SAF GROUP

Energy Tidbits

Sept 16, 2022

Produced by: Dan Tsubouchi

Will New Shell CEO Sawan Move in Near Term on FID for LNG Canada's Brownfield 1.8 bcf/d Phase 2? We Think So.

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. Got to believe new Shell CEO Sawan will be recommending FID on LNG Canada Phase 2 sometime soon (Click Here)

2. FedEx CEO Subramaniam says weekly numbers are not looking so good and sees a worldwide recession (Click Here)

3. No indications from Xi/Putin Thurs meeting if China commits to buying more Russian oil and LNG (Click Here)

4. Trafigura Chief Economist Rahim sees a serious upcycle for oil (Click Here)

5. Chevron CEO Wirth sees energy instability in certain markets "*is a signal that we can't count on tomorrow's energy system until it is built.*" (Click Here)

6. We had to post our Energy Tidbits memo today and not Sunday due to our systems maintenance weekend. It also means our news cut off was 11am MT today and not our normal 7am MT Sunday morning

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

8. 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].

Dan Tsubouchi	**Ryan Dunfield**	**Aaron Bunting**	**Ryan Haughn**
Chief Market Strategist	CEO	COO, CFO	Managing Director
dtsubouchi@safgroup.ca	rdunfield@safgroup.ca	abunting@safgroup.ca	rhaughn@safgroup.ca

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Natural Gas – Natural gas injection of +77 bcf, storage now -223 bcf YoY deficit

The YoY storage deficit started last winter at -282 bcf YoY at Oct 31 and is now -223 bcf YoY. The EIA reported a +77 bcf build (+73 bcf expectations) for the Sept 9 week, which was below the 5-yr average build of +82 bcf, and above last year's injection of +83 bcf. Storage is 2.771 tcf as of Sept 9, with a basically unchanged YoY deficit of -223 bcf YoY vs -222 bcf YoY last week, -228 last week and is -349 bcf below the 5-year average vs -351 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -223 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (09/09/21)		Historical Comparisons: 5-year average (2017-21)	
Region	09/09/22	09/02/22	net change	implied flow	Bcf	% change	Bcf	% change
East	661	635	26	26	728	-9.2	759	-12.9
Midwest	809	776	33	33	871	-7.1	876	-7.6
Mountain	163	159	4	4	193	-15.5	195	-16.4
Pacific	235	238	-3	-3	240	-2.1	275	-14.5
South Central	904	887	17	17	962	-6.0	1,020	-11.4
Salt	187	182	5	5	216	-13.4	246	-24.0
Nonsalt	717	705	12	12	746	-3.9	774	-7.4
Total	**2,771**	**2,694**	**77**	**77**	**2,994**	**-7.4**	**3,125**	**-11.3**

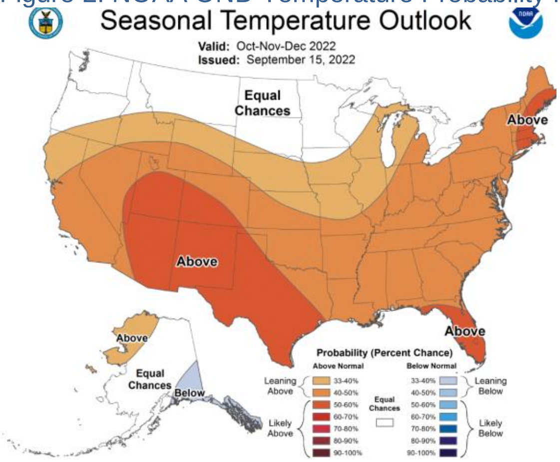
Source: EIA

Natural Gas – NOAA expects a warm start to a warmer than normal winter

On Thurs, NOAA updated its seasonal temperature forecasts for OND [LINK] and DJF [LINK]. NOAA's probability is for warmer than normal temperatures for most of the US to going into the winter (OND) and in the peak of winter (DJF). Warmer temperatures throughout the winter means less demand for natural gas. Below are the new NOAA temperature probability maps for Oct/Nov/Dec and for Dec/Jan/Feb.

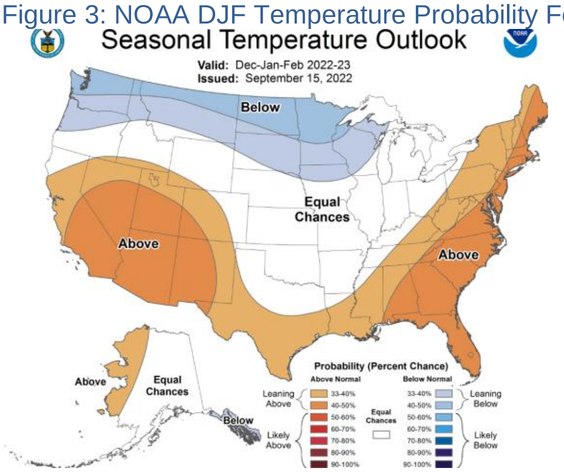
NOAA forecasts a warm winter

Figure 2: NOAA OND Temperature Probability Forecast



Source: NOAA

Figure 3: NOAA DJF Temperature Probability Forecast



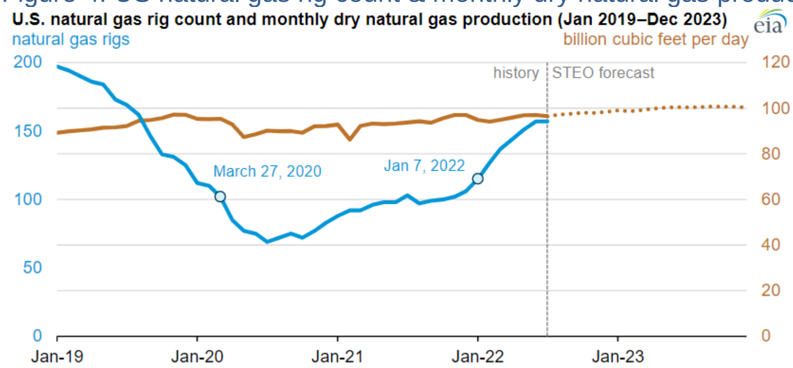
Source: NOAA

Natural Gas – No surprise, US gas rigs back to pre-Covid levels given huge HH prices

US natural gas rigs back up

On Thursday, the EIA posted its blog "*More natural gas rigs are now operating in the United States than before the pandemic*" [LINK]. This shouldn't surprise anyone given that HH gas prices are still well over $8. And given the big ramp in HH prices driven in great part by the flowback of global gas prices, the big ramp up in gas rigs is in the Haynesville shale gas play – a pure natural gas play in Louisiana and perfectly located for US Gulf Coast LNG exports. The EIA notes "*Most of the growth in natural gas-directed rigs in the United States has been in the Haynesville region, which spans Texas and New Mexico. The rig count in Haynesville increased by more than 50% between January 2020 and August 2022. Despite relatively high natural gas prices, drilling in Haynesville remains economical. Haynesville's well productivity and proximity to the U.S. Gulf Coast liquefied natural gas (LNG) export terminals and to major industrial natural gas consumers draws operators to the region.*" Our Supplemental Documents package includes the EIA blog.

Figure 4: US natural gas rig count & monthly dry natural gas production



Source: EIA

Natural Gas – EIA, US shale/tight natural gas breaking out, now over 94 bcf/d

Shale/tight gas production

EIA's updated Drilling Productivity Report Sept 2022 was released on Monday, and the key takeaway is that US shale/tight natural gas has had six consecutive months of steady growth with Oct forecast at 94.135 bcf/d vs 90.105 bcf/d in April. It keeps supporting the commentary that US shale/tight natural gas is breaking out. The DPR [LINK] is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case Sept) and the next month (in this case Oct). (i) Shale/tight natural gas is breaking out. April was 90.105 bcf/d, each month has steadily increased and is now up 4 bcf/d to reach 94.135 bcf/d in Oct. (ii) The EIA revised up its Sept estimate to 94.135 bcf/d vs 93.835 bcf/d that was in the Sept DPR. (iii) The EIA forecasts Oct at 94.741 bcf/d, which is up 0.606 bcf/d MoM from Sept 2022, and up +7.074 bcf/d YoY. (iv) For Oct, the EIA forecasts all basins to be up MoM in Oct, albeit most only up small MoM. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So whatever the trends are for shale/tight gas are the most likely the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

Figure 5: MoM Change – Major Shale/Tight Natural Gas Production

				2022												
mmcf/d	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Oct YoY	Oct YoY %	Oct less Sep
Anadarko	6,107	6,203	6,321	6,278	6,341	6,286	6,118	6,134	6,275	6,554	6,658	6,715	6,724	617	10%	9
Appalachia	34,838	35,601	34,825	34,988	35,716	36,298	35,443	35,476	35,155	35,121	35,332	35,486	35,577	739	2%	91
Bakken	3,004	3,012	3,071	3,150	3,137	3,079	2,932	3,076	3,088	3,086	2,915	3,191	3,223	219	7%	32
Eagle Ford	5,994	5,950	6,012	6,118	6,176	6,288	6,298	6,394	6,538	6,671	6,985	7,101	7,220	1,226	20%	119
Haynesville	13,514	13,778	13,874	14,019	14,291	14,425	14,527	14,863	15,023	15,261	15,643	15,835	16,023	2,509	19%	188
Niobrara	5,183	5,308	5,329	5,339	5,293	5,196	5,254	5,187	5,195	5,205	5,212	5,223	5,238	55	1%	15
Permian	19,027	19,298	19,573	19,936	20,233	20,160	19,533	19,870	20,227	20,373	20,417	20,584	20,736	1,709	9%	152
Total	87,667	89,150	89,005	89,828	91,187	91,732	90,105	91,000	91,501	92,271	93,162	94,135	94,741	7,074	8%	606

Source: EIA, SAF

Natural Gas – US LNG exports flat MoM in July at 9.7 bcf/d vs 10.0 bcf/d in June

US July LNG exports

As a reminder, the US Dept of Energy posts monthly US LNG export data about two weeks before the EIA (part of the US Dept of Energy) posts US LNG export data in its monthly Natural Gas Monthly report (next report is Sept 30). Normally, the data points are the same. On Thursday, the DOE posted its LNG Monthly for US LNG exports in July. The headline numbers as the US exported 9.7 bcf/d of LNG in July, which was down small MoM from 10.0 bcf/d and essentially flat YoY. Reminder, US LNG is down because of the continued outage at Freeport LNG. The advantage of the DOE report is that it provides other LNG insights. The DOE reported "Top five countries of destination, representing 58.4% of total U.S. LNG exports in July 2022 o France (53.4 Bcf), Netherlands (34.9 Bcf), Spain (34.4 Bcf), South Korea (34.3 Bcf), and Japan (18.2 Bcf). • 100 cargos shipped in July 2022 o Sabine Pass (40), Cameron (28), Corpus Christi (19), Cove Point (10), Elba (3), and Freeport (0) o 96 cargos in June 2022 o 97 cargos in July 2021." Below is our table of EIA's monthly LNG exports. Our Supplemental Documents package includes excerpts from the DOE LNG Monthly.

Figure 6: US LNG Exports (bcf/d)

(bcf/d)	2016	2017	2018	2019	2020	2021	2022
Jan	0.0	1.7	2.3	4.1	8.1	9.8	11.4
Feb	0.1	1.9	2.6	3.7	8.1	7.4	11.3
March	0.3	1.4	3.0	4.2	7.9	10.4	11.7
Apr	0.3	1.7	2.9	4.2	7.0	10.2	11.0
May	0.3	2.0	3.1	4.7	5.9	10.2	11.3
June	0.5	1.7	2.5	4.7	3.6	9.0	10.0
July	0.5	1.7	3.2	5.1	3.1	9.7	9.7
Aug	0.9	1.5	3.0	4.5	3.6	9.6	
Sept	0.6	1.8	2.7	5.3	5.0	9.5	
Oct	0.1	2.6	2.9	5.7	7.2	9.6	
Nov	1.1	2.7	3.6	6.4	9.4	10.2	
Dec	1.3	2.7	4.0	7.1	9.8	11.1	
Full Year	0.5	1.9	3.0	5.0	6.6	9.7	10.9

Source: EIA, DOE

Natural Gas – Devon ties up 0.26 bcf/d of Delfin's liquefaction capacity in Gulf Coast

Devon ties up 0.26 bcf/d liquefaction capacity

There weren't a lot of details disclosed, but it looks like Devon is trying to capture more of the upside arbitrage of global LNG prices vs HH prices. Last week, Delfin Midstream and Devon Energy "*entered into a liquefied natural gas (LNG) export partnership that includes an executed Heads of Agreement ("HOA") for long-term liquefaction capacity and a pre-Financial Investment Decision (FID) strategic investment by Devon in Delfin. The HOA provides the framework for finalizing a definitive long-term tolling agreement representing 1.0 million tons per annum (MTPA) of liquefaction capacity in Delfin's first Floating LNG vessel, with the ability to add an additional 1.0 MTPA in Delfin's first or a future Floating LNG vessel. In addition to providing Devon up to 2.0 MTPA of total liquefaction capacity on a long-term basis, the HOA also provides opportunity for additional future equity investments in Delfin by Devon*." There weren't any details disclosed but Devon is making some sort of equity investment in Delfin, and locking liquefaction capacity of up to 0.26 bcf/d. We assume Devon has the right or obligation to market the produced LNG, which means they should keep any upside in the arbitrage between global LNG prices and HH prices. Our Supplemental Documents package includes the Delfin release. [LINK]

Natural Gas – Cheniere says Corpus Christi LNG meets EPA's emissions standards

Cheniere's Corpus Christi LNG

We will still need to see how the EPA responds, but, it looks like there is a much lower risk to Cheniere having to do a major retrofits of their gas turbines that power all of their LNG projects. Last week's (Sept 11, 2022) Energy Tidbits wrote "*On Tuesday, we tweeted [LINK] "#EPA rejects #Cheniere request. Feels like likely scenario will be staggered corrective shutdown by #LNG train. If so, not clear how much corrective time needed per train and if can be coordinated with a normal maintenance turnaround. #NatGas #OOTT." Cheniere had requested a waiver on its exceeding emissions levels in their LNG projects and that was rejected by the EPA. As a result, Cheniere will have to comply and somehow reduce the emissions levels from its gas turbines*." We did not see any Cheniere release or tweet, but, on Thursday, Bloomberg reported "*Emissions from a Cheniere Energy Inc. natural gas export facility were within federal pollution limits, suggesting no need for significant equipment retrofits, the company said. "Cheniere has submitted our initial testing results for our Corpus Christi LNG facility, showing that all of the turbines covered by the EPA rule are below the emissions threshold," company spokesman Eben Burnham-Snyder said."* And "*Testing is still under way at Cheniere's Sabine Pass facility in Louisiana, Burnham-Snyder said."* The EPA will have to respond to the submitted data, but we would think this suggests a lower risk for a major retrofit of the emissions from all the gas turbines that power the LNG. Surely if

Cheniere says their testing meets the EPA standards, they have to at least be close? Our concern has been that Cheniere would be forced to make some sort of fix to all of the gas turbines that power their LNG projects and that would impact LNG production even if the fixes were done on a staggered basis. Our Supplemental Documents package includes the Bloomberg report.

