Energy Tidbits

July 25, 2021

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Big Potential Upside to 2022 HH/AECO Prices, New US LNG Export Capacity Could Reduce Gas Storage By 1 Tcf in 2022

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. BloombergNEF forecasts Oct 31/22 storage at 2.64 tcf, which would be hugely bullish for 2022/23 prices HH/AECO prices. (Click Here)

2. Nord Stream 2 now set to be completed and put in-service post US/Germany agreement. (Click Here)

3. Japan's new 2030 target energy mix hits LNG the hardest and makes us wonder if it also reflects concern on future LNG supply/cost. (Click Here)

4. Precision reminds Cdn public E&P years of building sustainable models are why they, not the US peers, are able to take advantage of high prices. (Click Here)

5. Quebec's reasons for rejecting Saguenay LNG will likely be used in future Liberals rejections. (Click Here)

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

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

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YoY storage at -532 bcf YoY deficit

The EIA reported a 49 bcf injection (vs 43 bcf injection expectations) for the July 16 week, which was above the 5-yr average injection of 36 bcf, and above last year's injection of 37 bcf. Storage is 2.678 tcf as of July 16, decreasing the YoY deficit to 532 bcf from 543 bcf last week and storage is 13 bcf above the 5 year average vs 1 bcf below last week. The significant YoY deficit along with the forecasted hot summer will help support natural gas prices during the injection season. Below is the EIA's storage table from its Weekly Natural Gas Storage Report. [LINK]

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (07/16/20)		5-year average (2016-20)	
Region	07/16/21	07/09/21	net change	implied flow	Bcf	% change	Bcf	% change
East	562	543	19	19	690	-18.6	618	-9.1
Midwest	683	662	21	21	796	-14.2	697	-2.0
Mountain	183	180	3	3	189	-3.2	178	2.8
Pacific	247	250	-3	-3	311	-20.6	290	-14.8
South Central	1,002	995	7	7	1,222	-18.0	1,071	-6.4
Salt	279	283	-4	-4	350	-20.3	295	-5.4
Nonsalt	723	712	11	11	872	-17.1	776	-6.8
Total	2,678	2,629	49	49	3,210	-16.6	2,854	-6.2

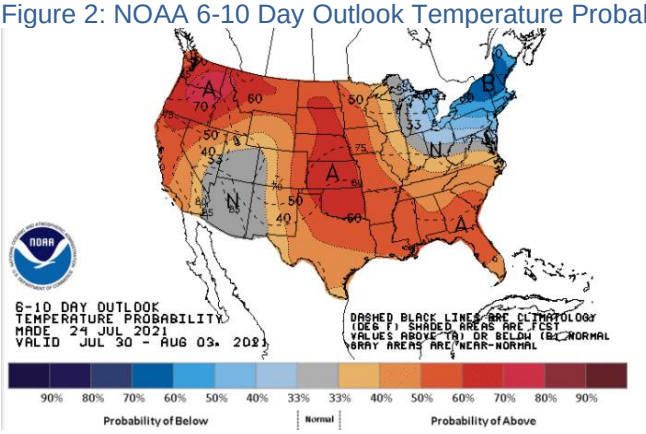
Source: EIA

Natural Gas – Positive US weather continues for natural gas

YoY storage at -532 bcf YoY deficit

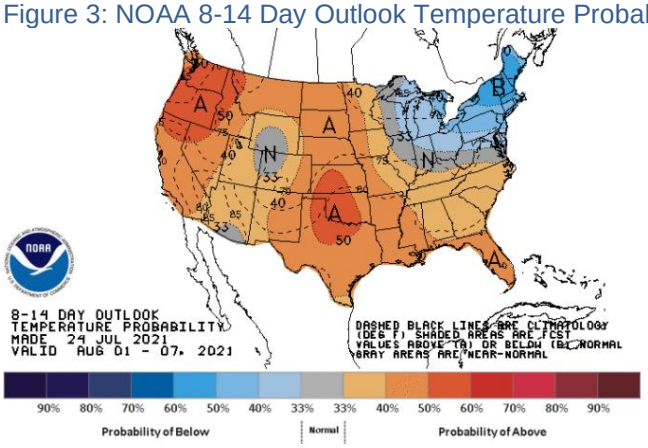
It may not be as blistering hot as it was last month, but NOAA's near term 6-10 and 8-14 day temperature probability forecast maps still look to be positive for natural gas. The 6-10 day outlook is found at [LINK] and 8-14 day outlook is found at [LINK].

Figure 2: NOAA 6-10 Day Outlook Temperature Probability



Source: NOAA

Figure 3: NOAA 8-14 Day Outlook Temperature Probability



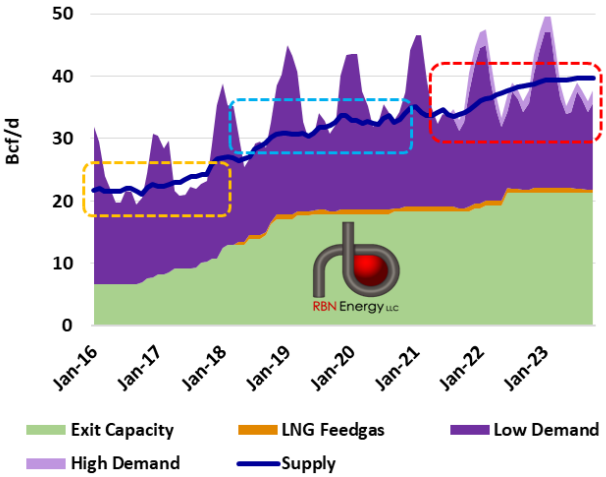
Source: NOAA

Natural Gas – RBN warns on big risk to Appalachian gas prices in 2022/2023

Bearish outlook for Appalachian gas prices

There was another good RBN Energy blog on Tuesday "*The Outlook For The Appalachian Natural Gas Market*" [LINK]. RBN highlighted that while the Appalachian natural gas market hasn't looked this bullish in a while, it warns of a new threat to Appalachian gas prices. They expect seasonal takeaway constraints to get worse in the coming years, which may lead to basis meltdowns and, in a worse-case scenario, production shut-ins. The fundamentals behind this prediction are detailed in the chart below. When the top of stacked layers exceeds the dark blue supply line, it means that there is enough demand + exit capacity to absorb the supply. However, as you can see in the chart, there are many instances where there has been a gap between the supply and demand + exit capacity present. In this situation, the only place excess gas can go is either into storage or be curtailed. The prediction in the red dashed box is certainly bearish. Eastern Gas/Dominion South cash prices are averaging about $2.40/MMBtu this season, but by next October EGS basis could reach minus $2.00/MMBtu, and in 2023 could sink down to -$2.50/MMBtu. Our Supplemental Documents package includes the RBN blog.

Figure 4: Northeast Supply-Demand Monthly Outlook



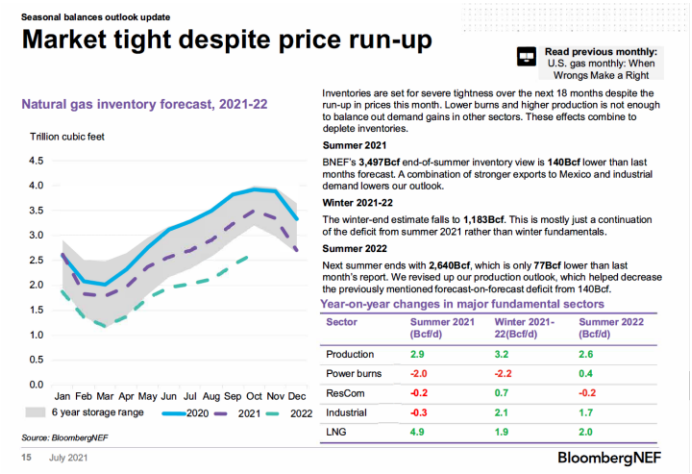
Source: RBN

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 (~$3.40 for 2022 and ~$2.90 for 2023) and AECO (~C$3.10 for 2022 and ~C$2.60 for 2023). BloombergNEF's forecast for US gas storage for Oct 31/2021 was 3.497 tcf (140 bcf lower YoY) is on the conservative side considering storage is currently 532 bcf lower YoY with expectations for strong US LNG exports in the summer/fall. But then BloombergNEF had a shock forecast for Oct 31/2022 for US gas storage to be 2.640 tcf. This is a hugely bullish storage number, basically at least 1 tcf less than normal and the last time Oct 31 storage was under 3 tcf was Oct 31/2000 when HH went over $10 the winter 2000/2001. 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 2.64 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. Our Supplemental Documents package includes excerpts from BloombergNEF US Gas Monthly.

Figure 5: US Natural Gas Inventory Forecast



Source: BloombergNEF

Natural Gas – LNG supply risk as Chevron behind CCS commitments at Gorgon LNG?

Gorgon well behind CCS commitments

No one should be surprised to see the Bloomberg report this week "*Chevron's Carbon Capture Struggle Shows Big Oil's Climate Hurdle".* Our Jan 17, 2021 Energy Tidbits highlighted concern that Chevron being behind on its CCS commitments at Gorgon LNG raise the risk for ultimate LNG rates/recovery. Note that no analysts asked on this at the Chevron analyst day. (i) The Bloomberg report reinforces this risk. Bloomberg wrote "*While Chevron has sequestered almost 5 million tons of carbon dioxide since the capture project began in August 2019, that's fallen short of a target to capture an average 80% of emissions in the first five years of the LNG facility's operation. "Chevron is working with the Western Australia regulator on making up the shortfall," the company's Australia Managing Director*

Mark Hatfield said in a statement. The company has buried only 30% of about 15 million tons of CO2 generated since Gorgon began producing gas in March 2016, oil industry publication Boiling Cold reported Friday." "Western Australia's government insisted on the CCS facility as a condition for approving Gorgon, which is expected to run for four decades. The state's regulator has requested details on why Chevron missed its target, and Western Australia's Environment Minister Amber-Jade Sanderson is seeking a meeting with the company." (ii) We tweeted [LINK] "*Another reason to worry about #LNGSupplyGap? Hopefully WA will give $CVX more time to catch up and let them offset with #CarbonCredits. If not, won't other potential WA fix-the-shortage actions seem to add risk to #GorgonLNG future recovery/rate? Thx @SStapczynski #LNG."* (iii) The real question is what will Western Australia require? Its hard to see how this isn't a negative to Gorgon LNG, the only question is how much of a negative. Will they just give them more time to catch up? will they just let Chevron buy carbon credits? Or will they only allow lower rates of production to lower the emissions? or will they force a shorter life at Gorgon LNG? (iv) Our tweet noted that we suspect the hope for Chevron is that Western Australia gives them a combination of more time to catch up and get Chevron to buy carbon credits to make up for the shortfall without asking for any change in LNG volumes. That would be the cheapest but would also add more on the buy side for carbon credits. Gorgon LNG is ~2.3 bcf/d. (v) We hope that Western Australia doesn't put Chevron in a show-me position and restricts any LNG production or recovery until Chevron proves it can catch up. (vi) Regardless, the underperformance has to add to future LNG supply risk from Gorgon LNG. Our concern remains that continued underperformance of the CCS could lead to a lesser life for Gorgon LNG. (vii) Then there is the bigger question – understanding why this flagship CCS project hasn't worked anywhere to the level that it was expected? The hope is that this is a unique situation to Gorgon LNG and not to other potential LNG CCS projects. CCS is assumed to work and is the key to allowing more natural gas to be produced for longer to fit a Net Zero scenario. Gorgon LNG partners are Chevron 47.3%, Exxon 25%, Shell 25%, Osaka Gas 1.25%, Tokyo Gas 1% and JERA 0.417%. (viii) This will be an item to watch. Our Supplemental Documents package includes the Bloomberg report and Chevron's release on the shortfall [LINK] .

