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Energy Tidbits

April 10, 2022

Produced by: Dan Tsubouchi

Libya's Eastern Military Commanders Urge Haftar to Shut Down Libya Oil Exports

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 and not just a specific company results. Our target is to write on 48 to 50 weekends per year and to post by noon mountain time on Sunday.

This week's memo highlights:

1. Yesterday, Libya's eastern military commanders urged Haftar to shut down Libya oil exports (Click Here)
2. No major surprise big hits against oil and gas in the Liberals Budget 2022 (Click Here)
3. Environment Minister Guilbeault warning suggests Suncor's base mine expansion could be the 1st victim of the Liberals new Emissions Reduction Plan (Click Here)
4. China's ENN signs its 3rd long term LNG supply purchase in 2022, this time from NextDecade (Click Here)
5. Have to wonder if Shell's internal transfer of Montney a set up for LNG Canada Phase 2 in 2022? (Click Here)
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

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Natural Gas – Natural gas draw of -33 bcf, storage now -399 bcf YoY deficit

YoY storage at -399 bcf YoY deficit

The natural gas winter withdraw season, but, considering how warm it was in the US this winter, it's been a good winter for gas storage with a modest widening of the YoY storage deficit from -282 bcf YoY at Oct 31 to current -399 bcf YoY. The EIA reported a 33 bcf draw (vs 28 bcf draw expectations) for the Apr 1 week, which was less than the 5-yr average build of 8 bcf, and below last year's injection of 20 bcf. Storage is 1.382 tcf as of Apr 1, increasing the YoY deficit to -399 bcf, from 347 bcf last week and storage is 285 bcf below the 5-year average vs 245 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 (04/01/21)		5-year average (2017-21)	
Region	04/01/22	03/25/22	net change	implied flow	Bcf	% change	Bcf	% change
East	241	268	-27	-27	305	-21.0	278	-13.3
Midwest	296	317	-21	-21	398	-25.6	371	-20.2
Mountain	91	89	2	2	115	-20.9	100	-9.0
Pacific	165	161	4	4	197	-16.2	180	-8.3
South Central	589	581	8	8	765	-23.0	739	-20.3
Salt	173	169	4	4	234	-26.1	229	-24.5
Nonsalt	416	412	4	4	532	-21.8	511	-18.6
Total	**1,382**	**1,415**	-33	-33	**1,781**	**-22.4**	**1,667**	**-17.1**

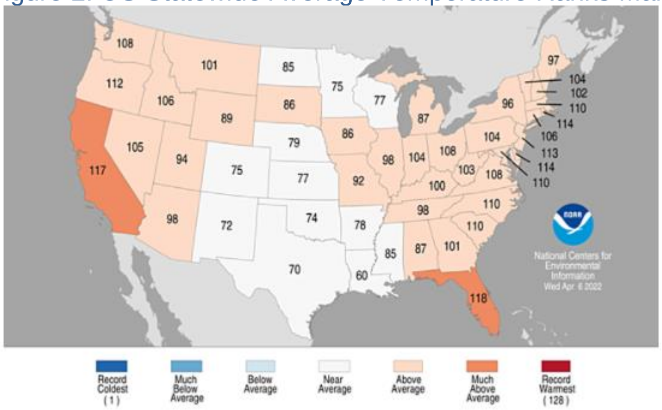
Source: EIA

Natural Gas – March was 25th warmest March in last 128 years

25th warmest March in 128 yrs

It's a good thing US LNG exports have been increasing because, if not, this warm of a winter would have set HH prices close to $2 and not high $4's. In pre LNG days, a hot March to end the winter would normally be a big negative to HH gas prices. March was very hot. NOAA posted its recap of March 2022 weather [LINK], which was the 25th warmest in the last 128 years. D/J/F was the 18th warmest winter on record in the last 128 years. Below is a graphic depicting the state average temperature ranks.

Figure 2: US Statewide Average Temperature Ranks March 2022



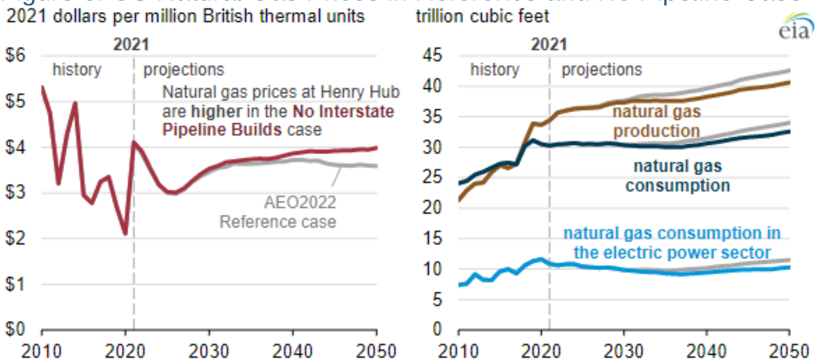
Source: NOAA

Natural Gas – EIA, holding back interstate pipelines means less gas production

EIA on interstate gas pipelines

We were a little surprised the EIA posted this blog because it reinforces how regulatory restrictions are holding back US natural gas supply. But, on Monday, the EIA posted its blog [LINK] "*EIA explores effects of not building future interstate natural gas pipelines*", which analyses the impact on the energy market if there were no additional US pipeline capacity built between 2024 and 2051. They forecast in their base case, which assumes no natural gas pipelines built in the mentioned period, they forecast a 5% reduction in natural gas production and 4% less consumption in 2050 compared with the reference case. This also includes the assumption that the Henry Hub spot price will be 11% higher in 2050 than in the reference case. Restricting US interstate pipeline builds led to a 7.2 bcf/d reduction in interregional capacity in 2050 than in the Reference case projection, which, for example, limits the amount of natural gas that can flow from the Appalachia production region to demand areas such as the Midwest. Higher natural gas prices make natural gas less economical for electric power generation compared with alternative sources, such as coal or renewables. The forecast projects that natural gas's share of US electricity generation would fall from 35% in the reference case to 31% in 2050. *"We project that restricting interstate U.S. natural gas pipeline capacity would only slightly lower energy-related carbon dioxide (CO2) emissions in the United States relative to the Reference case. Total CO2 from all fuel sources in 2050 are 4% lower in the No Interstate Natural Gas Pipeline Builds case than in the Reference case. The relatively small effect on CO2 emissions, despite the decline in natural gas consumption and growth in electric power generation from renewable sources, is due to our forecast of increased coal-fired power generation, which would be more carbon intensive than the natural gas-fired generation it displaces."* Below is a graphic from the two forecast cases. Our Supplementals Documents package includes the EIA blog.

Figure 3: US Natural Gas Prices in Reference and No Pipeline Case



Source: EIA

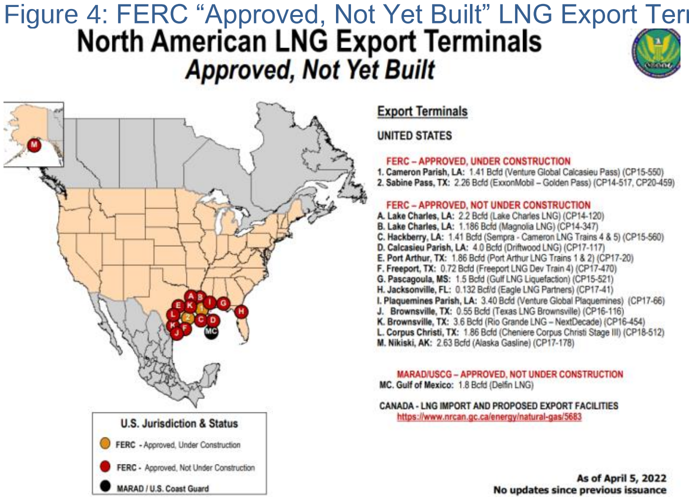
Natural Gas – FERC's updated US LNG Export Terminals maps

FERC's updated LNG export terminals maps

On Tuesday, FERC updated their series of "North American LNG Export Terminals", which we recommend adding to reference libraries. Please note that FERC calls these maps North American, but they do not include Canadian LNG projects ie. LNG Canada Phase 1. The three maps split out North American LNG export terminals into "Existing", "Approved, Not Yet

Built", and "Proposed". The FERC maps are found at: [LINK]. Our Supplemental Documents package includes the three FERC maps.

Figure 4: FERC "Approved, Not Yet Built" LNG Export Terminals



Source: EIA

Natural Gas – Is Shell's internal transfer of Montney a set up for LNG Canada Phase 2?

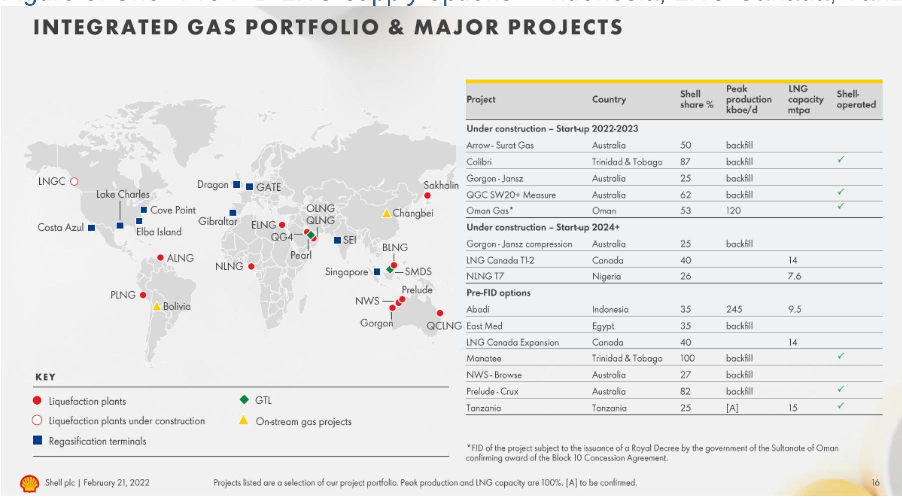
Shell's internal transfer of Montney

It didn't get any attention, but we couldn't help notice Shell's transferring of its its Cdn shale (Montney) gas assets from its Upstream group to its Integrated Gas group. This had zero attention in the Thursday morning "*Shell first quarter 2022 update note*" [LINK] as all the headlines were on Shell's expectation for an impairment of $4 to $5b related to pull out of Russia. This was the Shell first quarter 2022 update note ie. this is the kind of guidance or pre-warning document for their upcoming Q1 report. Shell reports Q1 on May 5. We tweeted [LINK] "*Hmm! Clean up or set up? #Shell transfers ~50 kboed of Cdn shale assets from Upstream to Integrated Gas. Clean up for reporting? Or set up ahead of #LNGCanada Phase 2 FID? Should know by Q1 on 05/05. Would be big value to all Cdn #NatGas if FID another 1.8 bcf/d #LNG. #OOTT*". Our tweet asks if this is simply a clean up transfer or it is represents a set up transfer for a future event for LNG Canada such as its Phase 2 FID. No question it looks like a throw-away comment that Shell is transferring 50,000 boe/d of Cdn shale assets out of Upstream and into Integrated Gas. Integrated Gas is their LNG business. It may well be a clean up, but, if so, the question is why now and not at year end 2021. LNG Canada Phase 1 is over 50% constructed but 1st LNG is still over 2 years away and within their Integrated Gas group. We would have thought that they would have already had any related shale (Montney) gas assets in the same Integrated Gas group long before now given the >50% construction completion. So why would they do this now for LNG Canada Phase 1? Why are they now moving the shale (Montney) gas assets now? What is different? The only thing we can think is different is if they planned to look at a FID for LNG Canada Phase 2, which is why we ask if this transfer represents a set up trade and not a clean up trade. But, maybe we will be surprised and find out that Shell, for some reason, just now decided to link the assets. The first thought that came to mind is that Shell would look to add natural gas asses in western Canada and any such acquisition would be done out of the Integrated Gas group and not the Upstream group. We have been very bullish on the potential for Shell to

FID LNG Canada Phase 2. Our Supplemental Documents package includes the Shell first quarter update release.

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

Figure 5: Shell Pre-FID LNG supply options – Indonesia, LNG Canada, Tanzania



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

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

Source: Shell

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

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

Natural Gas – SAMIM troops expect to de-escalate Mozambique security in April

Mozambique security situation

It's hard to tell from a distance exactly how it is going on the ground for security stability in the key Cabo Delgado province in Mozambique. But we have to believe there is huge desire from both Mozambique and TotalEnergies to get a restart to the Phase 1 LNG project. Especially from TotalEnergies given it is one of the two key growth areas, the other being Sakhalin 2 LNG in Russia. The reports over the past two months have been that there has been an improvement in the security situation, but it still needs to get better. On Monday, the Club of Mozambique (Mozambique news) reported [LINK] the Southern African Development Community Mission in Mozambique (SAMIM) has extended their mission by 3 months to July 15, but "*is expected to begin its de-escalation to Scenario 5 of its deployment to combat acts of terrorism and violent extremism in the northern region of Cabo Delgado Province, in Mozambique*." There are two armed forces helping Mozambique – Rwandan and SAMIM. It sounds positive, but just reminds that there is still security risk ie. we would be surprised to see any change, at least for now in TotalEnergies restart timing. Our Feb 13, 2022 Energy Tidbits highlighted TotalEnergies Q4 call on Feb 10 and out Feb 10 tweet [LINK] "*1/2. #LNGSupplyGap getting biggger. Expect longer time to restart @TotalEnergies #Mozambique. In Q&A, @PPouyanne "But my view is that the conditions under which we could restart the project might be fulfilled, maybe it will take a year. I don't know. We'll see" #LNG #NatGas #OOTT."* And [LINK] "*2/2. @PPouyanne "We know that when we say yes we can come back, it will take six months really to start up again". Hope was 2022 restart for 1st #LNG in 2026. Backs up ~5 bcf/d of #MozambiqueLNG. see SAF 04/28/21 blog. Need brownfield FIDs ie. #LNGCanada Phase 2. #NatGas #OOTT".* Pouyanne received headlines for his other comments that day such as "*We will not build a plant in a country where we will be surrounded by soldiers."* Pouyanne was clear, the restart of work on Mozambique LNG is likely not happening until at least H2/2023. Our Supplemental Documents package includes the Club of Mozambique report.

