprise by the MBS comments on US. And unfortunately for the US, it means that Saudi isn't likely to help the US unless it helps them. We will be watching to see if there are reports on restocking Patriot missiles and any potential MBS/Biden meeting. Our Supplemental Documents package includes The Atlantic report."*

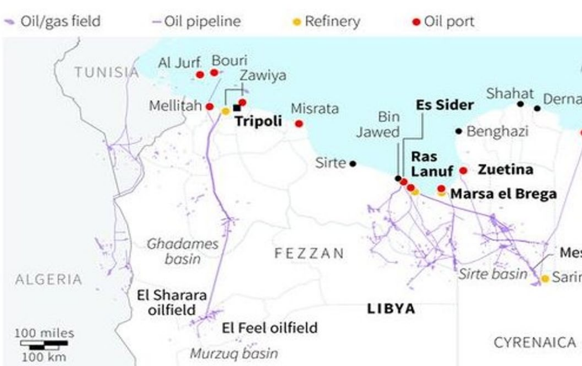
Oil – Libya oil production has been stable, now 1.2 mmb/d on Monday

Libya now 1.2 mmb/d

There has been relative quiet in Libya over the past two weeks in terms of internal conflicts/skirmishes. And not surprise, that has led to stable LIbya oil production, which was up small in the last two weeks. It recently fell to under 1.2 mmb/d at 1.186 mmb/d, but, on Monday, Alwasat reported [LINK] "*Libya's oil production is running at 1.208 million barrels per day, the National Oil Corporation (NOC) said in a statement on Monday, an increase of 3,000 barrels compared to the previous 24-hour period. Condensate production amounted to 51,000 barrels during the past 24 hours".*

Figure 34: Libya Ports, Major oilfields and Terminals map

SAF Group Compiled Libya Ports & Terminals Status



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

Source: Bloomberg, HFI Research, SAF

Source: SAF Group

Oil – Vitol Mike Muller "*don't think we're going to see any snap in China [oil] demand*"

Vitol Asia Head Mike Muiller

We had a lot of comments on our item from last week's (Oct 9, 2022) Energy Tidbits memo on the early Sunday morning comments from Mike Muller, Head Vitol Asia, especially so after the market theme on Monday was on weakness in China. Here is what we wrote last week "*Earlier this morning, we tweeted [LINK] "#Vitol warns China demand. "CN demand is really down, petrochemicals in particular" "don't think we're going to see any snap in CN demand" 10/16 congress, "don't see any fundamental changes, certainly not affecting oil demand. Thx @michaelwmuller @sean_evers @CrystolEnergy. #OOTT." Mike Muller is Head, Vitol Asia. We created a transcript of Muller's China oil demand comments from the Gulf Intelligence Daily Energy Markets podcast this morning. [LINK]. Muller was asked for his views Coming out of China's national congress that starts on Oct 16 regarding the typical increase in Chinese oil demand that happens in the run up to Chinese new year. Muller warned that on near term China oil demand. The feedback from Chinese business people who were in Singapore last week was that easing of Covid restrictions would be gradual. But he is more concerned about the weak economic and productivity data, and that China isn't seeing any lift as Germany heaving industries are being shut down, which he says "it's clearly not happening in China where it should be happening. So that tells you that Chinese demand is really down, petrochemicals in particular. So, I think China is going to take quite some time to deleverage its property problem, the evergrand issue and all that. And I don't think we're going to see any snap in Chinese demand. There may be some headlines coming out of next Sunday which give the market reasons to buy the market, but I don't' see any huge fundamental changes, certainly not affecting oil demand." Our Supplemental Documents package includes the transcript we made of Muller's china oil demand comments."*

Indicator Xi still wants Zero Covid – everyone masked up for his speech

We watched the first 45 minutes or so of Xi's speech. After about 30 minutes, we tweeted [LINK] "*full mask on in china party congress during xi speech. xi has been soaking for over 30 min and no signs of an end to his speech*." It's a reminder that China will be moving out of Covid restrictions in a cautious manner. We have to believe with Chinese new year only ~3 months away, Xi doesn't want to have a broad Covid outbreak that could disrupt Chinese New Year.