Natural Gas – Korea also rushing to secure long term LNG supply

Korea rushing to secure long term LNG supply

Last week's (July 18, 2021) Energy Tidbits memo highlighted our July 14 8-pg blog "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs*" [LINK]. We wrote the blog because, in the week prior, we saw an abrupt change in Asian LNG buyer contracting with four new long term LNG contracts and India signaling they were reaching out to Qatar. We believe this abrupt change in Asian LNG buyer contracting is indicating their concern about LNG supply in the 2020s. We saw another example of this on Monday with the Korea Times report "LNG power generation poses dilemma for Korea's energy policy" [LINK]. Korea Times noted the challenge in replacing coal for power "*But the high cost of LNG fuel is posing a dilemma — it is more than 10 times higher than that of operating nuclear plants*." The part that caught our eye was the comment "*The Ministry of Trade, Industry and Energy is rushing to secure long-term supply contracts to meet growing demand due to the expanded use of LNG. Demand is projected to grow to 4,797 tons by 2034, up from 4,169 tons this year, according to the ministry's plan. This presents a challenge, as Korea will have to secure additional contracts with other countries."* Note this is not a material impact on LNG markets as Korea 2020 LNG imports were only about 5.5 bcf/d. Rather, the key takeaway from the report is that Korea feels an urgency to secure long term supply contracts. Clearly, they know what is going on in LNG markets and want to join the crowd of securing long term supply. Its just another reinforcement for our view that Mozambique LNG delays will be about 5 bcf/d and this is causing a sooner and bigger LNG supply gap. And Asian LNG buyers see this and are

moving to lock up long term supply. Our Supplemental Documents package includes the Korea Times report.

Natural Gas – India June natural gas production up MoM at 3.27 bcf/d

India natural gas production +4.8% MoM

Unfortunately, we are now in a period where YoY comparisons aren't necessarily relevant given 2020 was hit by the initial global wave of Covid causing interruptions in everything including oil and gas production. The key India natural gas theme for the past few years has been that India has not been able to grow its domestic natural gas production so any increase in natural gas consumption means equal increase in LNG imports. India's Petroleum Planning and Analysis Cell released their monthly report for June natural gas and oil statistics on Tuesday [LINK]. India's domestic natural gas production peaked in 2010 at 4.6 bcf/d. India's domestic natural gas production was up 19.5% YoY from 2.74 bcf/d in June 2020 to 3.27 bcf/d, up from 3.12 bcf/d in May. The YoY increase is not necessarily reflective of significant growth, more so a return to pre-pandemic production, as April 2019 to March 2020 production averaged 3.02 bcf/d. India has consistently struggled to grow domestic natural gas production with 2018-2019 production averaging 3.18 bcf/d, declining to 3.02 in 2019-2020 and averaged 2.78 bcf/d 2020-2021. This means that until they can grow production, any incremental natural gas demand is likely to be met by increasing LNG imports. Our Supplemental Documents package includes excerpts from the PPAC monthly package.

Natural Gas – India June LNG imports down 17.2% YoY to 2.73 bcf/d, down 7.5% MoM

India LNG imports -7.5% MoM

India is always viewed as an extremely price sensitive buyer in terms of its LNG imports, which was exemplified in their 2020-2021 import data. India had ramped up exports from June to October 2020, taking advantage of low LNG prices to fill their stocks. Imports began to decline in November as LNG prices began to rise, with the price trajectory ramping up in late Dec and reaching record levels January. This resulted in India LNG imports declining from a 2020-2021 peak of 3.836 bcf/d in Oct 2020 to just 2.814 bcf/d in Jan 2021. LNG imports have since normalized along with pricing, with imports in June of 2.73 bcf/d, down 17.2% YoY and down 7.5% MoM from 2.95 bcf/d in May and 3.13 bcf/d in Apr as prices are quite elevated.

Natural Gas – Rwandan troops attack/kill insurgents in Mozambique

Rwanda troops attack in Mozambique

It will be interesting to see how the injection of many foreign military forces in Mozambique discourages/encourages the insurgents in Mozambique, especially now that we are seeing reports of military attacks and deaths. Last week's (July 18, 2021) Energy Tidbits noted Europe was the latest to agree to send in military support to try to help restore safety and security in the Cabo Delgado province of Mozambique. No one expected that the EU forces will play an aggressive military role, rather they would be more military technical support. The Council of the EU July 12 release is found at [LINK]. However, the wild card is going to be how African military forces impact the determination of the insurgents. Last week, Rwanda also started to deploy 1,000 armed forces to help combat the insurgents in Cabo Delgado province. It didn't take long for the Rwanda forces to make an impact. On Friday, KT Press (Rwanda news) reported "*Rwanda Confirms Offensive On Mozambique Insurgents*" [LINK] and *"Media reports indicate that on July 20, 2021 RDF soldiers left early from Afungi – where they made a base at the Total camp – to patrol a forest near Palma and encountered the insurgents in Quionga village where some insurgents were reported killed in the face-off. Col. Ronald Rwivanga, the RDF spokesperson confirmed the offensive but said that Rwanda cannot confirm the numbers of those involved until they get a full field report from the Mozambique government."* There are various unconfirmed reports on Twitter that the deaths are in the "dozens".

Natural Gas – Distant peace in Mozambique reinforces LNG supply gap is coming

Distant peace in Mozambique

It sounds like nothing is getting better in Mozambique and that the expectation should be for at least a 1 year delay to TotalEnergies force majeure of its Mozambique LNG Phase 1. ON Friday, we tweeted [LINK] on a Reuters report *"ANALYSIS-Mozambique's gas ambitions rest on distant hope of peace*" [LINK]. TotalEnergies declared force majeure for Phase 1 on April 26. At that time, TotalEnergies expected the force majeure to last at least 1 year. (i) A distant hope of peace. The key Reuters disclosure was what was said by a TotalEnergies source. Reuters wrote "*Ultimately, success hinges on the Mozambican authorities, though time was running out, the official said. "I don't see a short-term solution ... The government has failed so many times."* Is only been 4 months but, it doesn't seem like there is any hope for peace in the near term ie. the TotalEnergies expectation of at least 1 year is still the expectation. (ii) TotalEnergies considering FLNG instead of onshore liquefaction. Reuters also had a new disclosure writing "*A TotalEnergies source told Reuters on condition of anonymity that the company's engineers might look again at the option of moving the project offshore but that would have its own technical and political challenges. Such a move would require the government to accept missing out on the boost to local jobs and the poor northern region in general it is counting on for economic development, an official working with TotalEnergies said."* Interesting comment that Total is considering moving from onshore to an offshore FLNG. This would work but, at best, would add years and cost to get it replace the big onshore facilities. Right now, there are 3 FLNG around the world. The largest is Shell Prelude FLNG (offshore NW Australia) that started in 2018 and produces 0.47 bcf/d of LNG. Next is Eni Coral FLNG (offshore Mozambique for 2022 start up and it will be 0.45 bcf/d, and then the oldest that started in 2016 Petronas offshore Malaysia that only does 0.16 bcf/d. Our SAF Group April 28 blog (see next point) notes how there is really a delay of 5 bcf/d at Mozambique. Total Phase 1 of 1.7 bcf/d start in 2024, Exxon Rozuma Phase 1 of 2.0 bcf/d start in 2025 and Total Phase 2 of 1.3 bcf/d start following Phase 1 ie. assume 2026/2027. Going to FLNG would start much smaller. Lets say they get to the front of the queue and get a FLNG in 4 or 5 years, then add 1 FLNG per year, that is getting to 2035 to get to the 5 bcf/d. There could be some logic here, but it would be an even bigger delay of the Mozambique 5 bcf/d of LNG. Our Supplemental Documents package includes the Reuters report.

Eni's 0.45 bcf/d FLNG in Mozambique still looks on track for in service 2022

Please note that our April 28 blog view that there is 5 bcf/d of Mozambique LNG delayed from the expected in service date does not include Eni's Coral Sul (Rovuma Basin) FLNG of 0.45 bcf/d planned in service in 2022. [LINK] This is an offshore floating LNG vessel that is still expected to be in service in 2022. It still looks to be on track to that timeline. On Thursday, Offshore reported [LINK] "*Coral FLNG vessel on track for year-end yard departure The Coral-Sul FLNG vessel should sail from the Samsung Heavy Industries yard in South Korea by year-end, according to Technip Energies."*

SAF blog, Mozambique impact on global LNG supply/demand, 5 bcf/d hit

As noted above, we released our April 28 blog [LINK] because of Mozambique. We believe there has been a major change to the outlook for LNG supply in the 2020s and one that is still being overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. It is being overlooked because markets are focused on Total's Tuesday announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d, but aren't focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow,

and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We have been warning on Mozambique has a major LNG market impact and its why, on Wed, we posted our new 7-pg blog "*Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?*" [LINK] Recall that Total stopped development in Dec due to the security/violence, resumed development on Wed March 24, 3 days of violence ensued, Total then stopped development again on Sat March 27, declared force majeure on Mon April 26, and announced at least a year delay on Thurs April 29. We posted a blog a day before Total's Thursday Q1 call, but saw nothing to change our view that the likely delay is at least 2 years. On the call, Total said they expect at least a year delay. Our blog reminds that even if Total makes a restart development decision in 12 months, it will take months just to get back to where they left off including rehiring services so any return to where they were in the construction process is at least more likely 18 months at a minimum. This is going to create a bigger and sooner LNG supply gap and the reality is that the only projects that can step up in any reasonable time frame will be brownfield LNG projects. Its why we also said what about LNG Canada Phase 2. There is much more in the 7-pg blog. Our Supplemental Documents package includes our blog.

Japan hits LNG the hardest

Energy Transition – Did future LNG supply/costs impact Japan's new energy mix

Later in the memo, we note the big news this week of Japan's new Energy Mix targets for 2030 hitting LNG the hardest relative to their previous targets. In a push to reduce emissions, it doesn't make sense to hit LNG harder than coal. Natural gas power generation can do all coal can in providing 24/7 reliable power and high intensity power for heavy industry. And coal power generation produces twice as much CO2 emissions versus natural gas power. We just have to wonder if its simply that Japan worries abouts future LNG supply and costs relative to coal ie. reliable future supply of LNG will cost way more than expected.