Background to Cheniere's EPA emissions issue

The Cheniere EPA emissions issue became public in July. Here is what we wrote in our July 10, 2022 Energy Tidbits memo. *"Does Biden dare shut in Cheniere's 5.9 bcf/d LNG for emissions reasons. There was a great Reuters scoop on Friday "Exclusive: Top U.S. LNG producer Cheniere asks Biden admin to drop pollution rule" [LINK] that the title didn't necessarily reflect the potential huge impact on global, including US and Canada, natural gas and LNG markets. It's why we immediately tweeted [LINK] "Does #Biden dare shut in #Cheniere 5.9 bcfd #LNG in whole or staggered basis to force compliance to emissions? Would doom EU to #NatGas shortage & more massive prices, hammer US HH price. Or exempt for now & push supply interruption down the road? Great scoop @ValerieVolco! #OOTT". We believe the report raises the risk of a temporary shut-in or staggered by train temporary shut-in of Cheniere's 5.9 bcf/d LNG capacity. And if there is any shut-in, the impact would be huge given what happened to LNG, TTF, HH and AECO prices with the temporary shutdown of Freeport LNG's 2.2 bcf/d capacity. Cheniere's LNG export capacity is 5.9 bcf/d. Sabine Pass has six trains with ~30mm tpa or 3.95 bcf/d. Corpus Christi has three trains with ~15mm tpa or 1.97 bcf/d. We don't know who leaked the report, but we have to wonder if someone wanted to leak it to make sure there was an environmental push on Biden to not cave in and give Cheniere a waiver. Cheniere's natural gas turbines in all of its LNG trains put Cheniere offside emissions, so have asked for a waiver to comply. This wasn't an issue pre Biden, but in Feb 2020, the Biden admin removed the exemption for natural gas turbines from these emissions limits. The question is if Biden will give an exemption to Cheniere in the face of the global gas crisis and need for US LNG on global markets? Or will he hold Cheniere to the same emissions levels as others? If not, the turbines would have to be retrofitted. The below Reuters report says Cheniere reportedly said it would take several years to do so. That seems way too long. Although there is no question supply change issues would be adding months or a year, maybe more? We have just seen how Germany has been asking Canada to return the Siemens turbines so Russia won't have any excuse on resuming Nord Stream volumes. Can you imagine the pressure from Germany, France and others to make sure Cheniere isn't shut-in with the panic to try to fill storage and the need for US LNG all winter? It would be very tough to shut it in and still expect the EU partners to stay firm on Russia sanctions. If Cheniere is cut off for some period, it would lead EU to not longer worry about a shortage and a massive EU energy crisis, but to move to a shortage plan. And of course, Putin would love it. Environmentalists in the US would, if anything, see a win to the US in terms of impact on inflation. Force more US natural gas to stay within the US would lead to much lower HH gas prices. However, we should at least consider the potential for some sort of shut in. Again, think about what happened with Freeport LNG shut-in. If he doesn't give an exemption, in light of the EU crisis, we have trouble believing they would force a full shut down of Cheniere. Rather, I would* *expect to see some sort of short time to start implementing and more of a staggered temporary shut down on a train by train basis. Maybe if it is a staggered train by train basis, then the impact on prices would be smaller. But is there any other choice? And then we have the added issue of the mid-terms in less than four months. It's a big dilemma for Biden."* And "*We still wonder who leaked the report. Was it some anti fossil fuels Democrat who wanted to put Biden on the spot to pressure him to not give into fossil fuels? Or who? Regardless, we have to believe the Europeans will be putting huge pressure on Biden to kick the can down the road on Cheniere being offside the emissions limits. But now that this has raised its public profile, we have to believe there will be a needed retrofit someday, if not now. And we would still believe the most likely scenario would be some sort of staggered by train retrofit to ensure high level of LNG capacity is on line. Similar to what Australia did with Gorgon LNG on a staggered by train fix. So unless Biden gives a permanent pass to Cheniere, this will add some positive impact to mid term LNG and TTF prices and a negative impact to HH gas prices. Conceptually like seen with the Freeport LNG shutdown. But if it can be done on a train by train basis, the impact will be about 1/4 the impact of Freeport LNG."* And hopefully, they can coordinate with maintenance to minimize any impact.

Natural Gas – Will new Shell CEO Sawan recommend FID LNG Canada Phase 2 in Sept

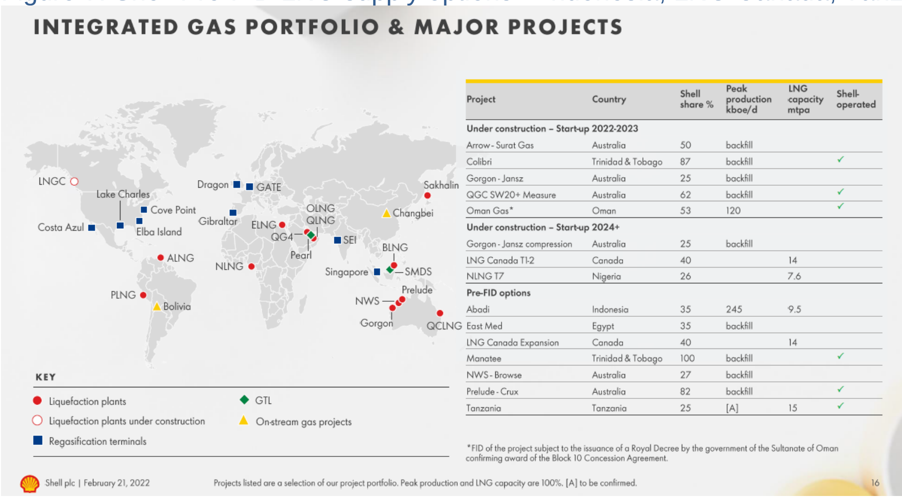
Will new Shell CEO move on Shell FID LNG Canada Phase 2?

There is only two weeks to go in September to see if our long standing call will turn out that we should see Shell FID the 1.8 bcf/d LNG Canada Phase 2 in H2/22 with our expected timing in September. (i) We still feel that timing has a good shot, especially since their big Thursday announcement [LINK] "*Shell Chief Executive Officer Ben van Beurden to step down, Wael Sawan appointed as his successor*". Sawan has been running their key group "*Integrated Gas, Renewables and Energy Solutions*". A FID on LNG Canada Phase 2 would be a major decision for Shell and we would think they wouldn't announce it and then appoint Sawan to be CEO. Van Beurden is stepping down at year end and a FID would seem to be a fitting major announcement as part of his legacy and also as part of the start of Sawan's legacy. (ii) Sawan has made a point of noting LNG Canada's strengths. We have been reporting on Sawan's comments on LNG and LNG Canada, which is why we tweeted [LINK] "*Gotta believe new #Shell CEO Sawan will be recommending FID for #LNGCanada brownfield 1.8 bcfd Phase 2. See 👇 Feb 21 thread, #LNG outlook only stronger since Sawan's showcasing of LNG Canada. What's good for LNG Canada is great for West Cdn #NatGas valuations. #OOTT."* We linked to two Feb 21 tweets on comments by Sawan on the Shell major webcasts "*Shell Integrated Deep Dive*" on Feb 21. Sawan made a number of positive comments on LNG Canada that we said felt like it was showcasing the project for a Phase 2 FID in 2022. (iii) This followed their separate LNG Outlook 2022 webcast that day that had a very bullish LNG outlook including their forecast for a LNG supply gap to emerge in the mid-2020s. The LNG outlook has only got more bullish since the Shell outlook. (iii) The combination of Sawan's glowing comments on LNG Canada and the even stronger LNG outlook is why we still believe in our expectation for Shell to FID its LNG Canada Phase 2 sooner than later. Our Supplemental Documents package includes the Shell appointment release.

Seems like Sawan was showcasing LNG Canada in the Feb 21 webcast

Here is what we wrote in our Feb 27, 2022 Energy Tidbits. "*Natural Gas – still seems Shell is showcasing LNG Canada as prelude to Phase 2 FID. 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 7: 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	✓

Source: Shell

Shell wants enough gas supply to align with LNG Canada offtake obligations

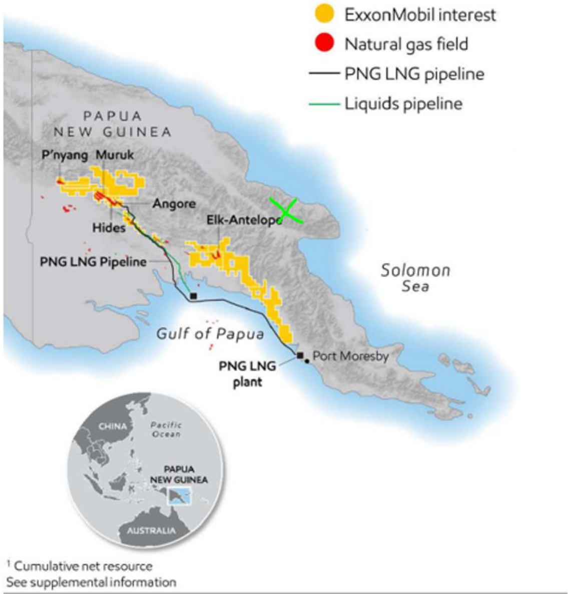
Here is another excerpt from our Feb 27, 2022 Energy Tidbits. "*We couldn't help tweet [LINK] "Buckle up, could be huge for Cdn #NatGas M&A. @Shell just said like to align equity #NatGas supply and offtake obligations, used #LNGCanada, Shell has 40% interest so would be 1.44 bcf/d if it FIDs #LNGCanada phase 2. It's why #LNGCanada Phase 2 is the must watch event #OOTT #LNG". Shell specifically said they want to have enough natural gas supply to align with their offtake obligations at LNG Canada. There was another excellent example of mgmt showcasing LNG Canada when they really didn't have to do so. In the Q&A, the analyst asks a general question if they will align their natural gas supply with their offtake obligations for any LNG project and then the analyst asked about the Coastal GasLink attack. The percentage question was not specifically directed at LNG Canada. However, mgmt took the opportunity to answer the supply question using LNG Canada. Mgmt replied "typically, what I would say, as much as possible, having access across the entire value chain in as close of a percentage as you can, helps ensure that wherever value might rate at any point in time, you are capturing that value. So in general. Take our LNG Canada investment that you just referenced in the second question, we would look to be able to at least assure ourselves that we are not caught up by vagaries of one part of the market. let's say the gas supply, but we would want to have enough on the gas supply equity side to be able to make sure if gas prices go up there, we benefit from them while maybe disadvantaging the midstream or vice versa depending on where prices go. So we are not in the game of necessarily taking undue risk. we are in the game of creating integrated value chains that we can leverage as part of the broader portfolio." Shell has 40% in LNG Canada. Phase 1 is 1.8 bcf/d so Shell equity gas supply is 0.72 bcf/d. Our tweet included the Shell disclosure on North America natural gas supply, they don't provide Canada/US split, but that is roughly equal to North America in Q4/2021. They have* *some GoM natural gas but don't know the split. Maybe half or a little more in Canada? Phase 2 is 1.8 bcf/d so another 0.72 bcf/d."*

Natural Gas – Exxon Papua New Guinea LNG reported not impacted by 7.6 earthquake

Papua New Guinea 7.6 earthquake

There was another big earthquake in Papua New Guinea. There was a big 7.6 earthquake in eastern Papua New Guinea Sept 11 morning local time. The Post Courier (Papua New Guinea news) reported [LINK] "*PNG Power advised of a total power system outage in Morobe, Madang and the Highlands regions following the earthquake*.". We did not see any formal Exxon response, but there were multiple reports that Exxon said there was no impact on its Papua New Guinea LNG operations. The below map shows the approximate location of the 7.6 earthquake that is east of Exxon's natural gas properties that supply the natural gas for the LNG.

Figure 8: Exxon PNG LNG and 7.6 earthquake market by X



Source: Exxon Investor Day March 2020

Source: Exxon

Reminder PNG LNG is in a major earthquake region

We updated a table from our May 12, 2019 Energy Tidbits that reminded that one of the big 2018 energy stories was the 7.5 earthquake on Feb 26, 2018 close to the Exxon Papua New Guinean LNG facilities that led to the shut down of the ~1 bcf/d LNG project for ~6 weeks. That week, there was a big 7.2 earthquake that, like this week, was east of the Exxon project so there were no damages or interruptions to natural gas supply and LNG operations. We reminded that PNG is one of the areas most at risk for big earthquakes. The earthquake risk in PNG is real, last Feb wasn't a fluke. In May 2019, there were 26 earthquakes 7.0 or greater in the world since Jan 1, 2017, and PNG was then #1 with 4 such earthquakes. The updated table, below is that, since Jan 1, 2017, there have been 81 earthquakes 7.0 greater in the world, and PNG has dropped to #3 with 7 such earthquakes, behind Indonesia and Japan with 8 such earthquakes. It may surprise that US is #4 with 6 such earthquakes all of which except one were in Alaska.

Figure 9: Earthquakes 7.0 or Greater Since Jan 1, 2017

Country	2017	2018	2019	2020	2021	2022	Total
Indonesia	-	1	3	-	-	4	8
Japan	-	-	-	-	8	-	8
Papua New Guinea	1	2	1	1	1	1	7
US	-	2	1	2	1	-	6
Mexico	2	1	-	1	-	1	5
Peru	-	2	3	-	-	-	5
Russia	1	1	-	2	-	1	5
New Zealand	-	-	1	1	2	-	4
Vanuatu	-	-	-	-	3	1	4
New Caledonia	1	2	-	-	-	-	3
Fiji	-	2	-	-	-	-	2
Chile	-	-	-	-	1	1	2
Fiji	-	1	-	-	1	-	2
Philippines	1	1	-	-	-	-	2
Argentina	-	-	-	-	1	-	1
Canada	-	-	-	-	-	1	1
Colombia	-	-	-	-	-	1	1
Costa Rica	-	-	-	-	-	1	1
Cuba	-	-	-	1	-	-	1
Ecuador	-	-	1	-	-	-	1
El Savador	-	-	-	-	-	1	1
Greeece	-	-	-	1	-	-	1
Guatemala	-	-	-	-	-	1	1
Honduras	-	1	-	-	-	-	1
Iran	1	-	-				1
New Caledonia	-	-	-	-	1	-	1
Pakistan	-	-	-	-	1	-	1
Philippines	-	-	-	-	-	1	1
South Georgia Islands	-	1	-	-	-	-	1
South Sandwich	-	1	-	-	-	-	1
Turkey	-	-	-	-	1	-	1
Venezuela	-	1	-	-	-	-	1
Total	**7**	**19**	**10**	**9**	**21**	**15**	**81**

Source: Wikipedia.