Figure 35: Xi speech at party congress

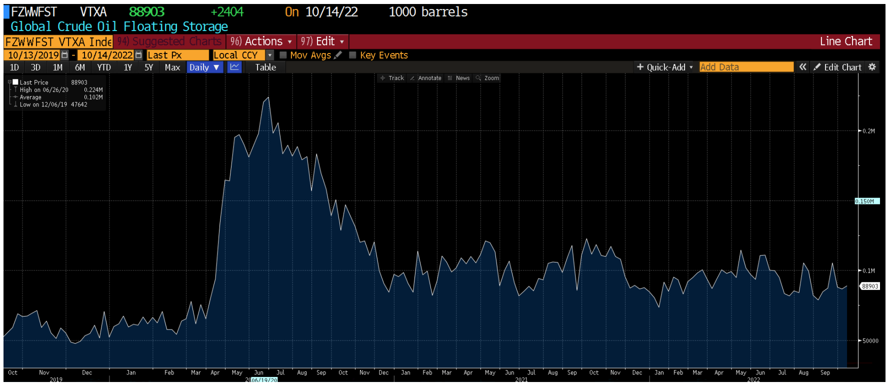
Source: SAF Group

Oil – Vortexa crude oil floating storage 88.90 mmb as of Oct 14, +2.40 mmb WoW

Vortexa crude oil floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 9am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments today on the new estimates are compared to the prior weeks Vortexa estimates posted on Bloomberg on Oct 8 at noon MT. (i) As of 9am MT yesterday, Bloomberg has posted Vortexa crude oil floating storage estimate for Oct 14 at 88.90 mmb, which is +2.40 mmb WoW from upwardly revised Oct 7 of 86.5 mmb. Note Oct 7 was revised up +6.44 mmb vs 80.06 mmb posted on Bloomberg at noon MT on Oct 8. (ii) Note that the revisions, other than Oct 7, were downward revisions.. The revisions posted yesterday vs the estimates posted on Bloomberg at noon MT on Oct 8 were: Oct 7 revised +6.44 mmb. Sept 30 revised -3.58 mmb. Sept 23 revised -3.13 mmb. Sept 16 revised -1.55 mmb. Sept 9 revised -2.22 mmb.. Sept 2 revised -3.03 mmb. (iii) Even with the revisions, other than the Sept 23 week, the last several weeks are generally +/- 85 mmb, the same comment as in last week's review. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) Oct 14 estimate of 88.90 mmb is -134.97 mmb vs the post-Covid peak on June 26, 2020 of 223.87 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 Q2/20 as Covid started to have a huge impact. Oct 14 estimate of 88.90 mmb is +36.61 mmb vs pre-Covid Oct 15, 2019 of 52.29 mmb Oct 14 estimate of 88.90 mmb is -29.64 mmb YoY vs Oct 15, 2021 of 118.54 mmb. (vii) Below are the last several weeks of estimates made as of yesterday 9am MT, noon MT on Oct 8, and 1pm MT on Oct 1.

Figure 36: Vortexa Floating Storage posted on Bloomberg Oct 15 at 9am MT



Source: Bloomberg, Vortexa

Figure 37: Vortexa Estimates Posted Oct 15 9am MT, Oct 8 noon MT, Oct 1 1pm MT

Posted Oct 15, 9am MT

FZWWFST VTXA Inde 10/13/2019 - 10/14/2022

	Date	FZWWFST VT... Last Px
Fr	10/14/2022	88903
Fr	10/07/2022	86499
Fr	09/30/2022	88038
Fr	09/23/2022	105.145k
Fr	09/16/2022	87340
Fr	09/09/2022	84573
Fr	09/02/2022	78835
Fr	08/26/2022	82138
Fr	08/19/2022	99524
Fr	08/12/2022	105.208k
Fr	08/05/2022	84107

Oct 8, noon MT

FZWWFST VTXA Inde 10/06/2019 - 10/07/2022

	Date	FZWWFST VT... Last Px
Fr	10/07/2022	80058
Fr	09/30/2022	91626
Fr	09/23/2022	108.283k
Fr	09/16/2022	88888
Fr	09/09/2022	86788
Fr	09/02/2022	81871
Fr	08/26/2022	84858
Fr	08/19/2022	101.811k
Fr	08/12/2022	106.383k
Fr	08/05/2022	85899
Fr	07/29/2022	87983

Oct 1, 1pm MT

FZWWFST VTXA Inde 09/29/2019 - 09/30/2022

	Date	FZWWFST VT... Last Px
Fr	09/30/2022	91246
Fr	09/23/2022	107.516k
Fr	09/16/2022	93751
Fr	09/09/2022	93139
Fr	09/02/2022	86098
Fr	08/26/2022	83843
Fr	08/19/2022	107.837k
Fr	08/12/2022	111.844k
Fr	08/05/2022	90967
Fr	07/29/2022	91221
Fr	07/22/2022	86950

Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: U.S. Gasoline Usage Above Five-Year Range

Bloomberg Oil Demand Monitor

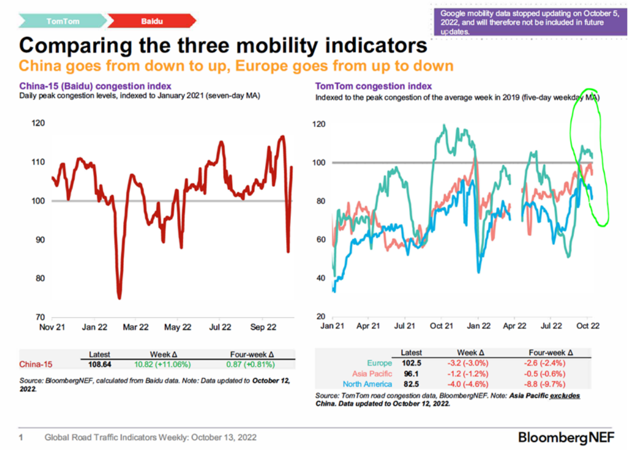
We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The Oil Demand Monitor noted U.S. gasoline usage (per EIA gasoline supplied data) is now above the five-year average and air travel finished the month of September down -10% YoY, which was -14% earlier in the month. U.S. gasoline demand bounced higher in late September while Indian road fuel sales remained comfortably above pre-pandemic levels. Holidays put a dent in road traffic in early October in some countries, including a week-long vacation in most of China. The number of worldwide commercial airline flights has moved up so far in October, further narrowing the gap to pre-covid levels. Demand for gasoline from American drivers jumped higher in the last week of September, peaking just above the five-year range to about 9.5 mmb/d. It's hard to know whether the EIA numbers will stay at the estimated level as there is a renewed headwind of the upswing in gasoline pump prices, especially after last week's decision by the OPEC+ to cut oil production. Car use in the UK still has not fully returned to pre-pandemic levels. When measured against the 2020 baseline, car usage was down 7% and combined diesel and gasoline sales were down 9%. Inner city traffic weakened around the globe with only two of 13 cities regularly tracked in this monitor showing higher-than-2019-average congestion levels, down from four the prior week. Traffic congestion in Chinese cities dropped in the first few days of October amid national holidays and continued coronavirus restrictions in some places. The index tracking congestion in China's 15 biggest cities showed a drop below the baseline for the first time since May 10, 2022. A key measure of the strength of the jet-fuel consumption airline industry is the number of commercial flights worldwide. Recently there has been an uptick with the global number currently trailing 2019 by 10%, which is an improvement from early September when it was down by 14%. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Oil – BNEF, Global mobility down WoW, while China mobility increases

