# Energy Tidbits

Aug 22, 2021

Produced by: Dan Tsubouchi

## Siemens CEO Bruch "*The Energy Transformation Will Cost a Lot of Money"*

**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. Siemens CEO Bruch had multiple comments on the reality check for the energy transition ie. "*I find the narrative that sustainability shouldn't cost anything is extremely difficult. The energy transformation will cost a lot of money*". (Click Here)

2. Gazprom says it can supply 198 bcf on Nord Stream 2 in 2021, which implies it well be ready to ship by Nov 1. (Click Here)

3. Prior to Nov 1, Gazprom can't do extra to refill Europe storage as it needs to fill depleted Russia storage for winter. (Click Here)

4. US envoy Malley's comments make it seem the US is opening the door to a lesser Iran deal. (Click Here)

5. Expert Group advising Norway says dividends from oil stocks can help accelerate green push. (Click Here)

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

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

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### Natural Gas – Natural gas injection of 46 bcf, storage now -547 bcf YoY deficit

**YoY storage at -547 bcf YoY deficit**

The EIA reported a 46 bcf injection (vs 30 bcf injection expectations) for the Aug 13 week, which was above the 5-yr average injection of 42 bcf, and above last year's injection of 43 bcf. Storage is 2.822 tcf as of Aug 13, decreasing the YoY deficit to 547 bcf from 548 bcf last week and storage is 4 bcf above the 5 year average vs 7 bcf above last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report. [LINK]

Figure 1: US Natural Gas Storage

| | Stocks billion cubic feet (Bcf) | | | | Historical Comparisons: Year ago (08/13/20) | | 5-year average (2016-20) | |
|---|---|---|---|---|---|---|---|---|
| Region | 08/13/21 | 08/06/21 | net change | implied flow | Bcf | % change | Bcf | % change |
| East | 645 | 629 | 16 | 16 | 748 | -13.8 | 694 | -7.1 |
| Midwest | 765 | 741 | 24 | 24 | 877 | -12.8 | 781 | -2.0 |
| Mountain | 188 | 185 | 3 | 3 | 209 | -10.0 | 190 | -1.1 |
| Pacific | 240 | 241 | -1 | -1 | 313 | -23.3 | 286 | -16.1 |
| South Central | 984 C | 979 | 5 | 1 C | 1,222 | -19.5 | 1,045 | -5.8 |
| Salt | 244 | 247 | -3 | -3 | 335 | -27.2 | 264 | -7.6 |
| Nonsalt | 741 C | 732 | 9 | 5 C | 887 | -16.5 | 781 | -5.1 |
| Total | 2,822 C | 2,776 | 46 | 42 C | 3,369 | -16.2 | 2,996 | -5.8 |

C=Reclassification.
Reclassifications from base gas to working gas resulted in increased working gas stocks of 4 Bcf in the South Central nonsalt region for the week ending August 13, 2021. The implied flow for the week is an increase of 42 Bcf to working gas stocks. (See Notes and Definitions for more information on "implied flow.")

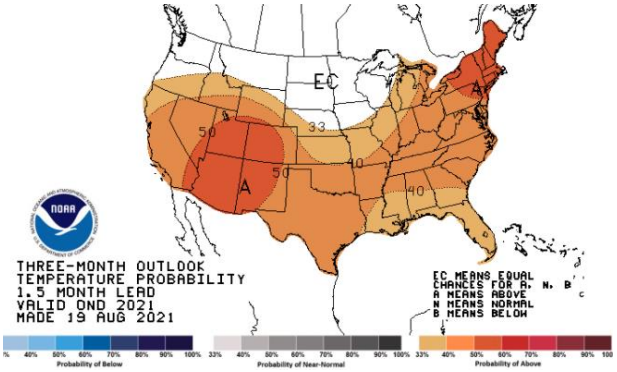
Source: EIA

### Natural Gas – Looking like a warm start to winter

**NOAA forecasts a hot fall and warm winter**

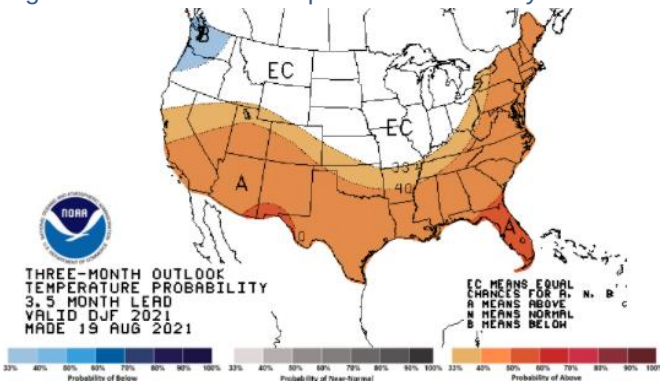
Its been a great year for natural gas and no one thought HH would be $3.85. And storage -547 bcf YoY provides good downside support for a warm start to winter. But winter is the biggest swing factor every year so all eyes are always on winter. On Thurs, we tweeted [LINK] on NOAA's updated its monthly update to its seasonal temperature forecasts [LINK]. NOAA 's probability is for warmer than normal temperatures for most of the US other than the part of the Midwest, the Plains and Pacific NW. This is the basic theme for both the start to winter OND and the peak of winter DJF. We tweeted following the forecast update *"Updated @NOAA 3-mth outlook temperature probability forecast. Still early with >2 mths to go, but calling for a warm start to winter. Reminder gas storage is -547 bcf YoY & new LNG startups Sabine Pass #6 0.7 bcf/d, Calcasieu Pass 1.3 bcf/c. #NatGas #LNG"*. Below are the new NOAA temperature probability maps for Oct/Nov/Dec and for Dec/Jan/Feb.

Figure 2: NOAA OND Temperature Probability Forecast




Source: NOAA

Figure 3: NOAA DJF Temperature Probability Forecast




Source: NOAA

### Natural Gas – EIA, US shale/tight natural gas shows marginal increase J/A/S

**Shale/tight gas up thru Sept**

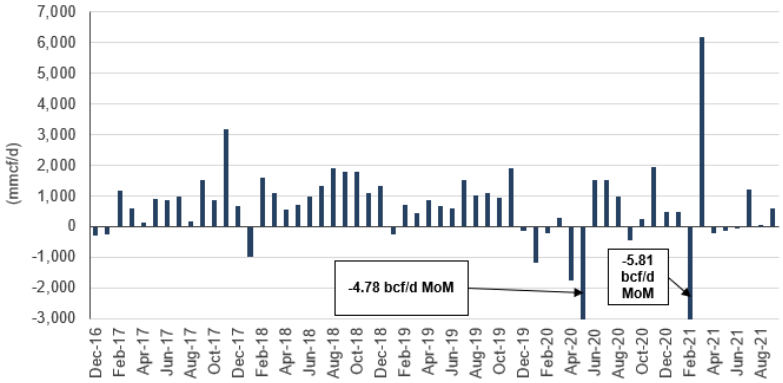
On Monday, the EIA issued its Drilling Productivity Report August 2021 [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case Aug) and the next month (in this case Sept). (i) The EIA forecasts Sept at 86.084 bcf/d which is +0.158 bcf/d MoM (would have been +0.578 bcf/d MoM if not for the +0.420 bcf/d revision to July) and down -0.800 bcf/d from the Nov/19 peak of 86.884 bcf/d. (ii) Note US shale/tight gas production is just below the all time peak of 86.884 bcf/d in Nov 2019. (iii) This month, all basins except for Anadarko (-0.060 bcf/d MoM), Bakken and Eagle Ford showed increases, but Bakken and Eagle Ford were basically flat MoM. The largest increases came from Haynesville (+0.124 bcf/d MoM) and Permian (+0.072 bcf/d MoM). (iv) All basins are now up YoY, except for Anadarko and Eagle Ford, with the most notable YoY increases being Haynesville +1.998 bcf/d YoY and Appalachia +0.956 bcf/d YoY. Total US shale/tight natural gas production is +3.420 bcf/d YoY for Sept. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So whatever the trends are for shale/tight gas are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

Figure 4: Major Shale/Tight Play's Natural Gas Production

| | | | | | 2021 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mmcf/d | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | August | Sept | Sept YoY | Sept less Aug |
| Anadarko | 6,293 | 6,272 | 6,627 | 6,598 | 6,411 | 5,257 | 6,163 | 6,082 | 5,992 | 5,919 | 6,129 | 6,192 | 6,132 | -161 | -60 |
| Appalachia | 33,430 | 33,762 | 34,829 | 35,653 | 35,587 | 34,894 | 34,823 | 34,685 | 34,619 | 34,586 | 34,364 | 34,366 | 34,386 | 956 | 20 |
| Bakken | 2,847 | 2,919 | 2,919 | 2,918 | 2,888 | 2,747 | 2,916 | 2,851 | 2,787 | 2,732 | 2,798 | 3,005 | 3,004 | 157 | -1 |
| Eagle Ford | 5,901 | 5,761 | 5,725 | 5,634 | 5,729 | 5,036 | 5,723 | 5,660 | 5,610 | 5,589 | 5,842 | 5,971 | 5,965 | 64 | -6 |
| Haynesville | 11,539 | 11,595 | 12,099 | 12,376 | 12,488 | 11,302 | 12,564 | 12,699 | 12,826 | 12,942 | 13,337 | 13,413 | 13,537 | 1,998 | 124 |
| Niobrara | 5,471 | 5,360 | 5,385 | 5,277 | 5,211 | 5,104 | 5,014 | 4,967 | 4,922 | 4,882 | 4,960 | 5,032 | 5,041 | -430 | 9 |
| Permian | 17,181 | 17,248 | 17,285 | 16,902 | 17,510 | 14,164 | 17,461 | 17,499 | 17,543 | 17,602 | 18,030 | 17,947 | 18,019 | 838 | 72 |
| Total | 82,664 | 82,918 | 84,868 | 85,358 | 85,824 | 78,503 | 84,664 | 84,444 | 84,300 | 84,252 | 85,460 | 85,926 | 86,084 | 3,420 | 158 |

Source: EIA, SAF

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



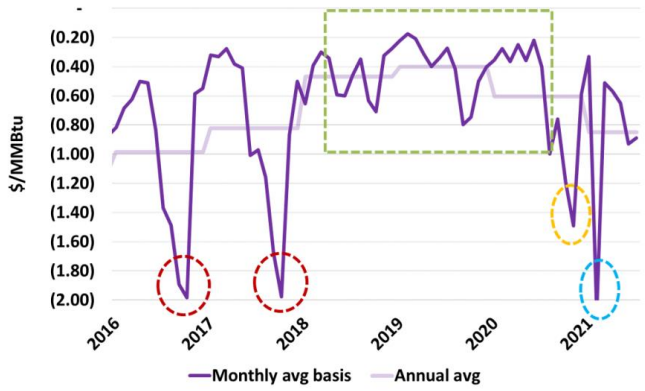

Source: EIA, SAF

### Natural Gas – RBN warns on big risk to Appalachian price diffs in 2022/2023

**Bearish outlook for Appalachian gas prices**

The big surprise in 2021 has been global LNG, US HH and Cdn AECO gas prices being way higher than anyone forecast a year ago. But in the look ahead to 2022/2023, RBN has been warning on the risk to Appalachian gas price differentials and absolute gas price. On Wednesday, RBN Energy had another good blog on this risk *"Appalachia's Dwindling Natural Gas Pipeline Takeaway Capacity"* [LINK], This is an update to its July blog (See our July 25, 2021 Energy Tidbits) "*The Outlook For The Appalachian Natural Gas Market".* We previously highlighted RBN's warnings of are renewed threats to Appalachian gas prices. They specifically warned about seasonal takeaway constraints worsening in the coming years, which may lead to basis meltdowns and, in a worse-case scenario, production shut-ins. RBN's most recent blog details that production is continuing to increase in Appalachia, but the supply/demand gap in the Northeast is widening and the market's ability to balance is *"highly dependent on its ability to flow any surplus gas"*. However, exit capacity is getting increasingly sparse and there are few projects to expand capacity, all of which all face uncertain futures. In fact, the spare egress capacity aggregates to less than 2 bcf/d capacity in 2021 so far and prices at the Eastern Gas South are already reflecting this. For example, in 2017 when storage was full, demand was low and takeaway constraints were at their worse, the differentials vs HH absolute prices (the cash basis) plummeted to -$2/MMbtu. So far, even ignoring the Feb-freeze, 2021 is reflecting the constraint-driven prices and is looking very similar to 2017 and 2018. Appalachia is in desperate need of expansion projects, but the future remains unclear for this market. We have included RBN's graphic of the differentials below. Our Supplemental Documents Package includes the RBN blog.

Figure 6: Eastern Gas South Cash Basis



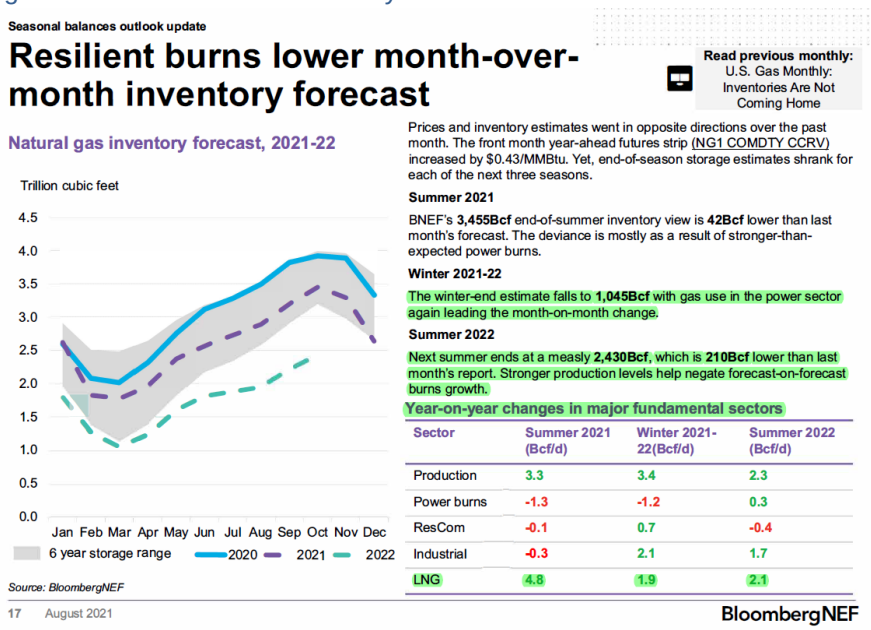

Source: RBN

### Natural Gas – Big potential upside to 2022/23 HH & AECO gas prices

**Big upside to 2022/23 HH & AECO prices**

Oil prices have been strong, but the bigger surprise to the upside in 2021 has been global LNG, HH and AECO gas prices. There was an excellent reminder from BloombergNEF's Monday US Gas Monthly, which is why we tweeted [LINK] that the takeaway therefrom is that there is big potential upside to 2022 and 2023 forward strips for HH (~$3.51 for 2022 and ~$3.02 for 2023) and AECO (~C$3.26 for 2022 and ~C$2.74 for 2023). BloombergNEF's forecast for US gas storage continues to decrease, Oct 31/2021 was 3.461 tcf (July's forecast was 3.497) and Oct 31/2022 was even lower at 2.430 tcf (July's was 2.640 tcf). We tweeted *"Last time Oct 31 storage was <3 tcf was Oct 31/2000 at 2.732 tcf when #HenryHub was $4.50 & spiked >$10 in winter 2000/01. Oct 31 storage: 3.929 Oct 31/20, latest 5 yr ave 3.751 tcf, the latest 10 yr ave is 3.784 tcf. Last time <2.5 tcf was Oct 31/74. #NatGas"* Even if storage is 3 tcf, its hugely bullish for HH and AECO gas prices. The key reason for this hugely bullish storage forecast is simple – BloombergNEF includes the start up of Calcasieu Pass LNG (1.3 bcf/d) and Sabine Pass LNG Train 6 (0.7 bcf/d) around year end 2021. This timing is consistent with Platts' recent forecast [LINK]. The assumption is that the global LNG markets will absorb this additional LNG volumes of >700 bcf. We want to reiterate even if the global LNG markets don't absorb all the added LNG volumes and BloombergNEF's 2.430 tcf storage forecast isn't met, an Oct 31/2022 US storage forecast in the low 3 tcf's is very bullish to the forward strips of HH and AECO. Winter 2021/2022 will be the big wildcard but if it's normal and puts storage on track or anywhere near the BloombergNEF forecast, the concept will be like we are seeing with Europe gas storage being so low going into the winter. It's why a BloombergNEF storage forecast for Oct 31, 2022 that is close to 3 tcf would be down another 461 bcf YoY. Our Supplemental Documents package includes excerpts from BloombergNEF US Gas Monthly.

Figure 7: US Natural Gas Inventory Forecast




Source: BloombergNEF

### Natural Gas – Are Rwandan troops the game changer for Mozambique LNG?

**Rwandan troops a game changer?**

Last week's (Aug 15, 2021) Energy Tidbits highlighted how Rwandan troops have led the charge to force the rebels out of the key port cities and raise the question if Mozambique calling in Rwandan troops in late July will turn out to be the game changer to bring back and establish sufficient security for TotalEnergies to lift force majeure in early 2022. This week, the reports continue to note the Rwandan and Mozambique forces are reclaiming more territory and forcing the rebels into the jungle. Clearly, the Rwandan troops are making a difference. On Aug 13, we tweeted [LINK] "*Was July a game changer for #TOT #XOM in Mozambique #LNG? Give a chance for force majeure removal in early 2022? Rwanda troops weren't under international scrutiny, aggressively fought and pushed out rebels from key ports/towns. Thx @AntonySguazzin".* And it seems like the Rwandan troops will be sticking around, which we have to believe will make a big difference for Mozambique to establish and maintain security. On Wednesday, The New Times (Rwandan news outlet) [LINK] reported "*After the insurgents' main stronghold was captured, more than 90 percent of the Province is now free save for very few "pockets" where operations to wipe out the terrorists are now focused. Cabo Delgado Province has 16 districts but only four including Palma and Mocimboa da Praia were affected by the insurgents."* And Rwandan and Mozambique troops are going after them in the jungle. On Wednesday, the Club of Mozambique (Mozambique news outlet) [LINK] reported ""*Major ambush on militants' Mozambique forest hideout – BBC report. Rwandan and Mozambican troops are reported to have launched a major operation against Islamist militants hiding in forests in northern Mozambique*."