Shallow vs intermediate depth earthquakes

We often hear how shallow earthquakes cause the most damage. USGS estimated the PNG 7.6 earthquake was at a depth of 90.0 km, which is an intermediate depth earthquake. And in their writeup of the earthquake reminded of this shallow vs intermediate depth earthquake risk. The USGS wrote [LINK] "*Earthquakes like the September 10th event, with focal depths between 70 and 300 km are commonly termed "intermediate-depth" earthquakes. Intermediate-depth earthquakes represent deformation within subducted slabs rather than at the shallow plate interface between subducting and overriding tectonic plates. They typically cause less damage on the ground surface above their foci than is the case with similar-magnitude shallow-focus earthquakes, but large intermediate-depth earthquakes may be felt at great distances from their epicenters. "Deep-focus" earthquakes, those with focal depths greater than 300 km, also occur in beneath Papua New Guinea and the Bismarck Sea to the northeast."* Our Supplemental Documents package includes the USGS commentary.

Natural Gas – Mozambique expects TotalEnergies to get going on its Mozambique LNG

TotalEnergies Mozambique LNG

Mozambique President Nyusi continues to stress to TotalEnergies and Exxon that they should be back at their LNG projects and not still in a force majeure. (i) Good timing for a reminder as TotalEnergies annual investor day is Sept 28 and Mozambique LNG is one of its growth pillars. (ii) On Wednesday, the Club of Mozambique reported [LINK] "M*ozambique's president, Filipe Nyusi, called on Wednesday for oil companies to resume gas projects in Cabo Delgado, considering that there is more security than before the attack on Palma and global demand requires it."The success in combating terrorists in the Mocímboa da Praia – Palma axis, which includes roads and access to the port, provides a situation of greater stability" than before the attack on the town in March 2021, the head of state said at a conference on gas in Maputo."* And "*"In this context, we expect that development activities will be resumed by the concessionaires of area 1," the consortium led by TotalEnergies and which suspended the construction of the gas liquefaction plant due to deteriorating safety conditions. Similarly, Nyusi advocated the final decision to invest in area 4, led by ENI and Exxon, "as soon" as possible. The president said he would hold "more specialised meetings" with the sector to study "other support measures to maintain security".* (iii) No surprise, TotalEnergies didn't say yes or no. Bloomberg reported "*But TotalEnergies told AFP that its "work will resume once security and safety conditions have been permanently restored in the region"."* They will have to say something at the Sept 28 investor day. (iv) TotalEnergies didn't say anything on Mozambique at its Q2 call. Our July 31, 2022 Energy Tidbits memo highlighted the lack of comments on Mozambique on its July 26 Q2 call. Mgmt did not make any statements on the timing for the restart of the 1.7 bcf/d Mozambique LNG Phase 1 and there were no analyst questions on a restart timing. (v) Our view on Mozambique is that we haven't expected TotalEnergies to announce a restart on its Mozambique LNG until early 2023 at the soonest ie, not in 2022. But if the security is as safe as Mozambique says, there is no reason why that restart decision couldn't be in Q4/22.Our Supplemental Documents package includes the Club of Mozambique report.

A TotalEnergies restart sets in motion 5 bcf/d of Mozambique LNG

It is important to remember that a restart of TotalEnergies Mozambique Phase 1 is more than a restart of the 1.7 bcf/d for Phase 1 – it's really sets in motion 5.0 bcf/d of Mozambique LNG. This is why we have highlighting TotalEnergies force majeure on its Mozambique LNG Phase 1 for the past 17 months as the game changing event for LNG markets. TotalEnergies Mozambique Phase 1 at 1.7 bcf/d is significant, but our view has been because TotalEnergies delaying Phase 1 of 1.7 bcf/d is actually leading to a delay of 5.0 bcf/d. This was the reason why, on April 28 2021, we posted a 7-pg blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [LINK] We thought, and still think, there has been a major change to the outlook for LNG supply in the 2020s and one that is still being overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. We saw Total's April 27, 2021 announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d was much more significant that viewed. We just didn't see market focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow, and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022 at the earliest. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We had been warning that Mozambique has a major LNG market impact and its why we posted the April 28 blog. Its also why earlier we said that this is starting the clock running for other LNG projects wanting to go FID to make their mind up ie. like LNG Canada Phase 2. Our Supplemental Documents package includes our 7-pg April 28, 2021 blog.

Natural Gas – Was security a reason for delaying 1st LNG from Eni's Coral FLNG

ENI FLNG offshore Mozambique

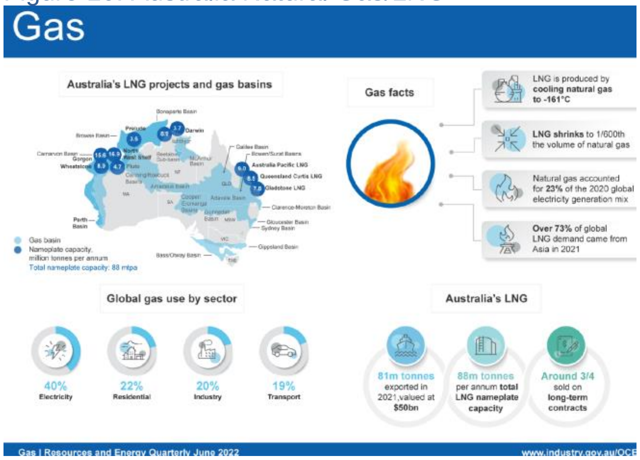
We probably wouldn't have noted this item if we hadn't had last week's (Sept 11, 2022) Energy Tidbits memo item on the last minute delay of the 1st LNG cargos at Eni's Mozambique 0.45 bcf/d Coral FLNG. This is the floating LNG facility in the deepwater offshore Mozambique. (i) What caused the technical issues that led to the last minute delays of 1st LNG at Coral FLNG? Last week's (Sept 11, 2022) Energy Tidbits memo highlighted BP has the exclusive right to take all of the LNG supply. In early August, BP's British Mentor LNG tanker had signaled Coral South FLNG as its destination, arriving in the proximity on Aug 26, and then the LNG tanker sailed away after changing its destination to Oman. On Aug 28, Energy Intelligence reported [LINK] "*Mozambique's Coral South floating LNG plant is understood to have suffered technical issues, which could delay the start-up of the project, potentially further squeezing an already tight global LNG market. "Serious issues [were] reported at Coral FLNG with one critical distillation column (demethanizer) suspected of having internal damage. Shutdown is required for inspection and repair, which will delay the start-up schedule by several days, if not weeks," a source told Energy Intelligence."* As noted above, BP sending the LNG tanker to Oman would signal that any issues weren't going to be fixed in a matter of days, otherwise they would have left the tanker waiting in Mozambique. (ii) Is security an issue at Coral FLNG, either from pirates or terrorists? Why we ask the question could they not produce LNG (ie. the distillation issue noted above) or did something else cause the LNG tanker to not want to wait for a day or two to load LNG? On Wednesday, Club of Mozambique reported [LINK] "*FLNG protection: South Korea sending patrol vessel to Rovuma basin, Mozambique. The South Korean government will shortly send a patrol vessel to Mozambique to protect the Coral Sul floating liquefied natural gas (FLNG) platform in the Rovuma basin. The news was announced in Nairobi by Byoung-Gug Choung, the special envoy of South Korea's President Yoon Suk-yeol, after a meeting with President Filipe Nyusi on the side-lines of the inauguration of President-elect William Ruto of Kenya."* The working assumption has been that it's deepwater floating LNG terminal so not at risk from the terrorism onshore. The timing seems curious. Our Supplemental Documents package includes the Club of Mozambique report.

Natural Gas – Australia La Nina winter brings supply risk to east coast LNG & coal

Australia La Nina risk

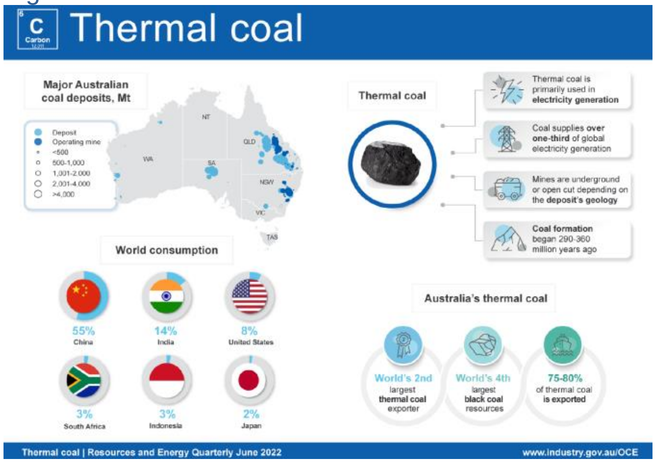
The fears about La Nina impacting Australia's exports was raised on Tuesday, when Australia's Bureau of Meteorology' provided its La Nina update [LINK] "*La Nina under way in the tropical Pacific*. *The Bureau's ENSO Outlook has been raised to LA NIÑA. Key atmospheric and oceanic indicators of the El Niño–Southern Oscillation (ENSO) show an established La Niña. Tropical Pacific sea surface temperatures have been cooling since June and are now at La Niña thresholds."* Our Aug 21, 2022 Energy Tidbits noted the Aug 16 Bureau of Meteorology moving from a La Nina WATCH to a La Nina ALERT. Now it's a La Nina. The Bureau also warned "*La Niña events increase the chances of above-average rainfall for northern and eastern Australia during spring and summer*." In our Aug 21, 2022 Energy Tidbits, we reminded that "*Eastern Australia is the big area for Australia coal exports and also big for coalbed methane gas that supplies the eastern Australia LNG exports. The flooding brings risk to the port export facilities as well as flooding in the field and for rail bring* *coal to the coast. Below are Australia's gas/LNG and thermal coal maps from its recent Resources and Energy Quarterly June 2022.*"

Figure 10: Australia Natural Gas/LNG



Source: Australia Resources and Energy Quarterly

Figure 11: Australia Thermal Coal



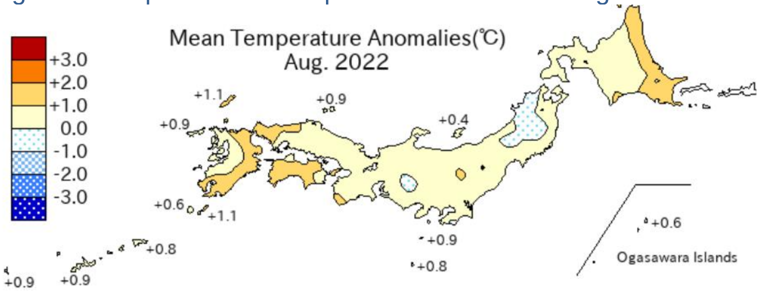
Source: Australia Resources and Energy Quarterly

Natural Gas – Above average Aug temperatures in Japan

Japan Aug temperatures

The Japan Meteorological Agency recap of Aug temperatures in Japan were that there were above normal temperatures for almost all of Japan ie. providing continuing support for weather related natural gas consumption ie. hot enough to justify air conditioning. On Wednesday, the Japan Meteorological Agency posted its recap of Aug weather [LINK] and their mean temperature anomalies map (below) shows the mean temperature breakdown for the month. Their recap noted "*Monthly mean temperatures were above normal in western Japan and significantly above normal in Okinawa/Amami, because warm-air, associated with the stronger Tibetan High, covered the regions.*"

Figure 12: Japan Mean Temperature Anomalies Aug 2022



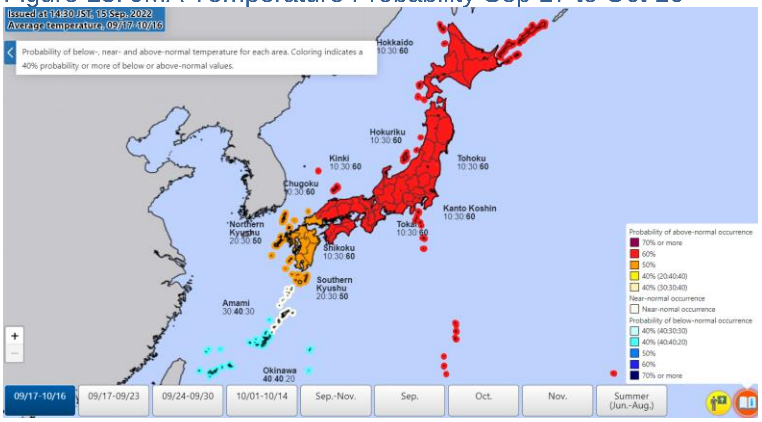
Source: Japan Meteorological Agency

Natural Gas – Continued hot weather to end the summer in Japan

Still above normal temperatures in Japan

It's been a hot summer in Japan and the warm temperatures are forecast to continue for the balance of September. The Japan Meteorological Agency (JMA) continues to expect warmer than normal temperatures to end September. But, because it's September, it means that much warmer than normal temperatures are not in the 30's, but high 20's ie. warm but not blistering hot and humid. AccuWeather forecasts daily highs for Tokyo for the next two weeks to be range from 26c to 29c. But anyone who has been in Japan in September knows it is humid so the weather is still expected to be a positive for power demand. The Japan Meteorological Agency posted its September 17 to October 16 weather forecast [LINK] calling for much warmer than normal temperatures. Note the below map is for the next month, but the maps for each of the next two weeks is for even warmer than normal temps.

Figure 13: JMA Temperature Probability Sep 17 to Oct 16



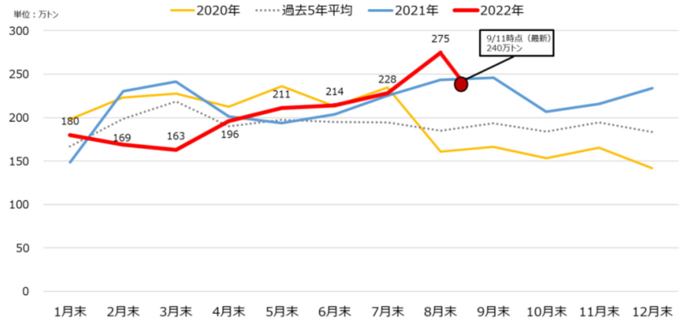
Source: Japan Meteorology Agency

Natural Gas – Japan's LNG stocks down -9.1% WoW

Japan LNG stocks -9.1% 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. Even at current LNG stocks levels, its only ~10 days of winter LNG imports. A cold winter or interruption in LNG imports could easily lead to a shortage. LNG stockpiles continue to be above the 4-yr average but dipped below last year's levels this week. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks at Sep 11 were 115 bcf, -9.1% YoW from 127 bcf at Sept 4. Below is the LNG stocks graph from the METI weekly report.

