Energy Tidbits

June 6, 2021

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Vitol: Oil Stocks Back to 2019 Levels Means “All The Spare Capacity Will Sit With Those Who Want To Control The Price”

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. Vitol sees global oil inventories back to 2019 levels in H2/21, which means “all the spare capacity will sit with those who want to control the price”. (Click Here)

2. Rosneft CEO says the "*world is at risk of facing an acute shortage of oil and gas"* ie. world not adding enough new reserves/productive capacity. (Click Here)

3. JCPOA looks at least a few weeks away, US expects “*there will be a sixth. I think there's just about every expectation there will be subsequent rounds beyond that.”* (Click Here)

4. BlackRock CEO Larry Fink on the energy transition “*we do not have the technology to do all this*”. (Click Here)

5. OPEC’s outlook shows sharp stock draws of more than 2 mmb/d from Sept-Dec. (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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YoY storage at -386 bcf YoY deficit

The EIA reported a 98 bcf injection (vs 95 bcf injection expectations) for the May 28 week, which was slightly above the 5-yr average injection of 96 bcf, and slightly below last year's injection of 102 bcf. Storage is 2.313 tcf as of May 28, increasing the YoY deficit to 386 bcf from 381 bcf last week and storage is now 61 bcf below the 5 year average vs 63 bcf below last week. The significant YoY deficit along with the forecasted hot summer will help support natural gas prices during the injection season. 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 (05/28/20)		5-year average (2016-20)	
Region	05/28/21	05/21/21	net change	implied flow	Bcf	% change	Bcf	% change
East	413	385	28	28	531	-22.2	448	-7.8
Midwest	522	499	23	23	630	-17.1	526	-0.8
Mountain	151	144	7	7	139	8.6	140	7.9
Pacific	268	256	12	12	272	-1.5	254	5.5
South Central	959	931	28	28	1,127	-14.9	1,007	-4.8
Salt	300	296	4	4	352	-14.8	312	-3.8
Nonsalt	659	635	24	24	775	-15.0	695	-5.2
Total	2,313	2,215	98	98	2,699	-14.3	2,374	-2.6

Source: EIA

Natural Gas – Could PHMSA review of refrigerants explosion risk lead to LNG pause?

PHMSA to review LNG refrigerants risk

Yesterday morning, we tweeted [LINK] "G*reat report & food for thought. @PHMSA_DOT tells @willenglund coming up with new regs re refrigerants explosion risk in #LNG? any risk they pause new US LNG projects during review? what can they do, refrigerants are critical in liquefaction? More in SAF Energy Tidbits tomorrow."* The Washington Post had a great report "*Engineers raise alarms over the risk of major explosions at LNG plants"* [LINK] that has to raise key questions/risks for new US LNG export projects in the short term. They wrote "*As fracking turned the United States into a major producer of natural gas over the past decade, federal regulators approved the construction of export terminals along the Atlantic and Gulf coasts while relying on industry safety calculations that critics say significantly understate the potential force of a specific type of accidental explosion. The particular event that worries engineers outside the business has a very low probability of happening but could have exceedingly destructive consequences if it does. Under new leadership since January, the federal Pipeline and Hazardous Materials Safety Administration, or PHMSA, told The Washington Post it intends to draw up rules at some point next year that would deal with the risk in question." "The threat of a vapor cloud explosion comes from the heavier hydrocarbons an export terminal relies on to chill the natural gas so deeply that it turns into a liquid, which is then loaded onto ships for sale abroad. These hydrocarbons are called refrigerants, and under the right conditions, a major leak of volatile refrigerants on a windless day could lead to the buildup of a cloud of ground-hugging vapor, until a spark sets it off."* When we read the report, our first thought was that there could be a pause on any approvals for new US LNG projects as this is studied. Wouldn't that be consistent with the Biden modus operandi? When they either have a concern or have something they want to shut down they put in a pause while they study ie. like they are doing with the drilling rights on federal lands. Its now on public record that the PHMSA says they will be reviewing the refrigerant explosion risk so what will the Biden administration do while the review is ongoing? Does this put at risk the US GoM LNG projects that are looking to get off the ground for at least a delay? We thought this was reinforced by the response to the

Washington Post that they remind there has been an administration change and they will be studying this info. The Post said they responded "*Regulations are one tool in PHMSA's toolbelt to ensure safety in the design and operations processes — and under new leadership we have been immediately focused on building out our capacity to more quickly develop and implement new regulations. This is particularly important given the dozens of new regulatory mandates passed in the bipartisan PIPES Act of 2020 (last December) — with updates to the LNG facilities rules being one of our top regulatory priorities.*" Our big concern is what is the solution or fix to existing LNG projects if they do a study and find out the explosion assumptions were wrong and there is more risk. How do you replace the critical role of refrigerants in the liquefaction process? That's the problem and the risk. The Washington Post report says there is very little risk to this explosion potential. Lets hope that it turns out to be viewed that way and that nothing will happen to cause a pause to US LNG. Our Supplemental Documents package includes the Washington Post report.

Any pause to US LNG would be a big positive to LNG markets in 2020s

The reason why we highlighted the Washington Post story is our concern that the Biden way of looking at oil and gas drilling on federal lands could be a precedent to other ways of studying items ie. the risk to a pause. Any pause on US LNG export projects would be another benefit to LNG markets in the late 2020s. The US LNG export projects have set themselves up for either brownfield or lower risk greenfield projects and are considered relatively fast to first supply. Any pause on US LNG projects would be viewed as a pause to LNG supply post 2025. On the surface, would be positive to LNG Canada Phase 2 need assuming environmentalists don't elevate this same concern with the Liberals. But it would be another hit to global LNG supply post 2025 that is already seeing a hit with the delays at Total's Mozambique LNG (see our SAF Group 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*?" [LINK]). Big winners would be natural gas to the extent it can get to Europe (key market for US LNG) and Asia (key market for Mozambique LNG and LNG Canada) ie. Russia via Nord Stream 2 and Power of Siberia 1 and 2, or North Africa like Libya or Egypt. We also wonder if an LNG supply gap would give more life to coal for India, China, Japan, South Korea? If LNG is too expensive, does anyone really expect these countries to not use coal??

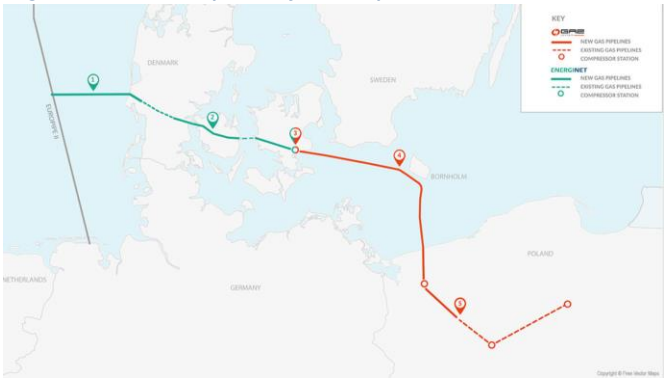
Natural Gas – Denmark also holding up Norway to Poland 1.3 bcf/d Baltic Pipe pipeline

Construction halt on Baltic Pipe pipeline

Nord Stream 2's hold up wasn't just because of US sanctions, recall the several months hold up on additional Denmark approvals. We tweeted that Denmark is at it again. On Friday, we tweeted [LINK] "*Denmark doesn't play favorites. #NordStream2 type delay (though not a year) due mice/bats on Norway to Poland #BalticPipe #NatGas pipeline leading to temp construction shutdown. reminds always timing execution risk even to an approved project*". Similar to what happened to Nord Stream 2, the Baltic Pipe pipeline is under construction, but Denmark repealed its prior environmental permit and is moving to block construction of the Baltic Pipe pipeline. Energinet is owned by the Danish Ministry of Climate and Energy and owns, operates and develops the transmission systems for electricity and natural gas in Denmark. On Thursday, Energinet announced[LINK] that the Danish Environmental and Food Appeals Board has repealed the permit originally issued by the Danish Environmental Protection Agency on July 12 of 2019. Baltic Pipe is a pipeline from Norway through Denmark land and waters, ending on Polish land. Its capacity is 0.3 bcf/d for Denmark and a further 1.0 bcf/d for Poland. Construction is underway and this will cause a temporary (undetermined period) for a section of the pipeline. The rest of construction will continue. It was planned to be operational in Oct 2022, however with the repeal of the permit, there will

be a risk for a delay depending on how long construction is stopped on this section. We haven't seen any estimates for how long a delay, but our tweet said we didn't think it would e a one year delay like Nord Stream 2. The point of contention is with the 210 km portion of the pipeline laid through Danish land. The Appeals Board is stating that the original permit did not sufficiently describe the measures taken to protect dormice, Nordic birch mice and bats, as they are protected by the European Habitats Directive Annex 4. Energinet will now have to work with authorities to clarify the impacts to the Baltic Pipe Project and is going to temporarily shutdown construction until the permit is reinstated. Our Supplemental Documents package includes the Energinet release and a Baltic Pipe project overview.

Figure 2: Baltic Pipe Project Map



Source: Baltic Pipe EU

Natural Gas – India's natural gas target could add >9 bcf/d LNG imports by 2030

India's target ramp up in natural gas consumption

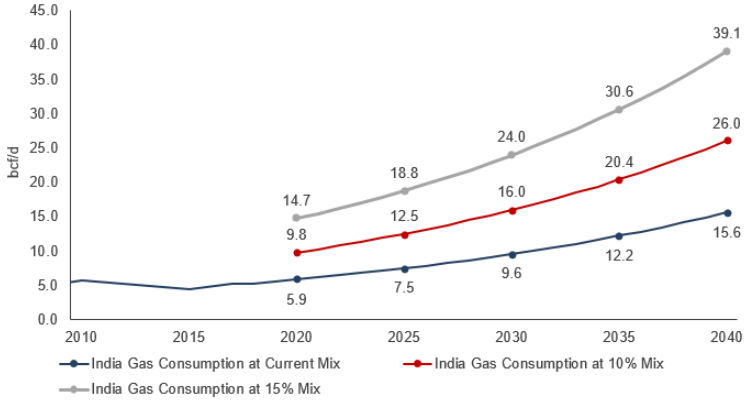
There was a reminder that India expects to be a major catalyst for LNG markets in the 2020s from a Friday tweet from India's Energy Minister Dharmendra Pradhan [LINK] "*We are rapidly deploying natural gas in our energy mix with the aim to increase the share of natural gas from the current 6% to 15% by 2030. One Nation, One Gas Grid is being implemented to remove regional imbalances in access to natural gas. #IndiasGreenFuture.*" We tweeted [LINK] on the significance of this target and this would be a big plus to global LNG markets for the 2020s. "*Big + to #LNG. IND hasn't grown domestic #NatGas prod so Demand ↑ = LNG ↑. See SAF Oct 23/19 blog "Finally some visibility that India is moving towards its target for natural gas to be 15% of its energy mix by 2030", could add >9 bcf/d LNG import to 2030*". This is significant because any increased natural gas consumption, at least for now, has to directly lead to increased LNG imports. And our prior math on this target is that it could lead to India increasing its LNG imports by >9 bcf/d by 2030. Recall India has not been able to increase its domestic natural gas production so right now any increase in natural gas consumption means increased LNG imports. India may not have the same impact as China but it is still a global LNG game change especially in the face of Covid stopping LNG FIDs. Like all countries, India's changes were put to a halt by Covid impacts. Pradhan is saying natural gas is 6% of its energy mix. That is unchanged from pre-Covid levels of 6.2% of the energy mix in 2018. Our Supplemental Documents package includes the Pradhan tweet.

Prior to pandemic, India was starting to move on natural gas infrastructure

As noted above the 15% target is not a new target, it is the same target as before the pandemic. And just before the pandemic hit, in H2/19 we had started to see signs India was finally moving on building out the necessary natural gas infrastructure to support a multi year increase in natural gas consumption. But like everywhere else in the world, its progress was held by back by the pandemic. In fact, we featured this

in our Oct 23, 2019 blog "*Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030*". Here is part of what we wrote in Oct 2019. "*It's taken a year longer than we expected, but we are finally getting visibility that India is taking significant steps towards India's goal to have natural gas be 15% of its energy mix by 2030. On Wednesday, we posted a SAF blog [LINK] "Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030". The blog noted comments from earlier on Oct, when India Oil Minister Dharmendra Pradhan said that there are $60 billion of natural gas infrastructure and LNG import terminals that are "under execution". He said "I am not talking about potential investment. This number relates to the project that are under execution". In the blog, we said "Natural gas consumption in India is only now back to 2011 levels at 5.6 bcf/d and represents only 6.2% of its energy mix. If India hits its 15% target of its energy mix by 2030, it would add natural gas demand, on average, of >1.5 bcf/d per year. At the same time India's domestic natural gas production peaked in 2010 at 4.6 bcf/d, but has been flat from 2014 thru 2018 at ~2.7 bcf/d, which means the big winner will be LNG. The most important factor driving this expectation for natural gas consumption growth is likely price. Asian LNG landed prices are down about 50% YoY and, more significantly, the expectation is for future Asian LNG prices to be at lower levels than prior cycles. India, by itself, may not be a LNG global game changer, but it is another positive support for why we believe LNG markets will rebalance sooner than expected ie. in 2022/2023". We projected how much India's natural gas consumption would increase if it can hit its target of 15% of total energy mix in 2030. BP data shows India's natural gas consumption in 2018 was 5.6 bcf/d and natural gas was only 6.2% of total energy mix. BP also estimates India's total energy consumption grew at a rate of 5.2% per year for the 2007 – 2017 period, but energy consumption growth increased to +7.9% in 2018 YoY vs 2017 But if we only assume a 5% growth in total energy mix to 2030, then if natural gas is 15% of India's energy mix, it would be 18.8 bcf/d in 2025 and 24.0 bcf/d in 2030 ie. growth of +13.2 bcf/d to 2025 and +18.4 bcf/d to 2030. India may not be a global LNG game changer by itself like China, but it does support the call that LNG markets rebalance sooner than expected. Our blog also includes our table of LNG projects for 2019 and 2020, which reinforce the potential for LNG growth post 2020. Below is our projection of India's natural gas consumption @15% of Energy mix, and our Supplemental Documents package has our India blog*."

Figure 3: India's Projected Natural Gas Consumption @15% Of Energy Mix (bcf/d)



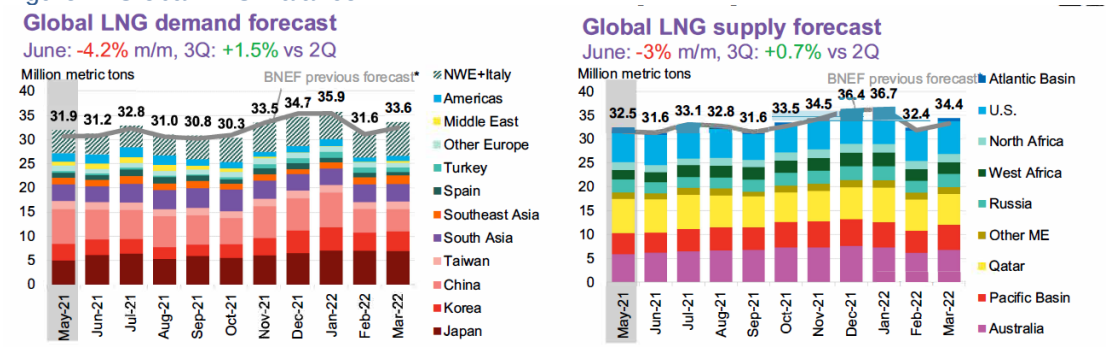
Source: BP, SAF

Natural Gas – Excellent insights from BloombergNEF Global LNG Monthly

Bloomberg's Global LNG Monthly

As usual, there were many great insights and a good near term LNG forecast from BloombergNEF Global LNG Monthly posted on Thurs. We recommend adding to reference libraries. (i) Overall comment is May LNG imports up more than expected, and a solid continued outlook for 2021. But weakness in Europe prices in 2022 ie. challenge for US LNG exports in 2022 to penetrate Europe. (ii) May. Global LNG imports 49.4 bcf/d in May, +5.2% MoM. This is driven by the theme noted from the China Gas Monthly – China saw the biggest surge in LNG imports. "*Global trends: May imports higher than expected as China took more LNG".* (iii) June down small to 49.0 bcf/d. "*June LNG imports are forecast to be 30.6 million tons, 4.2% lower than May. Imports over 30 could be 1.5% higher than 20".* (iv) Solid LNG prices in H2/21. "*Asia spot prices: BNEF forecasts JKM to range between $9.5-$10.3/MMBtu over 3Q-4Q".* (v) "*China gas balance: LNG imports forecast revised up on higher gas demand in power."*. Good graph that shows higher China pipeline imports and higher China domestic natural gas production – the two key themes why China LNG imports are not increasing at higher rates. (vi) *"Europe LNG outlook: Tightness to persist despite momentum in storage injections".* Europe gas storage to enter winter 2021/2022 at much lower YoY levels. (vii) Don't specifically say its because of Nord Stream 2, but their 2022 Europe forecast looks much weaker than might be expected absent a Nord Stream 2 impact especially since they note that Europe will start winter 2021/2022 with low gas storage levels. Interestingly, they show much higher Q1/22 Europe LNG imports YoY, which must be linked to there being less winter demand in Asia next year. Note the TTF Futures price included above. Our Supplemental Documents package includes excerpts from the Global LNG Monthly.

