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Energy Tidbits

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Produced by: Dan Tsubouchi

2020s Will be Great for Oil Even IF OPEC's Reference Case Forecast is 50% Right for Oil Demand +8 mmb/d to 2030

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. OPEC's new Reference Case forecasts oil demand to be +8 mm/bd to 108.3 mmb/d in 2030. (Click Here)
2. OPEC tries to forecast oil demand, very different than key IEA assumption that its STEPS "scenario based on prevailing policy settings that sees a definitive peak in global demand for fossil fuels". (Click Here)
3. Oil spiked on China Covid rumors because there is no slack in global oil inventories (Click Here)
4. Russia oil production was ~9.84 mmb/d in Oct, well below OPEC+ Oct quota of 11.004 mmb/d and Nov quota of 10.478 mmb/d. (Click Here)
5. COP27, expect the language to have qualified commitments and kick the can down the road for firm commitments (Click Here)
6. Pease follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

Dan Tsubouchi
Chief Market Strategist
dtsubouchi@safgroup.ca

Ryan Dunfield
CEO
rdunfield@safgroup.ca

Aaron Bunting
COO, CFO
abunting@safgroup.ca

Ryan Haughn
Managing Director
rhaughn@safgroup.ca

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Natural Gas – Natural gas injection of +107 bcf, storage now -101 bcf YoY deficit

YoY storage at -101 bcf YoY deficit

The YoY storage deficit started last winter at -282 bcf YoY at Oct 31 and is now -106 bcf YoY. The EIA reported a +107 bcf build (+101 bcf expectations) for the Oct 28 week, which was above the 5-yr average build of +45 bcf, and above last year's injection of +63 bcf. Storage is 3.501 tcf as of Oct 28, with a narrowed YoY deficit of -101 bcf YoY vs -142 bcf YoY last week and is -135 bcf below the 5-year average vs -197 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons			
					Year ago (10/28/21)		5-year average (2017-21)	
Region	10/28/22	10/21/22	net change	implied flow	Bcf	% change	Bcf	% change
East	848	825	23	23	897	-5.5	903	-6.1
Midwest	1,042	1,007	35	35	1,068	-2.4	1,072	-2.8
Mountain	204	199	5	5	213	-4.2	214	-4.7
Pacific	247	248	-1	-1	256	-3.5	290	-14.8
South Central	1,160	1,116	44	44	1,168	-0.7	1,156	0.3
Salt	299	277	22	22	318	-6.0	306	-2.3
Nonsalt	861	839	22	22	850	1.3	850	1.3
Total	3,501	3,394	107	107	3,602	-2.8	3,636	-3.7

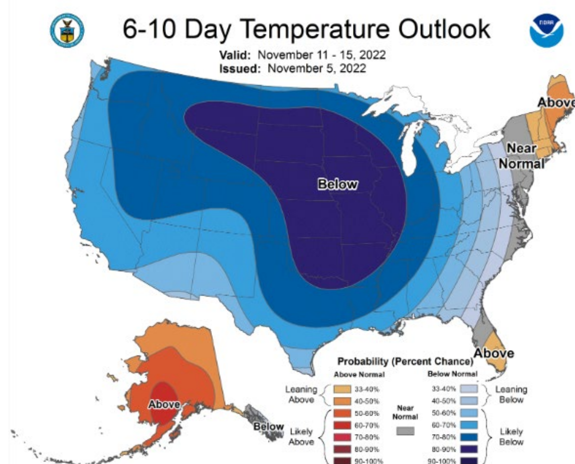
Source: EIA

Natural Gas – Big change, NOAA looking for very cold weather to hit next week

NOAA 8-14 day temperature outlook

Yesterday, we tweeted [LINK] "*Support for HH #NatGas prices. @NOAA's updated 6-10 day and 8-14 day outlooks call for colder than normal weather across almost all of the US Lower 48. #OOTT.*" We know weather forecasts are far from perfect, but the very near term forecasts tend to be reasonably good. NOAA updates its 6-10 day and 8-14 day outlooks every day, normally at 1pm MT. Both forecasts call for colder than normal weather across almost all of the Lower 48.

Figure 2: NOAA 6-10 day temperature outlook as of Nov 5



Source: NOAA

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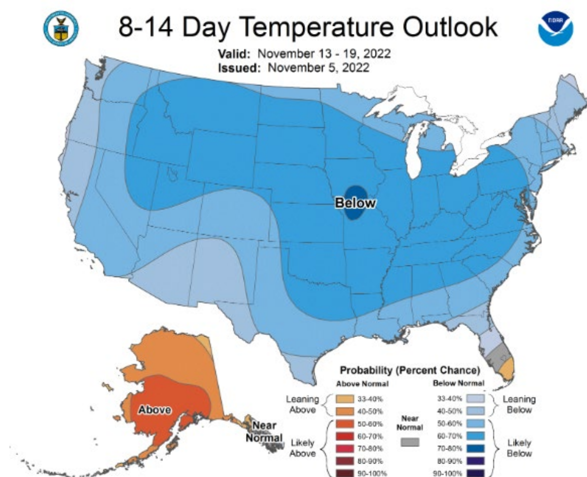
Figure 3: NOAA 8-14 day temperature outlook as of Nov 5



Source: NOAA

Natural Gas – US August gas production 99.4 bcf/d, continuing to move higher

US August gas production +5.1 bcf/d YoY

There is no change to the US natural gas story that US natural gas supply from both dry shale gas and association gas from shale/tight oil continues to be up strongly YoY. The EIA released its Natural Gas Monthly on Monday, [LINK], which includes its estimates for "actuals" for August gas production. The key takeaway from the August actuals is that August (+0.7 bcf/d MoM to 99.4 bcf/d) is at its highest point and now comfortably above the pre-Covid February 2020 level of 98.1 bcf/d. August 2022 is +5.1 bcf/d YoY. Our Supplemental Documents package includes excerpts from the EIA Natural Gas Monthly.

Figure 4: US Dry Natural Gas Production

bcf/d	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	56.0	60.0	66.0	65.3	66.8	73.4	73.6	70.6	78.7	89.4	95.1	92.8	95.3
Feb	57.2	58.8	67.0	65.4	68.4	73.8	77.3	71.5	80.4	90.0	98.1	86.2	94.5
March	57.3	61.5	65.0	65.3	68.9	74.1	73.8	73.2	81.3	90.6	94.6	92.3	95.4
Apr	57.6	62.3	64.8	66.1	70.5	75.2	73.7	73.3	81.2	91.0	92.9	93.2	96.5
May	58.0	62.4	65.0	65.9	70.2	74.1	72.9	73.3	82.1	91.7	87.8	93.0	97.7
June	57.2	62.1	64.6	65.8	70.5	74.0	72.2	74.0	82.5	92.0	88.4	93.2	98.5
July	58.2	62.5	66.3	67.1	72.0	74.2	72.8	74.7	84.2	92.5	89.8	93.7	98.6
Aug	58.9	63.2	66.0	66.9	72.4	74.3	72.2	74.7	85.9	94.8	90.2	94.3	99.4
Sept	59.1	63.1	66.4	66.8	72.4	74.7	71.7	76.0	87.3	94.7	89.5	93.6	
Oct	60.1	65.1	66.5	67.0	73.1	74.2	71.4	77.3	88.4	96.0	88.9	95.6	
Nov	60.1	65.9	66.6	67.7	72.6	73.9	72.0	79.8	89.9	96.7	92.0	97.0	
Dec	61.0	65.6	66.0	66.5	73.2	73.9	71.2	80.4	89.5	97.0	92.5	97.0	
Average	58.4	62.7	65.9	66.3	70.9	74.2	72.9	74.9	84.3	93.0	91.6	93.5	97.0

Source: EIA

Natural Gas – US pipeline exports to Mexico down MoM to 5.8 bcf/d in August

US pipeline exports to Mexico down MoM

The EIA Natural Gas Monthly also provides its "actuals" for gas pipeline exports to Mexico, which were 5.8 bcf/d in August, which was down 0.4 bcf/d YoY and down 0.3 bcf/d from July. There were no material revisions to this month's data. Mexico's unchanged production over the past five years has created the need for increased US pipeline exports to Mexico as

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Mexico builds out its domestic natural gas infrastructure. Below is our table of the EIA's monthly gas exports to Mexico.

Figure 5: US Pipeline Gas Exports To Mexico (bcf/d)

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.6
Feb	1.8	2.3	3.5	4.0	4.5	4.8	5.4	4.9	5.5
March	1.9	2.4	3.3	4.2	4.3	4.8	5.4	5.9	5.5
Apr	1.9	2.6	3.5	3.7	4.4	4.7	4.6	6.1	5.9
May	2.0	2.8	3.7	4.0	4.4	5.0	4.7	6.2	6.0
June	2.2	3.0	3.9	4.5	4.6	5.2	5.4	6.6	6.0
July	2.2	3.3	4.0	4.4	4.9	5.4	5.8	6.4	6.1
Aug	2.1	3.3	4.3	4.4	5.0	5.4	6.0	6.2	5.8
Sept	2.2	3.3	4.1	4.2	5.0	5.4	6.1	6.0	
Oct	1.9	3.2	4.2	4.2	4.9	5.5	6.0	6.0	
Nov	1.9	3.0	4.0	4.5	4.7	5.3	5.5	5.5	
Dec	2.1	3.2	3.6	4.4	4.5	4.9	5.3	5.4	
Full Year	2.0	2.9	3.8	4.2	4.6	5.1	5.5	5.9	5.8

Source: EIA

Natural Gas – US LNG exports flat MoM in Aug at 9.7 bcf/d

US Aug LNG exports

The new EIA Natural Gas Monthly estimates US LNG exports for August were 9.7 bcf/d This is the same number as in the DOE monthly LNG data that was posted on Oct 20. Here is what we wrote in our Oct 23, 2022 Energy Tidbits. "*As a reminder, the US Dept of Energy posts monthly US LNG export data at least a week before the EIA (part of the US Dept of Energy) posts US LNG export data in its monthly Natural Gas Monthly report. Normally, the data points are the same. On Thursday, the DOE posted its LNG Monthly for US LNG exports in Aug. [LINK] The headline numbers as the US exported 9.7 bcf/d of LNG in Aug, which was down 0.1% MoM vs July 2022, and up +0.7% YoY vs Aug 2021. Our table below is rounded numbers to one decimal and the the actual Aug is 9.67 bcf/d. 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 55.9% of total U.S. LNG exports in August 2022 o Netherlands (50.4 Bcf), South Korea (36.0 Bcf), France (33.9 Bcf), Spain (26.1 Bcf), and United Kingdom (21.3 Bcf)." 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	9.7
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	10.8
Full Year bcf	186.8	707.5	1,083.1	1,819.4	2,390.0	3,560.8	2,317.7

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Source: EIA, DOE

Natural Gas – Eversource says New England needs natural gas for foreseeable future

New England needs natural gas

Last week, Eversource mgmt sent a letter to Biden on the risk for natural gas shortage in New England this winter and lists a number of options to minimize this risk. [LINK]. Eversource warns that there is a risk during cold spells. Ie. it doesn't have to be cold all winter. *"and the Federal Energy Regulatory Commission have acknowledged for many months that New England will not have sufficient natural gas to meet power supply needs for the region in the event of a severe cold spell this winter*"". The letter leads off "*Thus, the New England region remains dependent on natural gas to meet our power needs this winter and for the foreseeable future*". And he makes his suggestions such as waiver of Jones Act. I don't know the latest data but Natural Gas Intelligence wrote a couple years ago that there weren't any US flagged, owned, manned LNG tankers ie. Jones Act wouldn't free up any LNG tankers. What surprised us that Eversource mgmt. seems to trying to warn Biden on the risk of natural gas shortage this winter and in future years as it says natural gas is needed for the foreseeable future, it's not just a this winter risk. Yet, for some reason Eversource doesn't even mention the possibility of bring more pipeline capacity of Marcellus gas – the easiest solution. It's too bad that they can't even talk about it. It's why we tweeted [LINK] "*Shame #Biden won't allow the KISS solution - Marcellus. @EversourceCorp to Biden, large-scale #CleanEnergy projects won't bring power to the grid for several years. New England remains dependent on #NatGas to meet power needs this winter AND For The Forseeable Future. #OOTT."* Our Supplemental Documents package includes the Eversource letter.

Natural Gas – ConocoPhillips to be in Qatar Energy's North Field South expansion

Qatar names ConocoPhillips as 3rd partner

We didn't see this news last Sunday before our 7am MT news cut off, but last Sunday, "*QatarEnergy announced that it has selected ConocoPhillips as its third and final international partner in the North Field South (NFS) expansion project, which comprises two LNG mega trains with a combined capacity of 16 million tons per annum (MTPA*)." ConocoPhillips joins TotalEnergies and Shell as the international partners in Qatar's Phase 2 LNG expansion – the North Field South expansion that is to add 2.1 bcf/d to be operational in 2027. Qatar Energy said "*Pursuant to the agreement, ConocoPhillips will have an effective net participating interest of 6.25% in the NFS project, out of a 25% interest available for international partners. Qatar Energy will hold the remaining 75% interest*." Qatar Energy will hold the remaining 75% interest. Our Supplemental Documents package includes the Qatar Energy release. [LINK]

Qatar's LNG expansion is two Phases to add 6.5 bcf/d in total

Here is an excerpt from our June 12, 2022 Energy Tidbits. "*Our tweet this morning [LINK] reminded that Qatar's expansion is two phases. We tweeted We tweeted "Qatar names @TotalEnergies as 1st partner. Reminder Qatar's #LNG expansion is 2 phases. Phase 1 North Field East, adds 4.4 bcfd BY 2026. Phase 2 North Field South adds 2.1 bcf operational IN 2027. Current 10.1 reaches 16.6 bcfd. Thx @SimoneFoxman @V_Ratcliffe. #NatGas #OOTT". (i) Phase 1: North Field East: increases existing LNG capacity from 77 to 110 million tons by 2026 ie. operational in 2025. This is an increase of 4.4 bcf/d from current 10.1 bcf/d to 14.5 bcf/d. (ii) Phase 2: North Field South: increases then 110 million tons to 126 million tons but won't be*

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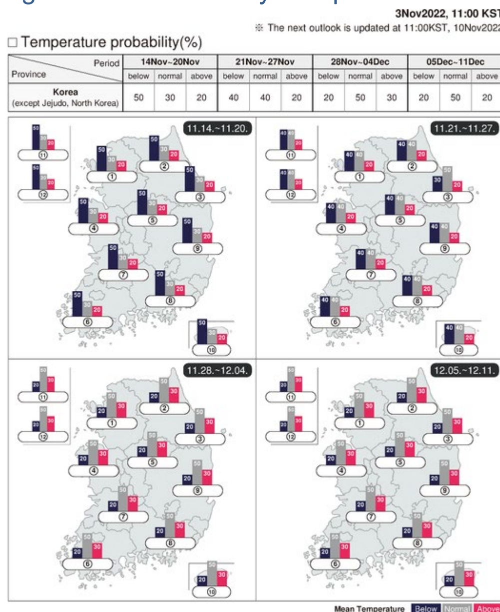
finished until 2027 ie. operational in 2027. This is an increase of 2.1 bcf/d from then current 14.5 bcf/d to 16.6 bcf/d. (iii) So total expansion of 6.5 bcf/d from current 10.1 bcf/d to 14.5 bcf/d sometime in 2025, and then to ultimate 16.6 bcf/d sometime in 2027.

Korea 30-day weather outlook

Natural Gas – Colder than normal Nov but warmer than normal start to Dec

The Korean Meteorological Administration released their 1-month outlook temperature probabilities [LINK]. It is a good link to bookmark for the average temperatures over the next 30 days in South Korea. The First 7 days of the outlook, beginning on Nov 14, has an equal chance of being below average and normal temperatures. The following week has a 50% change of being below and the Nov 28 week has a 50% change of being normal. The Dec 55 week has an equal probability of being below, at, or above normal temperatures in Korea. Below is a graphic depicting the temperature probability forecast in South Korea over the Nov 14 – Dec 11 period.

Figure 7: Korea 30-day Temperature Probability Outlook



Source: KMA

Japan 30-day temperature outlook

Natural Gas –Slightly warmer than normal Nov in Japan

Winter is on so we are back to including Japan Meteorological Agency's every Thursdays near term 30-day temperature forecast. The JMA expects a warmer than normal Nov 5-Dec 4 period. [LINK] But, because it's November, it's negative for electricity demand, but not huge. AccuWeather forecasts Tokyo daily highs around 19c and lows around 3c for November and early December.