As expected, Japan topped up its LNG tanks

Natural Gas – Japan LNG inventories have recovered

It looks like Japan is doing their best to keep their LNG tanks full for the summer power reserve. It's a good thing considering its been in the mid-30's C this week. We have been highlighting Japan's low summer peak power reserve for some time, and tweeted on May 11 [LINK] *"Japan will want to keep #LNG tanks topped up until worst is over. Japan summer peak power reserve only 3.7-3.8%. Positive for LNG & US LNG, less cargos redirected to refill EU storage. Imagine the AC bill if they had 0.5 mm visitors for olympics. Thx @SStapczynski #NatGas #OOTT".* We previously highlighted that Japan LNG inventories were below normal ahead of peak summer demand, but as we expected Japan has been topping up its LNG tanks. According to the Ministry of Economy, Trade and Industry (METI), Japan's end-June LNG stocks are estimated to have recovered to the 3-yr average. Bloomberg reported that Japan inventories had reached a low point in Jan, but recovered to 211.23 bcf in March. Argus reported on July 12 [LINK] that as of June 30, according to a survey by METI, stocks were around 97.5 bcf. This is ~4.8 bcf higher than both May's month-end stocks and the 4-yr average of June-end stocks. Argus wrote *"The utilities have been urged to secure more LNG summer supplies earlier than in past years, as the government called on buyers to take precautionary measures to tackle possible power shortages during the summer peak demand season that typically runs from July-September."* Further, Bloomberg added that Japan is set to announce new guidelines for the minimum required LNG stockpiles in order to guarantee sufficient supply, which could boost winter LNG

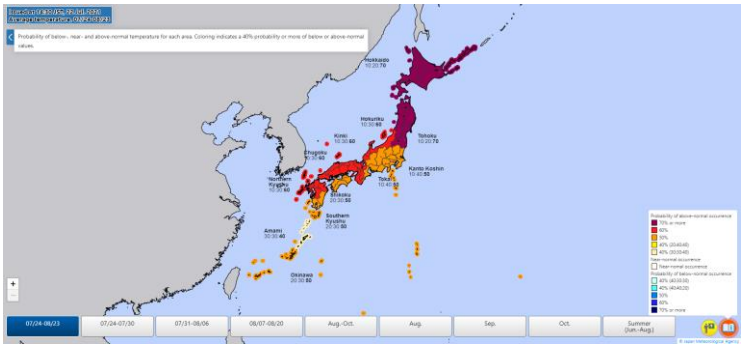
purchases from Japanese players like Jera Co. and Tokyo Gas Co. Our Supplemental Documents package includes the Bloomberg report.

Natural Gas – Japan next 30 days looks very hot, Sept also warm

JMA forecasting a very hot August

Anyone following the Tokyo Olympics knows it has been hot and humid in Japan in July. And it looks like the hot humid temperatures will continue into August and the weather in Japan will continue to be very supportive of the strong summer LNG prices. Weather always changes and there is no certainty of that the forecasts will be accurate. However, the last week has seen a much warmer outlook for Japan for the next 30 days. August temperatures are forecasted to be very hot throughout the country, especially in the North. Everywhere apart from the southern Islands of Amami has a 50%+ chance of experiencing above-normal temperatures. September temperatures look to also be a bit warmer than normal. The Japan Meteorological Agency issued its updated month ahead weather forecast for July 24 – Aug 23 on Thursday [LINK] Below is the current JMA forecast for the remainder of July and the month of Aug as well as the forecast for the month of September.

Figure 6: JMA Temperature Probability Forecast for July 24 – August 23



Source: Japan Meteorological Agency

Figure 7: JMA Temperature Probability Forecast for September

Source: Japan Meteorological Agency

Natural Gas – Nord Stream annual maintenance completed as planned

Nord Stream annual maintenance completed

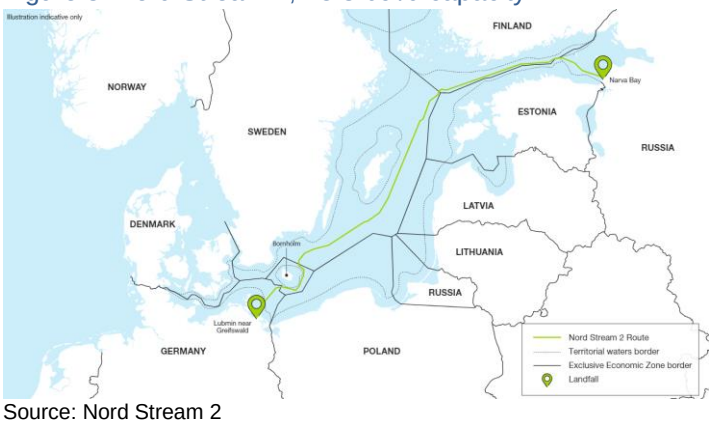
On Friday, Nord Stream announced [LINK] that it "*has successfully completed all planned maintenance works on its twin gas pipelines within the scheduled period. After the temporary shutdown of the pipeline system, gas transmission resumed on 23 July 2021".* The shut down was from July 13 to July 23 and it meant the full pipeline capacity of 5.3 bcf/d was down. The maintenance period this year was 10 days compared to 12 days (July 14-26, 2020) last summer. Our Supplemental Documents package includes the Nord Stream announcement.

Natural Gas – US/Germany strike Nord Stream 2 deal post Merkel/Biden meeting

Nord Stream 2 deal

We have to assume that no one was surprised by the US/Germany announcement, the day after the Merkel/Biden meeting, "*Joint Statement of the United States and Germany on Support for Ukraine, European Energy Security, and our Climate Goals".* We guess they didn't want to call this the Nord Stream 2 deal. But the agreement is what provides the ability for Nord Stream 2 to be completed and deliver natural gas to Germany. The final agreement matched up with the leaks over the days prior to the release. The US and Germany "*commitment is designed to ensure that Russia will not misuse any pipeline, including Nord Stream 2, to achieve aggressive political ends by using energy as a weapon."* The deal also said "*The United States and Germany are united in their belief that it is in Ukraine's and Europe's interest for gas transit via Ukraine to continue beyond 2024. In line with this belief, Germany commits to utilize all available leverage to facilitate an extension of up to 10 years to Ukraine's gas transit agreement with Russia, including appointing a special envoy to support those negotiations, to begin as soon as possible and no later than September 1. The United States commits to fully support these efforts."* Our Supplemental Documents package includes the US/Germany agreement.

Figure 8: Nord Stream 2, ~5.3 bcf/d capacity



Source: Nord Stream 2

Natural Gas – Gazprom reminds Nord Stream 2 brings lower cost of gas to Europe

Nord Stream 2 emits 5.6x less CO_2 than Ukraine route

Gazprom released a message to the media from CEO Alexey Miller on Thursday [LINK] reminding that it has *"always approached Nord Stream 2 as an economic project"*. It highlighted that thanks to Nord Stream 2, gas will have to travel 2,000 km less to Germany than the route from Ukraine, resulting in much less expensive LNG for end customers. Gazprom also reminded that Nord Stream 2 has much lower emissions than the Ukrainian route – CO_2 emissions from Nord Stream 2 are 5.6x lower thanks to it having less compressor stations. Miller noted as well that it is not ruling out transporting gas via Ukraine, saying it will *"need to be settled under market conditions and at market prices. If the aggregate of the new volumes of Russian gas to be purchased and transited via the Ukrainian route exceeds the current transit obligations, Gazprom will readily increase the volumes of gas transit across Ukraine".* Our Supplemental Documents Package includes the Gazprom release.

Natural Gas – Gazprom finally books some extra capacity via Ukraine

Gazprom books extra capacity via Ukraine

Is the end of July, its hot in Asia, LNG spot prices for Sept are in the high $14's, and it looks like Nord Stream 2 will start deliveries around the end of the year, so we probably shouldn't be surprised to see Gazprom finally move to take on some of the offered extra capacity

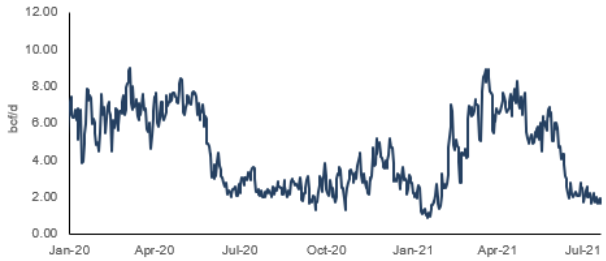
offered on natural gas pipeline in Ukraine. Gazprom has changed its prior strategy and booked extra capacity via Ukraine in August. As we previously highlighted in our July 11 Tidbits, Gazprom had rejected extra gas capacity via Ukraine for years 2021 until at least 2022. Post the news release, Dutch TTF natural gas futures soared. Bloomberg reported on Tuesday, however, that Gazprom has booked the entire 0.53 bcf/d of firm capacity offered by Ukraine's Gas TSO in August, which is in addition to contracted volumes. Sergiy Makogon, CEO of Gas TSO wrote on his LinkedIn page on Saturday [LINK] *"Instead of additional transit this year, Gazprom began extracting gas from European gas storages to offset reduced gas supplies to Europe while NS1 is shut off. And this is happening during the period of maximum gas prices in the EU and critically low gas reserves in European underground storage facilities."* He also added *"Perhaps, Gazprom is sending additional signals that without the launch of #NordStream2, Europe will not receive additional volumes of gas."* Gas TSO of Ukraine will hold an auction for interruptible capacity next month, a type of contract Gazprom has not booked in previous auctions.

Natural Gas – LNG flows to NW Europe at ~3.35 bcf/d in June, down to 1.96 bcf in Jul

LNG flows to NW Europe -2.2 bcf MoM in June

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). And its not just Asian markets taking LNG cargoes away from Europe, its also surprisingly South America. Further, demand for LNG is also quite strong in Latin America because of droughts causing low hydro-generation in Brazil and a chilly winter in Argentina. In fact, several LNG tankers bound to NW Europe from the US have been redirected. For example, the Gaslog Chelsea was expected arrive in Rotterdam on July 26 but was diverted in the middle of the Atlantic to Bahia Blanca, Argentina. The weak flows to Europe are not for lack of demand, however. European natural gas prices are gaining due to the tight gas balances and tight coal markets due low Colombian imports and strong Chinese demand. 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. Thus far in July, flows have averaged 1.96 bcf/d, which is the lowest since the beginning of February and represents a ~65% drop since May.