TotalEnergies Mozambique LNG delay was the game changer to LNG markets

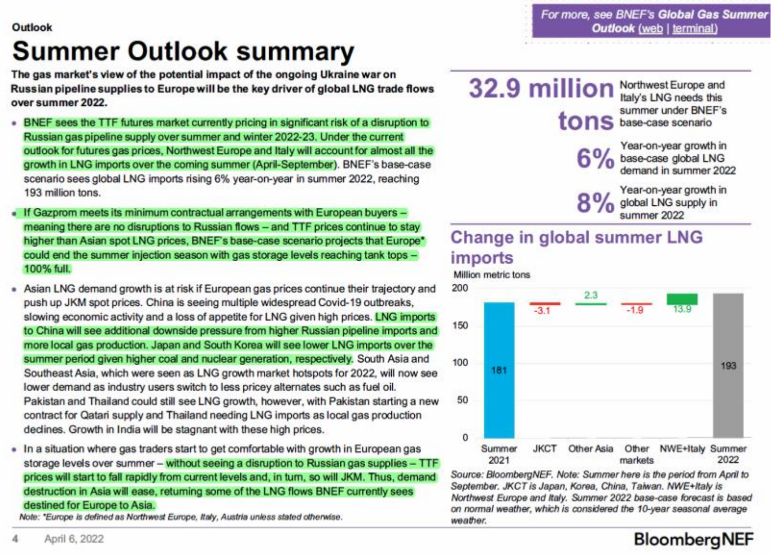
We have been highlighting TotalEnergies force majeure on its Mozambique LNG Phase 1 for the past year as the game changing event for LNG markets. Phase 1 at 1.7 bcf/d is significant, but our view has been because TotalEnergies delaying Phase 1 of 1.7 bcf/d is actually leading to a delay of 5.0 bcf/d.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

Natural Gas – BNEF sees a rapid drop in JKM price if Russia doesn't cut supply

BloombergNEF's bold call for TTF & JKM prices

We were a little surprised that BloombergNEF's bold call on TTF/JKM prices didn't get much attention. On Wednesday, BNEF posted their Global LNG Monthly report, which is an excellent reference report to download. But what seemed overlooked was their forecast for the summer "*In a situation where gas traders start to get comfortable with growth in European gas storage levels over summer - without seeing a disruption to Russian gas supplies – TTF prices will start to fall rapidly from current levels and, in turn, so will JKM. Thus, demand destruction in Asia will ease, returning some of the LNG flows BNEF currently sees destined for Europe to Asia*." The forecast assumes "*If Gazprom meets its minimum contractual arrangements with European buyers - meaning there are no disruptions to Russian flows - and TTF prices continue to stay higher than Asian spot LNG prices, BNEF's base-case scenario projects that Europe* could end the summer injection season with gas storage levels reaching tank tops - 100% full*." The math seems reasonable based on those assumptions. The comment that "*in a situation where gas traders start to get comfortable with ….*" reminds of the comments on why most think the best time for Putin to try to squeeze Europe and cut off natural gas is this summer. Whereas we have said we thought the max play for Putin would be to keep delivering gas thru the summer. Let people get that comfort, and wait to see what winter is like and do the squeeze then. Because if they run out of gas in a normal winter, it is a crisis. As opposed to getting people to cut back on natural gas consumption in the summer. Regardless of when you think Putin should play his squeeze, it's worth going thru the BNEF summer call. Our Supplemental Documents package includes excerpts from the Global LNG Monthly report.

Figure 6: BNEF LNG Summer Outlook Summary



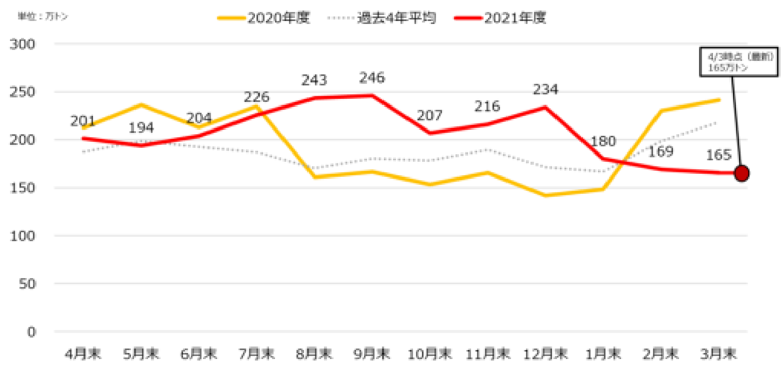
Source: BloomergNEF

Natural Gas – Japan's LNG stocks -18% YoY

Japan LNG stocks -18% YoY

The cooler March temperatures and the continued offline of some thermal coal plants following the earthquake have helped keep Japan's LNG stocks down YoY. Japan's METI weekly LNG stocks data was released on Wednesday morning local time [LINK]. LNG stocks at April 3 were ~79 bcf, which is -18% YoY and -13% vs the 4-yr average. Below is the LNG stocks graph from the METI weekly report.

Figure 7: Japan's LNG Stocks



Source: METI

Natural Gas – FT "Russia fears push Japanese gas importers to seek new suppliers"

Japan on Russian LNG imports

It sounds like there must be increasing pressure on Japan to cut out Russian LNG imports including from the Russian LNG imports that include Japanese companies. To date, Japan has resisted following the lead of Shell in saying they will get out of the Sakhalin LNG-2. But yesterday, the FT report "*Russia fears push Japanese gas importers to seek new suppliers*" [LINK] noted that Japanese companies are preparing contingency plans to tie up some near term LNG supply in case Japan decides to ban LNG imports from Russia. If Japan moves to ban Russia LNG imports, it would put Japan in the market for mre LNG this spring/summer. The FT wrote "*Japanese gas companies are preparing plans to source liquefied natural gas from Malaysia, Australia and the US in case of what they fear could be looming disruption of supply from LNG projects that Japan jointly developed with Russia. The contingency plans could put the world's third-largest economy in direct competition with Europe for global gas supplies, highlighting Japan's focus on meeting its own energy needs despite its desire to show solidarity with Russia's western neighbours. Japanese gas importers said that while some excess LNG cargos have been shipped to Europe since February, there was no prospect of major diversions from long-term contracts from producers such as Qatar because of Japan's energy security sensitivities. The Japanese power companies are concerned about the security of supplies from Russia, despite pledges by Tokyo not to pull out of the 10mn-tonnes-a-year Sakhalin-2 LNG project and other joint developments with Russia on Sakhalin island north of Japan. "In case of difficulties in procuring gas from Sakhalin, we are considering tapping our Malaysian suppliers to increase volume or to ask them to deliver supplies in advance," said Takayuki Yamane of Hiroshima Gas Co. The utility buys about 200,000 tonnes of its annual LNG from Sakhalin-2 in a contract that runs through March 2028."* Our Supplemental Documents package includes the FT report.

Natural Gas – China's ENN signs 3rd long term LNG buy deal in 2022

Another Asian long-term LNG deal

We continue to believe the best data point to show the sooner and larger LNG supply gap is the continued push by Asian LNG buyers to lock up long term LNG supply. We have been calling the LNG supply gap for a year now but we think it's even sooner and larger now with the western push to move away from Russian pipeline natural gas and pulling of capital from Russian LNG under construction LNG projects. On Thursday, we saw another Asian LNG buyers lock up long term LNG supply from North American LNG projects. NextDecade inked a 20-year sale and purchase agreement (SPA) with China's ENN on its 3rd deal of the year and its second deal with NextDecade [LINK]. The deliveries will come from NextDecade's Rio Grande LNG facility in Brownsville, Texas with 0.2 bcf/d of LNG indexed to the Henry Hub on a free board basis; deliveries are expected to begin in 2026. ENN stated *"We are pleased to announce this long-term LNG SPA with ENN, a premier Chinese energy company. As one of China's largest private companies, ENN is a major participant in China's energy market, and we look forward to a successful, long-term relationship with ENN," said Matt Schatzman, NextDecade's Chairman and Chief Executive Officer. "This SPA underscores the strength of NextDecade's differentiated offering. The commercial momentum at RGLNG is accelerating and we believe the company is well placed to benefit from the strengthening LNG market*." Our Supplemental Documents package includes the Next Decade release. [LINK]

Asian LNG buyers abruptly switched to long term LNG deals last July

Last week's (April 3, 2022) Energy Tidbits memo noted that Europe LNG buyers are 9 months behind Asian LNG buyers in locking up long term LNG supply. It was clear to many that there was a major change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog *"Multiple*

Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas."* Our Supplemental Documents package includes our July blog.

There have been 6.44 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two-week period. We continue to update that table, which now shows 6.44 bcf/d of long-term LNG deals since July 1, 2021. 83% of the deals have been by Asian LNG buyers, but we are now seeing rest of world long term deals post Russia/Ukraine. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021

Figure 8: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sept 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.20	20.0	2026	2026
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**5.55**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
March 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
March 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
March 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**0.89**			
Total New Long Term LNG Contracts since Jul/21				**6.44**			
*Excludes Asian short term/spot deals							
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period							

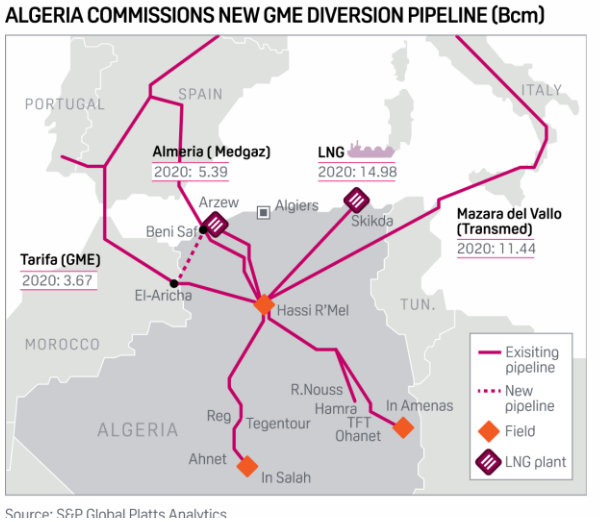
Source: Company reports, SAF Group

Natural Gas – Italy expected to lock up additional Algeria pipeline natural gas

Algeria and Italy natural gas deal

Yesterday, Bloomberg reported that Italy PM Draghi was travelling to Algeria tomorrow to sign a deal that would see additional Algeria pipeline natural gas to Italy. Bloomberg reported "*Algeria is set to boost its natural gas exports to Italy by almost 50% with a new deal due to be signed Monday, people familiar with the matter said. The export boost will probably lead Algeria to replace Russia as Italy's largest natural gas supplier. The north African country will boost its exports to Italy by 9 to 10 billion cubic meters per year by as early as the end of 2022, the people said, asking not to be named because the agreement isn't public. Italy received around 21 billion cubic meters of gas from Algeria in 2021, compared to around 29 billion cubic meters from Russia.*" We assume the gas will be via the Transmed pipeline, which we understand has sufficient unused capacity. Our Supplemental Documents package includes the Bloomberg report.

Figure 9: Algeria's export gas pipelines



Source: Platts

Natural Gas – Bavaria PM warns against Germany stopping Russia gas imports

Bavaria PM warns on natural gas

Germany must be under intense pressure to commit to stopping Russia natural gas imports in some timeline that is totally unacceptable for Germany because we keep seeing German leaders warn they can't quickly cut off Russia natural gas. The latest was earlier today, when Bavaria Prime Minister Soder jumped in with his warning. Bavaris is Germany's industrial centre for more than luxury cars. Some of Soder's reported comments were "*At the same time, Söder warned of an import stop for Russian gas. "Our country is on the threshold of social and economic overload," he said. "We have to be careful that middle society does not fall into a downward spiral. If we now stop gas from Russia overnight, we will experience mass unemployment, social decline and democratic upheaval."It is necessary to become independent from Russia when it comes to energy. But the key is the schedule. "Skid marks for Germany are completely acceptable, but it must not take us out of the curve," warned the CSU leader. "I share the German government's view that we can do without oil and coal from Russia in the short term. With gas it is much more difficult. We have to consider the consequences for the majority of the population."* It was interesting to see Soder also commented on fracking and nuclear. Soder reportedly wants to look at fracking to increase domestic oil and natural gas production, and that Germany's nuclear plant should continue to operate. Our Supplemental Documents package includes some of the German reporting on Soder's comments.

Germany says "endangering social peace" if cut off Russia natural gas

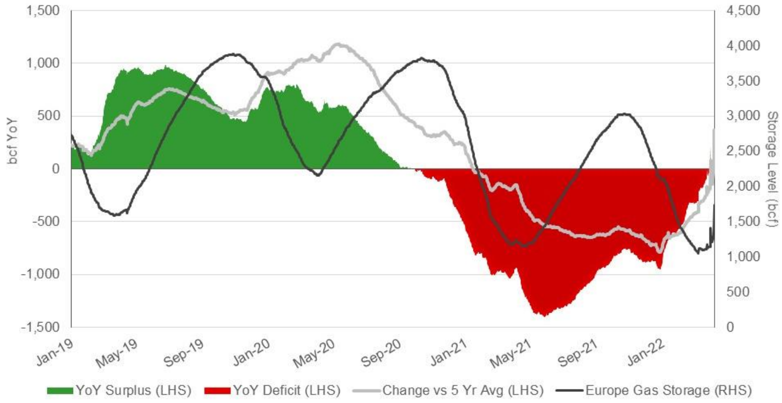
Soder's warnings aren't the first on what happens if there is an immediate shut down of Russia natural gas imports. Our March 6, 2022 Energy Tidbits highlighted comments from Germany's Economic Minister Habeck (from the Green party) on the same issue. At that time we wrote "Habeck made it clear that Germany cannot cut off Russia oil, natural gas and coal. Der Spiegel reported [LINK] "*At the same time, the Economics Minister made it clear that Germany does not support calls from other* *countries for a ban on the import of oil, gas or coal from Russia. "I would even speak out against it because we are endangering social peace in the republic," said Habeck. Germany is initially dependent on deliveries of oil, gas or coal. The dependency on Russia for energy that has built up in recent years cannot be ended in a few months, said the Green politician. "That's why we need and will keep open the possibility of energy supplies from Russia." This is needed to create price stability and energy security. However, work is being done to reduce dependency, for example by building up coal and gas reserves. In addition, efforts to save energy would have to be intensified, demanded Habeck. Coal-fired power plants that went offline would be held in reserve; The problem, however, is that they also need fuel. Energy prices are unlikely to remain as high as they are now, but: »It is very, very likely that we will have to expect higher prices."*

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

Natural Gas – Europe storage YoY deficit is now only 4.06% ie. 26.77% full vs 30.83%
Europe avoided natural gas shortages this winter with the combination of warmer weather, strong wind generation and a massive increase in US LNG imports. As a result, the YoY Europe storage gap continues to narrow since the start of the winter natural gas season. Europe gas storage started down 18.52% YoY and is now down to a YoY deficit of 3.75%. Draws to European gas storage units ended this week with the second observed build. It was a small injection but signals the beginning of the injection season as Europe exits the heating season. The YoY deficit is narrowing but, even still, Europe inventories are at their lowest level at this time of the year in more than a decade. Europe gas storage started last winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1/21. Europe storage levels bottomed in late Apr at 29%, which was the lowest level since Apr 2018. This winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has tightened since Nov 1. Despite the warm weather and US LNG, storage as of Apr 7 is still only at 26.77%, which is -4.06% less than last year levels of 30.83% and are -8.56% below the 5-year average of 35.33%. As winter draws come to an end we expect to see a decline in demand for LNG as less is used to heat homes as we enter the injection season. Below is our graph of Europe Gas Storage Level.