Mobility down globally, China jumps

We are big fans of the BloombergNEF weekly indicators reports as they provide updates on WoW changes, but also provide some good graphs that show trends. Inflation and cost of living challenges are the big news story everywhere in the world and people having less cash in their pockets has to impact spending, including on driving. On Thursday, BloomergNEF posted its Global Road Traffic Indicators which highlighted that globally mobility decreased, however China again was the odd one out and posted an increase WoW. But, as we circled on the below right hand graph, the TomTom indicators are showing some softness in the past few weeks. Over the last couple weeks TomTom trends are moving lower relative to 2019 as all three regions dropped WoW. So it's worth keeping an eye on these indicators as they are happening at the same time as places like the US have seen lower gasoline prices. TomTom congestion index showed Europe down 3.0%, Asia Pacific down 1.2%, China up 11.1%, and North America down 4.6% from last week. Europe and North America are bearish and subject to drivers responding to rising cost, including high gasoline prices. China's mobility data highlights the increase in congestion due to National Day ending on October 7.

Figure 38: BloombergNEF Mobility Indicators



Source: BloombergNEF

Energy Transition – Xi says won't discard fossil fuels until clean energy is ready

China not discarding fossil fuels

No surprise, Xi is saying China will only take a realistic approach to clean energy – it won't abandon fossil fuels until clean energy is ready to take over. We only listened to about 45 minutes of Xi's speech last night, so didn't see his energy transition comments until this morning. Earlier this morning, we tweeted [LINK] "*Anti-West or common sense to avoid energy crisis? Xi: China "will advance initiatives to reach peak carbon emissions in a well-planned and phased way, in line with the principle of getting the new before discarding the old". Thx @danmurtaugh @luzdingyu. #OOTT #NatGas #Coal".* Bloomberg reported on quotes from Xi's address including ""*We will work actively and prudently toward the goals of reaching peak carbon emissions and carbon neutrality," Xi said in his address. "Based on China's energy and resource endowments, we will advance initiatives to reach peak carbon* *emissions in a well-planned and phased way, in line with the principle of getting the new before discarding the old."* Xi also highlighted coal is not going away. Xi said "*Coal will be used in a cleaner and more efficient way and we will speed up the planning and development of new energy systems."* Our Supplemental Documents package includes the Bloomberg report.

JP Morgan CEO Dimon warns need fossil fuels to make the energy transition
Later, we highlighted JP Morgan CEO Jamie Dimon's warning on markets. But, on Monday, he also reminded of his fossil fuels views. CNBC reported [LINK] ""*In my view, America should have been pumping more oil and gas and it should have been supported," Dimon told CNBC's Julianna Tatelbaum at the JPM Techstars conference in London*." ""*We have a longer-term problem now, which is the world is not producing enough oil and gas to reduce coal, make the transition [to green energy], produce security for people," he said"*.

Energy Transition – Chevron CEO calls out Biden Admin for lack of energy expertise

Chevron calls out Biden admin

It was a WOW interview, that's for sure. It's extremely rare to get a supermajor CEO to make blunt statements on their government capabilities and the results of their policies. But that was the case in the FT's Thursday interview with Chevron CEO Mike Wirth. [LINK]. There were multiple blunt assessments and we tweeted on one of them. We tweeted [LINK] ""*There's not a lot of deep energy expertise in the administration. There's a point of view that you find quite visible in the administration that we can move from system A to system B very quickly and easily. And it's not that simple" see 👇for more blunt $CVX CEO views. #OOTT*." Wirth also reminded ow the energy transition just assumed no issues on energy affordability or security. Wirth said ""*The conversation [about energy] in the developed world for sure has skewed towards climate, taking affordability and security for granted".* There was more in the FT interview. Our Supplemental Documents package includes the FT interview.

Energy Transition – EU just can't say need affordable, available energy & raw materials

EU needs energy and raw materials

Later in the memo, we highlight the must read EU high representative Josep Borrell speech. It is a stark warning to Europe and a must read. But, in his speech, is also something that annoys us – western leaders just can't come out and say they need fossil fuels to provide affordable, available, reliable energy to power their worlds. Rather, Borrell says "*We have to be a little bit out of the crisis mode. This will require thinking more about how technology is reshaping the world and the nexus between energy, climate and raw materials*." We think this is western leader code for they have to realize that they need some sort of available, affordable energy and raw materials.