Figure 14: Japan's LNG Stocks



Source: METI

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

Japan July LNG imports -0.4% YoY

Good illustration of how sky-high LNG prices are impacting Japan's LNG imports. Japan, in particular Tokyo, were leaders in pushing their citizens to reduce natural gas consumption. And we believe it has worked. In addition, we have seen Japan utilities try to maximize coal and petroleum products this summer because of very high LNG prices. It's worked. On Wednesday, 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%. Normally, we would have expected the warm Aug to lead to a bigger increase in LNG imports. But not this year due to the sky-high LNG prices. Below is our table that tracks Japan LNG import data.

Figure 15: 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

Natural Gas – But Japan loading up on cheaper Russian LNG

Japan increases LNG imports from Russia

Earlier today, we tweeted [LINK] "*Looks like Japan trying to average down its #LNG import prices. Aug LNG imports from Russia 0.70 bcf/d, up YoY vs 0.22 bcf/d in Aug 2021. MOF doesn't provide all by country split so don't know how much AUS, NGA, or who makes up balance. #NatGas #OOTT,*" Our tweet included the below table, but Japan's Ministry of

Finance provides by country import data for eight countries/areas – Asia, ASEAN, China, EU, Korea, Middle East, Russia and US.. So we don't know which LNG exporters are in the balance ie. how much is Australia, Nigeria or other countries. As opposed to crude oil and petroleum products, we don't believe there are many disguised LNG tankers hidden in the Balance.

Figure 16: Japan Aug 2022 LNG imports by country

	Aug 2022	Aug 2021	
	bcf/d	bcf/d	YoY%
Asia	1.93	2.26	-14.6%
ASEAN	1.84	2.26	-18.5%
Middle East	1.39	1.95	-28.4%
Russia	0.70	0.22	212.5%
US	0.52	0.84	-38.4%
China	0.09	0.00	-
Balance	3.24	2.22	46.1%
Total	9.71	9.75	-0.4%

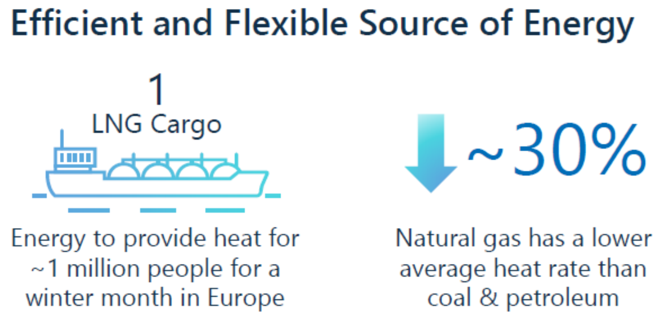
Source: Japan Ministry of Finance

Natural Gas – Cheniere says 1 LNG cargo = heat for ~1 million Europeans

Energy provided per LNG cargo

There was an interesting Rule-of-Thumb tidbit in Cheniere's new slide deck this week. Cheniere includes the below graphic that says "1 LNG Cargo = Energy to provide heat for ~1 million people for a winter month in Europe." There are about 600 million people in Europe. The DOE LNG Monthly did not provide a by-country split of the 100 LNG cargoes shipped in July.

Figure 17: Cheniere's energy supplied per LNG cargo



Source: Cheniere

Natural Gas – Wonder how DE will get Norway natural gas & US LNG prices down?

Germany to lower natgas/LNG prices?

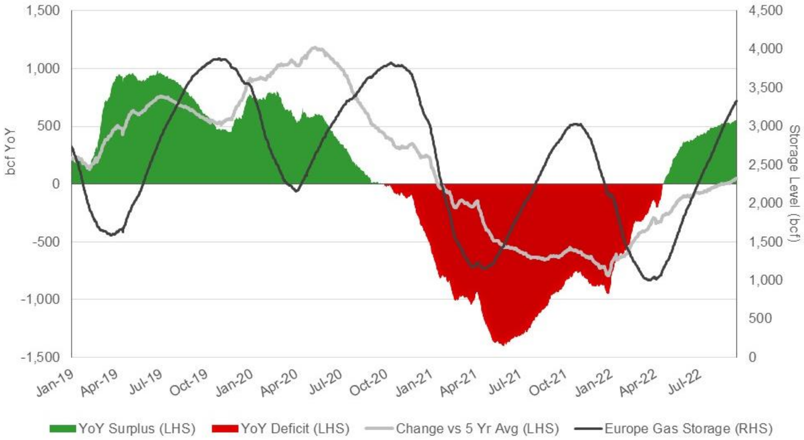
On Tuesday, German Chancellor Scholz's speech talked about his view that a cap on natural gas prices isn't likely, rather Germany will be taking further measures to get natural gas and LNG prices down. We tweeted [LINK] "*Wonder how #Scholz plans to do this? re NO #NatGas US #LNG "they charge prices for this" "We will take further measures to get those prices down FROM THE SOURCE and make them competitive and affordable again for the German industry". Thx @mcnienaber. #OOTT"* . We recognize Scholz is a politician but, given natural gas prices are one of the most important issues for all Germans, we really think he would want to try to make promises he can deliver. So we are interested in how what measures they will take to get Norway natural gas and US LNG prices down. Bloomberg reported "*Scholz hinted, however, that a general cap on natural gas might not be the best way forward as such a measure could lead to reduced supply from the world market. "With gas, for example, we are talking about supplies from friendly Norway, from the United States, from many other countries in the world, they are supplying us and they charge prices for this," Scholz added. "We will take further measures to get those prices down from the source and make them competitive and affordable again for the German industry," Scholz said."* Our Supplemental Documents package includes the Bloomberg report.

Natural Gas – Europe storage is now +13.88% YoY ie. 84.71% full vs 70.83%

Europe storage now 84.71% full

It looks like the continued strong LNG imports and massive industrial demand response to sky-high natural gas prices are having a big impact. Even with the reduced volumes on Nord Stream, 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 13.88%. 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 Sep 14 is at 84.71%, which is +13.88% greater than last year levels of 70.83% and are +1.12% above the 5-year average of 83.59%. Below is our graph of Europe Gas Storage Level.

Figure 18: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs +8 to 599 oil rigs at Sept 16

US oil rigs +8 WoW

Baker Hughes released its weekly North American drilling activity data this morning. This week US oil rigs were +8 to 599 oil rigs. It looks like US oil companies are working towards a world of ~$90 oil instead of ~$100 oil. US oil rigs have been more or less rangebound for the past 13 weeks from 591 to 605 oil rigs. US oil rigs hit a 13-week low of 591 last week. US oil rigs are now +140 oil rigs since the Covid Sept 17, 2020 oil rigs of 179 oil rigs. And US oil rigs are +188 oil rigs YoY. US gas rigs were -4 WoW to 162 gas rigs with the declines coming in smaller basins and not the Haynesville and Marcellus.

Figure 19: Baker Hughes Total US Oil Rigs

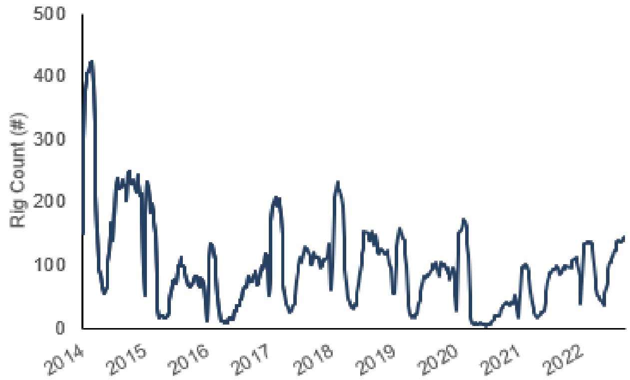
Source: Baker Hughes

Oil – Total Cdn rigs down +6 WoW to 211 total rigs, +57 rigs YoY

Cdn rigs down WoW

Total Cdn rigs were +6 to 211 rigs as of Sept 16, 2022. Cdn oil rigs were +6 to 144 oil rigs. Cdn gas rigs were flat at 65 rigs. Cdn rigs have been in a bit of a pause with WTI ~$90 and weak AECO. Total rigs are now +147 vs the comparable Covid period of 64 rigs on Sept 18, 2020. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 95 and Cdn gas rigs were 59 for a total Cdn rigs of 154, meaning total Cdn oil rigs are +51 YoY to 146 oil rigs and Cdn gas rigs are +6 to 65 gas rigs.

Figure 20: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat at 12.1 mmb/d

US oil production flat WoW

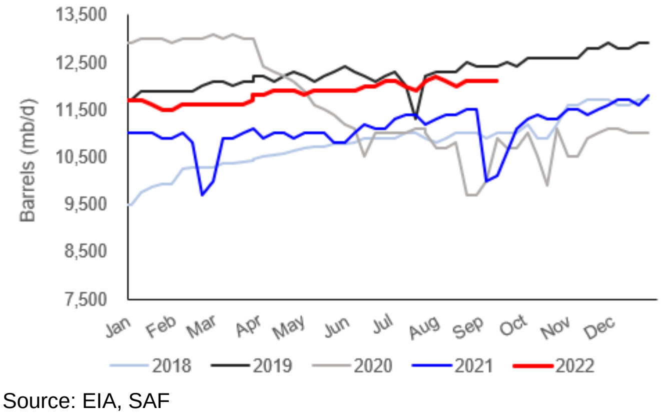
US oil production was flat at 12.1 mmb/d for the week ended Sept 9. US oil production has been range bound between 11.9 to 12.1 mmb/d for the past 18 weeks. Lower 48 production was flat WoW at 11.7 mmb/d this week and Alaska was flat WoW at 0.4 mmb/d. US oil production is up YoY at +2.0 mmb/d but is still down significantly at -1.0 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 21: 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						

Source: EIA

Figure 22: US Weekly Oil Production



Source: EIA, SAF

Oil – Surprisingly, North Dakota July oil 1.070 mmb/d was down MoM

North Dakota oil production

On Thursday afternoon, the North Dakota Industrial Commission posted its Director's Cut, which includes July oil and natural gas production data [LINK]. The NDIC reported North Dakota July oil production was 1.070 mmb/d, which was down 0.7% YoY and also down 2.5% MoM vs June production of 1.097 mmb/d. We were surprised by the MoM decrease given the NDIC estimated well completions were only 27 in June and much higher at 74 in July. We would have expected the much higher completions to lead to higher MoM production in July, not less production. Our Supplemental Documents package includes excerpts from the Director's Cut.

Figure 23: North Dakota Oil Production By Month

(b/d)	2017	2018	2019	2020	2021	2021/2020	2022	2022/2021
Jan	981,380	1,179,564	1,403,808	1,430,511	1,147,377	-19.8%	1,088,613	-5.1%
Feb	1,034,248	1,175,316	1,335,591	1,451,681	1,083,554	-25.4%	1,089,091	0.5%
Mar	1,025,690	1,162,134	1,391,760	1,430,107	1,108,906	-22.5%	1,122,640	1.2%
Apr	1,050,476	1,225,391	1,392,485	1,221,019	1,123,166	-8.0%	900,597	-19.8%
May	1,040,995	1,246,355	1,394,648	859,362	1,128,042	31.3%	1,059,060	-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%	1,069,517	-0.7%
Aug	1,089,318	1,292,505	1,480,475	1,165,371	1,107,359	-5.0%		
Sept	1,107,345	1,359,282	1,443,980	1,223,107	1,114,020	-8.9%		
Oct	1,183,810	1,392,369	1,517,936	1,231,048	1,111,910	-9.7%		
Nov	1,194,920	1,375,803	1,519,037	1,227,138	1,158,622	-5.6%		
Dec	1,182,836	1,402,741	1,476,777	1,191,429	1,144,999	-3.9%		

Source NDIC, NDPA

North Dakota was also surprised by the MoM decrease in oil production

We always look to the local North Dakota oil media for extra insights from the monthly North Dakota Director of Mineral Resources Lynn Helms press conference on the monthly North Dakota production data. Unfortunately, we didn't get any added insight from Helms, rather he was surprised by the lower July oil production. The Bismarck Tribune reported [LINK] "*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.*" Helms comment on well completions was interesting. In our above commentary, we referenced the NDIC estimated well completions were only 27 in June and much higher at 74 in July. Our Supplemental Documents package include the Bismarck Tribune report.

Oil – North Dakota crude by rail basically flat MoM at 79,479 b/d in July

North Dakota CBR basically flat in July

The North Dakota Pipeline Authority posted its monthly update "*September 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 July was a low of 64,479 b/d and a high of 94,479 b/d for an average of 79,479 b/d. This is basically the same as June's low of 65,222 b/d and a high of 95,222 b/d for an average of ~80,222 b/d. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

Figure 24: Estimated North Dakota Rail Export Volumes

Source: North Dakota Pipeline Authority

Oil – EIA shale/tight oil forecast revised down for Sept

US shale/tight oil production

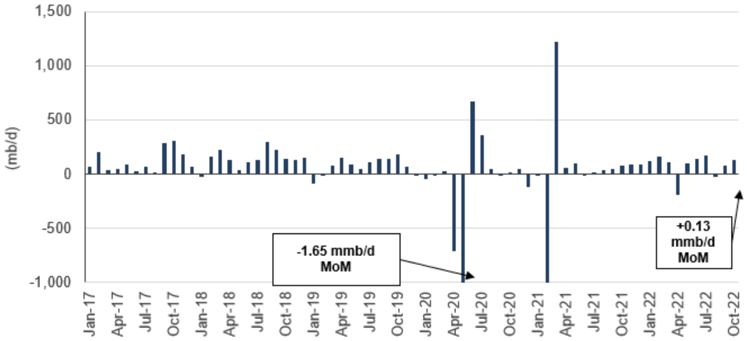
The EIA Drilling Productivity Report Sept 2022 [LINK] forecast for US shale/tight oil saw a downward revision to its forecast for Sept shale/tight oil production vs last month's DPR, but its revised lower Sept is still showing growth vs Aug. The EIA's Drilling Productivity Report Sept was posted on Monday and it is EIA's forecast for production for the major shale/tight oil and gas basins for the current month (in this case Sept) and the next month (in this case Oct). (i) The EIA revised down its forecast for Sept to 8.963 mmb/d, from its Aug DPR forecast of 9.049 mmb/d. The major revision was the EIA revised the Permian down to 5.347 mmb/d for Sept vs 5.408 mmb/d in the Aug DPR. (ii) The EIA's new Sept forecast of 8.963 mmb/d still represents growth vs August of 8.908 mmb/d. And the EIA's new forecast for Oct is 9.115 mmb/d. (iii) For Oct vs Sept, the EIA forecasts flat Haynesville MoM, but growth in all other basins led by the Permian +66,000 b/d MoM, the Eagle Ford +26,000 b/d MoM, and Bakken +21,000 b/d MoM. (iii) Note that shale/tight oil is approx. ~75% of total US production, so whatever the trends are for shale/tight oil are normally the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Our Supplemental Documents package includes the EIA DPR.