Europe storage now 26.77% full

Figure 10: Europe Gas Storage Level



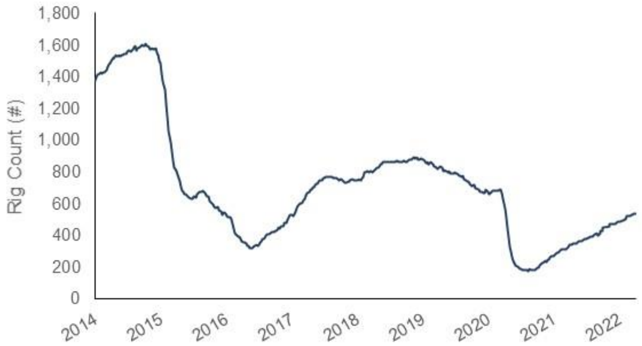
Source: Bloomberg
Prepared by SAF Group https://safgroup.ca/news-insights/

Oil – US oil rigs +13 WoW at 546 oil rigs at Apr 8

US oil rigs +13 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. We expected another increase given the ~$100/bbl WTI and producers have ramped up production with the elevated prices. There is still strong oil, NGLs and natural gas prices and industry has fresh 2022 capex budgets and is still just catching up in 2021 from an extremely low 2020 activity level. This week US oil rigs were +13 WoW at 546 oil rigs, with all major oil and gas basins up slightly. Oil rigs are +374 off the bottom of 172 in Aug14/2020 week. There were modest basin changes this week; Permian was up 9 at 331 rigs this week while Bakken was +11 at 33 rigs after increasing last week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 132 to 546 oil rigs (-12%). US gas rigs were +3 WoW though still higher than normal with increases in the Haynesville basin reflecting the heightened $4 HH. Below is our graph of US oil rigs since January 1, 2014.

Figure 11: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – US frac spreads +2 to 275 for week ended April 8

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for week ended April 8 on the Primary Vision network. YouTube video is at [LINK]. For the week ended April 8, US frac spreads at the high point in the week were +2 to 275. Note that Rossano did not post videos for the prior two weeks. The increase was primarily driven by the Permian. Rossano expects to get to 290 frac spreads by the end of April. Then "the last 10" should come in May to get to 300, and that is where he expects to see some of these disconnects ie. pipes/steel. Also are starting to see more spreads in the Anadarko, the Haynesville, East Texas remains very active. The continued demand for natural gas to feed US LNG exports will keep East Texas, Louisiana and the southern part of Oklahoma active. Eagle Ford has been showing paired increases in spreads and rigs so he doesn't expect to see a DUC build. But Permian should start to see a DUC build

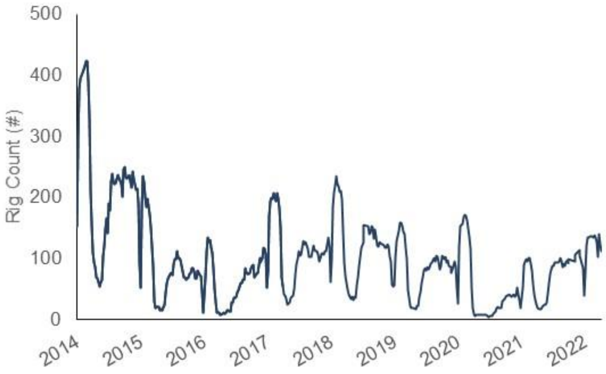
Frac spreads +2 to 275

Oil – Total Cdn rigs -13 to 111 total rigs, +53 rigs YoY

Total Cdn rigs were down -13 this week to 111 total rigs. Cdn oil rigs were -11 at 53 rigs. Cdn gas rigs were -2 at 58 gas rigs; attributed to the drilling season coming to an end; we expect the end of the declines in the coming weeks. But, as noted later in our comments on Precision, Cdn rigs are expected to be higher than normal during spring breakup. Total rigs are now +98 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 19 and Cdn gas rigs were 39 for a total Cdn rigs of 58, meaning total Cdn rigs are +53 YoY and total rigs are +45 vs 2019.

Cdn rigs -13 WoW

Figure 12: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production up +0.100 at 11.8 mmb/d

It was the second consecutive increase in production after 7 consecutive weeks of flat US weekly oil production, at 11.8 mmb/d for the week ended Apr 1. Lower 48 production drove total production and was up from last weeks level at 11.4 mmb/d this week, Alaska was also basically flat this week. US oil production is up YoY at +0.9 mmb/d from last year's production and is still down significantly at -1.3 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. Absent weather impacts, we would expect US oil production to remain relatively flat if not inch up a little higher in Q2/22 as the US exits the turnaround season.

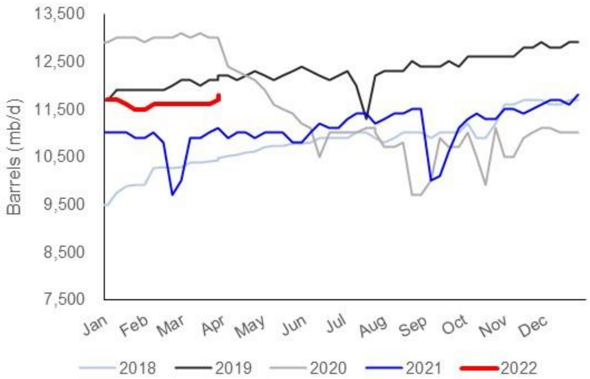
US oil production up WoW

Figure 13: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1 End Date	Week 1 Value	Week 2 End Date	Week 2 Value	Week 3 End Date	Week 3 Value	Week 4 End Date	Week 4 Value	Week 5 End Date	Week 5 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								

Source: EIA

Figure 14: US Weekly Oil Production



Source: EIA, SAF

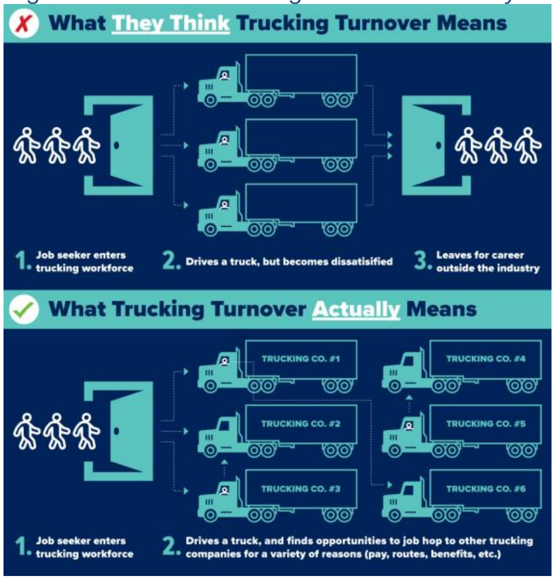
Oil – ATA warns that truck driver turnover is more a cost issue than losing drivers

Truck driving turnover

We don't know how much this applies to the oil/fuel tank truck drivers, but we have to believe there is some relevance. The American Trucking Association's March 25 blog "*The truth about trucking turnover"* [LINK]. The ATA, referencing a March 15 New York Times essay, writes "*the author also claims to have struck the nail on the head when it comes to driver turnover rates "For decades, truckers have quit at alarming rates, leading to a chronic shortage. The turnover rate was at a staggering 91 percent in 2019, which means that for every 100 people who signed up to drive, 91 walked out the door. Plenty of people have the commercial driver's licenses needed to operate trucks, said Michael Belzer, a Wayne State*

University economist who has studied the industry for 30 years. "None of them will work for these wages," he added". The ATA then reminds *"If 91% percent of truck drivers were quitting the industry within a year, our economy would have collapsed a long time ago*." Rather the ATA says the drivers moving around is because they are chasing higher pay in a tight market – it's job hopping to make more money. ATA writes "*Trucking is an extremely tight labor market, for cyclical and structural reasons. Drivers are in high demand today—a fact exacerbated by COVID. To attract and retain drivers, fleets must increase pay, which is now happening at extraordinary levels. We're witnessing unprecedented pay increases across the industry, with weekly driver earnings surging at a rate more than 5x their historical average—up more than 25% for long-haul, truckload drivers since the beginning of 2019. Fleets are also offering sizable, five-figure sign-on bonuses and full benefits as they all compete for the same limited pool of drivers. What does this mean for "turnover"? Driver A, who's been working for a fleet for only four months, knows he can jump to another carrier and get an immediate $15,000 sign-on bonus plus pay raise. Six months later, he can do the same thing again. This churn—or poaching, or whatever one wants to call it—is what inflates turnover in a tight labor market."* Our Supplemental Documents package includes the ATA blog.

Figure 15: What Trucking Turnover Actually Means



Source: American Trucking Association

Oil – Is Suncor's Base Mine expansion the 1st victim of Emissions Reduction Plan?

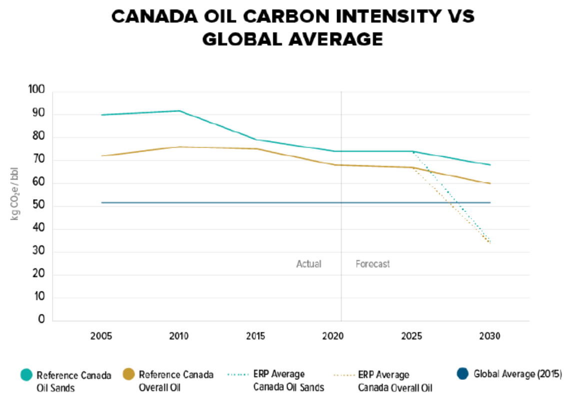
Guilbeault warns Suncor

After seeing the Canadian Press report "*'May not align:' Guilbeault pens letter to Suncor over oilsands mine expansion GHGs*" [LINK], we tweeted [LINK] "*Is #Guilbeault warning #Suncor's expansion will be 1st casualty of Liberals #EmissionsReductionPlan's still to be disclosed targets for emissions reductions for 2025 so #Oil #NatGas #OilSands sector is on track to hit 2030 targets? Thx @row1960 #OOTT.* " We did not see the letter, but the CP reporting of the Liberals Environment Minister Guilbeault's quotes seem to clearly point to his opinion that Suncor's mine will not fit within the still to be disclosed hard emissions reductions targets for the oil and gas sector for 2025 so that the oil and gas sector can be on track for the 2030 emissions reduction target set by the Liberals. This has been our big fear – the Liberals are setting hard targets for 2025 so that it will require immediate actions in 2022. This looks to be one such immediate action. And remember, these 2025 targets were not released in the Liberals Emissions Reduction Plan and are still to be disclosed. CP wrote "*Federal Environment Minister Steven Guilbeault has warned Canada's biggest oilsands producer that its planned mine expansion may not meet climate targets. In a letter released Wednesday to Mark Little, the head of Suncor Energy Inc., Guilbeault says the greenhouse gases that would be released by the company's proposed Base Mine expansion in northern Alberta may conflict with the government's carbon-reduction goals. "Emissions at this level may not align with the pace and scale of emissions reductions required to achieve our targets," the letter says. "I am of the opinion that the project, as currently proposed, would likely cause unacceptable environmental effects within federal jurisdiction." Guilbeault also said the government is reviewing how fossil fuel projects are evaluated against each other. "The government will develop guidance for how oil production projects subject to review ... should demonstrate that their emissions will be 'best in class,'" his letter says."* Our Supplemental Documents package includes the CP report.