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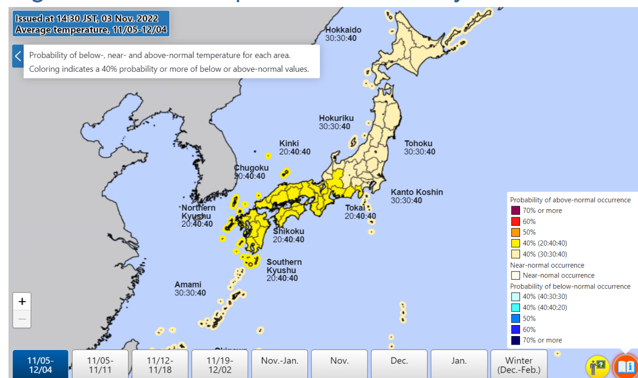
Figure 8: JMA Temperature Probability Nov 5 to Dec 4

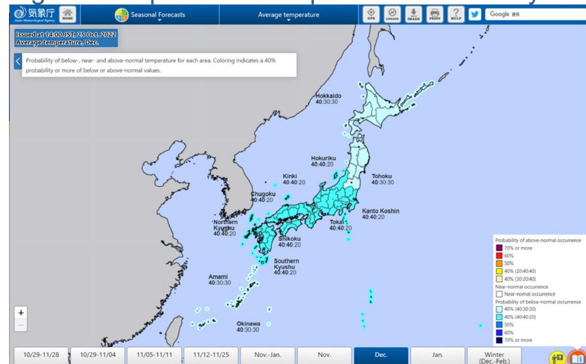


Source: Japan Meteorology Agency

Japan forecasts colder than normal Dec and Jan

The updated JMA 30-day forecast calling for a warmer than normal November is consistent with the JMA's Oct 25 seasonal forecast for Nov/Dec/Jan. Here is what we wrote in last week's (Oct 30, 2022) Energy Tidbits memo. *"On Thursday, we tweeted [LINK] "Still early, but Japan Meteorological Agency 10/25 forecast calls for colder than normal Dec and Jan. Nov expected warmer than normal. #NatGas #LNG #OOTT". With winter right around the corner, Japan expects a warmer end to fall with November being warmer than normal, but then switching to below normal temperatures in December and January. On Thursday, the Japan Meteorological Agency posted its seasonal forecast for Nov 2022 – Jan 2023 and overall it is a positive indicator for electricity demand as residents look to heat their homes [LINK]. So far in 2022, Japan has been trying to maximize coal and petroleum products due to the sky-high prices of LNG. But a cold Dec/Jan should lead to increased natural gas/LNG consumption. The JMA forecasts that most of the country should expect colder than average winter temperatures, especially in the southern regions of the island. Below is the current JMA forecast for Dec 2022 and Jan 2023.*

Figure 9: Japan Dec Temperature Probability Forecast



Source: JMA

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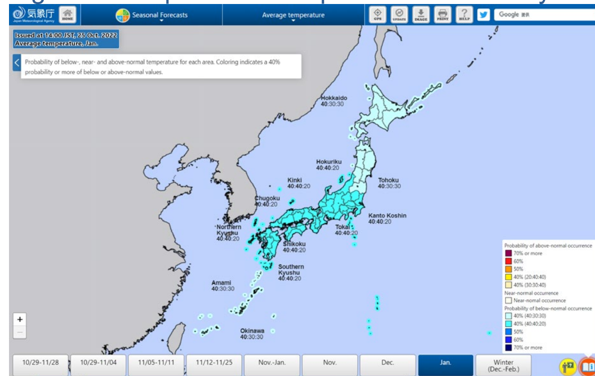
Figure 10: Japan Jan Temperature Probability Forecast



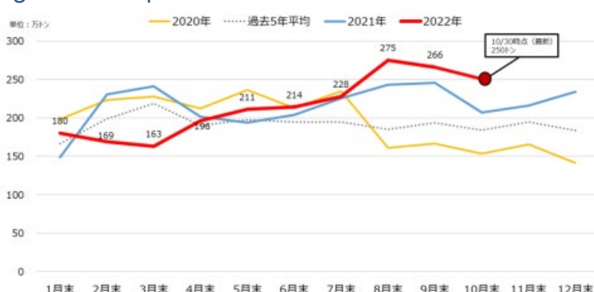
Source: JMA

Natural Gas – Japan's LNG stocks down -2.0% from last week

The risk for Japan in the winter is that they need full storage and continued LNG imports to avoid natural gas outages. That's because Japan's LNG stockpiles are not huge relative to LNG imports that have ranged from 7 to 14 bcf/d since Jan 1, 2021. A cold winter or interruption in LNG imports could easily lead to a shortage. LNG stockpiles held by Japanese power producers have exceeded both last year's level and the 4-year average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks at Oct 23 were ~120 bcf, -2.0% WoW from 123 bcf and up from the 5-yr average of 99 bcf. Below is the LNG stocks graph from the METI weekly report.

Japan LNG stocks -2.0% WoW

Figure 11: Japan's LNG Stocks



Source: METI

Natural Gas – 1st YoY decline in China natural gas consumption in ~20 years tweet

One of the big global natural gas themes has been how sky-high LNG and global natural gas prices have led to fuel switching where possible and cuts in consumption. This is not just in Europe but also in China. We have been warning that China's LNG imports will be less in 2022 for three key reasons - higher pipeline imports of cheaper Russian natural gas via Gazprom's Power of Siberia, increasing domestic natural gas production, and sky-high LNG prices are seeing China switch to coal where possible. But the sky-high LNG prices have also meant something that hasn't happened in ~20 years – China's natural gas consumption will be down YoY in 2022. On Thursday, we tweeted [LINK] "*1st YoY decline in China #NatGas*

China natural gas demand down YoY

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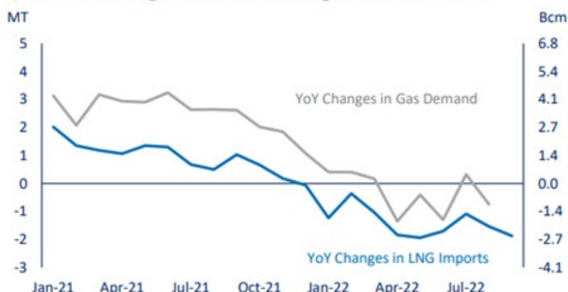
consumption in ~20 years was the saving grace for Europe #NatGas this year. See 👇from @Cheniere just posted Q3 call slides. #OOTT." Our tweet included the below graph from Cheniere's Q3 call slide deck.

Figure 12: China natural gas and LNG demand



Source: Cheniere

Natural Gas – Most of China should see warmer than normal temps from Dec to Feb

China forecasts a warm winter

The most important swing factor every winter is temperatures, is it a cold, normal or warm winter. And this year, it is even more important how cold is it in different parts of the world. Will it be cold in China and Japan and Korea? If it's a warm winter, it will free up LNG cargos for Europe and be a negative to LNG prices. On Thursday, we tweeted [LINK] *"Negative to #LNG. Changed Dec/Jan/Feb forecast vs prior expectations La Nina to drive colder China winter. @business "most parts of China will see temperatures close to or even higher than historic norms from Dec to Feb". Thx @business John Liu Kathy Chen. #OOTT #NatGas."* Our tweet included the Bloomberg report "*China Weather Agency Sees Normal-to-Warmer Winter Ahead. Most parts of China will see temperatures close to or even higher than historic norms from December to February, although some northern parts of the country could see cold snaps, according to Shen Yanbo, chief scientist with the China Meteorological Administration. * Effects of global warming including melting polar ice may counter impacts from the La Nina weather pattern around the Pacific Ocean, reversing earlier expectations for a colder winter across China, Shen said at the Chongqing Gas and Petroleum Exchange's winter gas forum."*

Natural Gas – France continued nuclear problems should help natural gas

France nuclear power problems

We put this item in the natural gas section because EDF's continue problems bringing back nuclear power generation should lead to more natural gas demand. Europe better hope for a warm winter. France's nuclear problems have made France net importer of electricity when it was the #1 net exporter as France moves into its peak electricity demand in Jan/Feb. ie. France's nuclear problems impact all of Europe. (i) EDF cut its nuclear power outlook for 2022. Bloomberg's Stephen Stapczynski tweeted on EDF's new forecast [LINK] "*EDF updates its 2022 French nuclear output estimate to 275-285TWh, compared to the previous estimate of 280-300TWh. This estimate takes into account the following factors. The impact on maintenance schedules of strikes movements in autumn 2022. Outage extensions at 4*

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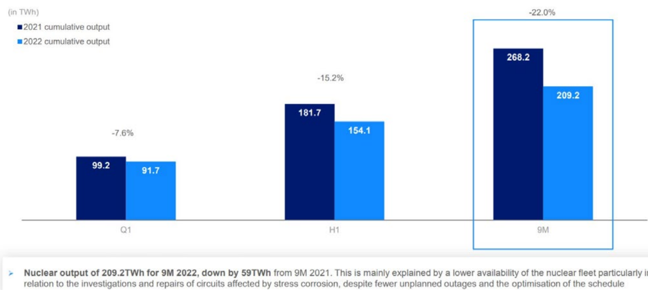
nuclear reactors involved in the programme of inspections and repairs related to the stress corrosion phenomenon[1]. The French nuclear output estimates for 2023 and 2024, respectively 300-330TWh and 315-345TWh, remain unchanged.". (ii) EDF nuclear generation has been getting worse all year. Yesterday, we tweeted [LINK] "*Plus #EDF 10/27 sales update shows how France #Nuclear output has got progressively worse every quarter. "cumulative output" -7.6% YoY thru Q1/22, -15.2% YoY thru H1/22, -22.0% YoY thru YTD Sept 30! Good thing it's been warm. Thx @SStapczynski @willwwade #OOTT.*" (iii) EDF nuclear problems have made France a net importer of electricity and France electricity demand peaks in Jan/Feb. Yesterday, we tweeted [LINK] "*Reduced #EDF #Nuclear is big risk to Europe. H1/22, FR was net #Electricity importer vs #1 net exporter in H1/21. Just coming up to FR peak electricity demand in Jan/Feb. A normal/cold EU winter should be big boost to #NatGas #LNG. Thx @enappsys.*" Below are a couple of key EDF charts form our tweets. Our Supplemental Documents package includes the two EnAppSys reports.

Figure 13: France 9 month nuclear output

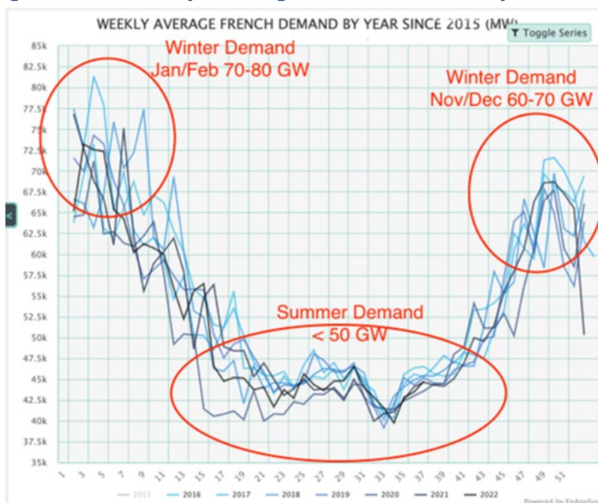
FRANCE 9M NUCLEAR OUTPUT



EDF 9M 2022 SALES & HIGHLIGHTS 15

Source: EDF

Figure 14: Weekly average French electricity demand by year since 2015



Source: EnAppSys

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Shell warned no short term EU natural gas fix other than cutting demand
Last week's (Oct 30, 2022) highlighted Shell's warning that the only significant short term Europe gas saving is from cutting demand. We then wrote "*Shell CEO van Beurden didn't give much hope for short term solutions to EU's natural gas crisis – he doesn't see any other than hope for warm weather and for EU to cut natural gas consumption. We tweeted [LINK] "Buckle up! Hope for a very warm winter in Europe. #Shell CEO on solutions for current Europe #EnergyCrisis. "Yes, we will but it won't' be without pain. It won't be easy" "But a short term fix, I'm afraid is not going to be available other than demand response." #OOTT #NatGas." In the Q&A of the Q3 call on Thursday, mgmt. was asked what Shell sees as solutions for the current energy crisis in Europe. Our tweet included the transcript we made of van Beurden replying "I wish I could give you a very simple, one liner answer to your question. There isn't really, I think this is a very difficult position we find ourselves in Europe. It's not necessarily a global picture, of course, but it's a European challenge. Will we manage to solve this? Yes, we will but it wont' be without pain. It won't be easy. So very simply put, if you have to deal with such a significant drop away of supply of natural gas coming out of Russia, there's only a few things that you can do of course to offset it. First of all, it is responding with reducing demand. And I think that is happening quite by the fact that if you have seen how much already in Europe demand has been reduced, that's quite encouraging. Some of it has to do with reasonably warm weather still. Some of it has to do with turning down industrial activity, which is not a great way to reduce demand, but, there is definitely a very strong response. The other thing of course is to bring on more supply. And this is exactly where we come in. In addition, by the way, to reducing demand, we have reduced very significantly in our operations as well. But bringing more gas into Europe, we have doubled the amount of gas, LNG, coming into Europe already. Here in the UK, it's three times as much compared to the last 12 months or the 12 months before that. And of course, we are bringing on, where we can, short term projects like for instance, the North Sea project Pierce. We are working on [?]. We are looking here and there what we can do with near field tie-backs, etc. to bring new supply on. All of these things will have to be done and will bring some form of relief. And then finally, what we also have to do is to accelerate the energy transition. At the moment what we are seeing out of necessity almost is a certain amount of gas to coal switching, we have to reverse that again. We have to make sure if you bring on more renewable capacity, it's not going to be a short term fix either. But this better be the wake up call for policymakers to see where we can accelerate permitting processes, where we can do other things to award contracts just to make sure that we are seeing an effect over the next few years. But a short term fix, I'm afraid is not going to be available other than demand response.*

Natural Gas – French October natural gas consumption at 15-year low

French Oct Gas Consumption

The big natural gas story this in H2/22 is how Europe natural gas consumption is down from mild weather so far and industrial demand getting hammered by the sky-high prices. On Thursday, we tweeted [LINK] "*France #NatGas Oct consumption at 15-yr low. Mild Oct = less*

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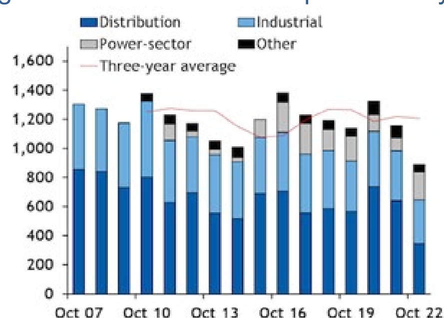
home/small business consumption. Sky-high prices = hit to industrial activity/consumption + force home/small business to use less. FR has advantage of big #Nuclear power. Thx @ArgusMedia @AugusteBreteau. #OOTT." On Thursday, Argus reported that French October gas consumption is at a 15-year low [LINK] with aggrgated French gas consumption at its lowest in October since at least 2007. Argus noted the expected reasons of a mild Oct, which was 2.7C above norms, and how sky-high natural gas prices hurt industrial activity and therefore industrial natural gas consumption. But Argus also noted that the high natural gas prices led to homes/small businesses using less natural gas. Argus wrote "*Argus analysis suggests that weather-adjusted gas demand on the distribution network has been lower than in previous years since the beginning of September, as consumers have reacted to high prices."* Our Supplemental Documents package includes the Argus report.

Figure 15: October Consumption at 15-year low Gwh/d



Source: Argus

Natural Gas – UK Met Office forecasts normal to slightly below normal NDJ temp

UK NDJ temp forecast

On Monday, the Met Office released its UK 3-month outlook for the months Nov, Dec, and Jan [LINK]. It reported that key drivers to the current outlook are the La Nina winter, which can bring higher pressure regimes in north and west of Europe and the negative Indian Ocean Dipole which could potentially reinforce the influence of La Nina. The Met Office expects Nov/Dec/Jan weather is more likely normal to slightly below normal temperatures. This means chances of dry conditions being greater than normal. The Met Office also noted that stormy conditions, and impact from high winds, are less likely than normal. Our Supplemental Documents package includes excerpts from the UK Met Office report.

Figure 16: UK 3-month outlook NDJ

Source: Met Office

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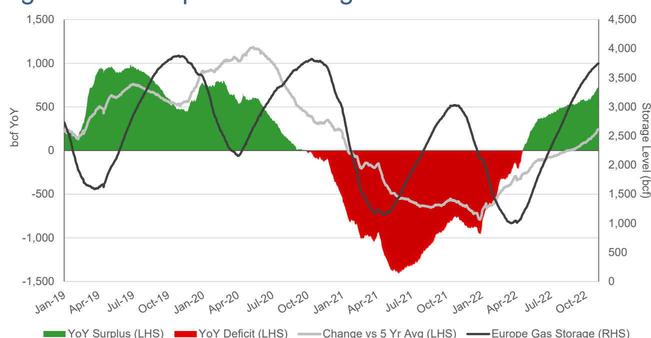
Natural Gas – Europe storage is now +18.53% YoY ie. 95.04% full vs 76.51%

Europe storage now 95.04% full

It's been a good October for minimizing natural gas consumption in Europe with the very mild temperatures. That, along with big cuts in industrial activity/natural gas consumption has led to a strong gas storage position at the beginning of November. So even with Nord Stream volumes down to zero, Europe storage continues to have increasing YoY levels. Europe gas storage began the year in a YoY deficit, but the YoY Europe storage deficit changed to a YoY storage surplus, and it continues to build this week. Europe gas storage started the winter down 18.52% YoY and is now a YoY surplus of 18.53%. 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 Nov 3 is at 95.04%, which is +18.53% greater than last year levels of 76.51% and are +6.12% above the 5-year average of 88.92%. Below is our graph of Europe Gas Storage Level.

Figure 17: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs up +3 to 613 oil rigs at Nov 4

US oil rigs +3 WoW

Baker Hughes released its weekly North American drilling activity data this morning. This week US oil rigs were +3 to 613 oil rigs. There looks to be no significant changes across the basins. US oil rigs hit a 14-week low of 591 eight weeks ago. US oil rigs are now +434 oil rigs since the Covid Sept 17, 2020 oil rigs of 179 oil rigs. And US oil rigs are +163 oil rigs YoY. US gas rigs were -1 WoW at 155 gas rigs.