Energy Transition – Chevron CEO doesn't see people stop driving, flying

Chevron CEO on people's behavior

Chevron CEO Mike Wirth's FT interview also noted that he doesn't see people want to move backwards in their quality of life. However, Wirth didn't address what most overlook – all emissions reductions plans include a reduction of emissions from behaviour changes. Wirth didn't tell the FT do people know what they will be expected to do to cut the emissions to reach Net Zero? Rather, Wirth said what pretty well everyone believe – people don't want to go backwards in their quality of life. FT wrote ""*If people want to stop driving, stop flying . . . that's a choice for society," he said. "I don't think most people want to move backwards in terms of their quality of their life . . . our products enable that*."

July 2021, UK suggested individual behavioral changes to get to Net Zero

Here is what we wrote in our Aug 1, 2021 Energy Tidbits. "*It looks like many, at least in the UK, don't realized that all plans and forecasts for Net Zero involve individual behavioural changes as a key factor to reach lower emissions targets. And that these individual behavioural changes are much more than involved with transportation. The IEA's recent "Net Zero by 2050: A Roadmap for the Global Energy Sector" wrote "Behavioural changes are important in reducing energy demand in transport, buildings and industry. If the changes in behaviour assumed in the NZE were not attainable, emissions would be around 2.6 Gt CO2 higher in 2050. Avoiding these emissions through the use of additional low-carbon electricity and hydrogen would cost an additional USD 4 trillion." This will be a huge government messaging/information campaign for the foreseeable future. Its much more than turning setting your thermostat to cooler temperatures in the winter and your air conditioner to higher temperatures in the summer. There will be all these little tips on how to reduce an individual's energy footprint. And, as we saw in the UK this week, people got angered by as the UK drilled down and decided to note some of these "micro-steps" individuals should make to fight climate change. Its why we felt sorry for UK COP-26 spokeswoman, Allegra Stratton, being ridiculed for her article in The Daily Telegraph suggesting the British public can take "micro-steps" to help in the climate crisis. We couldn't access The Daily Telegraph but all the UK press jumped in on the Stratton article. The Independent wrote [LINK] "So the headline suggestion from Boris Johnson's Cop26 spokesperson, Allegra Stratton, that the British public can help tackle the climate crisis through "micro-steps" such as not rinsing dishes before putting them in the dishwasher, or by putting bread in the freezer to help it last longer, has drawn a broad array of criticism. In an article in The Daily Telegraph, she also suggested that consumers might buy shower gel in bar form, packaged in cardboard, and could consider walking rather than driving to the shops." We recognize that people got upset as the focus of her article was on individual micro-steps instead of focusing on big emitters. However, we remind that all plans/forecasts on how to get to Net Zero assume individuals make micro-steps to reduce their footprint."*

IEA's Net Zero pathway includes back to 60's before clothes dryer

The UK wasn't alone, rather they built upon the IEA's Net Zero pathway from May 2021 that behaviour changes are included in the emissions savings for the IEA's Net Zero pathway. Here is what we wrote in our May 30, 2021 Energy Tidbits. "*Wouldn't it be interesting if the IEA Net Zero pathway was adopted as a plan? There are many little tidbits in the pathway/plan that would catch people by surprise. Hopefully its never to Putin's extreme warning of sending people back to the caves if natural gas is gone. Rather for baby boomers in North America, it would be a back to the future of what it was like in the 60's to watch your mom do laundry. The IEA pathway/plan talks about needed behavioural changes "Behaviour changes are also important in the NZE, with a reduction of almost 250 Mt CO2 in 2030 reflecting changes in temperature settings for space heating or reducing excessive hot water temperatures. Additional behaviour changes such as greater use of cold temperature clothes washing and line drying, facilitate the decarbonisation of electricity supply." if* *this were to be the plan, then countries would ban the sale of clothes dryers much like they banned wood burning fireplaces. We didn't have a clothes dryer until the 70s and prior to that, my mom had the tub washing machine that had the hand ringer on the top to wring out the clothes so she could then go hang the clothes to dry on the clothes line in the back yard. The problem was during winter, when my dad would put up some makeshift clothes line anywhere he could find in our 900 sq ft post war house. Don't forget the 60's really pre-high rise apartment/condo living, it was move to suburbia. Clothes line drying is still common in most of the world outside developed western countries, but could you imagine seeing the typical family back to line drying in the backyard or from the apartment like in parts of Hong Kong?"*

Figure 39: Rigging a clothes line, Hong Kong clothes drying in highrise 2017

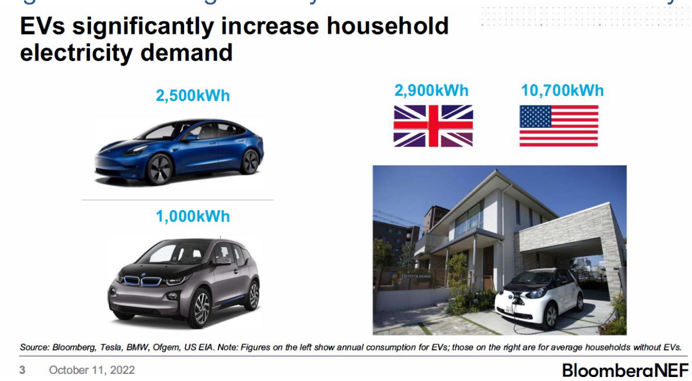
Source: Martha Stewart, A Day in the Kitchen

Energy Transition – BNEF, EVs pose huge challenge for household electricity demand.