Figure 4: Global LNG Balance



*Source: BloombergNEF, Bloomberg Terminal's AHOY JOURNEY <GO> (historical). Note: M/m is month-on-month and y/y is year-on-year . *Previous forecast is as per previous Global LNG Monthly (web | terminal). **Numbers shown on chart are revised LNG forecast.** Refer to appendix for country breakdown of regions*

Source: BloombergNEF

Many LNG tidbits not noted in our Energy Tidbits memos

One of the reasons why we the Global LNG Monthly is that it is also a good check on items we haven't, but probably should/could have in our Energy Tidbits memos. (i) Reminder restoration of Libya oil and gas means more natural gas via pipeline to Spain and Italy. BloombergNEF doesn't mention the name Libya but said "*cheaper pipeline imports replace LNG in Spain and Italy"* and this means Libya. (ii) "*Sempra Energy delays FID on its Port Arthur LNG project to 2022 due to the effect of the pandemic and emissions considerations*." (iii) "*Total will resume work at Papua LNG, aiming to reach FID in 2023; project will be integrated with ExxonMobil's existing LNG plant*." (iv) One of the themes we have been highlighting is that CCS will be made part of US Gulf Coast LNG export projects . BloombergNEF wrote "*Cheniere and Sempra aim to add ccs to their LNG plants. Sempra is also considering*

renewable power and hydrogen production". (v) Maintenance at Australia LNG reduced Australia LNG exports by 1.1 bcf/d MoM in May. "*Australian exports fell 15% m/m to 5.9m tons. Maintenance at Gladstone, lchthys and Darwin reduced output by a total of 0. 7m tons m/m, while repairs at Gorgon reduced output by four cargoes m/m."* (vi) Little surprised they did not mention the tight Japan power reserve for the summer, but did say "*China and Japan could take more LNG than expected due to rising power demand*". (vii) Our Energy Tidbits noted the lower Japan and Korea LNG storage levels, the Global LNG Monthly includes graphs for both.

Natural Gas – Environment groups try to stop Woodside Scarborough LNG

Woodside Scarborough under fire by environmentalists

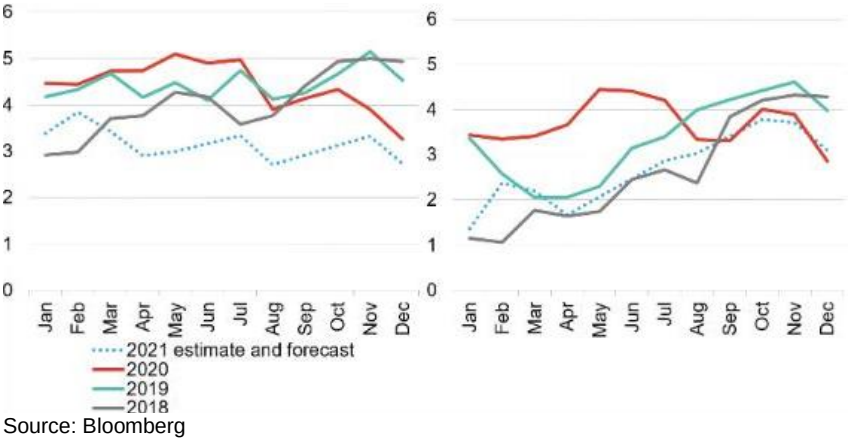
The Woodside & BHP Scarborough to Pluto LNG project is coming under fire by the Conservation Council of Western Australia (CCWA) and the Australian Institute, whose joint research stated the project would release annual carbon pollution equal to over 15 new coal fire power stations [LINK]. The CCWA estimates that Scarborough would release 1.69bn tonnes of GHG over the life of the project and increase Western Australia's total emissions by almost 5%, or 4.4 tonnes per year. Other considerations were raised about the possibility of impacting submerged Indigenous rock art on the sea floor where part of the pipeline will run. Further, experts have raised concerns that acid gas emissions from LNG processing is eroding Murujuga Rock art, which is proposed for World Heritage Listing. The CCWA went on to warn shareholders that Woodside's emissions reductions target falls short of what is required under the Paris Agreement, describing them as empty promises and greenwashing. They recommended that shareholders and investors decline to invest in the project and urge them to engage with Woodside against the development.

Natural Gas – Japan/Korea LNG inventories provide support for LNG in Q2

Japan/Korea LNG inventory

Its been a good Q2 in Asia for LNG markets. Later in the memo, we note China LNG imports in May were at very high levels. On Monday, Bloomberg reported that both Japan and South Korea had LNG inventory draws in April (Japan: -19.21 bcf, Korea: -24.01 bcf), which is unusual at the end of the winter season; typically during April LNG importers are building up their stockpiles in anticipation for shoulder season. As a result, both countries are finding their LNG inventory/supply lower than normal ahead of peak summer demand with the Olympics adding even more potential demand in Japan. The Japan LNG inventory draws in April also tie to a key theme that we started to highlight in our May 11, 2021 tweet [LINK] "*Japan will want to keep #LNG tanks topped up until worst is over. Japan summer peak power reserve only 3.7-3.8%. Positive for LNG & US LNG, less cargos redirected to refill EU storage. Imagine the AC bill if they had 0.5 mm visitors for olympics. Thx @SStapczynski #NatGas #OOTT*." Japan has very low electricity reserves going into the summer and that they will want to keep their LNG tanks topped up more than normal for the summer until they get thru any potential electricity crunchy. Note that if any US areas have reserve margins below 10%, its generally considered some sort of critical situation. The support for LNG prices is only increasing as we get closer to peak summer demand, signalling a possible supply crunch. Below is a Bloomberg chart showing the dwindling LNG inventories in Japan and South Korea. Our Supplemental Documents includes the Bloomberg Report.

Figure 5: Japan (LHS) and Korea (RHS) LNG Inventories (million metric tons)



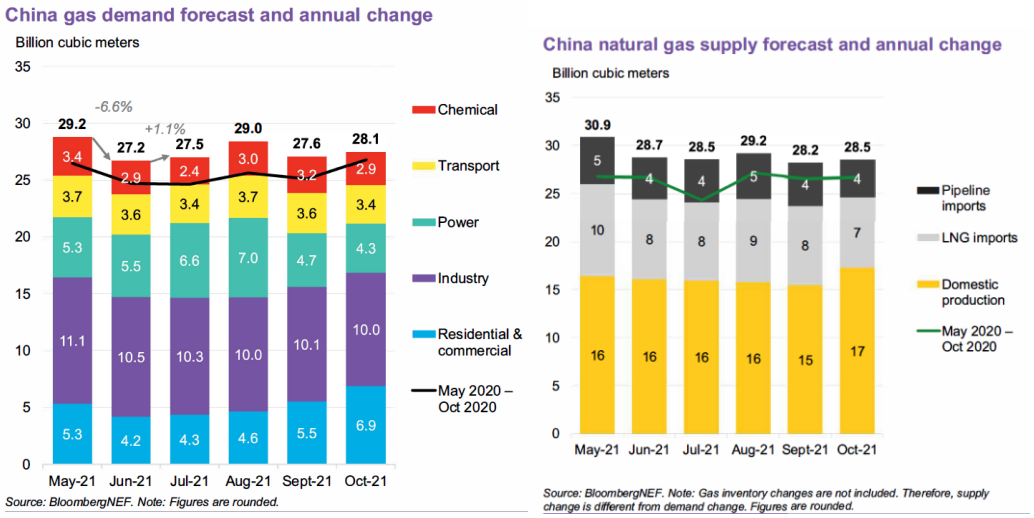
Source: Bloomberg

Bloomberg's China Gas Monthly

Natural Gas – Excellent insights from BloombergNEF China Gas Monthly

There was another excellent monthly BloombergNEF report this week – its China Gas Monthly. We recommend adding to reference libraries. (i) On Thursday, we tweeted [LINK] on the big surprise from China in May "*ICYMI. Key reason for strong LNG, China new record LNG imports in May so kept its #LNG cargoes in May and didn't redirect to Europe. Thx @BloombergNEF Lujia Cao & Daniela Li for China Gas Monthly. #NatGas".* BloombergNEF *estimates China "LNG imports surged 26.1 % year-on-year in May, reaching 7 .2 million metric tons, up 13% from April."* This is 11.2 bcf/d in May and 9.9 bcf/d in April. *BloombergNEF said "China's LNG imports in May surprisingly reached a new record, higher than last November when the country entered peak heating season".* We don't want to take away from the strong May LNG imports, but the data we have from China Customs shows the records were in Dec of 11.76 bcf/d and Jan of Jan of 13.15 bcf/d. But this would be #3. And this would be the first >10 bcf/d not in a Nov, Dec, or Jan. (ii) BloombergNEF doesn't say this but, we have been highlighting how the cold winter and strong Asia LNG demand has kept Asian LNG cargos from being redirected to Europe and why Europe gas storage is so low and not catching up. (iii) BloombergNEF does expect lower LNG imports in June and July. This makes sense given BloombergNEF estimates China domestic gas production +1.6 bcf/d YoY in June/July, and China pipeline gas imports +1.4 bcf/d YoY in Q2/21. (iv) BloombergNEF estimates China apparent gas consumption +11.1% YoY in June/July to 31.7 bcf/d. This is down from May of 33.3 bcf/d. (v) But BloombergNEF warns that there could be some upside to summer LNG demand as they warn on power shortages in 3 provinces that import LNG. BloombergNEF wrote "*Five Chinese provinces (Guangdong, Jiangsu, Shandong, Zhejiang and Yunnan) have warned of power shortages in the upcoming summer. Three are coastal provinces which also import LNG -Guangdong, Jiangsu and Zhejiang - which also have the largest gas power fleets. A resurgence in activity from businesses and factories is the main reason for strong power demand. High temperatures are also boosting air-conditioning demand, while low rainfall in Yunnan province means less hydropower supply".* Note populations for the coastal provinces are Guangdong 115 mm, Jiangsu 80 mm, and Zhejiang 57 mm. Shangdong is 102 mm and Yunnan is 48 mm. Our Supplemental Documents package includes excerpts from China Gas Monthly.

Figure 6: China Gas Demand and Supply



Source: BloombergNEF

Natural Gas – Novak & Putin expects Nord Stream 2 completed by year end

Construction on Nord Stream 2 to be completed by end of 2021

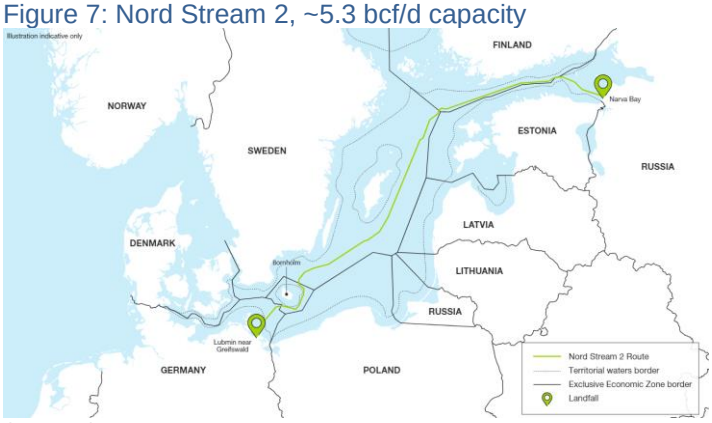
Last week's (May 30, 2021) Energy Tidbits highlighted Biden's effective agreement to let Nord Stream 2 go ahead by saying "*To go ahead and impose sanctions now I think is counterproductive to our European relations no matter how strongly I feel.*" By effectively standing down the question become when will Nord Stream 2 be in-service. We have been expecting a completion date in Q4/21. The reason we keep highlighting Nord Stream 2 is that it will impact Europe gas markets in 2022 and therefore impact US LNG exports to Europe. On Thursday, TASS reported [LINK] on comments made by Russian Deputy Prime Minister Alexander Novak at the St. Petersburg forum that he expects that the remaining 100 km of Nord Stream 2 will be completed by the end of 2021. Novak stated *"The work continues, it has not stopped. The operator with the companies that participate in the project continue its implementation. We hope that this work will be completed by the end, perhaps this year. Depends on the builders, technological and technical conditions, weather conditions."* The pipeline will have a total capacity of ~5.3 bcf/d and will carry gas from the coast of Russia through the Baltic Sea to Germany. Putin's speech at the St. Petersburg forum also highlighted Nord Stream 2. Putin didn't give a timeline but said the "*pipe laying is over*" and "*To sum up, Gazprom is ready to fill Nord Stream 2 with gas. This route will create direct links between the Russian and German systems and will ensure energy security and reliable gas supplies for the Europeans, like Nord Stream 1. I must add that this project is profitable economically and fully conforms to the most stringent environmental and technical requirements*." We have included a map of the project below. Our Supplemental Documents includes a translated version of the TASS release and the Kremlin transcript of Putin's Nord Stream 2 comments.