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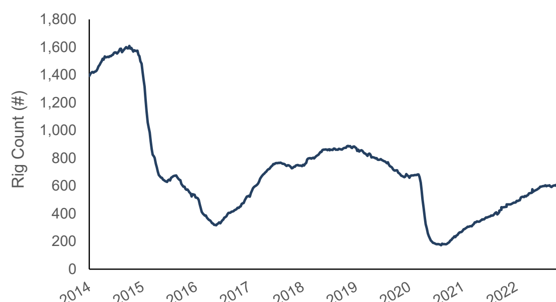
Figure 18: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – US frac spreads -3 to 290 spreads for the week ending Nov 4

Frac spreads -3 to 290

Please note that we hadn't expected to see a frac spread update as last week Rossano noted he was moving the weekly frac spread update behind a pay wall. But there was an update on Friday. So at least for this week, Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for the week ending Nov 4 on the Primary Vision network. YouTube video is at [LINK]. For the week ending Nov 4, US frac spreads at the high point in the week were -3 to 290 spreads. Here are some of his comments on the week. The drops were in some of the smaller regions, whereas some of the larger basins had a tick up in activity. He wasn't surprised by the -3 week, but he wonders if the US has hit its seasonal peak. Normally, the seasonal peak is later in November ahead of US Thanksgiving. And the normal slowdown is US Thanksgiving thru New Year. Rossano still thinks will get one more little bump up before the seasonal decrease. Had thought would get to 300 but realistically doesn't think will get there.Maybe get to 297 spreads in a week or two is doable.

Oil – Total Cdn rigs down -3 WoW to 209 total rigs, +49 rigs YoY

Cdn rigs -3 WoW

Total Cdn rigs were -3 to 209 rigs as of Nov 4, 2022. Cdn oil rigs were -4 to 141 oil rigs. Cdn gas rigs were +1 to 68 rigs. We still expect rigs to remain fairly flat ahead of winter drilling season. Total rigs are now +120 vs the comparable Covid period of 89 rigs on Nov 6, 2020. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 95 and Cdn gas rigs were 65 for a total Cdn rigs of 160, meaning total Cdn oil rigs are +46 YoY to 141 oil rigs and Cdn gas rigs are +3 to 68 gas rigs.

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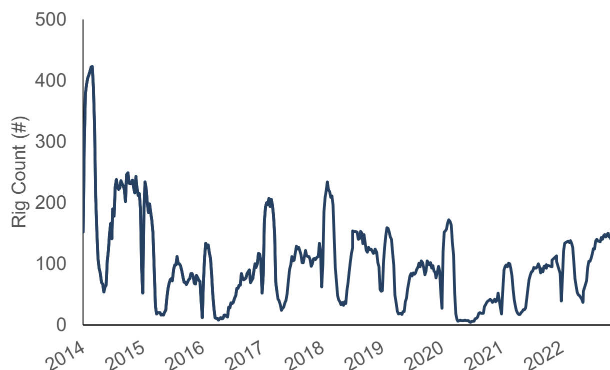
Figure 19: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

US oil production down WoW

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

The EIA provides weekly estimates of US oil production, which was down to 11.9 mmb/d from 12.0 mmb/d for the week ended Oct 28. US oil production has been range bound between 11.9 to 12.1 mmb/d for the past 22 weeks. Lower 48 production was down WoW at 11.5 mmb/d this week and Alaska was flat WoW at 0.4 mmb/d. US oil production is up +0.743 mmb/d YoY at 11.9 mmb/d but is still down significantly at -1.2 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 20: EIA's Estimated Weekly US Oil Production

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

Source: EIA

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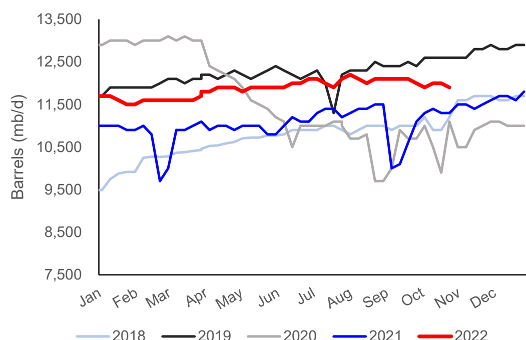
Figure 21: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA Form 914 August oil production is only +341,000 b/d vs Dec 2021 exit

EIA Form 914 August

US oil production is viewed as a key global oil supply growth, but to date, the growth in 2022 has been less than expected. There are two key takeaways from the EIA's look back at August actual oil production – August is only +341,000 b/d vs the Dec 2021 exit and was -100,000 b/d below the weekly estimates. The EIA released its Form 914 data [LINK] on Monday, which is the EIA's "actuals" for August US oil and natural gas production. (i) Form 914 estimates total US oil production is up 1.002 mmb/d MoM to 11.975 mmb/d in August. The actuals for August were 100,000 b/d lower than the EIA's weekly estimates that worked out to just over 12.075 mmb/d. (ii) One of the growing questions has been how much US oil will grow in 2022. August actuals at 11.975 mmb/d is only +341,000 b/d more than the year end Dec 2021 average of 11.634 mmb/d.

Figure 22: EIA Form 914 US Oil Production

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	11,369	11,316	11,701	11,668	11,629	11,797	11,873	11,975				
2021	11,124	9,925	11,326	11,305	11,356	11,356	11,347	11,277	10,918	11,569	11,790	11,634
2020	12,852	12,842	12,797	11,914	9,713	10,442	11,006	10,577	10,921	10,457	11,196	11,168
2019	11,869	11,673	11,913	12,149	12,154	12,218	11,902	12,486	12,590	12,809	13,000	12,978
2018	10,001	10,281	10,467	10,500	10,435	10,641	10,897	11,392	11,443	11,509	11,886	11,945
2017	8,875	9,110	9,166	9,101	9,185	9,111	9,247	9,250	9,517	9,669	10,085	9,983
2016	9,202	9,066	9,101	8,874	8,835	8,676	8,662	8,690	8,544	8,804	8,903	8,816

Source: EIA

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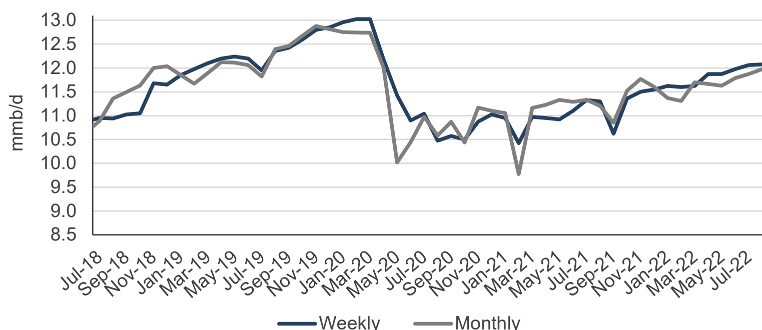
Figure 23: EIA Form 914 US Oil Production vs Weekly Estimate



Source: EIA

Oil – Dallas Fed consensus U.S. oil production to +0.6 mmb/d YoY in 2023

Dallas Fed US Oil Production

On Wednesday, the Dallas FED released its "Energy Indicators" report [LINK]. The consensus outlook for U.S. crude production growth in 2022 has changed little since the beginning of the year. A key takeaway from the report is that the YoY cost inflation was >20% in recent months and similarly the Producer Price Index for drilling and oilfield services was up 18.5% in September. Crude output is only set to rise +0.5 mmb/d in Q4/22 YoY due to tight labour markets, rising costs and extended lead times for new equipment orders. Looking forward, its also noted that consensus sees +0.6 mmb/d U.S. production growth from Q4/22 to Q4/23. The report wrote, *"oil prices have eased from summer highs but remained elevated in October. Rising oilfield costs, labor shortages and supply-chain delays are limiting the capacity to grow, and drilling activity has leveled off. Nonetheless, industry employment is rising. Taken together, a consensus of projections for U.S. oil production from major agencies, banks and consultancies compiled by the Dallas Fed predicts modest and steady production growth through 2023."* Our Supplemental Documents package includes the Dallas Fed Energy Indicators.

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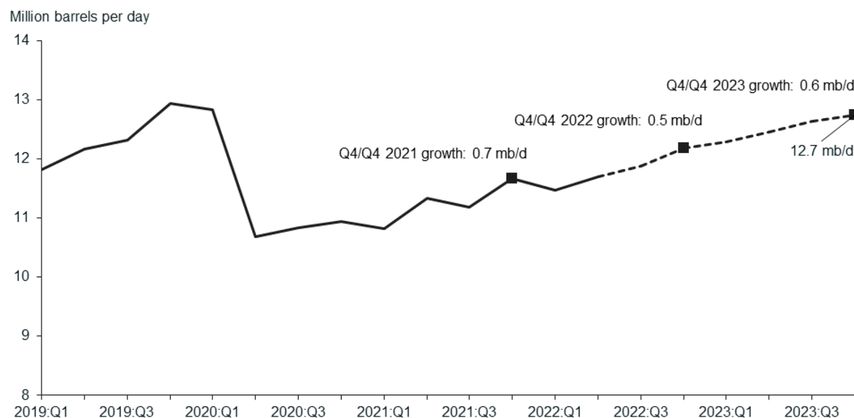
Figure 24: Consensus of Projects for US Crude Oil Production



Source: Dallas Fed

Oil – US doesn't understand why oil companies aren't investing at $100 $90 oil

Oil companies investing at $100 oil

We have to hope Biden Administration's Amos Hochstein said these comments to try to shame oil companies to crank up drilling. Or, at least we hope so or else it shows they just don't understand reality. Hochstein was interviewed on Bloomberg on Tuesday morning. We tweeted [LINK] a clip from the interview and wrote ""*$100, $90 is naturally, historically when companies [#Oil] do invest. the problem now is is that they're not doing what they always used to do" @amoshochstein. surely this isn't a surprise under get rid of oil objective? great interview @ManusCranny."* There has been a clear priority since Biden took over to work to eliminate the use of oil as quickly as possible and to force investors to move away from fossil fuels. Oil companies had to change to low or no growth and return of capital to shareholders to attract a limited capital pool.

Chevron CEO called out Biden Admin for lack of energy expertise

We really hope Hochstein was trying to shame oil companies as we would hate to think he falls into the camp of non-energy people in energy roles in the Biden Administration. Here is what we wrote in our Oct 16, 2022 Energy Tidbits memo. "It was a WOW interview, that's for sure. It's extremely rare to get a supermajor CEO to make blunt statements on their government capabilities and the results of their policies. But that was the case in the FT's Thursday interview with Chevron CEO Mike Wirth. [LINK]. There were multiple blunt assessments and we tweeted on one of them. We tweeted [LINK] ""*There's not a lot of deep energy expertise in the administration. There's a point of view that you find quite visible in the administration that we can move from system A to system B very quickly and easily. And it's not that simple" see 👇for more blunt $CVX CEO views. #OOTT.*" Wirth also reminded ow the energy transition just assumed no issues on energy affordability or security. Wirth said ""*The conversation [about energy] in the developed world for sure has*

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skewed towards climate, taking affordability and security for granted". There was more in the FT interview."

Oil – No specifics this week on Biden's warning last week on oil company profits

Biden keeps threatening oil companies

The oil and gas sector should be prepared for some Biden actions post the midterms. Sooner or later, he has to follow up his threats with action. He may well be limited in his ability to legislate if the Republicans win control of the Senate and/or House, but, if so, it means regulations and executive orders. But he really has to do something. You can tell it's the final stretch for the midterms on Tuesday as oil and coal were increasingly in Biden's election campaigning this week. Later in the memo, we note Biden's comments to shut down all coal plants. But oil companies were the daily attack. (i) Last week's (Oct 30, 2022) Energy Tidbits memo noted our Oct 29 tweet [LINK] "*Yes, it's rally the troops talk but Dems will push Biden to put his money where his mouth is vs #Oil sector. See 👎 Biden "they talk about me picking on them. They ain't seen nothing yet". How can #Oil #NatGas co's not stay with disciplined capex/focus on returns strategy? #OOTT*". Biden's #1 target in his Friday night speech was the oil sector. Part of his comments got the headlines. The White House transcript wrote "*And these companies raised their dividends as well. They say that's how it's getting back to the taxpayers. I wonder how many people in South Philly have that Exxon stock with them. Look, those excess profits are going back to their shareholders and their executives instead of going to lower prices at the pump and give relief to the American people who deserve it and need it. (Applause.) And I'm going to keep harping on it. They talk about me picking on them. They ain't seen nothing yet. (Applause.) I mean it. It outrages me."* (ii) On Monday, Biden spoke to the nation on oil companies. The expectation was that a national address would see some sort of action, but his address was another warning. On Monday, we tweeted [LINK] *"#Biden: #Oil co's "profits are a windfall of war", have a responsibility to invest in US by increasing production and refining capacity, because if they don't "they're going to pay a higher tax on their excess profits and face other restrictions". #OOTT* ." Here is his key quote "*oil companies, record profits today, are not because they're doing something new or innovative, their profits are a windfall of war. Windfall from the brutal conflict that is ravaging Ukraine and hurting tens of millions of people around the globe. You know at a time of war, any company receiving historic windfall profits like this has a historic responsibility to act beyond their narrow self interests of its executives and shareholders. I think they have a responsibility to act in the interests of the consumers, their community and their country. Invest in America by increasing production and refining capacity because, if they don't want to do that, they have the opportunity to do that. Lowering prices for consumers at the pump. if they don't, they're going to pay a higher tax on their excess profits and face other restrictions".* (iii) On Friday, the White House transcript of Biden's latest warning was "*Well, I'm working like hell to deal with the energy prices. I'm going to have a little, as they say, come-to-the-Lord talk with the oil companies pretty soon*."

Always think of Michael Douglas's line when Biden blames Big Oil

When we hear Biden talk about Big Oil, we can't help wonder why some Big Oil CEOs haven't used Michael Douglas's classic line as he played Democrat President Andrew Shepherd in the American President movie in 1994. We don't think many believe Amos Hochstein saying that CNBC's Hadley Gamble's comment that CEOs say Biden doesn't meet with them was flatly not true. But it just seems like the Biden priority is to make sure Americans know who to blame instead of trying to meet with

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them to figure out what can be done. It is the perfect line. On June 21, 2022, we tweeted on Michael Douglas speech from his ending press conference going after Richard Dreyfuss's character Senator Bob Rumson. Rumson was the Republican nominee in the Presidential election fight against Shepherd. At that time, we tweeted [LINK] *"Too bad @Chevron CEO Wirth letter didn't channel some KDouglasMichael American President & say your Administration "is interested in two things, & two things only. making you afraid of it, & telling you who's to blame for it. That ladies & gentlemen is how you win elections" #OOTT".* Our tweet included an excerpt from his speech *""I've known Bob Rumson for years. And I've been operating under the assumption that the reason Bob devotes so much time and energy to shouting at the rain was that he simply didn't get it. Well, I was wrong. Bob's problem isn't that he doesn't get it. Bob's problem is that he can't sell it! We have serious problems to solve, and we need serious people to solve them. And whatever your particular problem is, I promise you Bob Rumson is not the least bit interested in solving it. He is interested in two things, and two things only: making you afraid of it, and telling you who's to blame for it. That, ladies and gentlemen, is how you win elections."*

Figure 25: Michael Douglas as President Shepherd in American President 1994

Source: YouTube

Oil – Will Biden ever meet with Exxon, Chevron & other CEOs?

Biden still hasn't met with oil CEOs

We still believe one of, if not the, key signs that Biden wants to do everything possible to go against the oil industry is his refusal to meet with any of the CEOs. Think about it – Biden is a person who is very big on how he meets people to build some sort of relationship as he believes in face-to-face relationships are value-added. He went to Saudi Arabia to kiss the ring of MBS! Yet he has refused to meet with oil CEOS despite gasoline prices being the #1 negative to his Administration. (i) He was called out on this on Friday. The White House transcript wrote "*Q You said that you were going to meet with the oil companies. THE PRESIDENT: Well, I — Q When is that going to happen? THE PRESIDENT: Well I — nothing is set up.".* (ii) Hochstein seems to say Biden does talk to CEOs, but we have yet to ever see an oil CEO who has said he met with Biden. Maybe Hochstein got away with a little untruth. We created a transcript of comments from US Amos Hockstein with Hadley Gamble on CNBC on Oct 31, 2022 [LINK]. Items in "italics" are SAF Group created transcript
At 1:55 min mark, Hochstein ".. *the Administration has taken every step to encourage the companies in the US and around the world to*" Gamble "*I talk to CEOs all the time and they tell me he [Biden] is not talking to them*". Hochstein "*That is not true. That's flatly not true. I talk to the CEOs. Other senior members of the Administration talk to CEOs on a regular basis. People know that. I don't think that's the issue. The issue is this, we want them to*

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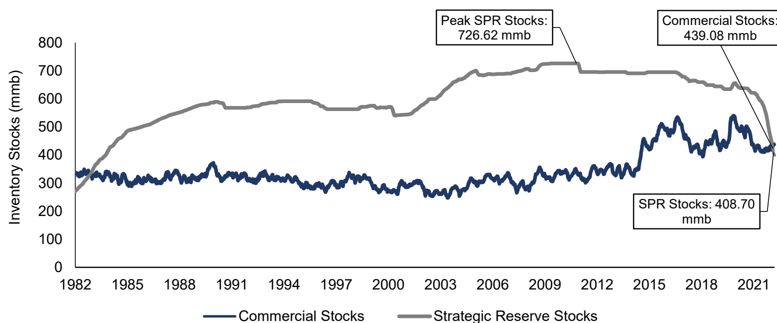
increase their capex, increase their investment. The price environment for the last year, over a year now, lends itself to investment".