### Natural Gas – Peru's Energy Minister tries to lessen industry's worry

**Peru lessens nationalization talk**

Last week's (Aug 15, 2021) Energy Tidbits highlighted Peru Prime Minister Guido Bellido's interview with Reuters [LINK] that clearly noted Peru's plan to participate in many key industries including natural gas and new hydroelectric projects. Call it participation or some level of nationalization, the question will be what form, how much and when. This should not

surprise anyone as this was the expectation. This week, there was a good Argus interview [LINK] that seemed as if Peru sent out new Energy Minister Ivan Merino to put on a kinder, gentler face to lower the concern industry will have about Peru. Our first thought on seeing the contrast was that it reminded us of Canada and how the Liberals always seem to send out Natural Resources Minister O'Regan to talk nice and be supportive of the oil and gas sector, but then only to see that any Liberals policy decision is worse than what would be expected after hearing O'Regan. Industry will hope that Merino isn't Peru's O'Regan. And maybe Peru is realizing they need industry capital? But here are a few of Merino's supportive comments for industry. "*We believe in public companies and many of the major oil companies in the world are public. We want public companies that generate revenue for the state, not employment for the party in power."* Re the need for natural gas to grow, Merino said *"The first thing is exploration. We need to explore to find reserves. This can be done by both the private and public sector. Part of the problem with declining production and failure to explore has to do with social conflicts, which is a product of inefficient state management and mistakes by private companies. We need to guarantee that agreements that have been reached by the state or companies with communities are respected. Many agreements have been signed, but few have been implemented. This leads to resentment. We need clear rules, not favorable or unfavorable rules, to guarantee a stable operating climate that allows for exploration and production."* Our Supplemental Documents package includes the Argus interview.

**Natural Gas – Petronet LNG demand is growing much faster than happened in the past**

**Petronet LNG demand outlook**

Petronet LNG held its Q1/2022 call on Monday and it looks like their Q&A response to their view on long term LNG markets matches up with what they said and we put in our June 20, 2021 Energy Tidbits. (i) There is a difference but that is due to the qualifier in Monday's Q1/2022 call that Petronet said assuming LNG share of natural gas consumption was left at its current 55% ratio. Whereas in June, Petronet forecasts the LNG share to increase from 50% to 70% of India natural gas consumption. On Monday, Petronet said "*"See, it has been to the extent of 55% as far as the imported cash and 45% natural gas required. And I think back through domestic production. So, it has been the case in the previous year and similar trend is going on and in future. It may increase further, but right now this is the percentage. And as far as the prospects are concerned. I'm just ensuring it that the consumption will continue to increase, because the requirement is much more than what is happening now and perhaps to the estimated, as high as almost --70 to 90 MMTPA 2030."* At 55%, LNG would range from 9.1 to 11.8 bcf/d. (ii) Our June 20, 2021 Energy Tidbits highlighted Petronet LNG CEO AK Singh's long term forecast for India's natural gas demand and LNG imports. Key to his comments were that Singh forecast LNG to increase to 70% share of India's natural gas consumption. In June, CEO Singh forecast that LNG increases to 70% share and then LNG would be 15.8 bcf/d in 2030. Whereas the Monday Q&A LNG forecast assumes the existing 55% share, but if that share was adjusted to the CEO's 70% share, the 11.8 bcf/d would be 15.0 bcf/d so close to the 15.8 bcf/d June forecast. Below is what we included in the June 20, 2021 Energy Tidbits on the Petronet LNG CEO comments. Our Supplemental Documents package includes excerpts from the Petronet LNG Q1/2022 call transcript.

> **June 20, 2021 memo. Petronet sees India LNG imports +13 bcf/d to 2030**
> Here is what we put in the June 20, 2021 Energy Tidbits. "*There was an even better reminder on Friday from India on how their plan to increase natural gas to 15% of its energy mix will be a major catalyst to LNG markets in the 2020s. Recently our June 6, 2021 Energy Tidbits noted the June 4 tweet from India's Energy Minister Dharmendra Pradhan [LINK] "We are rapidly deploying natural gas in our energy mix*

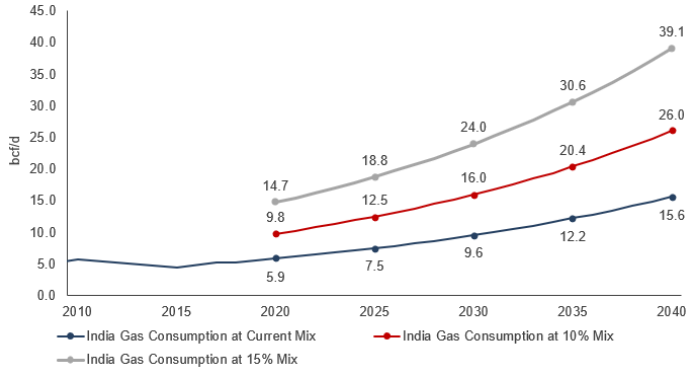
*with the aim to increase the share of natural gas from the current 6% to 15% by 2030. One Nation, One Gas Grid is being implemented to remove regional imbalances in access to natural gas. #IndiasGreenFuture." Pradhan didn't give a forecast of what this meant for increased bcf/d of natural gas and LNG imports. But this week Petronet CEO AK Singh gave a specific forecast. Reuters report "LNG's share of Indian gas demand to rise to 70% by 2030: Petronet CEO" [LINK] included Petronet's forecast if India is to hit its target for natural gas to be 15% of energy mix by 2030. Singh forecasts India's natural gas consumption would increase from current 5.5 bcf/d to 22.6 bcf/d in 2030. And LNG shares would increase from 50% to 70% of natural gas consumption ie. ~3 bcf/d to 15.8 bcf/d in 2030. Singh did not specifically note his assumption for India's natural gas production, but we can back into the assumption that India natural gas production grows from ~3 bcf/d to 6.8 bcf/d. Our Supplemental Documents package includes the Reuters report.*

**Petronet's natural gas demand forecast is in line with our Oct 2019 forecast**

Our June 20, 2021 Energy Tidbits also compared the Petronet June LNG forecast to our Oct 2019 forecast. At that time, we wrote "*It was good to finally see India come out with a specific forecast for 2030 natural gas consumption and LNG imports if India is to get natural gas to 15% of its energy mix in 2030. Petronet's Singh forecasts India natural gas consumption to increase from 5.5 bcf/d to 22.6 bcf/d in 2030. This forecast is pretty close to our forecast 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." Our Supplemental Documents package includes our Oct 23, 2019 blog.*

Figure 8: India's Projected Natural Gas Consumption @15% Of Energy Mix (bcf/d)




Source: BP, SAF

**Natural Gas – Petronet LNG wants to extend Qatar LNG deals for at least 10 yrs**

**Petronet wants Qatar extension**

There were another key Q&A LNG insights from the Petronet LNG Q1/2022 call that would seem to fit the view that LNG demand is growing in the 2020s (not just in India) and our concern that the growth in LNG supply in the 2020s isn't as strong as was expected in 2019 and 2020. Petronas LNG wants to extend the existing long term Qatar LNG supply deals for a further 10 years. The long term contract expires in 2023 and they are clearly saying they want to extend. Here is the back and forth from the Q&A. "*Q: "Right, that answers my question. And sir. One more if I may. So again, but any impact ofthis topic only. So, we are basically pulling capacity of 16.5, but 8.5 that we are getting from RasGas that you have contracted was an integral part of this is 16.5 the half assured business that we have." A: "Right". Q: "Would that mean that, let's say in the contract expiring in 2028. So it is imperative upon us to more surely renew that contract, otherwise assure business will go unsold, so which in effect means that, let me. We have very little elbow room over there. So, then right to understand?" A: "No, no, we are and this already said that it should be reviewed in 2023. And our endeavor renewable contracts for further at least for 10, 20 years, 10, 15 years. It is our ambition and I'm fully confident that this will happen, because this is a good contract and perhaps they will be able to negotiate with them and we'll continue to utilize our capacity as we are doing right now."*

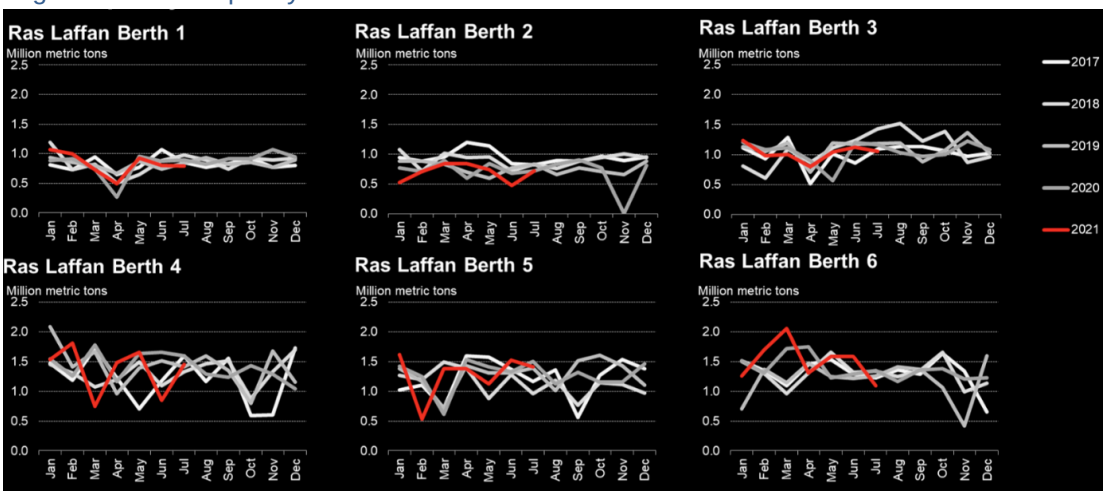
**Natural Gas – Qatar LNG supply management by shifting maintenance earlier**

**LNG imports from Asia decrease, Qatar shifts output**

BloombergNEF published a great article on Wednesday, with inferences that Qatar's maintenance schedule has shifted based on market dynamics. We tweeted [LINK] *"Smart @qatarpetroleum #LNG supply mgmt. Record LNG spot prices = some Asian #LNG buyers holding off spot. Yes, seasonally low Jun/Jul output, but great @BloombergNEF Fauziah Marzuki & Michael Yip Qatar loadings/maintenance graphs suggest some moving forward of Oct/Nov maintenance."* According to vessel tracking by Bloomberg, the loadings by berth may be signalling a shift in maintenance schedules at the 3.7 tcf Qatargas complex. As LNG imports to Asia decreased to due price-sensitive Asian buyers keeping away from the spot markets, there was low seasonal output for Qatargas. This output pattern suggests that Qatar might have shifted its Oct-Nov maintenance earlier in order to capture the likely tight market

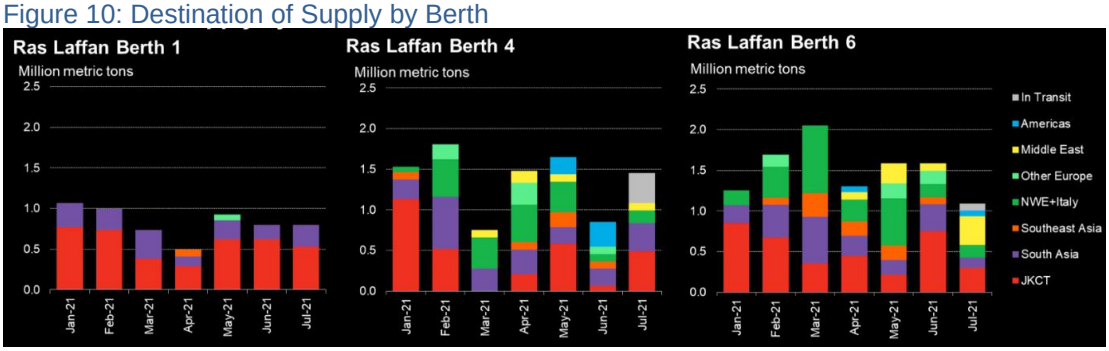
this month and heading into fall once Asian buyers return. Market tightness is only exacerbated by the amount of tankers off the Ras Laffan berths waiting to be loaded. It is normal to have a number of ships waiting given its sheer size, but it appears to be piling up. Loading times are up to an average of 1.3 days in July and 1.2 days in August, comparted to 1.1 days in 2020. It's unclear why the loading time is increasing, but if the pile up continues, supply will be even tighter. Below are charts from Bloomberg detailing the LNG output/destination by berth at Ras Laffan and the average loading time. Our Supplemental Documents Package includes the BloombergNEF report.

Figure 9: LNG Output by Berth




Source: Bloomberg

Figure 10: Destination of Supply by Berth




Source: Bloomberg

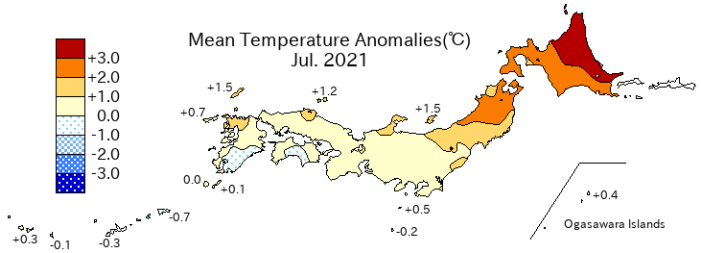
**Natural Gas – Japan had above normal temperatures and sunshine duration in July**

**A warm sunny July in Japan**

Its been a great summer for LNG markets and prices, and one factor has been it was hot in June in many parts of the world. This trend has only continued in July. The Japan Meteorological Agency posted its monthly climate anomaly recap for Japan for July [LINK]. No surprise, July was a month that saw above normal temperatures in all of Japan except for one region in the SE. It was also a month of low precipitation in the west and east, but humid and above average precipitation in the center of the country. The JMA wrote *"The northern Japan was frequently covered by high pressure systems. Monthly mean temperatures were significantly above normal and monthly precipitation amounts were significantly below normal in northern Japan. Monthly sunshine durations were the highest record for July since 1946 on*

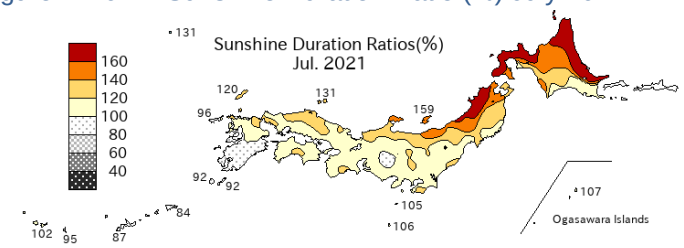
*the Sea of Japan side of northern Japan. -Monthly precipitation amounts were significantly above normal on the Pacific side of eastern Japan due to the Baiu-front. -In Okinawa/Amami, monthly mean temperatures were below normal and monthly precipitation amounts were above normal and monthly sunshine durations were below normal due to the typhoon IN-FA and moist airflow."* August began very hot with above-average highs, but in the past week has cooled off and temperatures have sunk below-average. Below are the JMA temperature and sunshine duration maps for July.

Figure 11: JMA Mean Temperature Anomalies (◦C) July 2021




Source: Japan Meteorological Agency

Figure 12: JMA Sunshine Duration Ratio (%) July 2021



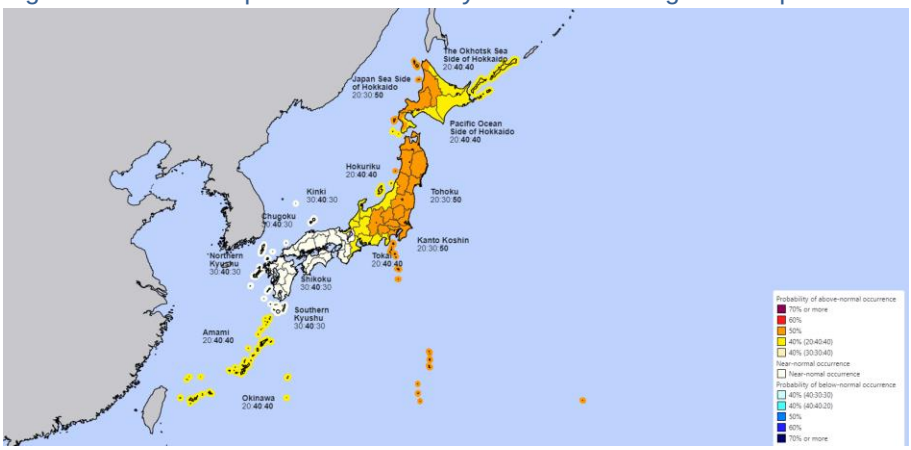

Source: Japan Meteorological Agency

**Natural Gas – Japan: hot to end August, returning to normal temperatures in Sept**

**Warmer than normal in Japan end of Aug**

It looks like weather in Japan will continue to be supportive of the strong summer LNG prices as we exit August, but will likely not offer much support in Sept. Weather always changes and there is no certainty of that the forecasts will be accurate. However, the last week has seen a warm outlook for Japan for the next 30 days. And it looks like a slight cooling off from the previous regional trend in July/Aug – warm in the north, a little above normal in the centre, and then normal in the south. It will be warmer than normal to end Aug but then the forecast turns to normal in Sept. The Japan Meteorological Agency issued its updated month ahead weather forecast for Aug 21 – Sept 20 on Thursday [LINK] Below is the current JMA forecast for the remainder of Aug and into Sept.