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

				2022											
Thousand b/d	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Oct YoY	Oct YoY %	Oct less Sep
Anadarko	363	366	378	389	393	399	398	391	406	413	425	424	432	69	19%	8
Appalachia	118	122	120	115	113	113	111	114	124	130	128	120	122	4	3%	2
Bakken	1,131	1,137	1,146	1,184	1,192	1,172	1,169	1,172	1,178	1,173	1,136	1,183	1,204	73	6%	21
Eagle Ford	1,076	1,078	1,090	1,104	1,122	1,123	1,140	1,149	1,152	1,180	1,204	1,224	1,250	174	16%	26
Haynesville	34	34	33	33	33	33	34	35	36	37	37	37	37	3	9%	0
Niobrara	594	608	615	615	611	613	610	627	630	632	649	648	657	63	11%	9
Permian	4,826	4,886	4,960	4,996	5,134	5,138	5,055	5,131	5,232	5,367	5,329	5,347	5,413	587	12%	66
Total	8,142	8,231	8,342	8,436	8,598	8,591	8,517	8,619	8,758	8,932	8,908	8,983	9,115	973	12%	132

Source: EIA Drilling Productivity Report

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



Source: EIA Drilling Productivity Report

Oil DUCs keep declining

Oil – EIA total DUCs flat since March, but oil down -156 DUCs vs natural gas +146

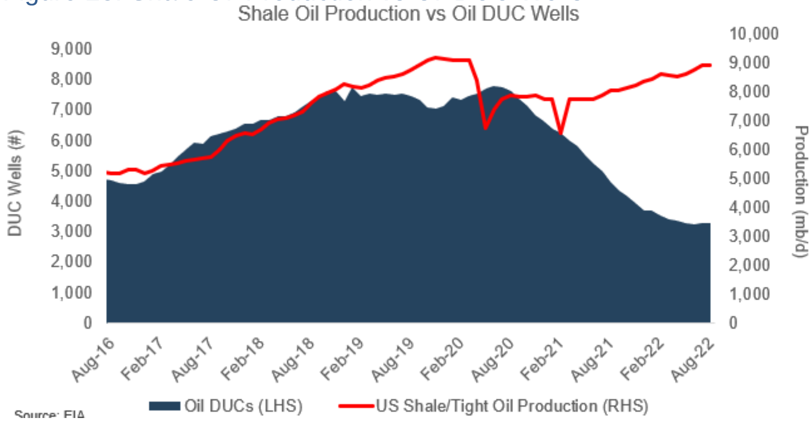
We are not seeing the hoped build in oil DUCs, rather we continue to oil DUCs continue to decline. We remind of our previously noted caveat that DUCs do not take into account potential refracs. But we still believe a key risk to how much US oil production can grow in 2022 and 2023 is the need to increase rig counts to replenish the inventory of Drilled UnCompleted wells at higher levels and the challenge for oilfield services to add capacity to increase frac spreads and completions. The biggest problem in the past with the EIA's Drilling Productivity Report [LINK] estimate of Drilled UnCompleted wells was that the data had been constantly revised and sometimes significantly. However, the DUC estimates provide a good picture of the DUC trends. US oil rigs are up ~15% (up ~70 oil rigs to ~590 oil rigs) since the end of Feb and that has stopped the steady decline of DUCs. Rather DUCs seem to have found a bottom. DUCs stopped declining in March and were 4,293 DUCs at March 31. Since then, DUCs have ranged from 4,271 to 4,299 DUCs with the EIA's forecast for Aug 31, DUCs at 4,283 DUCs. However, despite fairly flat total DUCS, oil DUCs are down156 DUCs vs March 31 but offset by natural gas DUCs being up 146 DUCs since March 31. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Our Supplemental Documents package includes the EIA DPR.

Figure 27: EIA - Estimated Drilled UnCompleted Wells

						2022								
Drilled UnComplet	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Aug YoY
Anadarko	824	812	799	787	773	758	753	740	724	727	723	716	709	-115
Appalachia	588	557	537	513	565	457	473	471	497	526	524	529	521	-67
Bakken	566	541	516	485	464	436	426	426	429	425	427	426	425	-141
Eagle Ford	869	833	796	760	685	683	653	642	612	598	611	620	622	-247
Haynesville	406	396	392	386	372	369	371	395	419	441	466	483	491	85
Niobrara	379	375	372	362	354	343	331	317	320	310	328	345	354	-25
Permian	1,994	1,812	1,669	1,537	1,444	1,482	1,380	1,302	1,294	1,244	1,218	1,180	1,161	-833
Total	5,626	5,326	5,081	4,830	4,657	4,528	4,387	4,293	4,295	4,271	4,297	4,299	4,283	-1,343

Source: EIA, SAF

Figure 28: Shale Oil Production vs Oil DUC Wells



Source: EIA, SAF

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

DUCs do not include potential refracs

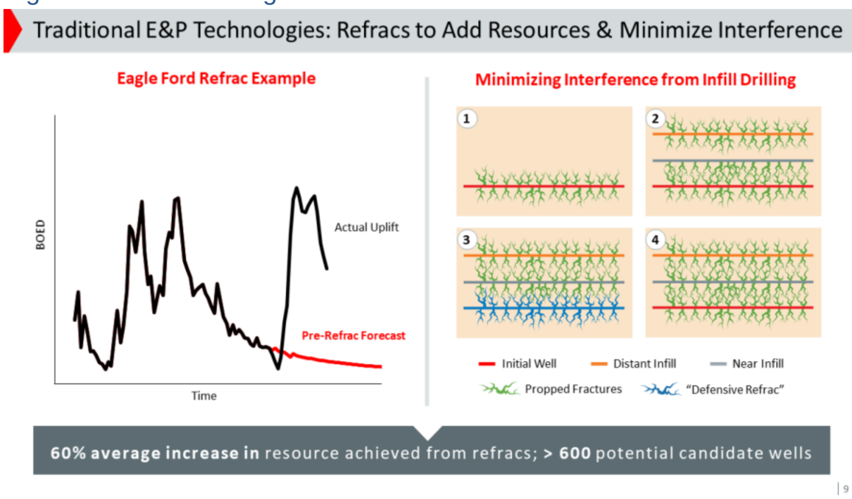
Here is what we wrote in our Aug 14, 2022 Energy Tidbits memo. "*We want to highlight that the declining DUCs (Drilled UnCompleted Wells) inventory really underestimate the potential oil production adds from already drilled wells because DUCs do not include potential refracs. Potential refracs are older horizontal producing wells that will be refrac'd. On Aug 9, we tweeted [LINK] "DUCs inventory don't tell the full story as don't incl existing wells that will be refrac'd. Devon's #EagleFord deal incl 350 locations + 150 refrac candidates. Refrac success is now new, see 👇SAF 10/27/19 Energy TIdbits, $CLB highlighted refac in #Bakken #EagleFord. #OOTT." We were reminded of this potential in Devon's Eagle Ford acquisition on Tuesday. Devon's announcement noted "the transaction also adds 350 repeatable drilling locations in the core of the Karnes Trough oil window along with 150 high-quality refrac candidates. This highly economic inventory positions the company's Eagle Ford assets to sustain its high-margin production and free cash flow generation for several years.". The 150 high-quality refrac candidates are likely the 1st and 2nd generation multi-stage horizontal wells that have been drilled, completed and are on production or produced and are currently shut-in. These 150 refrac candidates are not considered DUCs. Our Supplemental Documents package includes excerpts from the Devon release and slide deck on the Eagle Ford acquisition.*

Core Labs highlighted Eagle Ford & Bakken refrac success in 2019

Devon's highlighting refract potential shouldn't surprise, especially in the Karnes Trough part of the oil leg. Karnes County has always been considered the prime Eagle Ford oil area. And refrac success in the Eagle Ford (and Bakken) is not new. Here is what we wrote in our Oct 27, 2019 Energy Tidbits. "We were a little surprised that Core Labs Q3 call comments on refracking didn't get any traction. Perhaps its because the impact of refracking success won't really show up for years to come, But Core Labs had bullish comments on the industry refrack success in Eagle Ford and Bakken. We don't expect refrack success will lead to growth in these plays, but it should reduce mid term declines by increasing rate and recovery on old 1st and likely 2nd generation fracked wells. Mgmt said "Moving now to Production

Enhancement. Core's Production Enhancement energetics team partnered with one of the world's largest independent E&P companies to develop a breakthrough perforating solution for their mechanically isolated recompletion programs in both the Eagle Ford and Bakken formations onshore U.S. This technology helped the operator minimize risk, improve recovery from existing wells and optimize their return on investment." "The operator has reported the ability to complete double the number of stages per day over conventional perforating techniques. The E&P company has also seen consistent and reliable frac -- fracs from stage to stage and well to well along with encouraging production results. Core's refrac technology breathes new life into the large fleet of older existing wells that were originally under-stimulated. High-quality reservoir rock and the intervals between the original stages can now be tapped, increasing oil recovery and significantly without the expense of drilling and completing an additional well." With respect to the significance to industry, it really doesn't' matter who is the company, But we believe the "one of the world's largest independent E&P companies" refers to ConocoPhillips. In theory, it could be big companies who in both plays like EOG Resources, Marathon Oil, but we think its Conoco even though Conoco has stated clearly Bakken is in plateau production and Eagle Ford is in late stage growth (see our Aug 4, 2019 Energy Tidbits on Conoco's Q2 call). Conoco's regular investor presentations do not mention refracking success, but Conoco held a Feb 19, 2019 "Shale Oil Technical Teach In" that had the below refrack Eagle Ford slide."

Figure 29: Conoco Eagle Ford Refrac



Source: ConocoPhillips

Oil – Trafigura reminds US shale growth is less than what was expected

Trafigura on US shale growth

In our discussion of the EIA weekly oil production data, we have been highlighting how US oil production has been rangebound between 11.9 to 12.1 mmb/d for the past 18 weeks. We probably should be saying that US oil production exited 2021 at 11.8 mmb/d so it's been rangebound more or less all year. On Wednesday, we tweeted [LINK] "*US shale #Oil growth not as strong as expected earlier this year. #Trafigura @saadrahim "'we're gong to be lucky* *to hit 600, 650" thousand b/d growth in 2022. Hard to disagree, See 👇 @EIAgov weekly oil production data shows +0.3 mmb/d in 2022 to date. See #OOTT."* Trafigura Chief Economist Saad Rahim spoke at a Pareto Securities event on Wednesday [LINK] and highlighted that US shale has been less than most expected at the beginning of the year. We created a transcript of his comments. At the 13:40 min mark, Rahim said "*.. so we have not seen that reaction function from shale that people were expecting, which was, if you had said to people at the beginning of the year hey guys oil prices will be $120 at some point this year, everyone would say I'll give you a million barrels a day of US production. We're going to be lucky to hit 600, 650."*

Chevron on US export ban

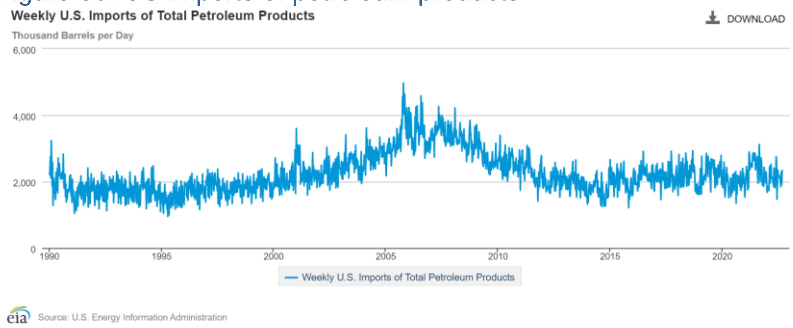
Oil – Chevron CEO, a US export ban of products could take prices up, not down

On Tuesday, we tweeted [LINK] *"#Chevron CEO Wirth on an #PetroleumProducts export ban. "risk in an action like that has unintended consequences. And, in fact, the U.S. is both an exporter & importer of products" "I think there's a risk that it could take prices up, not down". US imports >2 mmbd products #OOTT*." Wirth was on CNN on Tuesday morning and CNN asked "*Energy Secretary Granholm wrote you a letter a few weeks ago and asked Chevron and other big suppliers not to export more fuel and instead to, quote, focus on building inventories here in the United States. This is after a number of Democrats in the Congress called on you guys to flat out stop exporting oil out of the United States. Would a ban like that actually bring down prices for American consumers, because that is their argument?"* Wirth replied "*The risk in an action like that has unintended consequences. And, in fact, the U.S. is both an exporter and importer of products. An export ban runs the risk of taking supplies that are needed in other parts of world and reducing those, which can drive oil prices up, which then can affect the price of imports into this country."* CNN followed up "*Which means it doesn't get cheaper here is what you're saying*?" Wirth then said "*I think there's a risk that it could take prices up, not down."*

US imports over 2 mmb/d of petroleum products

Chevron CEO Wirth reminded of something that is overlooked – the US also imports significant petroleum products. The US is still a big petroleum products exporter, but our tweet included the EIA's weekly petroleum products imports and exports graphs as of Tuesday noon MT. The US imports over 2 mmb/d of petroleum products, in particular in areas like the East Coast. What may surprise many is that US imports close to 0.5 mmb/d of petroleum products from Europe, especially into the East Coast. Below are the EIA graphs attached to our tweet.