Oil – US SPR reserves now 37 mmb less than commercial crude oil reserves

SPR reserves keep going lower

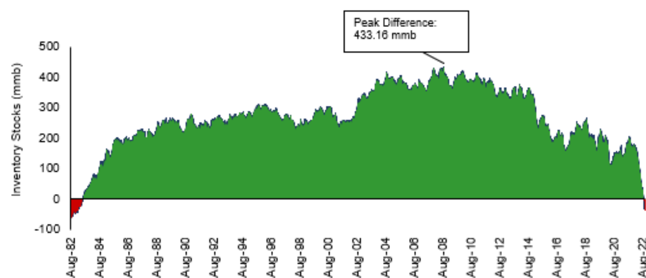
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, and the deficit continues to widen each week. The EIA's new weekly oil data for Oct 28 has SPR reserves at 399.79 mmb vs commercial crude oil reserves at 436.83 mmb. The below graph highlights the difference between commercial and SPR stockpiles.

Figure 26: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 27: US Oil Inventories: SPR less commercial



Source: EIA

Oil – EPRINC recap of very low New England distillates inventory

xxxx

On Wednesday, we tweeted [LINK] "*New England needs warm winter. See 👇 tweet re @EversourceCorp #NatGas risk. Also #Distillates risk. NE typical 12-15 mmb inventory vs current 3.3 mmb. Most USGC distillates export is under contract, some spot cargos if #JonesAct waived. Great @EPRINC_DC slide deck. #OOTT.*" EPRINC posted a slide deck "*Revisited: Overview of Tight Distillate Markets*" [LINK]. EPRINC highlighted "*New England (part of the Atlantic Coast data) typically has 12-15 million barrels of inventory. It currently holds 3.3*." One of the factors contributing to the low distillates inventory is that "*while US refinery utilization is at ~90% and above trend a 500-600 thousand barrel per day decline in US refining capacity has helped to increase distillate constraints.*" EPRINC note that the

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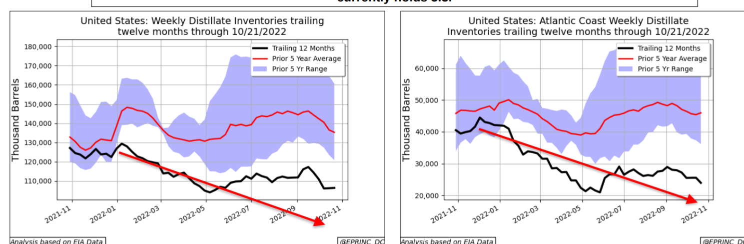
Biden Administration has to move quick. And that the US exports approx. 1 mmb/d of distillate from the Gulf Coast and "*High Jones Act clean product waterborne freight rates impede moving more distillate into Atlantic Coast consuming regions. While most USGC distillate trade is under contract, there are some spot cargos available that would alleviate Atlantic Coast shortfalls this winter.*" Our Supplemental Documents package includes a few of the key EPRINC charts.

Figure 28: Distillates inventory across US and in Atlantic Coast

Distillate Inventories Viewed Nationally and along the Atlantic Coast

As COVID-19 has been abating and demand has recovered, U.S. distillate Inventories have declined considerably in the last year. In particular, Atlantic Coast inventories are at levels last seen in the early 1950s.

New England (part of the Atlantic Coast data) typically has 12-15 million barrels of inventory. It currently holds 3.3.



Source: EPRINC

Oil – Trans Mountain apportioned by 15% for Nov

Trans Mountain apportionment

On Oct 26, Trans Mountain released an update [LINK] on its capacity for the month of November. Total system nominations are apportioned by 15% for Nov (Oct was 11%), meaning 15% of demand for the pipeline exceeds its capacity. Trans Mountain reminds that it has been running at full capacity and has seen regular monthly apportionment for over a decade ie, the clear sign for a need for expansion. The Trans Mountain apportionment update also includes a bit of an apportionment 101. Trans Mountain wrote "*When a pipeline experiences significant and prolonged apportionment like in the case of the existing Trans Mountain Pipeline, it's one signal that more capacity is needed. Apportionment can bring with it a discounting of prices as producers compete to sell what they can through the pipeline before having to use another pipeline or other modes of transport to another, less profitable market. It can also mean the buyers at the end of the pipeline are forced to source their shortfall of supply from alternate, less desirable sources.*" Below is a chart which shows the average apportionment since 2016. Our Supplemental Documents package includes the Trans Mountain release.

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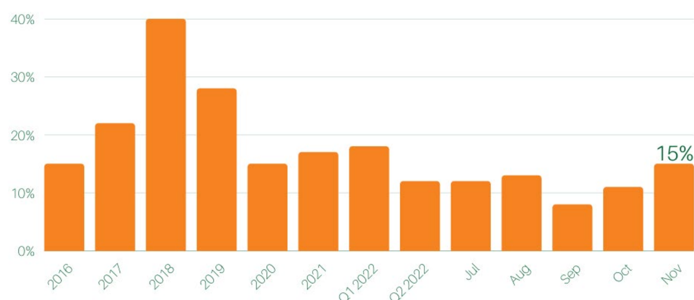
Figure 29: Trans Mountain Pipeline Apportionment



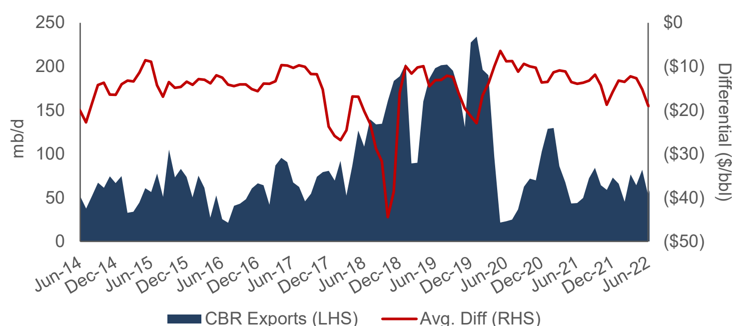
Source: Trans Mountain Pipeline

Oil – Cdn crude by rail imports to Gulf Coast down 2% YoY in August to 71,000 b/d

Cdn CBR imports to Gulf Coast down 1,700 b/d YoY

The EIA posted its monthly "U.S. Movements of Crude Oil by Rail" [LINK] on Monday, which also had good insights on Cdn crude by rail. Canadian CBR volumes to PADD 3 (Gulf Coast) were 71,000 b/d in August, which is down 7,000 b/d MoM from July, and down 1,700 b/d YoY vs August 2021. There were no revisions to last months data. Below is our graph of Cdn CBR exports to the Gulf Coast.

Figure 30: Canada CBR Exports to US Gulf Coast vs WCS Differential



Source: EIA, Bloomberg

Oil – Refinery inputs +0.406 mmb/d WoW to 15.842 mmb/d

Refinery inputs up WoW

Sept and Oct are normally seasonal periods that see the trend to lower crude oil inputs to refineries as they do turnarounds to produce more winter blends. And then crude oil input into refineries tends to slightly increase in Nov and Dec. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended Oct 28. The EIA reported crude oil inputs to refineries up +0.406 mmb/d WoW to 15.842 mm/d, which is +0.819 mmb/d YoY from 15.023 mmb/d for the week ended Oct 29, 2021. Note last year's week ended Oct 29, refineries continued to recover from the impacts of Covid and Hurricane Ida and we observed inputs decline as refineries progress through regularly schedules seasonal maintenance. Total products supplied (i.e., demand) decreased WoW, down 0.106 mmb/d to 20.481 mmb/d, and Motor gasoline was down -0.271 mmb/d at 8.660 mmb/d from 8.930 mmb/d last week. The 4-week average for Motor Gasoline was down -0.776 mmb/d YoY to 8.636 mmb/d.

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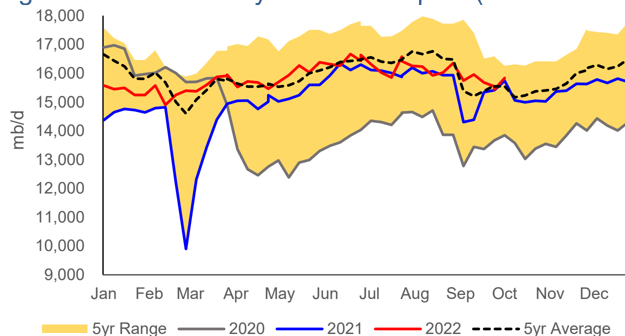
Figure 31: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – BP 160,000 b/d Toledo refinery restart doesn't seem likely until sometime in Q1/23

BP's 160,000 b/d Toledo refinery is down

A continued negative impact on Cdn oil differentials is BP's 160,000 b/d Toledo refinery continues to be down as it processes Cdn medium/heavy crude. It certainly seems that BP's 160,000 b/d Toledo refinery will be down until sometime in 2023. On Tuesday, we tweeted [LINK] *"#BP 160,000 b/d Toledo refinery shut down. Q3 Q&A, @bp_plc investigations continue, can't give any guidance for how much longer refinery will be down. one of the pressures on Cdn #Oil differentials as Toledo runs on Cdn crude. #OOTT."* In the Q&A of the BP q3 call, mgmt. was asked how long Toledo would be down. Mgmt didn't give a timeline and no indication/hint that a restart could happen before Xmas. Mgmt replied "*on Toledo, I can't really guide you on anything right now. The site is shut down as we talked about the investigations continue and we need to complete the investigations we learn lessons and then multi side how we move forward but, I can't really give you guidance until we're through that process*." A restart sometime in Q1/23 would be consistent with what we wrote in our Oct 2, 2022 Energy Tidbits and in our Sept 27 tweet [LINK] "*#BP Toledo refinery shut down. @barbarajpowell8 reports repairing & restarting @bp_plc Toledo refinery "may not be completed until early 2023, people familiar with operations said." Negative to Cdn #Oil diffs, See 👎WCS/WTI diffs hit ~$1.25 since 160,000 b/d refinery fire. #OOTT."* And in our Sept 28 tweet [LINK] "*More indicators #BP Toledo 160,000 b/d refinery will be shut down for extended time. @LauraSanicola reports BP laid off most contractors according to sources indicating will experience a prolonged shutdown following last week's explosion and fire." #OOTT [LINK].*"

Oil – Cdn oil differentials have been hit by more than the Toledo refinery shut down

Explaining Cdn oil differentials

Toledo is a factor to why Cdn oil differentials have been hit, but it really is a small factor relative to the big challenge for Cdn medium/heavy oil – the impact of Russian oil to India and China. Last week's (Oct 30, 2022) Energy Tidbits memo highlighted Valero's explanation of why Cdn oil differentials have been hit. We wrote "*We try to look at as many earnings call transcripts as possible. Not being a stock analyst, we have the luxury of looking for sector and commodity insights. And we normally find the best insights come in the Q&A. Valero held its Q3 call on Tuesday and included a good explanation for their view of why Cdn oil differentials have been hit. Valero reminded that Cdn oil differentials have been hit this year the redirection of Russian crudes from Europe to China/India and forcing more US Mars*

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crude to stay in the Gulf of Mexico. We tweeted [LINK] "#Valero EVP Simmons explains why Cdn #Oil diffs have been hit - China/India refiners taking lot more RUS Urals crude backed up Mars & Cdn heavy into Gulf Coast refineries. Cdn normally narrow in spring but didn't this year and widened in summer/fall. Thx @business. #OOTT". Our transcript was Valero EVP Gary Simmons comment in the Q&A. ""Yeah, so this is Gary. As Joe touched on a few of these things, but there is a number of factors that have been really driving the heavy sour discounts. First the sanctions put on Russia have caused some rebalancing, a lot of the Indian and Chinese refineries are running Urals, it's backed-up Mars and heavy Canadian into the Gulf, which are driving those discounts wider. So we talked about the higher prices in natural gas around the world cause the operating expenses running heavy and medium, sours to be higher so that causes discounts to be wider, there's a higher naphtha content in heavy Canadian crude, naphtha has been discounted so that drives the discounts wider, we've seen some unplanned maintenance in the U.S., which has also contributed. But overall, I think we continue to see weakness in high sulfur fuel oil combined with higher refinery utilization putting more product on the market. So some of that what we expected in IMO 2020, we're finally starting to see in the market, lack of Chinese demand is certainly also contributing to that. So for us, when we look at the market going forward, seasonal maintenance in Western Canada is coming to an end, you'll see higher diluent volumes as we head into winter, so all of that's putting more heavy Canadian on the market. We expect to see even more rebalancing occur if sanctions are wrapped up in Russia. And so we expect this market to continue, we're certainly maximizing heavy Canadian in our system today and seeing a lot of opportunity to buy high-sulfur fuel blend stocks as you mentioned that we're putting into our Cokers." Below is Bloomberg's current WCS–WTI differential as of Friday close.

Figure 32: WCS less WTI oil differentials up to Nov 4 close

Source: Bloomberg

Oil – US "net" oil imports up 1.229 mmb/d WoW at 2.280 mmb/d

US "net" oil imports up WoW

US "NET" imports were up +1.229 mmb/d to 2.280 mmb/d for the Oct 28 week. US imports were up +0.025 mmb/d to 6.205 mmb/d. US exports were down -1.204 mmb/d to 3.925 mmb/d. The WoW increase in US oil imports was driven Top 10 with and increase of 0.129 mmb/d with "other" decreasing -1.04 mmb/d. Some items to note on the by country data. (i) Canada was down this week by -0.073 mmb/d to 3.410 mmb/d. (ii) Saudi Arabia was up 0.208 mmb/d to 0.533 mmb/d this week. (iii) Colombia was relatively flat WoW at +0.003

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mmb/d. (iv) Ecuador was down -0.201 mmb/d to 0 mmb/d. (v) Iraq was down -0.086 mmb/d to 0.134 mmb/d. (vi) Mexico was up +0.239 mmb/d to 0.748 mmb/d.

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Aug 26/22	Sep 2/22	Sep 9/22	Sep 16/22	Sep 23/22	Sep 30/22	Oct 7/22	Oct 14/22	Oct 21/22	Oct 28/22	WoW
Canada	3,093	3,538	2,937	3,868	3,775	3,298	3,300	3,372	3,483	3,410	-73
Saudi Arabia	330	423	425	489	422	398	370	230	325	533	208
Venezuela	0	0	0	0	0	0	0	0		0	0
Mexico	440	965	484	855	598	539	759	747	509	748	239
Colombia	289	261	288	212	72	360	242	214	215	218	3
Iraq	401	222	343	120	202	275	109	130	220	134	-86
Ecuador	231	144	199	319	191	203	136	134	201	0	-201
Nigeria	137	2	232	0	0	0	0	29	42	81	39
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	4,921	5,555	4,908	5,863	5,260	5,073	4,916	4,856	4,995	5,124	129
Others	1,035	1,224	884	1,084	1,189	874	1,147	1,052	1,185	1,081	-104
Total US	5,956	6,779	5,792	6,947	6,449	5,947	6,063	5,908	6,180	6,205	25

Source: EIA

Oil – Baker Hughes International rigs +32 MoM to 911 rigs in October

International rigs +32 MoM

Baker Hughes posted its monthly update to international rigs on Friday, which showed a sixth consecutive month of increasing rig count. (i) Total international rigs were +32 rigs MoM to 911 rigs in October, which is up from the recent bottom of 806 in April. Oct 2022 rigs are +111 rigs YoY from 800 in Oct 2021. (ii) Ukraine is flat MoM at 27 active rigs in October and is almost back to year ago levels. This comes from being at a low of 5 in May with a big pivot in momentum on the Ukraine war. Saudi Arabia increased by +7 rigs MoM to build on the +4-rig increase in September. Pakistan was up +4, while Indonesia was also up +2 MoM. Libya's rig activity has been hit by internal conflict and uncertainty recently, but added +2 rigs totaling 6 in October, from a low of 2 in August. Australia's rigs decreased -2 rigs to be at 21 active rigs, falling from the highs seen in September. Russia has been hit in the major project area, Sakhalin, with rigs dropping to zero in May and June after maintaining a steady 5 rigs for 17 months. (iii) October of 911 rigs were +14% YoY from 800 in October 2021, but still down 14% vs pre-Covid March 2020 of 1,059 rigs. The YoY rig count is as followed: Asia-Pacific +16, Africa +5, Europe +3, Latin America +36, and the Middle East +51. North Sea rigs were flat MoM with the UK and Norway up -1 and +1 rigs respectively. Lain America continues to be strong with Columbia and Argentina both up YoY at +11 and +14 respectively. Middle East is the key YoY increase region led by Iraq +9 rigs YoY, UAE +9 rigs YoY, and Saudi Arabia +11 rigs YoY. Below is our graph of international rigs by region and avg monthly Brent price.

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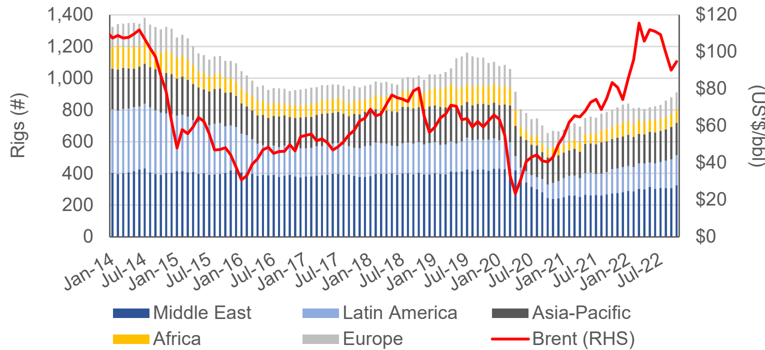
Figure 34: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg

Oil – Tropical Storm Lisa only had a short one day impact on some Pemex operations

Lisa had a limited 1-day impact

On Wednesday, we tweeted [LINK] *"#TropicalStormLisa, looks like will be down to Depression strength when it re-emerges in GoM over #Pemex offshore oil fields & loading platforms. Maybe some minor #Oil loading delays but wouldn't think any lasting impact. #OOTT.*" Lisa did re-emerge over the GoM as a depression strength event and did have a minor 1-day impact on the Dos Bocas terminal. During storms, we check the Pemex meteorological page [LINK] that gives a great weather impact relevant to Pemex operations and has a status of operations chart. Below is the chart as of yesterday, but on Friday, the Dos Bocas terminal didn't have an operating green dot ie. it was temporarily halted.