Figure 13: JMA Temperature Probability Forecast for Aug 21 – Sept 20




Source: Japan Meteorological Agency

Figure 14: JMA Temperature Probability Forecast for Sept 4 – Sept 17


Source: Japan Meteorological Agency

**China July LNG imports**

### Natural Gas – China July LNG imports +12.7% YoY, pipeline gas imports +58.9% YoY

For the past two years, we have been warning that the start up of Gazprom's Power of Siberia natural gas pipeline would cut into LNG demand growth. And for the past year, we have warned that we are seeing increasing China domestic natural gas production. Both of these themes are continuing to play out and why China's LNG import growth is solid but not spectacular. The General Administration of Customs for China released its Monthly Bulletin on Wednesday, which is a detailed breakdown of imports for July [LINK] . We are seeing the same China LNG import trends – YoY increases in LNG imports are so so because of YoY growth in gas pipeline imports from Russia and domestic natural gas production. China LNG imports in July were +12.7% and +0.99 bcf/d YoY to 8.78 bcf/d. China gas pipeline imports in July were +58.9% and +2.1 bcf/d YoY to 5.7 bcf/d. China domestic natural gas production in July was +10.7% YoY and +1.73 bcf/d YoY to 17.95 bcf/d.

Figure 15: China LNG Imports

| bcf/d | 2016 | 2018 | 18/17 | 2019 | 19/18 | 2020 | 20/19 | 2021 | 21/20 |
|---|---|---|---|---|---|---|---|---|---|
| Jan | 3.84 | 8.03 | 50.0% | 10.20 | 27.1% | 10.31 | 1.1% | 13.15 | 27.6% |
| Feb | 3.10 | 6.84 | 66.9% | 7.46 | 9.1% | 7.26 | -2.7% | 9.52 | 31.1% |
| Mar | 2.60 | 5.04 | 64.5% | 6.28 | 24.8% | 6.49 | 3.3% | 8.74 | 34.6% |
| Apr | 3.00 | 5.43 | 57.8% | 7.27 | 34.0% | 8.16 | 12.3% | 10.77 | 32.0% |
| May | 2.20 | 6.39 | 41.9% | 6.87 | 7.6% | 8.10 | 18.0% | 10.89 | 34.4% |
| June | 3.51 | 6.31 | 30.1% | 7.25 | 14.9% | 9.27 | 27.8% | 10.76 | 16.1% |
| July | 2.46 | 6.40 | 33.4% | 7.56 | 18.1% | 7.79 | 3.1% | 8.78 | 12.7% |
| Aug | 3.54 | 7.26 | 49.2% | 8.04 | 10.8% | 9.23 | 14.8% | | |
| Sept | 4.05 | 7.00 | 26.3% | 8.16 | 16.7% | 9.17 | 12.4% | | |
| Oct | 2.85 | 7.13 | 29.6% | 6.26 | -12.2% | 7.78 | 24.3% | | |
| Nov | 4.26 | 9.59 | 47.5% | 10.42 | 8.7% | 10.58 | 1.6% | | |
| Dec | 5.80 | 9.75 | 25.0% | 10.01 | 2.7% | 11.76 | 17.5% | | |
| Full Year Avg. | 3.43 | 7.10 | 41.2% | 7.98 | 12.5% | 8.83 | 10.6% | | |
| Note: Jan/Feb 2020 figures are averaged. Not applicable for YoY comparison | | | | | | | | | |

Source: China General Administration of Customs, Bloomberg

### Natural Gas – Gazprom needs to refill Russia storage before winter

**Russia needs Gazprom's supply**

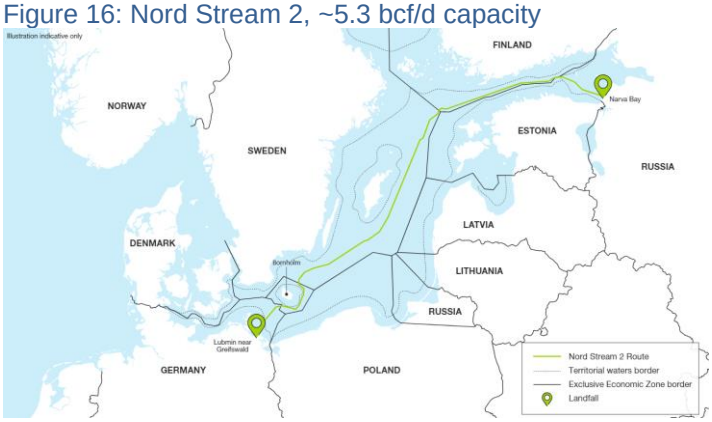
Further signals of tight natural gas supply to come with Gazprom having more domestic needs for natural gas to fill prior to exporting additional volumes to Europe – in particular to refill Russian storage before the winter. Gazprom posted on its Facebook [LINK] *"August has become another 'winter' month in the gas market"*. Gazprom reported that according to preliminary data, it produced ~50 bcf/d over the first 7.5 months of 2021, which represents an 18.1% increase vs the same period of 2020. The company increased its gas exports to countries beyond the Former Soviet Union to 4.343 tcf, which is an all-time high and +21.5% vs 2020. The European market is in need of more exports, with reserves in gas storage in the EU and Ukraine the lowest seen in many years. Specifically, in the EU gas storage facilities, only about 1.1 tcf out of the 2.3 tcf that had been withdrawn over last winter has been replenished. Gazprom then went on to say that although Gazprom has been increasing production and EU demand is high, they must first satisfy their domestic needs. First, they explained that there is peak demand in Russia *"As we analyze the volumes of supplies within Russia and to the countries beyond the FSU observed in August, we see that the consumption of gas in this month has lately reached a new peak level. For instance, the average daily figure for Russia recorded in 2021 is 53 (!) million cubic meters (or by 9%) higher than the average gas supply volume observed over the previous eight years. Our gas exports increased by 9.4%, which makes the average daily supply volumes of August comparable with those of the winter months."* They added that now the priority for Russia is injecting gas into its underground storage facilities for winter. Our Supplemental Documents package includes the Gazprom Facebook posting.

### Natural Gas – Gazprom says Nord Stream 2 is ready to supply gas for Nov 1

**Nord Stream 2 can deliver on Nov 1**

We continue to highlight Nord Stream 2 as the key event to impact LNG prices in 2022. On Thursday, we tweeted [LINK] *"#NordStream2. Looks ready to start deliveries for start of winter #NatGas year on Nov 1, 2021. #Gazprom says can supply 5.6 bcm (198 bcf) in 2021. Nord Stream 2 capacity is 5.3 bcf/d. Assuming some ramp up levels, implies ready for Nov 1 start. This is key relief for 2022 #LNG*." TASS reported [LINK] *""The Nord Stream 2 gas pipeline can supply 5.6 billion cubic meters of gas this year," the gas holding said in a statement*." Our tweet said that it implies Nord Stream 2 is ready to ship on Nov 1, 2021. And that means the pipeline will be operational likely in Sept for line fill. Nord Stream 2 capacity is 5.3 bcf/d, which would be 38 days of full capacity to supply 198 bcf/ in 2021. We assume some ramp up in volumes towards capacity, which is why we said it implies being ready to supply natural gas on Nov 1, 2021. Our Supplemental Documents package includes the TASS report.

Figure 16: Nord Stream 2, ~5.3 bcf/d capacity




Source: Gazprom

### Natural Gas – Gazprom takes almost zero available Ukraine capacity

**Gazprom books almost zero extra**

The summer Europe energy story continues to be record or near record electricity and natural gas prices. Russia may be doing all it is supposed to do to deliver natural gas, but it is certainly not doing all it can do to help relieve natural gas prices. This month, Gazprom booked only 0.02 bcf/d of additional interruptible transit capacity from Ukraine for September. The Kyiv Post reported on Monday [LINK] that while the Ukraine was offering 0.53 bcf/d of additional transit capacity at auction, Gazprom only elected to take a mere 4% of it. We reported in our July 25 Tidibts that Gazprom booked the entire 0.53 bcf/d firm capacity offered for the month of August. Last month's auction offered additional firm capacity for August, but this month's auction was for interruptible capacity. While Gazprom has previously elected to purchase additional firm capacity, it has never once purchased interruptible capacities through Ukraine until this month. Following the end of the auction, Dutch TTF September futures jumped to 48.05 euros per thousand kWh, hitting record highs as it appears the supply crunch is expected to continue. Our Supplemental Documents package includes the Kiev Post report. .

### Natural Gas – Putin on Nord Stream 2 and gas transit thru Ukraine after 2024

**Putin on natural gas**

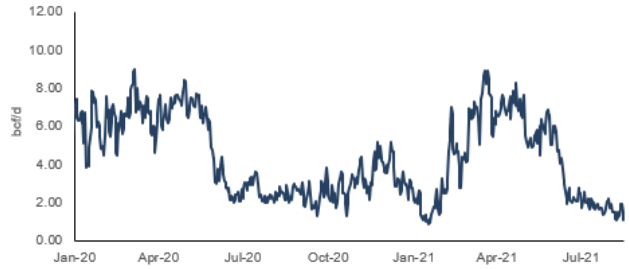
On Friday, Merkel and Putin held a joint press conference after their meeting in Moscow. No surprise, there were questions on Nord Stream 2 and Russia's preparedness to transport natural gas via Ukraine to Europe after the current transit agreement ends in 2024. (i) Yesterday morning, we tweeted [LINK] out the relevant sections of the Kremlin transcript, *"#NordStream2. Putin: only 15 km underwater pipe to go. Also for sure will deliver #NatGas to Europe via Ukraine after contract ends in 2024 but can't commit to specific volumes until they have contracts from Europe customers as to how much they will buy*." (ii) Nord Stream 2. Putin noted the project is nearing completion with only 15 km of underwater and 30 km of land pipeline to be constructed. He also reiterated "*Some people claim the project is politically motivated. This is a fallacy or an attempt to mislead people*." (iii) On post 2024 transit thru Ukraine. Putin said what he has said before, Russia is ready to transit gas via Ukraine to Europe after the current contract ends in 2024. But it can't commit to any specific volumes until they have contracts with European buyers as to how much natural gas they want to buy from Russia. And then in typical Putin style says "*With the green agenda, which is already underway in Europe, we are wondering whether anyone will be buying gas from us altogether and, if so, how much. This needs to be discussed. In any case, this is a purely business matter."* Our Supplemental Documents package includes excerpts from the Kremlin transcript on Nord Stream 2 and gas via Ukraine. [LINK]

**Natural Gas – LNG flows to NW Europe at 1.88 bcf/d in Jul, down to ~1.52 bcf in Aug**

**LNG flows to NW Europe -1.47 bcf MoM in July**

High Asian spot LNG prices continue to attract LNG cargos to Asia and we are seeing this in low LNG flows into NW Europe and US LNG exports moving to Asia instead of NW Europe. According to Bloomberg, it has been much more profitable to ship US LNG to North Asia due to strong Asia JKM prices (>$14/mmBtu JKM vs ~$12.50/mmBtu TTF). However, it's expected that LNG flows will return to Europe soon as differentials have narrowed. On Thursday, Bloomberg reported "*The price arbitrage between Europe and Asia for October deliveries has nearly closed, which suggests that more cargoes will opt to head to terminals in the Atlantic, according to traders. However, that is likely to be too little too late for European utilities to sufficiently refill inventories before winter's icy weather descends on the region."* Historically, LNG flows into Northwest Europe reached recent peaks at ~5 bcf/d in late November to early December before declining rather quickly through December to mid January where imports reached a low of 0.90 bcf/d on January 17. Since, LNG flows to Europe have been increased to peak to 8.92 bcf/d on March 22. Daily imports in April averaged 7.05 bcf/d, roughly flat to the March average of 7.08 bcf/d. However, May imports were 5.6 bcf/d down 1.4 bcf/d from 7.08 bcf/d in March. In June, the average fell even lower to 3.35 bcf/d as more LNG cargoes began to flow to Asia. Over July, this trend continued, and imports were down a further -1.47 bcf/d to only 1.88 bcf/d that month. Thus far, it appears the flows are down even further in August and are averaging 1.52 bcf/d. European gas storage is at extremely low levels compared to seasonal averages, so LNG flows to Europe remains a key item to watch as we head out of summer. Our Supplemental Documents Package includes the Bloomberg report.

Figure 17: Net LNG Flows to NW Europe




Source: Bloomberg

Figure 18: Net LNG Flows to NW Europe

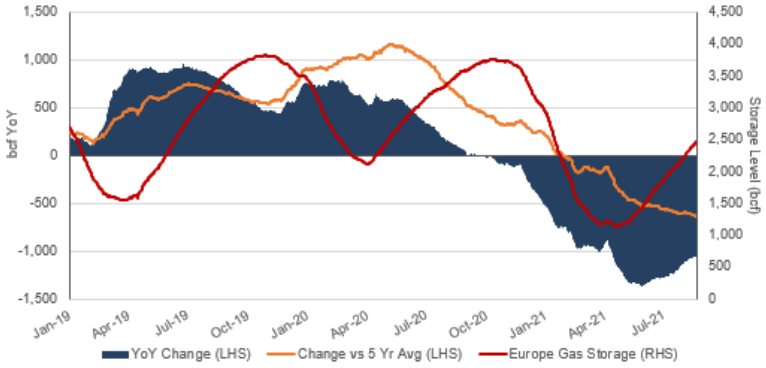

Source: Bloomberg

### Natural Gas – Europe storage 62.64% full vs 5 year average of 79.89%

**Europe gas storage 62.64% full**

Summer will soon be ending and the outlook has moved to how natural gas is set up for the winter. Its been a great summer for Europe gas prices – high Europe demand, strong Asian prices continue to preferentially attract LNG cargos, and very low gas storage levels will end summer refill season at hugely lower YoY levels. The set up for winter natural gas prices in Europe looks strong. The key indicator for winter Europe natural gas prices and also global LNG prices is Europe storage. 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. We are now seeing storage starting to build, but the storage build is slow for the above reasons, with storage as of June 3 being up 9.64% since April 19, which looks to be the bottom. Storage as of Aug 19 is 62.64%, 27.04% less than last year of 89.68% and 17.25% below the 5 yr average of 79.89%. 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 19: Europe Gas Storage Level



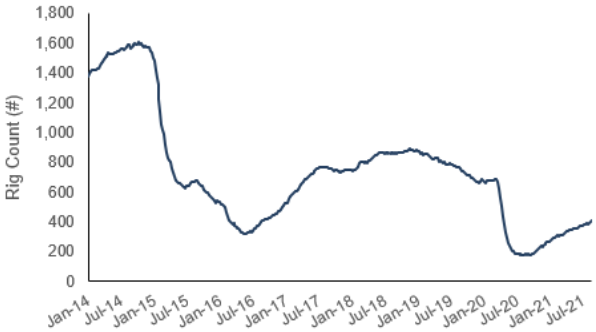

Source: Bloomberg

### Oil – US oil +8 WoW at 405 oil rigs

**US oil rigs +8 WoW**

Baker Hughes reported its weekly rig data on Friday. This week US oil rigs were +8 rigs WoW at 405 oil rigs. The pause experienced this week with the decrease in gas rigs (-5) is to be expected with the pull back of oil and gas prices. Oil rigs have been on a strong recovery path and are +233 off the bottom of 172 in the Aug 14/2020 week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 278 to 405 oil rigs (-40.70%). Below is our graph of Baker Hughes US oil rigs.

Figure 20: Baker Hughes Total US Oil Rigs




Source: Baker Hughes

### Oil – Frac spreads -2 to 236 as of Aug 20

**Frac spreads -2 to 236**

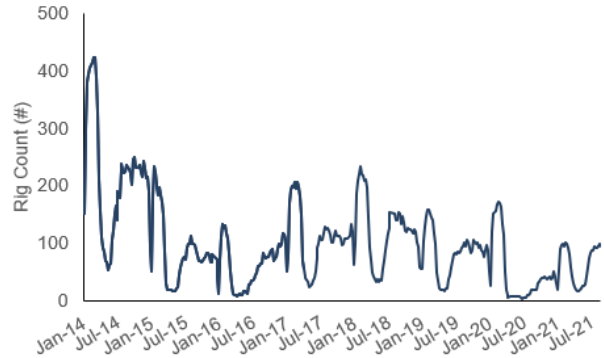
Every week, Mark Rossano (C6 Capital Holdings) posts a YouTube recap of frac spreads for the week on the Primary Vision Network. [LINK]. US frac spreads were -2 to 236 as of Aug 20. Rossano said it was a lot of one-offs in some of the bigger areas, as spreads move around in Aug. He still expects the trend of frac spreads to be positive, but the pace will be slower. He didn't provide any detail on frac spreads in specific basins. Rossano went thru his view of DUCs, he expects the pace of decline in DUCs to slow down and then level off. Note that he stopped providing his frac spread graphs for free about a month ago

### Oil – Total Cdn rigs -8 to 156 total rigs and +100 rigs YoY

**Cdn rigs -8 this week**

Total Cdn rigs were -8 this week to 156 total rigs. Cdn oil rigs were -5 at 95 rigs. Cdn gas rigs were -3 to 60 gas rigs. Total rigs are now +143 since the June 26, 2020 all-time low. We are not surprised to see a pullback in Cdn rigs as normally late Aug/early Sept sees a small decline, so this is not unexpected especially given the pull back in oil prices. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 20 and Cdn gas rigs were 36 for a total Cdn rigs of 56, meaning total Cdn rigs are +100 YoY and total rigs are up +17 vs 2019. Below is our graph of Baker Hughes Cdn oil rigs.

Figure 21: Baker Hughes Total Canadian Oil Rigs




Source: Baker Hughes

### Oil – US weekly oil production +0.1 mmb/d to 11.4 mmb/d

**US oil production +0.1 mmb/d WoW**

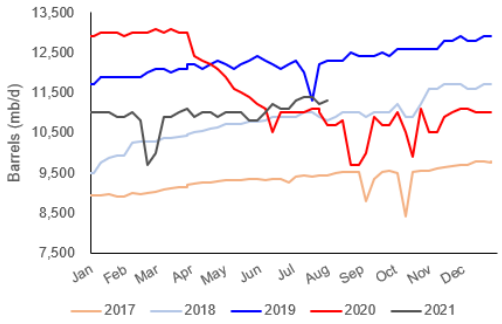
US oil production was up +0.1 mmb/d to 11.4 mmb/d for the Aug 13 week. Lower 48 up +0.1 mmb/d at 11.0 mmb/d. This puts US oil production up +0.7 mmb/d YoY, and is down 1.7 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The August STEO forecast slightly raised its US crude expectations thru 2021 however it is still not returning anywhere near the Q4/19 peak of 12.88 mmb/d, with Q4/21 US crude of 11.30 mmb/d (down 1.58 mmb/d from peak). In US oil production commentary, the EIA wrote *"We expect production to be relatively flat through October before it starts rising in November and December and throughout 2022. Forecast U.S. crude oil production for 2022 averages 11.8 million b/d, up from 11.1 million b/d in 2021."* The EIA DPR has the expectation of slight MoM increases in August/September. The EIA Form 914 May actuals were 281,000 mb/d above the weekly estimates average of 10.950 mmb/d for May, following a similar trend from April's +201,000 mmb/d underestimate.