Figure 9: Net LNG Flows to NW Europe



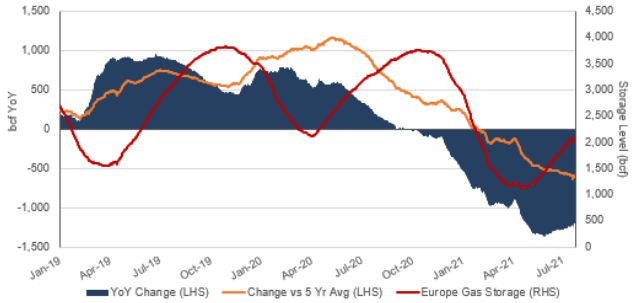
Source: Bloomberg

Natural Gas – Europe storage 53.55% full vs 5 year average of 70.07%

Europe gas storage 53.55% full

As noted above, high Asian spot LNG prices are attracting LNG cargoes away from Europe. And even though Europe storage started off well behind 2020 levels, it is unable to catch up due to the Asian LNG prices. Plus it has been hot in Europe so natural gas consumption has stepped up to fill the void from solar/wind. The continued significant YoY deficit in Europe gas storage sets up a push for Europe LNG imports this fall. It still looks strong for US LNG exports this summer/fall. 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 July 22 is 53.55%, 30.58% less than last year of 84.13% and 16.52% below the 5 yr average of 70.07%. 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 10: Europe Gas Storage Level



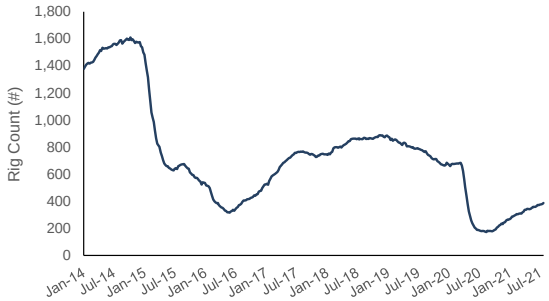
Source: Bloomberg

Oil – US oil +7 WoW at 387 oil rigs

US oil rigs +7 WoW

Baker Hughes reported its weekly rig data on Friday. This week US oil rigs were up +7 rigs WoW at 387 rigs. As expected with the price of oil, rigs have ramped up in the US, particularly in Texas. Permian were up 5 to 242 rigs. Increases came from Ardmore Woodford (+1), Granite Wash (+1), and Permian (+5). There were no decreases this week. Oil rigs have been on a strong recovery path and are +215 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 296 to 387 oil rigs (-43.33%). Below is our graph of Baker Hughes US oil rigs.

Figure 11: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – Frac spreads +1 to 243 as of July 23

Every week, Mark Rossano (C6 Capital Holdings) posts a YouTube recap of frac spreads for the week on the Primary Vision Network. [LINK] Note Rossano did not provide his normal graphs. US frac spreads were +1 to 243 as of July 23 with the addition coming in the Anadarko. He spent some time discussion the drilling rigs to frac spreads ration. He noted there are 490 rigs operating and 243 frac spreads, remain at highs of spreads to rigs, and this is what he expected last year how E&Ps would minimize decline curves by focusing on DUCs. But that in the fall 2021, he would expect rigs pick up relative to spreads and its what he sees happening right now with spreads levelling off. Rigs have not come back at the same pace as spreads, but now we will start to see that reverseHe still expect sto get to about 255 spreads by the middle/end of Aug, and then accelerate to about 275 as bring some of the spare capacity back in the market. Rossano noted that frac efficiencies will be levelling off or maybe a little bit of a decline in frac efficiencies.

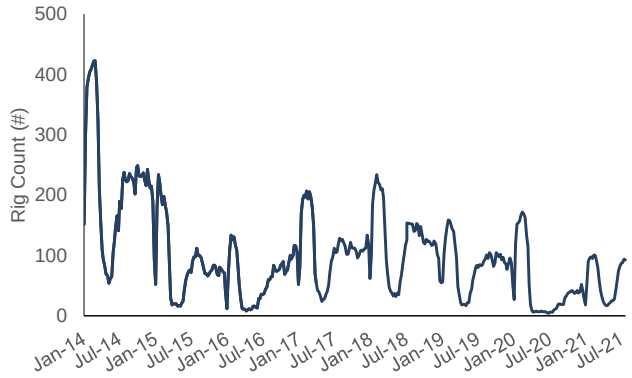
Frac spreads +1 to 243

Oil – Total Cdn rigs -1 to 149 total rigs and up 107 YoY

Total Cdn rigs were down 1 this week to 149 total rigs. Cdn oil rigs were down 1 to 93 rigs. Cdn gas rigs were flat at 55 gas rigs. Total rigs are now +136 since the June 26, 2020 all-time low. We have been seeing Cdn rigs continue to ramp up out of the Spring Breakup, but this week we have to wonder if the decrease is wildfire related as it is certainly not due to oil and gas prices. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 10 and Cdn gas rigs were 32 for a total Cdn rigs of 42, meaning total Cdn rigs are +107 YoY and total rigs are up +22 vs 2019.

Cdn rigs -1 this week

Figure 12: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat WoW at 11.4 mmb/d

US oil production was flat at 11.4 mmb/d for the July 16th week, which is the highest it's been since May of 2020. Lower 48 flat at 11.0 mmb/d. This puts US oil production up 0.3 mmb/d YoY, and is down 1.7 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The July STEO forecast slightly raised its US crude expectations thru 2021, however it is still not returning anywhere near the Q4/19 peak of 12.78 mmb/d, with Q4/21 US crude of 11.34 mmb/d (down 1.40 mmb/d from peak). In the US oil production commentary, the EIA wrote *"Higher oil price levels realized in 2021 drive increases in U.S. tight oil production in 2022. In addition, we expect more barrels from OPEC+ members to reach the market. We expect U.S. crude oil production to increase by 0.8 million b/d in 2022 and OPEC crude oil production to increase by 1.8 million b/d in 2022."* Additionally, on US rig counts, the EIA wrote *"The recent pace of rig deployment indicates that operators are adding rigs more slowly than during past*

US oil production up flat at 11.4 mmb/d WoW

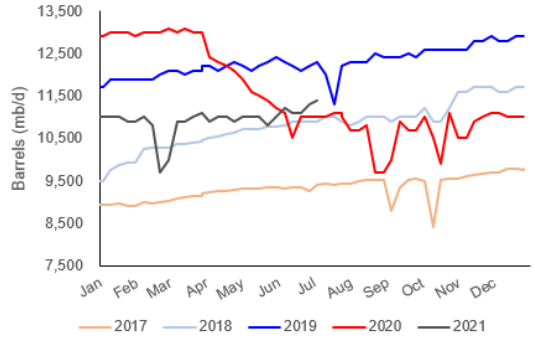
periods when prices reached similar levels. If operators take a more cautious approach to rig deployment than we are expecting, crude oil production could be lower than in our forecast". The EIA DPR has the expectation of slight MoM increases in July/August. The EIA Form 914 April actuals were 219,000 mb/d above the weekly estimates average of 10.950 mmb/d for Apr, following a similar trend from March's +213,000 mmb/d underestimate.

Figure 13: EIA's Estimated Weekly US Oil Production

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

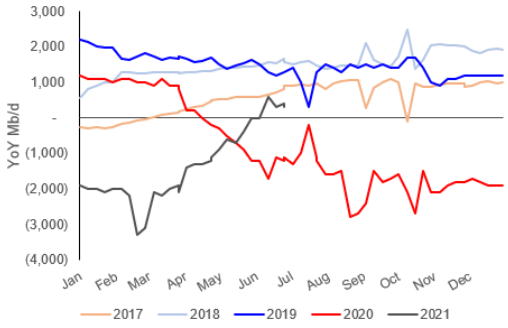
Source: EIA

Figure 14: US Weekly Oil Production



Source: EIA, SAF

Figure 15: YoY Change in US Weekly Oil Production



Source: EIA, SAF

Oil – Looks like high prices continuing to bring back North Dakota shut in wells

North Dakota production basically flat MoM

We recognize that this is not being highlighted, but we believe a key factor being overlooked in the stronger North Dakota oil production is the return of marginal shut in oil wells in March and April due to high oil prices. In May, the return of marginal shut in wells continued, however production was basically flat. This means that any near term oil production growth will now depend on how many wells are completed each month. And as NDIC Director Lynn Helms noted in his monthly press conference, North Dakota is facing a labor shortage to fill frac crews. And that it will cost more to attract experienced frac crews back to North Dakota. On Monday, the North Dakota Industrial Commission posted its Director's Cut, which includes May oil and natural gas production data [LINK]. North Dakota May oil production was basically flat MoM, up to 1.127 mmb/d from 1.123 mmb/d in April and is up 31.2% YoY. May's production was still ~20,000 b/d below production in Jan meaning there still was not a full recovery since the Feb freeze-off. We would have expected to see North Dakota oil production up a bit more with the high oil prices, but there is a frac crew shortage as noted later in the memo. But we are clearly seeing the numbers to show shut in wells are being brought back onstream. There was a further uptick in the # of producing oil wells in May vs April and only 19% of the new producing wells can be attributed to wells being completed. Rather it must be high oil prices bringing back the marginal shut in wells. The Director's Cut preliminary estimate for producing wells was 16,612, which is +217 from 16,395 wells in April. There were only 41 wells completed in May, which leaves 172 other additional wells in production. Rigs in North Dakota currently sit at 23, up 4 from May at 19. May completions increased 10 MoM to 41, and the preliminary estimate for June shows an increase back up to 47. Our Supplemental Documents package includes excerpts from the NDIC Director's Cut.

Figure 16: North Dakota Oil Production By Month

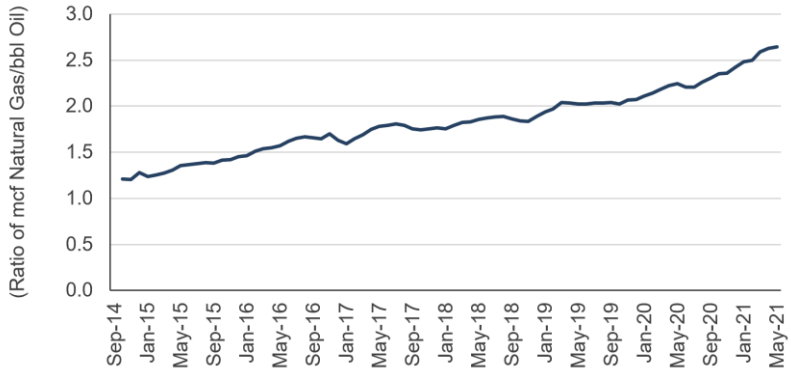
(b/d)	2016	2017	2018	2019	2020	2020/2019	2021	2021/2020
Jan	1,122,462	981,380	1,179,564	1,403,808	1,430,511	1.9%	1,147,377	-19.8%
Feb	1,119,092	1,034,248	1,175,316	1,335,591	1,451,681	8.7%	1,083,554	-25.4%
Mar	1,111,421	1,025,690	1,162,134	1,391,760	1,430,107	2.8%	1,108,906	-22.5%
Apr	1,041,981	1,050,476	1,225,391	1,392,485	1,221,019	-12.3%	1,123,166	-8.0%
May	1,047,003	1,040,995	1,246,355	1,394,648	859,362	-38.4%	1,127,517	31.2%
June	1,027,131	1,032,873	1,227,320	1,425,230	893,591	-37.3%		
July	1,029,734	1,048,099	1,269,290	1,445,934	1,042,081	-27.9%		
Aug	982,011	1,089,318	1,292,505	1,480,475	1,165,371	-21.3%		
Sept	971,760	1,107,345	1,359,282	1,443,980	1,223,107	-15.3%		
Oct	1,043,693	1,183,810	1,392,369	1,517,936	1,231,048	-18.9%		
Nov	1,034,484	1,194,920	1,375,803	1,519,037	1,227,138	-19.2%		
Dec	942,322	1,182,836	1,402,741	1,476,777	1,191,429	-19.3%		