Figure 35: Pemex Status of Operations in the Gulf of Mexico Nov 5, 2022

:. Situation of Opers. in the Gulf of Mexico

Port	State
Dos Bocas, Tab	●
Cd. Del Carmen, Camp.	●
Plat. Arcas Cay	●
Platform Area	●
Fpso. Yuum K'ak Náab (pto)	●
Seybaplaya, Camp.	●

Operating ● View Details ●

Source: Pemex

Oil – Russian oil production in Oct was 9.84 mmb/d, 1.164 mmb/d below Oct quota

Russia oil production 9.84 mmb/d

There is always a bit of mystery in Russia oil and gas data. But we do tend to get some reasonable data and insights from Kommersant reports. And Russia oil production looks >1 mmb/d below its Oct OPEC+ quota. Early Monday morning, we tweeted [LINK] "*Russia #Oil production ~9.84 mmb/d in Oct, assuming condensate is 8% of total oil + condensate of 10.7 mmb/d. #OPEC+ quota was 11.004 mmb/d for Oct, going down to 10.478 mmb/d for Nov-Dec. Thx @kommersant Dmitry Kozlov #OOTT.*" Kommersant wrote "*The Russian Federation failed in October to increase oil production, which is still kept at no more than 1.47*

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million tons per day, taking into account the production of condensate, kommersant sources familiar with the situation told Kommersant." Kommersant also note the b/d conversion writing "*The actual October figure is 10.7 million, taking into account condensate, which in September accounted for about 8%, and this is less than in September (10.8 million bpd for oil and condensate).*" This is for oil + condensate. Our tweet noted that, assuming condensate was 8% of total as in Sept, it meant that Russia oil production was only ~9.84 mmb/d. Russia's OPEC+ quota for Oct was 11.004 mmb/d, and its quota gets lowered to 10.478 mmb/d for Nov/Dec. Therefore for Oct, Russia oil production was 1.164 mmb/d below its Oct quota. Our Supplemental Document package includes the Kommersant report.

Oil – OPEC reference case sees oil demand up 8 mmb/d to 2030

OPEC sees big oil demand increases

It's easy to see why you see Saudi Arabia, UAE, OPEC Secretary General and others harp about the need for increasing investment in oil productive capacity around the world, not just in OPEC, when you look at their Reference Case forecast for oil demand. We realize that pro climate change side are dismissing the forecast as speaking to their book. But our concern is that if OPEC is half right on their demand growth thru 2030, there is an oil crisis for the next decade. We believe it's worth a read thru the outlook. On Monday, OPEC released its "*2022 World Oil Outlook 2045*", which includes its reference case for oil and gas demand thru 2045. It got a lot of headlines because it paints a very different picture for oil compared to the IEA's recent "World Energy Outlook 2022." The big headline for OPEC is its Reference Case that forecasts peak oil demand in the late 2030s, but for oil demand to plateau thru 2045. Vs 2022 oil demand of 100.3 mmb/d, OPEC sees oil demand hitting 105.5 mmb/d in 2025, 108.3 mmb/d in 2030, 109.5 mmb/d in 2035 and fairly flat thereafter. Our Supplemental Documents package includes the oil demand excerpts from the OPEC outlook.

Figure 36: OEPC Reference Case Medium Term oil demand

Medium-term oil demand in the Reference Case *mb/d*

	2021	2022	2023	2024	2025	2026	2027	Growth 2021–2027
OECD Americas	24.3	25.3	25.7	26.0	26.0	25.9	25.7	1.5
OECD Europe	13.1	13.7	13.8	13.7	13.5	13.4	13.2	0.1
OECD Asia-Pacific	7.4	7.6	7.6	7.6	7.5	7.4	7.3	–0.1
OECD	**44.8**	**46.6**	**47.2**	**47.2**	**47.0**	**46.6**	**46.2**	**1.4**
China	14.9	15.3	16.0	16.4	16.6	16.8	16.9	2.0
India	4.8	5.1	5.4	5.6	5.8	6.1	6.3	1.6
Other Asia	8.6	9.1	9.5	9.8	10.0	10.2	10.4	1.8
Latin America	6.2	6.4	6.5	6.6	6.7	6.8	6.9	0.7
Middle East	7.8	8.1	8.4	8.7	8.9	9.1	9.3	1.5
Africa	4.2	4.4	4.5	4.7	4.8	5.0	5.1	0.9
Russia	3.6	3.5	3.6	3.6	3.7	3.7	3.7	0.1
Other Eurasia	1.2	1.2	1.2	1.2	1.2	1.3	1.3	0.1
Other Europe	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
Non-OECD	**52.2**	**53.7**	**55.8**	**57.3**	**58.5**	**59.6**	**60.7**	**8.6**
World	**96.9**	**100.3**	**103.0**	**104.4**	**105.5**	**106.3**	**106.9**	**10.0**

Source: OPEC

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Figure 37: OEPC Reference Case Oil demand 2021-2045

Oil demand in the Reference Case, 2021–2045 mb/d

	2021	2025	2030	2035	2040	2045	Growth 2021–2045
OECD	44.8	47.0	44.5	41.1	37.5	34.1	–10.7
Non-OECD	52.2	58.5	63.8	68.4	72.3	75.7	23.6
World	96.9	105.5	108.3	109.5	109.8	109.8	12.9

Source: OPEC.

Source: OPEC

Apples & Oranges? OPEC reference case vs IEA Stated Policies Scenario
We worry that policy makers discount the OPEC outlook because they rely on their government funded IEA scenarios and that they don't understand there is a fundamental difference in the OPEC vs IEA long term outlook. They miss the IEA key assumption. We think there is a big difference between what OPEC and IEA are trying to present in what their long term outlooks for oil and natural gas. OPEC presents a reference case or a forecast for oil demand. We believe this is different than the IEA. We recognize that the IEA's World Energy Outlook 2022 took a lot of criticism as being an unrealistic outlook for future natural gas and oil demand. We don't think the criticism is justified because we don't believe this is the IEA's best "forecast" for oil and natural gas demand. The IEA states clearly that its Stated Policies Scenario (STEPS) "*The STEPS in this Outlook is the first World Energy Outlook (WEO) scenario based on prevailing policy settings that sees a definitive peak in global demand for fossil fuels*". The key assumption in the IEA outlook is that it is based on prevailing policy settings that see/assume a definitive peak in global demand for fossil fuels. That is the key assumption. That doesn't sound like a forecast. It's a scenario assuming policy settings are correct.

IEA warned "in practice, the future of energy markets is likely to be disjointed"
Last week's (Oct 30, 2022) Energy Tidbits memo noted a key comment on the IEA World Energy Outlook 2022. We then wrote "We were disappointed but not surprised that the IEA's press release to announce the outlook did not include the key warning/caveat in the IEA report. It's why we tweeted [LINK] "*Buckle up! 500+ pg @IEA WEO2022 explains the priced to perfection scenarios western leaders will be using for policy. But 👇one key caveat "IN PRACTICE the future of energy markets is likely to be disjointed .... In practice = reality check = #NatGas needed for longer. #OOTT".* The IEA models an "orderly process of change", which as we have seen in 2021 and 2022 is not reality. The IEA wrote "*Our scenarios model orderly processes of change in which markets are always in equilibrium, with investment rising and falling in different sectors to allow for a balance of supply and demand. However, today's energy crisis has underscored that, in practice, the future of energy markets is likely to be disjointed, subject to geopolitical friction and prone to regular market imbalances."* This is a pretty clear warning that reality isn't theory."

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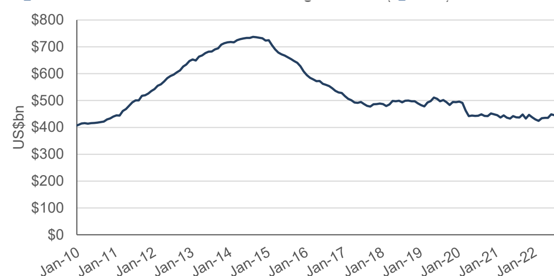
Oil – Saudi nest egg, increase in net foreign assets in September

Saudi net foreign assets

We continue to see key financial reasons why Saudi Arabia is going to do all it can to maintain high oil prices for the foreseeable future. And we continue to believe the #1 financial theme for Saudi Arabia in the 2020s will be their continued, and likely increasing, use of Other People's Money as they try to transition their country to MBS's Vision 2030. We believe this has been obvious with how Saudi Arabia's net foreign assets dropped by about $300 billion over seven years. We are surprised that markets and oil watchers didn't seem to pay attention to the Saudi net foreign assets data ie. what we call their nest egg to help them thru the Energy Transition. Saudi net foreign assets have dropped by $288.2b in the last 8 years, from is peak of $737.0b on Aug 31, 2014 to $448.8b on Sept 30, 2022. That is an average of $3.0b per month for the last 8 years. Oil prices were softening at the end of Sept, but Brent was ~$90 for the month, yet Saudi Arabia's net foreign assets on September 30 were up $9.89b MoM to $448.8b vs $438.9b in August. Saudi Arabia is far from going broke but there has been a huge decline in the last 8 years, but it is still a very big nest egg. This net foreign asset depletion is why we have been highlighting that the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money (OPM) to fund as much of their Vision 2030 as possible. And no question, accessing OPM has helped to slow down and temporarily pause the decline in net foreign assets. Saudi Arabia's central bank (SAMA) doesn't provide explanations for the monthly swings. Saudi net foreign assets on September 30 of $448.8b are up $0.81b YoY from $448.0b at September 30, 2021. We believe the $298.1b drop in net foreign assets is why there has been such a big push in the last few years to get OPM so Saudi doesn't keep depleting its nest egg. And why we call this the #1 financial theme for Saudi Arabia in the 2020s – the increasing use of Other People's Money. And not just in Saudi Aramco, although we do expect to see more equity and bond sales from Aramco. Below is our graph of Saudi Arabia net foreign assets updated for the August 31 data.

Figure 38: Saudi Arabia Net Foreign Assets



Source: Bloomberg

Oil – UAE says global oil declines at 5 mmb/d per year

UAE on global oil decline

We believe an overlooked basic of the global oil supply picture is the decline rate of the current oil production base of 100 mmb/d. It is a theme that we have highlighted for years and certainly before Covid. ADIPEC 2022 was this week in Abu Dhabi. One of the highlighted Monday speeches was by Abu Dhabi DNOC CEO HE Dr Sultan bin Ahmed Al Jaber. He reminded *"now is not the time to point out that long-term under-investment in oil and gas has made a difficult situation even worse, as the data is clear*." But al Jaber also reminded of the basics of oil supply – the existing oil production base declines so if the world

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produces 100 mmb/d today, those same producing assets will be producing a lesser amount in one year. Al Jaber said "*if we zero out hydrocarbon investment due to natural decline, we would lose 5 million barrels per day of oil each year from current supplies*." Al Jaber is using an approx. 5% decline rate, on average, across the existing global oil production base ranging from oil sands, to OPEC to deepwater to shale. The 5% global oil decline rate tends to be on the lower end of what we normally see of 5% to 7%.

Saudi Aramco CEO uses a 6% global oil decline rate

Our Sept 25, 2022 Energy Tidbits highlighted Saudi Aramco CEO Nasser's Sept 20 speech. Here is what we wrote in that memo. "*There was a stark warning from Saudi Aramco CEO Nasser's speech on Tuesday that was shoved to the back page as the oil story this week became all about the economic outlook and any positive oil stories were more than overshadowed by the negative economic outlook, especially following FED Chair Powell's Wed press conference. (i) We tweeted [LINK] "Wake up call. @aramco CEO headlines will be "little hope of ending the #EnergyCrisis anytime soon", global #Oil capacity ~1.5% of demand will be eliminated as demand recovers. Overlooked? global oil fields decline ~6% each year, that's every year! see 👇 06/23/19 blog. #OOTT;" (ii) The headlines were on his warning there is little hope of ending the energy crisis anytime soon. His speech is a reality check that the energy transition plan isn't working. Got to love his opening sentence "This week, however, autumn begins, and the global energy crisis promises a colder, harder winter, particularly in Europe. Unfortunately, the response so far betrays a deep misunderstanding of how we got here in the first place, and therefore little hope of ending the crisis anytime soon." (ii) Some of the other headlines were on his comments that global spare capacity is down to about 1.5% of global oil demand and "But when the global economy recovers, we can expect demand to rebound further, eliminating the little spare oil production capacity out there." (iii) Everything really got overlooked after Powell spoke on Wednesday, but one of the overlooked factors will be his "Equally concerning is that oil fields around the world are declining on average at about 6% each year, and more than 20% in some older fields last year. At these levels, simply keeping production steady needs a lot of capital in its own right, while increasing capacity requires a lot more." We have been highlighting this theme since well before Covid and it's a reminder that the world has to add ~6 mmb/d of new production capacity just to offset declines every year. There is much more in the Nasser speech. Our Supplemental Documents package includes the Nasser speech. [LINK].*"

Exxon uses a global oil production supply base decline of ~7% per year

Here is what we wrote in our July 31, 2022 Energy Tidbits. "*There was a great reminder from Exxon's Q2 call presentation of one of the reasons why oil looks good for the 2020s. Everyone has been made well aware of the underinvestment in the oil and gas sector, whether it be from industry, OPEC countries or pro-climate change agencies like the IEA. But most have overlooked the biggest challenge for the oil sector – the existing production supply base declines every day. This is very bullish for oil in the 2020s. We were reminded of this in the Exxon Q2 call prepared remarks. Exxon posted the remarks shortly before their Q2 call and we tweeted [LINK] "Bullish for #Oil. #Exxon reminds #Oil #NatGas supply declines at ~7% per year ie. need to*

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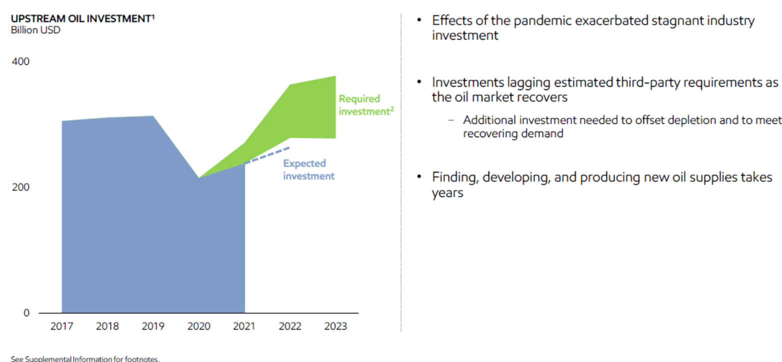
replace 7% to stay flat. not a new argument, see 👎SAF 06/20/19 blog "“Exxon’s Math Calls For Overall Global Oil Decline Rate of ~7%, A Very Bullish Argument For Post 2020 Oil Prices" #OOTT.” On an existing oil supply base of 100 mmb/d, that is approximately 7 mmb/d of annual declines. Note that Exxon said for oil and natural gas and they have previously suggested the oil decline rate was lower ie. below 6%. So that is 6 mmb/d of declines. Exxon said “As a depletion business, large annual investments in oil and gas production are needed to offset the decline in supply – roughly a 7% per year reduction. Even more investment is required to grow net production. As the world began to recover from the pandemic, demand for all but jet fuels recovered far faster than the time required to bring on new investments. As a result, the industry hasn’t been able to meet the recovery in demand.”

Figure 39: Industry Investment Not Keeping Up With Recovering Demand



Source: ExxonMobil

Our June 19, 2019 blog was all about global oil decline rate

Exxon’s warning on global oil decline rates in June 2019 was the reason for our SAF Group June 19, 2019 blog “*Exxon’s Math Calls For Overall Global Oil Decline Rate Of ~7%, A Very Bullish Argument For Post 2020 Oil Prices”* [LINK]. Exxon presented at a sellside conference that week in June 2019 and then thought Exxon presented a very bullish argument for oil prices beyond 2020 which was overlooked because most readers only flip thru a slide deck and don’t listen to or read transcripts of management’s spoken words. Exxon’s spoken words highlighted one of the forgotten (and perhaps most important) oil supply/demand concerns for post 2020 – the mid term challenge to replace increasing rate of overall global oil declines. And what was eye opening was Exxon’s estimated overall global oil decline rate, which is way higher than any we could then ever remember seeing. Our blog said *“Its impossible to tell from the small oil supply/demand graph in the slide deck, but Exxon’s spoken words says long term oil demand is 0.7% per year and then “When you factor in depletion rates, the need for new oil grows at close to 8% per year and new gas at close to 6% per year.” Exxon may not specifically say what the global decline rate is, but their math is that the world needs new oil supply to grow annually at close to 8% to meet the 0.7% annual increase in oil demand and offset declines ie.*

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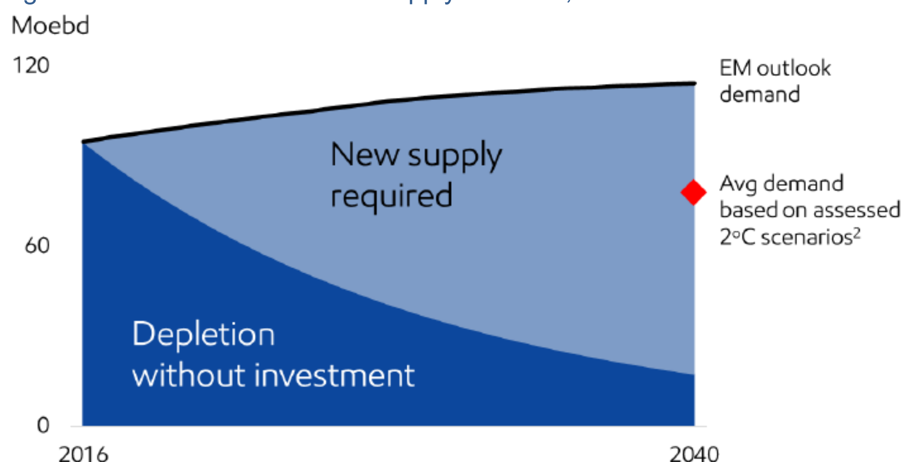
an overall global decline rate of approx. 7%. This is an overall global oil decline rate for OPEC and non-OPEC". At that time in 2019, BP's estimate of overall global oil decline rate is 4.5% and we expect most are probably assuming something around 5%, certainly not above 6%. No one should be surprised by the increased decline rate given that high decline US shale and tight oil have increased by ~2.5 mmb/d in the last ~2 years. But an implied ~7% overall global oil decline rate is way higher than expectations. There is a big difference between needing to offset oil declines of ~7 mmb/d vs declines of ~4.5 mmb/d ie. an additional 2.5 mmb/d of new oil supply every year. Even if the implied difference was to 6%, it would still be an additional 1.5 mmb/d of new oil supply and that would also be very bullish for post 2020 oil. At that time, we said we recognized that the 2019/2020 oil supply demand story is the need for OPEC+ to keep cuts thru 2020, but Exxon's math implying ~7% overall global oil decline rate sets up a very bullish view for oil post 2020. We believe the reality to replace oil declines post 2020 is overlooked. Our Supplemental Documents package includes our June 19, 2019 blog.