Figure 22: EIA's Estimated Weekly US Oil Production

| Year-Month | Week 1 | | Week 2 | | Week 3 | | Week 4 | | Week 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | End Date | Value | End Date | Value | End Date | Value | End Date | Value | End Date | Value |
| 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 | | |
| 2021-Jun | 06/04 | 11,000 | 06/11 | 11,200 | 06/18 | 11,100 | 06/25 | 11,100 | | |
| 2021-Jul | 07/02 | 11,300 | 07/09 | 11,400 | 07/16 | 11,400 | 07/23 | 11,200 | 07/30 | 11,200 |
| 2021-Aug | 08/06 | 11,300 | 08/13 | 11,400 | | | | | | |

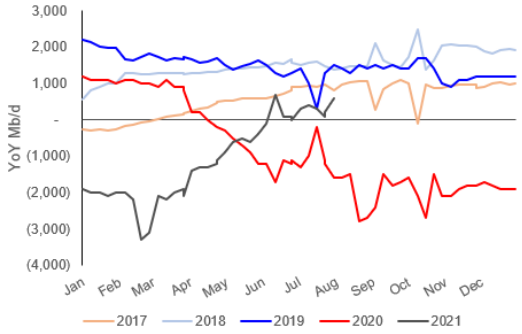
Source: EIA

Figure 23: US Weekly Oil Production




Source: EIA, SAF

Figure 24: YoY Change in US Weekly Oil Production




Source: EIA, SAF

**US shale/tight oil production**

### Oil – EIA DPR continues to estimate relatively flat shale/tight oil production

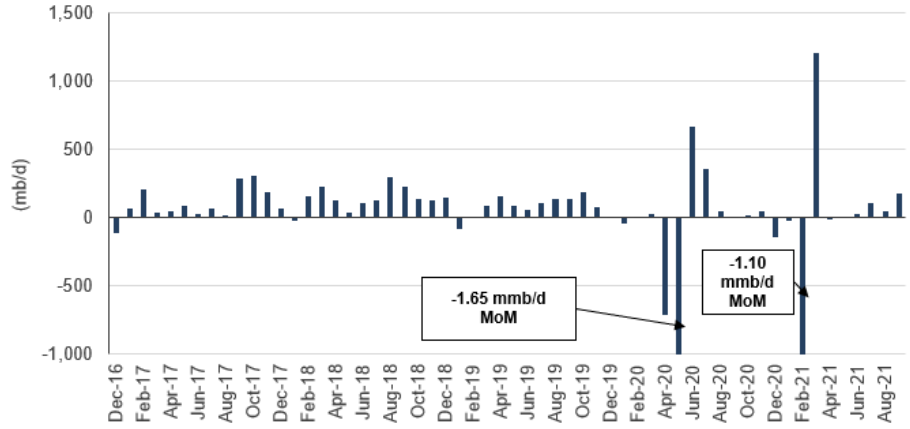
The EIA issued its Drilling Productivity Report Aug 2021 on Monday [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case Aug) and the next month (in this case Sept). (i) The takeaway for shale/tight oil is much the same as for natural gas – shale/tight oil production is expected to increase marginally moving into fall. (ii) The big dip in US shale/tight oil was in Feb and that was due to the freeze. But since then, production has been on a steady MoM increase. (iii) The EIA forecasts September at 8.086 mmb/d which is +49,000 b/d MoM (would have been +179,000 b/d MoM if not for revisions to July) and down 1.072 mmb/d from the Nov/19 peak of 9.158 mmb/d. (iv) This month, all basins are basically flat except for the Permian, which saw an increase of +49,000 b/d. YoY most basins are down, but the Permian has ramped up significantly since last year, +0.528 mmb/d YoY. Total US shale/tight oil production is now +0.250 mmb/d YoY. (v) US shale/tight oil production peaked at 9.158 mmb/d in Nov 2019. (vi) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 25: EIA - Major Shale/Tight Plays Oil Production

| | | | | | 2021 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thousand b/d | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | August | Sept | Sept YoY | Sept less Aug |
| Anadarko | 421 | 404 | 444 | 432 | 423 | 309 | 386 | 373 | 361 | 353 | 354 | 370 | 366 | -55 | -4 |
| Appalachia | 137 | 130 | 122 | 126 | 128 | 123 | 126 | 126 | 127 | 128 | 131 | 129 | 130 | -7 | 1 |
| Bakken | 1,236 | 1,242 | 1,237 | 1,204 | 1,166 | 1,106 | 1,129 | 1,118 | 1,108 | 1,102 | 1,116 | 1,139 | 1,138 | -98 | -1 |
| Eagle Ford | 1,107 | 1,116 | 1,111 | 1,075 | 1,054 | 882 | 1,062 | 1,045 | 1,032 | 1,027 | 1,043 | 1,054 | 1,049 | -58 | -5 |
| Haynesville | 34 | 34 | 34 | 35 | 34 | 28 | 33 | 33 | 32 | 32 | 34 | 34 | 34 | 0 | 0 |
| Niobrara | 626 | 594 | 588 | 574 | 571 | 556 | 544 | 534 | 524 | 516 | 540 | 555 | 564 | -62 | 9 |
| Permian | 4,277 | 4,330 | 4,359 | 4,308 | 4,354 | 3,546 | 4,471 | 4,510 | 4,555 | 4,607 | 4,647 | 4,756 | 4,805 | 528 | 49 |
| Total | 7,836 | 7,850 | 7,896 | 7,752 | 7,729 | 6,549 | 7,751 | 7,739 | 7,738 | 7,765 | 7,865 | 8,037 | 8,086 | 250 | 49 |

Source: EIA, SAF

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




Source: EIA, SAF

### Oil – EIA DUC's worked down by 258 in July

**DUCs continue to work down**

Our biggest concern in the past on EIA's Drilling Productivity Report [LINK] estimate of Drilled UnCompleted wells was that the data had been constantly revised and sometimes significantly. However, the EIA DUC data shows a clear trend since August 2020 of a continued work down of DUCs and we expect that trend is correct. It also reinforces the need for drilling rigs to pick up to replenish the DUC inventory if the US to have strong oil growth in 2022. (i) The EIA estimates DUCs are down another 258 MoM in July, meaning a total 2,917 DUCs were worked down since the Jun/20 peak of 8,874. The largest work downs are coming from the Permian (-1,401 YoY) and Eagle Ford (-464 YoY). With DUCs being worked down so significantly we will need to see rig counts go up to replenish DUCs in the near future. (iii) Bakken DUCs. As per the NDPA presentation on April 22, 2021, they estimate there are only 395 economic DUCs at April 30. This is 268 DUCs or ~40% lower than the EIA estimate of 663 as of April. Bakken DUCs were worked down 71 since then and in 2021 DUCs have dropped ~23 per month. This means that at this rate, the Bakken has ~14 months of economic DUC inventory. Below is our running table of the EIA Drilling Productivity Report DUCs.

Figure 27: EIA - Estimated Drilled UnCompleted Wells

| | | | | | | | | 2021 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drilled UnCompletec | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | July YoY |
| Anadarko | 1,054 | 1,048 | 1,022 | 1,002 | 982 | 965 | 952 | 932 | 921 | 901 | 880 | 863 | 856 | 836 | -212 |
| Appalachia | 694 | 688 | 678 | 661 | 648 | 645 | 641 | 623 | 616 | 603 | 590 | 598 | 595 | 579 | -109 |
| Bakken | 884 | 876 | 865 | 832 | 805 | 786 | 760 | 731 | 710 | 688 | 663 | 656 | 619 | 592 | -284 |
| Eagle Ford | 1,388 | 1,374 | 1,340 | 1,288 | 1,252 | 1,220 | 1,181 | 1,152 | 1,135 | 1,102 | 1,071 | 1012 | 954 | 910 | -464 |
| Haynesville | 395 | 397 | 393 | 395 | 383 | 374 | 380 | 375 | 389 | 387 | 385 | 392 | 399 | 397 | 0 |
| Niobrara | 790 | 779 | 783 | 767 | 713 | 663 | 621 | 575 | 530 | 489 | 448 | 402 | 373 | 354 | -425 |
| Permian | 3,669 | 3,690 | 3,622 | 3,507 | 3,363 | 3,227 | 3,116 | 2,988 | 2,955 | 2,852 | 2,731 | 2598 | 2,419 | 2,289 | -1,401 |
| Total | 8,874 | 8,852 | 8,703 | 8,452 | 8,146 | 7,880 | 7,651 | 7,376 | 7,256 | 7,022 | 6,768 | 6,521 | 6,215 | 5,957 | -258 |

Source: EIA, SAF

### Oil – No Wood Buffalo Covid update in oil sands facilities this week

**No change to 2 oil sands Covid outbreak**

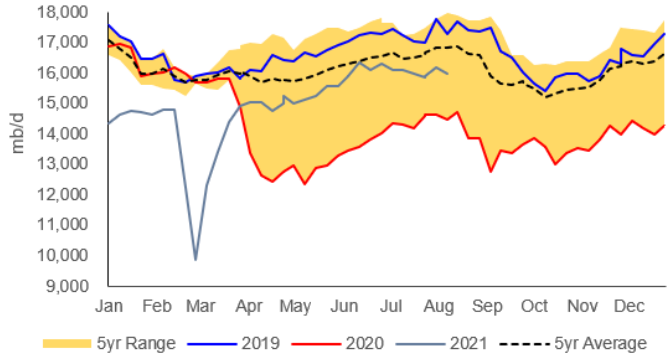
As of our 7am MT news cut off, Wood Buffalo has not yet posted any update on Covid outbreaks in oil sands facilities. Wood Buffalo has been provided once a week updates for the past month. Last week's (Aug 15, 2021) Energy Tidbits memo noted the Wood Buffalo Aug 13 Covid update [LINK].From Aug 1 to Aug 13, there were 3,592 new cases in Alberta, but Wood Buffalo only saw 11 new cases. Wood Buffalo's update noted no changes to the 2 remaining Covid outbreak facilities in the oil sands – CNRL Albian and Suncor Fort Hills

### Oil – Refinery inputs +1.519 mmb/d YoY to 16.006 mmb/d, down 1.696 mmb/d vs 2019

**Gasoline demand tapers off due to seasonality**

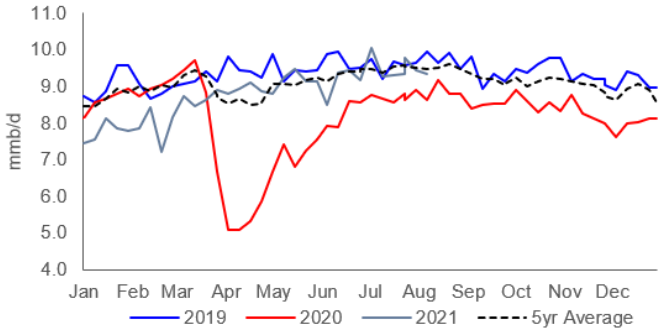
Crude inputs to refineries were up this week and were -0.191 mmb/d to 16.006 mmb/d, and are +1.519 mmb/d YoY, and are -1.696 mmb/d vs 2019. Refinery utilization was up by 0.4% this week at 92.2%, which is +11.3% YoY. Total products supplied (ie. demand) was up big this week, with a +1.949 mmb/d increase to 21.463 mmb/d, and this week motor gasoline was down, being -0.097 b/d to 9.333 mmb/d. For motor gasoline, the market has entered a period where demand will start to fall ahead of fall, so we expect demand to start levelling off at ~9.3 mmb/d, in line with seasonal trends. It's expected the 4-week average will hover around 9.3 mmb/d heading into Labour Day. Below is our graph of crude inputs to US refineries and our graph of US motor gasoline supplied.

Figure 28: US Refinery Crude Oil Inputs (thousands b/d)




Source: EIA, SAF

Figure 29: US Motor Gasoline Supplied (mmb/d)




Source: EIA, SAF

### Oil – US "net" oil imports down -0.813 mmb/d to 2.919 mmb/d

**US "net" oil imports -0.813 mmb/d WoW**

US "NET" imports were down big -0.813 mmb/d to 2.919 mmb/d for the Aug 13 week. US imports were basically flat, down by -0.046 mmb/d to 6.350 mmb/d. US exports were up, being +0.768 mmb/d to 3.431 mmb/d. The WoW decrease in US oil imports was driven by Canada and Colombia. Some items to note on the by country data. (i) Canada was down this week, and was -0.314 mmb/d to 3.057 mmb/d for the Aug 13 week, which is now ~0.6 mmb/d below the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was up by 61,000 b/d to 0.363 mmb/d this week. (iii) Colombia was down this week, erasing last weeks gains, -0.150 mmb/d to 0.143 mmb/d this week. (iv) Ecuador was up by 47,000 b/d at 197,000 b/d. (v) Iraq was up +30,000 b/d to 150,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico was up by 28,000 b/d to 0.629 mmb/d.

## Figure 30: US Weekly Preliminary Oil Imports By Major Countries

| | June 04/21 | June 11/21 | June 18/21 | June 25/21 | July 02/21 | July 09/21 | July 16/21 | July 23/21 | July 30/21 | Aug 06/21 | Aug 13/21 | WoW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada | 3,971 | 3,644 | 3,435 | 3,282 | 3,744 | 3,480 | 3,611 | 3,476 | 3,228 | 3,371 | 3,057 | -314 |
| Saudi Arabia | 144 | 381 | 555 | 565 | 316 | 347 | 359 | 363 | 351 | 302 | 363 | 61 |
| Venezuela | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mexico | 423 | 764 | 878 | 747 | 408 | 648 | 797 | 621 | 634 | 601 | 629 | 28 |
| Colombia | 137 | 143 | 340 | 139 | 154 | 140 | 144 | 144 | 141 | 293 | 143 | -150 |
| Iraq | 173 | 305 | 151 | 142 | 229 | 182 | 480 | 145 | 82 | 120 | 150 | 30 |
| Ecuador | 122 | 96 | 29 | 260 | 0 | 95 | 171 | 168 | 46 | 150 | 197 | 47 |
| Nigeria | 264 | 169 | 183 | 33 | 142 | 187 | 195 | 55 | 212 | 150 | 214 | 64 |
| Kuwait | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Angola | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Top 10 | 5,234 | 5,502 | 5,571 | 5,168 | 4,993 | 5,079 | 5,757 | 4,972 | 4,694 | 4,987 | 4,753 | -234 |
| Others | 1,404 | 1,244 | 1,372 | 1,238 | 882 | 1,142 | 1,340 | 1,535 | 1,738 | 1,409 | 1,597 | 188 |
| Total US | 6,638 | 6,746 | 6,943 | 6,406 | 5,875 | 6,221 | 7,097 | 6,507 | 6,432 | 6,396 | 6,350 | -46 |

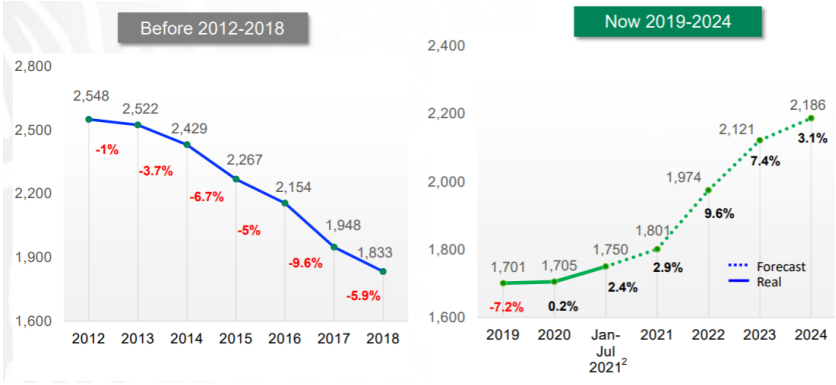
Source: EIA, SAF

### Oil – Pemex finally lowers its ridiculously high oil production forecasts

**Pemex lowers 2021 oil forecast**

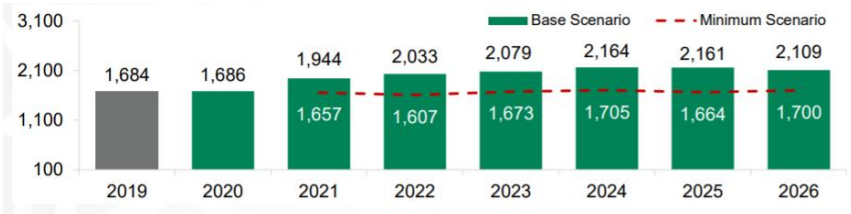
On Thursday, Pemex posted a new investor presentation [LINK]. It didn't provide all forecast information (ie. no natural gas production forecast) but did provide a revised lower oil production forecast We have been warning this was coming, the latest was in our August 1, 2021 Energy Tidbits when we wrote " *Pemex 2021 oil production forecast of 1.944 mmb/d looks ridiculously high. Pemex posted a investor presentation [LINK] on June 23, which includes its unchanged 2021 forecast for "Total Crude Oil Production" to average 1.944 mmb/d in 2021. The fine print says it includes condensate, which typically runs about <50,000 b/d. If we back out the condensate and use 1.90 mmb/d, it means crude oil production would have to average ~2.05 mmb/d for the last 7 months of 2021*." The new Aug 19 presentation lowers 2021 oil (including condensate & partners production) to 1.801 mmb/d for 2021 (was 1.944 mmb/d), and to 1.974 mmb/d for 2022 (was 2.033 mmb/d). Below are the Pemex oil production forecasts in the Aug 19 and June 23 slide decks.