Source: NDIC, NDPA

North Dakota gas-oil ratio increases as Bakken matures

One of the long term trends that we have been highlighting for all of the US tight/shale oil plays that produce associated natural gas and NGLs is that, over time, the percentage of natural gas increases in the production. We see this clearly in North Dakota where the gas-oil ratio continues to increase have having slowing down in 2017-2019 when natural gas flaring increased. But now with North Dakota reducing gas flaring, we are seeing the ramp up in gas-oil ratio. North Dakota natural gas production has held in much better YoY than oil production and increased at a faster pace MoM in April, production is was +3.1% MoM and is +9.3% YoY. Now in May, gas production is +1.09% and +54.6% YoY, vs oil production being basically flat MoM and +31.2%. It makes sense that North Dakota natural gas production was down less YoY as less gas was flared and Bakken oil wells produce associated natural gas and the natural gas % of boe production increase as Bakken oil wells mature. The Gas to oil ratio hit 2.64 in May, up from 2.63 in Apr 2021. We will continue to see the gas to oil ratio increase as the Bakken matures. A year ago it was 2.22 and two years ago 2.03. Below is our running graph of North Dakota gas-oil ratio updated for the new NDIC May production data.

Figure 17: North Dakota Gas-Oil Ratio



Source: NDIC, NDPA

North Dakota production flat due to worker shortage

Every month, we look to the Bismarck Tribune's monthly story on the press conference releasing the Director's Cut as there is always extra color or insight from quotes from NDIC Director Lynn Helms. This month's story was titled "*North Dakota oil output 'flat as a pancake' amid frack crew shortage*" [LINK]. Helms highlighted that, coming out of the pandemic, the oil industry in North Dakota is experiencing a worker shortage. At last month's prices, Helms noted that he would expect at least 20-25 fracking crews operating in the state. Last month there were only 8, up only +1 from the pandemic downturn. Helms said *"Most of these folks went to Texas where activity was still significantly higher than it was here, where they didn't have winter and where there were jobs in their industry. It's going to take higher pay and housing incentives and that sort of thing to get them here*". Our Supplemental Documents package includes the Bismarck Tribune report.

How many frac spreads does North Dakota need to grow oil production?

We want to thank Williston Herald Assistant Managing Editor Renee Jean for clarifying a sentence from the Williston Herald [LINK] report that "*To grow production*

at this point, Helms said the state needs to double or triple the number of hydraulic fracturing crews operating in the state." Our initial reaction was that we need to find out what Helms said as that didn't make any sense if Helms was talking about growing production from current levels. Jean let us know that Helms meant this in context to returning to pre-pandemic oil production levels and for North Dakota to regain its clear #2 oil producing basin status in the US ie. get back to 1.4 mmb/d and not just growing from the current 1.1 mmb/d. That makes sense. Here is why it doesn't make sense for growth from current levels. Helms is talking about 16 to 24 frac spreads. Our April 18, 2021 Energy Tidbits noted Helms comments that month that each fracking crew can complete up to six wells per month. This is inferring roughly 100 to 140 wells per month. That just seems way too high. In our April 18, 2021 Energy Tidbits memo, we wrote "*Rule of thumb, North Dakota needs ~48 completions & 17 rigs to hold 1 mmb/d. Every month, local North Dakota has good insight on North Dakota's oil and natural gas production from their monthly meeting with North Dakota's Director Lynn Helms and North Dakota PipeLine Authority's J.J. Kringstad. (i) This month, we tweeted [LINK] on an excellent insight reporting from KTVQ (Billings) on what is the breakeven level of drilling rigs and completion crews to keep North Dakota oil production flat at 1 mmb/d. North Dakota just reported Feb oil production was 1.083 mmb/d and is likely going a little lower in March KTVQ wrote [LINK] ""As of Thursday, 17 oil rigs were operating in the Bakken along with eight completion crews. Helms said each fracking crew can complete up to six wells per month. That combination of rigs and crews according to Helms, is the break even point for North Dakota to maintain oil production at one million barrels per month." (ii) This is different than the prior North Dakota breakeven rig/completion crew levels needed to hold North Dakota flat at ~1.2 to 1.3 mmb/d. The rule of thumb came from an Oct 8 North Dakota presentation by the North Dakota Pipeline Authority (JJ Kringstad) [LINK]. That presentation noted that North Dakota needed ~70 completions/mth and 35 drilling rigs to keep production flat at ~1.2 to 1.3 mmb/d."* Our Supplemental Documents package includes the Williston Herald report.

Oil – North Dakota crude by rail down MoM in May to ~204,000 b/d

North Dakota CBR down in May

The North Dakota Pipeline Authority also posted its monthly update "May 2021 Production & Transportation" [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority for more detailed numbers of crude by rail out of North Dakota. The NDPA Monthly Update (graph below) report only provides rounded numbers, and these rounded numbers are not accurate enough to match the graphs. In the backup excel, the NDPA estimates crude by rail in May was a low of 189,356 b/d to a high of 219,356 b/d for an average of ~204,356 b/d. This is down slightly from Apr low of 190,234 b/d to high of 220,234 b/d for an average of ~205,234 b/d. Note the April numbers were revised downwards by 3,718 b/d. CBR share of total transportation remained flat this month at 17%. The slight decrease is likely due to both oil production and the share of total production remaining flat. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2014. Our Supplemental Documents package includes the NDPA monthly update.

Figure 18: Estimated North Dakota Rail Export Volumes

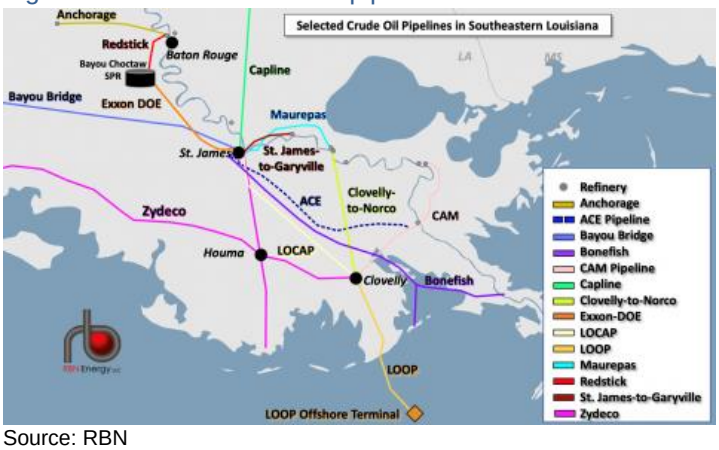
Source: North Dakota Pipeline Authority

Oil – Capline reversal about to finish, brings more Cdn heavy to Gulf Coast

More Cdn heavy to Gulf Coast

RBN wrote a great reminder blog last Sunday titled *"The St. James Crude Oil Hub Readies For Capline-Related Changes".* The blog highlighted that in only a few months, the St. James storage and distribution hub will start receiving heavy crude from Western Canada via the Capline pipeline from the Patoka, IL hub. The Capline has been in operation for nearly a half-century, but traditionally, it transported oil north from St. James to Patoka. The flow of the Capline pipeline is now being flipped southbound. Initially, Capline's owners (Plains All American 54%, Marathon Petroleum 33%, and BP 13%) also expected the newly reversed pipeline to receive light oil US oil from the planned Diamond pipeline extension, but due to strong local opposition, Plains announced on July 2 that the project had been scrapped. Although the St. James Hub has great storage capacity (~2.3 mmb/d) and several outbound pipeline connections, it currently does not have a direct route to Clovelly, which is a crucial link to the LOOP offshore terminal. There are talks about making the LOCAP pipeline (yellow) bi-directional, especially now that Capline has been reversed. Below is a map of the crude pipelines in SE Louisina, including the Capline. Our Supplemental Documents package includes the RBN blog.

Figure 19: Selected crude oil pipelines in SE Louisiana



Source: RBN

Oil – So far not seeing any oil sands/bitumen interruptions from Alberta wildfires

Wildfires near but not impacting oil sands projects

There ar a lot of wildfires in NE Alberta, but all are being classified as Under Control or Held and not Out of Control. And we aren't seeing any reports of oil sands/bitumen production being threatened. Fortunately so far this summer, there hasn't been anything like the massive Fort McMurray wildfires of 2016.

Oil – Big reduction in this week in oil sands facilities on Covid outbreaks list

Big drop in oil sands covid outbreaks

There was a big reduction this week in oil sands facilities considered Covid outbreak areas and we would hope so given Alberta's high vaccination rates. It looks like Wood Buffalo is now down to one Covid update per week with the latest being as of July 21 [LINK]. This week, there were three oil sands facilities removed from the outbreak list – Civeo Athabasca, Syncrude Mildred Lake and Syncrude Aurora. This brings the total down to six oil sands facilities still on the Covid outbreak list. Below, we pasted the oil sands facilities listed in June 21, 24, 29 and July 7, 14 and 21 updates.

Figure 20: Oil Sands Facilities With Covid Outbreaks at June 21, 24, 29, and July 7, 14 & 21

July 21	July 14	July 7	June 29	June 24	June 21
Outbreaks in RMWB:	**Outbreaks in RMWB:**	**Outbreaks in RMWB:**	**Outbreaks in RMWB Industrial:**	**Outbreaks in RMWB Industrial:**	**Outbreaks in RMWB Industrial:**
Cenovus Sunrise Lodge	Cenovus Sunrise Lodge	Cenovus Sunrise Lodge	MEG Energy - ongoing	MEG Energy - ongoing	MEG Energy - ongoing
CNRL Horizon	Civeo Athabasca	Civeo Athabasca	CNRL Horizon - ongoing	CNRL Horizon - ongoing	CNRL Horizon - ongoing
CNRL Albian	CNRL Horizon	CNRL Horizon	CNRL Albian - ongoing	CNRL Albian - ongoing	CNRL Albian - ongoing
MEG Energy	CNRL Albian	CNRL Albian	Kearl Lake - ongoing	Kearl Lake - ongoing	Kearl Lake - ongoing
Suncor Base Plant	MEG Energy	MEG Energy	Civeo McClelland Lake - ongoing	Civeo McClelland Lake - ongoing	Civeo McClelland Lake - ongoing
Suncor Fort Hills	Suncor Base Plant	Suncor Base Plant	Wapasu Creek Lodge - ongoing	Wapasu Creek Lodge - ongoing	Wapasu Creek Lodge - ongoing
	Suncor Fort Hills	Suncor Fort Hills	Civeo Athabasca - ongoing	Civeo Athabasca - ongoing	Civeo Athabasca - ongoing
	Syncrude Mildred Lake	Syncrude Mildred Lake	Cenovus Sunrise Lodge - ongoing	Cenovus Sunrise Lodge - ongoing	Cenovus Sunrise Lodge - ongoing
	Syncrude Aurora	Syncrude Aurora	Suncor Base Plant - ongoing	Suncor Base Plant - ongoing	Suncor Base Plant - ongoing
			Suncor Firebag - ongoing	Suncor Firebag - ongoing	Suncor Firebag - ongoing
			Suncor Fort Hills - ongoing	Suncor Fort Hills - ongoing	Suncor Fort Hills - ongoing
			Syncrude Mildred Lake - ongoing	Syncrude Mildred Lake - ongoing	Syncrude Mildred Lake - ongoing
			Syncrude Aurora - ongoing	Syncrude Aurora - ongoing	Syncrude Aurora - ongoing
			CNOOC Long Lake - ongoing	CNOOC Long Lake - ongoing	CNOOC Long Lake - ongoing