Figure 40: Exxon Estimated Oil Supply/Demand, June 2019 slide deck



Source: ExxonMobil June 2019

Oil – Libya NOC Chair targets oil production to hit 2 mmb/d in 3 to 5 years

Libya NOC targets big oil growth

So far, we haven't seen any major production interruptions despite Haftar's recent call for protests and Libya production has held in at ~1.2 mmb/d. On Tuesday, there were two excerpts posted on the Libya National Oil Corporation Facebook [LINK] of NOC Chair Farhat bin Qadara comments at ADIPEC 2022. Qadara said "*We annually need up to 4 billion dollars in investments to modernize the infrastructure of the oil sector in addition to developing services at the oil sites. We aim to raise production to 2 million barrels per day over a period of 3 to 5 years. We expect oil revenues for this year to reach between 35 and 37 billion dollars,"*

Libya has big oil production growth potential if there is lasting domestic peace

Libya's oil growth all comes is there a stable lasting domestic peace. Because if Libya returns to east vs west fighting, Libya oil production could drop to almost zero

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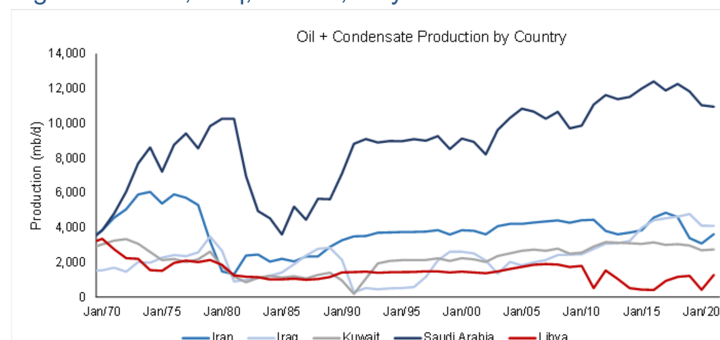
again. But, and a big but, if there is a stable lasting peace, we believe Libya's oil production growth potential is much more than the Libya NOC Chair's target of 2 mmb/d. One we saw the Libya NOC Chair oil target, we tweeted [LINK] "*Imagine if #Libya ever gets lasting peace? Could blow away @NOC_Libya Chair target to get to 2 mmbd in 3 to 5 yrs. Current 1.2 mmbd. Gaddafi took over 09/01/69 & #Oil went down from there. #OPEC 1970: Saudi 3.85 mmbd, Iran 3.85 mmbd, Libya 3.34 mmbd, Kuwait 3.04 mmb. #OOTT.*" Those numbers remind of how Saudi Arabia benefited by being the US ally whereas Iran and Libya got creamed for decades.

Figure 41: Iran, Iraq, Kuwait, Libya & Saudi Arabia oil + condensate production



Source: BP

Oil – India imports 946,000 b/d oil + 106,000 b/d of fuel oil from Russia in Oct

India priority is energy security & affordability

On Wednesday, we tweeted [LINK] "*India imports 946,000 b/d #Oil Plus 106,000 b/d #FuelOil from Russia in Oct. See 👇Oct 8 thread, @HardeepSPuri warned @SecGranholm that if "you believe in energy security, energy affordability you will buy from wherever you have to." Thx @EconomicTimes @Vortexa. #OOTT".* We included the Economic Times (India media) report that said '*Russia supplied 946,000 barrels per day of crude to India in October, the highest ever in a month. It accounted for 22% of India's total crude imports, ahead of Iraq's 20.5% and Saudi Arabia's 16%. Compared to September, overall crude import went up 5% in October and that from Russia rose 8%, according to Vortexa, an energy intelligence firm that has offices in Singapore and London and tracks oil and gas tankers across the globe, providing freight and inventories analytics. For the first time, India imported more seaborne Russian crude than the European Union - the volumes were 34% higher than the EU's. With imports of 1 million barrels per day in October, China remained the largest buyer of Russian seaborne crude. India also imported about 106,000 barrels per day of fuel oil from Russia in October, a new high."* Our Supplemental Documents package includes the full Economic Times report. [LINK]

India warned will buy oil from anyone, priority is energy security & affordability

No one should be surprised that India is buying a lot of oil and fuel oil from Russia. They said this clearly last month when India's Energy Minister Puri met with US Energy Secretary Granholm in Washington. Our tweet this week included our Oct 8 tweet that we expanded upon in our Oct 9, 2022 Energy Tidbits. Here is what we then wrote "*It got very little press but US Energy Secretary Jennifer Granholm met in*

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Washington with India oil minister Hardeep Singh Puri. The US Dept of Energy released a joint ministerial statement from the ministers that does not even note their names or quotes. Not the norm. And, to no surprise, it made zero mention of oil, LNG or Russia. We did see the photo-op but didn't see a joint press conference as is normally the case. No surprise why it looks like they didn't have a joint press conference based Puri's comments at a subsequent press conference in Washington. We watched multiple ANI (Indian news) video clips and their posted stories hit the highlights. (i) Russian oil. We tweeted [LINK] "1/3. Great @ANI reporting on clear India energy position from @HardeepSPuri post @SecGranholm meeting. "Have I been told by anyone to stop buying Russian oil? The answer is a categorical No". #OOTT #NatGas #LNG". (ii) India will buy oil from anyone. We tweeted [LINK] "2/3. "India will buy oil from wherever it has to for the simple reason that this kind of a discussion cannot be taken to the consuming population of India" says @HardeepSPuri. #OOTT @ANI." (iii) Priority is energy security/affordability. We tweeted [LINK] "3/3. ""If you are clear about your policy, which means you believe in energy security, energy affordability you will buy from wherever you have to. Our energy purchases from sources hitherto unheard of, we are in discussion with them." @HardeepSPuri. Thx @ANI. #OOTT." (iv) India has been able to keep prices down. Puri also noted that they have been able to keep oil price impact low. ANI wrote ""In terms of petrol and diesel, if the increases in North America are 43-46 per cent, in India we allow prices to go up by only 2 per cent or so. In terms of gas, global benchmarks went up by 260-280 per cent and our own ability to contain gas price increases was something around 70 per cent," Puri told reporters in Washington DC." (v) There are other items n the ANI reports. Our Supplemental Documents package includes three ANI reports."

Oil – Markets up on China covid opening rumors but China says sticking to Zero Covid

China says keeping with Covid Zero

It was a great week for markets and oil with the key factor being the rumors/expectations that China will be relaxing its Zero Covid policy soon. But, at the same time, China continues to stress they ae sticking to Zero Covid. Yesterday, Global Times (Chinese state news) reported "*China reiterates adherence to dynamic zero-COVID strategy, urges rectification of excessive, inappropriate anti-epidemic measures*." [LINK]. And "*Chinese health officials reiterated adherence to the dynamic zero-COVID strategy amid severe epidemic risks at a press conference on Saturday. In response to the problem of excessive and one-size-fits-all epidemic prevention and control measures in some parts of the country during recent flare-ups, officials urged serious rectification and vowed to hold those who fail to implement full rectifications accountable according to the law. During the Saturday press conference held in Beijing, Mi Feng, a spokesperson for the National Health Commission, stressed that China will continue to maintain its dynamic zero-COVID strategy as the country still faces the dual risks of imported cases and domestic community transmission. The epidemic prevention and control situation remains severe, Mi noted.*" Global Times also spoke to some of the reopening rumors. They wrote "*Some recent media reports said that several railway stations in cities in South China's Guangxi Zhuang Autonomous Region had stopped requiring passengers to show negative nucleic acid testing results before boarding trains. It's also reported that cities including Yibin in Southwest China's Sichuan Province and Yueyang in Central China's Hunan Province had begun charging the public for nucleic acid testing, with only certain groups exempted. These moves had led to speculations as to whether local*

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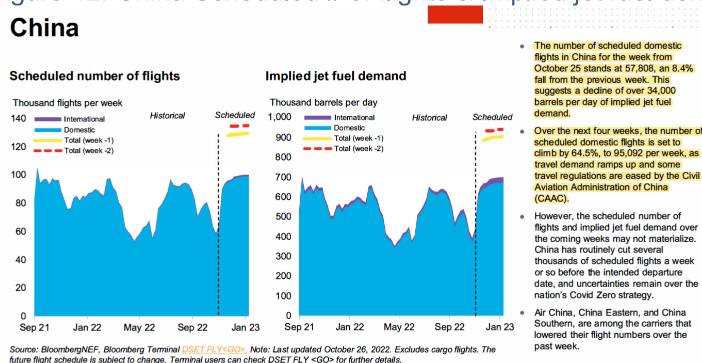
Chinese authorities were relaxing requirements for nucleic acid testing, a signal that China is gradually easing normalized anti-epidemic measures. In response, Hu Xiang, another official from the national epidemic prevention and control authority, said during the Saturday press conference that China will adhere to its dynamic zero-COVID strategy unswervingly, while continually optimizing its anti-epidemic measures according to the changes of the virus' incubation, transmissibility and pathogenicity."

Oil – Another week of China Covid fight leading to more cancelled domestic air flights

Many cancelled China air flights

If the rumors are correct that China is going to reopen, we should see a big uptick in the look ahead scheduled domestic air flights. This would be a reversal of the last two weeks. Last week's (Oct 30, 2022) Energy Tidbits highlighted that the worries that China's air flights would be hit by China not having a broad reopening have come true. And that the week for Oct 18 saw a big -14.4% WoW drop in scheduled domestic air flights. It was another week of the same. On Monday, we tweeted [LINK] "*#Oil. More support China not reopening quickly from #Covid. @BloombergNEF estimates China scheduled domestic air flights for week from 10/25: down 8.4% WoW to 57,808. Next 4 weeks, set to rise +64.5% to 95,092, but last week forecast was to 127,159 flights. #OOTT."* Our tweet included the below graph from BloombergNEF's Aviation Indicators Weekly. BNEF wrote "*The number of scheduled domestic flights in China for the week from October 25 stands at 57,808, an 8.4% fall from the previous week. This suggests a decline of over 34,000 barrels per day of implied jet fuel demand."* This 8.4% WoW decline follows the 14.4 WoW decline for the prior week. BNEF also wrote "*Over the next four weeks, the number of scheduled domestic flights is set to climb by 64.5%, to 95 ,092 per week, as travel demand ramps up and some travel regulations are eased by the Civil Aviation Administration of China (CMC)."* The new look ahead for the next four weeks # of schedule domestic flights is to climb 64.5% to 95,092 per week is a huge drop from last week's BNEF Oct 24 report that then forecast the then next four weeks to climb by 101.6% to 127,159 flights.

Figure 42: China Scheduled # of flights & Implied jet fuel demand



Source: BloombergNEF

Oil – Caixin PMI for Oct is below 50 at 49.2 after last month at 48.1

Caixin PMI 49.2 in Oct

On Tuesday, IHS Markit released the Caixin China Manufacturing PMI data for October [LINK] and the index showed the third consecutive month of below 50 with Oct at 49.2 (vs

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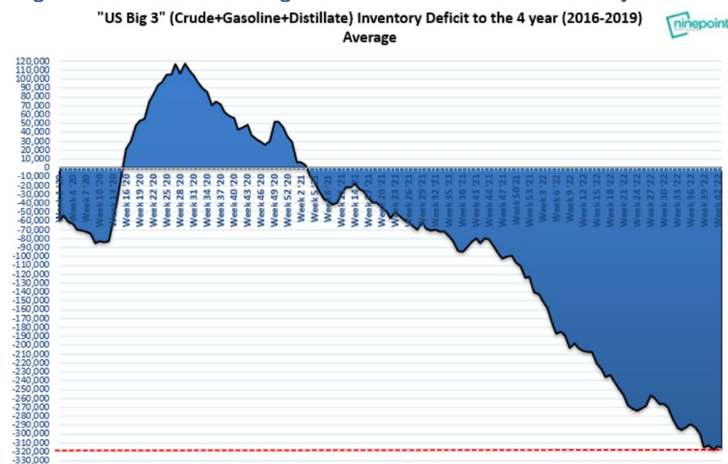
expectations of 48.1) but up from Sept at 48.1. The tone is negative for manufacturers with one key reason being covid containment continuing to restrict output and demand. This makes sense – a slowing global economy means less orders for Chinese products. The Caixin Insight Group said "*further declines in both output and new orders were seen at the start of the fourth quarter, with COVID-19 a principal factor behind lower client demand and disrupted factory operations. Nevertheless, decreases were only mild and slowed in both cases. All three monitored sub-sectors registered lower production and new orders in October. Intermediate goods makers registered the weakest reductions.*" Our Supplemental Documents package includes the Caixin China PMI for October.

Oil – China Covid rumors led to oil price spike because no slack in oil inventory

No slack in oil inventories

The big story to end the week were markets and oil up on rumors that China may soon be reopening. On Friday, WTI was +$4.44/b and Brent was +$3.90/b. Earlier this morning, we tweeted [LINK] "*In case you were wondering why Brent spiked ~$4 on Friday with rumors of China relaxing Covid restrictions. There is no slack in the global #Oil #Gasoline #Distillates inventory pictures. Thx @ericnuttall. #OOTT.*" Inventories are down to low levels, OPEC has cut but there isn't much surplus capacity, so it means that any surprise leads to a good move up in oil price.

Figure 43: US crude + gasoline + distillates inventory



Source: Ninepoint

Struggling oil supply is why Trafigura sees the case for a serious upcycle in oil

When we see the jump up in oil on the China Covid rumors and the frustration of governments (see Amos Hochstein comment earlier) on oil companies not cranking up E&P spending, it always reminds us of the Trafigura Chief Economist Saad Rahim's comments on the significance of oil supply investment not catching up to demand growth. Here is what we wrote in our Sept 18, 2022 Energy Tidbits memo. "*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*

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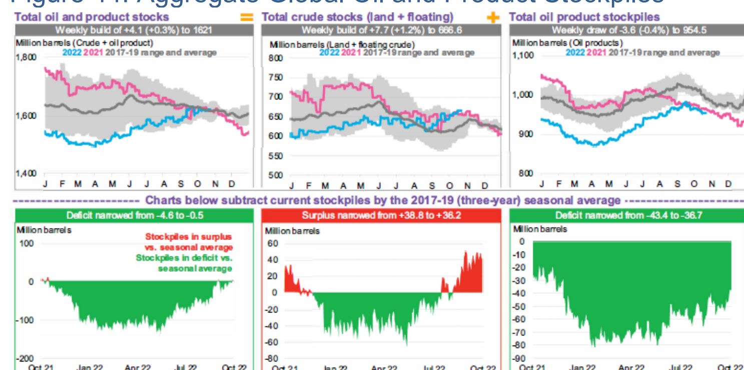
of investment in oil, and that investment never gets a chance to get caught up so the end result is a series of upward spikes with the lows keep getting higher. We tweeted [LINK] "#Trafigura case for a serious upcycle in #Oil. Prices spike to where causes demand destruction, but because haven't had enough 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 – BNEF: global oil and product stocks deficit narrowed

BNEF's global oil inventories

For those with a Bloomberg terminal we recommend flipping thru BloombergNEF's "Oil Price Indicators" weekly that came out on Wednesday as it provides good charts depicting near-term global oil demand and supply indicators. The global oil and products stockpile deficit narrowed for crude and products from 4.6 mmb to 0.5 mmb. The stockpile deficit against the five-year average (2015-19) widened from 20.4 mmb to 20.5 mmb. Total crude inventories increased by 1.2% to 666.6 mmb, including global floating inventories. Product stocks were down 0.4% WoW with the stockpile deficit against the 3-year average widening from 43.4 to 36.7 mmb. Gas oil and middle distillate stocks have widened against their three-year average deficit (2017-2019) from 32.3 mmb to 28.7 mmb. Jet fuel consumption by international departures increased by 58,000 b/d WoW while consumption by domestic passenger departures increased by 25,000 b/d. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 44: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

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Oil – Vortexa crude oil floating storage 79.61 mmb as of Nov 4, -22.59 mmb WoW

Vortexa crude oil floating storage

There will be a big watch on Vortexa data over the next couple weeks to see if there will be any revisions to the new Nov 4 data. Ie. is it an outlier data point or the start of a trend? We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 11am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments today on the new estimates are compared to the prior weeks Vortexa estimates posted on Bloomberg on Oct 31 at 10 am MT. (i) Yesterday, we tweeted [LINK] "*Hope this doesn't get revised up over the next week or two. If not, it's a big positive for #Oil. #Vortexa crude #Oil floating storage at 11/04 est 79.61 mmb, -22.59 mmb WoW vs upwardly revised 10/28 of 102.20 mmb. Thx @Vortexa @business. #OOTT.*" (ii) As of 11am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Nov 4 at 79.61 mmb, which is -22.59 mmb WoW vs upwardly revised Oct 28 of 102.20 mmb. Note Oct 28 of 102.20 mmb was revised +5.49 mmb vs the 96.79 mmb posted at 10am MT on Oct 31. (iii) We will have to watch if there is a big revision to Nov 4. If it isn't revised, is it an outlier or the start of a trend? (iv) Revisions for the past several weeks were mostly upward revision. The revisions posted at 11am today vs the estimates posted on Bloomberg at 10am MT on Oct 31 were: Oct 28 revised +5.49 mmb Oct 21 revised +1.73 mmb. Oct 14 revised -6.22 mmb. Oct 7 revised -0.97 mmb. Sept 30 revised +1.87 mmb. Sept 23 revised +1.57 mmb. Sept 16 revised +2.28 mmb. (v) If you put aside the new Nov 4 number, there is still a wide range, but I would pick an number +/- 95 mmb. Last week, it would have been +/- 90 mmb. (vi) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (vii) Nov 4 estimate of 79.61 mmb is -140.86 mmb vs the post-Covid peak on June 26, 2020 of 220.47 mmb. (viii) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in Q2/20 as Covid started to have a huge impact. Nov 4 estimate of 79.61 mmb is +10.37 mmb vs pre-Covid Nov 4, 2019 of 69.24 mmb. Nov 4 estimate of 79.61 mmb is -38.58 mmbd YoY vs Nov 5, 2021 of 118.19 mmb. (ix) Below are the last several weeks of estimates made as of 11am yesterday, 10am MT on Oct 31, and 11am MT on Oct 22.