Figure 30: US imports of petroleum products



Source: EIA

Figure 31: US exports of petroleum products

Source: EIA

Oil – US rail strike averted, a positive for WCS and Bakken

Tentative rail deal avoids strike

Early Thursday morning, we tweeted [LINK] "*Huge relief to US economy and spill over impact on CAN including Cdn medium/heavy oil - tentative labor agreement to avoid US rail strike. #OOTT.*" The White House released [LINK] "*Statement by President Joe Biden on Tentative Railway Labor Agreement*". There wasn't any details and it is a tentative deal, but the key was that it meant no strike today shutting down US rail transportation of people and goods. The White House wrote *"I thank the unions and rail companies for negotiating in good faith and reaching a tentative agreement that will keep our critical rail system working and avoid disruption of our economy*." This was a positive for WCS as it meant that there would be no interruption of crude by rail. Earlier in the week, we tweeted [LINK] "*Can Biden let a potential US rail strike on Fri last? Cdn crude by rail exports 103 kbd to US. Gas price hits as West Coast refineries get 154 kbd from US Bakken & 30 kbd from CAN. Frac programs would be hit with frac sand by rail. #OOTT #NatGas* " And [LINK] "*if strike happens and cdn crude by rail gets hit, it will hit WCS diffs. #OOTT.*" Our tweets included the items we include in our Energy Tidbits on the monthly crude by rail data. HH natural gas prices were hit with the news of the tentative deal as it meant that thermal coal by rail wouldn't be stopped.

Figure 32: Crude oil movements by rail (thousand barrels/day), June 2022

	Receipts						
Shipments	PADD 1	PADD 2	PADD 3	PADD 4	PADD 5	United States	Canada
PADD 1	0	0	0	0	0	0	0
PADD 2	31	0	0	0	154	185	0
PADD 3	0	0	0	0	0	0	0
PADD 4	0	0	0	0	0	0	0
PADD 5	0	0	0	0	0	0	0
United States	31	0	0	0	154	186	0
Canada	5	16	53	0	30	103	NA
Total	36	16	53	0	184	289	NA

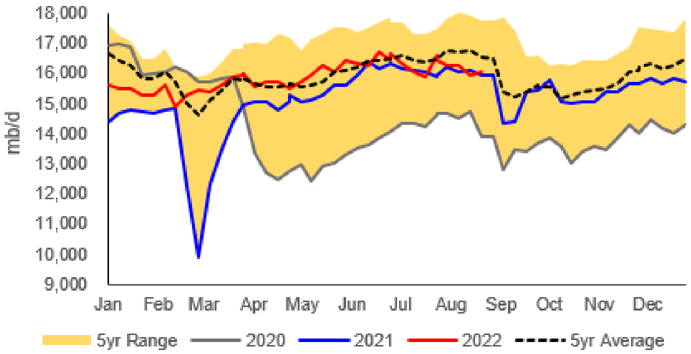
Source: EIA

Oil – Refinery inputs +0.094 mmb/d WoW to 16.022 mmb/d

Refinery inputs down WoW

This is a bit of contrary seasonal move in crude oil inputs to refinery and we suspect it is due to the restart of the BP Whiting refinery. September is normally a turnaround month for refineries in the US and that means less crude oil inputs into refineries. On Wednesday, the EIA released its estimated crude oil input to refinery data is for the week ended Sept 9. The EIA reported crude oil inputs to refineries down +0.094 mmb/d WoW to 16.022 mm/d, which is +1.635 mmb/d YoY to 14.387 mmb/d for the week ended Sept 10, 2021. Note last year's week ended Sept 10 was still recovering from the aftermath of Hurricane Ida. Total products supplied (i.e., demand) decreased -0.669 mmb/d WoW to 19.313 mmb/d. Motor gasoline was down -0.233 mmb/d WoW to 8.494 mmb/d. The 4-week average for Motor Gasoline supplied was down -0.213 mmb/d to 8.562 mmb/d.

Figure 33: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – Reminder Sept is a big refinery turnaround period

US "net" oil imports down WoW

The reason we include the above refinery graph is to show the seasonal trends. This is normally the period of large seasonal refinery turnarounds. We don't track the refinery turnarounds in details, but a couple popped up on our screen to remind of the seasonal turnaround. (i) On Tuesday, Reuters reported [LINK] "*Marathon Petroleum Corp MPC.N began shutting a diesel-producing hydrocracker at its 593,000 barrel-per-day (bpd) Galveston Bay Refinery in Texas City, Texas, on Tuesday to begin a planned overhaul, said sources* *familiar with plant operations. Marathon plans to upgrade the main compressor on the 60,000-bpd Ultracracker (UU-4) hydrocracker as well as performing maintenance on the 105,000-bpd cat feed hydrotreater and a 13,000-bpd coker during the overhaul, planned to last between 30 and 40 days, the sources said."* (ii) On Wednesday, Reuters reported [LINK] TotalEnergies "*cut production at its 238,000 barrel-per-day (bpd) Port Arthur, Texas, refinery because of the planned shutdown of two sulfur recovery units (SRUs) on Wednesday, said sources familiar with plant operations. Total cut the refinery's production by about 50% to prevent releases of sulfur into the atmosphere beyond permitted levels while the two SRUs are shut for work planned to last about two weeks, the sources said."*

Oil – US "net" oil imports down -1.069 mmb/d WoW at 2.277 mmb/d

US "net" oil imports down WoW

US "NET" oil imports were down -1.069 mmb/d to 2.277 mmb/d for the Sept 9 week. US imports were down -0.987 mmb/d to 5.792 mmb/d. US exports were up 0.082 mmb/d to 3.515 mmb/d. The WoW decrease in US oil imports was driven BP Whiting refinery being down and therefore less oil imports from Canada. US's Top 10 imports by country which were down by 0.647 mmb/d WoW from these countries. Some items to note on the by country data. (i) Canada was down 0.601 mmb/d WoW to 2.937 mmb/d and we believe this was directly due to the BP Whiting being down. It has since returned to service. (ii) Mexico was down 0.481 mmb/d WoW. We don't have a reason for why last week was so much higher than other weeks. (iii) Nigeria was +0.230 mmb/d WoW as last week was a zero week.

Figure 34: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	July 8/22	July 15/22	July 22/22	July 29/22	Aug 5/22	Aug 12/22	Aug 19/22	Aug 26/22	Sep 2/22	Sep 9/22	WoW
Canada	3827	3481	3308	3,673	3,351	3,455	3,834	3,093	3,538	2,937	-601
Saudi Arabia	634	242	516	500	412	244	247	330	423	425	2
Venezuela	0	0	0	0	0	0	0	0	0	0	0
Mexico	610	877	639	815	710	661	503	440	965	484	-481
Colombia	213	405	150	328	174	214	143	289	261	288	27
Iraq	302	454	165	369	181	163	225	401	222	343	121
Ecuador	149	57	150	243	212	36	278	231	144	199	55
Nigeria	79	136	143	57	161	253	72	137	2	232	230
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	5,814	5,652	5,071	5,985	5,201	5,026	5,302	4,921	5,555	4,908	-647
Others	861	867	1,093	1,357	970	1,106	869	1,035	1,224	884	-340
Total US	6,675	6,519	6,164	7,342	6,171	6,132	6,171	5,956	6,779	5,792	-987

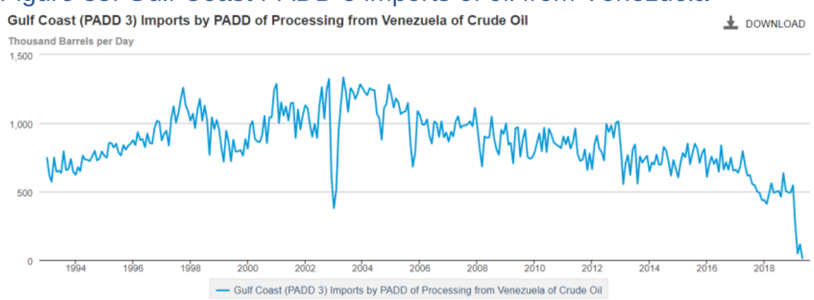
Source: EIA

Oil – Will Iran's Venezuela plans help Chevron get sanctions relief on Venezuela

Chevron in Venezuela

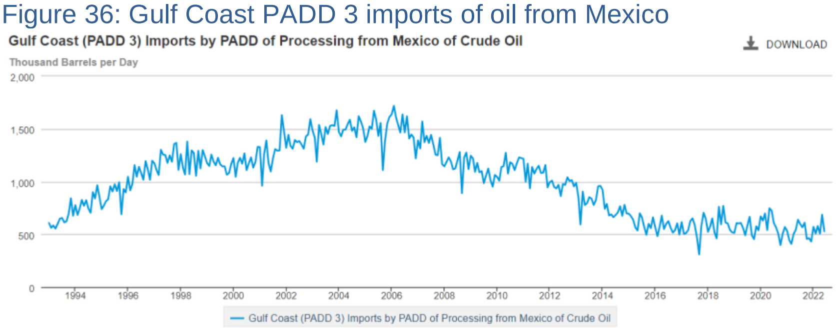
We recognize that most discount reports out of Iran as not being credible. But we like to to think if there are any oil and gas implications even if they don't fully come true.(i) Last Sunday, Iran media, Tasnim, reported [LINK] "*Speaking to Tasnim, member of the Iranian Parliament's Energy Commission Parviz Mohammadnejad said the lawmakers have repeatedly recommended that the Oil Ministry should take swift action to attract foreign investment and construct "extraterritorial refineries".He said two contracts have been signed so far to set up refineries in other countries. The MP noted that constructing refineries outside Iran will improve the country's international relations in the energy sector and help Tehran generate a high and sustainable currency income. The construction of extraterritorial refineries has many advantages, as it would allow for easier access to the customers without any barrier, Mohammadnejad noted. "Venezuela has many refineries which require our country's up-to-date knowhow and technology. We can take advantage of such a capacity to achieve our purposes in and outside the region. We can have access to the customers* *without paying additional costs in this way, because the extra and additional expenses for the export of oil are very high at present," he added*." (ii) This concept makes a lot of sense for Iran and Venezuela. Venezuela's production bumps come whenever Iran can get some blending oil for Venezuela's heavy crude. Fixing Venezuela's refineries will be be a great source of Venezuela medium crude oil. (iii) But what we wonder about is does the US just ignore this? We have to believe Chevron will be using this to try to get the Biden administration to ease off on Venezuela sanctions so Chevron can access Venezuela heavy/medium crude . (iv) If this somehow helps cause a reduction in sanctions on Venezuela oil, then this would be a mid term negative to Cdn medium and heavy oil. Chevron would be able to import Venezuela oil for its Gulf Coast refineries. And displace Canadian crude oil in the Gulf Coast. Don't forget the big build out in Gulf Coast refineries was due to the massive oil reserves/production potential in Mexico and Venezuela. (v) Canadian heavy oil only made it to the Gulf Coast because of the need as Mexico went into production decline and US stopped Venezuela imports. Below are the current US Gulf Coast PADD 3 oil imports from Canada, Mexico and Venezuela. Please be careful as the graphs have different vertical scales. Our Supplemental Documents package includes the Tasnim report.

Figure 35: Gulf Coast PADD 3 imports of oil from Venezuela



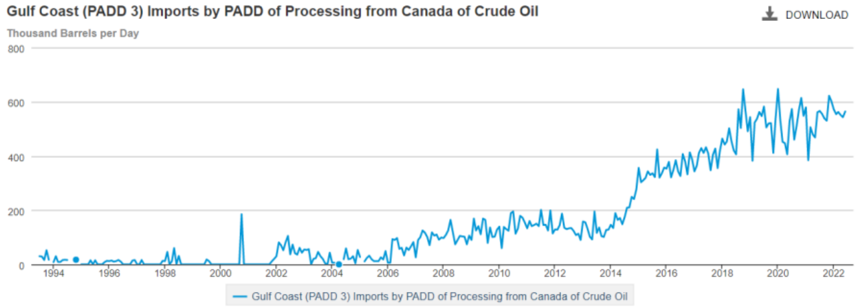
Source: EIA

Figure 36: Gulf Coast PADD 3 imports of oil from Mexico



Source: EIA

Figure 37 Gulf Coast PADD 3 imports of oil from Canada



Source: EIA

Oil – EU's challenge to replace Russia oil/products is soon to kick up a big notch

EU Russian oil & products embargo

Our Germany/Rosneft tweet remined that Europe's challenge to replace Russian oil is just about to start. On Wednesday morning, we tweeted [LINK] "*Hmmm! @IEA OMR describes EU Dec 5/Feb 5 bans means "an additional 1 mb/d of products and 1.4 mb/d of crude will have to find new homes". Agreed, but also could have described it as EU will have to go get replacement barrels or cut consumption. #OOTT.*" The IEA released its monthly Oil Market Report on Wed morning and reminded that "*the EU embargo on Russian crude oil and product imports that comes into effect in December 2022 and February 2023, respectively, is expected to result in deeper declines. An additional 1 mb/d of products and 1.4 mb/d of crude will have to find new homes. An EU ban on maritime services may force further reallocations from third countries not agreeing to the proposed G7 price cap.*" The EU oil embargo is Dec 5 and the products embargo is Feb 5. No one disagrees that these Russian barrels will have to find a new home, but our tweet reminded that Europe will have to find replacement barrels or cut consumption. A double edged sword!.