OMV and Uniper both expect Nord Stream 2 this year

OMV and Uniper both spoke at the St. Petersburg Forum, so no surprise they both commented on Nord Stream 2. (i) OMV. TASS reported [LINK] "*The head of the Austrian OMV Rainer Seele maintains a forecast for the completion date of the Nord Stream 2 gas pipeline this year. The project is of great environmental importance, he told reporters on the sidelines of the SPIEF. "This year," he said, answering the question if there are any suggestions when the construction of Nord Stream 2 will be*

completed." (ii) Uniper. Bloomberg terminal reported "*There are "optimistic signals" from the project operator that the completion of the Nord Stream 2 pipeline is "not far away," Klaus-Dieter Maubach, CEO of Unipec, which has co-financed the project, told reporters at the St. Petersburg International Economic Forum.* "The Biden administration is now looking at Nord Stream 2 from a different angle so I'm looking forward to seeing that pipeline being commissioned," Maubach said".*

Figure 7: Nord Stream 2, ~5.3 bcf/d capacity



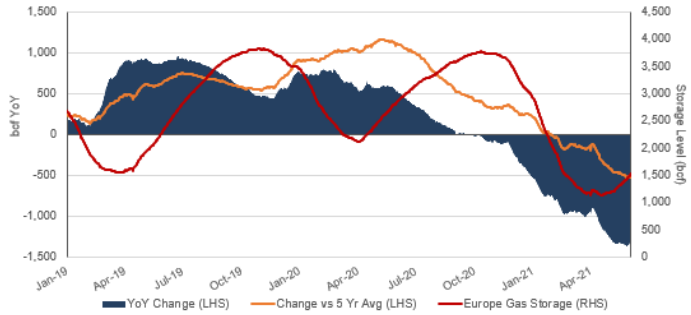
Source: Gazprom

Europe gas storage 38.77% full

Natural Gas – Europe storage 38.77% full vs 5 year average of 52.97%

We continue to see the set up for strong summer LNG price, which should support strong US LNG exports to Europe. It was cold through March and into April which had delayed the refill push in Europe and this is setting up support for summer prices. There was a big draw in Europe gas storage this winter so no surprise it was a good winter for LNG prices. Additionally, the significant YoY deficit in Europe gas storage at the end of winter indicates that there will be strong demand for European LNG imports during the refill push especially since Russia looks like it only plans to ship contract volumes via Ukraine to Europe ie. not sending above contract levels. This is a big positive indicator for US LNG exports this summer. Europe gas storage started the winter (Nov 1) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1. This 65.77% decline since Nov 1 compares to the 5 yr average that would be down 53.99% in the same period or to last winter that was only down 43.29% in the same period. So massive draw vs last year and the last 5 years. Storage at Apr 1 of 28.90% had looked to be the bottom for withdrawal season as the storge level subsequently increased 2.06% to 30.96% on April 6. However, cold weather continuing into the second half of April had further delayed the refill push as flows switch from injections between April 1-6, to draws once again. This had resulted in the longest withdrawal season in history, supporting Europe LNG cargo prices. We are now seeing storage starting to build, with storage as of June 3 being up 9.64% since April 19, which looks to be the bottom. Storage as of June 3 is 38.77%, 34.72% less than last year of 73.49% and 14.20% below the 5 yr average of 52.97%. Europe storage levels this summer will be the key item to watch for indications on LNG markets going into the winter. Below is our graph of YoY change in net LNG flows to NW Europe.

Figure 8: Europe Gas Storage Level



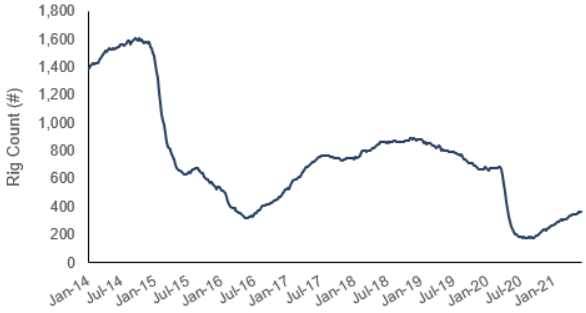
Source: Bloomberg

Oil – US oil flat WoW at 359 oil rigs

US oil rigs flat at 359 this week

Baker Hughes reported its weekly rig data on Friday. Nothing really stands out in this week's data other than the fact it isn't increasing despite WTI pushing $70. US oil rigs were flat this week at 359 oil rigs as of June 4. The Permian was also flat this week at 232 rigs. Increases came from Ardmore Woodford (+1) and Eagle Ford (+1). Decreases this week were from Granite Wash (-2). Oil rigs have been on a strong recovery path and are +187 off the bottom of 172 in the Aug 14 week US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 324 to 359 oil rigs (-47.44%). Below is our graph of Baker Hughes US oil rigs.

Figure 9: Baker Hughes Total US Oil Rigs



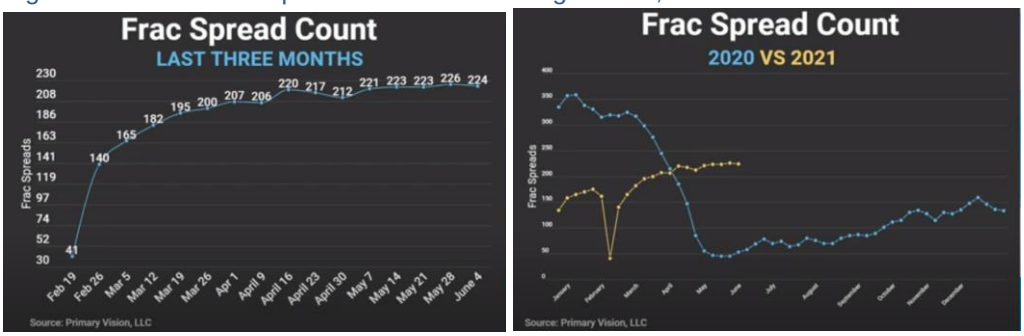
Source: Baker Hughes

Oil – Frac spreads -2 to 224 for week ending June 4

Frac spreads -2 to 224

Every week, Mark Rossano (C6 Capital Holdings) posts a YouTube recap of frac spreads for the week on the Primary Vision Network [LINK]. US frac spreads were -2 to 224 for the week ended June 4. The decline was in smaller basins like the Cherokee. This is in line with his expectation that we would be in the level before moving into a steady grind up starting next week. Not a big gap up, rather a steady move to about 235 spreads by the end of June. The 235 spread makes sense to him as he thought about where the Williston is now and can pick up several spreads in Texas. Also starting to hear from the E&Ps that will be starting to pick up rigs and additional spreads in July. He also highlighted again the rising labor, steel and other costs that have to be passed thru on OFS contracts. Below are his two key frac spread graphs.

Figure 10 Active Frac Spreads for Week Ending June 4, 2021



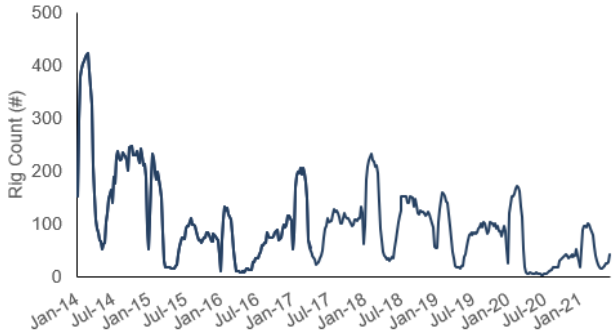
Source: Primary Vision

Oil – Total Cdn rigs 4 to 62 total rigs and up 42 YoY

Cdn rigs +4 this week

We are seeing Cdn rigs start their post Spring Break ramp up. Baker Hughes reported total Cdn rigs were up +15 this week to 77 total rigs. We expect Cdn to continue to ramp up faster this month. Cdn oil rigs were up 15 to 43 rigs. Cdn gas rigs were flat this week at 34 gas rigs. Total rigs are now +64 since the June 26 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 7 and Cdn gas rigs were 14 for a total Cdn rigs of 21, meaning total Cdn rigs are +56 YoY and total rigs are down 26 vs 2019. Below is our graph of Baker Hughes Cdn oil rigs.

Figure 11: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production -0.2 mmb/d to 10.8 mmb/d

US oil production -0.2 mmb/d WoW

US oil production was down 0.2 mmb/d to 10.8 mmb/d for the May 28 week. Lower 48 was -0.20 mmb/d to 10.4 mmb/d. This puts US oil production down 0.4 mmb/d YoY, and is down 2.3 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The EIA May STEO revised down US oil production for the remainder of 2021 and is still not returning anywhere near the Q4/19 peak of 12.78 mmb/d, with Q4/21 US crude of 11.34 mmb/d (down 1.44 mmb/d from peak). YoY growth returns in 2022 with production averaging 11.84 mmb/d, +0.82 mmb/d YoY (was 11.86 mmb/d previously), with Q4/22 production of 12.21 mmb/d, ie still down 0.57 mmb/d from Q4/19. In the US oil production commentary, the EIA wrote *"We estimate that production outages were generally limited to February and that U.S. crude oil production rose to 10.9 million b/d in March and to almost 11.0 million b/d in April. Because the average price of West Texas Intermediate crude oil remains above $55/b in our forecast, we expect producers will drill and complete enough wells in the coming months to offset declines at existing wells".* The EIA DPR has the expectation of slight MoM increases in May and June. The EIA forecasts June at 7.733 mmb/d which is +26,000 b/d MoM. The EIA Form 914

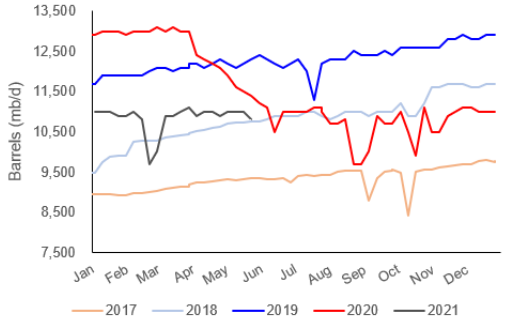
actuals for March came in 209,000 b/d higher than the EIA weekly estimates for March, which was likely due to the estimates being too low and not capturing the rapid return to production.

Figure 12: 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
2019-Jan	01/04	11,700	01/11	11,900	01/18	11,900	01/25	11,900		
2019-Feb	02/01	11,900	02/08	11,900	02/15	12,000	02/22	12,100		
2019-Mar	03/01	12,100	03/08	12,000	03/15	12,100	03/22	12,100	03/29	12,200
2019-Apr	04/05	12,200	04/12	12,100	04/19	12,200	04/26	12,300		
2019-May	05/03	12,200	05/10	12,100	05/17	12,200	05/24	12,300	05/31	12,400
2019-Jun	06/07	12,300	06/14	12,200	06/21	12,100	06/28	12,200		
2019-Jul	07/05	12,300	07/12	12,000	07/19	11,300	07/26	12,200		
2019-Aug	08/02	12,300	08/09	12,300	08/16	12,300	08/23	12,500	08/30	12,400
2019-Sep	09/06	12,400	09/13	12,400	09/20	12,500	09/27	12,400		
2019-Oct	10/04	12,600	10/11	12,600	10/18	12,600	10/25	12,600		
2019-Nov	11/01	12,600	11/08	12,800	11/15	12,800	11/22	12,900	11/29	12,900
2019-Dec	12/06	12,800	12/13	12,800	12/20	12,900	12/27	12,900		
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		

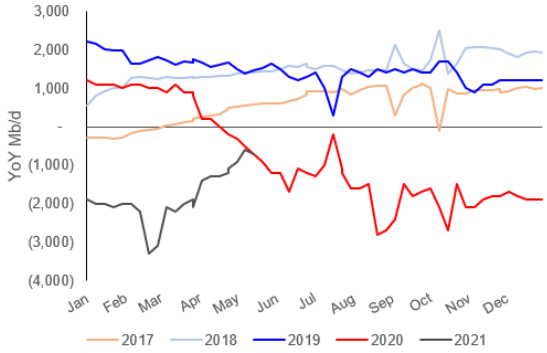
Source: EIA

Figure 13: US Weekly Oil Production



Source: EIA, SAF

Figure 14: YoY Change in US Weekly Oil Production



Source: EIA, SAF

Oil – A reminder the weekly SPR inventory data comes out a day before EIA data

Get a jump on oil inventory data with SPR on Tues

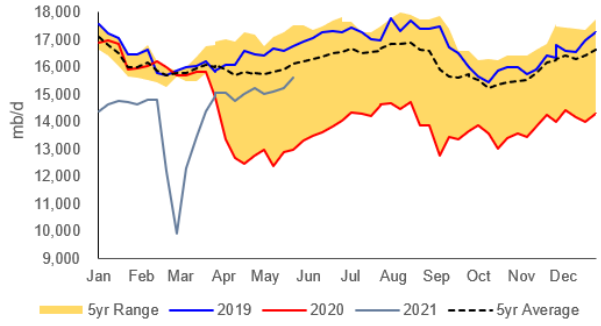
The EIA normally releases its weekly oil inventory data on Wednesdays except on weeks with a Monday holiday that push the oil inventory data back to Thursdays. On Thursday, we tweeted a reminder on the timing of the weekly US SPR data [LINK] *"US Strategic Petroleum Reserve weekly inventory changes typically don't impact #WTI price, reminder @ENERGY posts weekly #SPR inventory changes a day before @EIAgov weekly #Oil inventory data on Wed. Draw of 0.7 mmb for week ending May 28. #OOTT"* [LINK]. Although the SPR weekly inventory changes typically don't change WTI's price, you can get a jump on the inventory data on Tuesdays.

Oil – Refinery inputs +0.358 mmb/d YoY to 15.597 mmb/d

Refinery crude oil input still below 5 yr avg

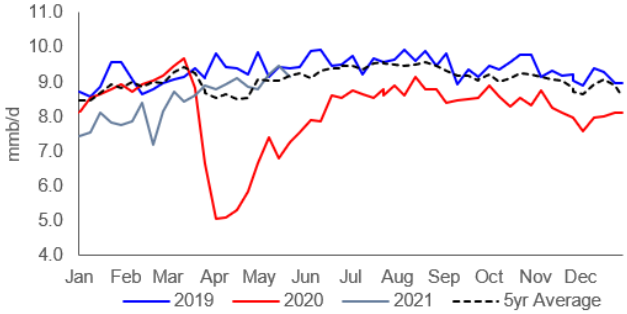
Crude inputs to refineries were up this week and were +0.358 mmb/d to 15.597 mmb/d, and are +2.29 mmb/d YoY. Refinery utilization was up 1.7% this week at 88.7%, which is +16.9% YoY and is the first time fuel makers have operated at pre-pandemic levels. Total products supplied (ie. demand) decreased this week, with a 0.817 mmb/d decrease to 19.140 mmb/d, and motor gasoline supplied was down being -0.333 mmb/d to 9.146 mmb/d. Gasoline consumption in the US is expected to rise, with the EIA writing in their 2021 Summer Fuels Outlook [LINK] *"We forecast that gasoline consumption in 2021 will peak in August at 9.1 million b/d, which is up from 8.5 million b/d in August 2020 but down from the 9.8 million b/d in August 2019. We forecast that 2021 summertime gasoline consumption will average almost 8.8 million b/d, a 1.0 million b/d (13%) increase from 2020 but a 0.7 million b/d (7%) decrease from summer 2019"*. Below is our graph of crude inputs to US refineries and our graph of US motor gasoline supplied.

Figure 15: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

Figure 16: US Motor Gasoline Supplied (mmb/d)



Source: EIA, SAF

Oil – Covid outbreaks at oil sands unchanged this week

Oil sands projects continue to be hit by Covid

The Fort McMurray area may still be one of the hotspots for Covid in Alberta, but similar to all of Alberta case numbers are going down at a very fast rate. The last Wood Buffalo Covid update is as of June 1 [LINK] and, for Fort McMurray, has 423 active cases and 532.6 cases per 100,000 population, which is down ~2/3 since the May 19 update that had 1,268 active cases and 1,596.6 cases per 100,000 population. However, there are still the outbreaks at oil sands facilities that are unchanged in terms of number of facilities still being called outbreaks in the June 1 update vs the May 28 update that was referenced in our May 30, 2021 Energy Tidbits and also unchanged vs the May 19 update that was referenced in our May 23, 2021 Energy Tidbits. Below, we pasted the oil sands facilities listed in the May 19, 25, 26, 28 and June 1 updates. The Wood Buffalo June 1 Covid update is attached.