## Figure 31: Pemex Total Crude Oil Production Forecast per Aug 18 slide deck




Source: Pemex

## Figure 32: Pemex total crude oil production forecast per June 23 slide deck



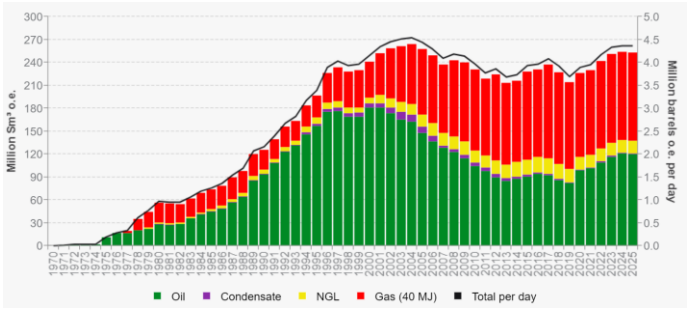

Source: Pemex June 23, 2021 investor presentation

### Oil – Norway July oil production of 1.753 mmb/d, back up post maintenance

**Norway oil production**

The Norwegian Petroleum Directorate released its July production figures [LINK] of 1.753 mmb/d of oil, which is +0.5% YoY and +5.1% MoM from June at 1.668 mmb/d. Note that July is back up from June which had been impacted by maintenance and technical issues. Production was basically on par with the forecasted amount of 1.752 mmb/d (only 0.1% higher than the forecast for the month) and +0.4% higher than the forecast so far this year. The story for Norway was that its oil production returned to growth in the last 3 years because of the Johan Sverdrup oil field and that Johan Sverdrup oil is expected to produce at higher-than-expected levels. Below is the NPD's historical and forecast production graph as of Feb 17 [LINK]. Our Supplemental Documents package includes the NPD July release.

Figure 33: Historical and expected production in Norway, 1970-2025




Source: Norwegian Petroleum Directorate

### Oil – OPEC/non-OPEC next meeting scheduled for Wed Sept 1

**OPEC/non-OPEC Sept 1 meeting**

We should start to see comments from the OPEC watchers later this week as the next scheduled OPEC and non-OPEC Ministerial Meeting is 10 days away on Wed Sept 1. But with Delta being the growing market and economy theme, no surprise we started to see more of the US oil analysts increasingly move to an expectation for OPEC+ to delay some of the planned production increases. One item we haven't seen is talk about any independent Saudi Arabia action. We know a lot can happen in 10 days, but we think its unlikely to have any significant switch in the Delta tone.

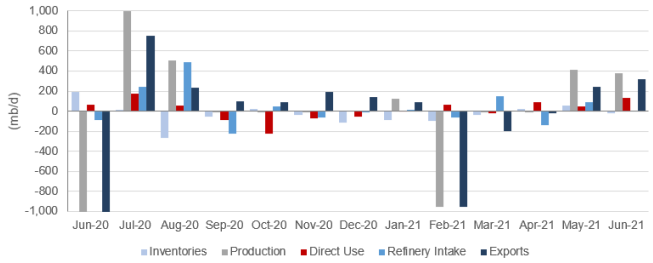
### Oil – Saudi ramping up to peak oil consumption in Aug for electricity season

**Peak Saudi oil for electricity season**

The JODI data for June was updated on Thursday. Saudi was increasing oil production, and Saudi use of oil for electricity increases in June as the country is approaching its peak period for use of oil for electricity that typically peaks in August. There was 0 b/d of unaccounted supply, and +98,000 b/d of unaccounted demand. There was an immaterial draw in inventories, down 21,000 b/d for the month. (i) Production was +383,000 b/d MoM to 8.927 mmb/d due to Saudi continuning to gradually return some of its voluntary 1 mmb/d production cuts. Exports also rose, but at a slower rate than production, being +316,000 b/d MoM to 5.965 mmb/d. Direct use for electricity was up, being +135,000 b/d to 586,000 b/d. (ii) Inventories decreased but were basically flat this month, down -21,000 b/d from 134.775 mmb in May to 135.139 in June. Crude inventories are still sitting at historically low levels, as the last time crude inventories were below 150 mmb was in April 2004 at 149.8 mmb. (iii) The one key reminder looking at the next few months is that Saudi Arabia is now in its peak months for using oil for electricity. As expected, Saudi used more oil for electricity in June vs May. May was 451,000 b/d (vs May 2020 of 407,000 b/d) and June was 585,000 b/d (vs June 2020 of 469,000 b/d). June was slightly above the latest 5 yr average of 574,000 b/d. Below are the AccuWeather Temp maps for Riyadh for Jul and Aug MTD. Careful they are different scales, but look for oil for electricity to continue to ramp up in July and peak in Aug.

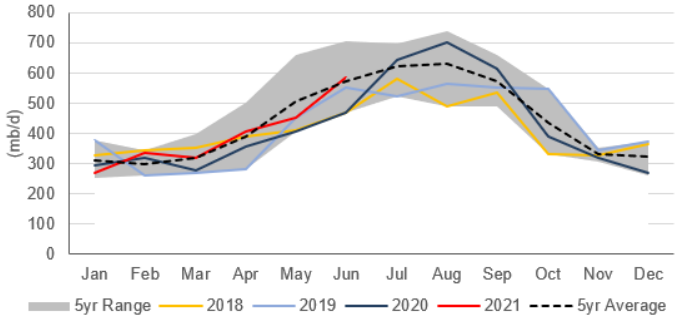
We are now in the peak period for oil for electricity. Below are our updated graphs for the Saudi JODI data for June.

Figure 34: MoM Saudi Inventories, Production, Direct Use, Refinery Intake & Exports



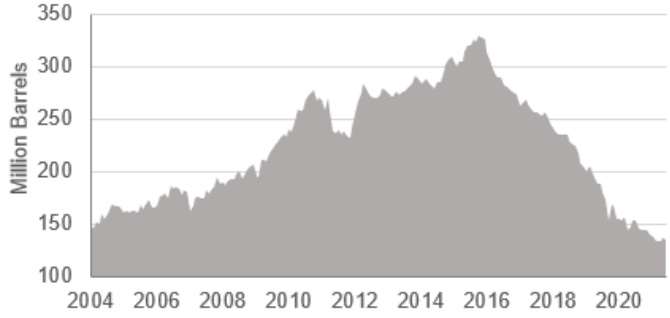

Source: JODI, Bloomberg

Figure 35: Saudi Arabia Direct Use of Crude Oil For Electric Generation



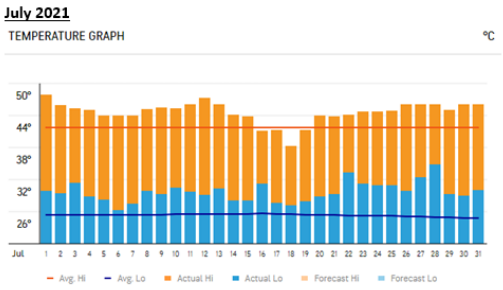

Source: JODI

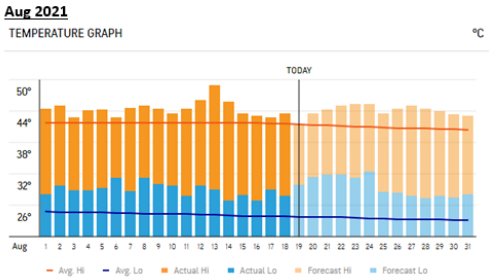
Figure 36: Saudi Arabia Crude Oil Inventories (million barrels)



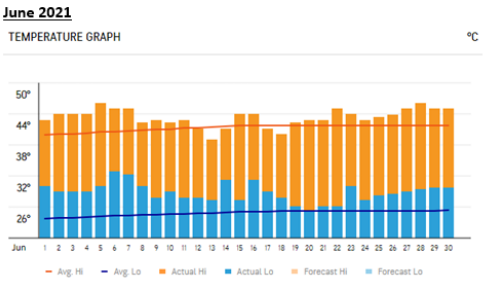

Source: JODI

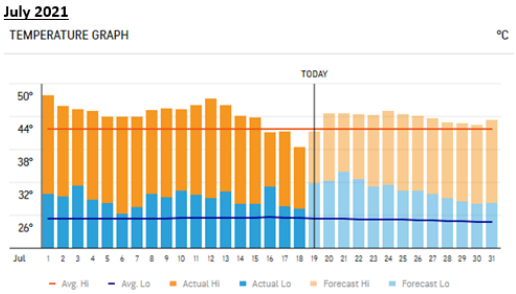
Figure 37: Riyadh Temperature Recaps for July and Aug




Source: AccuWeather




Source: AccuWeather

## Oil – Is the US thinking about lowering the bar for an Iran deal?

**US on JCPOA**

What isn't clear is how the Biden administration was surprised on Afghanistan is impacting their views on other Middle East item, especially on Iran. Putting the Afghanistan impact aside, we couldn't help tweet [LINK] after seeing the Political exclusive interview with Robert Malley, the US envoy leading the US JCPOA efforts. Politico didn't say or point to the same question but we tweeted "*#JCPOA. Is US thinking about lowering the bar? Great @alexbward @QuintForgey exclusive w/ US envoy @Rob_Malley US preparing contingencies incl "One is that Washington and Tehran sign a wholly separate deal, complete with different parameters than the current accord" #OOTT."* The headline from the pickup of the interview were all on how "*It's just one big question mark*" about getting a return to the JCPOA. And Politico closed its report *"It at least makes us very aware of the fact that it is certainly not a done deal, that it's a legitimate question whether we will be able to come back, and that we have to be prepared for a world in which Iran's intentions are not to go back into the [pact], at least not in a realistic way," he said."* What didn't get much attention and the reason for our tweet was Politico writing "*Should the United States and Iran fail to agree on terms in the coming months, the envoy says his team is preparing some contingencies. One is that Washington and Tehran sign a wholly separate deal, complete with different parameters than the current accord*. *Another is a suite of punitive responses in coordination with European allies, though Malley didn't specifically detail what those would be."* On one hand, he saying that Iran isn't coming back in a realistic way on the JCPOA so that makes it tougher to see a return to the JCPOA. And then he says in that event, they could look to do a new separate one on one deal with Iran ie. certainly infers a deal that isn't as tough. We don't recall ever seeing the US come forward with this type of view and publicly suggest there could be a different deal that, based on the reasons why US is considering this approach, suggests it would be an easier deal with Iran. We don't understand why Malley would do this. Our Supplemental Documents package includes the Politico report.

### Iran will be on Israel PM Bennett agenda for his White House Aug 26 meeting

Israel PM Bennett is meeting Biden at the White House on Thurs Aug 26 and probably the #1 discussion item will be Iran. It was interesting to see the Jerusalem Post Wed report "*How the Taliban takeover changes the dynamics in a Biden-Bennett meeting – analysis*" [LINK] bring in the Israeli view on how the Biden miscalculation on Afghanistan impacts how Israel should be dealing with and counting on the US in Middle East issues, especially in Iran. On the miscalculation, the Jerusalem Post noted "*the US intelligence estimate that was made public was that it would take 90 days for the Taliban to take Kabul; it took them less than a week.*" On Iran, the Jerusalem Post wrote "*The same is true of US security assurances when it comes to Iran. The Biden administration is still pushing for a return to a nuclear deal with Tehran that would allow it to have a nuclear weapon when the deal expires in less than a decade. Washington has asked Jerusalem to work with it instead of making a loud public campaign against the nuclear negotiations, as former prime minister Benjamin Netanyahu did, saying it will make sure Iran can never threaten Israel with nuclear weapons. And Bennett agreed to greater cooperation on the issue, even saying on Wednesday that he is taking an "approach of partnership." But the situation in Afghanistan must give him pause when taking a long-term view on the Iranian nuclear threat."* Our Supplemental Documents package includes the Jerusalem Post report.

### Oil – Iran plans to develop West Karoun area oil fields to add 1 mmb/d

**Iran's oil development potential**

There was a good reminder yesterday that Iran has a lot of low hanging fruit that can crank up oil production if it can ever have an extended period of no sanctions and foreign capital. Yesterday, Shana (the news agency for Iran's oil ministry) reported [LINK] that it is planning to develop a cluster of 11 oil fields in the West Karoun area that will increase Iran's oil production by 1 mmb/d. Shana wrote "*West Karoun is home to a cluster of oil fields Iran shares with neighboring Iraq. This area in western Iran is set to form a new oil civilization in Iran. There are 11 oil fields in West Karoun. Iran Plans to develop them to increase its oil output by 1 mb/d by developing these fields. Arvand and Phase 3 of Darquain are among these projects. Darquain field will have a 200,000 b/d share in the above figure. Darquain which lies in Khuzestan Province is 45 kilometers north of the city of Khorramshahr and 100 kilometers south of the oil-rich city of Ahvaz. The field is expected to see its output exceed 220,000 b/d once phase 3 development is fulfilled."* Note Darquain Phase1 and 2 have been developed. Darquain was discovered in 1964. Our Supplemental Documents package includes the Shana report.

### 1970s saw Saudi Arabia emerge as the world's oil power

It hasn't happened yet but we have always warned that Iran has huge oil production growth potential if it can ever have a multi year clear runway to get at its existing oil opportunities. Iran has been under some sort of sanctions or restrictions for most of the past 40+ years since the Iran revolution started in Jan 1978. Don't forget Iran was over 6 mmb/d in 1974. It was the 1970s that reshaped the oil world and saw Saudi Arabia establish itself as the world's oil power. In 1969, Iran produced more than Saudi Arabia at 3.386 mmb/d to 3.26 mmb/d. By 1974, Iran was up to 6.06 mmb/d, but Saudi Arabia was up to 8.62 mmb/d. Then by 1980, Iran was down to 1.48 mmb/d vs Saudi Arabia at 10.27 mmb/d.

### Oil – Libya PM warns on risk to holding the Dec 24 election

**Risk to Libya Dec 24 election**

Its now 4 months to go until the Libya general election to be held on Dec 24, 2021. We recognize this is the big event for Libya, we hope its held, goes smoothly and, most

importantly, the election results are accepted by all and Libya moves ahead united. This week, there were a couple of high profile moves by Libya in the lead up to the election. We don't know the inner workings of Libyan politics/regional issues, but we would have thought the lead up the election would not see a focus on major changes before the election and a new government. We just have to wonder if these aren't indicators of increasing internal divisions going into the election and what Haftar has planned? (i) Libya's Oil Minister Mohamed Oun asked the government to immediately replace the board of the Libya National Oil Corporation including its long standing Chairman Mustafa Sanalla. Bloomberg reported "*Oun said a change was needed as soon as possible because the current board of National Oil Corp. was formed in a way that was incompatible with the OPEC member's laws. Taher al-Qahtani should replace Sanalla, Oun said in the letter*." It certainly has appeared that Sanalla has been the stable guiding hand over the past few years for the Libya NOC. (ii) Perhaps the bigger question or concern for stability is will Haftar do anything before, during or after the election. We haven't seen any reports of what Haftar is up to or plans to be up to over the critical next few months. On Thursday, the Libya Observer reported "*JMC calls for reorganizing security forces, but no mention of Haftar's militias*" [LINK] "*The 5+5 Joint Military Committee (JMC) has called for the reorganization of the security and military organs, expressing concern that the current status could affect the committee's plans to remove the specter of war and restore security and stability. Many security services have been granted powers or assigned overlapping functions that may undermine security and stability in the country, the committee said in a statement following a meeting in Sirte on Saturday. But it was notable that the JMC listed a group of security and military organs, none of which were from the eastern region operating under Haftar's command*." (iii) And then on Friday, there was a clear warning from Libya's Prime Minister Abdul Hamid Dbeibah specifically warned on the risk to holding the Dec 24 election. Bloomberg wrote ""*International interventions, as well as the interventions of military systems, may create obstacles to the holding of elections, despite all countries officially" supporting the vote, Dbeibah said Wednesday in an interview in Tripoli."* Dbeibah clearly has concerns on Haftar, which is not surprising considering their issue above about security forces. Bloomberg wrote "*Dbeibah said he only communicated indirectly with Haftar when his term began to resolve matters including prisoner exchanges, but Haftar's recent speeches haven't been encouraging. The premier doesn't object to meeting Haftar if he "recognizes me as prime minister and defense minister," he said."* Our Supplemental Documents package includes the Libya Observer report and the Bloomberg report.

**India selling oil from ISPRL**

### Oil – India starts selling oil from its Indian Strategic Petroleum Reserves (ISPRL)

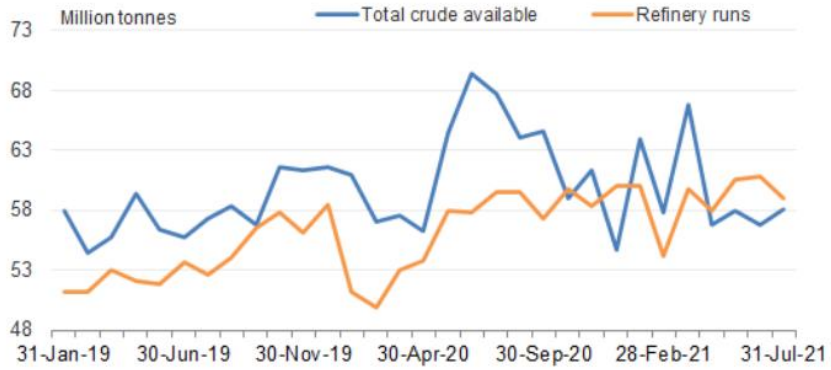
On July 27, we tweeted [LINK] on the Argus report [LINK] that "*India is planning to commercialise its strategic petroleum reserves (SPR) for the first time, including by generating revenue from leasing capacity and freeing up some of its stocks for trading. State-controlled Indian Strategic Petroleum Reserves (ISPRL), which manages the country's strategic stocks, will trade the equivalent of 20pc of the reserves' capacity to hedge against price inflation or to supply refiners that are in urgent need of crude, ISPRL's chief executive HPS Ahuja told Argus. Another 30pc will be leased to all third-party entities, Ahuja said. The commercialisation plans were approved by the cabinet."* It looks like India is already started to move on this initiative by selling oil from is ISPRL to state-run refiners. On Tuesday, Reuters reported [LINK] on this change in policy on the ISPRL "*Exclusive India starts selling oil from strategic reserves after policy shift*" "*The ISPRL is gradually releasing 8 million barrels from the SPRs to create space to also lease to state-run Mangalore Refinery and Petrochemicals Ltd (MRPL.NS) and Hindustan Petroleum Corp (HPCL.NS), the sources said, asking not to be named."* Our Supplemental Documents package includes the Reuters report.