Vitol, it's impossible for the world to get by without all of RUS 7 mmb/d exports

We couldn't help remember an item from our Sept 4, 2022 Energy Tidbits when we read the IEA's reminder of EU's oil and products embargo on Russia. In that memo, we wrote on Vitol Asia Head Mike Muller's comments on the early morning Sept 4 Gulf Intelligence Daily Energy Markets PODCAST. Their 1st Sunday podcast of each month features Vitol Asia Head Mike Muller, who always provides some different oil market insights. Here is what we wrote in our Sept 4, 2022 memo on Muller's comments on Russia oil. "*There is a major oil risk coming up over the next few months – what will happen with Russia's 7+ mmb/d of oil and products exports and can the West find a way for Russia oil to keep flowing (their Russian price cap idea) and for Putin to not stop oil & products exporting? (i) It is impossible for the world to get buy without Russian oil and products exports. Earlier this morning, we tweeted [LINK] "#Vitol's @michaelwmuller "[RUS] exports of 7+ mmbd of crude oil & products combined are an even greater % of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that". Great podcast @sean_evers . #OOTT." Mike Muller is Vitol's Asia Head and said "I think we have to bear in mind that Russia's production is a much larger number than Iran's production so you can't draw parallels about sanctions taking effect in Russia in the same way as Iran because Russia has the capability to produce 11 mmb/d of oil.*

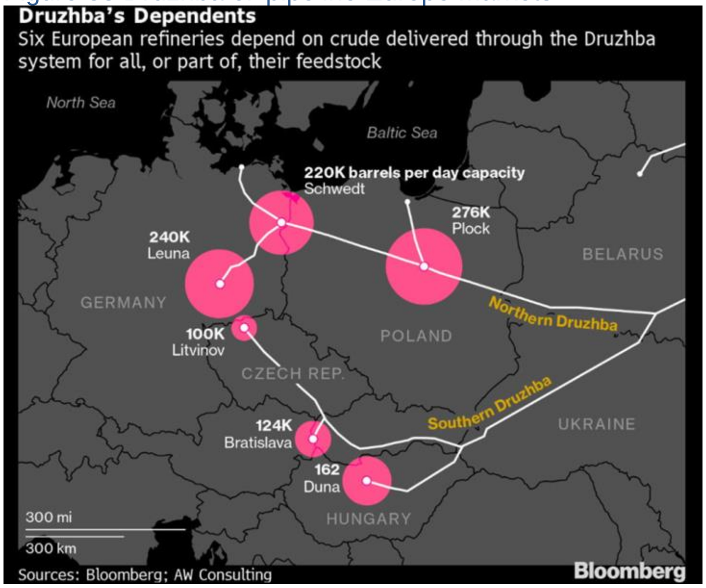
That's 11% of global supply. And its exports of 7 plus mmb/d of crude oil and products combined are an even greater percentage of the global supply picture. It is impossible, let me repeat, it is impossible for the world to get by without all of that." (ii) Absent some resolve, Europe's sanctions on Russia oil kick in in early December. Our Aug 14, 2022 Energy Tidbits noted RBC Helima Croft view that it will mean 2 mmb/d of Russian oil that will cut out of Europe market and either looking for a home or shut in. (iii) G7's price cap on Russia oil seeks to keep Russia oil flowing but forcing an effective lower price to Russia. The challenge will be how many countries will also sign on to this price cap concept. (iv) And then the big question is what will Russia do? Surely no one expects they won't do something. Look at what they are doing on natural gas. Russia said this week they wouldn't deliver oil to any country supporting the price cap. And then we have to ask if Russia will do non-oil actions against these countries? (v) If we loop back to Muller's point that the world needs "all" of Russia's 7 plus mmb/d exports of oil and products, it's why we think there is a major risk to oil coming up over the next few months."

Oil – Germany seizes Rosneft's local unit incl its German refineries

Germany seizes Rosneft's local unit

We believe crunch time is coming on EU's ban on Russian oil and products. Early this morning, we saw another indicator Germany is committed to the EU Dec 5 ban on Russian oil imports. We tweeted [LINK] "*Buckle up! EU's energy challenge is about to crank up with EU import bans on RUS #Oil Dec 5, RUS #PetroleumProducts Feb 5. DE looks to follow as just seized #Rosneft unit incl Schwedt refinery. How will Putin retaliate/escalate? Thx @nicola_news @ja_herron. #OOTT."* It was a bold, but necessary move if Germany wants to have any chance of the Rosneft refineries producing any petroleum products. Otherwise, Russia would just make sure no oil was sent to the refineries to process. This way, Germany can try to get oil barrels to the refinery anyway it can. Bloomberg wrote "*Germany seized the local unit of Russian oil major Rosneft PJSC as Berlin moves to take sweeping control of its energy industry, secure supplies and sever decades of deep dependence on Moscow for fuel. In the latest move, the government said it was taking over Rosneft's German unit, including stakes in three oil refineries."* And "*Seizing the Rosneft unit is an escalation in the economic standoff with Russia as Berlin unwinds decades of tight collaboration. The Schwedt refinery -- near the Polish border --has, until now, got its crude via the Druzhba pipeline from Russia. As long as the plant remained significantly in Russian hands, it was hard to see how the facility would keep getting enough fuel to supply Berlin and other parts of eastern Germany."*

Figure 38 Druzhba oil pipeline Europe markets



Source: Bloomberg

Oil – OPEC MOMR, no change to demand forecasts but maybe some China downside

OPEC MOMR

On Tuesday, OPEC released its Monthly Oil Market Report at 6:10 am MT. Oil was down Tuesday morning but that was due to the hotter than expected US CPI Aug data that was released at 6:30am MT. (i) The headlines were on no change or immaterial changes to OPEC's demand and non-OPEC supply forecasts for 2022 and 2023. It was one of the reports with the fewest MoM changes in demand and supply. (ii) YoY demand growth unchanged for 2022 at +3.10 mmb/d to 100.03 mmb/d, and for 2023 at +2.70 mmb/d to 102.73 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. We have to wonder if they are setting the stage to reduce their China demand forecasts. OPEC is probably no different than most and doesn't know what Xi will do on Covid Zero policy. The Sept MOMR was less certain on a post Covid recovery . In 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*". Whereas in the Aug MOMR, they used "expected", not "anticipated". Aug MOMR, they wrote "*In 2023, expectations for healthy global economic growth, combined with expected improvements in the containment of COVID-19 in China, are expected to boost consumption of oil."* (iv) Non-OPEC supply. Immaterial changes to YoY growth for 2022 of +2.11 mmb/d to 65.78 mmb/d (was +2.15 mmb/d to 65.80 mmb/d, and to for 2023 of +1.73 mmb/d (was +1.71) to 67.51 mmb/d (unchanged). (v) OPEC Secondary Sources for Aug +618,000 b/d MoM to 29.651 mmb/d. For OPEC10 (the countries in the quota), they produced 25.278 mmb/d in Aug, well below the Aug quota of 26.689 mmb/d. (vi) One difference in Direct Communications (what the OPEC countries report) is that Saudi says it produced 11.051 mmb/d, which is above their quota of 11.004 mmb/d for Aug. (vii) OECD inventories at July 31, deficit widened "crude only" stocks -144 mmb (vs June May -135), product stocks -127 mmb (vs June -100) below

2015-2019 average. Our Supplemental Documents package includes excerpts from the OPEC MOMR Sept.

Oil – IEA OMR: no change to overall demand, but China demand lowered re Covid

IEA Oil Market Report

On Wednesday, the IEA released its monthly Oil Market Report for Sept 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) No change to 2022 oil demand of 99.7 mmb/d and 2023 of 101.8 mmb/d. (ii) 2022 is still below pre-Covid of 100.4 mmb/d in 2019. (ii) China demand hits offset by other items such as "*robust oil use for power generation in the Middle East and Europe*". Sept OMR has China 2022 at 15.0 mmb/d, down 0.4 mmb/d vs Aug OMR of 15.4 mmb/d. IEA writes ""*Chinese oil demand will decline by 420,000 barrels a day, or 2.7%, this year in the first annual drop since a 1% retreat in 1990, the Paris-based adviser said. The pullback that year is the only previous retreat in IEA records dating back to 1984.*" (iii) Gas-to-oil switching to reach 0.7 mmb/d in both Q4/22 and Q1/23 and "*double the rate of a year ago*". (iv) Non-OPEC supply YOY growth is unchanged for both 2022 and 2023. Sept 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 30.1 mmb/d (was 30.0). (vi) OPEC Aug production was +680,000 b/d to 29.72 mmb/d led by Libya +430,000 b/d MoM, Saudi +150,000 b/d, UAE +70,000 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 10.96 mmb/d for Aug is below what OPEC MOMR reported as Direct Communications from Saudi of 11.051 mmb/d. (viii) Tight products/diesel market. IEA wrote "*Such losses would still leave the market oversupplied in 2H22, by close to 1 mb/d, and roughly balanced in 2023. But product markets, especially diesel, are expected to remain in deficit due to downstream capacity constraints outside of China. Global diesel markets have tightened this year, with demand robust and as lower Chinese export quotas have sharply reduced its sales abroad. More recently, newly introduced taxes in India have discouraged exports from Asia's largest supplier*." (ix) Q3 is refinery turnaround period. IEA writes "*After reaching a post-Covid peak in August of 81.4 mb/d, refinery throughputs are expected to fall in September-October on seasonal maintenance. With lower runs, refined product inventories are now unlikely to see any substantial builds for the remainder of the year."* (x) OECD crude oil inventories at July 31 were 274.9 mmb below the five-year average vs 292.1 mmb at June 30. Our Supplemental documents package includes the IEA release and the Bloomberg reports.

Figure 39: 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
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 – Increasing Biden polls make US less likely to haggle on JCPOA

JCPOA still seems stuck

We have to believe Biden's increasing poll numbers and momentum for the Democrats into the mid-terms is giving him more political capital to try to get a win on JCPOA that he can clearly say is the win he wanted. And not be portrayed as settling just to get a deal done. The US has moved off their talking points from the summer that the big issues were resolved and they were getting close to the goal line. The position has reverted to the spring that there was a deal on the table they were accept, Iran wasn't meeting those terms and it was up to Iran to make the move to meet those acceptable terms. We have to believe Iran can also see the momentum to the mid-terms, which is a big reversal from the expectations that the Democrats would be the big loser. We just don't know if they see it as a reason to move or a reason to wait to see if they can get haggle a bit after the mid-terms. If Biden's positive poll numbers translate into the Democrats doing well, they may feel he has the ability to haggle a little bit so he can get a JCPOA done.

All polls showing Biden's approval ratings are going up

Listening to US media the last day, Biden is getting some of the credit for averting the rail strike, which should help his poll numbers. Prior to that, he has already been seeing strong increases in his approval ratings. A couple examples. The Associated Press-NORC poll yesterday had a 9% increase in Biden's approval rating to 45%. Last week's Yahoo News/YouGov polls shows 48% of registered voters would choose Biden vs 42% for Trump, a 6% lead vs 3% in August.

Oil – No mention if Xi/Putin discussed China buying more Russian oil and gas

Xi/Putin meeting yesterday

We had a news cut off of 11am MT for today's memo. As of our news cut off, we have not seen specifics on any potential additional China commitments to purchase Russian oil and LNG post the Xi/Putin meeting last night. We have to believe these were discussed given this is a crucial issue for Russia who are facing the EU Dec 5 ban on Russian oil and Feb 5 ban on Russian natural gas/LNG. So we have only seen general comments by China and Russia that they were likely discussed. For example, People's Daily (the news agency for China's Communist Party), reported [LINK] "*China ready to work with Russia to support each other on issues concerning core interests: Xi. China is ready to work with Russia in extending strong support to each other on issues concerning their respective core interests, Chinese President Xi Jinping said during a meeting with his Russian counterpart, Vladimir Putin, here on Thursday. China is also willing to deepen pragmatic cooperation in such areas as trade, agriculture and connectivity, Xi added.*" Surely, "core interests" includes Russian oil, natural gas and LNG.

Imagine if Xi agreed to buy more Russia oil and then relaxed zero-Covid

Ahead of the Xi/Putin meeting, we had a couple of tweets. (i) On Wednesday morning, we tweeted [LINK] "*Better watch out if Xi opens up China post Oct congress. @IEA OMR took down CN demand. New Q3/22 is 14.9 mbd (was 15.6). Q4/22 is 15.5 mbd (was 15.8), Q1/23 is 15.4 mbd (was 15.8), Q2/23 is 15.9 mbd (was 16.1), Q3/23 is 16.1 mbd (was 16.3), Q4/23 is 16.5 mbd (was 16.8). #OOTT.*" The China party congress starts Oct 16. And, as noted earlier, the IEA cut its forecast for China oil demand. (ii) The thought that came to mind in seeing the IEA cut its oil demand forecast basically due to Covid handling was what a money making opportunity for China. Just like we have seen in them flipping some Russian LNG cargos for profit, why not for oil. Why not take on more oil from Russia and then open up the economy. So at lunchtime on Wed, we tweeted [LINK] "*Hmmm! Will public know if Xi/Putin meeting Thurs sees China take on additional Russian #Oil & #PetroleumProducts. China could make some big $ if it then pivots away from zero-Covid at Oct 16 congress! Any surplus cargos could be flipped for profit like doing for #LNG. #OOTT.*"

Oil – Trafigura sees the case for a serious upcycle in oil

Trafigura very bullish oil view

We weren't able to see Trafigura Chief Economist Saad Rahim's presentation at the Pareto Securities conference on Wednesday, but did see the subsequent webcast Q&A. [LINK]. Rahim clearly had a very bullish view for oil. Rahim highlights the lack of investment in oil, and that investment never gets a chance to get caught up so the end result is a series of upward spikes with the lows keep getting higher. We tweeted [LINK] "*#Trafigura case for a serious upcycle in #Oil. Prices spike to where causes demand destruction, but because haven't had enough time to catch up on investment, each subsequent low is actually higher. See 👇 SAF Group transcript. Thx @saadrahim @paretosec. #OOTT.*" We created a transcript of his comments. At the 9:00 min mark, Pareto asks ".. *you believe that you believe we are in the start of a serious upcycle in oil. And saw in your presentation this morning you describe the current market as spike. I think it's time we debate.*" Rahim replies *".. for me, I don't think these things are mutually exclusive. I think you can have a series of spikes that actually when you put them together, effectively are a cycle. Or at least an upcycle. If you are in a position where you're ultimately, the spikes I was referring to because of the underinvestment, you get to a point where prices spike to a level that then causes demand destruction. And you come off, but because you haven't had enough time to catch up on investment, your lows. Each subsequent low is actually higher. Right, so again if you put all those series together you maybe end up in a cycle."*

Oil – FedEx CEO thinks a worldwide recession

FedEx sees worldwide recession

The big negative on oil remains the expectations for a global slowdown. This was reinforced by one of the CEOs who should have a good pulse on business and consumer activity around the world – FedEx CEO Raj Subramaniam, who was interviewed by Jim Cramer on his show CNBC's Mad Money last night. Earlier this morning, we tweeted [LINK] "*ICYMI. See 👇 @jimcramer are we going into worldwide recession, @FedEx CEO Subramaniam "i think so but again these numbers don't portend very well" "seeing volume decline in every segment around the world" "weekly numbers are not looking so good" "US is slowing down too" #Oil #OOTT.*" Our tweet attached the following transcript we made of his comments [LINK]. Items in "italics" are SAF Group created transcript. Cramer "… *that's got to be more than just Asia and services?"* Subramaniam "*no, no, we're seeing the volume decline in every segment around the world. And so, since the start of our second quarter, the weekly numbers are not looking so good. So we just assume at this point that the economic conditions are not very good. But it basically allows us then to fully go into cost cutting mode and take those actions that we can then restructure FedEx [intelligible word]"* Cramer "*Raj, are we going into a worldwide recession?* Subramaniam "*Well, I'm not an economist but*" Cramer "*You know more than an economist. Come on. They just push papers, you actually look at things*." Subramaniam "*Well, I think so*." Cramer "*you think we are going into a worldwide recession*"

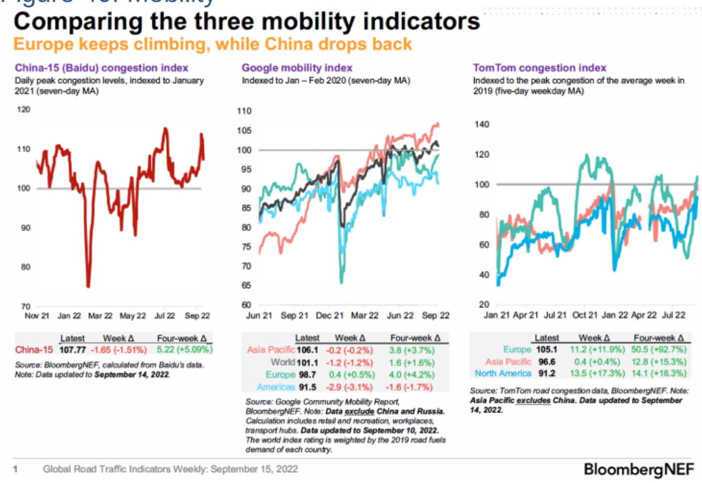
Subramaniam "*I think so. But again, these numbers don't portend very well*" Cramer "*US in the last few weeks as bad as China in the last few weeks?*" Subramaniam "*The US consumer is definitely spending less. The US has been somewhat insulated because of the US dollar is the currency of choice for the world so there is some insulation there. But I do see the US is slowing down too*".