EVs stress on household electricity

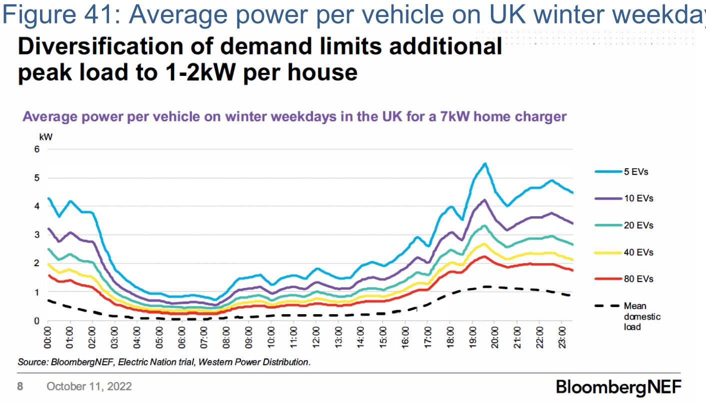
We recommend Bloomberg terminal users flip thru the BlombergNEF report "EVs in an Evolving Electricity Industry". (i) Note adjective "evolving", which is a buzzword for challenge. The executive summary says "*Passenger electric vehicles have surpassed 20% of total sales in China and Europe in recent quarters, and adoption is growing across the rest of the world too. By 2040, BloombergNEF expects there to be over 700 million EVs in the global fleet. While this bodes well for decarbonizing road transport, there are likely to be challenges ahead. Will electricity suppliers and grids be able to cope with demand? How will smart charging scale up? Has the current rise in electricity prices affected the industry? Will we be able to install the charging infrastructure required to sustain electric vehicle adoption?"* Everyone is following the challenges of the high cost of EVs, the increasing challenge to price from the need for critical metals, but one of the key highlights from BNEF is the impact of EVs on household electricity consumption. (ii) We tweeted [LINK] on the challenge for increasing household electricity consumtpion "*No one can deny world is on a path for #EVs to replace #ICE, but also many challenges = slower pace, bumpy adoption & more expensive ride to get there. ie. managing big increase in home #Electricity demand especially at peak hrs. Thx @BloombergNEF Ryan Fisher. #OOTT #NatGas* " We believe the world is put on a path of EVs growth, but it will take longer and cost more than expected. (iii) There will be a huge need to have electricity for EVs, and the peak hour electricity demand will get even worse. Electricity companies always worry about peak demand in the late afternoon from people coming home, turning on the TV, cooking dinner, etc. Throw the biggest individual usage of home electricity on top of that. There has to be a way for electricity companies to reduce home consumption ie. smart grids. In the future, everyone will have to be on a smart grid, just so the power can be restricted or cut off when needed. (iv) It links back to the electricity challenge. BNEF notes how EVs require a lot of electricity at home and will create a huge peak time power problem. So creates needs to smart charging systems and grid upgrades, and huge need for chargers everywhere. BNEF doesn't say it, but also creates opportunity/need for storage at home, and the big delay factor, transmission to get electricity to demand centers. (v) They don't mention energy savings/conservation, but we think this will be like the 70s and an increasing focus on devices, upgrades, enhancements to increase energy efficiency. The amount of incremental electricity usage at a home is significant, which will force a look for other places within a home or a business to save electricity. Below are two of the key household EV impact slides. Our Supplemental Documents package includes excerpts from the BNEF report.

Figure 40: EVs significantly increase household electricity demand



Source: BNEF

Figure 41: Average power per vehicle on UK winter weekdays for a 7kw EV charger



Source: BNEF

Capital Markets – Defining theme for 2020s? West makes it clear China is the big issue

West's anti-China position

This is not just a capital markets item, but an item that will impact all areas including oil and natural gas. But when we think about the US comments, the Jamie Dimon comments, the EU Borrell speech, the recent Deutsche Bank CEO speech, we have to believe the defining theme for the 2020s will be that the west's anti-China push means that world's economic norms have or will be changing. t's not just Russia/Ukraine war forcing a redo of global energy markets. It's the new long term battle driven by the US and, importantly, now Europe against China that will reshape supply chains, rare earths, etc. Don't' forget anti China is one of the few issues shared by Republicans and Democrats.

US Security Advisor Sullivan decisive decade to deal with China

The US view on China is unchanged. However, in the run up to the midterms, it has been an increasingly vocal position. And it was the big issue for the 2020s for the US in their national security strategy. Plus the US emphasizes this is the decisive decade to deal with China. On Wednesday, National Security Advisor Sullivan held a briefing on US National Security Strategy and highlighted China. Sullivan said "*And, finally, we need to set the rules of the road for the 21st Century in critical areas, from emerging technologies in cyberspace to trade, economics investment and more, both so that the international order continues to reflect our values and our interests and so that the international order is better designed to be able to take on the challenges ahead. So this decisive decade is critical both for defining the terms of competition, particularly with the PRC, and for getting ahead of massive challenges that, if we lose the time this decade, we will not be able to keep pace with most notably the climate crisis but -- but other challenges as well. Next, we recognize that in the geopolitical space the PRC represents America's most consequential geopolitical challenge. And while that will play out in the Indo-Pacific to a significant extent, there are global dimensions to the challenge as well. But this strategy also makes clear that we avoid seeing the world solely through the prism of strategic competition. And we will not try to divide the world into rigid blocks. We are not seeking to have competition tip over into confrontation or a new Cold War. And we are not engaging each country as simply a proxy battleground. We're going to engage countries on their own terms and pursue an affirmative agenda to advance common interests and to promote stability and prosperity. Next the strategy indicates that we have to turn the page on the traditional formula for trade and adopt a new model of economics investment and trade that is fit for purpose for the coming decades of the 21st Century on everything that has been laid bare in the last few years: supply chains, the energy transition, new standards for labor, the environment, as well as the increasing role of technology and digitization in the global economy. And then finally I would just say that this notion of trying to preserve and increase international cooperation in an age of competition requires a dual track approach. On one track, we'll cooperate with any country, including our geopolitical rivals, that is willing to work constructively on shared challenges. And then on the other track we're going to deepen and sharpen our cooperation with like-minded democracies. And we believe that we can accomplish both of these as we move forward.*"