Figure 17: Oil Sands Facilities With Covid Outbreaks at May 19, 25, 26, 28

June 1	May 28	May 26	May25	May 19
Outbreaks in RMWB	**Outbreaks in RMWB**	**Outbreaks in RMWB**	**Outbreaks in RMWB**	**Outbreaks in RMWB**
Industrial:	**Industrial:**	**Industrial:**	**Industrial:**	**Industrial:**
MEG Energy	MEG Energy	MEG Energy	MEG Energy	MEG Energy
CNRL Horizon	CNRL Horizon	CNRL Horizon	CNRL Horizon	CNRL Horizon
CNRL Albian	CNRL Albian	CNRL Albian	CNRL Albian	CNRL Albian
CNRL Jackfish	CNRL Jackfish	CNRL Jackfish	CNRL Jackfish	CNRL Jackfish
Kearl Lake	Kearl Lake	Kearl Lake	Kearl Lake	Kearl Lake
Civeo Lynx Lodge	Civeo Lynx Lodge	Civeo Lynx Lodge	Civeo Lynx Lodge	Civeo Lynx Lodge
Civeo McClelland Lake	Civeo McClelland Lake	Civeo McClelland Lake	Civeo McClelland Lake	Civeo McClelland Lake
Wapasu Creek Lodge	Wapasu Creek Lodge	Civeo Beaver River Lodge	Civeo Beaver River Lodge	Wapasu Creek Lodge
Civeo Athabasca	Civeo Athabasca	Wapasu Creek Lodge	Wapasu Creek Lodge	Civeo Athabasca
Cenovus Sunrise Lodge	Cenovus Sunrise Lodge	Civeo Athabasca	Civeo Athabasca	Cenovus Sunrise Lodge
Suncor Base Plant	Suncor Base Plant	Cenovus Sunrise Lodge	Cenovus Sunrise Lodge	Suncor Baseplant
Suncor Firebag	Suncor Firebag	Suncor Base Plant	Suncor Baseplant	Suncor Firebag
Suncor Mackay River	Suncor Mackay River	Suncor Firebag	Suncor Firebag	Suncor Mackay River
Syncrude Mildred Lake	Syncrude Mildred Lake	Suncor Mackay River	Suncor Mackay River	Syncrude Mildred Lake
Syncrude Aurora	Syncrude Aurora	Syncrude Mildred Lake	Syncrude Mildred Lake	Syncrude Aurora
Suncor Fort Hills	Suncor Fort Hills	Syncrude Aurora	Syncrude Aurora	Suncor Fort Hills
CNOOC Long Lake	CNOOC Long Lake	Suncor Fort Hills	Suncor Fort Hills	CNOOC Long Lake
Oilsands Industrial Lodge - Fort McKay	Oilsands Industrial Lodge - Fort McKay	CNOOC Long Lake	CNOOC Long Lake	Oilsands Industrial Lodge - Fort McKay
		Oilsands Industrial Lodge - Fort McKay	Oilsands Industrial Lodge - Fort McKay	

Source: Wood Buffalo

Oil – Suncor base plant turnaround to finally start in Aug

Suncor turnaround starts in Aug

On Friday afternoon, Suncor posted [LINK] "*Base Plant Planned Maintenance Event. Our 2021 maintenance event is re-scheduled to begin in August at our Base Plant operation, located 25 km north of Fort McMurray, Alberta. To ensure a successful event, which will encompass maintenance within the Upgrading, Extraction and Energy & Utilities areas, our maintenance contractors require approximately 2500 professional skilled tradespeople."* This is the long delayed turnaround for its 130,000 b/d U2 upgrader that was originally scheduled to start in May, but has been delayed with the Covid hit to the oil sands regions. We first warned on this risk in our April 11, 2021 Energy Tidbits but it took until April 19 to see reports that there was going to be delay. The issue was that the oil sands projects had to coordinate their turnarounds due to Covid hitting the trades.

Oil – US "net" oil imports up 0.248 mmb/d to 3.087 mmb/d

US "net" oil imports +0.248 mmb/d WoW

US "NET" imports were up 0.248 mmb/d to 3.087 mmb/d for the May 28 week. US imports were down 0.641 mmb/d to 5.631 mmb/d. US exports were down, being -0.889 mmb/d to 2.544 mmb/d. The WoW decrease in US oil imports was driven by decreases from Canada, Iraq and Saudi Arabia. Some items to note on the by country data. (i) Canada was down this week, and was -0.402 mmb/d to 3.147 mmb/d for the May 21 week, which is now ~0.552 mmb/d below the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was down 89,000 b/d to 0.188 mmb/d this week. (iii) Colombia was up 144,000 b/d to 0.185 mmb/d this week. (iv) Ecuador was down 3,000 b/d to 226,000 b/d. (v) Iraq was down 21,000 b/d to 163,000 b/d.

(v) Venezuela remained at 0 due to US sanctions. (vi) Mexico increased 41,000 b/d to 0.702 mmb/d.

Figure 18: US Weekly Preliminary Oil Imports By Major Countries

	Apr 02/21	Apr 09/21	Apr 16/21	Apr 23/21	Apr 30/21	May 07/21	May 14/21	May 21/21	May 28/21	WoW
Canada	3,414	3,367	2,901	3,492	3,232	2,924	3,806	3,549	3,147	-402
Saudi Arabia	258	181	358	480	178	224	424	277	188	-89
Venezuela	0	0	0	0	0	0	0	0	0	0
Mexico	635	739	451	608	467	434	692	661	702	41
Colombia	258	209	111	294	307	278	325	71	185	114
Iraq	245	223	34	270	41	235	199	184	163	-21
Ecuador	284	295	172	225	318	257	80	229	226	-3
Nigeria	161	129	71	119	95	157	73	29	169	140
Kuwait	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0
Top 10	5,255	5,143	4,098	5,488	4,638	4,509	5,599	5,000	4,780	-220
Others	1,009	709	1,307	1,128	813	979	812	1,273	851	461
Total US	6,264	5,852	5,405	6,616	5,451	5,488	6,411	6,273	5,631	-138

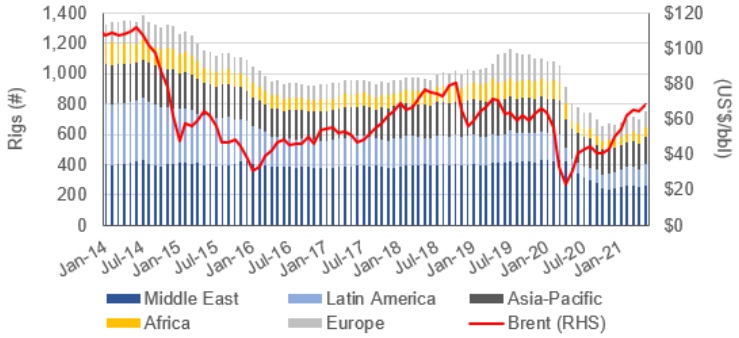
Source: EIA, SAF

Oil – Baker Hughes International rigs +55 MoM to 750 rigs in May

Asia Pacific and Lat Am drove increase

Baker Hughes released its updated international rig counts for May on Friday which showed an increase back to levels higher than before last month's modest decline. International activity had been increasing modestly but May showed a large increase and May is only down 7% YoY, but still down 33% vs March 2019. Total international rigs increased 55 MoM to 750 in May. The MoM increase was mainly driven by an 18 rig increase in Latin America, APAC +16, and the Middle East +14. The largest increase in Latin America was Argentina which had bounced back up by +12 rigs MoM to 45 as it gets back to drilling the Vaca Muerta. Within Asia Pacific, Indonesia had the largest increase at +6 followed by Australia at +5 and Vietnam at +3 MoM. The increase in the Middle East was driven by an addition of 6 rigs in Saudi Arabia. No regions showed decreases in May. Below is our graph of international rigs by region and avg monthly Brent price.

Figure 19: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg

Oil – Colombia low capex/drilling in 2020 results in oil reserves down 11% YoY

Colombia's oil reserves down 11% YoY

The low level of capex and drilling in Colombia has been showing up in the production data even before the recent shut-ins caused by protests. The protests continue to impact more fields (ie. Fronterra announced it was shutting in a 3,500 boe/d field this week). Our recent May 23, 2021 Energy Tidbits noted the government estimates that, at that time, the anti-governmental protests and road blockades had shut-in 55,000 b/d in the second week of May. The protests did not impact 2020 and the low level of drilling. This week, we saw how

the low level of 2020 activity has hit Colombia's oil reserves. On Wednesday, we tweeted on Wednesday [LINK] *"Colombia #Oil sector challenges aren't fixed overnight or whenever protests end. Low drilling in 2020 led to lower 2020 oil production and now proven oil reserves -11% YoY to 1.8b barrels or only 6.3 yr RLI. Need a burst of new capex. Thx @Bloomberg @omedinacruz #OOTT".* A proved RLI of only 6.3 does not provide a strong platform for extensive output growth unless additional exploration and development capital is allocated. Gas reserves had also declined significantly in 2020, falling 6.8% YoY to 2.949 bcf or 7.7 years. Our Supplemental Documents package includes the Bloomberg report.

Oil – Russia crude production ~95,000 b/d above their May quota

Russia production increases

Russian oil output was almost flat in May amidst a larger OPEC+ quota, which was originally granted to the country as an exception was extended to the entire alliance. On Wednesday, Bloomberg reported Russian crude and condensate production in May was about 10.453 mmb/d, practically flat from April output. The official Russian data doesn't split out crude vs condensate, but if Russia's condensate production is in line with April, about 940,000 b/d, crude output would be 9.513 mmb/d, ~95,000 b/d above their 9.379 quota. Russia has been allowed to add back a small amount of production each month since Jan, but output was flat between April and May. Russia's quota will increase by 116,000 b/d by July reaching 9.495 mmb/d. Our Supplemental Documents package includes the Bloomberg report.

Oil – Bloomberg OPEC survey data, up 320,000 b/d to 25.560 mmb/d

Bloomberg OPEC survey for May

The Bloomberg survey of OPEC May oil production was released this week, which showed a MoM increase in production, mainly due to Saudi Arabia returning some of their 1 mmb/d voluntary cut. There were no major surprises in the production levels. Total production increased 320,000 b/d MoM in May to 25.560 mmb/d. The increases were primarily driven by Saudi Arabia, which was up 350,000 b/d this month. This was no surprise as the Kingdom had moved to a higher production target and reversed 250,000 b/d of its voluntary cut it had made previously in support of the market. Saudi Arabia is still 0.772 mmb/d below its May quota of 9.232 mmb/d. Iran was down 10,000 b/d in May, to 2.400 mmb/d. Venezuela was down 20,000 MoM at 470,000 b/d. We were a little surprised to see Venezuela down MoM given reports of PDV allocating an increasing amount of diluent to crank up Merey production and load tankers ahead of the $30/bl China tax on diluted bitumen. Venezuela is up 130,000 b/d since their June 2020 low. Below is our table of the Bloomberg survey data.

Figure 20: Bloomberg Survey Of OPEC Production

thousand b/d	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	**May**	MoM	YoY	May Quota
Algeria	820	810	810	870	870	870	860	860	880	880	880	880	**890**	10	70	887
Angola	1,270	1,240	1,180	1,250	1,270	1,230	1,180	1,180	1,180	1,100	1,200	1,150	**1,120**	-30	-150	1,283
Congo	290	300	280	290	310	260	290	270	270	260	290	270	**270**	0	-20	273
Equatorial G.	100	130	120	120	100	110	110	130	130	100	120	120	**100**	-20	0	107
Gabon	190	220	160	160	180	200	190	190	170	190	180	190	**180**	-10	-10	157
Iran	1,950	1,940	1,960	1,920	1,950	1,930	1,970	2,020	2,140	2,180	2,350	2,410	**2,400**	-10	450	
Iraq	4,210	3,910	3,790	3,690	3,710	3,870	3,810	3,880	3,870	3,910	3,940	3,950	**3,960**	10	-250	3,905
Kuwait	2,290	2,150	2,220	2,270	2,310	2,300	2,240	2,270	2,330	2,350	2,320	2,320	**2,350**	30	60	2,358
Libya	90	110	100	80	150	450	1,090	1,210	1,160	1,150	1,220	1,140	**1,140**	0	1,050	
Nigeria	1,630	1,510	1,510	1,520	1,490	1,610	1,540	1,520	1,470	1,600	1,550	1,590	**1,530**	-60	-100	1,535
Saudi Arabia	8,660	7,530	8,450	8,920	8,940	8,990	8,990	9,000	9,120	8,210	8,150	8,110	**8,460**	350	-200	9,232
UAE	2,500	2,430	2,450	2,990	2,680	2,490	2,560	2,540	2,610	2,630	2,630	2,620	**2,690**	70	190	2,659
Venezuela	550	340	360	310	310	340	430	410	460	470	490	490	**470**	-20	-80	
Total OPEC	24,550	22,620	23,390	24,390	24,270	24,650	25,260	25,480	25,790	25,030	25,320	25,240	**25,560**	320	1,010	22,396

Source: Bloomberg

Oil – No change to OPEC+ cut schedule

No change to OPEC+ plans

The OPEC+ ministerial meeting turned out to be the shortest in history at less than 30 minutes because they didn't have to deal with the expected immediate return of some Iran

barrels. Without having to debate addition Iran barrels coming back on the market in July, the OPEC+ Ministerial Meeting on Tuesday [LINK] was quick and they decided to make no changes to the current cut schedule as agreed to last month. OPEC noted that market fundamentals were continuing to strengthen – oil demand is showing clear signs of recovery and OECD stocks have been falling. The OPEC release also noted that that the conformity to the cuts in March was 114%. The compensation period runs to the end of September 2021. Below is the current OPEC+ cut schedule. Our Supplemental Documents package includes the OPEC release.

Figure 21: OPEC+ Cut Schedule

OPEC (mmb/d)	Reference Level Production	May-July 2020	Aug-Dec 2020	Jan 2021	Feb 2021	March 2021	April 2021	May 2021	June 2021	July 2021	Jan/21 - Apr/22 per Apr/20 Agreement
Algeria	1,057	816	864	876	876	876	876	887	898	912	912
Angola	1,528	1,179	1,249	1,267	1,267	1,267	1,267	1,283	1,298	1,319	1,318
Congo	325	251	266	269	269	269	269	273	276	281	281
Equatorial G.	127	98	104	105	105	105	105	107	108	110	110
Gabon	187	144	153	155	155	155	155	157	159	161	161
Iran	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Iraq	4,653	3,592	3,804	3,857	3,857	3,857	3,857	3,905	3,954	4,016	4,016
Kuwait	2,809	2,168	2,297	2,329	2,329	2,329	2,329	2,358	2,387	2,425	2,424
Libya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nigeria	1,829	1,412	1,495	1,516	1,516	1,516	1,516	1,535	1,554	1,579	1,579
Saudi Arabia*	11,000	8,492	8,993	9,119	8,119	8,119	8,119	9,232	9,347	9,495	9,495
UAE	3,168	2,446	2,590	2,626	2,626	2,626	2,626	2,659	2,692	2,735	2,735
Venezuela	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total OPEC	26,683	20,598	21,815	22,119	21,119	21,119	21,119	22,396	22,673	23,033	23,031
OPEC vs. ref.	**0**	**-6,085**	**-4,868**	**-4,564**	**-5,564**	**-5,564**	**-5,564**	**-4,287**	**-4,010**	**-3,650**	**-3,652**
*Saudi Arabia quota for Feb-Apr 2021 includes voluntary 1mmb/d cut; May-July includes w ind dow n of voluntary cut											
Non-OPEC	**Reference Level Production**	**May-July 2020**	**Aug-Dec 2020**	**Jan 2021**	**Feb 2021**	**March 2021**	**April 2021**	**May 2021**	**June 2021**	**July 2021**	**Jan/21 - Apr/22 per Apr/22 Agreement**
Russia	11,000	8,600	8,993	9,119	9,184	9,249	9,379	9,418	9,457	9,495	9,495
Kazakhstan	1,709	1,319	1,397	1,417	1,427	1,437	1,457	1,463	1,469	1,475	1,475
Oman	883	682	722	732	732	732	732	741	750	762	762
Azerbaijan	718	554	587	595	595	595	595	603	610	620	620
Malaysia	595	459	486	493	493	493	493	499	506	514	513
Bahrain	205	158	168	170	170	170	170	172	174	177	177
Sudan	75	58	61	62	62	62	62	63	64	65	65
South Sudan	130	100	106	108	108	108	108	109	110	112	112
Brunei	102	79	83	85	85	85	85	86	87	88	88
Total Non-OPEC	15,417	12,009	12,603	12,781	12,856	12,931	13,081	13,154	13,227	13,308	13,307
Non-OPEC vs. ref.	**0**	**-3,408**	**-2,814**	**-2,636**	**-2,561**	**-2,486**	**-2,336**	**-2,263**	**-2,190**	**-2,109**	**-2,110**
Total OPEC+	42,100	32,607	34,418	34,900	33,975	34,050	34,200	35,550	35,900	36,341	36,338
OPEC+ vs ref.	**0**	**-9,493**	**-7,682**	**-7,200**	**-8,125**	**-8,050**	**-7,900**	**-6,550**	**-6,200**	**-5,759**	**-5,762**