### Oil – China draws on crude oil stocks for the 4th consecutive month

**China draws on oil stocks**

Reuters reported on Tuesday [LINK] that China drew about 0.223 mmb/d from reserves in July. In 6 of the past 10 months, refiners have drawn on stockpiles, and July's call on inventories was smaller than the last 2 months due to weak refinery processing rates. In fact, refinery processing rates hit a 14-month low in June at 13.03 mmb/d, down from 13.87 mmb/d in June. This signals that refiners are deeming oil prices to be too high, and would rather draw from the inventories built up during ultra-low prices in 2020. This coincides with China's July oil imports also being down 0.6% MoM and ~19% YoY, as we highlighted in our August 15 Tidbits. Our Supplemental Documents package includes the Reuters report.

Figure 38: China crude available from imports/domestic output vs refinery throughput



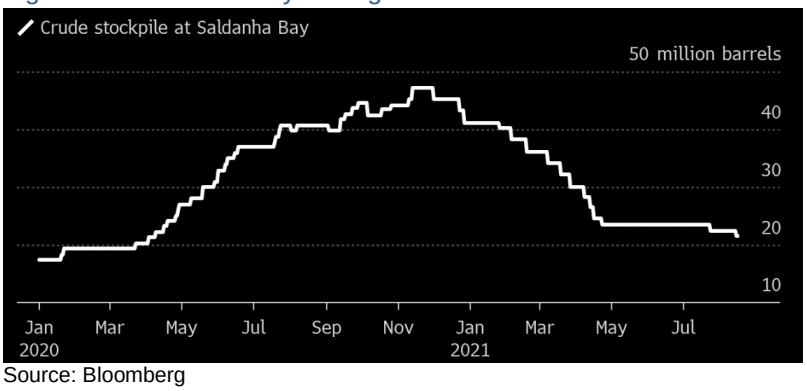

Source: Reuters, Refinitiv Eikon

### Oil – Saldanha Bay inventories continue to decline to pre-pandemic levels

**Saldanha Bay inventories**

We continue to see data indicators that global oil inventories built up in the early day of Covid shutting down the world are being worked down. We have been noting the work down of inventories at Saldanha Bay in South Africa that began in December. We last noted in our April 11 Tidbits that crude stocks at Saldanha Bay had declined 44% since the late Nov/20 peak of just under 50 mmb. Bloomberg reported on Tuesday that once Suezmax tanker Ridgebury Lindy B loads its scheduled cargo, crude socks are expected to be down to 20.5 mmb if it loads a full 1 mmb cargo which would put storage below pre-pandemic levels. Below is a chart tracking the stockpiles at Saldanha Bay since Jan 2020. Our Supplemental Documents Package includes the Bloomberg report.

Figure 39: Saldanha Bay Storage Level




Source: Bloomberg

### Oil –Chevron CEO sees oil demand growing, but at a slower rate

**Chevron CEO on oil demand**

Chevron CEO Mike Wirth was interviewed by the Washington Post on Monday [LINK]. Later in the memo, we note Wirth's comments on energy transition items. But Wirth also noted Chevron's views on oil demand. (i) Believes oil demand will continue to grow because transitions take a long time. Wirth said "*Well, you know, the world runs on the energy system that we have today, and the entire global economy depends on the mix that we have today. And even as that mix changes, demand also increases. And if you look back at the history of energy beginning with biomass, wood, peat, going to coal, natural gas, oil and then as we introduced nuclear and hydro and wind and solar into the system, the system continues to grow, and there's a place for all of these, and there certainly historically has been. We've never really seen any of these sources go down in terms of absolute demand. We've seen them reduce as a percentage of a larger energy system. And so the reality is, as you look at any credible forecast for the future, we're going from 7 1/2 billion people on the planet to more than 9 billion over the next 20 years, energy demand likely to increase by 25 percent, and the traditional energies that we produce will be a large part of that system as it grows, even as we bring in these lower-carbon energies to diversify that system. So we do believe the demand for our products is growing slowly. It's not growing as fast as demand for wind and solar. But the current demand is quite large, and it's very difficult for economies to transition off of that as rapidly as some people would--you know, would suggest*". (ii) Reminds oil demand is much more than EVs and ICE. Wirth says *"It's important to remember that only about 25 percent of a barrel of oil ends up in light-duty vehicle transportation in cars. The remainder, 75 percent ends up in heavy-duty transportation in trucks. It ends up in marine transportation, in ships. Aviation fuels for airflight, petrochemical production.*"

### Oil – Vortexa floating storage est at 95.11 at Aug 20, +20.33 mmb since June 25

**Vortexa floating storage**

On Saturday, Bloomberg posted the Vortexa crude oil in floating storage as of Aug 13. Bloomberg writes it weekly Vortexa floating oil storage story on Mondays. Vortexa estimated crude oil in floating storage as of Aug 20 at 95.11 mmb, which is down from the revised Aug 13 estimate of 96.80 mmb. Aug 13 was originally estimated at 95.40 mmb. Yesterday, we tweeted [LINK] "*Increased #OPEC+ #Oil since June not being fully absorbed by market. Vortexa floating crude oil storage estimated 08/20 at 95.11 mmb, down vs revised 08/13 of 96.80 mmb. But +20.33 mmb vs recent 06/25 trough of 74.78 mmb. Thx @Vortexa @TheTerminal #OOTT*". At 95.11 mmb at Aug 20, floating storage is down 57% (down 125.27 mmb) from the June 26, 2020 peak of 220.38 mmb. But still about double the pre-Covid of 47.39 mmb on Aug 19, 2019. Below is the Bloomberg terminal Vortexa graph.

Figure 40: Vortexa Global Floating Storage Aug 20, 2019 to Aug 20, 2021

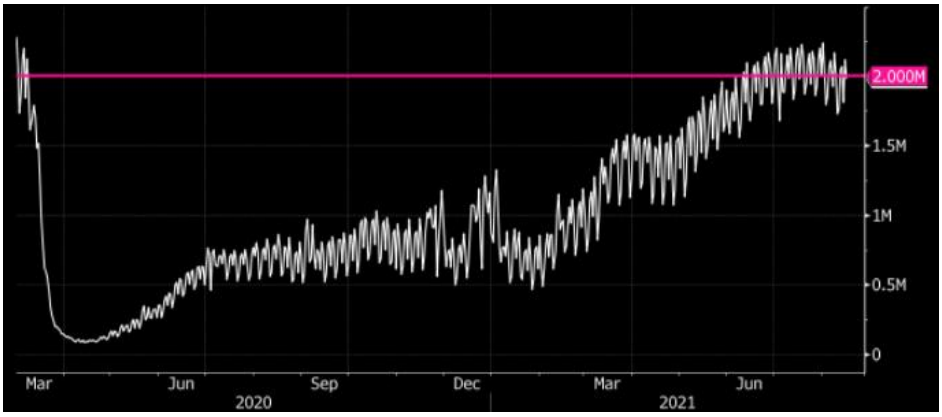

Source: Bloomberg, Vortexa

### Oil – Bloomberg Oil Demand Monitor, Air travel concerns spread to the US and Japan

**Bloomberg's Oil Demand Monitor**

We recommend reading the weekly Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Their update provides insight into oil demand recovery and highlights two sides of the overall coin: jet fuel demand and gasoline demand. As previously mentioned, air travel's recovery has been dragged down by a recent plunge in Chinese airline activity due to Delta-variant concerns, and now the concerns have spread to the US and Japan. TSA traveller throughput is beginning to dip, and seat capacity has dropped by 2.1%, which is equivalent to ~407,000 less seats filled this week. Japan lost 293,000 seats, which comes at no surprise as the nation continues to fight the virus' spread through emergency restrictions. While this did not net out to a significant change in worldwide seat capacity, this trend will be one to monitor as the United States and China are easily the largest airline markets by seat capacity, with India, Spain and Japan competing for third place. As we have been highlighting, the gasoline demand side of things shows a much more bullish picture. Toll roads are consistently getting busier WoW, with Italy, Brazil, Chile and Mexico's volumes cresting past 2019 levels. France and Spain are only -1.7% and -3.4% respectively vs 2019. In the US, passenger miles travelled are only 1% lower than 2019. Below is a chart tracking throughput at TSA check points in American airports since March 2020. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 41: TSA Traveler Throughput per Day




Source: Bloomberg, TSA

### Oil & Natural Gas - Panama Canal maintenance to "severely impact transit capacity"

**Panama canal maintenance**

Oil, petroleum products and LNG tankers transit times thru the Panama Canal will be impacted over the next few weeks. On Friday, Platts reported [LINK] that the planned Panama Canal maintenance from Aug 29 to Sept 10 will severely impact transit capacity, according to shipping agents. In fact, they recommended that their customers apply for early transit booking to avoid delay, saying for non-booke0.d ships the maintenance could extend transit delays for *"days, if not weeks after completion"*. The delays are due to the maintenance period changing the canal condition from 1 to 1.a, which decreases the daily transit capacity from 15 super-class tankers per day to 13 per day. Typically during maintenance periods, delays for non-booked ships can by up to 14 days. Our Supplemental Documents package includes the Platts report.

### Oil & Natural Gas – Hurricane Grace didn't turn so missed US & Mexico GoM oil & gas

**Hurricane Grace**

Grace ended up reaching hurricane strength, but its path didn't turn either north or south and remained on a fairly straight path due west. As a result, it stayed south of any US GoM oil and gas fields or Gulf Coast oil, gas & LNG infrastructure. And it stayed just to the north of the major offshore Mexico oil production. Blow is NOAA's history map for Grace.

Figure 42: Hurricane Grace History


Source: National Hurricane Center

### Energy Transition – Siemens "the energy transformation will cost a lot of money"

**Siemens blunt talk on energy transition**

The Energy Transition is Not Ready for Prime Time is what we call the theme we expect to emerge in 2021 and 2022 as the pro Net Zero countries push to commit to Net Zero and we see an increasing number of watchers point out that the reality isn't there to meet these aspirations. It all fits our big picture thesis that the Energy Transition is happening, but it will take longer, cost more and be a bumpy road. Last Sunday, there was a blunt reminder of this from Siemens CEO Christian Bruch in the Frankfurter Allgemeine Zeitung report "*Will green electricity get even more expensive, Mr. Bruch?"* [LINK]. Bruch's comments were the most direct reality check comments we have seen from a CEO. We wish others were as direct ie. Chevron CEO Wirth. He made a number of blunt comments and we tweeted [LINK] on one these comments "*I find the narrative that sustainability shouldn't cost anything is extremely difficult. The energy transformation will cost a lot of money", need #NatGas & many other #EnergyTransition reality checks from @Siemens_Energy CEO Bruch. Great interview @MeckGeorg @MarcusTheurer."* There are many other energy transition reality check comments. Another example is "*What are renewables worth to us? Just setting goals will not be enough. To believe that we can quickly expand renewable energies and that electricity is becoming cheaper and cheaper, that doesn't go together. The energy transition will cost money."* He also warns that natural gas is needed in Germany for more than a transition fuel. Bruch says "*The demand for electricity in Germany will grow considerably, by 30, 40 or even 100 percent, as some say. The federal government recently increased its demand forecast, but I also think the new forecast is too low. If we are really serious about the change in mobility, industry and heating, then we will need a lot more electricity. Renewable energies form the backbone. But we will also need gas-fired power plants as a bridging technology for a transition phase. Not only for weather conditions with little wind and sun, but because otherwise we simply cannot meet the demand. The only alternative to this is to continue operating coal-fired power plants. And that is clearly worse. If you replace an old coal-fired*

*power plant with a new gas-fired power plant, you reduce CO2 emissions by around two thirds. In Germany, with the phase out of nuclear and coal, almost 40 percent of electricity generation capacity will be lost. We need a replacement quickly for this."* There are many other energy transition reality check comments in the interview. Our Supplemental Documents package includes the Zeitung interview.

### Energy Transition – Chevron CEO softly raises energy transition reality check concerns

**Chevron's not so blunt energy transition views**

We saw Siemens CEO Bruch comments on Sunday night, and then saw Chevron CEO Mike Wirth comments on Monday and Wirth had the most common big company CEO approach in being gentle in his views. Readers know we don't get this approach because it never seems to work, rather the politicians take away that industry isn't that critical so mustn't have a big issue. Wirth had a high profile chance to make his case on the Energy Transition with a Washington Post interview on Monday. [LINK]. (i) He just doesn't want to come out hard in any criticism of the Biden administration. This is the Washington Post so if he wants the administration to hear him, this is the place to do it. but he doesn't want to come out criticizing. So when he answers a question, its more general. He is asked if the US should encourage more domestic oil production. Wirth replies "*Well, look. It's a global market, and so we need supply from all over the world to meet needs all over the world. But the--you know, the energy industry was a tremendous part of the recovery out of the last recession in 2008, has created a tremendous number of new jobs and economic strength. We're seeing investment in manufacturing and other industries that is predicated upon readily available and affordable domestic energy, and we think that's good policy for the United States*." (ii) He is aske if California's plan to stop ICE sales by 2035 is realistic. Instead of simply stating Newsom's plan isn't realistic and won't work and why, he talks about the reasons why it will be difficult to achieve and believes that common sense will carry the day. Here is his response "*Well, you know, the governor's asked the California Air Resources Board--so the regulator in the state--to evaluate the technical and economic feasibility of an action like that. It's a process that will take time. There will be public consultation. I think there will be a lot of dialogue on just the topics you ask about, David. And the reality is, California today has had its challenges in providing enough electricity during certain times of the year to keep the lights on. And so we've had the beginning of rolling brownouts and outages, with today's demand for electricity. We've got another nuclear power plant in the state that is scheduled to be taken out of service, which provides a large contribution to the state's electricity today. And adding that much demand at a time when grid stability and storage are still issues that are being worked and the--you know, the affordability of these vehicles for not people who have, you know, high incomes but really for people who do most of the work in the state is still a challenge. And so I think there's a number of both technical and economic issues that will emerge in this dialogue that will bring some reality to the ambition and I think inform ultimately what actions the state of California will take*." (iii) His comments on the energy transition costing more are another example of this very gentle and maybe too suble view on the reality check of the energy transition. This is a stark contrast to the Siemens CEO from Sunday. Wirth says "*And I think it's unwise to dismiss any of these ideas prematurely, as we have smart people working hard at solving these problems. So, you know, there's no free lunch in here. The existing energy system is in place because it has met the needs of society in an affordable manner. And as we look for new technologies to displace that, they inevitably are going to bring with them greater costs and some tradeoffs. And I think we all need to be working together to evaluate those and try to find solutions that work for everyone*." Our Supplemental Documents package includes the Washington Post transcript of the Wirth interview.

**Energy Transition – Sounds like California will need natural gas for longer than 2021**

**California needs more natural gas**

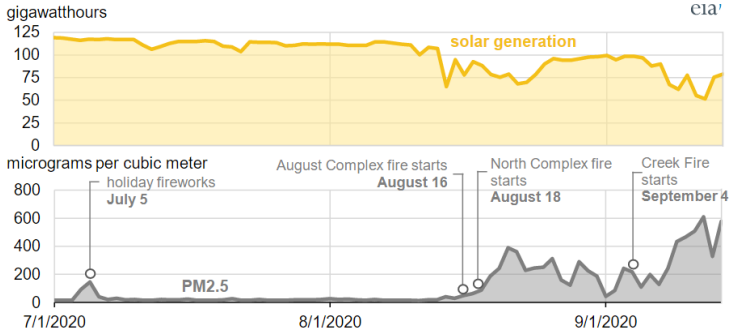
We recognize that this is a terrible year for California with the massive wildfires and drought along the west coast, which has really put California's power security at risk. No question it is a brutal year. But we also think its important to look at their recent 2-step natural gas actions and recognize its more than just dealing with 2021, rather its an acknowledgement that they need natural gas for longer. (i) Step 1 was to increase natural gas generation thru Oct 31. The purposed for this was to get California thru the 2021 wildfire season risk. On Aug 2, we tweeted [LINK] *"#NatGas power generation to increase thru Oct 31 as CA to pay large energy users to move to backup generation ie #NatGas. #EnergyTransition greenwashing? @GavinNewsom critical times causes forgot to say wildfires don't just hurt transmission, also cut #Solar generation efficiency."* On July 30, California proclaimed a state of emergency that will see them pay large energy users to go to their backup generation, so positive for natural gas as these large energy users get paid to go to their natural gas power. Interestingly, Gov Newsom's release went on about their moving to clean energy and its almost an after thought that they are allowing these emergency measures. And clearly no mention of natural gas being the backup power. (ii) Step 2 was this week's approval for 5 natural gas power generators for up to 5 years. The expectation is that these 5 new natural gas generators will be in place before the end of Sept to help provide more support for this 2021 wildfire season, but the part that seemed to be overlooked is that these are approved for 5 years. So while this is being messaged as needed to provide power support for 2021, the reality is that this is being put in place for the next 5 years. Our Supplemental Documents package include the Newsome July 30 release, excepts form the California July 30 emergency proclamation, and POWER reporting on the California approval of natural gas generators.