Oil – BNEF: Europe TomTom congestion index back over 2019 levels

Europe driving indicators back to 2019 levels

We have to believe that we are seeing the big difference between demand response vs demand destruction. It wasn't demand "destruction" when US and Europe drivers reduced driving when gasoline and diesel prices went crazy in Q2. It was a demand "response". We have seen support for this with Europe and US mobility data that supports Europe and US drivers have been hitting the road with the drop in gasoline and diesel prices. On Wednesday, BloombergNEF posted its "*Global Road Traffic Indicators".* Note this is a weekly look at indicators so its commentary is on a WoW basis. But the one surprise data point was BNEF writing "*TomTom congestion index: Europe levels surpass 2019 average as global upward trend continues*". BNEF included the below mobility graphs.

Figure 40: Mobility



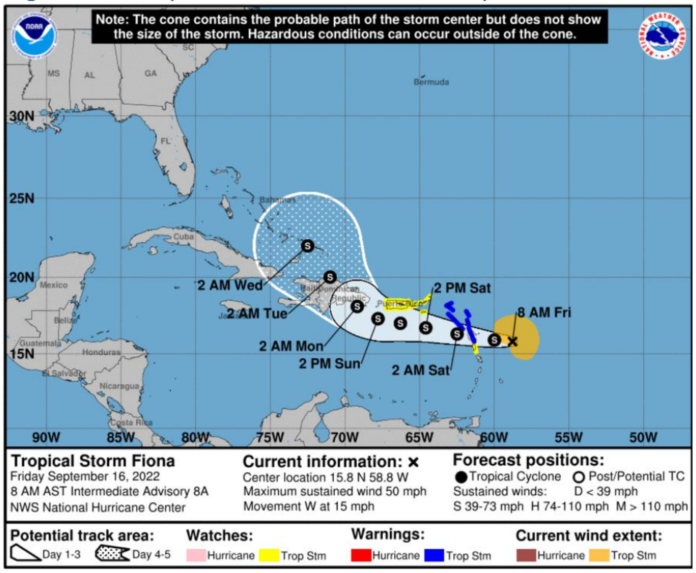
Source: BloombergNEF

Oil & Natural Gas –Fiona reminds Puerto Rico is a good marker for GoM hurricane risk

Hurricane risk GOM vs Atlantic

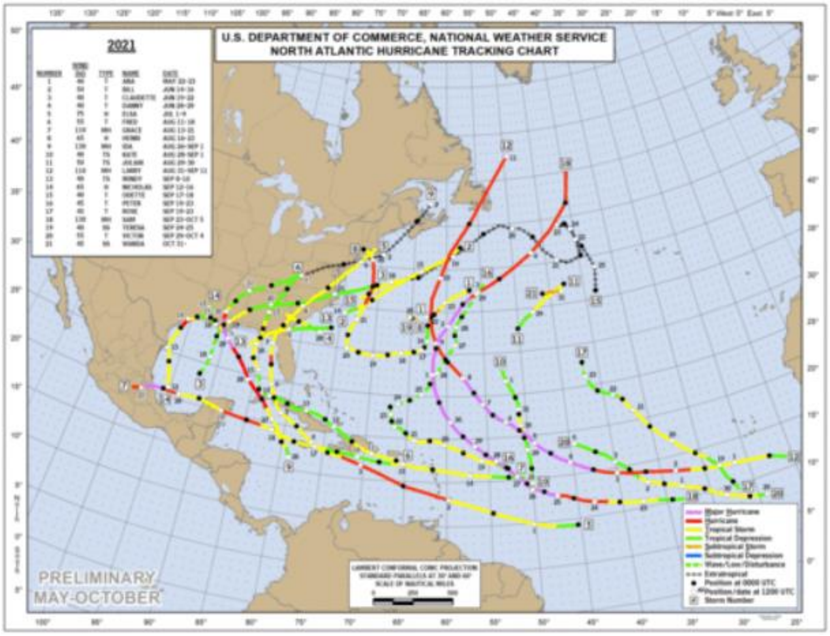
There is a continuing absence of tropical storm or hurricane activity in the Gulf of Mexico and all the activity since late July has been gone into the Atlantic side of the US. That is continuing with Tropical Storm Fiona that emerged this week and is on path to hit Puerto Rico and Dominican Republic this weekend. Earlier this morning, we tweeted [LINK] "*Tropical Storm Fiona path reminds hurricane risk to GoM #Oil #NatGas #LNG #Refinery infra tends to increase if hurricanes are south of Puerto Rico & Dominican Republic. See 👇 excerpt SAF Group Dec 5, 2021 Energy Tidbits. Hoping people are safe in PRI/DOM. #OOTT."* Here is what we wrote in the Dec 5, 2021 Energy Tidbits "*Is normally not a perfect correlation but the 2021 Atlantic hurricane season was for the early indicator for risk to the GoM oil and gas being if the tropical storm/hurricane hits north of Puerto Rico or not. This year, all the* *storms/hurricanes that were north of Puerto Rico went into the Atlantic and all that were south of Puerto Rico went into the GoM. Below is NOAA's 2021 tracking map*."

Figure 41: Tropical Storm Fiona as of Sept 16 at 6am MT



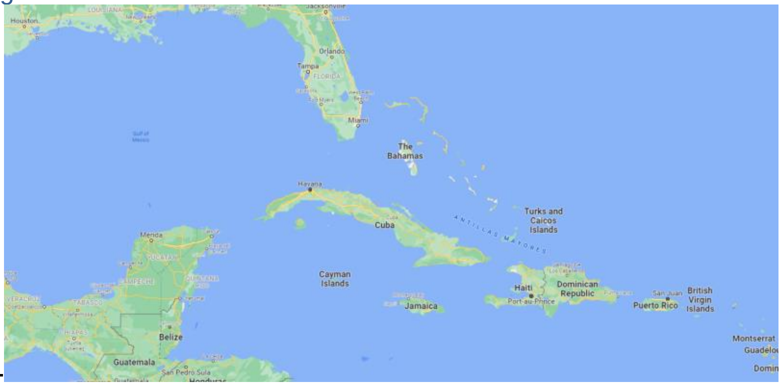
Source: NHC

Figure 42: North Atlantic Storm Tracking Map in 2021



Source: National Hurricane Center

Figure 43: Caribbean Sea



Source: Google Maps

Energy Transition – Chevron CEO tomorrow's energy system isn't yet built

Tomorrow's energy system isn't yet built

Chevron CEO Mike Wirth said it clearly although we suspect that his comments were summarily dismissed by the western politicians as what do you expect from a fossil fuels guy. But it was a clear message that "*we can't count on tomorrow's energy system until it is built*". On Tuesday, we tweeted [LINK] *"#EnergyTransition is happening, but need a plan that doesn't cause chaos for 2020s.#Chevron CEO Wirth "And I think the instability we're seeing in certain markets around the world today is a signal that we can't count on tomorrow's energy system until it is built." #NatGas #OOTT*." This is the point that we have made for the past couple years – the Energy Transition is happening but it will take longer, be a bumpy road and cost a lot more. Doesn't make a difference what you call it, the energy transition isn't ready for prime time and that started being exposed long before Russia invaded Ukraine. CNN asked "*The U.N. climate report said it is now or never to address climate change. They said, we're on a fast track to climate disaster. A third of Pakistan is under water right now. So, on a scale of one to ten, one being not concerned, ten being a five-alarm fire, where is your concern level about climate change?"* Wirth replied "*It is difficult to put these things on a scale for me. We take it very seriously. And our objective is to deliver lower carbon energy to supply a growing economy. We also need to keep the economy running. And I think the instability we're seeing in certain markets around the world today is a signal that we can't count on tomorrow's energy system until it is built*."

Energy Transition – RBC, more acceptance for investors for increasing oil/gas capex

RBC feedback on Shell investor meetings

We have always believed that some of the best insights come from analysts after they have taken a company on the road for one-on-one meetings with institutional investors. The analyst doesn't have to do the talking so can observe and listen. And see what a range of investors think about a company, but more importantly, what institutional investors think about energy, markets, and capital allocations. And we continue to see feedback that investors are being more open to oil and gas. No surprise, even with oil around $90, oil and gas stocks have been the only big winning stock sector (and by a wide margin) in 2022. As of Thursday close, the Dow was down 14.8% and Nasdaq down 26.2% YTD in 2022, whereas the TX Composite Oil & Gas E&P index was +51.5% YTD. On Tuesday, RBC's Biraj Borkhataria (London) posted his comment "*Shell PLC: On the road with RBC*" following mgmt. meetings with investors in North America. Putting his Shell specific comments aside, it was interesting to see investors not as solely focused on energy transition issues for oil and gas companies. Borkhataria wrote "*Based on our discussions with investors, the feedback on potential capex increases was mixed, but on the margin we felt more acceptance for increasing oil & gas capex relative to low carbon projects".* And "*"Shell highlighted that its recent conversations with investors were much more balanced now than in the last couple of years, while some North American investors noted that the company should talk more about its core business rather than its low carbon business. We believe this will be the case in future CMDs."*

CPPIB led the new investor focus back to oil and gas investments

Our Dec 19, 2021 Energy Tidbits highlighted CPPIB's Dec 15 "new" investment approach. In that memo, we wrote "*There was a significant positive to oil and gas investing this week and one that we expect others to follow, and this will lead to more long term investor capital allocation to oil and gas. On Wednesday, CPPIB announced its "new" investment approach in its release "CPP Investments highlights importance of decarbonizing hard-to-abate sectors in addressing climate change". [LINK] This is a significant change for a couple of reasons and one that we have been expecting based on the feedback we hear from long term investors. CPPIB calls it a "new investment approach" including on oil and gas. (i) CPPIB is a leader and is providing the messaging framework that we expect others to follow. Big long term investors like CPPIB have mostly all come out plans on how they taking their investment strategy to Net Zero. But, in discussions, more are realizing the Energy Transition isn't happening as fast as expected so their challenge is how to slow play their capital allocation to Net Zero. CPPIB provide the messaging on how they will do so. (ii) CPPIB now calls oil and gas a "strategic sector" and one for capital allocation. CPPIB said "helping businesses decarbonize is critical to addressing climate change, according to a recent perspective published by Canada Pension Plan Investment Board (CPP Investments). The perspective, "Investing to enable an economy-wide evolution to a low-carbon future," highlights the opportunity decarbonization presents for long-term investors, noting the need to address a particularly serious obstacle to decarbonization: strategic sectors that are essential, high-emitting and hard-to-abate. The perspective also outlines CPP Investments' new investment approach which aims to identify, fund and support companies that are committed to creating value by lowering their emissions over time, consistent with CPP Investments' time horizon advantage. "High-emitting companies that successfully navigate the economy-wide evolution to a low-carbon future will preserve and deliver embedded value for patient long-term investors like CPP Investments," said Deb Orida, Global Head of Real Assets & Chief Sustainability Officer. "This new investment approach complements the Fund's ongoing commitment to investing in companies that have the potential to develop innovative climate technologies around the world and furthers our existing capabilities in technologies that enable the energy evolution." Strategic sectors that are essential, high emitting and hard-to-abate within this investment approach include agriculture, chemicals, cement, conventional power, oil and gas, steel and heavy transportation. The successful decarbonization of these sectors is not only essential to meet wider* *net-zero ambitions, but also to sustain economic growth, stability and a responsible transition."*

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

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

@Energy_Tidbits on Twitter

LinkedIn – Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

Misc Facts and Figures.

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

Hopefully a good weekend for Cdn golf fans

We have a 11am MT news cut off for today's memo other than the Baker Hughes rig data at 11am so we only have round 1 scores for this week's LPGA Amazingcre Portland Classic. It's a new name for the Portland Classic. After round 1, Canadians Alena Sharp and Brooke Henderson are T7 at -4 and 3 shots off the lead. A great start for both Alena and Brooke. It's only round 1 but the interesting item is that, after a one-year absence, the Classic returned to the Columbia Edgewater G.C that hosted the tournament from 2013 thru 2020. Brooke won her first LPGA victory at Columbia Edgewater in 2015 at the age of 17 and won by 8 shots – the largest margin of victory on the LPGA tour that year. And she successfully defended her title at Columbia Edgewater in 2016. So it is a course she has had huge success.

Great perspective from Seattle Seahawks QB Geno Smith

NFL fans had a nailbiter for the first Monday Night Football when the Seahawks beat the Denver Broncos 17-16. The game was all about long time Seahawks QB Russell Wilson returning in his first game as Broncos QB. And all the doubts all off-season if Geno Smith could step up as Seahawks starting QB. Smith played well with 23/28 for 195 yards, 2 TDs and no INTs. It's been several years since Smith was a QB1 and the post game story was his incredible journey as a long time backup back to be a QB1. What was impressive was his perspective. NBC ProfootballTalk wrote "*When people say 'what I've been through,' I think that's a stretch, man," Smith said, via the team's website. "I'm in the NFL for 10 years, so to say what I've been through is kind of funny. Then to say people wrote me off, I've just been working."* Smith has things in perspective. He has been making backup money but his career salary is ~$15 million so that isn't too bad.

Where do you run if you're caught in the Papua New Guinea 7.6 earthquake

There were many videos posted on Twitter of the Papua New Guinea 7.6 earthquake, but one caught our attention. It was someone showing how a local paved road was splitting up from the earthquake near the term of Kainantu that wasn't too far from the earthquake. You can see the dilemma for people – where do they try to run? The 2 min video is at [LINK]

Figure 44: Papua New Guinea during 7.6 earthquake

Source: NCIB News Network