Figure 45: Vortexa Floating Storage posted on Bloomberg Nov 5 at 11am MT

Source: Bloomberg, Vortexa

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Figure 46: Vortexa Estimates Posted Nov 5 11am MT, Oct 31 10am MT, Oct 22 11am MT

Posted Nov 5, 11am MT

FZWWFST VTXA Index 94) Sugg
11/03/2019 - 11/04/2022
1D 3D 1M 6M YTD 1Y 5Y

	Date	FZWWFST VT... Last Px
Fr	11/04/2022	79612
Fr	10/28/2022	102.199k
Fr	10/21/2022	96010
Fr	10/14/2022	88505
Fr	10/07/2022	85558
Fr	09/30/2022	91891
Fr	09/23/2022	107.74k
Fr	09/16/2022	92314
Fr	09/09/2022	85715
Fr	09/02/2022	80070
Fr	08/26/2022	87045

Oct 31, 10am MT

FZWWFST VTXA Index 94) Sug
10/27/2019 - 10/28/2022
1D 3D 1M 6M YTD 1Y 5

	Date	FZWWFST VT... Last Px
Fr	10/28/2022	96787
Fr	10/21/2022	94281
Fr	10/14/2022	94734
Fr	10/07/2022	86539
Fr	09/30/2022	90020
Fr	09/23/2022	106.173k
Fr	09/16/2022	90027
Fr	09/09/2022	84088
Fr	09/02/2022	79371
Fr	08/26/2022	85033
Fr	08/19/2022	100.664k

Oct 22 11am MT

FZWWFST VTXA Index 94) Sug
10/20/2019 - 10/21/2022
1D 3D 1M 6M YTD 1Y 5Y

	Date	FZWWFST VT... Last Px
Fr	10/21/2022	90479
Fr	10/14/2022	93338
Fr	10/07/2022	89887
Fr	09/30/2022	91806
Fr	09/23/2022	107.292k
Fr	09/16/2022	90014
Fr	09/09/2022	85280
Fr	09/02/2022	79985
Fr	08/26/2022	83916
Fr	08/19/2022	100.486k
Fr	08/12/2022	105.794k

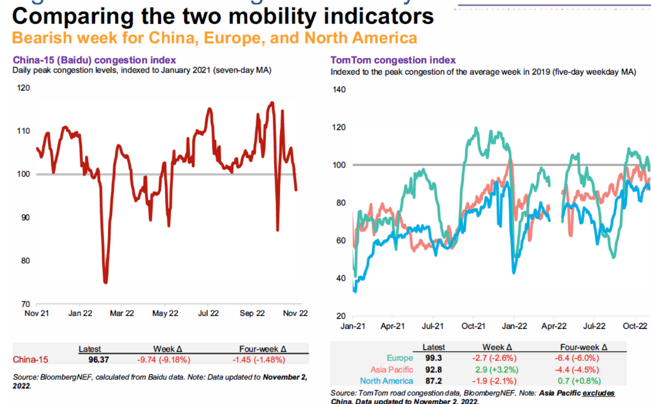
Source: Bloomberg, Vortexa

Oil – BNEF, Mobility down WoW, while Asia Pacific ticks up

Mobility down globally, Asia Pacific up

We are big fans of the BloombergNEF weekly indicators reports as they provide updates on WoW changes, but also remind that WoW changes do not necessarily mark a trend. On Friday, BloomergNEF posted its Global Road Traffic Indicators which included a drop in China's mobility, as well as North America and Europe, while the Asia Pacific increased WoW. The softness in the TomTom indicators we highlighted in the last two weeks memo continued this week. Over the last few weeks TomTom trends are moving lower relative to 2019 as one of the three regions dropped WoW. So it's worth keeping an eye on these indicators as they are happening at the same time as places like the US have seen lower gasoline prices. TomTom congestion index showed Europe down 2.6%, Asia Pacific up 3.2%, China down 9.18%, and North America down 2.1% from last week. Europe and North America are bearish and subject to drivers responding to rising cost, including high gasoline prices. China's mobility data should not come as a surprise given the increasing impact of the zero-covid policy and various lockdowns throughout the country. Our Supplemental Documents package includes excerpts from the BNEF Global Road Traffic Indicators report.

Figure 47: BloombergNEF Mobility Indicators



Source: BloombergNEF

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Oil – Bombardier CEO says flying private is much cheaper than most believe

Bombardier CEO on flying private

We couldn't help tweeting on Bombardier CEO's comments on BNNBloomberg on Thursday following his Q3 results. It wasn't on the results, rather his comments on the cost of flying private. We tweeted [LINK] "*really? "from a 1st class seat in a normal airline that it was not, first of all, not much more to expensive flying private" @Bombardier ceo to @JonErlichman. haven't seen that math on the past 20 years. #OOTT."* We have to wonder about the math. We don't disagree that is the case for flying some sort of prop plane less than 2 hours, but based on what we know from people who fly families privately, either from an ownership or buying hours, we can't see that being anywhere near the case for flying a family on an jet for any 4 hour trip. Maybe Bombardier CEO gets charged much lower rates when he flies private than anyone else?

Oil & Natural Gas – sector/play/market insights from Q3 calls

Sector insights from Q3 calls

Please note we ran out of time this weekend to write up more of the Q3 calls comments. It was a busy week of Q3 reporting. This is our favorite time each time of each quarter as it is quarterly reporting and this is when we get the best insights into a range of oil and gas themes/trends, sectors and plays. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts, or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks. Plus, we tend to get the best E&P sector insights from services, pipelines, refineries, and utilities

Chevron – products demand not showing signs of a recession tweet

There is more support from the views from industry players that the physical markets aren't showing the signs of a big hit to oil and products demand, which runs contrary to the financial markets pointing to a slowdown already in effect. Chevron held its Q3 call on Oct 28. Last Sunday, we tweeted [LINK] *"Seeing signs of economic slowdown? See 👇#Chevron CEO says not really "and so overall, I wouldn't say that product demand that we've seen to date is sending a strong signal that a recession is underway or that the economy is significantly slowing". Thx @business . #OOTT."* In the Q&A< mgmt. was asked if Chevron was seeing any signs of an economic slowdown. Chevron CEO Mike Wirth replied "*Yeah, Irene, thanks. Demand remains pretty strong globally across the product barrel. Though there are some variations in that. Certainly, the US West Coast which had some refining issues, and prices reflected that. We saw gasoline demand in the third quarter responsive to those higher prices and a little bit of softness there. Diesel demand has been pretty strong around the world, maybe a little less so in China given some of the lockdowns that they're seeing and aviation demand has been steadily coming back as people are flying again not quite to pre-COVID levels yet but steadily increasing and so overall, I wouldn't say that product demand that we've seen to date is sending a strong signal that a recession is underway or that the economy is significantly slowing. As I said there is always some kind of regional or maybe sectorial unique characteristics but no, we're not really seeing that yet, Irene."*

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Maersk – Slowing global economy, Q3 container volumes down 3% YoY
Maersk reported Q3 results on Wednesday. We look to Maersk for insights on the global economy as it is the dominant shipping company. On Wednesday, we tweeted [LINK] "*Slowing global economy. @Maersk Q3 results: global container volumes est -3% YoY in Q3. global air cargo est -9% YoY in Jul/Aug. Lowered 2022 global container volume guidance to -2%/-4% YoY from prior +1%/-1%. #OOTT #Oil.*" The key summary market situation for Maersk was "*Demand for logistics services moderated across global supply chains in Q3 2022. Supply-side bottlenecks continued to pose challenges, but there are signs of easing as demand slows and COVID 19-related restrictions in China diminish. Freight and charter rates declined in Q3 2022 relative to the previous quarter as the expected normalisation gained momentum through the quarter. Global container volumes are estimated to have declined –3% year-on-year in Q3 while global air cargo volumes, measured in CTKs, dropped by 9% in July/August (IATA). As a result of slowing economic activity, global container demand is expected to contract between –2 and –4% in 2022.*"

Energy Transition – Hochstein said oil, gas, refining, renewable capex is all needed

Hochstein's comments at Adipec

Unfortunately, this didn't last but on Monday, we saw what looked like a change in US messaging that seemed like a reality check acknowledgement that the world needs an all inclusive approach to energy (ie. need more fossil fuels) for the energy transition. But the comments by Hochstein in Abu Dhabi were immediately overshadowed by Biden's comments back in the US on the election trail going after fossil fuels and planning to shut down coal. Perhaps it's just a reminder that what officials say doesn't really matter unless Biden confirms the same thought. It was nice while it lasted. Back to Monday, we couldn't find a video clip of Hochstein's comment at Adipec on Monday so we relied on the Argus reporting. On Monday, we tweeted [LINK] "*1/2. Did we just see a major shift in #Biden messaging on #Oil #NatGas role in the #EnergyTransition? ie. the energy transition requires increased investment in all forms of energy, not just renewables? normally US just calls on producers to produce more but today ..... #OOTT*" and [LINK] "*2/2, @amoshochstein "we hope this happens around the world,"Increased investment in production, investment in refining capacity and… at the same time additional investment in the [energy] transition." Thx @ncitayim @Bacharelhalab #OOTT.*" Our Supplemental Documents package includes the Argus report.

Energy Transition – Joe Manchin unloads on Biden's shut down coal plants comments

Manchin unloads on Biden on coal

WOW was the only way to describe Democrat Senator Joe Manchin's statement yesterday on Biden's Friday comments on coal. But we also think it is important to note that Biden's statement is a reminder that coal, oil and natural gas should expect some more hits from him in the final two yeas of his term. Yesterday we tweeted [LINK] "*WOW. Dem @Sen_JoeManchin "Biden's comments [ton shutting down #Coal plants] are not only outrageous and divorced from reality", America "believes he does not understand the need to have an all in energy policy that would keep our nation totally energy independent & secure." #OOTT.*" There was a lot in Manchin's statement such as "*it is time he learns a lesson that his words matter and have consequences.*" It's worth reading the short statement. We also tweeted [LINK] "*Forgot to include #Biden' s comments "we're going to be shutting down those [#Coal] plants all across America and having wind and solar". @Sen_JoeManchin is right "his words matter and have consequences". #NatGas #OOTT.*" Then later yesterday, White House Press Secretary Karine Jean-Pierre issued a statement. Her statement was meant to

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counter Manchin's views, but for all the positive she says about Biden and coal, she doesn't deny Biden's Friday statement or Manchin's accusations. After reading it, we tweeted [LINK] "*Non-denial denial by @PressSec. Doesn't deny Biden is going to shut #Coal plants all across US. Doesn't deny #Biden doesn't understand the need to have an all in energy policy. Reminds still more hits to come vs #Coal #Oil #NatGas in last 2 yrs of Biden term. #OOTT."* Our Supplemental Documents package includes the Manchin statement, Biden transcript and Jean-Pierre statement.

Energy Transition – COP27 will be qualified statements & kick the can down the road

COP27 starts today

COP27 started today in Egypt. What a difference a year makes. In 2021, there was a good three to six month leadup to COP26 in Glasgow of major announcements, commitments and statements on reducing emissions. Whereas this year, the combination of Russia/Ukraine, global inflation, increasing interest rates, increasing anti-China chatter, poorer countries being short on energy, increasing coal generation in Europe, etc has put a totally different spin on COP27. It's hard to see how the world can agree on "firm" commitments to accelerate emissions reductions. That doesn't mean there won't be what look to be some bold statements and commitments. However, we repeat our warning from our Oct 9, 2022 Energy Tidbits that there will be bold commitments, but there will be qualifiers to those commitments and kick the can down the road commitments. (i) Qualified commitments. Here is what we wrote in our Oct 9, 2022 Energy Tidbits "*Energy Transition – COP 27 "taking into account different national circumstances" The lack of media coverage and leaders statements is a good indicator that the expectations are low for COP27 in Egypt that starts on Nov 7. We expect to see many statements that, will on the surface, look to be big successes. However, just like we noted posted COP26, we expect to see these statements with the big qualifier "taking into account different national circumstances. We were reminded of this by the joint US/India ministerial statement post the Granholm/Puri meeting. Yesterday, we tweeted [LINK] "Key caveat in joint @SecGranholm @HardeepSPuri #CleanEnergy statement "taking into account different national circumstances." No one can deny India wants to reduce emissions, etc, but will do so in the way, pace and cost impact to India consumers that is best for them. #OOTT." The joint statement had a number of strong clean energy joint efforts. It says "As climate and clean energy leaders, the United States and India share a common vision to deploy clean energy at scale during this critical decade to reduce emissions and achieve climate change mitigation goals, taking into account different national circumstances." We don't doubt that reducing emissions is a priority for India, but the joint statement using "taking into account different national circumstances". This caveat is what India and other countries will use to remind they will go on emissions at their own pace and cost.*" (ii) Kick the can down the road. Agree on a concept with no commitments. Earlier this morning, we tweeted [LINK] "*Kick the can down the road has to be a key theme from #COP27 given global economic slowdown ie. breakthrough agreement on financing damages caused by extreme weather events would aim to reach a conclusive decision on loss and damage no later than 2024. Thx @business. #OOTT."* Earlier this morning, Bloomberg reported "*COP27 Talks Begin With Breakthrough on Loss and Damage. UN climate talks began in Egypt with a breakthrough agreement to discuss the financing of damages caused by increasingly extreme weather events -- an issue that had exposed splits between rich and poor nations. The agreement, reported in advance by Bloomberg, will allow diplomats and leaders to officially debate the issue for the first time during the two week-long*

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conference in the Egyptian seaside town of Sharm el-Sheikh. Egypt's Foreign Minister ameh Shoukry, who took up Sunday his position as president of COP27, said the breakthrough was reached after 48 hours of intense talks and would aim to reach a conclusive decision on loss and damage "no later than 2024."

Energy Transition – Squeezing oil & gas capex didn't solve climate change

Squeezing oil and gas capex

We always appreciate when others can communicate in a way that delivers a clear message and that was the case with Amena Bakr (Energy Intelligence) Friday interview with Crescent Petroleum CEO Majid Jafar on Friday on why he sees the energy crisis lasting for a decade. On Friday, we tweeted [LINK] "*Key #EnergyTransition assumption didn't work -squeeze #Oil #NatGas access to capital & "that will somehow solve climate change" so failing on energy affordability, security & sustainability, fears last for >decade. See 👇transcript @CrescentPetrol CEO. Thx @Amena__Bakr. #OOTT.*" Jafar reminded that the energy crisis had started well before Russia invaded Ukraine, but, no question Russia has exacerbated the crisis. One of this quotes was on how governments decided to tackle climate change. Jafar said ". *And then do nothing about tackling demand. And instead, there was a concerted effort to starve supply. There was somehow a misguided idea that if we squeeze or starve the energy sector and, oil and gas in particular, from finance that that will somehow solve climate change. That's ludicrous.".* And then his summary energy crisis comment "*So if we starve investment into these and think that only solar and wind is going to be sufficient, we have what we have today. Which is a spike in energy prices, more burning of coal. So we have more emissions. So actually we are failing on all three of the important legs of the stool on the Energy Transition, which are affordability, which are availability and security of supply, and sustainability. At the moment, we are having record high prices, risks of blackouts and emissions are going up. So there has been a basic failure in terms of overall policy and insufficient investment in energy. That's my concern".* Our Supplemental Documents package includes the transcript we made of his key comments.