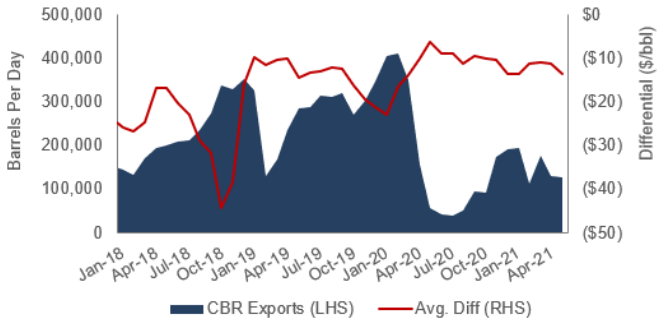
Source: Wood Buffalo

Oil – Cdn crude by rail exports down marginally MoM to 128,006 b/d in May, up 120% YoY

Cdn crude by rail exports decrease MoM

The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were basically flat, down -1,721 b/d MoM in May to 128,006 b/d vs 129,727 b/d in April [LINK]. This puts May export volumes at +69,958 b/d YoY (+120.52%) vs May 2020 of 58,048 b/d. CBR volumes are +89,139 since the July bottom of 38,867 b/d. With the MoM increase in the differential, we would have excepted CBR volumes to increase, but the differential didn't hit its highs between $13-15 until the end of the month.

Figure 21 Cdn Crude By Rail Exports vs WCS Differential



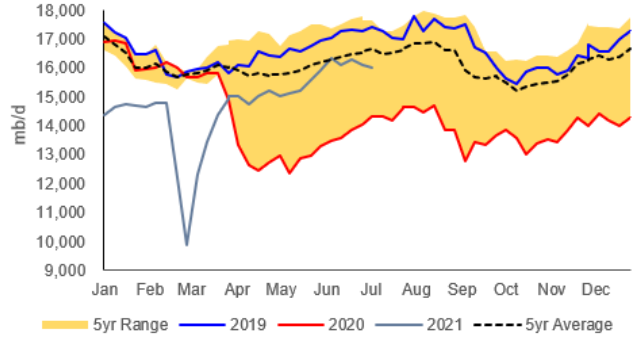
Source: Canadian Energy Regulator, Bloomberg

Oil – Refinery inputs +1.801 mmb/d YoY to 16.007 mmb/d, down 1.027 mmb/d vs 2019

Gasoline demand levelling off at ~9.3 mmb/d

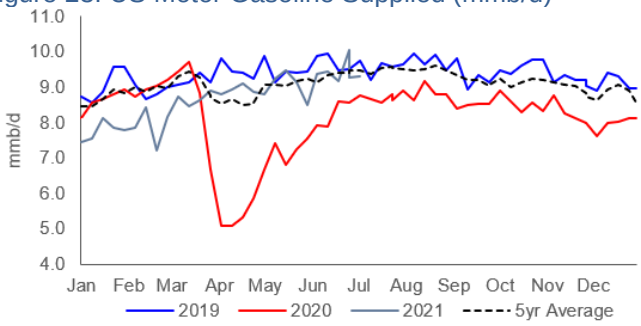
Crude inputs to refineries were down but basically flat this week and were -0.087 mmb/d to 16.007 mmb/d, and are +1.801 mmb/d YoY, and are -1.027 mmb/d vs 2019. Refinery utilization was down 0.4% this week at 91.4%, which is +13.8% YoY. The drop in refinery utilization was likely due to recent unplanned outages, but nationally utilization is still above the 90% mark which exceeds pre-pandemic levels. Total products supplied (ie. demand) increased this week, with a 1.278 mmb/d increase to 20.581 mmb/d, and this week motor gasoline was up slightly but basically flat, being +12,000 b/d to 9.295 mmb/d. For motor gasoline, the market has entered a period where demand starts to fall ahead of fall, so demand levelling off the past 2 weeks at 9.3 mmb/d is in line with seasonal trends. Gasoline consumption in the US is expected to rise, with the EIA writing in their 2021 Summer Fuels Outlook [LINK] *"We forecast that gasoline consumption in 2021 will peak in August at 9.1 million b/d, which is up from 8.5 million b/d in August 2020 but down from the 9.8 million b/d in August 2019. We forecast that 2021 summertime gasoline consumption will average almost 8.8 million b/d, a 1.0 million b/d (13%) increase from 2020 but a 0.7 million b/d (7%) decrease from summer 2019".* Below is our graph of crude inputs to US refineries and our graph of US motor gasoline supplied.

Figure 22: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

Figure 23: US Motor Gasoline Supplied (mmb/d)



Source: EIA, SAF

Oil – New refinery emission rules in Bay Area would cost Chevron $1.5bn

California gas prices about to get more expensive

It looks like higher gasoline prices are coming to California. On Wednesday [LINK] the Bay Area Air Quality Management District announced a new rule for refineries in the area in an effort to reduce emissions. The new rule specifically targets pollution by small particulate matter, and refineries are the worst culprits of this in Bay Area. To be in compliance, refiners must limit annual particulate matter emissions 0.01 grain per dry standard cubic foot.

Consequently, refineries in the area are to be forced to install wet gas scrubbers. Bloomberg reported that Chevron anticipates costs to install the scrubbers at $1.5bn, while the District estimated a cost of $241mm-$579mm. Refineries are obviously not pleased with the development, and several advocates including labor unions are predicting refinery layoffs and possible plant shutdowns as a consequence of the new rules. Chevron's company spokesman Sean Comey said the new rule is *"so flawed"* that Chevron will be investigating its legal options. Chevron and PBF energy, another refinery in the region are pushing for a less stringent limit of 0.02 grains per standard cubic foot. Luckily for Valero Energy Corp's refinery, they already have a wet gas scrubber. Our Supplemental Documents Package includes the release, and the Bloomberg report.

Oil – Exxon stopped refining operations at 120,000 b/d Slagen, Norway refinery

Exxon stopps Slagen refinery operations

On Friday, Argus reported "*ExxonMobil has told Argus that its stopped operations at its 120,000 b/d Slagen refinery in Norway in June*" [LINK], which leaves Equinor's 200,000 b/d Mongstad refinery as Norway's only refinery. Our April 11, 2021 Energy Tidbits noted Exxon's announcement that week saying "*"Refineries in Europe operate in an increasingly challenging market, characterized by falling demand and strong competition, leading to overcapacity in the market. In Norway, demand has decreased for road transportation fuels".* When we reported on the Exxon announcement in April, we thought the question would be they would turn it into an import terminal. We will have to figure our if this is a permanent end to Slagen as an operating facility or if it's a permanent end to refining operations and Slagen will be used for other operations ie. as a fuel import terminal. Our Supplemental Documents package includes the Argus report.

Oil – US "net" oil imports up 2.437 mmb/d to 4.634 mmb/d

US "net" oil imports +2.437 mmb/d WoW

US "NET" imports were up big +2.437 mmb/d to 4.634 mmb/d for the July 16 week. Crude imports outstripped exports by the widest margin (4.63 mmb/d) since December 2020. US imports were up big by +0.875 mmb/d to 7.097 mmb/d, which is a high since July 2020 and likely driven by tight WTI-Brent spreads in the last month. US exports were down, being -1.562 mmb/d to 2.463 mmb/d. The WoW increase in US oil imports was driven by increases in Iraq, Mexico, Ecuador and Canada. Gasoline imports are at their highest levels since May 2011. Some items to note on the by country data. (i) Canada was up this week, and was +0.131 mmb/d to 3.611 mmb/d for the July 16 week, which is now ~0.1 mmb/d below the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was up slightly by 12,000 b/d to 0.359 mmb/d this week. (iii) Colombia was basically flat again this week, +4,000 mmb/d to 0.144 mmb/d this week. (iv) Ecuador was up by 171,000 b/d at 171,000 b/d. (v) Iraq was up big +298,000 b/d to 480,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico was up by 149,000 b/d to 0.797 mmb/d.

Figure 24: US Weekly Preliminary Oil Imports By Major Countries

	May 14/21	May 21/21	May 28/21	June 04/21	June 11/21	June 18/21	June 25/21	July 02/21	July 09/21	July 16/21	WoW
Canada	3,806	3,549	3,147	3,971	3,644	3,435	3,282	3,744	3,480	3,611	131
Saudi Arabia	424	277	188	144	381	555	565	316	347	359	12
Venezuela	0	0	0	0	0	0	0	0	0	0	0
Mexico	692	661	702	423	764	878	747	408	648	797	149
Colombia	325	71	185	137	143	340	139	154	140	144	4
Iraq	199	184	163	173	305	151	142	229	182	480	298
Ecuador	80	229	226	122	96	29	260	0	0	171	171
Nigeria	73	29	169	264	169	183	33	142	187	195	8
Kuwait	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0
Top 10	5,599	5,000	4,780	5,234	5,502	5,571	5,168	4,993	4,984	5,757	773
Others	812	1,273	851	1,404	1,244	1,372	1,238	882	1,237	1,340	103
Total US	6,411	6,273	5,631	6,638	6,746	6,943	6,406	5,875	6,221	7,097	876

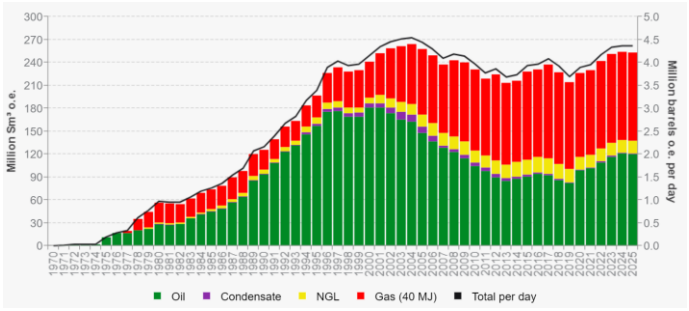
Source: EIA, SAF

Oil – Norway oil production of 1.674 mmb/d, -3.6% lower than forecast

Norway oil production

The Norwegian Petroleum Directorate released its June production figures [LINK] of 1.674 mmb/d of oil, which is +8.5% YoY and +0.7% MoM from April at 1.662 mmb/d. This was a deviation from the forecasted amount of 1.736 mmb/d, -3.6% lower than the forecast for the month and +0.4% higher than the forecast so far this year. The NPD cited technical problems and maintenance work on some fields as the reason for below-forecasted levels. 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 June release.