Liberals Emissions Reduction Plan was released on March 29

Here is what we wrote in our April 3, 2022 Energy Tidbits memo on the Liberals Emissions Reduction Plan. Note point (iv) that reminded the Liberals did not release the specific hard target for emissions reductions by the oil and gas sector by 2025 to ensure they are on track to hit 2030 targets. Last week, we wrote "*We are surprised that we didn't see outrage from the oil and gas sector after the Liberals released the 2030 Emissions Reduction Plan on Tuesday, the 271-page report is found at: [LINK]. The plan sets up the oil and gas sector for failure. (i) Our comments are based on the 271-pg report and not just the press release. (ii) There is still bad news to come as the plan specifically doesn't include key details. (iii) No details on what is being eliminated in the Liberals statement of eliminating subsidies for fossil fuel. Pg 53. Note this is for 2023. If this is like Biden's elimination of fossil fuels, this would hit things like CDE and much more. We suspect that people just didn't read the Biden Greenbook. It just seems like the same angle on "subsidies" for fossil fuels. "Eliminating subsidies for fossil fuel. The Government has committed to eliminating inefficient fossil fuel subsidies, and developing a plan to phase-out public financing for the fossil fuel sector, including by federal Crown corporations." Pg 102 "..Canada recently accelerated this commitment from 2025 to 2023". (iv) We were disappointed to see that the Liberals announcement on its new emissions reduction plan did not, as expected, include the hard targets for emissions reduction for the oil and gas sector. We are still waiting for the targets for 2025. Pg 8, No change to the big picture target of oil and gas reductions, but still haven't defined the specific 2025 target. "The Plan presents modelling of the most economically efficient pathway to meeting Canada's 2030 target. Drawing on that modelling, the Plan includes a projected contribution from the oil and gas sector of emission reductions to 31% below 2005 levels in 2030 (or to 42% below 2019 levels). This will guide the Government of Canada's work with industry, provinces, Indigenous partners, and civil society to define and implement the cap on oil and gas sector emissions. Following consultations, the cap will be designed to lower emissions at a pace and scale* *needed to achieve net-zero by 2050." (v) Our concern remains that the Liberals are setting a 2025 hard target that keeps the oil and gas sector on track for the massive cut by 2030. Pg 50. Note this below graph on where it has to go. As noted on page 8 above, they haven't defined the exact dotted lines from 2022 to 2030, but they have set the end point in 2030. There is massive cutting required. (vi) Reminder there are checks in 2023 to make sure the oil and gas sector is on track to meet 2025 and 2030 emissions reduction targets. Pg 7. There are progress checks so they can take more actions if behind the timelines. "Progress under the plan will be reviewed in progress reports produced in 2023, 2025, and 2027. Additional targets and plans will be developed for 2035 through to 2050". (vii) Looks like the Liberals are setting up the oil and gas sector for failure and to be a bigger villain. The Liberals will be setting emissions reduction targets that rely upon items beyond proven reduction actions to hit targets including targets in 2025. They are basically setting up impossible to achieve targets. On Tuesday, it appears that most were commenting based on the short press release and not the 271-pg report. It's why we tweeted [LINK] "Hmmm! One of the tidbits in 271-pg Liberals 2030 Emissions Reduction Plan. pg 197, #Oil #NatGas sector will need to develop new actions beyond existing proven solutions to meet still to be defined targets, even to meet 2025 & 2026 reduction targets. #OOTT" and [LINK] "Is #Trudeau #EmissionsReductionPlan setting up #Oil #NatGas #OilSands for failure and be the fall guy? See pg 197, how can they hit targets if Liberals plan says will need new actions/inventions beyond existing proven solutions to meet targets including 2025/26 targets?" Pg 197. For anyone who thinks the emission reduction targets for oil and gas will be not too hard to attain, they should read this item. They are signaling their targets, even for 2025 and 2026, will be based on technologies, etc that aren't identifiable today to generate these targeted reductions. "Drive new and more ambitious actions. Targets for the oil and gas sector should be ambitious and require new actions that go beyond what is already contemplated using existing proven solutions. Regulatory targets drive innovation. Targets should lead to a scale of emissions reductions that would not otherwise have occurred. At the same time, targets must be realistic and credible, while pushing the sector to go further than it would otherwise. Targets should result in visible leadership, innovation in technology and business models, and new investments. It is acceptable to set emissions reduction targets in the future for which there is not currently complete certainty on how to attain the target. The further away the target is (e.g., 2030 versus 2025 or 2026), the more this principle applies." (viii) Pg 52. Oil and gas companies can afford it. Trudeau made this same comment in his speech. "Canada's oil and gas industry is currently generating record cash flow. If deployed strategically, these funds could enhance carbon competiveness and enable the sector to do its fair share in contributing to the country's climate goals." (ix) Pg 53: Note the "intent". "The intent of the cap is not to bring reductions in production that are not driven by declines in global demand. " Linked to this is Pg 196 "… While the International Energy Agency (IEA) has forecasted that global demand for oil and gas over the next 5 years will decline". They linked to the IEA forecast, which does not show this. Rather, the linked IEA forecast Here is the table from the linked IEA oil demand forecast is 99.4 mmb/d in 2022, 101.2 mmb/d in 2023, 102.3 mmb/d in 2024, 103.2 mmb/d in 2025 and 104.1 mmb/d in 2026. Our Supplemental Documents package includes excerpts from the plan.*

Figure 16: Canada's Oil Carbon Intensity vs Global Average



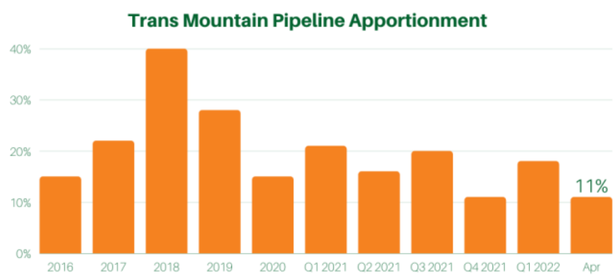
Source: Government of Canada

Oil – Trans Mountain apportioned by 11% for Apr

Trans Mountain apportionment

On Tuesday [LINK], Trans Mountain released an update on its capacity for the month of April. Total system nominations are apportioned by 11% for April, meaning 11% 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 1010. 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.

Figure 17: Trans Mountain Pipeline Apportionment



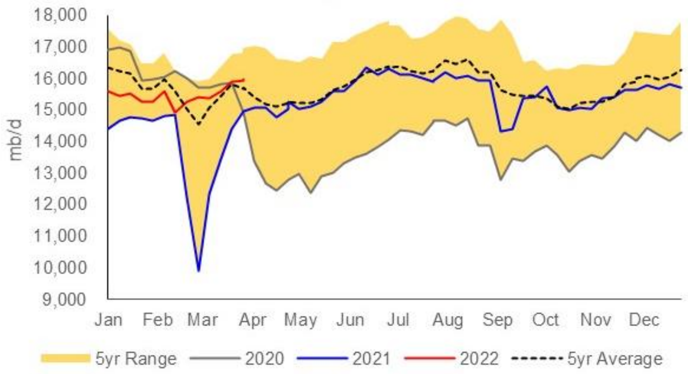
Source: Trans Mountain Pipeline

Oil – Refinery inputs +0.035 mmb/d WoW at 15.948 mmb/d

Refinery inputs +0.035 mmb/d WoW

The EIA crude oil input to refinery data is for the week ended Apr 1. We are in the normal seasonal period that sees increasing refinery inputs as refineries come out of seasonal turnarounds to crank up summer fuels. US refineries have also been impacted by unplanned outage that have been impacting crude oil inputs. This week, the EIA reported crude oil inputs at refineries, up 0.035 mmb/d this week to 15.948 mmb/d for the week ended Apr 1 and are +0.904 mmb/d YoY from last years February Freeze in the Permian. Refinery utilization was up at 92.5%, which is +8.5% YoY though is still below 5-year average utilization levels. Total products supplied (i.e., demand) decreased WoW, down 0.059 mmb/d to 19.815 mmb/d. Motor gasoline was up 0.063mmb/d at 8.562 mmb/d from 8.499 mmb/d last week. Gasoline supplied, a proxy for demand, was up last week. Gasoline stockpiles are at their lowest levels with demand for gasoline at a 4-week high. The four-week average of production supplied decreased to 20.366 mmb/d, up from last year..

Figure 18: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – US "net" oil imports up +0.644 mmb/d WoW at 2.607 mmb/d

US "net" oil imports down WoW

US "NET" imports were down +0.664 mmb/d to 2.607 mmb/d for the Apr 1 week. US imports were up +0.041 mmb/d to 6.300 mmb/d. US exports were down 0.705 mmb/d to 3.693 mmb/d. The WoW increase in US oil imports was driven by US's Top 10 imports by country were down by 0.340 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was up this week by +0.311 mmb/d to 3.923 mmb/d, which is now ~0.1 mmb/d above the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was up 240,000 b/d to 0.573 mmb/d this week. (iii) Colombia was down 0.068 mmb/d to 0.216 mmb/d. (iv) Ecuador was down -0.02 at 0.076 mmb/d. (v) Iraq was down 11,000 b/d to 71,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico was down by 112,000 b/d to 0.619 mmb/d.

Figure 19: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Jan 21/22	Jan 28/22	Feb 4/22	Feb 11/22	Feb 18/22	Feb 25/22	Mar 4/22	Mar 11/22	Mar 18/22	Mar 25/22	Apr 1/22	WoW
Canada	3,752	3,953	3,631	3,342	3,869	3,630	3,731	3,398	3,806	3,612	3,923	311
Saudi Arabia	596	613	383	250	358	520	701	562	534	333	573	240
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	321	383	958	510	768	497	412	645	641	731	619	-112
Colombia	143	286	258	234	332	144	71	279	72	284	216	-68
Iraq	133	412	226	225	285	295	188	161	489	82	71	-11
Ecuador	0	236	101	98	98	0	160	205	103	96	76	-20
Nigeria	43	9	144	182	25	43	96	0	2	148	148	0
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	4,988	5,892	5,701	4,841	5,735	5,129	5,359	5,250	5,647	5,286	5,626	340
Others	1,248	1,193	688	949	1,093	638	960	1,145	839	973	674	-299
Total US	6,236	7,085	6,389	5,790	6,828	5,767	6,319	6,395	6,486	6,259	6,300	41

Source: EIA, SAF

Oil – Baker Hughes International rigs +2 MoM to 815 rigs in March

International rigs +2 MoM

Baker Hughes posted its monthly update to international rigs on last Friday. International rigs would be showing an expected increase if not for Russia invading Ukraine. There was a marginal increase in international rig counts after a larger decline over February. There continues to be some seasonality within the data, but there as also a large decline in rigs in Ukraine, as the war continues to impact production in Europe. As expected, post the invasion, Ukraine rigs dropped from 39 in Jan to 31 in Feb, they are down -23 in Mar at 8 rigs. International activity had been increasing with stronger oil and gas prices though the turnaround season typically begins at the end of Feb and the Russian invasion of Ukraine damped European drilling. March is up +14% YoY from 715, but still down 23% vs March 2020 at 1,058. Total international rigs increased by +2 MoM to 815 in March. The YoY rig count is as followed: Asia-Pacific -3, Africa +6, Europe -24, Latin America +7, and the Middle East +16. The rig count in Latin America was driven by +4 oil rig decrease in Colombia after a decline last month; Argentina was -1 MoM but up +11 YoY from Mar 2021. Brazil was +2 oil rigs MoM and +5 rigs YoY at 14 rigs and are focused in offshore operations. Saudi Arabia increased by +7 rigs MoM and +14 YoY, driving growth while Iraq and Egypt were up +13 and +10 rigs YoY respectively. Indonesia was up +8 rigs YoY in March while the rest of Asia pacific relatively flat YoY with the exception n Australia at +5 rigs YoY. Below is our graph of international rigs by region and avg monthly Brent price.

Figure 20: Baker Hughes International Rig Count and Brent Price

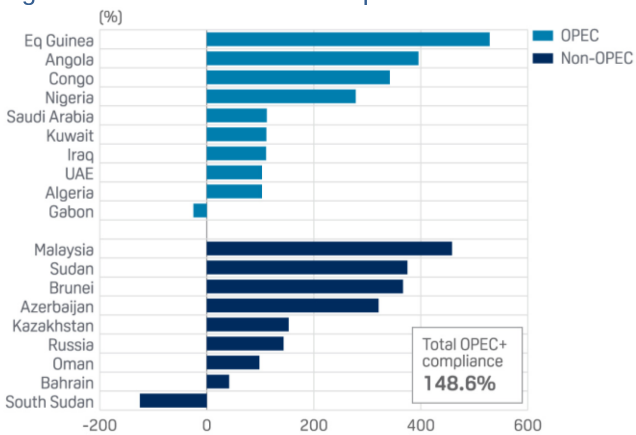
Source: Baker Hughes, Bloomberg

Oil – Platts survey, OPEC+ crude production -100,000 b/d MoM as sanctions hit Russia

Platts: OPEC+ down 0.1 mmb/d in March

On Thursday, Platts released its survey of OPEC+ production for March [LINK] that show the start of the action against Russia for its invasion of Ukraine is having an impact on non-OPEC countries while OPEC countries increased production less than the scheduled quota increase. Platts survey noted that, for March, OPEC production was up 60,000 b/d to 28.73 mmb/d whereas non-OPEC was down by 160,000 b/d to 13.91 mmb/d. This is net decline of 100,000 b/d has widened the gap between OPEC+ production and quotas have jumped to a record 1.24 mmb/d. The MoM drop was the first since February 2021, when Saudi Arabia instituted a unilateral voluntary 1 mmb/d cut to help prop up the market that at the time was still wobbly from resurgent coronavirus cases. Saudi Arabia is one of the only OPEC+ countries believed to have any significant spare capacity but kept its production steady in March at 10.25 mmb/d. Non-OPEC leader Russia, hit by western sanctions targeting its financial sector, saw its crude production fall to 10.04 million b/d. Iraq and Venezuela saw the largest rise in production with Iraq up at 4.34 mmb/d vs a quota of 4.37 mmb/d and Venezuela posting a 40,000 b/d increase in March. Below is a Platts chart showing OPEC+ March quota compliance. Our Supplemental Documents package includes the S&P Global Platts article.

Figure 21: OPEC+ March Compliance



Source: S&P Global Platts

Oil – Nigeria says "most" OPEC countries do not have any spare capacity

Nigeria says lack of OPEC+ spare capacity

On Friday, we tweeted [LINK] "*Nigeria states the obvious, "most" #OPEC members do not have spare ready capacity. still think the real question is how much sustainable, not temporary burst, spare #Oil capacity is there in Saudi and UAE? #OOTT*". Anadolu Agency (Turkish news) reported on comments from Nigeria's state minister for petroleum resources, Timipre Marlin Sylva. AA reported "*"It is not something that you can open a tap for at this point. You must have the additional capacity, the idle capacity to bring on, but it takes a lot of work and a lot of investment for it to have additional production," Timipre Marlin Sylva told Anadolu Agency. "If there is anything we can do to produce more, OPEC will be the first to produce more. But unfortunately, this capacity doesn't exist in most OPEC countries," he said."* As we put in our tweet, all he was doing was stating what everyone assumes – almost all of OPEC+ countries do not have any spare capacity. Our tweet also stated the key question for oil markets is how much sustainable, not temporary burst, oil production capacity is there in Saudi Arabia and UAE? Our Supplemental Documents package includes the Anadolu Agency report. [LINK]

Oil – Russian oil output drops most in 2 years in early April

Russia's oil production down this week

We expect to see an increasing hit on Russia's near term oil production as Russia strives to find ways to move its oil production in the face of the international shunning of Russian oil and near term declines in Russian refinery runs. On Thursday, Bloomberg reported the biggest early drop in Russia oil production in the last two years.[LINK] If the reduction is maintained for the entire month, it would result in a decline of 500,000 b/d from March, which would be the most profound decline since OPC+ agreed to production cuts at the outset of the pandemic. Russia averaged production of 10.52 mmb/d from April 1-6 according to data from the Energy Ministry's CDU-TEK unit, a 4.5% reduction from March's average production of 11.01 mmb/d. Sanctions have become tougher in recent days, with the European Union planning to ban coal imports from the country. Only a few countries, including the U.S. and the U.K., have explicitly banned purchases of Russian oil and petroleum products. Some other traditional buyers are shunning the fuel, while others, notably in Asia, continue to purchase the country's energy supplies. Russia's domestic energy demand have declined as uncertainties over the countries economic growth continue to arise. Our Supplemental Documents package includes the Bloomberg report.