**Gov Newson forgot to mention wildfires reduce solar generation**

We clearly understand that the governments like California are taking the leadership to try to get the world to Net Zero, but just believe the governments should be giving its people the reality checks on the energy transition to do so and if there are bumps in the road. Our concern is that governments and the bullish energy transition corporate leaders are greenwashing and choosing to ignore to even mention any potential issues that are already rising from the shift from fossil fuels to clean energy. But that is probably why they don't mention these items, there will be less questions on accelerating emissions reductions. Our Aug 2 tweet on California raised the Energy Transition greenwashing by Gov Newsom. In Newsom's press release on the emergency, Newsom says "*during critical times when extreme heat events or the interruption of transmission lines from wildfires or other causes threaten energy supply this summer".* The obvious question is why doesn't Newsom say wildfires smoke reduces solar generation? On July 18, we tweeted [LINK] "*Reminder, #NatGas power generation is needed right now more than normal to fill #Solar shortfalls. Wildfires = less solar generation. Rule of thumb, Sept 2020, @EIAgov estimated #solar generation was down 30% from CA wildfires. #EnergyTransition."* Wildfires remain the big story in the western US and Canada and we reminded that wildfire smoke reduces solar panel efficiency. Our tweet included a link to an EIA analysis Sept 30, 2020 on how wildfires reduced California solar generatiuon [LINK]. The EIA estimated wildfire smoke reduced the amount of sunlight that reached solar panels and as a result solar-power electricity generation in the California Independent System Operator declined nearly 30%. While this report from the EIA is from September 2020, it will certainly still apply to this wildfire season. In the chart below, you can clearly see the effect that smoke pollution (PM2.5 air particulate matter) has on daily CAISO solar generation; as the largest fires, such as the North

Complex fire and the Creek fire, start, solar generation drops. Last year, the peak smoke pollution was 659 µg/m$^3$ on September 15, and solar power generation during that time dropped to as low as 50 GWh. To put that in perspective, average solar power generation in July averaged 113 GWh, when average state-wide smoke pollution levels were below 10 µg/m$^3$. Currently in California, PM2.5 level remain below 10 µg/m$^3$, but wildfire season has just begun. Our Supplemental Documents package includes the EIA Sept 30, 2020 report.

Figure 43: Daily CAISO solar generation & California peak air particulate matter level




Source: EIA

**Energy Transition – Record EU solar generation but record high electricity prices**

**Record EU solar generation**

Last week's (Aug 15, 2021) Energy Tidbits noted the big Europe summer energy story continues to be very high, often record, electricity prices. This week, we tweeted [LINK] on the Reuters report "*EU solar power generation hits record high*" [LINK] that noted "*Solar power supply in the European Union during June and July rose to a record high in 2021, accounting for 10% of total electricity produced in the region, a report by independent climate think-tank Ember said on Wednesday."* There is no question wind and solar are on an accelerating growth rate. But our reminder is that its not providing relief to high electricity prices. Our tweet was "*Record EU #Solar generation. But doesn't provide relief to high #Electricity prices. No surprise EU is replacing 24/7 #Coal #Nuclear baseload with variable Solar #Wind power so prices spike when supply/demand gets tight. Reminds why #NatGas is needed.*" We just believe this is the inevitable outcome of the energy transition replacing 24/7 reliable power with unpredictable wind and solar has to lead to price spikes and shortages when supply/demand is tight. Our Aug 8, 2021 Energy Tidbits noted this electricity price spike risk. We wrote " *We believe the "Energy Transition is Not Ready for Prime Time" will be one of the growing Energy Transition themes for 2021 and 2022. It will show up in results, actions, and warnings that the "Energy Transition is not Ready for Prime Time". Some will be direct, but many will be indirect or unsaid examples. The big energy stories in Europe and the US this summer are high electricity prices and warnings to watch power usage. The big blame, especially in Europe, is given to high natural gas prices. No question, high natural gas prices are an important factor. But we think the reason is simple. On Friday, we tweeted [LINK] "Positive to #NatGas #LNG in 2020s. OECD's steady replacement of 24/7 #Coal # the detailed bp table showing electricity generation by fuel by region and is worth a look."* We just believe this is the inevitable outcome of the energy transition replacing 24/7 reliable power with unpredictable wind and solar has to lead to price spikes and shortages when supply/demand is tight. Last week's (Aug 8, 2021) Energy Tidbits noted this electricity price spike risk. We wrote "*We believe the "Energy Transition is Not Ready for Prime Time" will be one of the growing Energy Transition themes for 2021 and 2022. It will show up in results, actions, and warnings that the "Energy Transition is not Ready for Prime Time". Some will be*

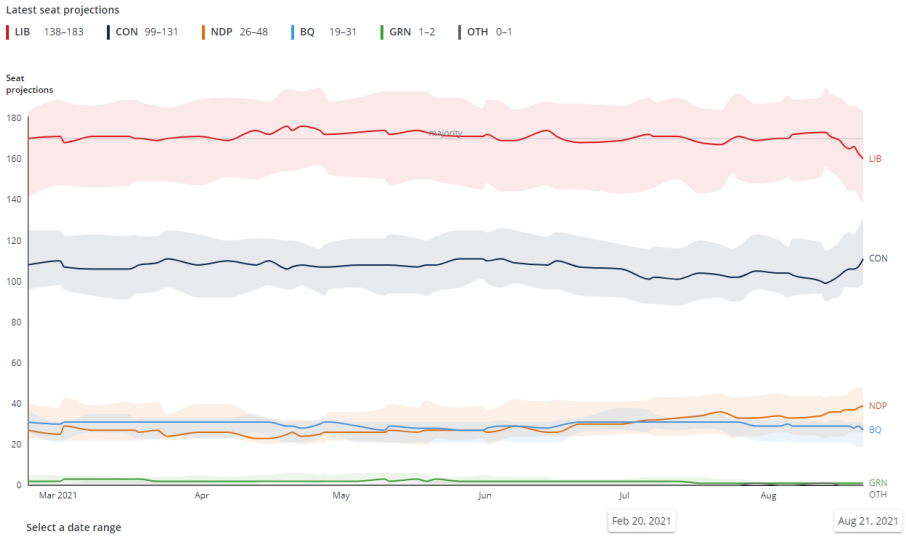
*direct, but many will be indirect or unsaid examples. The big energy stories in Europe and the US this summer are high electricity prices and warnings to watch power usage. The big blame, especially in Europe, is given to high natural gas prices. No question, high natural gas prices are an important factor. But we think the reason is simple. On Friday, we tweeted [LINK] "Positive to #NatGas #LNG in 2020s. OECD's steady replacement of 24/7 #Coal # the detailed bp table showing electricity generation by fuel by region and is worth a look."* Our Supplemental Documents package includes the Reuters report and the BP data showing EU electricity generation by fuel source. This BP data was also attached to our tweet.

**Canada election Sept 20**

### Energy Transition – Less than a month until Canada election on Sept 20

As expected, last Sunday, the Liberals called an election for Sept 20, which is the minimum 36-day election period We had previously noted that we didn't think the election call would come until after Labour Day and especially not two days after Theresa Tam, chief public health officer for Canada, declared we were in the 4th wave and with only two weeks left in summer vacations. But in talking with political people, they thought the timing was right for multiple reasons included two not so well known leaders (O'Toole for the Conservatives and Paul for the Greens) and hopefully keep Canadians focused less focused on the election. In short campaigns, its tough to recover from gaffes. Below is the CBC Poll Tracker updated on Saturday. The 170 seats needed for a majority line is faint, but the poll expected case has the Liberals at 160, Conservatives 111, NDP 39, Bloc 2, and Green 1. As expected, it showed a little slippage from the Liberals, but political commentators have been commenting this week that it wasn't as bad for them as many expected in the face of calling the election. Our Supplemental Documents package includes the CBC Poll Tracker updated yesterday https://newsinteractives.cbc.ca/elections/poll-tracker/canada/ .

Figure 44: CBC Poll Tracker Updated Aug 21




Source: CBC

Figure 45: House of Commons Seats as of Aug 10, 2021

| | Lib. | CPC | BQ | NDP | GP | ind | Vacant | Total |
|---|---|---|---|---|---|---|---|---|
| Alberta | - | 33 | - | 1 | - | - | - | 34 |
| British Columbia | 11 | 17 | - | 11 | 2 | 1 | - | 42 |
| Manitoba | 4 | 7 | - | 3 | - | - | - | 14 |
| New Brunswick | 7 | 3 | - | - | - | - | - | 10 |
| Newfoundland and Labrador | 6 | - | - | 1 | - | - | - | 7 |
| Northwest Territories | 1 | - | - | - | - | - | - | 1 |
| Nova Scotia | 10 | 1 | - | - | - | - | - | 11 |
| Nunavut | - | - | - | 1 | - | - | - | 1 |
| Ontario | 76 | 34 | - | 6 | - | 4 | 1 | 121 |
| Prince Edward Island | 4 | - | - | - | - | - | - | 4 |
| Quebec | 35 | 10 | 32 | 1 | - | - | - | 78 |
| Saskatchewan | - | 14 | - | - | - | - | - | 14 |
| Yukon | 1 | - | - | - | - | - | - | 1 |
| | 155 | 119 | 32 | 24 | 2 | 5 | 1 | 338 |

Source: House of Commons

### Energy Transition – Japan adds rare earth metals to tougher restrictions list

**Japan on rare earth metals**

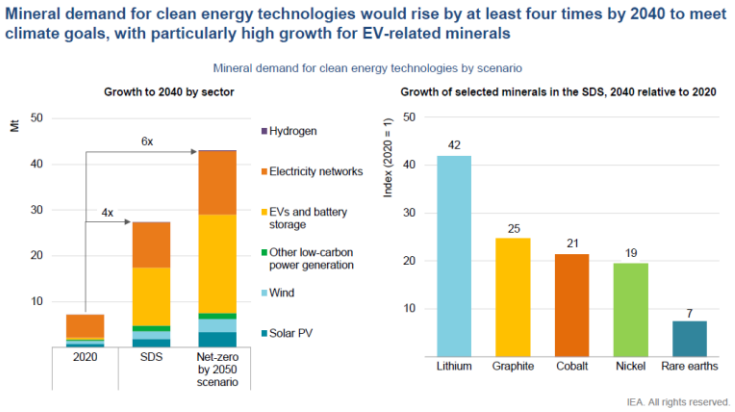
We believe one of the major energy transition themes for the 2020s will be industrialized countries setting up formal or informal stockpiles of critical minerals and rare earths. Our Aug 8, 2021 Energy Tidbits highlighted the good food for thought Argus report "*South Korea to increase stockpiles of rare metals"* [LINK] as to why there is likely an additional leg of demand for critical metals (copper, zinc, cobalt, etc) and rare earths over and above an already strong decades long demand outlook. This week, Nikkei reported [LINK] "*Rare-earth metals were added on Wednesday to Japan's list of industries subject to tougher restrictions on foreign investment, as Tokyo attempts to shield a potential weak point in its supply chains. The measure covers 34 materials, including other strategically important metals such as cobalt and titanium. Foreign investors will be required to notify the government before investing in a variety of connected fields, including mining, building survey ships, component analysis, and construction of ports on remote islands. Japan imports the bulk of its rare earths, and there have long been concerns about risks to its supply in the event of a conflict. These materials, used in electric motors and other high-tech applications, have only grown in importance in recent years with trends such as the pivot away from fossil fuels. Consequently, Tokyo sees a need to protect companies involved in tapping its domestic resources from possibly problematic investment."* We think we have to look at Japan's move here and the Korea move earlier as early indicators of what is to come unless there is some abrupt change in the outlook for critical minerals and rare earths. Most are looking at this as a supply chain issue brought on by Covid. We think its more than that. And that means is that industrialized countries will be looking at critical minerals/rare earths, much like what happened to oil post the Arab Oil Embargo Oct 1973. We know that its different in that was an immediate supply cut off wake up call. And this, at least for now, is a massive multi year demand push that is only going to make supply tighter. Formal or informal strategic reserves will be created (like Korea). And then there will be the other wildcard – Will there be the risk that companies lose access to supply? It doesn't have to be a nationalization or partial, maybe its just restrictions so govt has to be in all deals, maybe its where governments can back into a working interest position after discovery, or some other way for host governments get more ownership and control over critical minerals and rare earths. When we see Korea and Japan, it just feels like the very early innings of countries realizing there critical minerals and rare earths will be the concern for the 2020s and its not just a transitional supply chain issue. Our Supplemental Documents package includes the Nikkei report.

### IEA warned on the critical minerals risk for the energy transition

Our May 9, 2021 Energy Tidbits highlighted the IEA"s May 5 major report "*The Role of Critical World Energy Outlook Special Report Minerals in Clean Energy*

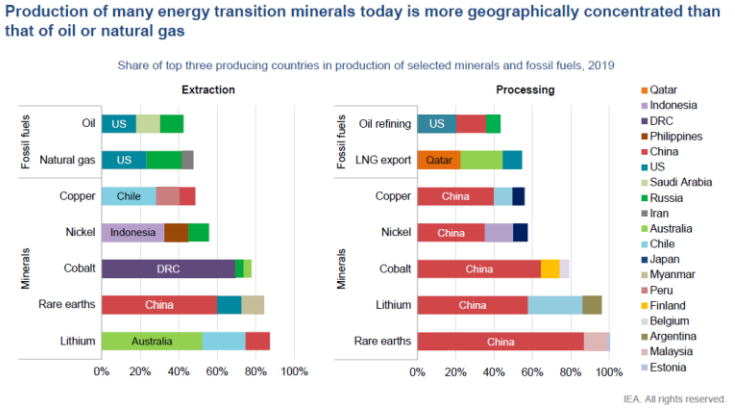
*Transitions*" [LINK] that warned the world is behind on where it needs to be on critical minerals for the energy transition. The IEA release starts off "*Supplies of critical minerals essential for key clean energy technologies like electric vehicles and wind turbines need to pick up sharply over the coming decades to meet the world's climate goals, creating potential energy security hazards that governments must act now to address, according to a new report by the International Energy Agency."* The messaging isn't in any doubt here and why we tweeted [LINK] "*Path to #EnergyTransition is clear, but demise of #Oil #NatGas won't be as quick as aspirations. Another @fbirol warning not on track to meet #NetZero aspirations. this time critical minerals raising risk of delayed or more expensive #EnergyTransition. Great report @IEA . #OOTT".* This is a good report to read and for reference libraries. There are a huge amount of good insights and perspective report. One perspective example is that coal revenues will still be almost double energy transition minerals revenues in 2030. Its not just a potential shortage of critical minerals, it's the concentration of minerals sources that will cause increased security risks ie. China in the below chart. Its why the IEA recommendations include "*as well as voluntary strategic stockpiles in some instances*". Our Supplemental Documents package includes excerpts from the IEA Executive Summary from the report.

## Figure 46: Critical Minerals demand




Source: IEA

## Figure 47: Extraction and Processing of Fossil Fuels and Critical Minerals




Source: IEA

### Energy Transition – US guidance for fossil fuels lending Multilateral Development Banks

**US Treasury takes hard stance on MDBs and fossil fuels**

On Tuesday, the US Treasury just announced its fossil fuel guidance for Multilateral Development Banks (MDBs) [LINK], which looks to be in line with G7 commitments from late May to end financing for fossil fuels ie. it isn't just focused on coal or oil, but also includes natural gas. Overall, the guidance *"directs MDBs oppose oil and coal projects, and to support natural gas investments only if certain strict criteria are met"*. It strongly opposes coal across the entire value chain and would only accept oil projects in *"rare circumstances"* like humanitarian crises or as back up generation for clean off-grid projects. As for natural gas, this limited, almost reluctant, support for midstream and downstream projects, and only in specific circumstances, ie: supporting a poor or developing country, if there is no technical/economically feasible alternative, or it has positive impact on energy security. Our Supplemental Documents package includes the Treasury Dept release and FAQ.

#### G7 policymakers committed in May to major new emissions/climate actions

For new readers of Energy Tidbits, we highly recommend going back 3 months to what we viewed as a major development – the G7 policymakers commitments made in May. Our May 23, 2021 Energy Tidbits was titled "*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 the IEA's Net Zero pathways. These were commitments from G7 policymakers and what the G7 policymakers are committed to enact as laws/regulations. The US Treasury actions are in line with these G7 commitments. For example, no one should have been surprised to see the US Treasury include natural gas. The G7 policymakers commitments were clear. The G7 clearly focuses on all fossil fuels "*We reaffirm our commitment to the elimination of inefficient fossil fuel subsidies by 2025 and encourage all countries to adopt this commitment*". And that the G7 policymakers would only support natural gas on a time limited basis and, if used, to look at on an abated (ie. CCS) basis. 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*." Our Supplemental Documents package includes the G7 release and the 30-pg communique.

#### G7 policymakers also clearly warned on the risk to stranding assets

The other big warning that we highlighted in our G7 emissions/climate actions commitments is that the G7 specifically warns on the risk to stranding high carbon assets. 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*."

### What is a Multilateral Development Bank

The reason why this is significant is that the US has the most influence or impact on MDBs. Investopedia has a good explainer on what exactly an MDB is [LINK] and lists some of the major MDBs. Investopedia notes "*there are two main forms of multilateral development banks. The first, which includes the largest and best-known institutions, makes loans and grants. These banks often distinguish between poorer, borrowing members and wealthier, non-borrowing members. Examples include the World Bank, founded in 1945, and the Inter-American Development Bank (IDB), founded in 1959. The second type of multilateral development bank is formed by governments of low-income countries that can then borrow collectively via the MDB in order to secure more favorable rates. The Caribbean Development Bank (CDB), founded in 1969, is an example of this type."* Our Supplemental Documents package includes the Investopedia outline.

## Energy Transition – GM ends up recalling all Chevy Bolt EVs due to battery fire risk

**GM recalls all Chevy Bolt EVs**

The Energy Transition is Not Ready for Prime Time. It probably shouldn't be a big surprise to see the Friday dinner time news from GM. We tweeted [LINK] "*Not a good day for #GM #BoltEV, GM expands recall to cover remaining 2019 and all 2020-2022 Bolt #Evs re risk of fire from batteries, so will replace defective battery modules. #OOTT*." GM issued its recall notice for additional Bolt Evs [LINK]. "*"General Motors is voluntarily expanding the current Chevrolet Bolt EV recall to cover the remaining 2019 and all 2020-2022 model year vehicles, including the Bolt EUV. In rare circumstances, the batteries supplied to GM for these vehicles may have two manufacturing defects – a torn anode tab and folded separator – present in the same battery cell, which increases the risk of fire. Out of an abundance of caution, GM will replace defective battery modules in Chevrolet Bolt EVs and EUVs with new modules, with an expected additional cost of approximately $1 billion*." GM said the new recall population includes 9,335 of the 2019 model year Bolt EVs that were not included in the previous recall and 63,683 of the 2020–2022 model year Chevrolet Bolt EVs and EUVs. No surprise, GM also told Bolt EV owners to "*Park their vehicles outside immediately after charging and should not leave their vehicles charging indoors overnigh*t." Our Supplemental Documents package include the GM recall notice.