Figure 25: Historical and expected production in Norway, 1970-2025



Source: Norwegian Petroleum Directorate

Oil – Strong activity on the Norwegian shelf

Growth ahead for Norwegian oil

There has been a lot of activity on the Norwegian continental shelf so far this year. The Norwegian Petroleum Directorate reported on Wednesday [LINK] that despite lingering Covid concerns, there have been 8 new discoveries, strong production and many new development projects in process. While the size of the new discoveries is still uncertain, the NPD estimates that they could amount to ~390 mmb of oil, double the estimated reserves of the Goliat field in the Brents Sea. Even better, the discoveries have been made in mature areas near existing fields/infrastructure so developing these areas will likely be quite cost-effective. As you can see from the chart below, resource growth so far in 2021 is very strong. Torgeir Stordal, directo of Technology and Coexistence and the NPD says *"The addition of oil and gas resources from new discoveries, like we have seen so far this year, is necessary to prevent a sharp decline in petroleum industry activity after 2030. Without new discoveries, production could fall by more than 70 per cent in 2040 compared with 2020".* As previously mentioned, production has been strong thus far in 2021. So far, production is ~710 mmb, which is only 15 mmb lower than the equivalent period in 2020. Further, 10 fields are under development on the Norwegian shelf. These include Breidablikk in the North Sea and Northern Lights' CO_2 storage in the Longship projects. There are also as many as 50 projects which are expected to obtain investment decisions by the end of 2022, which all in represent 1.5x Johan Sverdrup fields of oil (~4 bn barrels). Overall, there are very strong growth prospects for Norwegian oil. Our Supplemental Documents includes he NPD activity update.

Figure 26: Resource growth in the first half of 2021 vs previous whole years

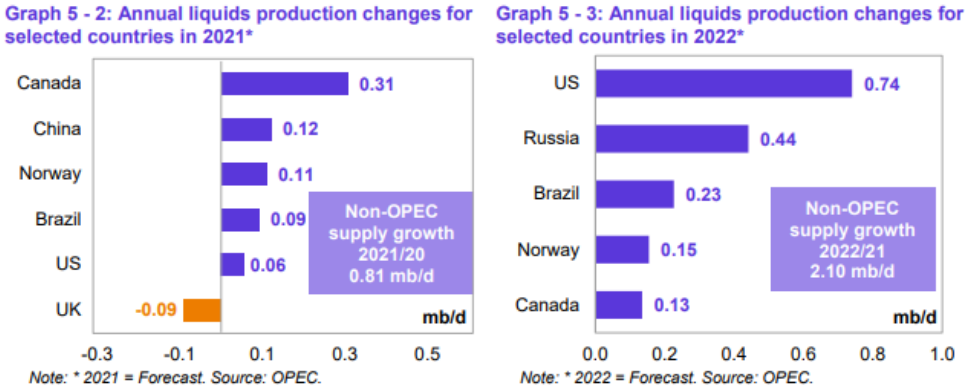
Source: Norwegian Petroleum Directorate

Brazil Q2 oil production down YoY

Oil – Brazil Q2 oil production down 0.8% YoY

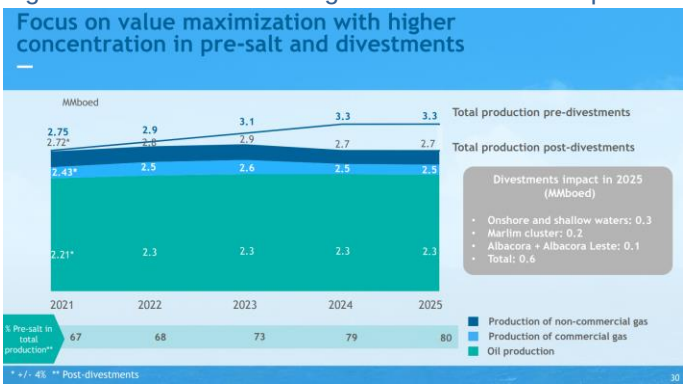
We have been highlighting our view that one of the 2021/2022 positives to oil is the likelihood that Brazil disappoints on its production growth targets. This is, at least so far, unfolding as Q2 oil production was down 0.8% YoY. And recall that Brazil has been expected to have oil growth in both 2021 and 2022. Its been a tough year for Petrobras with CEO and board changes and Covid impact so no surprise it hasn't been delivering on plan. On Thursday, the Financial Post reported [LINK] that Petrobas' reported Q2 oil production numbers were roughly flat at 2.226 mmb/d over the period, as the ramp up some of its major platforms, P-68 and P-70 were offset by maintenance stoppages at several fields in the Campos Basin as well as the divestment of the Frade field. This represents a +1.4% increase from Q1, but a -0.8% decrease YoY from Q2 2020. It's a positive to oil markets that Brazilian growth was lackluster as Brazil is expected to be one of the key 2021 non-OPEC oil growth areas. Below are two of the OPEC MOMR March graphs on non-OPEC oil growth. Our recent Feb 22, 2021 tweet [LINK] included the below graph from Petrobras Day Strategic Plan on Dec 1, 2020 [LINK].

Figure 27: Key non-OPEC YoY Changes for 2021 and 2022



Source: OPEC Monthly Oil Market Report July 2021

Figure 28: Petrobras Strategic Plan Oil Growth Expectations



Source: Petrobras Day Strategic Plan Dec 1, 2020

Oil – OPEC+ revised quotas by country post July meeting

Revised OPEC+ quotas by country

Last week's (July 18, 2021) Energy Tidbits memo highlighted OPEC+ new deal that was announced on Sunday morning. [LINK] The OPEC+ announcement included the revised baselines by country, but did not include new quotas by country. Thanks to Bloomberg's Julian Lee for providing the by country quotas in his July 18 report "*OPEC+ Output Targets for 2H and New Baselines for Cuts (Table)*". We used his by country quotas to update our excel sheet below. Our Supplemental Documents package includes the OPEC July 18 release.

Figure 29: OPEC+ Cut Schedule

OPEC (mmb/d)	Reference Level Production	March 2021	April 2021	May 2021	June 2021	July 2021	Aug 2021	Sept 2021	Oct 2021	Nov 2021	Dec 2021	May/22 per July/21 Agreement -	Change in Ref. Level Post May/22
Algeria	1,057	876	876	887	898	912	922	932	942	952	962	1,057	-
Angola	1,528	1,267	1,267	1,283	1,298	1,319	1,334	1,348	1,363	1,377	1,392	1,528	-
Congo	325	269	269	273	276	281	284	287	290	293	296	325	-
Equatorial G.	127	105	105	107	108	110	111	112	114	115	116	127	-
Gabon	187	155	155	157	159	161	163	165	166	168	170	187	-
Iran	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Iraq	4,653	3,857	3,857	3,905	3,954	4,016	4,060	4,104	4,149	4,193	4,237	4,803	150
Kuwait	2,809	2,329	2,329	2,358	2,387	2,425	2,452	2,478	2,505	2,532	2,558	2,959	150
Libya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nigeria	1,829	1,516	1,516	1,535	1,554	1,579	1,596	1,614	1,631	1,649	1,666	1,829	-
Saudi Arabia*	11,000	8,119	8,119	9,232	9,347	9,495	9,600	9,704	9,809	9,913	10,018	11,500	-
UAE	3,168	2,626	2,626	2,659	2,692	2,735	2,765	2,795	2,825	2,855	2,886	3,500	332
Venezuela	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total OPEC	26,683	21,119	21,119	22,396	22,673	23,033	23,287	23,539	23,794	24,047	24,301	27,815	1,132
OPEC vs. ref.	**0**	**-5,564**	**-5,564**	**-4,287**	**-4,010**	**-3,650**	**-3,396**	**-3,144**	**-2,889**	**-2,636**	**-2,382**	**0**	**0**

*Saudi Arabia quota for Feb-Apr 2021 includes voluntary 1mmb/d cut; May-July includes wind down of voluntary cut

Non-OPEC	Reference Level Production	March 2021	April 2021	May 2021	June 2021	July 2021	July 2021	Sept 2021	Oct 2021	Nov 2021	Dec 2021	May/22 per July/21 Agreement -	Change in Ref. Level Post May/22
Russia	11,000	9,249	9,379	9,418	9,457	9,495	9,495					11,500	500
Kazakhstan	1,709	1,437	1,457	1,463	1,469	1,475	1,475					1,709	-
Oman	883	732	732	741	750	762	762					883	-
Azerbaijan	718	595	595	603	610	620	620					718	-
Malaysia	595	493	493	499	506	514	514					595	-
Bahrain	205	170	170	172	174	177	177					205	-
Sudan	75	62	62	63	64	65	65					75	-
South Sudan	130	108	108	109	110	112	112					130	-
Brunei	102	85	85	86	87	88	88					102	-
Total Non-OPEC	15,417	12,931	13,081	13,154	13,227	13,308	13,308	0	0	0		15,917	500
Non-OPEC vs. ref.	**0**	**-2,486**	**-2,336**	**-2,263**	**-2,190**	**-2,109**	**-2,109**	**-15,417**	**-15,417**	**-15,417**		**0**	**0**
Total OPEC+	42,100	34,050	34,200	35,550	35,900	36,341	36,595	23,539	23,794	24,047		43,732	1,632
OPEC+ vs ref.	**0**	**-8,050**	**-7,900**	**-6,550**	**-6,200**	**-5,759**	**-5,505**	**-18,561**	**-18,306**	**-18,053**		**0**	**0**

Source: Bloomberg, OPEC

Figure 30: Revised baseline oil production levels effective May 2022

	Reference Production up to end of April 2022	Reference Production effective May 2022
Algeria	1057	1057
Angola	1528	1528
Congo	325	325
Eq.Guinea	127	127
Gabon	187	187
Iraq	4653	4803
Kuwait	2809	2959
Nigeria	1829	1829
Saudi Arabia	11000	11500
UAE	3168	3500
Azerbaijan	718	718
Bahrain	205	205
Brunei	102	102
Kazakhstan	1709	1709
Malaysia	595	595
Mexico*	1753	1753
Oman	883	883
Russia	11000	11500
Sudan	75	75
South Sudan	130	130
OPEC 10	26683	27815
Non-OPEC	17170	17670
OPEC+	43853	45485

Source: OPEC

Oil – Excellent Blomberg Javier Blas piece on Saudi Energy Minister Abdulaziz

Abdulaziz is "The Man"

Its really hard for anyone to deny that its been Saudi Energy Minister Abdulaziz that has saved oil markets. He continues to be able to craft OPEC+ deals, or as we say in our tweet, shows remarkable skills at herding cats. On Thursday, Bloomberg Javier Blas posted what he termed a long read "*Saudi Prince of Oil Prices Vows to Drill 'Every Last Molecule'.* Our big push in the morning is from 4-5:30am when we try to get market/energy news out to our SAF Group team members well ahead of the market opening. But this was such a good read, we couldn't help taking the time to read the piece. We tweeted [LINK] *"#SaudiEnergyMinister Abdulaziz is the top of my list of 3 people to invite to dinner. <2 yrs on job, Abqaiq missile attack, Covid, global recession yet he saved #Oil markets. He is "The Man" and the master of the impossible -herding #OPEC+ cats. Great @JavierBlas story. #OOTT"* There has been so much going on in the oil markets in the past 18 months that we forget Abdulaziz only took over as energy minister in Sept 2019, and that was a week before the Houthis missile attack on Abqaiq. Imagine getting on a new job and then having a missile attack hit one your biggest and most important assets. But Blas reminds that Abdulaziz has been involved in the Saudi oil sector for over 30 years. And as any Do-It-Yourself home owner knows, its easier to build your second deck. Because if Abdulaziz didn't have his extensive oil experience and global contacts, there is no way he could have immediately and effectively assumed the role of maestro for global oil markets. The Javier Blas piece is an excellent read. Below are some of the Abdulaziz quotes in the Blas report. Our Supplemental Documents package includes the Blas piece.