Europe no longer has security of prosperity, it was based on China and Russia

We recommend reading EU High Representative Josep Borrell's Oct 10 opening address to the EU Ambassadors Annual Conference. [LINK]. This is a must read, it paints a negative view for Europe in the 2020s because it has or is losing the two key countries for its prosperity – China and Russia. Borrell said "*We have to take a bigger part of our responsibility in securing security. You - the United States - take care of our security. You - China and Russia – provided the basis of our prosperity. This is a world that is no longer there." "So, our prosperity was based on China and Russia – energy and market. Clearly, today, we have to find new ways for energy from inside the European Union, as much as we can, because we should not change one dependency for another. The best energy is the one that you produce at home. That will produce a strong restructuring of our economy – that is for sure. People are not aware of that but the fact that Russia and China are no longer the ones that [they] were for our economic development will require a strong restructuring of our economy."* There is much more in this speech on the China risk, but it's clear that Europe sees itself in big trouble because of its anti Russia and anti China positions. Our Supplemental Documents package includes Borrell's speech.

Remember the must read Deutsche Bank CEO keynote speech

Every time we hear someone warn that the west's decision to make China the enemy for trade, it reminds of the excellent (and short) Deutsche Bank CEO speech. Here is what we wrote in our Sept 11, 2022 Energy Tidbits. "*We weren't certain where to put this item, but we believe the Deutsche Bank CEO Christian Sewing views of the world, if correct, will be positive for oil and natural gas thru the 2020s. The headlines on his Wednesday comments were all about his warning a recession is coming for Germany. (i) We tweeted [LINK] "1/2. Must Read @DeutscheBank CEO. RUS/UKR "destroyed a number of certainties on which we build our economic system over the past decades". NEXT UP, "awkward question on how to deal with China" in light of increasing CN/US isolation/tension, reducing China dependency will .. #OOTT", and [LINK] "2/2.."require a change no less fundamental than decoupling from RUS energy". Globalization gone, labor a global bottleneck. Extremely expensive #Electricity #NatGas s a threat to economy. the longer inflation remains high the higher the potential for social unrest, etc. #OOTT.". (ii) As you can see from our tweets, there are many thoughts. We tend to agree with a lot of what he is saying unless there is a social revolt to say enough is enough. (iii) The real theme of his theme of his speech is excellent – the world has changed for the foreseeable future. The norms of the past decades are gone. Globalization gone. China dependency must be reduced. Global value and supply chains disrupted. Workforce a worldwide bottleneck. Electricity/natural gas will be expensive in EU for a long time.. The truth is that 30 years of presumed calm will now be followed by a period of heightened volatility with economic uncertainty, regular crises and geopolitical conflicts that are also likely to drag on for decades. Trouble spots are not cut off from the rest of the world; they impact other regions in a number of ways. (iv) And he doesn't say much about it, but says "But the longer inflation remains high, the greater the strain and the higher the potential for social conflict." We still wonder about social conflict and if there will be Arab Spring type revolt within Germany and other European countries to how people feel they are getting hit by the Russian sanctions. (v) His views are* *relevant to longer term capital allocation. It's not just Germany has a terrible economic outlook. He raises issues like we have noted about China is the next Russia type target even if they don't invade Taiwan. Germany affects more than itself. And think about it, if Germany can hold the line on Russian sanctions on energy, then it probably says most of Europe can hold the line other than a handful like Hungary, etc. (vi) There is much more in this short viewpoint. Our Supplemental Documents package includes the CEO viewpoint.*

Capital Markets – JP Morgan CEO Jamie Dimon warns disorderly markets are coming

Jamie Dimon's warning

We could have written pages on all the JP Morgan CEO Jamie Dimon markets and oil and gas comments this week. We listened to most of the clips from his CNBC interview on Monday and our biggest concern for his markets comments is that it's going to be messy. We created a transcript of some of Dimon's comments with CNBC's Julianna Tatelbaum on Oct 10, 2022. [LINK]. At 1:40 min mark of one of the clips. Dimon ".. *but the one guarantee, which we have been consistent on, is volatile markets. You're going to have volatile markets. We've already seen markets down quite a bit, no IPOs, very little high yield, bridge loans being hung, stuff like that. Which is pretty typical, but it's still been orderly. I think it's possibly that you will see it disorderly in some time in the not too distant future*." At 0:05 min mark of another clip, Dimon ".. *we see early signs of distress. Again, this is fairly typical. Markets go down. People forecast the economy, etc. IPO market closes first, this has kind of happened. High yield closes second. And structured credit, that's kind of happened to the most part. Things can get done. But then it starts to affect other credit – you saw the gilt markets here, you see a lack of liquidity in a lot of markets. Lot of intermediaries, intermediaries we used to because of regulations. It is going to happen. And I think the likely place you are going to see more of a crack , more of a panic is in credit markets. And it might be ETFs, it might be a country. It might be something we don't suspect. Make a list of all the prior crisis, sitting here we would not have predicted where they came from. Though I think you can predict this time it will probably happen. If I was out there I would be very cautious. You need money, go raise it*. "