### Our big concern remains for battery quality control

We don't wish this battery problem on any company or person, but we hope this battery problem is limited to the Chevy Bolt EV and not to more EV manufacturers. However, there is no change to the concerns we raised when the Chevy Bolt recall first came up – battery quality control Our July 18, 2021 Tidbits noted that we can't help wonder about future quality control on batteries as the world is forced to switch from ICE vehicles to EVs and the need for hundreds of millions batteries to power new EVs and for replacement in existing EVs in the 2020s. Recall the incidents of Chevrolet Bolt EV batteries igniting and cause fires led to the July 14 National Highway Traffic Safety Administration issued "*Consumer Alert: Important Chevrolet Bolt Recall for Fire Risk: Owners should park their vehicles outside until further notice*" [LINK]. We weren't too surprised to see this risk as it would seem like the going on fire cell phone battery at a bigger scale. But it does make us wonder on future quality control for batteries for EVs. This week's recall has GM once again warning owners of Bolts to not charge their Bolts over 90%, avoid depleting the batteries below approx. 70 miles, park their vehicle outside immediately after charging and not to leave vehicles charging indoors overnight. We had to think – good thing it's not winter. The original ecall in November 2020, the second in July

2021 and now this one. Plus in July, Chevy's spokesman said "*The company is aware of eight fires total and two related injuries but no deaths".*

**Energy Transition – UK move standard Petrol to E10 ie. incl 10% renewable ethanol**

**UK new standard for gasoline**

The UK moves on gasoline are likely what will be coming to North America sometime as a way to help push along the retirement of older cars. It will be interesting to see how much drivers complain when the UK finishes its transition for standard gasoline to E10 effective next week, Sept 1 as part of its plan to reduce emissions from cars. The U explains "*E10 petrol contains up to 10% renewable ethanol, which will help to reduce carbon dioxide (CO2) emissions associated with petrol vehicles and tackle climate change. Petrol in the UK currently contains up to 5% renewable ethanol (known as E5)".* [LINK] The UK also estimates "A*lmost all (95%) petrol-powered vehicles on the road today can use E10 petrol and all cars built since 2011 are compatible. If your petrol vehicle or equipment is not compatible with E10 fuel, you will still be able to use E5 by purchasing the 'super' grade (97+ octane) petrol from most filling stations*." There are likely over 600,000 cars in this category. And for them it means they will have pay even more for gasoline (Petrol) for their cars with estimates generally around US$200 or more per year of added cost of gasoline.

**Climate Change – Rain, not snow, fell for the first time on record at Greenland summit**

**Rain fell on Greenland summit**

We haven't been noting all the different weather/climate events unless they link into the energy call. But we do think its worthwhile to note weather/climate events when they are the first time ever events. This is what happened last week, when CNN, and others similarly, reported [LINK] "*For the first time on record, precipitation on Saturday at the summit of Greenland — roughly two miles above sea level — fell as rain and not snow. Temperatures at the Greenland summit over the weekend rose above freezing for the third time in less than a decade. The warm air fueled an extreme rain event that dumped 7 billion tons of water on the ice sheet, enough to fill the Reflecting Pool at the National Mall in Washington, DC, nearly 250,000 times."*

**Capital Markets – IFIC: Mutual funds and ETF assets +1.7% in July**

**Mutual Fund & ETF assets increase MoM**

On Thursday, the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for July. IFIC does not provide any commentary on the numbers but given the strong market performance since the end of Jan dip, it is not surprising to see an increase. For July, the IFIC reported *"Mutual fund assets totalled $1.983 trillion at the end of July 2021. Assets increased by $33.0 billion or 1.7% compared to June 2021. Mutual funds recorded net sales of $8.8 billion in July 2021. ETF assets totalled $313.6 billion at the end of July 2021. Assets increased by $6.7 billion or 2.2% compared to June 2021. ETFs recorded net sales of $3.0 billion in July 2021."* Our Supplemental Documents package includes the IFIC release.

**Capital Markets – Japan & US ESG funds are underperforming in 2021**

**Japan/US ESG funds underperforming**

We recognize that taking different periods can always provide different results but, this week, Bloomberg reported on Japan and US ESG funds performance in 2021. On Japan, Bloomberg wrote "*Japan-Focused ESG Funds Return 5.6% This Year, Underperforming" "Japan-focused ESG funds returned 5.6% on average this year * The Topix Index this year climbed 9.6%, while the Topix Total Return Index JPY rose 9.6%."* On the US, Bloomberg wrote "*U.S. ESG Funds Return 17% This Year, Underperforming S&P 500" "U.S. ESG-related funds have returned 17% on average this year, compared to 20% for the Standard & Poor's 500 Index and 19% for the Russell 1000 Index".* Our Supplemental Documents package includes the Bloomberg Japan and US ESG reports.

### Capital Markets – Norway wealth fund strong H1 returns due to energy equities +19.55

**Energy equities +19.5% for Norway wealth fund**

Norway's sovereign wealth fund had strong returns over H1/21, returning 9.4% overall [LINK]. We couldn't help but notice that Norway made a point of highlighting that energy equities were strong drivers of return, while renewables had negative returns. We tweeted [LINK] *"Energy equities +19.5% highlighted in world's largest sovereign wealth fund, Norway, strong H1/21 returns at +9.4%: Equities +13.7% vs Fixed Income -2.0% vs Unlisted real estate +4.6% vs Unlisted #RenewableEnergy Infrastructure -1.9%. #OOTT."* Nicolai Tangen, CEO of Norges Bank Investment Management said, *"The equity investments had the most positive contribution to the return in the first half of the year, and especially the investments within the sectors of energy and finance. The investments in energy companies returned 19.5 percent".* Our Supplemental Documents package includes the Norway release.

#### Norway's wealth fund is world's largest sovereign wealth fund

As we mentioned in our tweet, Norway's fund is the largest of its kind in the world, at $1.36 tn of total assets. Runners up include China (#2), Kuwait (#3), Abu Dhabi (#4) and Hong Kong (#5). Below are the list and rankings of the Top 10 Sovereign Wealth Funds by total assets [LINK] from the Sovereign Wealth Fund Institute.

Figure 48: Top 10 Sovereign Wealth Funds by Total Assets

| Rank | Fund | Total Assets ($bn) |
|---|---|---|
| 1 | Norway Government Pension Fund Global | $1,364 |
| 2 | China Investment Corporation | $1,046 |
| 3 | Kuwait Investment Authority | $693 |
| 4 | Abu Dhabi Investment Authority | $649 |
| 5 | Hong Kong Monetary Authority Investment Portfolio | $581 |
| 6 | GIC Private Limited | $545 |
| 7 | Temasek Holdings | $484 |
| 8 | Public Investment Fund | $430 |
| 9 | National Council for Social Security Fund | $372 |
| 10 | Investment Corporation of Dubai | $302 |

Source: Sovereign Wealth Fund Institute

### Capital Markets – Norway's wealth fund: oil dividends can be used for green shift

**Oil dividends help the energy transition**

Norway's wealth fund was also in the news on Friday morning when the Expert Group submitted their report to the Norwegian government titled "*Report from expert group on climate risk in the GPFG*" [LINK]. The Expert Group advises Norway who in turn gives the mandate to the Norges Bank (the manager) on the investing strategy for the Norwegian sovereign wealth fund "Government Pension Fund Global "GPFG"". The government's release was extremely short and nothing of substance. However, we did a Google Translate on the I did a google translate on the Expert Group's press release [LINK]. No question, the Expert Group is clearly saying climate risk is "*potentially significant*" for the fund. And that the "*overall climate risk in the financial system is high*". The media reports on the release had headlines such as "*Norway's $1.4 Trillion Wealth Fund Puts Oil Stocks on Notice."* When we went thru the release, we didn't get that same feeling as if they are going to sell their oil stocks. Rather the Expert Group said they need the invested companies to have an long term goal of net zero. They wrote ""*The expert group suggests:  Norges Bank's responsible management receives an overall long-term goal of zero emissions from the companies the fund has invested in, in line with the Paris Agreement*." And they say they can help the decarbonize by helping the invested companies decarbonize. They wrote *"- Decarbonisation of the fund should take place by contributing to the decarbonisation of the companies as the fund is invested in. This is the best way to reduce climate risk in our common wealth, says*

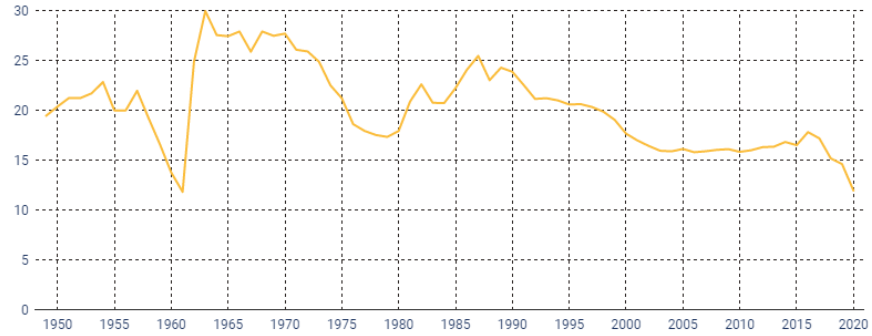
*Skancke*." And then there was the most interesting comment in the Expert Group recommendation, which led us to tweet [LINK] *"is this the 1st sovereign wealth or major pension investor to say owning #Oil stocks can help transition to low emissions if investors use the #Oil dividends to invest in green shift opportunities? see excerpt Expert Group advising Norway on its wealth fund. #OOTT".* We don't recall ever seeing this commentary from fund managers. The Expert Group is using a commentary similar to what we are seeing from supermajors in their energy transition on how they will be using oil and gas higher returns and cash flows to fund the shift to more capital to energy transition items that have lower returns. e supermajor commentary on using oil and gas cash flow to fund the transition. But we don't recall seeing this type of comment from a fund manager concept that they can own oil stocks that has free cash flow can help to decarbonize if the oil company pays out dividends that the shareholder can then use to buy more green investments. The Expert Group writes "*Through targeted and effective exercise of ownership, Norges Bank can contribute to understanding and influencing the robustness of the business models of the companies the fund has invested in, as well as emphasize the importance of capital discipline so that companies have underlying investment projects that benefit benefit from climate-related opportunities and are profitable in the transition to a low-emission society. Capital discipline means, among other things, that fossil fuel companies with weaker profitability prospects return surplus capital to the owners in the form of dividends, which gives investors the opportunity to invest capital in new ones investment opportunities related to the green shift"*. Our Supplemental Documents package includes the Google Translate of the Export Group press release.

**Demographics – China tries to stem aging population, formally adopts 3 child law**

**China approves 3-child policy**

On Friday, Xinhua [LINK], and other media, reported the National People's Congress Standing Committee formally passed an amendment to the Population and Family Planning law that will allow couples to now have 3 children. This follows the formal change in 2016 that allowed the move to 2 children. This was the formal passing of the law. Our June 20, 2021 Energy Tidbits noted that this was approved by the Communist Party of China Central Committee, which meant that the formal passing of the amendment was going to happen, it was just a question of when. The big global demographic trend is China's ageing population versus India's growing still relatively youthful population. As we say, demographic trends are predictable and China has been well aware that its population is aging. China made the biggest change to stem that in January 2016, which it changed its one-child policy (began in 1980 to avoid over population) to move to a two-child policy. That hasn't stemmed the direction with the Chinese government estimates that the population will peak in 2027 being much more optimistic than most other estimates predicting peak population could be as soon as 2022. This newest policy change (up to 3 children permitted) is in response to a declining birthrate and a fertility rate below the replacement level needed for a stable population (China's fertility rate was 1.3 children per woman, vs the 2.1 needed). In 2020, Chinese mothers gave birth to 12mm babies, down 18% from 2019, representing the 4$^{th}$ consecutive annual drop in the birth rate. As a result, population growth rate in the country is the slowest of any recorded decade since China first recorded Census data in 1953. The challenge will be for China to get young couples to have 3 children or at least 2 children. When the communist part change was announced in June, the South China Morning Post wrote "*State News Agency Xinhua polled 31,000 people, finding just 1,443 of them were "ready" to have a third child. It was "on the agenda" for 213 respondents, while 828 were "hesitant". The poll results, though, disappeared not long after they were posted.A report by demographers at Renmin University of China backed up the sentiment as they estimated that the policy would lead to an annual increase of 200,000 to 300,000 births in the next five years – a slight increase from the rate of 12 million births last year".*

Figure 49: China's births (in millions)




Source: Wind, National Bureau of Statistics

**Demographics – EIG 1/5 of person income in the US is derived from asset income**

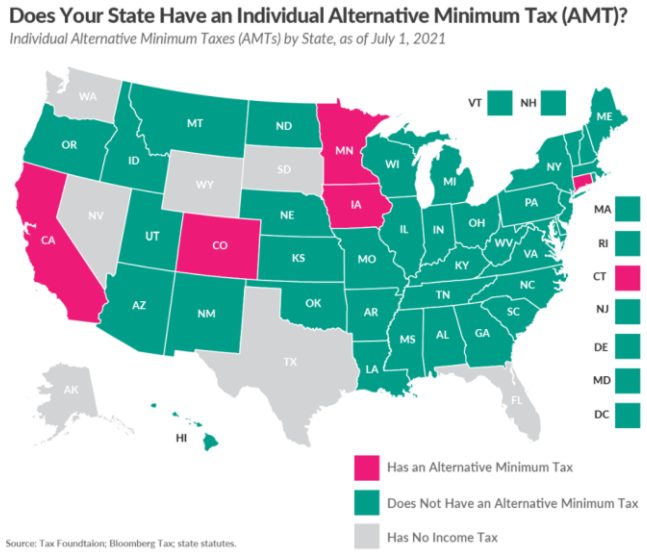
**EIG Wealth Report**

There was some good wealth reminders/insights from the Economic Innovation Group (EIG) report "*From Wealthy Enclaves to Asset Deserts: What the geography of asset income signals about wealth distribution in the United States*." One good reminder is why Elizabeth Warren and others want to have a wealth tax – EIG writes "*finds that one-fifth of personal income in the U.S. is derived from asset income—defined as dividends, interest, or rent*". As to where in the US is wealth, EIG writes "*Today's asset income hotspots are overwhelmingly centers of finance, technology, mining, or recreation. Teton County, WY has the highest income from assets per capita in the country at $161,400. Among populous counties, Manhattan (NY), San Mateo (CA), and Palm Beach (FL) lead. Mountain West states such as Wyoming and Colorado contain some of the greatest asset income inequality in the country, hosting enclaves of extreme affluence alongside deeply distressed rural areas."* Our Supplemental Documents package includes the EIG release. [LINK]

**Jackson Hole (Wyoming) has no income tax and very low other taxes**

On Friday, the Federal Reserve Bank of Kansas City said it was changing it annual economic symposium in Jackson Hole, Wyoming from an in-person to a virtual symposium due to Delta. When the EIG wealth report, it seemed like some were surprised to see that Jackson Hole (Wyoming) was ranked as the US highest per capita income from assets in the Economic Innovation Group wealth report. In fact, on Wednesday one of the younger reporters had a backrop of the mountains and she said how she can see why they (the wealthy) would want to mov there referencing the mountains. Years ago, I had the opportunity to ask a very wealthy person why he moved there from California and he said simply to cut taxes. We think this is a key reason why the wealthy have residence in Jackson Hole. Below is the Tax Foundation reminder of no income tax in Wyoming.

Figure 50: Does Your State Have an Alternative Minimum Tax




Source: Tax Foundation

### 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.

#### Hurricane Henry delaying final round at PGA Northern Trust

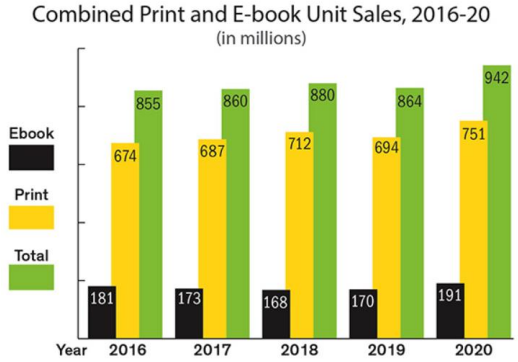
Cdn golf fans will have to wait at least a day to see if PGA pros Corey Connors and Mackenzie Hughes can maintain their positions to qualify for the next stage of the FEDEX cup. The final round of the Northern Trust tournament in Jersey City, New Jersey is postponed with Hurricane Henri landfall today along the east coast. Lets hope for all in the path that the impact isn't significant. After the Northern Trust, the PGA pros are cut to the top 70 to move to the next stage BMW Championship. Connors sits solidly at #20, whereas Hughes is at #64 so will need another good round. But there is golf for Cdn golf fans today. As of our 7am MT news cut off, Cdn LPGA golf Brooke Henderson is about to tee off for the final round of the AIG

Women's Open, the 5th major of the year, she enters the round at -6 and tied for 13th but only 3 shots off the lead.

### Print book sales benefited from Covid

Our initial thoughts on seeing the Dutch NL Times Monday report [LINK] "*Dutch book sector struggling under paper shortage"* [LINK] was that so what, who reads books these days? The report was straight forward, "*The massive increase in online shopping and food deliveries resulted in a huge demand for cardboard boxes, which in turn resulted in a shortage of paper pulp, NOS reports. Paper pulp is increasingly likely to rather become a package- or pizza box than a book, as even book paper factories in Europe are being converted into cardboard box factories".* We hadn't thought of paper book sales, but naively assumed that sales were lower thinking that Ebook sales would have had a big impact like seen in magazines and newspapers. NL Times wrote that books are expected +5% in 2021, after 2020 was +6% vs 2019. Covid was a plus for print book sales, which makes sense as a stay at home, more time on your hands activity. We wanted to take further lookback and, at least in the US, Ebook really took market share in the 2007-2012 period, putting print book sales at the trough, but since then both print and Ebook sales have co-existed and generally moved in tandem. It looks like Ebook taking market share isn't really changing. Below is a graph from Publishers Weekly. [LINK]
5617532

Figure 51: US Combined Print and E-book Unit Sales, 2016-20 (millions)




Source: Publishers Weekly, NPD Bookscan