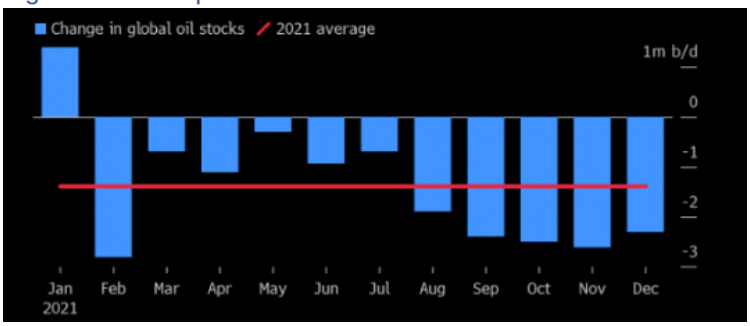
Source: Bloomberg

Oil – OPEC expecting tightening oil supply, draws of over 2 mmb/d from Sept-Dec

OPEC anticipating tightening supply

The big positive to oil markets from the OPEC meetings was OPEC's view of correcting global oil inventories and strong monthly draws from Sept thru Dec. Bloomberg reported on Monday morning on OPEC's updated demand outlook from the JTC meeting. Some items of note are as follows. (i) OPEC sees global oil stocks falling below the 2015-2019 average in July. (ii) OPEC sees oil stocks falling by 1.4 mmb/d in 2021 vs 1.2 mmb/d previously. (iii) The outlook shows sharp stock draws of more than 2 mmb/d from Sept-Dec. (iii) OPEC anticipates that global stocks will fall below their 2015-2019 average in July. (iv) On Tuesday, Bloomberg also reported on the effect of tightening supply on potential future OPEC decisions. Holding back and keeping output steady would support the market against both risks of Iran renewing JCPOA and flooding the market with exports or a renewed virus outbreak. Iran is a critical factor indeed, as estimates are that daily oil output in Iran could rise to about 4 mmb/d from 2.4 mmb/d. However, OPEC Secretary-General said that Iran's return would be *"orderly and transparent,"* as to not cause market instability. Also, the remaining areas of disagreement on JCPOA are rather complicated and Araghchi said *"I'm not sure we can reach a conclusion in this round of talks".* On the other hand, Brent is already up 36% this year to over $70 a barrel. Inflationary pressures could be further exacerbated if there is a supply crunch. Below is a graph showing the anticipated oil stock draws up to December. Our Supplemental Documents package includes the Bloomberg reports.

Figure 22: Anticipated oil stock drawdown



Source: OPEC, Bloomberg

Oil – Abdulaziz doesn't see threats to market stability, so what's his price target

Abdulaziz doesn't see threats to market stabiltiy

We have said many times that oil companies owe a big debt to Saudi Energy Minister Abdulaziz for how he has managed the oil markets from a massive crisis to a position of great strength and increasingly positive outlook. Kudos to Abdulaziz. We are also big fans of him for his comments like his comments to CNBC on Thursday. His comments on La La Land were what was picked up from the CNBC interview, but we tweeted [LINK] on the more interesting comments "*Gotta love KSA Abdulaziz? @_HadleyGamble asks re threats to "price stability". He says no threat to "market stability", "i don't talk about prices anymore". Hmmm, wasn't purpose of 2020 amazing market stabilization to protect a certain #Oil price? See SAF transcript."* We were surprised to get some direct comments from Energy Tidbits readers explaining the theory that the Saudis weren't managing the market for any particular price levels. Lets just say we disagree with them. Later in the memo, we noted Vitol's Mike Muller comments today on the Saudi success in managing the oil market. Rather we thought it was interesting how Abdulaziz sidestepped a direct answer to the CNBC question on risks to price stability. Rather he talked about market stabilization and we, like most, had assumed his work to stabilize markets was to get prices up to certain levels. So our question is what is his targeted price level. Our Supplemental Documents package includes the transcript we made of the CNBC interview.

Oil – JCPOA, US says at least 2 more rounds are needed

JCPOA deal is still weeks away

The surprise to many, including us, was that the parties didn't get to a JCPOA agreement in principle prior to Biden's trip to Europe this week and the Iran Presidential election. No question there were some last minute wrinkles that added to the failure to get to the agreement in principle. On Thursday, we tweeted [LINK] on comments by US State Department spokesman Ned Price that clearly indicate any agreement is still weeks away. Price said the US is expecting at least another two rounds of negotiations will be needed. Price said "*We expect there will be a sixth. I think there's just about every expectation there will be subsequent rounds beyond that. The fact is that we have made progress*". Notwithstanding the delay, Price also seemed to put to bed the risk that the US would only rejoin the JCPOA if there was a broader extended deal. Price was asked if there would be other demands ie. a broader deal. Price says "*Well, what we have said is that as a necessary but insufficient step, we are looking to return to mutual compliance. We are willing to return to compliance with the deal, knowing that, again, the benefits we would accrue from Iran doing the same would profoundly be in our own national interest. I say it's necessary but insufficient because there are follow on steps that we would like to see from there - a longer and stronger Nuclear Deal to address some of the issues that you raised and follow on agreements that address the broader set of threats, challenges we see from the Iranian regime - support for proxies in the region, support for terrorism and terrorist groups, its*

destabilizing activities, its human rights abuses. So again, right now, we are focused on a potential mutual return to compliance because Iran moving closer to having the capacity to quickly develop a nuclear weapon, if it so choose, would make every single challenge we face with Iran all the more difficult. We see halting Iran's nuclear program and rolling it back in significant - deeply significant ways as this first line of business, because it is so important now." Our Supplemental Documents includes Price's comments.

Oil – Saudi nest egg, its net foreign assets -8.1b MoM in March, back to 11 yr bottom

Saudi net foreign assets back to 11 year low

We look at Net Foreign Assets for someone like Saudi Arabia as their nest egg to help them thru the Energy Transition. Saudi is far from going broke, but the data supports that their nest egg has been depleted at a faster rate than most expect, which is why we continue to believe the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money to fund as much as possible. Saudi Arabia saw a significant decline in their net foreign assets in 2020, but also since the peak in 2014. The decline in 2020 was fueled by low oil prices a long with higher spending. This a driving factor for the Saudi's want/need for higher oil prices and, perhaps just as significantly, the increasing of OPM in funding the future of Saudi Arabia. March and April saw Brent average over $65 and but this failed to stabilize Saudi Net Foreign Assets. Saudi net foreign assets declined in April despite the better oil prices. April 30/21 net foreign assets were $436.3b, down YoY vs $442.2b at April 30/20. The peak was $737.0b on Aug 31/14, which means the decline is $300.7b, a massive decline. Saudi net foreign assets had increased off the 11 year bottom seen in Feb, but with the MoM decline in April, it has set a new 11 year low. Our thesis is unchanged, there is a bottom level and that they likely don't want to go below $400b, which is why there has been this huge and increasing push to use OPM across the Saudi industry and government. The decline in Saudi net foreign assets is a positive to oil markets. On Wed, we tweeted [LINK] on the reminder that the decline is not just an increasing use of Other People's Money, its also a reason why Saudi will keep being disciplined to maintain high oil price. Below is our graph of Saudi Arabia net foreign assets.

Figure 23: Saudi Arabia Net Foreign Assets

Source: Bloomberg

Oil – Aramco exploring bond sale to help fund dividend

Aramco looking to issue ~$5b of bonds

As noted above, the declining Saudi net foreign assets has been a big reason the push for OPM has accelerated as of late. Saudi Arabia is in need of additional capital to fund Vision 2030. Bloomberg and others reported on Wednesday another example of the push for OPM. Aramco is looking into a bond issue to help supplement the $75b annual dividend. It has chosen 15 banks to manage a sale of the debt, which could be a total raise of around $5b. We anticipate that this will not be the last time Saudi hits the debt markets, as plans for Vision 2030 will require a significant amount of spend and the nation will likely get OPM to fund as

much as possible, along with funding for the dividend. It all fits into our view that the big Saudi financial theme for the 2020s is that they will be increasingly looking for OPM.

Oil – Lukoil estimates 1.5 mmb/d of Iran barrels coming back quickly

~1.5 mmb/d of Iran export potential

The big question for Iran's ultimate return to oil markets is how much more Iran oil will hit the market and when. We have seen a range of estimates with most seeming to be around an additional 1 mmb/d of oil. We are always interested when we see estimates from companies that might have an insight into Iran, in this case Russia's Lukoil. On Thursday, TASS reported on comments from the Lukoil CEO at the St. Petersburg forum as to the magnitude of Iran barrels that are likely to return once sanctions are lifted [LINK]. TASS wrote *"If the sanctions are lifted, Iran will potentially be able to offer the market up to 1.5 million barrels per day of oil in the near future. But the potential for increasing production in the country is much higher, Leonid Fedun, vice president of Lukoil, told reporters on the sidelines of the SPIEF".* And with no concrete visibility as to exactly when this may occur or the true magnitude of returning barrels, it is difficult for OPEC to account for this when altering the cut schedule for the next few months. Our Supplemental Documents package includes the TASS report.

Oil – Rosneft CEO Sechin "*world is at risk of facing an acute shortage of oil and gas*"

Sechin warns on acute shortage of oil and gas

Shout out to my friend Dennis Gartman (The Gartman Letter), who drilled it into my head that its always worth listening to Rosneft CEO Sechin, who he described as an evil genius and the 2nd most powerful man in Russia. So when I see a Sechin headline I always take a look. Early yesterday morning, the first TASS report from the St. Petersburg forum that jumped out as us were the multiple reports of Rosneft CEO Sechin's comments. I tweeted [LINK] ""*world is at risk of facing an acute shortage of oil and gas" says #Rosneft CEO Sechin. Its just math - need to add enough new reserves/production capacity to offset #Oil decline rate or resources are being depleted. Sechin reminds recent reserve adds are historic lows*." I put in the tweet that its just math. Sechin say those words, but his concept is simple – the world is adding oil and gas reserves at record low levels, supermajors are shifting to a new normal of shifting capital from oil and gas to renewables and demand is returning to pre Covid levels. Its just math. TASS reported [LINK] Sechin saying "*"The increase in oil and gas reserves in recent years is at historic lows, and a certain shortage of resources is already visible. This trend may become a" new normal "for the world majors and lead to depletion of the resource base. The world is at risk of facing an acute shortage of oil and gas."* And "*As large-scale vaccinations and the impact of the pandemic on the global economy decrease, the demand for oil will recover, and you need to be prepared for this. The demand for energy will continue to grow, and new waves of infections can only slow down, but not stop this process," he said.*" As we always say, its just math. Sechin made other comments such as how dirty US oil was due to fracking. Our Supplemental Documents package includes TASS reporting of Sechin's comments.

Its just math: oil declines + less capex = future oil supply squeeze

We have noted for the past couple years that its really just math. There are global oil decline rates that have to be replaced every year just to stay flat. There are different views on the global oil decline rate. Our May 2, 2021 Energy Tidbits note the JP Morgan assumed ~4% conventional decline, whereas our March 7, 2021 Energy Tidbits noted Exxon's new view for global oil declines to be "about 5-7%" per year. Remember every 1% change in decline rate means there is another ~1 mmb/d of new oil production that has to be added just to stay flat. No one has really cared about global oil declines during the Covid period with OPEC+ having to take millions of barrel of supply off the market when demand collapsed. But we continue to believe it remains the overlooked factor for post Covid and why we believe oil is for a

higher for longer period. The other factor that we have been highlighting is that there is even less capital being allocated to oil and gas by the supermajors as they accelerate their energy transition and reallocate capital from oil and gas to renewables. This new trend makes a bullish outlook even more bullish. Its just math.

Oil – Vitol "*all the spare capacity will sit with those who want to control the price*"

Vitol on OPEC+ meeting

One of our must listen to podcasts is the Gulf Intelligence Managing Partner Sean Evers New Silk Road "Live" especially on Sunday mornings and today's [LINK] was excellent. Earlier this morning, we tweeted [LINK] on comments from Mike Muller (Head Vitol Asia) in response to Evers asking about the OPEC+ meeting. Muller explained it clearly – all the global spare oil capacity will end up with those who want to control oil prices! We tweeted "*Why Saudi will keep market stability.@vitolnews Mike Muller global #Oil inventory to 2019 baseline in H2/21, then "all the spare capacity will sit with those who want to control the price" "3 major protagonists in OPEC+ and of course Iran". Usual great podcast @sean_evers! #OOTT".* Muller described it the best in explaining why Saudi will stay disciplined in managing the oil market that will see global oil inventories back to 2019 levels later this year and, most importantly, his impactful comments on where the oil market will be as it exits 2021. Muller said "*But we see global inventories moving exactly as OPEC+ intended back to that 2019 average sometime later this year, which, essentially, if I want to paraphrase, means that all the spare capacity will sit with those who want to control the price. And therefore, the market has confidence that the Saudis will stick to their successful formula in leading by example and putting back their share"* and "*And as a consequence, the spare capacity will be with the two major protagonists or three major protagonists in OPEC+ and, of course, with Iran*". Our Supplemental Documents package includes the transcript we made of the Muller response.

Oil – Engine No. 1 nominees end up with 3 of 12 Exxon board seats

1/4 of Exxon' s BoD goes to Engine No. 1

Engine No. 1's defeat of Exxon at last week's annual meeting voting is no doubt one the biggest items so far in 2021 that illustrated the increasing momentum and investor buy in for the energy transition. This week, Exxon updated on the results announcing that they expect three Engine No. 1 nominees to have won board seats [LINK]. Engine No. 1 is a hedge fund that owns just 0.02% of Exxon, but last week their activist campaign was successful in rallying institutional support for a change in board. This has ultimately resulted in ¼ of the board seats going to Engine No. 1. The fund had previously criticized Exxon on its returns and it not moving on the energy transition ie. being stuck on fossil fuels. We tweeted [LINK] "*Positive for #Oil. Hard not to see $XOM making some concessions, which can only lead to more capital reallocated from Oil & #NatGas to renewables & #EnergyTransition items. Hmm, investors are reshaping the strategy. #OOTT*." Their ability to beat Exxon and rally institutional support for its fight as a huge wake up call to Exxon and all other oil companies. A theme to follow is company's agendas being shaped increasingly by what investors (the vocal ones) want and not what the company believes is the way to maximize value for shareholders. As a result, we expect more capital be allocated to energy transition, which can only be positive for the outlook for oil.