Oil – US's Yellen sees "skyrocketing" oil prices if a complete ban on Russia oil

Yellen "skyrocketing" oil prices potential

On Wednesday, Treasury Secretary Yellen appeared before House Financial Services Committee. [LINK] No surprise, she was asked about Russia and if they had looked at the impact of the sanctions including the impact of full sanctions on all of Russia oil. We created a transcript of her reply at the 2:24:30 min mark and tweeted [LINK] "*Yellen "the issue with blocking oil exports from Russia is that many countries, especially in Europe, are very dependent on that oil. And we're likely to see skyrocketing prices if we did put a complete ban on oil. And as I said at the outset, our concern has been in designing sanctions. we want to impose the maximum pain we can on Russia. But also taking care not to impose undue pain on Americans, or on our partners."* The full answer from Yellen was "*the issue with blocking oil exports from Russia is that many countries, especially in Europe, are very dependent on that oil. And we're likely to see skyrocketing prices if we did put a complete ban on oil. And as I said at the outset, our concern has been in designing sanctions. we want to impose the maximum pain we can on Russia. But also taking care not to impose undue pain on Americans, or on our partners."* We also tweeted [LINK] "#Yellen 2:27:30 mark *"the demand for oil is highly inelastic in the short run. And so too large a restriction on supply could have very large price effects and that's what we're trying to balance." Hmm!, did she bring this up 2 mths ago*?" In watching the video, it seemed like the Administration, at least Yellen, expected to see oil prices respond like they have, but that isn't what has seemed to be the impression as oil prices moved up with the sanctions.

Oil – Biden still showing he doesn't want to walk away without a JCPOA

Biden still wants to get a JCPOA

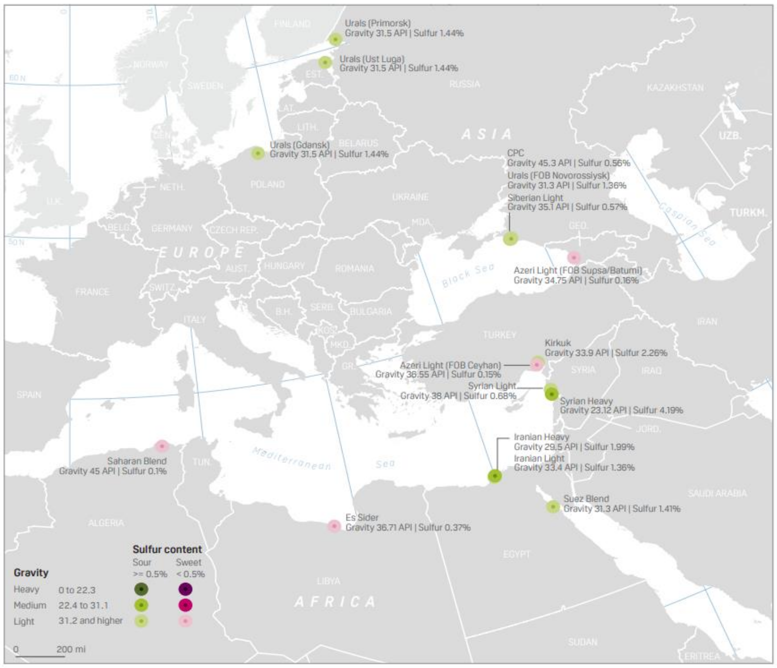
We thought there was another good indicator that Biden really doesn't want to give up on one of his big goals – to get a new JCPOA. (i) On Thursday, General Milley (Chairman of the Joint Chiefs of Staff) testified before the Senate Armed Service Committee. Rep Senator Sullivan (Alaska) asked "*The IRGC has recently been responsible for missile attacks in* *coordination with the Houthis against UAE civilians, our longstanding ally in the region, UAE. Is there any universe in which the two of you could say you support the delisting of this terrorist organization with blood of American soldiers on its hands recently and de-list them as the state sponsor of terrorism because Iran wants it?"* Tilley replied "*So in my personal opinion, I believe the IRGC-Quds Force to be a terrorist organization and I do not support them being delisted from the foreign terrorist organization."* (ii) At the US State Dept daily briefing, Jalina Porter (Principal Deputy Spokesperson) was asked "*One follow-up for you on Iran. Can you say whether the Biden administration shares General Milley's view that the IRGC's Qods Force specifically should remain on the U.S. list of terror organizations?"* Porter replied "T*hanks, Elizabeth. I'd say that the President shares the chairman's view that IRGC Qods Forces are terrorists, and beyond that we aren't going to comment on any of the topics in the nuclear talks. But what I would say is out of the 107 Biden administration designations in relation to Iran, 86 have specifically targeted the IRGC-related persons as well as affiliates."* (iii) We don't recall ever seeing the US split the terrorist designation to only the Quds portion of the IRGC and not the IRGC overall. And we interpret this as Biden trying to find a way to get Iran onside while being able to say at home that he still calls the IRGC, or at least part of it, as terrorists. And is indicative of him trying to do all he can to not walk away without a JCPOA. On Friday, we tweeted [LINK] ""*I'd say that the President shares the chairman's view that IRGC Qods Forces are terrorists" says US State Dept. Is #Biden's narrowing terrorist designation to Quds part of IRGC a trial balloon for Iran, US or both? Reinforces #Biden doesn't want to give up on #JCPOA. #OOTT."* Our Supplemental Documents package includes the Sullivan/Milley exchange, excerpts from the State Dept Friday briefing, and Wikipedia's summary of the IRGC Quds.

Oil – Iran's oil would be a good crude quality replacement for Urals crude to Europe

Iran oil similar to Russia Urals

On Wednesday, we tweeted [LINK] on a good reminder from the Gulf Intelligence daily Podcast [LINK] that Iran's crude oil quality would be a good replacement for Russian Urals crude oil to Europe. We tweeted *"#JCPOA. Good reminder from @gulf_intel podcast. Matt Stanley @starfuels reminds Iran light matches API and H2S very well and is a good substitute RUS Urals. See below @SPGlobalPlatts crude specs map. #OOTT".* Our tweet included the below Platts map that noted crude qualities for Russia were Urals (Primorsk) 31.5 API 1.44% H2S, Urals (Ust Luga) 31.5 API 1.44% H2S, and Urals Gdansk 31.5 API 1.44% H2S, which compares to Iranian Light 33.4 API 1.36% H2S.

Figure 22: Platts Specifications Guide Europe and Africa Crude Oil



Source: S&P Global Platts

Source: Platts

Oil – Eastern Libya military leaders urge Haftar to shut down Libya oil exports

Haftar urged to shut down Libya oil exports

It looks like one of the oil news stories for Monday will be Libya. Last night, we tweeted [LINK] "*Positive for #Oil prices with risk to Libya oil exports. Libya unity looking like a fantasy. @Lyobserver says eastern military leaders leaving 5+5 & urge Haftar to stop oil exports, close key road, etc. Libya loaded ~1 mmbd in March. #OOTT* ". We have to wonder if we are about to go back to a split in Libya and oil supply interruptions. Yesterday, Tripoli based and pro Western Libya, Libya Observer, reported [LINK] "*Haftar's representatives in JMC 5 + 5 call for closing oil, coastal road and cutting cooperation with GNU Representatives of warlord Khalifa Haftar in the Joint Military Commission 5+5 (JMC) have advised him to stop oil exports, close the coastal road linking the eastern region with the western region, suspend flights between both regions, and stop all aspects of cooperation with the Government of National Unity (GNU). The representatives have also suspended their participation in UN-brokered JMC talks. In a statement issued on Saturday, they claimed that "the Prime Minister of the GNU, Abdel Hamid Dbeibah, had practised behaviours that are contrary to the political agreement and a flagrant violation of human rights in accordance with international and national standards".* Our tweet referenced Libya loadings at ~1 mmb/d in March, which was from Bloomberg's tanker tracking.

Oil – IEA releases individual country commitments for the latest 60 mmb reserves release

IEA details SPR release

On Thursday the IEA posted a release showing the individual member country commitments on the previously announced release of 60 mmb. [LINK]. The release included a table listing each country's commitment. The original announcement was April 1. The IEA noted "*The unprecedented decision to launch two emergency oil stock releases just a month apart, and on a scale larger than anything before in the IEA's history, reflects the determination of member countries to protect the global economy from the social and economic impacts of an oil shock following Russia's aggression against Ukraine," said IEA Executive Director Fatih Birol. "This latest collective action once again demonstrates the unity of IEA member countries in their solidarity with Ukraine and their determination to provide stability to the oil market during this challenging time. Events in Ukraine are becoming more distressing by the day, and action by the IEA at this time is needed to relieve some of the strains in energy markets."* Prior to the Russian invasion IEA members held collectively 1.54 bnb in reserves; Over the next six months, around 240 million barrels of emergency oil stocks, the equivalent of 1 mmb/d. The DOE will contribute 50% or 60 mmb to the coordinated release, which will include some sweet crude oil this time. Japan will be contributing 15 mmb to the collective release. We noted the first extraordinary release by OECD member countries after a March 1 meeting in our March 6 Energy Tidbits, that saw the collective release of 62.7 mmb; the two collective releases account for 9% of total emergency reserves. Below is table depicting the contribution of OECD member countries to the release. Our Supplemental Documents package includes the IEA release.

Figure 23: OECD 2nd Collective SPR Release Contributions by Country

Country	kb
Australia	1 608
Estonia	74
Finland	369
France	6 047
Germany	6 480
Greece	624
Hungary	531
Ireland	451
Italy	5 000
Japan	15 000
Korea	7 230
Lithuania	180
Netherlands	1 600
New Zealand	483
Poland	2 298
Spain	4 000
Turkey	3 060
United Kingdom	4 408
United States	60 559
Total IEA	**120 000**

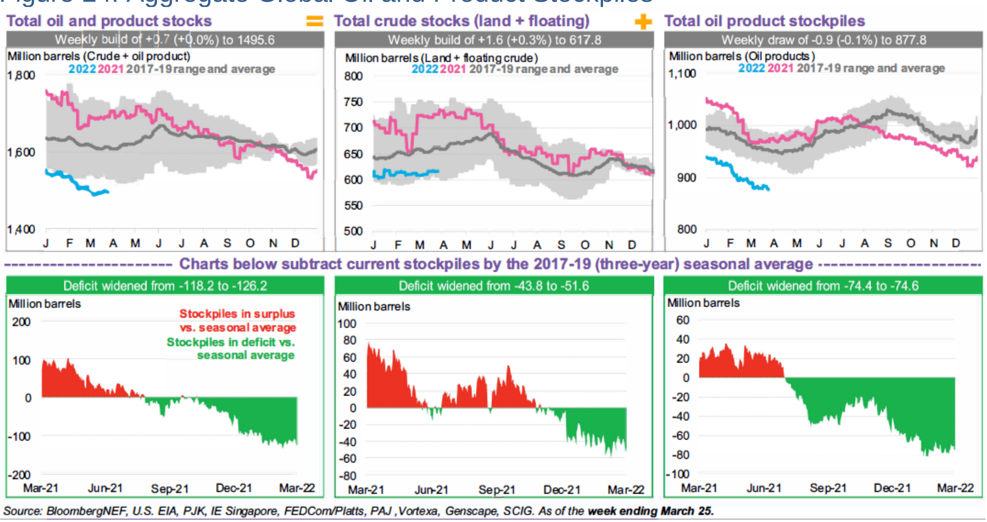
Source: IEA

Oil – BloombergNEF: Global oil inventories continue to show big deficit

BNEF's global oil inventories

For those with a Bloomberg terminal we recommend flipping thru BloombergNEF's "Oil Price Indicators" weekly that comes out on Mondays as it provides good charts depicting near-term global oil demand and supply indicators. The key data this week is the outlook for global oil and products stocks which delivers a bullish outlook at the widening of the deficit relative to the 2017-2019 average. It is also important to note that most indicators outside of Asia are positive. The deficit for crude and product narrowing from 118.2 mmb to 126.2 mmb compared to the 2017-2019 average. For the week ended Mar 25, land crude oil storage in tracked regions were basically flat WoW at 525.1 mmb. The stockpile deficit against the 5 yr average (2015-2019) widened from 84.2 mmb to 85.1 mmb. Total crude inventories increased by 1.2% to 617.8 mmb, including global floating inventories. Product stocks were down 0.7% WoW with the stockpile deficit against the 3-year average widening from 74.4 mmb to 74.6 mmb. Gas oil and middle distillate stocks have narrowed against their three-year average deficit (2017-2019) of 41.2 mmb to 39.1 mmb. Jet fuel consumption by international departures increased by 185,900 b/d WoW while consumption by domestic passenger departures declined by 63,700 b/d, a consecutive week of declines. Global mobility indices were mixed over the week after a decline last week with declines in the Americas and Asia Pacific. The high frequency oil and product stockpile deficit against the three-year seasonal average (2017-2019) suggests the stockpile deficit has widened to near the post pandemic record set three weeks ago. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the Bloomberg report.

Figure 24: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Oil – Vortexa crude oil floating storage 87.30 mmb as of April 8, +1.33 mmb WoW

Vortexa crude oil floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of Noon MT yesterday. And we note that these estimates get revised over the course of the week. Note we do not check daily for the revisions, so our comments are compared to the April 1 and March 25 posted on Bloomberg on April 2 at 1pm MT. (i) As of Noon MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate as of

April 8 was 87.30 mmb, which was +1.33 mmb WoW vs revised down April 1 of 85.97 mm. Note April 1 was revised -3.53 mmb from the Bloomberg estimate of 89.50 mmb posted as of 1pm MT on April 2. (ii) The weekly storage fits the general trend over the past few months with crude oil floating storage generally being around the 90 to 95 mmb range. (iii) There were revisions to the prior two week's estimates. Today's April 1 estimate of 85.97 mmb was revised -3.53 mmb from the Bloomberg estimate of 89.50 mmb posted as of 1pm MT on April 2. Today's March 25 estimate of 89.58 mmb was revised -0.61 mmb from the Bloomberg estimate of 90.19 mmb posted as of 1m MT on April 2. (iv) April 8 estimate of 87.30 mmb is -135.97 mmb vs June 26, 2020 peak of 223.28 mmb. (v) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in late March/early April as Covid started to have a huge impact. April 8 estimate of 87.30 mmb is +40.21 mmb vs pre-Covid of 47.09 mmb as of April 8, 2019. Note April 10, 2020 of 92.38 mmb had started the ramp up vs 63.50 mmb on March 27. (vi) Below are the last several weeks' estimates made as of yesterday at Noon MT, Apr 2 at 1pm MT, and March 26 at 1pm MT.