Capital Markets – Louisiana pulls capital from BlackRock, calls out their comments

Louisiana calls out BlackRock

Louisiana State Treasurer John Schroeder posted his Oct 5 letter to BlackRock CEO Larry Fink that "*Louisiana Treasury will liquidate all BlackRock investments by the end of 2022. To date we have divested $560 million. We are strategically divesting over a period of time so state money is not lost to the detriment of our citizens. Once complete, this divestment will reflect $794 million no longer entangled in BlackRock money market funds, mutual funds or exchange-traded funds (ETFs) holdings."* Schroeder explained that they have a fiduciary duty, "*which requires a sole focus on financial returns for the beneficiaries of state funds. Focusing on ESG's political and social goals or placing those goals above the duty to enhance investors' returns is unacceptable under Louisiana law*." Schroeder writes "*You have admitted that your ESG agenda of forcing behaviors will not increase investor returns. Your 2022 letter to CEOs stated plainly that "We need to be honest about the fact that green products often come at a higher cost." High cost/low return environmental policies will reduce a company's profits...and investors' returns."* Our Supplemental Documents package includes the Schroeder letter.

What did BlackRock say in private to Schroeder that is contrary to public views
On Thursday, we tweeted [LINK] "*Wonder what they said? @LATreasury to #LarryFink on pulling LA $ from $BVI. post meeting #BlackRock reps, "i found that the statements your representative made contradicted most of the public messaging I have read in your annual letters to CEOs or heard you say in media". #OOTT".* We know it happens that companies/politicians will make bold public statements but th*en,* when trying to get support, will say in private something different than their public promises. It seems that BlackRock was, in private, trying to convince Louisiana that it's investment practices on oil and gas are not as harsh as believed by Louisiana. It may just be on how they plan to implement a policy in a way that will soften the blow. So no one should have been surprised that Schroeder write "*Thank you for the opportunity to visit with members of your team at the National Association of State Treasurers (NAST) conference. While I appreciate the meeting and look forward to further discussion, I found that the statements your representatives made contradicted most of the public messaging I have read in your annual letters to CEOs or heard you say in the media*."

Demographics – the "marginal luxury" class

The "marginal luxury" class

We don't recall hearing it described this way and it does sound a little snobby to hear people described as the "*marginal luxury*" class. But we guess they are trying to distinguish from upper middle class? This week, Bloomberg wrote on the LVMH quarterly sales. LVMH is the owner of brands such as Louis Vuitton. Bloomberg wrote on how LVMH sales have een good, but also some of the warnings signs ahead. Bloomberg wrote "*Investors should still be cautious. The third quarter was always going to be a blockbuster with travel restrictions easing and many Americans venturing back to Europe with a strong dollar to make the most of. And now LVMH has set a very high bar for the forthcoming reporting season — at a time when risks are growing for even the industry giants. Although Europe has shone, the most important drivers of top-end demand are US and Chinese consumers. And there are considerable uncertainties around both. US big spenders are more vulnerable to shocks than slowing economic growth, and so recent stock market gyrations area a worry. Demand from US customers was "more or less" in line with the second quarter, LVMH said. But a slowdown at Tiffany is worth watching. The company said weakness in the silver business was due to an inflationary environment, where customers prefer gold. But it is also possible that some marginal luxury buyers are being more careful with their budgets."*

Demographics – Beyond Mean layoffs done via a phone call and not in person

Beyond Meat layoffs

Maybe it's just the new normal, but we have to believe the bar is being set lower for how management is supposed to deal with negatives. Beyond Meat laid off ~19% of its workforce on Thursday, and apparently did so by telling employees to work at home that day, restricted access to documents and then were told by a phone call if they were losing their job. Layoffs are a traumatic event for the person being canned and telling the employee he is being canned is probably the hated management job to do. But, it was always done in person and management knew that was the way it was done. That's changing now. On Friday morning, we tweeted [LINK] "*Is it wrong to expect mgmt to have the respect/guts for employees to do layoffs in person? #BeyondMeat asked employees to work from home Thurs, restricted access to documents, & then mgmt set up individual calls to inform if they were keeping their jobs. Thx @deenashanker."* On Friday, Beyond Meat released "*The Company is reducing its* *current workforce by approximately 200 employees, representing approximately 19% of the Company's total global workforce."* Our tweet was before the Beyond Meat release [LINK]. Rather on Thursday, Bloomberg reported "*Plant-based burger maker Beyond Meat Inc. is conducting further layoffs following a round of cuts made in August, according to people familiar with the matter. It wasn't immediately clear how many workers were terminated. Beyond Meat asked employees to work from home on Thursday and restricted access to documents, according to some of the people, who asked not to be named because they weren't authorized to speak for the company. Management then set up individual calls to inform some workers that they were losing their jobs."*

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

@Energy_Tidbits on Twitter

For new followers to our Twitter, we are trying to tweet on breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. Our Twitter handle is @Energy_Tidbits and can be followed at [LINK]. We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos for over 20 consecutive years. Please take a look thru our tweets and you can see we aren't just retweeting other tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

I can also be reached on Linkedin and plan to use it as another forum to pass on energy items in addition to our weekly Energy Tidbits memo and our blogs that are posted on the SAF Energy website [LINK].