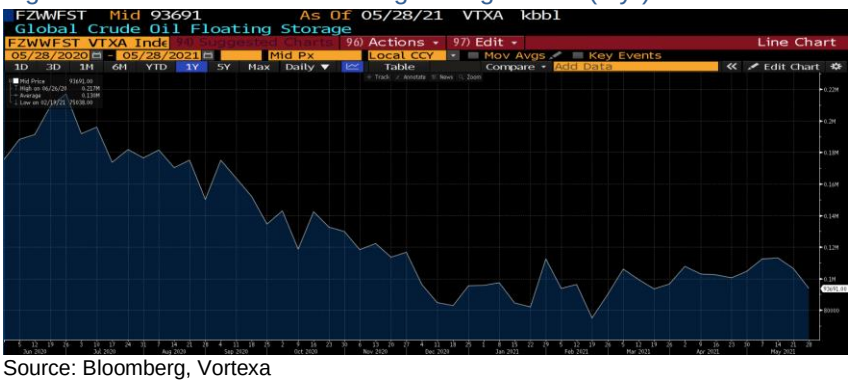
Oil – Vortexa floating storage -17% WoW, down 49.8% YoY

Vortexa floating storage

The amount of crude oil in floating storage this week is the lowest it's been since February. We are seeing continued decreases from APAC, which coincides with the gradual improvement in Indian covid cases. Bloomberg reported on Vortexa floating oil data that showed a WoW decrease of 17.94 mmb or -17% WoW to 87.93 mmb on May 31 from 105.87 mmb on May 21. Note the May 21 numbers were adjusted upwards from 101.66 mmb. Floating storage is down 59.36% since the June 19, 2020 peak of 216.38 mmb. All areas were down WoW and specifically, as mentioned above, the situation in India is slowly

improving and APAC floating storage is down 17% WoW to 58.61 mmb. Our Supplemental Documents package includes the Bloomberg Vortexa report

Figure 24: Vortexa Global Floating Storage Level (1 yr)



Source: Bloomberg, Vortexa

Oil – Caixin General Manufacturing PMI up to five-month high in May

Caixin PMI hits 5-month high

The big positive for oil to start 2020 (aside from vaccine news) was the strong and timely recovery out of Covid in China and its related recovery in oil/products demand. The China growth story is showing accelerated recovery in manufacturing in 2021 with the PMI showing the strongest increase in new work for five months. The Caixin China General Manufacturing PMI data for May [LINK] shows a MoM increase, and the index continues to be in expansionary territory. We recommend reading the short release as opposed to just seeing the headlines as there is more color on China. On Monday, we tweeted [LINK] *"China Caixin manufacturing PMI in May 52.0 vs 51.9 estimate and 51.9 in Apr and 50.6 in Mar. "New work expands at quickest rate for five months". Worth a read for good China recap. Thx @IHSMarkitPMI #OOTT.* A Sr. Economist at Caixin stated *"To sum up, manufacturing expanded in May as the post-epidemic economic recovery kept its momentum. Both domestic and overseas demand were strong and supply recovered steadily. The job market remained stable. Manufacturers stayed confident about the business outlook as the gauge for future output expectations was higher than the long-term average. Inflation was still a crucial concern as prices continued rising… Rapidly rising commodity prices began to disrupt the economy as some enterprises began to hoard goods, while some others suffered raw material shortages. Supply chains were also significantly affected."* Our Supplemental Documents package includes the Caixin release.

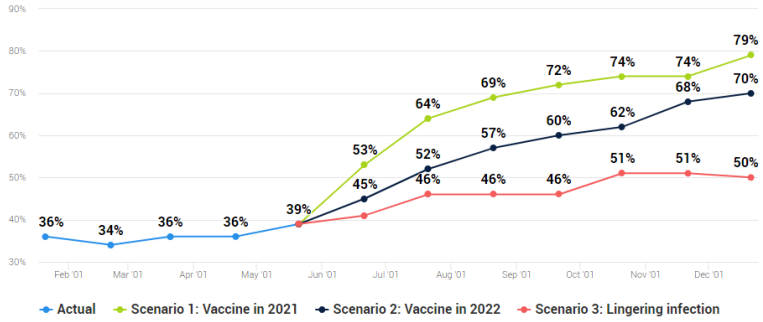
Oil – EU air traffic at ~70% of 2019 levels by year end

Europe air traffic at 70% of 2019 by year end

We believe the key oil theme this summer and thru year-end is the demand surge. We have seen it, when vaccinations ramp up quickly and get to high enough levels, there is a demand surge in oil. And the US provides a model to look at other countries/areas for how a demand surge can quickly hit. On Tuesday, Eurocontrol released an updated Traffic Scenario for 2021 [LINK]. We tweeted following the release [LINK] *"#1 #Oil theme is demand surge is happening. About to enter demand surge for EU #JetFuel after being ~flat YTD unless renewed virus outbreaks. EU air traffic should be ~70% of 2019 levels by yr end. US demand surge shows what happens with vaccinations. Thx @eurocontrolDG #OOTT".* Eurocontrol outlines 3 scenarios: (i) assumes widespread vaccination across Europe by summer 2021 and easing of travel restraints, (ii) assumes widespread vaccination across Europe and travel restraints easing by Q1 2022, (iii) assumes patchy vaccine uptakes and/or new outbreaks or new virus strains. In its base case (scenario ii), Eurocontrol predicts that the number of flights should rise from 39% of 2019 levels in May to 57% in August. Their optimistic scenario

(scenario i) has flight levels rising to 69% of 2019 in August. According to Eamon Brennan, Director General of Eurocontrol, this would require *"if more States relax their restrictions sooner and fully implement procedures such as the EU's Digital COVID Certificate as soon as possible*". Our Supplemental Documents package includes the Eurocontrol release.

Figure 25: Eurocontrol Traffic Scenarios (June 1, base year 2019)



Source: Eurocontrol

Oil & Natural Gas – Should be great Q2 oil & gas company reporting both Q/Q and Y/Y

Strong prices thus far in Q2/21

This week, one of our Twitter followers @garquake tweeted [LINK] a good reminder that Q2 reporting should be great for oil and gas companies "*Q2 WTI pricing just touched $64 Avg - Now 10% over Q1 !!! - Huge reports in 6-8 weeks*". He is correct, it will be a great Q2. Prices have been very strong thus far through Q2/2021. Brent, WTI, EdPar and WCS are all up over 10% QoQ. YoY, the price increases are more dramatic, with Brent (+113.7%), WTI (+130.1%), EdPar (+173.8%) and WCS (+184.4%) all up over 100% since Q2/2020. Natural gas has also seen price boosts YoY. Henry Hub saw a 62.4% increase since Q2/2020, and AECO is up 47.3% YoY.

Figure 26: Oil & Natural Gas Average Quarterly Prices: Jan 1, 2018 thru June 4, 2021

Quarter	Brent	WTI	EdPar	WCS	HH	AECO
Q1/18	$67.00	$62.90	$57.26	$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*	$66.55	$63.65	$59.81	$51.25	$2.76	$2.95
*Includes data up to June 4, 2021						

Source: Bloomberg

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

Above average hurricane season expected

The theoretical start to hurricane season was Tues June 1. The well regarded Philip Klotzbach and team at Colorado State University issued their updated Atlantic Hurricane season forecast on Thursday [LINK], still calling for another above-normal year. Their April forecast had called for an above-average season. While that is an early forecast, the typical pattern is that the April forecasts tend to underestimate the actuals. There were some

immaterial changes vs the original April 8 forecast. The CSU forecasters wrote *"We have maintained our above-average forecast for the 2021 Atlantic basin hurricane season. Current neutral ENSO conditions are anticipated to persist for the next several months. While sea surface temperatures averaged across portions of the tropical Atlantic are near to slightly below normal, subtropical North Atlantic sea surface temperatures are much warmer than average. We anticipate an above-normal probability for major hurricanes making landfall along the continental United States coastline and in the Caribbean".* 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 27: June 3 Klotzbach Atlantic Hurricane Forecast

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2021

Forecast Parameter and 1991-2020 Average (in parentheses)	Issue Date 8 April 2021	Issue Date 3 June 2021	Observed Activity Through June 2 2021	Total Seasonal Forecast (Includes Ana*)
Named Storms (14.4)	17	17	1	18
Named Storm Days (69.4)	80	78.25	1.75	80
Hurricanes (7.2)	8	8	0	8
Hurricane Days (27.0)	35	35	0	35
Major Hurricanes (3.2)	4	4	0	4
Major Hurricane Days (7.4)	9	9	0	9
Accumulated Cyclone Energy Index (123)	150	149	1	150
Net Tropical Cyclone Activity (135%)	160	158	2	160

*Ana formed prior to the start of the Atlantic hurricane season on June 1st.

Source: Colorado State University

Above normal hurricane season expected

Oil & Natural Gas – AccuWeather also calls for above-normal Atlantic hurricane season

Last week, AccuWeather posted its 2020 Atlantic hurricane season forecast [LINK] and they also call for above normal season. AccuWeather "*predicts that the 2021 Atlantic hurricane season will result in 16-20 named storms, including seven to 10 hurricanes. Of the storms projected to reach hurricane strength, three to five are predicted to become major hurricanes (Category 3 or higher storms that have maximum sustained winds of 111 mph or greater).* And "*AccuWeather's forecast, when compared to that 30-year average, indicates that 2021 is expected to be an above-normal season for tropical activity in the Atlantic. A normal season is considered to have 14 storms, seven hurricanes and three major hurricanes. Last year, 14 hurricanes formed, and seven of those reached the major hurricane threshold, and, upon further review, no hurricanes last year reached Category 5 force."*

Figure 28: AccuWeather Atlantic Hurricane Season Forecast

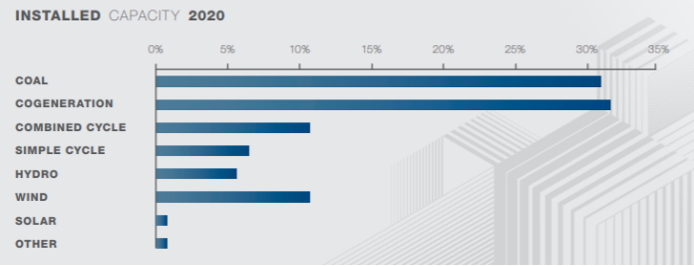
Source: AccuWeather

Oil & Natural Gas – Alberta natural gas to be hard hit if NDP regain power

Alberta NDP's net zero electricity by 2035

We could have put this in the Energy Transition or electricity section of the memo but put it here because it would be a big hit to Cdn E&P companies. Yesterday we tweeted [LINK] on the Calgary Herald report "*Notley announces plans to move Alberta's electricity grid to net-zero by 2035 if elected*" [LINK]. We recognize that it could still be two years to the next Alberta election that must be held before May 31, 2023, but the NDP continue to track well ahead in polls. The current 338Canada.com poll has the NDP with a 5 point lead and tracking to majority government. But we tweeted "*Be a big hit to Cdn E&P. @theAESO AB electricity generation ~50% #NatGas ~31% #Coal. @AER_news est ~0.8 bcf/d AB #NatGas used for electricity. Electricity bills will be going higher, need something for 24/7 electricity reliability. Next AB election by May 31/23. #OOTT".* Our tweet referenced the Alberta Energy System Operator data that shows Alberta electricity generation is approx. 50% from natural gas and ~31% from coal. And the Alberta Energy Regulator forecast that estimates 0.8 bcf/d of Alberta natural gas production is used for electricity generation. Alberta would either have to replace over 80% of its electricity generation from renewable sources and still maintain the ability to deliver reliable 24/7 electricity, or add in significant nuclear power generation, or add hydrogen from natural gas by adding CCS. In any of these, we would expect natural gas demand down and electricity costs up. Our Supplemental Documents package includes the Calgary Herald report, the AESO electricity data, the AER natural consumption by sources and the latest 338Canada.com Alberta polls.

Figure 29: Alberta Installed Electricity Generation Capacity



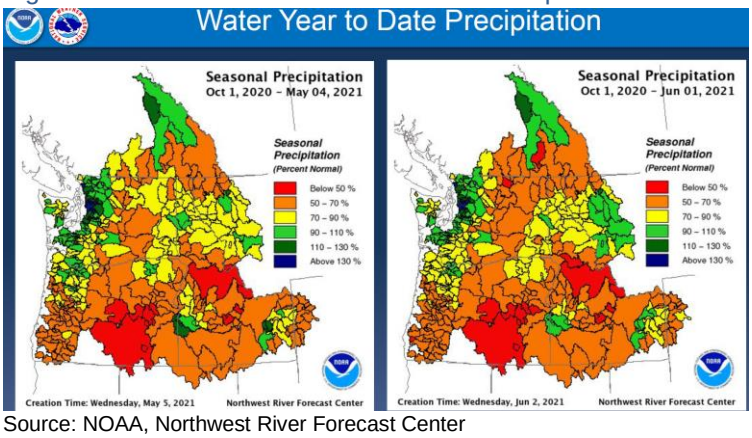
Source: AESO 2020 Annual Report

Electricity – Low Pacific NW precipitation = less electricity for export to CA

Below-average season precipitation in the Pacific NW

On Thursday, we tweeted [LINK] on NOAA's North River Forecast Center June 2021 Water Supply Briefing on Thursday [LINK]. Unfortunately, the latest outlook is not better and is pointing to lower than normal Pacific NW hydro generation. We tweeted "*Low Pacific NW accumulated seasonal precipitation means updated NWRFC fcast for key The Dalles is 84% of average water supply for Apr-Sept. Less water supply = less #Electricity for export. #NatGas".* The monthly update is calling for low accumulated precipitation, especially in The Dalles (north Oregon), which is the key region for hydroelectricity generation in the region. Snowpack and season precipitation is 71% of normal levels as of June 2. Less precipitation in the region translates to less hydrogeneration, therefore lower exports this summer to California. This means less electricity available in a crunch this summer if California has an issue. Contributing to the high risk assigned by NERC to California in their Summer Reliability Assessment. Below is North River's chart showing the below-normal levels of precipitation in The Dalles. Our Supplemental Documents Package includes the excerpts from the monthly briefing.

Figure 30: Seasonal Water Year to Date Precipitation



Source: NOAA, Northwest River Forecast Center

Electricity – Terrapower first small scale nuclear demonstration project in Wyoming

1st small scale nuclear demonstration project

Long term readers know that we have been big believers in mini-nukes or small scale nuclear reactors since the early 2000's when we first wondered about the potential to fuel oil sands. But we have been highlighting even more in the last couple years, especially with an increased global focus on reducing emissions. This week, there was big news with the announcement that Terrapower (the Bill Gates backed venture) is working towards the first small scale nuclear reactor demonstration project in Wyoming. We believe this is significant to be moving to a demonstration project and not just talking about the theory. Wyoming Governor Mark Gordon said the demonstration project would be on a still to be disclosed retiring coal plant. The Terrapower project will reportedly feature a 345 megawatt sodium-cooled fast reactor with molten salt-based energy storage that could boost the system's power output to 500 MW during peak power demand. There was no formal cost estimate but prior estimates are for a cost of approx. $1 billion. Our Supplemental Documents package includes the Terrapower report.

Will emissions reductions targets push oil sands to use mini nukes?

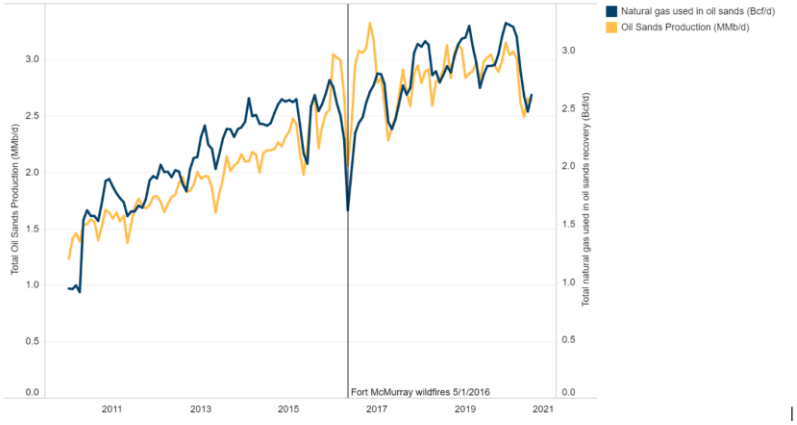
Our Feb 28, 2021 Energy Tidbits asked the question if emissions targets will push oil sands to use mini nukes. In that memo, we noted our Feb 26, 2021 tweet [LINK] that noted the Daily Oil Bulletin story "*Suncor Eyeing Small Modular Nuclear Reactors In Oilsands Extraction*" [LINK] that reported Suncor *" would be "super interested" in a nuclear reactor technology that could replace the energy intensive natural gas fired boilers and steam generators in its oilsands extraction, a company executive said Wednesday. "The place where small modular reactors really, really shine is in heavy industry providing a very high temperature heat that can be used in various ways, including the extraction of oil and gas," he said. This offers the potential to create a less carbon intensive and increasingly competitive product in Alberta and in the Alberta oilsands."* Our other Friday tweet [LINK] on the DOB report linked to some of our prior reporting on mini nukes for the oil sands. We also noted one item that wasn't in the DOB reporting – the advantage that mini nukes can be buried deep underground. Our only surprise is that it has taken this long for the major oil sands players to come out publicly in favor of mini nukes. They have had this in their potential playbook for almost 20 years. Long term Energy Tidbits readers might remember we first started writing on using mini-nukes to power the oil sands in the early 2000's when the former Cameco CFO told me this was something they were trying to get people up in Fort McMurray to do to power the oil sands for electricity to

run upgraders and to power steam generation at SAGD projecs. There was some interest, but there was more fear on nuclear at that time. It looks like those fears are gone, or at least rank below the fear that aggressive new emissions reductions targets will impact future reserve life of oil sands unless the oil sands operators take a more aggressive emissions reductions action plan. We expect to see mini nukes be part of the formal messaging of oil sands players in the coming months.