Figure 25: Vortexa Floating Storage as of April 8 Posted on Bloomberg Noon MT Sat

Source: Bloomberg, Vortexa

Figure 26: Vortexa Estimates Apr 9 noon MT, Apr 2 1pm MT, and Mar 26 1pm MT

Est as of Apr 9, noon MT

FZWWFST VTXA Inde

04/06/2019 - 04/08/2022

1D 3D 1M 6M YTD 1Y

	Date	FZWWFST V... Mid Px
Fr	04/08/2022	87295
Fr	04/01/2022	85965
Fr	03/25/2022	89581
Fr	03/18/2022	91542
Fr	03/11/2022	93402
Fr	03/04/2022	92397
Fr	02/25/2022	92181
Fr	02/18/2022	84472
Fr	02/11/2022	97403
Fr	02/04/2022	98271
Fr	01/28/2022	93433

Est as of Apr 2, 1pm MT

FZWWFST VTXA Inde

03/31/2019 - 04/01/2022

1D 3D 1M 6M YTD 1Y

	Date	FZWWFST V... Mid Px
Fr	04/01/2022	89501
Fr	03/25/2022	90194
Fr	03/18/2022	96062
Fr	03/11/2022	90367
Fr	03/04/2022	96009
Fr	02/25/2022	94149
Fr	02/18/2022	85687
Fr	02/11/2022	99352
Fr	02/04/2022	100.9k
Fr	01/28/2022	95887
Fr	01/21/2022	98802

Est as of Mar 26, 1pm MT

FZWWFST VTXA Inde

03/24/2020 - 03/25/2022

1D 3D 1M 6M YTD 1Y

	Date	FZWWFST V... Mid Px
Fr	03/25/2022	91443
Fr	03/18/2022	95618
Fr	03/11/2022	89990
Fr	03/04/2022	96966
Fr	02/25/2022	93293
Fr	02/18/2022	85019
Fr	02/11/2022	97292
Fr	02/04/2022	98869
Fr	01/28/2022	94032
Fr	01/21/2022	98387
Fr	01/14/2022	84689

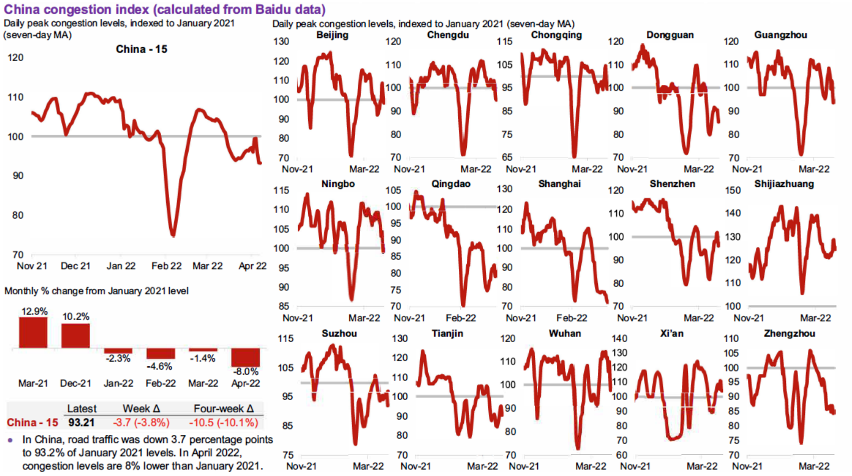
Source: Bloomberg, Vortexa

Oil – Covid drives "sudden drop in congestion in China"

BNEF global road traffic indicators

Hopefully, yesterday's reports of On Thursday, BloombergNEF posted "*Covid-19 Indicators: Global Road Traffic*". This is a good recap of global driving demand indicators by region. BloombergNEF did warn "*Sudden drop in congestion in China*" as they look forward, but the reality is that the road congestion levels fluctuate with Covid-19. China saw an a significant decline in congestion evels as the country endures another wave of lockdowns from the rising number of covid cases. BloombergNEF wrote "I*n China, road traffic was down 3.7 percentage points to 93.2% of January 2021 levels. In April 2022, congestion levels are 8% lower than January 2021."* Bloomberg had no commentary on congestion levels in the Americas but oil demand indicators indicate that it has been steadily returning as more and more lockdown measures are lifted in around the world. Below is a chart depicting the drop in congestion across China. Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 27: China Congestion Drops Across Major Centres



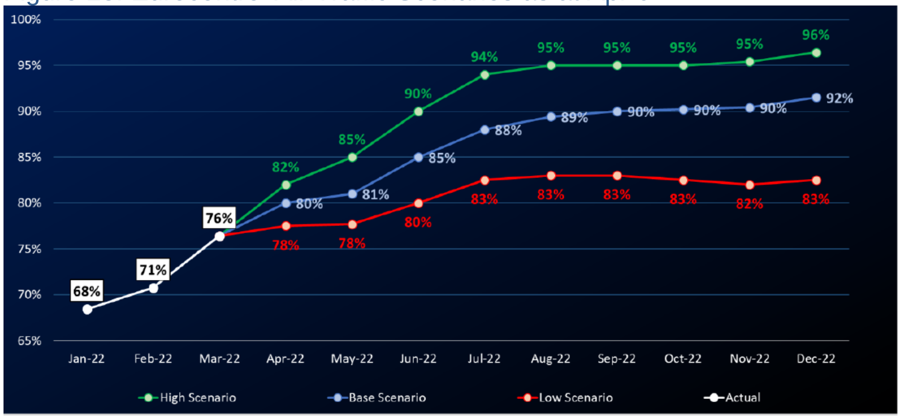
Source: BloombergNEF

Oil – Eurocontrol sees air travel to return to 92% of pre-pandemic in 2022

The global air travel continues to unfold with the US and Europe recovering and China being hit by Covid. On Wednesday, Eurocontrol posted its updated outlook for 2022, which calls for continued modest growth throughout the year. [LINK] The latest Eurocontrol traffic scenarios predict steady growth between April and peak summer, reaching 89% of 2019 traffic by August in their base scenario, and slowly rising to 92% of 2019 levels by Dec 2022. The release noted *"Aviation has continued to recover well over the last few weeks, and there has been a steady climb from 68% in January rising to 79% by the start of April compared to 2019 levels, even factoring in the impact on the network and on fuel prices of the unprovoked aggression by Russia against Ukraine. Airlines are adding lots of capacity, and some airlines are already outperforming their pre-pandemic levels. People are showing that they are really keen to fly – many for the first time since before the pandemic began. Hitting 90% or more of 2019 traffic at peak summer moments is firmly on the cards, and we expect holiday destinations and some other parts of the network to exceed 100% of their 2019 levels."* Our Supplemental Documents package includes the Eurocontrol release.

EU Air travel to recover to 92% of 2019 levels

Figure 28: Eurocontrol Air Traffic Scenarios as at Apr 6



Source: Baker Hughes, Bloomberg

Oil & Natural Gas – Updated EIA Egypt country brief

EIA's country brief on Egypt

Egypt has re-emerged in the past 6 and ½ years as a natural gas exporter and one with continued natural gas growth potential for the coming years. We continue to recommend adding the EIA's country analysis briefs to reference libraries as good quick references, in this case its new EIA country executive summary [LINK] on Egypt. Egypt is the third largest producer of natural gas in Africa following Algeria and Nigeria, but more significantly it moved from declining natural gas production and natural gas imports to increasing natural gas production and natural gas exports. Egypt returned to being a net exporter in 2019, when it produced about 2.3 tcf of dry natural gas in 2019 and consumed about 2.1 tcf . The increase in natural gas production the result of large natural gas discoveries in the mid-2010s, such as the Zohr, Atoll, and West Nile Delta projects that were fast-tracked for development. The Zohr field discovery turned Egypt from a natural gas importer to an exporter in 2019. Zohr went from discovery in Sept 2015 to peak production at 3.01 bcf/d of production in Feb and Mar of 2021, though has been subject to many technical issues that have led to a pullback in production; water breakthrough issues led to an 2.4-2.5 bcf/d pullback in production on an annualized basis. Eni, and its concession partners plan to drill additional wells to increase capacity. And there have been other nearby offshore natural gas discoveries that have led to an increase in natural gas exports. In July 2020 Eni announced the discovery at the Bushrush well in North El Hammad concession located offshore in the Mediterranean sea has yielded with initial testing production estimates at 0.3 bcf/d. This is the latest of recent discoveries that have boosted Egypt's total natural gas production. The Arab Gas Pipeline runs from Arish, Egypt and connects to Israel, Jordan, Syria and Lebanon with a reported capacity of 0.64 bcf/d; it is subject to sabotage or attacks by militant groups which repeatedly disrupt gas transport through the pipeline. Israel and Egypt are reportedly planning to build an onshore natural gas pipeline that will add an additional 177 bcf/d. Egypt currently has two LNG export facilities, the Spanish-Egyptian Gas Company, a single LNG train located in Damietta on the Mediterranean coast, and the Egyptian LNG facility. Since the start of commercial operations in 2004, Egypt underutilized SEGAS LNG, leading to the plant's closure in December 2012 because of growing domestic energy demands. Our Supplemental Documents package includes the EIA country brief.

Eni was right in calling Zohr a "supergiant" natural gas discovery in Sept 2015
Long term readers know that we very seldom highlight individual oil and gas discoveries unless we think they are material and impactful to oil and gas such as Eni's Zohr's offshore Egypt gas discovery, Exxon's Liza offshore Guyana oil discovery, and even Lundin Petroleum's offshore Norway oil discovery Alvadnes that has ultimately been named as Johan Sverdrup. In Zohr's case, Eni was right when it made the discovery and called it a "world class supergiant" discovery. Here is what we wrote in our Sept 6, 2015 Energy Tidbits. "*Natural gas – ENI makes a "supergiant" deepwater natural gas discovery offshore Egypt in the Mediterranean Sea. We generally don't note many international natural gas discoveries , unless there is the big near term production potential. This week, ENI made what they call a "world class supergiant gas discovery at its Zohr Prospect, in the deep waters of Egypt. The discovery could hold a potential of 30 trillion cubic feet of lean gas in place covering an area of about 100 square kilometres. Zohr is the largest gas discovery ever made in Egypt and in the Mediterranean Sea". ENI also stated that it "will immediately appraise the field with the aim of accelerating a fast track development of the discovery that will utilise at best the existing offshore and onshore infrastructure". The key to this discovery is that it is big AND it can be brought on stream quickly. ENI didn't give a timeframe in the press release, but we also listened to the CNBC interview where CEO Claudio Descalzi said "It is close to the facilities so the time to market will be very good… that is part of our strategy to…continue to do our exploration in the mature area where we have a deep geographical knowledge and we can take advantage of our facilities and that will make the unit cost in terms of capital very positive," and "I don't want to put a date now but it is a question of a few years to have production—then a full production, that will be a very quick fast track development". This is viewed as a multi bcf/d project and can be on stream, to some level, in a few years. Its still early but you would have to expect that some of the early natural gas will go domestically as Egypt basically uses almost 100% of its natural gas produced in domestic markets with only very small amounts of LNG exports. BP Amoco estimates that Egypt natural gas consumption was 4.6 bcf/d in 2014. But it is a large discovery and could have surplus natural gas to export via LNG. We attached the ENI release, which is found at: [LINK] We also attached the CNBC article, which includes the link to the interview and is found at: [LINK].*" [Note, we checked, the Eni link doesn't work, but the CNBC link still works]

Oil & Natural Gas– Expect record cash flows in Q1 for Cdn E&P, higher again in Q2
We are about 3 weeks away away from Q1 reporting for the Cdn oil and gas companies and one thing is clear, there should be record cash flows. And that means the conference calls will all the analysts starting off with the "great quarter guys". The conference calls will be peppered with analysts. A week ago, we tweeted [LINK] that Cdn E&P should report record Q1/22 cash flows. Cash flows will be up huge YoY and also big QoQ. Edmonton par oil prices in Q1/22 were If we use Ed Par oil prices, WCS oil prices and AECO natural gas prices, Q1/22 Ed Par prices of US$93.66/b were +72.9% YoY and +26.8% QoQ. Q1/22 WCS prices of US$82.51/b were +80.0% YoY and +35.3% QoQ. Q1/22 AECO prices of $4.51 were +43.9% YoY and +0.6% QoQ. And based on April 8 closing prices, it looks like Q2 will

Expect record Q1 cash flows

be even higher cash flows. On Friday, WTI closed at $98.26, Ed Par at $104.03, WCS at $85.18 and AECO at $5.84. Below is our updated table of quarterly oil and natural gas prices.

Figure 29: Oil and Natural Gas Prices

Quarter	Brent US$	WTI US$	EdPar US$	WCS US$	HH US$	AECO C$
Q1/18	$67.00	$62.86	$57.19	$37.11	$3.09	$2.06
Q2/18	$74.41	$67.83	$60.78	$49.88	$2.84	$1.23
Q3/18	$75.27	$69.69	$59.81	$42.32	$2.92	$1.25
Q4/18	$68.18	$59.41	$36.53	$25.63	$3.78	$1.62
Q1/19	$62.91	$54.49	$50.28	$43.79	$2.92	$2.55
Q2/19	$68.58	$59.96	$54.41	$47.46	$2.55	$1.13
Q3/19	$61.95	$56.48	$52.43	$43.91	$2.37	$1.00
Q4/19	$62.51	$56.83	$50.61	$37.98	$2.36	$2.46
Q1/20	$51.28	$46.73	$39.75	$28.55	$1.91	$2.04
Q2/20	$31.14	$27.67	$21.84	$18.02	$1.70	$2.00
Q3/20	$42.70	$40.87	$36.83	$31.13	$1.98	$2.26
Q4/20	$44.47	$42.67	$37.92	$31.34	$2.47	$2.65
Q1/21	$60.51	$57.75	$54.17	$45.83	$3.39	$3.13
Q2/21	$68.44	$65.90	$61.94	$53.11	$2.89	$2.95
Q3/21	$72.95	$70.57	$66.90	$57.65	$4.28	$3.41
Q4/21	$79.43	$77.31	$73.84	$60.96	$4.74	$4.49
Q1/22	$99.08	$94.79	$93.66	$82.51	$4.61	$4.51

Source: Bloomberg

Oil & Natural Gas – Precision warns service sector running out of high end rigs

Precision's sector outlook

On Wednesday, Precision Drilling posted its new investor slide deck. Putting aside their specific results/outlook, there were a number of good insights on the service sector's ability to drive thru oil and gas production growth thru 2022 and into 2023. Precision highlighted the increasing well efficiency rates in the Permian and Montney, increasing service sector rates, but also points to high end rig capacity running out ie. limiting future production growth. Some of the Precision quotes are "N*orth American dayrate momentum is strong with leading-edge rates moving up "several thousands of dollars per day", "U.S. market for high spec rigs is tight", "modest increases in U.S. land rig count could results in full utilization of "super spec" rigs in 2022, "Canadian industry rig count reflects strong customer demand with April active rigs at highest levels since 2019. Expectations for industry levels to meet or exceed Q1 this fall", "international market poised for growth", "personnel – a competitive advantage in labor challenged market", "improved commodity prices driving activity with workover projects", "lack of industry investment has tightened well service rig supply", "AlphaAutomationTM record performance. Case Study #20-06: Delaware Basin" "6 days improvement over operator target" "55% productivity improvement over non-Alpha offsets",* and *"AlphaTM sets new benchmark. Case Study #20-08: Montney Drilling Program" "3 days improvement over operator target" "27 productivity improvement over non-Alpha offsets".* Our Supplemental Documents includes excerpts from the Precision slide deck.