Energy Transition – Inadequate returns on some major NE US offshore wind projects

Offshore wind delays

We continue to see more support for our long stated view that the Energy Transition may be happening, but Energy Transition will take way longer, be bumpy/rocky road and cost a lot more than aspired by these leaders. Our concern is elevated when leaders don't look beyond Russia to what was happening prior to Russia/Ukraine ie. the supply chain, critical metals cost escalation etc. And the result will be years of energy crisis as "clean energy" is ready to replace fossil fuels in the aspired timelines, in this case offshore wind. Offshore wind is expected to be the big growth area for the 2020s, but we are seeing indicators that some major offshore NE US wind projects may not get done or will have later start up time. This should not be a surprise as we have been highlighting the skinny returns, at best, on big offshore wind projects in competitive rights bidding. Even if electricity companies want to be accelerating the addition of clean energy, they still have to do so on a basis that meets returns criteria. On Thursday, we tweeted [LINK] "*#EnergyTransition will take longer & cost $$. See 👇 09/28 @PPouyanne warning on lack of IRR in offshore #Wind. @joshfromalaska @willwwade report PSEG may not proceed with Ocean Wind 1, Avangrid delays Commonwealth start. #NatGas is needed for longer #OOTT [LINK].*" On Tuesday, Bloomberg posted a report "*The Great US Offshore Wind-Power Boom Has Begun to Falter*" that, is like the title suggests, highlighting the lack of economic returns from some major offshore US east coast wind projects. Bloomberg wrote "*On Monday, New Jersey utility*

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Public Service Enterprise Group Inc. said it's deciding whether to pull out of Ocean Wind 1, a proposed project in the Atlantic Ocean that would generate 1.1 gigawatts -- enough for 500,000 homes. Less than two weeks earlier, New England utility Avangrid Inc. said its similarly sized Commonwealth Wind project was no longer viable because of higher costs and supply chain woes." In its Q3 release, PSEG wrote "*Regarding the Ocean Wind 1 project in New Jersey, PSEG's continuation as an equity owner is subject to its Final Investment Decision (FID), which represents the decision to proceed to the construction phase of the project. We are reviewing our options regarding the status of PSEG's 25% equity investment in the project.".* That sounds like big company speak for don't be surprised if we drop out. Our Supplemental Documents package includes the Bloomberg report.

TotalEnergies CEO: insufficient returns in competitive offshore wind deals
Our PSEG and Avangrid tweet above retweeted our Sept 28, 2022 tweet [LINK] ""*Renewables, if you compete with others, you lose money! Okay, I said that, I declared it." says @PPouyanne . It's why #TotalEnergies is selective to ensure their renewables deliver >10% ROE ie. uses its advantage to farm-down, merchant, trading, to enhance returns. #OOTT."* TotalEnergies held their 2022 Strategy & Outlook webcast. In the Q&A, mgmt was asked why rush into renewables when renewables are seeing the massive inflation etc. We created a transcript of CEO Pouyanne's answer "*Renewables, if you compete with others, you lose money! Okay, I said that, I declared it." "I say to my colleagues, stop spending your time to go to this because we face competitions with financial institutions, when clearly I am not ready to pay NPV 4 or NPV 5*." NPV 4 or NPV 5 is even too low for the big multinationals like BP and TotalEnergies.

Energy Transition – Avangrid needs better returns on offshore/onshore wind & solar

Avangrid offshore wind

We understand fully that the Energy Transition is happening, but we also remind that it's going to take way longer than expected and cost a lot more. The Avangrid item noted above is more than a delay to one, albeit a big one, offshore wind project. Rather Avangrid is clearly telling investors the big offshore wind projects don't make money and Avangrid is also renegotiating onshore wind and solar projects for better returns. We like to go back to source documents/comments instead of just relying on reports. Rather, we use a good Bloomberg report above as a starting point. And there was a lot more in the Avangrid Q3 call transcript [LINK]. On Thursday, we tweeted [LINK] "*Worth a read. #Avangrid says renegotiating not just big #OffshoreWind, but also #OnshoreWind & #Solar. Mgmt for offshore, "we need to find these projects back to the return we were expecting, and basically Not To Lose Money". #NatGas will be needed for longer. #OOTT."* It's not just the big offshore Commonwealth wind project that has negative returns, its also concerns on their Park City offshore wind project AND on their onshore wind and solar economics. Mgmt's prepared comments on Commonwealth and Park City were recent deals that need to renegotiated. Avangrid said "*In Park City and Commonwealth Wind, our focus is on improving the project economics and renegotiating our PPAs because of the difficult environment. As you know, we did these projects in 2019 and 2021 respectively. Since then, the markets experienced meaningful and anticipated changes due to high inflation and supply chain constraints and higher capital and borrowing costs, making it necessary for us to pursue changes to the PPA terms, which we believe are modest and achievable."* And in the Q&A, mgmt. was even clearer on Park City and Commonwealth and then also said they need to renegotiate onshore wind and solar

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projects. Plus one other big warning – these projects are also late as they have to renegotiate period of delivery. Avangrid CEO said "*I think – I'm going to take the lead on this one. I think, first of all, from a gain point of view, I think we're very comfortable. The value, as you can see of just the leases of those projects [*referring to Commonwealth and Park City] *is huge. So from that point of view, I think there is a value in those assets whether you go ahead with the projects now, later, or you just cancel them and start again, you know, the lease is worth a lot. So from that point of view, I think that the value that we have agreed for our gain that you mentioned in the agreement with CIP is clearly a very good value for us, well below most of the comparable transactions, just [indiscernible] (00:35:15), okay. <u>Second, I think it's important that everything we're doing right now is what we do in many projects. We renegotiate. We've been working right now in onshore wind, on solar projects that we were developing this year in renegotiating timelines, in renegotiating period of delivery, and avoid tens and tens of millions of potential penalties</u>. We're doing the same thing here. There is a change – a dramatic change in the world right now in many aspects that we have commented. And therefore, we believe these projects are the cheapest alternative for energy in New England by any means, without any doubt, it doesn't matter what you compare this with. And therefore, we're not suggesting we want to make more money. <u>We're just suggesting we need to find these projects back to the return we were expecting, and basically not to lose money</u>. And it's a question of putting that on the table, which we are doing. And I think we are comfortable that this is something to work with many parties and we are working right now in the negotiations, many meetings already. <u>It is a process that is going to take probably nine months at least.</u> So from that point of view, we are working as we do in other situations. So, very comfortable in the process ahead of us, either to renegotiate or to start again, but I think we're comfortable right now with the process and the arguments we're using."*

Avangrid's Commonwealth and Park City offshore wind projects
Commonwealth. On July 20, 2022, Avangrid press release "*Avangrid Joins President Biden in Support of Efforts to Advance Offshore Wind, Address Climate Change*" included "*Commonwealth Wind is the largest offshore wind project in New England and will create 11,000 full time equivalent jobs over the project's lifetime while generating enough energy to power 750,000 homes annually. The project will also deliver a host of energy, environmental, and workforce benefits to Massachusetts, including a first-in-the-nation partnership to supply offshore wind power to municipal utilities, significant investments in the development of a diverse, inclusive, and equitable workforce, and an investment in New Bedford to create an offshore wind operations and maintenance control center."* Park City offshore wind project. " *Park City Wind, named after the City of Bridgeport, is an 804 megawatt offshore wind project to be constructed in AVANGRID's federally designated lease area (Lease Area OCS-A 0534). This lease area is located at least 22 miles off the coast of Massachusetts. Park City Wind will not be visible from any shoreline in Connecticut, but will bring clean, renewable, cost effective energy to the residents of Connecticut."*

Energy Transition – AES Indiana to replace coal with natural gas not renewables
This week, we saw a good example of the dilemma facing electricity providers – what do they do if they want to provide reliable and affordable electricity while moving to reduce emissions.

AES India replacing coal with natural gas

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And, as noted above by PSEG and Avangrid, the costs of renewables are going up and up. AES Indiana decided to replace some coal generation with natural gas generation and not renewable generation that would have cost an additional $381 million. On Wednesday, we tweeted [LINK] *"#EnergyTransition may be happening but will lead to higher #Electricity costs to consumers. But @AESIndiana priority is reliability, affordability & sustainability so will replace #Coal with #NatGas and not #Wind #Solar #Storage and expect to save customers $281 million. #OOTT."* Note our tweet had a typo, it should have been $381 million saving, not $281 million. AES Indiana posted its 2022 Integrated Resource Plan (IRP) Public Advisory Meeting #5 [LINK], which included their analysis on what the options to replace its Petersburg Units 3 and 4 coal generation with natural gas generation vs wind/solar/storage. Their plan to move ahead with natural gas would save its customers $381 million.

Figure 48: AES Indiana Final Portfolio Matrix

Final Portfolio Matrix

Results from Capacity Expansion Scenario Analysis → Candidate Portfolios

20-Year PVRR (2023$MM, 2023-2042)	Scenarios: No Environmental Action	Current Trends (Reference Case)	Aggressive Environmental	Decarbonized Economy
Generation Strategies				
No Early Retirement	$7,111	$9,572	$11,349	$9,917
Pete Refuel to 100% Gas (est. 2025)	$6,621	$9,330	$11,181	$9,546
One Pete Unit Retires (2026)	$7,462	$9,773	$11,470	$9,955
Both Pete Units Retire (2026 & 2028)	$7,425	$9,618	$11,145	$9,923
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,211	$9,711	$11,184	$9,690
Encompass Optimization without predefined Strategy	$6,610	$9,262	$10,994*	$9,572
Encompass Optimization Results by Scenario:	Refuels Petersburg Units 3 & 4 in 2025	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027	Refuels Petersburg Unit 4 in 2027 Retires Unit 3 in 2028*	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027

20 2022 IRP *Refueling Pete 3 & 4 at the same time provides cost efficiencies. These efficiencies are not captured when only one unit refuels. aes Indiana

Source: AES Indiana

Capital Markets – Liberals to have new tax on stock buybacks

Liberals to tax stock buybacks

The Liberals have confirmed that they plan to put in a new tax on stock buybacks, On Thursday, The Financial Post report [LINK] "*Ottawa reveals plan for new tax on stock buybacks"* and "*The federal government plans to impose a new tax on public companies that pursue share buybacks, a popular way to reward investors and reduce volatility, but one criticized by some politicians for diverting funds away from pressing goals such as the energy transition and domestic job creation. The tax plan, unveiled by Finance Minister Chrystia Freeland in her fall economic update Thursday, is to be fleshed out in the 2023 budget and come into force Jan 1, 2024. It is expected to increase federal revenues by $2.1 billion over five years. Freeland said the tax will be "similar" to the one-per-cent buyback tax in the Inflation Reduction Act signed into law by United States President Joe Biden in August. "We're taxing share buybacks to make sure that large corporations pay their fair share, and to encourage them to reinvest their profits in workers and in Canada," Freeland said in prepared remarks for the economic update."*

Capital Markets – Top 20% Cdn high income pay 61.4% of Cdn personal income tax

Measuring progressivity in Cdn tax system

Last week, the Fraser Institute posted its report *"Measuring Progressivity in Canada's Tax System, 2022*". [LINK] The Fraser Institute divided Cdn families into 5 income group with the top 20% being income >$227,486. The key conclusions were "*Indeed, the evidence shows*

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that the top 20 percent of income-earning families pay nearly two-thirds (61.4 percent) of the country's personal income taxes and more than half (53.0 percent) of total taxes. In contrast, the bottom 20 percent of income-earning families are estimated to pay only 0.8 percent of all federal and provincial personal income taxes and 2.1 percent of total taxes in Canada." The argument will be made that they should have split the top 20% into subgroups as there is clearly a wide range of incomes in that group. We suspect that a top average tax rate of 24.1% for this top 20% group reinforces there is a wide dispersion within this group. Our Supplemental Documents package includes excerpts from the Fraser Institute report.

Capital Markets – Markets can relax? Astros beat Phillies to win the World Seriies

Astros beat Phillies

Can markets now relax now that the Houston Astros won game 6 last night to win the World Series 4-2 over the Philadelphia Phillies? Last week's (Oct 30, 2022) Energy Tidbits memo wrote "*We probably should have put this in Misc Facts and Figures but it is a stock markets fact – Every Phillies World Series win has been followed by a big economic slowdown. On Friday, we tweeted [LINK] "Is it up to @astros to save US from a lasting recession? Every time the @Phillies win the World Series, the market crashes. 1929 then Great Depression. 1980, recession thru 1983. 2008, the global financial crisis. Thx @BillPowerWSJ." The WSJ wrote "If the Philadelphia Phillies Win the World Series, Prepare for an Economic Crisis It happens every time a team from the city succeeds" "The Philadelphia Phillies are in the World Series. Hold on to your wallets. When Philadelphia baseball teams do well, in a pattern that has held for a century, financial markets tend to strike out. It started with the old Philadelphia Athletics (before they left town). Their 1929 championship preceded the stock crash and Great Depression. In 1980, the Phillies won their first World Series, and a recession raged right through 1983, when the team again got to the final round and lost. The Phils won the World Series a second time in 2008, and boom: a home-run financial crisis." Our Supplemental Documents package includes the WSJ report.* "

Demographics – Average person believes they hit peak health at 34

Is peak health at 34?

On Friday, Study Finds reported "*Average person believes they hit peak health at 34, began noticing signs of aging at 42*". [LINK] "*When did you start noticing those gray hairs, wrinkles, and unexplained aches? Research shows the average American begins to notice the signs of aging at the age of 42, but 15 percent noticed themselves getting older before age 35. That's according to a new poll of 2,000 Americans with representative samples for Gen Z, millennials, Gen-X, and baby boomers, where respondents believe they were at the peak of their health at the age of 34."* Study Finds also wrote "*With these noticeable changes in mind, many respondents are making adjustments to their health and wellness routines. Overall, 36 percent are updating the types of vitamins and supplements they take, with baby boomers (41%) being the most likely generation to do so. Two in five (40%) baby boomers are changing the types of food they eat, with 34 percent of Gen X doing the same. Even 30 percent of Gen Z are doing so, despite being relatively young*."

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

@Energy_Tidbits on Twitter

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

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just retweeting other tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

LinkedIn – Look for quick energy items from me on LinkedIn

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.

The world's largest deserts are Antarctic and Arctic deserts

We haven't played Trivial Pursuit since the mid 80's but, if it's not there, we have to believe a good question would be what is the world's largest desert? We suspect most won't guess that it's the Antarctic desert. We certainly didn't realize that most of the Antarctic and Arctic is classified as a desert. We didn't until we had an old episode of Life Below Zero on in the background and heard Chip Hailstone say that Arctic is a desert. Never thought of what classifies as a desert and it's apparently an area that gets less than 250 mm or less than 10 inches of precipitation per year. For the Arctic, you have to convert inches of snow and water content of the snow into inches or precipitation. There is no one conversion factor, but some rules of thumb for below zero is 50 inches of snow is equivalent to 1 inch of precipitation. Not all of the Arctic meets this criteria, but a lot does. The CIA World Factbook's 10 largest deserts in the world is below and ranks Antarctic as #1 and Arctic as #2. [LINK]

Figure 49: 10 Largest Deserts in the World

Desert	Sq KM
Antarctic Desert	14,200,000
Arctic Desert	13,900,000
Sahara	9,200,000
Arabian	2,330,000
Gobi	1,295,000
Kalahari	900,000
Pentagonian (Argentina)	673,000
Syrian	500,000
Chihuahuan (Mexico)	362,000
Kara-Kum (Turkmenistan)	350,000
1. Sahara: Algeria, Chad, Egypt, Libya, Mali, Niger, WesternSahara, Sudan, Tunisia	
2. Arabian: Saudi Arabia, Iraq, Jordan, Kuwait, Oman, Qatar, UAE, Yemen	
3. Gobi: China, Mongolia	
4. Kalahari: Botswana, Namibia, South Africa	
5. Syrian: Syria, Iraq, Jordan, Saudi Arabia	

Source: CIA, The World Factbook

Last minute, Jets deactivated former CFL star Chris Streveler for Patriots game

Unfortunately, we have a 7am MT news cut off so it was before the last minute active roster for the Jets/Patriots 11am MT game last week when they deactivated former CFL star QB Chris Streveler for the game. They had added him to the 53-man roster

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the day before the game and the expectations were for a suite of run/pass plays against the Patriots. The Jets lost at haome 22-17, and QB Zach Wilson didn't have a good game throwing three interceptions. After the game CBS reported "*Streveler was elevated for the Jets' matchup against the Patriots but was surprisingly left inactive. There was a belief the dual-threat quarterback could be used in certain packages against New England, but the situation remains unclear. "We had some things going into the weekend," coach Robert Saleh said. "Not going to go into detail in terms of having the opportunity to get him up. A couple things happened, and we deactivated him." Regardless of what happened in Week 8, it appears Streveler's running ability could be utilized by New York moving forward. However, the practice-squad quarterback is now eligible for just two more elevations this season*. Perhaps if they had of kept Streveler active for the game and put in some designed run/pass option plays for him, it might have made the difference.

Chef Boyardee was pretty popular in the 70s/early 80s

Who didn't eat Chef Boyardee tin ravioli or spaghetti in the 70s/80s. Yesterday, Fox News reported on comments from Democrat congressman Maloney on families dealing with inflation. [LINK] It wasn't just an inflation, college students would have a single burner in the dorm and throw a tin of Chef Boyardee directly on the burner for a dorm room snack. Fox wrote "*Yeah, well, I grew up in a family where, you know, if the gas price went up, the food budget went down," Rep. Maloney said. "So by this time of the week, we'd be eating Chef Boyardee if that budget wasn't gonna change. So that's what families have to do. Here's what we should do," Maloney said before discussing actions that he says would lower inflation."* Note the label from the 1971 can – it was "Beef" ravioli.

Figure 50: 10 Chef Boyardee Beef Ravioli

Source: flickr

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