Oil sands use over 3 bcf/d of western Cdn natural gas

Our Friday tweet also said warned that the oil sands moving to mini nukes is a potential long term (>2030) negative to natural gas. The reason is that oil sands is one of the major consumers of western Canadian natural gas. CER's Sept 9, 2020 blog "*Market Snapshot: Oil sands use of natural gas for production decreases considerably in early 2020"* [LINK] highlighted how the Covid production shut ins reduced oil sands use of natural gas. But its below graph also highlighted that oil sands were using >3 bcf/d of natural gas prior to Covid.

Figure 31: Natural Gas Used in Recovery of Oil Sands & Total Oil Sands Production



Source: CER, AER

Energy Transition – BlackRock's Fink "we do not have the technology to do all this"

Fink raises concerns on energy transition

Our longstanding view is unchanged - we believe the world is being put on a path and that energy transition is happening but that it will take longer, be a bumpy road and cost more than the aspirations. It also means the demise of oil and natural gas will not be as fast as hoped for by the energy transition and policymakers aspirations. On Wed, BlackRock CEO Larry Fink spoke at a US sellside conference and he made several comments that are in line with our thesis. Don't forget Fink has been one of the global financial leaders supporting and pushing the energy transition view. Fink isn't talking about anything new, but hopefully the policymakers will listen. Fink says several comments on this thesis, but concluded "*The last thing I just want to say and to link in ESG&E with the question on inflation, let's be clear. If we rush this and if our solution is entirely just to get a green world, we're going to have much higher inflation, because we do not have the technology to do all this yet to have it equivalent to the cheapness of hydrocarbons. And so that's going to be a big policy issue going forward too. Are we going to be willing to accept more inflation if the inflation is to accelerate our green footprint? And that's going to be a big policy question".* Note there are numerous other relevant Fink comments. Our Supplemental Documents package includes Finks' numerous comments on the energy transition.

Fink's technology concern has been well known, just ignored by policymakers

We just don't get why policymakers have ignored Fink's key concern that technology isn't there yet for the aspirations of energy transition. This year, we noted John Kerry's comments that 50% of the emissions reductions will come from technologies to be developed. Note he since kind of backtracked on that. But Fink's concern is not new. It was a key reason for the blog we wrote a year ago, our June 11, 2020 blog "*Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition*". One of the items from that blog was "*The IEA reminds the energy transition has many "critical energy technologies", the vast majority of which are not on track. There was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the "critical energy technologies" and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these "critical energy technologies "into major groupings and then ranked the progress of each of these pieces in its report "Tracking Clean Energy Progress" [LINK] by on track, more efforts needed, or not on track".* Our Supplemental Documents package includes our SAF Group June 11, 2020 blog.

Figure 32: IEA's Progress Ranking for "Critical Energy Technologies" for Clean Energy Transition

Power	Renewable Power	Geothermal	
	Solar PV	Ocean Power	
	Onshore Wind	Nuclear Power	
	Offshore Wind	Natural Gas-Fired Power	
	Hydropower	Coal-Fired Power	
	Bioenergy Power Generation	CCUS in Power	
	Concentrating Solar Power		
Fuel Supply	Methane Emissions from O&G	Flaring Emissions	
Industry	Chemicals	Pulp and Paper	
	Iron and Steel	Aluminum	
	Cement	CCUS in Industry and Transformation	
Transport	Electric Vehicles	Transport Biofuels	
	Rail	Aviation	
	Fuel Consumption of Cars and Vans	International Shipping	
	Trucks and Busses		
Buildings	Building Envelopes	Lighting	
	Heating	Appliances and Equipment	
	Heat Pumps	Data Centres and Data Transmission Networks	
	Cooling		
Energy Integration	Energy Storage	Demand Response	
	Hydrogen	Direct Air Capture	
	Smart Grids		

Source: IEA

On Track | More Efforts Needed | Not on Track

Source: IEA Tracking Clean Energy Progress, June 2020

Energy Transition – Chevron would sell oil sands, would reduce emissions

Chevron willing to sell oil sands at the right value

We believe that many oil and gas companies are building serious plans to reduce emissions over the coming year. The challenge for oi land gas companies is that it is extremely difficult to make a big quick reduction in emissions other than thru selling higher emissions assets to others and pass the emissions down the food chain. On Thursday, Chevron presented at a US sellside conference and noted how they are prepared to sell Cdn oil sands. We tweeted [LINK] *"The only way for #BigOil to make big cuts in near term emissions is sell & pass on higher emissions oil to someone else. Operational items work but take time. Any $CHV sale of #OilSands helps on #ESG compliance, likely compensation targets. thx @Bloomberg for transcript #OOTT".* Chevron CEO Michael Wirth stated *"I think it's one of the most*

challenged asset classes there is, because it's an energy intensive asset class to develop. And so absent some real significant progress on carbon capture and storage and offsets, I think production that requires thermal production techniques becomes really at the margin, right, it's more costly, it's more energy intensive, it's more carbon intensive." When he was asked specifically about their Canadian oil sands asset, a 20% stake in the Athabasca Oil Sands Project, he went as far as to say that Chevron is willing to transact and sell its Canadian oil sands interest. He said *"I think we've done some portfolio high grading here over the last few years, at the right value, and we don't need to sell anything, because our balance sheet is strong and our cash position is good. So we're not in the kind of fire sale mentality, but if we've got what we think is fair value for an asset like that, we've been willing to transact on things that are of that scale and kind of relative important in the portfolio".* Selling off oil sands assets would likely be top of list to keep the environmentally concerned investors happy and low hanging fruit for a quick emissions cut. Our Supplemental Documents package includes the CEO comments on this subject.

Energy Transition – Sustainable aviation fuel to power United's new supersonic jet

United to add net-zero supersonic aircrafts

One of the big challenges for the airline industry is how to decarbonize without having airfares go thru the roof. Note that we are specifically saying for the airline industry as the ones who are concerned about keeping airfares under control so air travel doesn't shrink due to price. On Thursday, United Airlines announced they signed a conditional purchase agreement for supersonic planes running on sustainable aviation fuel [LINK]. The agreement is with Boom Supersonic, a Denver-based aerospace company, whose supersonic aircraft is set to cut travel times in half and run on 100% sustainable aviation fuel. The airline is set to purchase 15 of Boom's Overture airliners, with an option for 35 more aircrafts. Overture will be optimized to run on 100% sustainable aviation fuel, making it the first ever large commercial plane to be net-zero from day-one of operations. The roll out of the Overture is expected to begin in 2025, with first flights in 2026 and is expected to begin carrying passengers by 2029. Boom's Overture can fly at speeds of Mach 1.7, which is twice as fast as the fastest airliners in operation currently. For example, a flight from San Francisco to Tokyo would typically be about 12 hours. On an Overture airliner, the flight time would be cut down to just 6 hours. Flights from Newark to London would only be 3 hours long. If this airliner is ultimately found to be feasible, it may help to solve the decarbonization issue using SAF, but have to wonder what the fares would be like given its max capacity is 88 people, so little volume to spread additional costs of more expensive SAF. Our Supplemental Documents package includes the United announcement and Boom supersonic jet overview.

IEA's Net Zero pathway assumes govt policies (ie taxes) reduce air travel

As noted above, the issue on airfares is more for the airline industry if they want to retain and grow air travel. Whereas governments will be incentivized to reduce air travel as a way to reduce emissions from air travel. And the way to do that is by higher cost airfare from sustainable aviation fuels and taxes. The recent IEA Net Zero pathway assumes that aviation growth is constrained by government policies (ie. taxes) if the world is to be on track for Net Zero. On page 135, tThe IEA wrote "*The NZE assumes that aviation growth is constrained by comprehensive government policies that promote a shift towards high-speed rail and rein in expansion of long-haul business travel, e.g. through taxes on commercial passenger flights (see section 2.5.2).*"

Energy Transition – Maersk: $450/ton carbon tax needed for green fuels to compete

Maersk calling for increased VLSFO carbon tax

On Wednesday, we tweeted [LINK] on a clear example of the reality that the Energy Transition will cost more. We tweeted "*#EnergyTransition = Higher Costs. Shipping fuel*

costs almost double under #Maersk CEO proposes #CarbonTax of >$450/ton fuel ($150/ton CO2) to bridge gap between VLSFO and greener alts that are currently more expensive. Almost double of ~$525 VLSFO. Thx @ShipandBunker #OOTT." Simply put, Maersk is saying that >$450/ton fuel carbon tax on ship fuel is needed to make alternative cleaner fuels competitive relative to VLSFO. Maersk CEO, Soren Skou, posted on LinkedIn on Wednesday [LINK] proposing of a carbon tax on ship fuel of at least US$450 per ton of fuel, which equates to US$150 per ton of carbon. Skou said *"Fossil fuels cannot keep being cheaper than green fuels. Action is required NOW. It is vital to consider all greenhouse gas, not just CO, on a full life cycle analysis, otherwise we will not be able to truly decarbonize shipping by 2050 in line with the Paris agreement".* Maersk is calling on the International Maritime Organization to move on this, saying members play a key role in securing the production and availability of zero carbon fuels. Maersk is not the first to call for such a tax – one other notable player is Trafigura Group. The issue will be discussed at a UN meeting next week. Close to half of Maersk's customers have set targets to decarbonize, so Maersk sees the tax as a business opportunity, Skou saying *"This is a cost problem, but on the other hand it's also a business opportunity. We're meeting customer demand by developing carbon neutral products".* Our Supplemental Documents package includes the Maersk CEO Linkedin post.

Energy Transition – AUS courts rule Environment Minister has duty of care to children

Australia court win for anti emissions side

We hate to be the negative voice in the room but Shell's loss in the Netherlands courts was only the tip of the iceberg for environmental lawsuits against companies and governments on fossil fuels. The lawsuits will only be increasing and not just like the lawsuit against Shell on meeting its Paris targets. Rather, there will be a range of lawsuits. There was an overlooked Australia federal court ruling on May 27 that will inevitably be followed in other countries Its hard to see how this case won't have an impact on how politicians look at and approve fossil fuels projects. This time, Australia federal courts in a case against the Minister of Environment. The case was brought against the minister by some children and an elderly person seeking an injunction to prevent the minister from approving a coal mine expansion arguing that the minister had a duty of care to protect young people from future harm from climate change given the increasing emissions of CO2 into the earth's atmosphere. The court ruled [LINK] "*For the reasons given above, I have concluded that the applicants have established that the Minister has a duty to take reasonable care to avoid causing personal injury to the Children when deciding, under s 130 and s 133 of the EPBC Act, to approve or not approve the Extension Project. I have also concluded that an injunction restraining the Minister from exercising her power under s 130 and s 133 of the EPBC Act in a manner that would permit the extraction of coal from the Extension Project should not be granted*." We recommend reading the ruling for the more fulsome explanation of what the court ruled on duty of care. The court ruled that the minister has this duty to take reasonable care. Don't forget our big concern on the Liberals in Canada and their making it law to meet and be on track to meet climate change plans. We realize most think the worst is over but we think its just starting and their argument going forward will be they have to do take hard actions to reduce emissions to hit Net Zero as it's the law. And how can the Liberals not reference this case? Note what the judge wrote on duty of care.

Energy Transition – G7 this week to highlight new climate/emissions commitments

G7 new commitments

The G7 summit is June 11-13 in Cornwall, UK. We, and others, expect to see the G7 summit to prominently feature climate and emissions commitments. It is important to note that the G7 policymakers already announced major new climate/emissions commitments on May 21. For some reason, the May 21 commitments really didn't receive much attention, whereas we feature them by titling our May 23, 2021 Energy Tidbits memo "*G7 Policymakers Make New*

Commitments On Energy Transition ie. Future Emissions Laws/Regulations That Are Coming" because we believe the new G7 30-pg communique with increased climate policies was the major story for oil and natural gas, moreso than that week's IEA's Net Zero pathways. These were commitments from G7 policymakers and what the G7 policymakers are committed to enact as laws/regulations. We expect this to get a lot of attention this week from the G7 leaders summit. (i) The 30-pg communique is all about accelerating progress towards Paris emissions targets. And the G7 is saying they recognize there will be casualties (stranded assets) by this accelerated push towards Paris. The big clear warning to oil and gas is that the G7 is openly "*recognising the risk of stranded assets associated with high carbon investments*" with their work to accelerate progress towards Paris. That's a clear warning that they realize their actions will strand high carbon assets. Here is the critical full sentence "*To accelerate progress towards achieving our Paris Agreement goals, we need to harness the significant opportunities for sustainable development – including green jobs and sustainable, resilient growth – by making investments in the recovery from COVID-19 that are aligned with pathways towards our respective enhanced Nationally Determined Contributions (NDCs) and 2050 net zero commitments, recognising the risk of stranded assets associated with high carbon investments*." (ii) The headlines continue to be almost all about stopping financing for coal staring in 2021. Its understandable that the headline come from the press release and most didn't read the 30 page communique. Its why yesterday morning, we tweeted [LINK] on the coal headline. No question the G7 want to get rid of coal power but it is disappointing their press release wasn't accurate compared to the detailed communique. Release says G7 will end all new finance for coal power by the end of 2021. The communique details this but all references are for unabated coal ie. where coal doesn't have CCS or other potential abatements. (iii) These G7 commitments are a reminder that the Liberals of items to expect as the Liberals accelerate their emissions actions in the run up to COP-26 Glasgow in Nov. Most still don't appreciate how setting 2030 targets and the Liberals making it law to stay on track to emissions means the Liberals have no choice (in their minds) but to step up climate change actions. (iv) Note the G7 says "*We reaffirm our commitment to the elimination of inefficient fossil fuel subsidies by 2025 and encourage all countries to adopt this commitment*". How broadly will this be interpreted? Does it mean basic items like CCA deductions for natural gas plant be gone? (v) There is a clear push away from natural gas as a long term transition fuel. Again remember, Canada is committing to this. The communique says "*We recognise that natural gas may still be needed during the clean energy transition on a time-limited basis and we will work to abate related emissions towards overwhelmingly decarbonised power systems in the 2030s*." This fits to Liberals latest goal for 90% electricity with no emissions. Also means that CCS will ultimately be needed for natural gas production. If CCS is needed, what parts of the western Cdn natural gas can't do this? (vi) The G7 don't say that the emissions reduction past 2030 relies on massive quick adoption of emerging, still costly technologies like CCS and hydrogen, but kind of hint around that. The communique says "*We also recognise the need to accelerate innovation this decade to meet our net zero goal by 2050 or sooner. This includes scaling up demonstrations and the early deployment of zero and negative carbon technologies*". (vii) It may not jump out, but it seems like a bias away from nuclear. This has to be the European emphasis away from nuclear. The nuclear industry will be annoyed by the G7 calling its "*low carbon energy*". The communique says "*Those countries that opt to use it reaffirmed the role of nuclear energy in their energy mix. Those countries recognise its potential to provide affordable low carbon energy and contribute to the security of energy supply as a baseload energy source*." Whereas the Nuclear Energy Institute (and all others) say "*Nuclear is carbon-free. It is the largest source of carbon-free electricity in the United States and protects our air quality by generating electricity without other harmful pollutants like nitrogen oxide, sulfur dioxide, particulate matter or mercury*." We know the 30-pg communique is a grind but there is much more in it

than in the short press release. Our Supplemental Documents package includes the G7 release and the first 18 pages from the 30-pg communique.