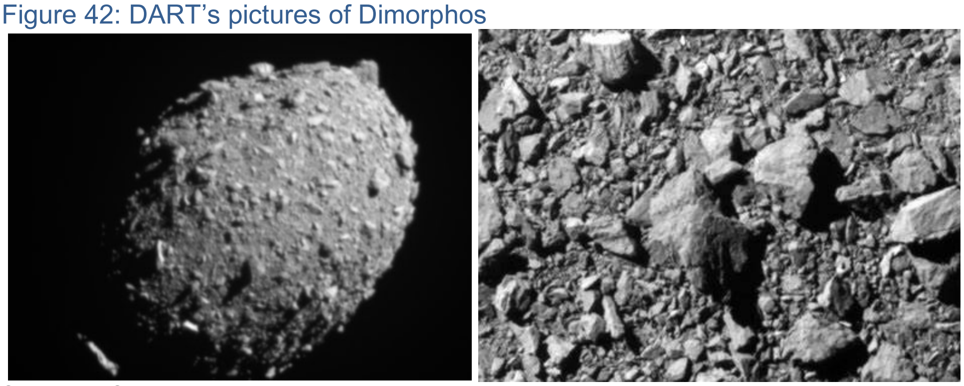
Misc Facts and Figures.

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

NASA's DART worked, crashed into asteroid and alters its orbit

On Tuesday, we tweeted [LINK] "*#DART worked! @NASA says observations after hitting the asteroid show knocked 32 min off the orbit time. congrats @NASA!"* This was NASA's test to see if they could collide DART into an asteroid and change its course. The collision came on Sept 26, when we, and other space nerds, watched DART. That afternoon, we retweeted [LINK] *"ICYMI, #NASA #DART impact right on target. Great pictures of asteroid. Kudos to @NASA DART team!."* It was a rewtwet of the NASA clip showing DART's pictures of the asteroid, Dimorphos. It doesn't feel like NASA's DART (Double Asteroid Redirection Test) crashing into its asteroid target, Dimorphos, on Monday night was a must watch TV event other than for those die hard space fans. After being launched 10 months ago, DART successfully crashed into its target asteroid. This was the purpose of the mission – it was a deliberate collision, to crash into an asteroid to see if the impact would cause a redirection in the asteroid's flight path. It was not to plant a nuclear bomb on the asteroid as is the norm in the movies about stopping an asteroid from hitting Earth. DART transmitted images of Dimorphos right up until impact. It doesn't look the moon, rather it looks like some smashed up rock on the surface. The test is still to come from monitoring Dimorphos – did it work? Will we be able to redirect an asteroid with a collision? It looks like it worked at least for this asteroid and hopefully we earthlings never have to see if works on an asteroid coming towards earth. Our Supplemental Documents package includes the NASA graphic attached to our tweet that shows the data points supporting DART worked.

Figure 42: DART's pictures of Dimorphos



Source: NASA

Tony Gonzalez calls Carson Wentz a "*microwave player*"

Couldn't help think of some of the lessons learned from working with some of the best all-time people in the Cdn investment dealer business. And how one of the keys was the pressure to perform at high levels and, most importantly, do it every day and not just on spurts. The thesis was that if it was only in spurts, then your clients couldn't count on you when they might need you. On Thursday morning, hall of famer tight end Tony Gonzalez was on Good Morning Football and his comments reminded of that same lesson. He was asked about the Chicago Bears/Washington Commanders NFL game he was calling that night. In talking about the two quarterbacks – Justin Fields for the Bears and Carson Wentz for the Commanders. Gonzalez used an expression we hadn't heard before a *"microwave player*". Gonzalez said "*and with Carson Wentz. Carson Wentz is Carson Wentz. We kind of know what he is. He's that guy who can light it up at any second, I call it, kind of like those "microwave players". They can heat it up, but it doesn't last that long. He can make those mistakes at the end*."

UK "milk pours" to promote a plant based future

It was a big week for reading and watching UK news with the Truss Chancellor sacking and backtracking on corporate tax reductions. But also in the UK news was something that we hadn't seen before – a "milk pour", where protestors for a plant based future go into a high profile store, like Harrods and Fortnum & Mason, go tot the dairy/food and then take milk bottles and pour them on the floor or on other animal-based products. On Saturday, Animal Rebellion reported [LINK]*"At around 11:45, supporters of Animal Rebellion entered Fortnum & Mason at Piccadilly and Harrods in Knightsbridge and emptied milk onto the floor. This mirrors actions supporters of the group took in Harrods in July, and more recently in Fortnum &*

Mason and Selfridges in London where two individuals were arrested and charged with £100,000 in damages [1]. Actions simultaneously took place in Waitrose, Wholefoods, and Marks & Spencer's shops in London, Norwich, Manchester, and Edinburgh, as individuals took milk from the shelves, and emptied it over the floor of the stores." Animal Rebellion also posted pictures this week of a recent July 10 milk pour at Selfridges.

Figure 43: Animal Rebellion Milk Pour Selfridges July 10, 2022

Source: Animal Rebellion