Oil & Natural Gas – Klotzbach forecasts above normal Atlantic hurricane season

Above normal hurricane season expected

While it may be early, the beginning of April is when we start to see hurricane forecast groups release their initial hurricane forecasts for upcoming Atlantic hurricane season which runs from Jun 1 – Nov 30. The well-regarded Philip Klotzbach and his team at Colorado State University issued their first forecast for the season on Thursday [LINK] calling for another above-normal year. The CSU forecasters wrote *"We anticipate that the 2022 Atlantic basin hurricane season will have above-normal activity. Current weak La Niña conditions look fairly* *likely to transition to neutral ENSO by this summer/fall, but the odds of a significant El Niño seem unlikely. Sea surface temperatures averaged across the eastern and central tropical Atlantic are currently near average, while Caribbean and subtropical Atlantic Sea surface temperatures are warmer than normal. We anticipate an above-average probability for major hurricanes making landfall along the continental United States coastline and in the Caribbean. As is the case with all hurricane seasons, coastal residents are reminded that it only takes one hurricane making landfall to make it an active season for them. They should prepare the same for every season, regardless of how much activity is predicted."* The above average forecast isn't surprising give the current El Nino forecast is for Neutral/La Nina conditions, while El Nino summers are usually associated with lower hurricane activity. Our Supplemental Documents package includes excerpts from the Klotzbach forecast.

Figure 30: CSU Forecast for 2022 Hurricane Activity

Forecast Parameters	CSU Forecast for 2022	Average for 1991-2020
Named Storms	19	14.4
Named Storm Days	90	69.4
Hurricanes	9	7.2
Hurricane Days	35	27.0
Major Hurricanes	4	3.2
Major Hurricane Days	9	7.4
Accumulated Cyclone Energy+	160	123

Source: CSU, Philip Klotzbach

Actual hurricanes tend to be way more than early season hurricane forecasts
Last year (our April 11, 2021 Energy Tidbits memo included a reminder from Klotzbach's 2021 hurricane forecast on how early season hurricane forecasts tend to be too low. Here is what we put in our April 11, 2021 Energy Tidbits. "*Actual hurricanes tend to be way more than early season hurricane forecasts. We tweeted [LINK] on the new Klotzbach forecast because we know most tend to ignore the early April forecasts for the hurricane season with the rationale that they tend to be wrong. We don't disagree that they tend to be wrong. But what we always remind is that these early season April hurricane season forecasts tend to be light. Our tweet said "Well regarded @philklotzbach 1st forecast for 2021 Atlantic #hurricane is for above average season. Worth noting 4 of 5 last years, actual #hurricane activity significantly exceeded April forecasts, ie. Apr 20 was similar fcast & turned out to be well above average. #Oil #NatGas." This is overlooked because most don't read the full 34 pages of the forecast and included on page 34 is the below table that we included in our tweet."*

Figure 31: CSU Hurricane Season Forecast History

Year	NS	NSD	H	HD	MH	MHD	ACE	NTC
1996	13	79.00	9	45.00	6	13.00	166	192
2000	15	71.50	8	32.75	3	5.00	119	134
2001	15	68.75	9	25.50	4	4.25	110	135
2008	16	88.25	8	30.50	5	7.50	146	162
2012	19	101.25	10	28.50	2	0.50	133	131
2021	21	79.00	7	27.50	4	13.75	146	177
Average	16.5	81.3	8.5	31.6	4.0	7.3	137	155
2022 Forecast	**19**	**90**	**9**	**35**	**4**	**9**	**160**	**170**

Source: CSU, Philip Klotzbach

Oil & Natural Gas – No big oil and gas surprises from Liberals Budget 2022

Liberals Budget 2022

The Liberals introduced their Budget 2022 on Thursday. (i) Our comments are focused on resources and not items like the one-time tax on financial institutions or the fact their economic assumptions were set prior to the Russian invasion of Ukraine. . (ii) We didn't see any surprise hits to oil and gas. (iii) We saw some say they were surprised that CCU credit didn't include EOR projects but that should have been expected. On Dec 14, 2021, we tweeted [LINK] *"#Liberals @cafreeland fiscal update released confirms tax incentive for carbon capture, utilitization & storage #CCUS does not apply enhanced oil recovery. Too bad, would be capital allocation opportunity with known economics & IRR. #OOTT."* This tax incentive made a point of specifically excluding "enhanced oil recovery projects", which we remind has known economics and IRR. The Liberals update said "*Budget 2021 proposed an investment tax credit for capital invested in carbon capture, utilization, and storage (CCUS) projects with the goal of substantially reducing emissions. The new investment tax credit would be available for a broad range of CCUS applications across different industrial subsectors (e.g. concrete, plastics, fertilizers, fuels), including blue hydrogen projects and direct air capture projects but not enhanced oil recovery projects. The government will consider how equivalent tax support can be provided to producers of green hydrogen. The government has engaged in consultations with stakeholders from industrial subsectors, provincial and territorial governments, as well as other interested parties or members of the public, to provide input on the design of the investment tax credit for CCUS. The government will outline the final design of the proposed investment tax credit in Budget 2022."* (iv) The elimination of flow thru was also previously indicated in the Emissions Reduction Plan. (v) Pg 60, 104. Canada Growth Fund. This is going to be the key investment vehicle where they try to direct money into decarbonization. (vi) Pg 66. A new Critical Minerals flow thru tax credit. (vii) Pg 93. The Liberals may not like it, but we expect a big opportunity for oil and gas companies is related to nature investments to conserve, restore and enhance lands. (viii) Pg 99. Small modular reactors. They are positive on this but they aren't making huge dollar push to it. Readers know this is an area we have been highlighting for years as one that will be growing in the Energy Transition. (ix) Pg 99. Flow thru gone for oil, natural gas and coal after March 31, 2023. This was expected. (x) Pg 105. Broadened role for Canadian Infrastructure Bank to help in energy transition and this "will allow the CIB to invest in small modular reactors; clean fuel production; hydrogen production, transportation and distribution; and carbon capture, utilization and storage. These new areas fall under the CIB's existing clean power and green infrastructure investment areas." (xi) Pg 220, 222. They note their higher WTI oil price assumptions, but we couldn't find the incremental $ revenue impact. "*Reflecting recent strength in commodity prices, the outlook for West Texas Intermediate* *crude oil prices has been revised up to US$80 per barrel for 2022 and to US$74 per barrel for 2023, about US$6 to US$7 per barrel higher on average than in EFU 2021. Going forward, crude oil prices were expected to remain higher than in EFU 2021 by about US$3 per barrel on average per year*." (xii) Pg 253. This is the one non resources comment we will make is that we continue to be surprised that no one ever questions the government on this line item. It's probably because most don't read the budget detail, especially back at page 252. They basically put aside $855 million for 2021/22, and $895 million for 2022/23 for "*the net fiscal impact of measures that are not announced is presented at the aggregate levels and would include provisions for anticipated Cabinet decisions not yet made ….*" Our Supplemental Documents package includes excerpts from Budget 2022.

Record tornadoes in March

Oil & Natural Gas – Most tornadoes on record in March at 218

Yesterday, NOAA's NWS Storm Prediction Center [LINK] had a Facebook posting that noted March 2022 set a new monthly record with 218 tornadoes beating the prior record of 192 tornadoes in March 2017. And there were 5 days with 3 or more strong (EF2+) tornadoes. An EF2 is with wind gusts of 111-135 mph. Note that normally, tornado activity is March is much lower activity than April and May. Last week's (April 3, 2022) Energy Tidbits memo reminded that hurricanes are the potential huge impact item on oil and natural gas, but tornadoes can impact oil and gas onshore operations in Oklahoma and Kansas. Most of the Texas oil and gas productions tends to be south of major tornado activity. NWS also included some maps of the 5 days with the EF2+ tornadoes and they fit that typical location that doesn't impact Texas oil and gas. Last week's memo also noted the AccuWeather forecast "*2022 predicted to spawn more tornadoes than recent years. Spring is almost here, but severe weather season is already ramping up -- and AccuWeather forecasters say that tornado activity will shift into high gear in one particular month across the central and eastern U.S. The arrival of meteorological spring on March 1 also marked the opening chapter of severe weather season across the central United States, a season that AccuWeather predicts could spin up a higher number of twisters and life-threatening storms than what has unfolded in recent years.*" Below is the AccuWeather forecast table. Our Supplemental the NWS Storm Prediction Center Facebook posting.

Figure 32: AccuWeather Forecast for 2022 Tornado Activity

TORNADO OUTLOOK
2022

	AMOUNT	MARCH	APRIL	MAY
AVERAGE	1,253	80	155	276
2019	1,517	107	272	510
2020	1,075	83	271	126
2021	1,376	191	73	289
2022 FORECAST	1,350-1,475	120-170	200-275	140-190

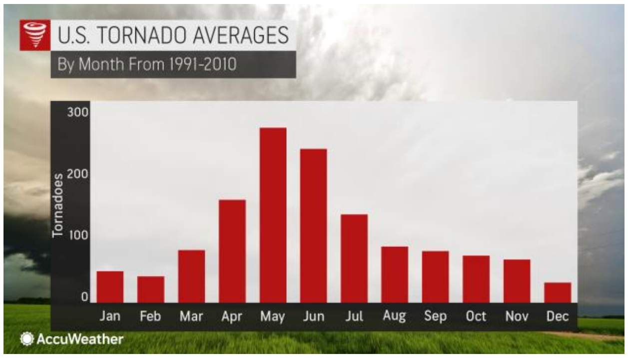
Source: AccuWeather

Tornados happen throughout the year

We were a little surprised that AccuWeather didn't include a graph used in their 2021 tornado forecast that reminds tornado activity happens throughout the year. Our April

11, 2021 Energy Tidbits included AccuWeather's 2021 tornado forecast [LINK], which called for 1,350 to 1,500 tornadoes (vs 1,376 actual). AccuWeather also included the below graph that shows the tornado distribution throughout the year.

Figure 33: Monthly Tornado Averages



Source: AccuWeather

Tornados Enhanced Fujita Scale (EF Scale) Intensity & Rating

NOAA's National Weather Service has a recap of the Enhanced Fujita Scale (EF Scale) for the intensity and rating of tornadoes. [LINK]. NOAA explains "*The Fujita Scale. Fujita Scale (or F Scale) of tornado damage intensity. The F Scale was developed based on damage intensity and not wind speed; wind speed ranges given are estimated, based on the extent of observed damage*." But there is also the Enhanced Fujita Scale (EF Scale). NOAA explains "*The Enhanced Fujita Scale or EF Scale, which became operational on February 1, 2007, is used to assign a tornado a 'rating' based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators (DIs) and Degrees of Damage (DoD) which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned. The EF Scale was revised from the original Fujita Scale to reflect better examinations of tornado damage surveys so as to align wind speeds more closely with associated storm damage. The new scale has to do with how most structures are designed.*" Our Supplemental Documents package includes the NWS explanation.

Figure 34: Enhanced Fujita Scale (EF Scale) for Tornadoes

EF SCALE	
EF Rating	**3 Second Gust (mph)**
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	Over 200

Source: NOAA

Electricity – France reminds it will hurt if Russia cuts natural gas this smmer

GRTgaz warns of on Russia cuts gas scenario

It seems like most believe the likely time for any Russia cutting off Europe of natural gas is this summer and not next winter. No one knows what Putin will decide, but we are more in the camp that his cutting off Europe could have an even bigger impact if it was in Dec or Jan. However, the impact would be big this summer if he cut off Europe. On Friday, GRTgaz, France's largest gas transmission company, posted a decree warning on the priority of consumers for how they would shed electricity load. [LINK]. The release stated "*In the event of an interruption in supplies from Russia, simulations made by GRTgaz show that France, which consumes around 17% Russian gas in its gas mix, would be less affected than its European neighbours. However, in such a situation, it should be prepared for reductions in consumption, in particular in the event of a cold winter or a cold spell during the winter.*" In addition, gas injections have started 15 days earlier, in mid march than is typical for the injection season. GRTgaz is primarily concerned according to the following load shedding order: i) Combined cycle gas power plants of more than 150 MWe, provided that the security of the electricity network remains maintained and ii) Large industrial sites (chemicals, refineries, petrochemicals, glassmakers, etc.) and large tertiary buildings such as shopping centers, performance halls, stadiums. Depending on the gas supply-demand balance in France, GRTgaz could issue orders to reduce or interrupt gas consumption to be carried out within two hours with large consumers connected to its network and ask network operators to distribution to do the same with their own affected customers. Before enacting the load shedding plan GRTgaz can use various levers to incentivize a reduction in natural gas consumption for certain industrial customers that have signed commitments to reduce consumption on demand against financial compensation. Our Supplemental Documents package include the GRTgaz release.

Energy Transition – France could see a huge shift in wind/nuclear if Le Pen wins

France 1st round Presidential election today

Wind and nuclear power sectors are going to watching today's 1st round of France Presidential election that determines the two candidates who will face off in the final Presidential vote on April 24. The reason for the close watching is that all reports are that Macron and Le Pen are very close in the first round voting. The challenge is that there are a lot of uncertainties for the final April 24 vote. There are 12 candidates today. The pre-election polls showed Macron and Le Pen with about 50% of the support. That means there will be about 50% of the electorate up for grabs for the final voting. So a close vote today between Macron and Le Pen isn't necessarily a predictor for April 24. But if Le Pen ultimately wins the Presidential election, there could be a huge shift in wind (negative) and in nuclear (positive). And because of this, on Friday morning, we tweeted [LINK] ""*Stop #Wind projects & gradually dismantle existing farms", "return to households the 5b in subsidies in particular to wind turbines" "get out of EU electricity market to find decent prices" "relaunch the #Nuclear & hydroelectric sectors" Le Pen is closing gap on Macron. #OOTT".* Our tweet included Marine Le Pen's "22 Measures for 2022" [LINK], which is her priority list if she wins. It will be a big hit to wind power and a big plus to nuclear. Here are the key bullet points on energy from Le Pen's 22 Measure. "*12 Ensure our energy independence to lower the French bill. Return to households the 5 billion in subsidies paid in particular to wind turbines. Stop wind projects and gradually dismantle existing farms. Relaunch the nuclear and hydroelectric sectors and invest in the hydrogen sector. Get out of the European electricity market to find decent prices*." Our Supplemental Documents package includes Le Pen's 22 Measures for 2022.