Energy Transition – BP acquires 9GW pipeline of solar projects from 7X Energy

BP acquires 9GW pipeline of solar projects from 7X Energy

Global capital allocation to new oil and gas projects continues to decline and be replaced by renewable allocations. This is creating significant implications for the future of oil and gas supply. On Tuesday, we saw another example of this capital flight, with BP announcing that it had reached an agreement to purchase 9GW of solar development projects from US solar developer 7X Energy [LINK]. This will aid BP's progress towards its target of developing 20GW of low carbon energy by 2025, growing its renewables project pipeline from 14GW to 23GW. The projects will be developed by BP's 50/50 solar JV Lightsource BP. BP will pay 7X Energy $220mm for the projects, plus 1GW of "safe harbour equipment" and will meet BP's low carbon returns threshold of 8-10%. Our Supplemental Documents package includes the BP release.

How BP gets to 8-10% IRR for renewables

We last highlighted the math of how BP gets its targeted 8-10% return on renewables in our Feb 28, 2021 Energy Tidbits. It is worth reminding. BP doesn't spell it out, but the way they get to 8-10% returns is by throwing in trading, marketing and other integration items. BP's CEO spelled this out in his Sept 2020 strategy presentation. To date, trading/marketing was kind of a bonus or surprise upside to BP in a deal. Now it becomes part of the way they get returns to renewable deals. We tweeted [LINK] *"1/2 $BP CEO says investors not yet rewarding strategy shift to #renewableenergy. Yes, EU investors want Energy Transition shift but won't sacrifice returns. CEO's math on how BP gets 8-10% return on renewable is likely why investors are in "show me" mode on returns #OOTT #NatGas".* With renewables projects, expected returns that are much lower than what investors expect with oil and gas projects, so the IRR calc has to be different. Our Supplemental Documents package includes the BP CEO Sept 2020 comments.

Energy Transition – Green's NIMBY is also now impacting renewable energy

NIMBY now impacting big solar projects

One of our big reasons for our view that the energy transition will take longer, be a bumpy road and cost more is that the shifting to renewable energy will result in massive power generation supply in less populated areas and transmission to demand markets. And the increased logistics will be facing NIMBY issues/delays. We have noted previously how Germany hasn't been able to get needed new transmission from renewable in the north to the south industrial belt, which is a key reason why Merkel wants Nord Stream 2. We expect new transmission to be similarly challenged in the US. On Friday, the WSJ highlighted the increasing NIMBY challenges for major solar generation projects in remote areas. The WSJ story "*Solar Power's Land Grab Hits a Snag: Environmentalists*" [LINK] wrote "*Across the U.S., more than 800 utility-scale solar projects are under contract to generate nearly 70,000 megawatts of new capacity, enough to power more than 11 million homes, equivalent to Texas and then some. More than half this capacity is being planned for the American Southwest, with its abundance of sunshine and open land. These large projects are increasingly drawing opposition from environmental activists and local residents who say they are ardent supporters of clean energy. Their objections range from a desire to keep the land unspoiled to protection for endangered species to concerns that their views would no longer be as beautiful ".* The WSJ also notes wind is included writing "*Similar battles have broken out over other big renewable energy projects, such as offshore wind turbines in places including Martha's Vineyard, which on May 11 received a go-ahead from the Interior and*

Commerce departments 12 years after state and federal officials first started the process of building there". Our Supplemental Documents package includes the WSJ report.

US solar growth will mean massive land requirements

We fully expect that, over time, most of us will have solar panels on our home roof. But it is also important to remember there will be massive land requirements to support the planned US growth in solar generation. Our March 21, 2021 Energy Tidbits highlighted the Rystad blog on solar land requirements. Here is what was in the March 21 memo. "We were a little surprised that Rystad's March 16 blog on solar PV didn't get more attention "*To meet its 2050 net-zero target, the US needs to cover land 50 times the size of Austin with solar PV*" [LINK]. The blog is a reality check on the math if the US to be on track for Net Zero including the land requirements. Our Supplemental Documents package includes the Rystad blog."

Energy Transition – EV only 1% of all cars on the road, still a long way to go

EV only 1% of all cars on the road

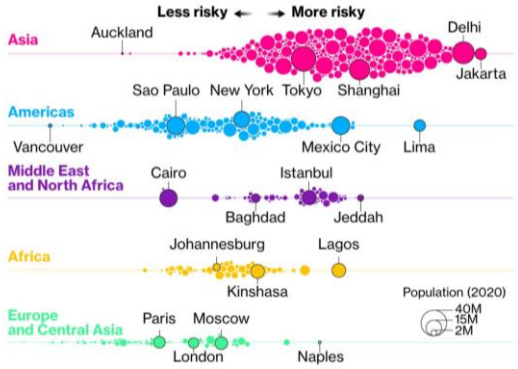
On Tuesday, we tweeted [LINK] on a Bloomberg report that reminded of the math of accelerating EV sales and penetration. We tweeted "*Great @colinmckerrach recap of accelerating global #EV penetration. Takes 3 mths to add 1 mm EVs, sb down to 2 mths by yr end, but even if ICE sales peaked 2017 still "herculean task" to get road emissions down ie. EVs only 15% of global fleet even if 50% of 2030 sales #OOTT*." Bloomberg reported on the Hyperdrive daily briefing, which showed that EV market penetration was about 1% of all cars on the road. The briefing was a good recap of the math of EV global fleet penetration. According to Hyperdrive, the total number of passenger EVs is anticipated to hit 12mm this month, which is up 1100% from 1mm in 2015. It is difficult to track the total number of vehicles on the road, as older vehicles tend to migrate to emerging economies, but Hyperdrives' data comes to about 1.2 bn passenger vehicles on the road, resulting in the 1% EV proportion. This provided a good recap of the math of EV penetration and showed that the rate of sales is increasing, but still have a long way to go. While it took 18 months to sell the second incremental million EVs, adding 1 million more EV sales from 11 million took only 3 months. However, even if battery EVs were 50% of global sales by 2030, they'd only make up around 15% of the total fleet. Note that the sales of ICE vehicles peaked in 2017. Accordingly, over the past 10 years ~200 mm cars were added to the global vehicle count, almost all being ICE models, so it's important to note that there is a significant lag between new sales and the translation to fleet impact, or proportion of EVs on the road globally. Our Supplemental Documents package includes the Bloomberg report.

Climate Change – No surprise Asian urban centres and worst for pollution, etc.

99 of the top 100 most vulnerable cities to climate are in Asia

Our Energy Tidbits have highlighted how the most polluted cities are in mostly in India and other Asian countries. So no surprise to see the report that Asian cities face the greatest risk from the impacts of climate change including pollution, water shortages, extreme heat, natural disasters. Bloomberg reported on May 12, on research from Verisk Maplecroft [LINK]. The report found the top 100 most vulnerable cities to the effects of climate change, and of those top cities, 99 are in Asia. Of the 99, 37 are in China and 43 are in India. No surprise as China and India are also the world's 1st and 3rd largest GHG emitters. The report also found that 414 cities around the globe are at high risk from pollution, which are home to 1.5 bn people. The riskiest city, based of all nine factors analyzed was Jakarta. India, home to some ~1.39bn people has 13 of the top 20 riskiest cities in the world due to its extreme levels of air and water pollution. Our Supplemental Documents package includes the Bloomberg report and excerpts from the report.

Figure 33: Cities at risk from climate change



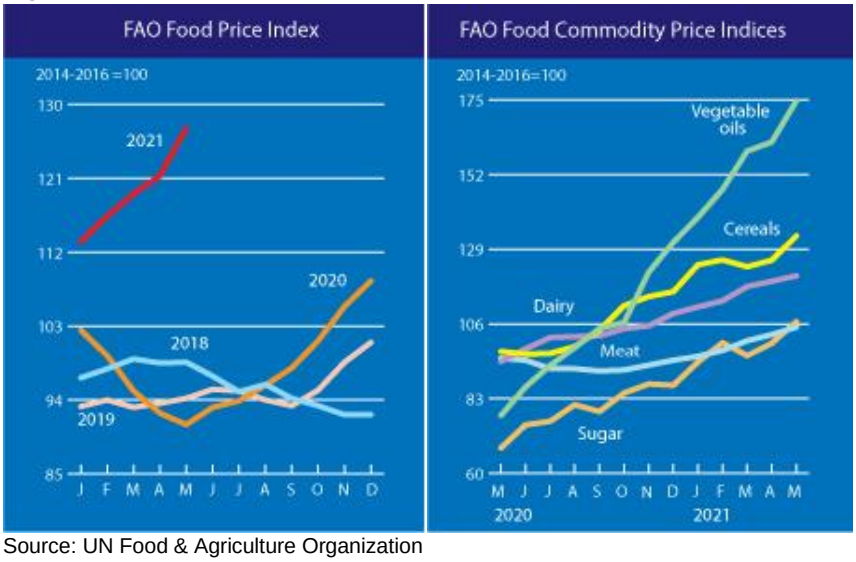
Source: Verisk Maplecroft Global Risk Analytics Dataset

Capital Markets – Highest MoM increase since Oct 2010 in FAO Food Price Index

FAO Food Price Index continues to reach new heights

Global food prices continue to skyrocket. One of the other major capital markets focus/concern is inflation, which is why we put this item in the capital markets section. The United Nations' Food and Agriculture Organization released their monthly Food Price Index results on Thursday [LINK] that showed big MoM increases in food prices. The UN wrote "*The FAO Food Price Index (FFPI) averaged 127.1 points in May 2021, 5.8 points (4.8 percent) higher than in April and as much as 36.1 points (39.7 percent) above the same period last year. The May increase represented the biggest month-on-month gain since October 2010. It also marked the twelfth consecutive monthly rise in the value of the FFPI to its highest value since September 2011, bringing the Index only 7.6 percent below its peak value of 137.6 points registered in February 2011. The sharp increase in May reflected a surge in prices for oils, sugar and cereals along with firmer meat and dairy prices*." Our Supplemental Documents package includes the UN release.

Figure 34: FAO Food Price Index



Source: UN Food & Agriculture Organization

Capital Markets – BlackRock Larry Fink warns on supply shock

Larry Fink warns on supply shock

Earlier, we noted BlackRock CEO Larry Fink's comments on the energy transition. But we also want to highlight his concerns on inflation and markets. His warnings are clear and the words speak for themselves. Its worth reading his comments. Here is just one of his warnings "*And so question one we will have to answer is we're seeing commodity prices increases from steel and cement. Lumber is up dramatically because of demand for housing. So we're seeing all the demand increasing. We have the supply problems going on right now. The question is, do we rather rectify some of the supply issues as more people go to work and as more economies turn back on, does that satisfy the demand curve? Or is the demand curve now more and more people are vaccinated increase, and we're going to have severe supply shocks, and the supply shock will then lead to much higher inflation? I'm on the opinion and I've been in this business 40 something years, so I started my career during the hyperinflation. And let's be clear, most people haven't had a 40-plus year career. And they've only seen declining inflation over the last 30-plus years. And so this is going to be a pretty big shock. And I do believe it's going to be a bigger shock if it happens. I'm not saying it will happen. But if it happens, if we see inflation above 3.5%, which comparing to the 1970s and early '80s, 3.5% would be a dream. But we're not accustomed to that type of inflation. Now, the big issue is going to be if it is determined that demand still is higher than the supply curve, even as we fix some of the supply curve issues, if demand remains high across the board, it will probably lead to central banks reassessing their policies."* Our Supplemental Documents package includes Fink's comments on supply shock, inflation and interest rates.

Capital Markets – Costco's reminder on supply chain/cost pressures

Costco on supply chain and cost pressures

I always seem to run out of time on weekends so don't get items written up. One such item was from the Costco Q3/21 call on May 27. I have to believe everyone in North America has experienced the dramatic increase in time to get products from Asia since Covid. Costco mgmt had a simple explanation – there is a shortage of containers and with the increased volume at US ports, it takes twice as long for a container to make a full trip. Mgmt said "*Containers and pallets are also facing shortages anecdotally, 35% to 50% increase in incoming containers this year versus a year ago. Some of that's pent-up demand, but just from the low points a year ago. The turnaround of a container hitting the U.S., delivering its contents and being back at the U.S. port to head back overseas has gone from approximately 25 days to 50 days. So a combination of things in terms of delays."* And mgmt warned on the other pricing pressures. "*We've had a lot of questions about inflation over the past few months. There have been and are a variety of inflationary pressures that we and others are seeing. Inflationary factors abound. These include higher labor costs, higher freight costs, higher transportation demand, along with the container shortage and port delays that I mentioned, increased demand in various product categories some shortages, various shortages of everything from chips to oils and chemical supplies by facilities hit by the Gulf freeze and storms and, in some cases, higher commodity prices."* The reality is that these types of costs do more than hit Costco's business, they have an impact to some degree on all businesses including oil and gas. Our Supplemental Documents package includes excerpts from the Costco Q3/21 call transcript.

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.

A 20 yr secrecy on the Liberal cabinet decision for hotel quarantine?

We have to believe any Canadian who wanted to travel by plane has to wonder what was discussed by the Liberals cabinet before making the decision on requiring mandatory hotel quarantine for returning Canadians or foreigners via plane as opposed to car or train or walking or whatever else. We are certainly expecting this rule to be lifted prior to Trudeau to returning to Canada from the G7 in the UK next week. We suspect many didn't really wonder what led to the decision until the reports this week that the Liberals cabinet deliberations were now classified to be secret for 20 years. As my long time GMP oil analyst partner, Todd Kepler, would say when he heard something that sounded a little funny or suspicious "Hmmm".

Tokyo Olympics still going ahead, 1/8th of volunteers have quite

Its less than 7 weeks, now 47 days to the July 23 start of the Tokyo Olympics and despite the increasing domestic opposition to holding the Olympics, Japan is determined to go ahead with the Games. On Wed, we were listening to CTV national news and they reported that about 10,000 of the 80,000 volunteers have quit the Games because the Covid controversy. CTV also reported that the organizing committee said that wouldn't hurt the ability to hold the Games as there weren't going to be any foreign spectators. Having lived and attended many events during both the Calgary 1988 and Vancouver 2010 Olympics, having less fans will no question lessen the need for volunteers. But we have to believe losing at least 1 out of 8 volunteers will impact the Games execution. We have to believe this is big pressure on the remaining volunteers to not quit in the next 7 weeks.

A big week for global football (soccer) fans with the start of Euro 2020

The UEFA Euro 2020 runs from June 11 to July 11 and it is the 2020 tournament that was postponed due to Covid pandemic. That's why it's the Euro 2020 being held in 2021. This is a huge TV audience even though it is less than the World Cup. The World Cup 2018 final had over 1.1 billion people tune in, whereas the Euro 2016 final had 0.6 billion viewership. Betting odds are not necessarily the best indicator as to who will win as to how the house can come out ahead. But the betting favorites are England 4/1, France 5/1, Belgium 13/2, Spain 7/1, Italy and Germany 8/1. Of the 15 prior Euro winners, England has never won or even been in the final two, and only been in two semi-finals.