Energy Transition – GM restarts sale of Chevy Bolt after 8-month stall in production

GM Chevy Bolt EV

GM has restarted the production of their Chevrolet Bolt after a global recall on their 2017-2022 models made last summer due to defective batteries that were subject to a fire risk. Our September 26, 2021 Energy Tidbits last noted the statement by GM's CEO that announced the defective battery issue has been resolved. On Wednesday, the Detroit Free Press reported [LINK] that production at Orion assembly restarted on Monday and has approximately 800 bolts that are ready for shipment to dealers. GM stated, "*Our goal is to get back to and, quite frankly, increase all of our business metrics whether that's production, whether that's retail sales," Majoros said. "We all see what's happening in the marketplace and we think both Bolt EV and Bolt EUV can catapult to their highest levels ever in both production and sales."* GM decline to answer how many of the 140,000 bolts received the fix to the battery modules, as well as declining to disclose how many bolts GM repurchased during the recall. GM did indicate they have an ample supply of new batteries and has performed enough fixes on the recalled vehicles to begin building new bolts in addition to the repairs. The price of the Bolt is being held lower than other EVs in the market. The 2022 Bolt EV starts at $31,500 and the EUV at $33,500. By comparison the starting price of Tesla Model 3 is $46,990. The 2022 Ford Mustang Mach-E starts at $43,895. The report also noted "*Chevrolet will cover the cost of standard installation of Level 2 charging capability for eligible customers who buy or lease a 2022 Bolt EUV or Bolt EV, Majoros said. Chevrolet has partnered with home EV-charger installation company Qmerit to give Bolt owners access to faster charging at their homes, a significant savings given that installation of a Level 2 charger could cost up to $2,000, according to Realtor.com."* Our supplemental Documents package includes the Detroit Free Press article

Energy Transition – Mercedes says long way off EVs being as cheap as ICE vehicles

EVs more expensive for foreseeable future

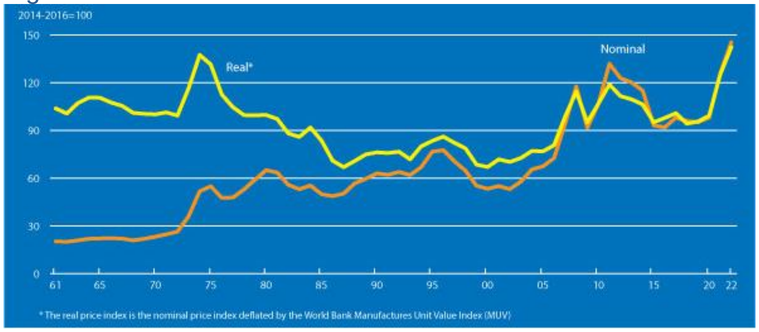
There is no doubt the developed economies of the world are being pushed to, and are heading to a world of EVs over time. The question is how fast. We still believe the biggest challenge for EVs in the near term is how to make them more affordable for the general population. There still exists a significant cost penalty for EVs over traditional internal combustion engine vehicles (ICE) and we see more car dealers acknowledge this challenge. On March 27, we tweeted [LINK] on the FT reporting on comments from Daimler Trucks CEO Martin Daum. The FT wrote "*If you take the entirety of engine, transmission, axle, tank system, cooling . . . " the chief executive officer of Daimler Truck, Martin Daum, told the Financial Times, "we have a maximum of about €25,000 [of material in a combustion engine truck]." "How much battery do you get for €25,000? Even if [battery costs fall to] €60 per kilowatt hour, and I need 400 kilowatt hours, then I need €24,000 alone for the battery cells [in a single truck]". He added that it would be up to governments to make up the difference, using whichever mechanism they chose. "Without any subsidies . . . the price of an [electric] truck will always, forever be higher than a [combustion engine] truck."* So we shouldn't have been surprised to see the Yahoo Monday report [LINK] that Mercedes Chief Technology Officer believes this trend will not be going away anytime soon and it may take a number of years until we see the a decline in prices. Mercedes CTO stated *"Coming to [a battery price of] 50 U.S. dollars per kilowatt, which would lead to comparable cost basis to an I.C.E. engine, I would say this is far out there," Mercedes CTO Markus Schäfer told Road & Track. "I don't see that with the chemistry that we have today."* The cost of battery metals has appreciated drastically in recent months as supply has struggled to keep up with demand in recent months. Markus Schafer continued to state *"It's a crystal ball thing to answer. And it* *will very much depend on mining capacity [for raw materials] and the global ramp-up of EVs. So these are the two main factors," he said. "But I would say, for quite a while we will see headwinds on the raw material side."* Our Supplemental Documents report includes the Yahoo report.

Capital Markets – UN FAO Food Price Index in Mar is +33.6% YoY

UN food price index +33.6% YoY

UN global food price index continues to set new all time record highs and were +33.6% YoY in Mar. We have highlighted before how global food prices are going up at multiples higher than is being indicated in the US food price index. And there are global concerns that food prices are going to keep higher in 2022 in part of items how high natural gas prices are leading to a massive escalation in ammonia prices that have to flow thru to food prices or lesser harvests. Our fear is that we will keep seeing the same headlines for many months to come. The headline was in line with what we have been expecting in UN FAO index reports after noting a record increase in last months food price index; it noted a surge in food prices in February. We expect these costs to begin flowing through Canada and European countries as goods that come out of Ukraine (sunflower oil) see educed exports due to the conflict with Russia. We expect to see restaurants altering what they offer, especially their fried foods. On Friday, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*The FAO Food Price Index makes a giant leap to another all-time high in March*" Note this is on a Real price basis. The FFPI averaged 159.3 points for Mar 2022, which was +12.6% MoM and +33.6% YoY. All food categories registered monthly increases. The Cereal Price Index was +3.0% MoM and +17.1% MoM and Dairy Price Index that was +2.6% MoM and +23.6% YoY. The Vegetable oil Index was up 23.2% MoM marking an all time high. We were surprised to see that the Meat Price Index was one of the lowest YoY price increase areas, up 4.8% MoM. Below is the all time FFPI graph. Our Supplemental Documents package includes the UN FAO Food Price Index update.

Figure 35: UN FAO Food Price Index



Source: UN

Capital Markets – Forbes' 36th Annual Billionaires List

Forbes' Billionaires List

Forbes released its 36th Annual Billionaires List on Tuesday [LINK], which, given the big rally in markets was a record year for wealth increases. There was an increase in the number of new billionaires (236 newcomers), and a $400 billion decrease in wealth for the group YoY from $13.1 trillion to $12.7 in 2022, with the most dramatics drop in wealth occurring in Russia flowing the invasion of Ukraine. Jeff Bezos lost his 1st place position for the first time in four years year running a net worth of $171 billion to Elon Musk who saw his fortune grow to $219 billion from $169 billion, earning the #1 spot, improving from 2nd[st] spot last year. The top 20 richest are worth $2.025 trillion- a 6.2% increase from 2021. There are now 3 new people have eclipsed the $100 billion mark this year, Warren Buffet, Larry Page, Sergey Brin and Larry Ellison. New to the top 10 are Steve Ballmer at $91.4 billion and Mukesh Ambani at $90.7 billion. Concentration of billionaires remains in the US at 735, up 11 YoY. However, China is catching up though down 7 YoY to 607. For Canadians, Changpeng Zhao (Crypto) ranks 19 at $65 billion, David Thomson (Thomson Reuters) ranks 26 at $49.2 billion, Jim Pattison Diverse) ranks 152 at $12.2 billion, David Cheriton (Tech) ranks 180 at $10.9 billion and Joseph Tsai ranks 260 with a net worth of $8.4. The table below shows the YoY change in Top 20 Billionaire net worth. Our Supplemental Documents package includes some of the Forbes posted reports.

Figure 36: Forbes Top 20 Billionaires – 2022 & 2021

Ranking	2022	Net Worth (US$b)	2021	Net Worth (US$b)	YoY
1	Elon Musk	$219.0	Jeff Bezos	$193.4	$25.6
2	Jeff Bezos	$171.0	Elon Musk	$169.0	$2.0
3	Bernard Arnault & family	$158.0	Bernard Arnault & Family	$168.1	-$10.1
4	Bill Gates	$129.0	Bill Gates	$129.5	-$0.5
5	Warren Buffett	$118.8	Mark Zuckerberg	$113.3	$5.5
6	Larry Page	$111.0	Larry Ellison	$99.8	$11.2
7	Sergey Brin	$107.3	Warren Buffet	$99.6	$7.7
8	Larry Ellison	$106.2	Larry Page	$97.7	$8.5
9	Steve Ballmer	$91.4	Sergey Brin	$94.7	-$3.3
10	Mukesh Ambani	$90.7	Francoise Bettencourt Meyers & Family	$80.3	$10.4
11	Gautam Adani & family	$90.1	Amancio Ortega	$77.4	$12.7
12	Michael Bloomberg	$82.1	Mukesh Ambani	$76.2	$5.9
13	Carlos Slim Helu Family	$81.2	Steve Ballmer	$74.5	$6.7
14	Francoise Bettencourt Meyers & family	$74.8	Carlos Slim Helu & Family	$67.7	$7.1
15	Mark Zuckerberg	$67.3	Alice Walton	$66.1	$1.2
16	Jim Walton	$66.2	Jom Walton	$64.4	$1.8
17	Zhong Shanshan	$65.7	Rob Walton	$63.6	$2.1
18	Alice Walton	$65.3	Zhong Shanshan	$62.6	$2.7
19	Rob Walton	$65.1	Ma Huateng	$60.2	$4.9
20	Changpeng Zhao	$65.0	Michael Bloomberg	$59.0	$6.0
TOTAL		$2,025.2		$1,917.1	$108.1

Source: Forbes

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

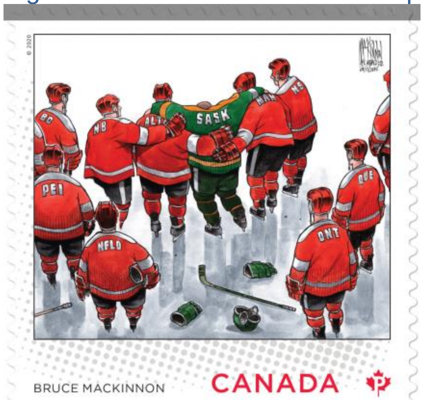
US advises Americans to "reconsider travel" to Canada due to Covid

As readers know, we check the US Overseas Security Advisory Council "OSAC" alerts [LINK] most days at this time of the year and in last week's (April 3, 2022) Energy Tidbits memo, we noted we finally saw the first Ramadan terrorist warning. We checked every day this week and did not see any more Ramadan warnings. However, what caught our attention was the OSAC Feb 4 "*Travel Advisory: Canada - Level 3 (Reconsider Travel). Reconsider travel to Canada due to COVID-19. The Centers for Disease Control and Prevention (CDC) has issued a Level 3 Tavel Health Notice due to COVID-19, indicating a high level of COVID-19 in the country."* [LINK]

4th anniversary of tragic Humboldt Broncos hockey team bus crash

Wednesday April 6 was the 4th anniversary of the tragic Humboldt Broncos Junior hockey team bus crash that killed 16 people and injured 13 others. The hockey team's bus was hit by a semi that ran a stop sign at 4:50pm local time. It was six months ago that the Broncos were also in the news. Our Oct 10, 2021 Energy Tidbits highlighted the unveiling of a commemorative stamp from Canada Post. We then wrote "*On Friday, Canada Post "unveiled a stamp paying tribute to Bruce MacKinnon of The Chronicle Herald (Halifax) [LINK], one of the country's most thoughtful, talented and respected editorial cartoonists. MacKinnon had his first editorial cartoon published in his hometown weekly paper in Antigonish, Nova Scotia, when he was just 14. After he drew weekly cartoons for the Herald, the paper hired him full time in 1986. Since then, he has drawn roughly 8,000 cartoons – but it is their quality that has won him numerous accolades". MacKinnon is noted for his political cartoons but, like other cartoonists, also moves to more powerful serious themes, such as on the tragic Humboldt Broncos bus crash that will be a new Canada stamp."*

Figure 37: Bruce MacKinnon stamp



Source: Canada Post

Biden's big release from Strategic Petroleum Reserves

We don't include a lot of political cartoons because most tend to not get laughs from both sides of the aisle. But every now and then, we see one that should at least get an acknowledged chuckle from both sides, in this case even some of the Democrats have to chuckle. Below is the cartoon of Biden and his big release from the Strategic Petroleum Reserve, which is found at: [LINK]

Figure 38: Biden Use of SPR Cartoon

Source: AF Branco

Did a commercial jet cause the mysterious cloud over Alaska?

Do you believe the below mysterious cloud over Alaska on Thursday morning is from a commercial jet or do you believe there may well be a good UFO type conspiracy? The commercial jet explanation is the Alaska State Troopers explanation for the mysterious cloud on Thursday over Alaska. The Alaska State Troopers Facebook posting [LINK] explained the cloud as "*The Alaska State Troopers and our partners at the Alaska Rescue Coordination Center investigated the Lazy Mountain photos and video that were reported to Troopers and have also been circulating across social media this morning. There have been no reports of overdue aircraft or ELT activations indicating an aircraft crash. A rescue team on a helicopter flew a mission around the Lazy Mountain area this morning and located nothing suspicious and there were no signs of crashed aircraft. Further investigation revealed that a large commercial jet was flying in that area around the time that the photos and video were taken. The aircraft was contacted and reported normal flight operations on its way to JFK airport in New York. Troopers believe that the photos and videos showed a contrail from the commercial jet combined with the rising sun which together caused the unique atmospheric sight. We greatly appreciate the numerous Alaskans that reported the suspicious sight this morning to law enforcement.*"

Figure 39: Mysterious cloud over Alaska on April 7

Source: New York Post