- "*Consensus-building is an art, "Why should I divulge it? This is an art, and we keep it between ourselves. We call it a state secret*."
- Re the 2020 price war *"is a good example [of] what free markets would do if the commodity market is not attended to*."

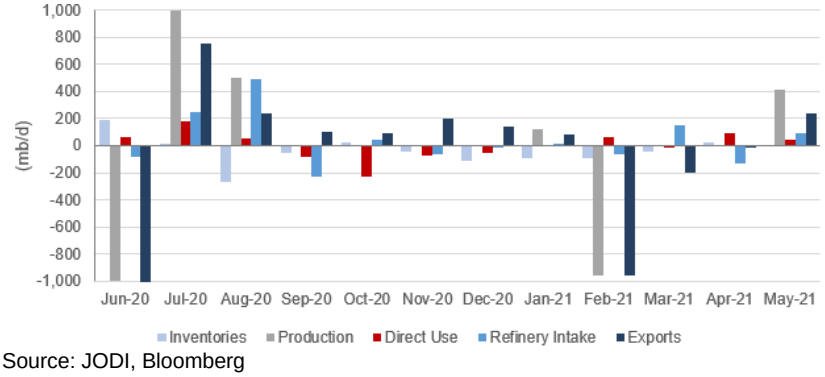
- *"If I'm going to be called something, I would like to be 'volatility buster.' "*
- *""We are sitting on a huge amount of hydrocarbon resources, and we want to bring it to better use."*
- *""If I had to be concerned with IEA projections, I probably [would] be [on] Prozac all the time."*
- *""If you are less predictable, you become more in command." "Ironically, funnily enough, the more people refrain from investing elsewhere, the more our possibility improves to increase our production,"*
- *"I have copied and pasted what central bankers have done.*
- *"I want the guys in the trading floors to be as jumpy as possible," "I'm going to make sure whoever gambles on this market will be ouching like hell."*
- *"I don't like the market or the speculators or the media to take us for granted; that's why I keep so many rabbits under my taqiyah," "If you are less predictable, you become more in command."*

Oil – Saudi moving into peak oil consumption for electricity season

Peak Saudi oil for electricity season

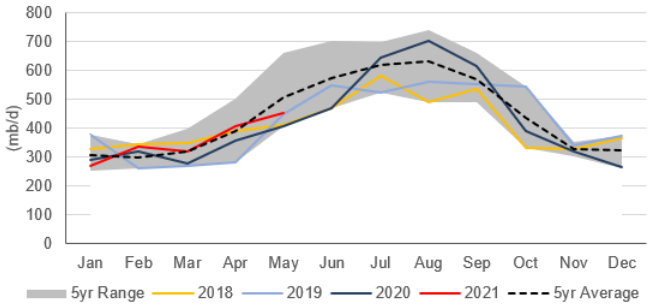
The JODI data for May was updated on Monday. There was no surprise or takeaway from the data, rather it confirms the expected trends – Saudi was increasing oil production, and Saudi use of oil for electricity increases in May as it ramps to its summer peak. There was 0 b/d of unaccounted supply, and +24,000 b/d of unaccounted demand. There was a build in inventories, up 1.690 mmb for the month. (i) Production was +410,000 b/d MoM to 8.544 mmb/d due to May marking the beginning of a gradual return to production. Exports also rose, but at a slower rate than production, being +241,000 b/d MoM to 5.649 mmb/d. Direct use for electricity was up, being +44,000 b/d to 451,000 b/d. (ii) Inventories increased for the again this month, up +55,000 b/d from 134.085 mmb in Apr to 135.775 in May. Crude inventories had been declining to 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 moving into its peak months for using oil for electricity. As expected, Saudi used more oil for electricity in May vs Apr, but we would have expected larger increases given the much higher than average daytime high and nighttime low temps in May. The balancing item must be increasing natural gas used for power. Apr was 407,000 b/d (vs Apr 2020 of 355,000 b/d) and May was 451,000 b/d (vs May 2020 of 407,000 b/d). May was below the latest 5 yr average of 507,000 b/d. Below are the AccuWeather Temp maps for Riyadh for Jun and Jul MTD. Careful they are different scales, but look for oil for electricity to continue to ramp up in June and July. We are moving into the peak period for oil for electricity. Below are our updated graphs for the Saudi JODI data for May.

Figure 31: MoM Saudi Inventories, Production, Direct Use, Refinery Intake & Exports



Source: JODI, Bloomberg

Figure 32: Saudi Arabia Direct Use of Crude Oil For Electric Generation

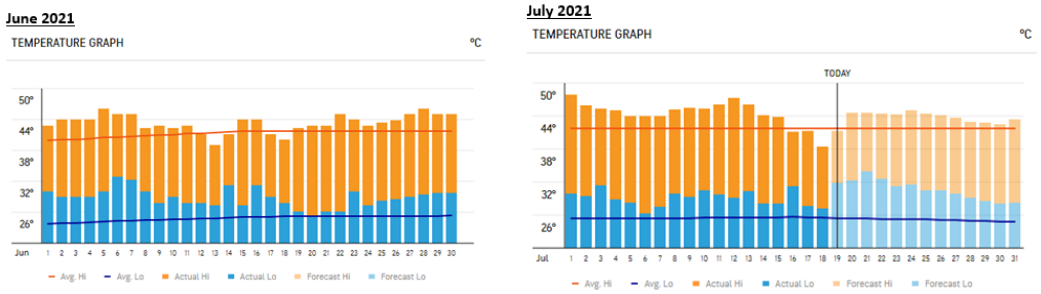


Source: JODI

Figure 33: Saudi Arabia Crude Oil Inventories (million barrels)

Source: JODI

Figure 34: Riyadh Temperature Recaps for June and July



Source: AccuWeather

Oil – No indication yet for any 7th round of JCPOA negotiations

It seemed like a pretty quiet week on the JCPOA front and that isn't a big surprise as the old Rouhani administration is in it last days before Raise takes over on Aug 3. There were some reports out of Iran that the 7th round would be in the following week, but we have not seen any confirmation by other parties. Rather the negotiations seem to be in a bit of limbo. Our reminder continues to be that no one expects the 7th round to be the last round to get a deal and that there will be an 8th, possibly a 9th or who knows how many more rounds. And no one knows how long it will take to get thru these next rounds given the introduction of new Iranian representatives. Iran will be throwing a new team into the negotiations. At a minimum, it will take time to establish some level of trust in the discussions. Its why we still believe the return of full Iran oil is months away and might not even happen in 2021.

No date yet for 7th round JCPOA

Oil – Libya oil exports holding relatively steady

Libya July oil exports +2.7% MoM

It looks like Libya's oil exports are continuing a slow and steady growth. On Thursday, Bloomberg reported that Libya plans to export 1.13 mmb/d of crude and condensate in July, which is up +2.7% MoM from June's exports of 1.19 mmb/d. June had previously been a 14% increase from 1.05 mmb/d in May. With crude and condensate exports now reaching and holding a level roughly equivalent to pre-blockade exports, the key now for Libya is to bring back production from their shut-in fields, along with necessary repairs and maintenance to neglected infrastructure that has slowed the gap up in Libyan production. Our Supplemental Documents Package includes the Bloomberg report.

Oil – India oil imports down MoM to 3.88 mmb/d in June

India June crude imports 3.88 mmb/d

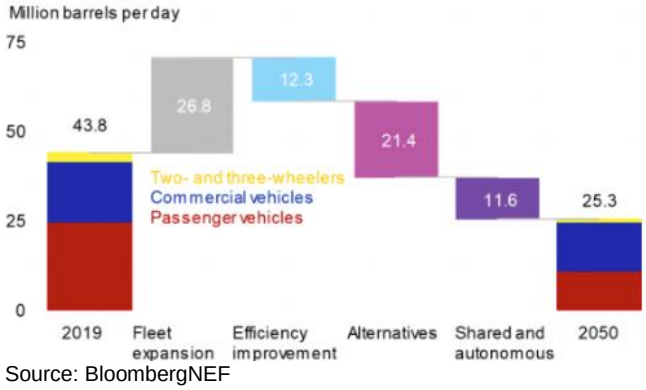
On Tuesday, India's Petroleum Planning and Analysis Cell released crude oil import data for June [LINK]. Total crude oil imports increased 16% YoY in June to 3.88 mmb/d and decreased from 4.09 mmb/d May. Crude imports for the 2020-2021 financial year were down 12.7% YoY. Petroleum products demand for June was +1.2% YoY to 3.98 mmb/d and was up +11.5% MoM from 3.57 mmb/d in May. As the Covid situation in India improved and most lockdown measures started to be lifted this month, this increase in demand was expected. Refinery throughput in June was +4.7% YoY to 4.50 mmb/d and a slight increase from 4.49 mmb/d in May.

Oil – Overlooked factor for road fuel demand forecasts, global vehicles are growing

Global vehicles are growing

There was an excellent, and overlooked, reminder on oil demand forecasts from BloombergNEF in their "*BNEF Theme: The Outlook for Road Fuels*". We tweeted [LINK] "*Overlooked factor in most long term #Oil demand forecasts & why demand should increase in 2020s - global road transport fleet is growing. Note how fleet expansion impacts @BloombergNEF @DavidDo26949144 forecast for road fuels 43.8 mmbd in 2019 dropping to 25.3 mmbd in 2050 #OOTT."* Its not like BloombergNEF is saying oil demand is going away, but they remind of a critical reality that seems to get overlooked in long term forecasts for road fuel demand – the global fleet has huge expansion. Its not like the global fleet has peaked, the global fleet (ie China) is still growing and has to be built into road fuel demand forecasts. BloombergNEF starts by saying here is road fuel demand in 2019 of 43.8 mmb/d and the fleet expansion under the same demand assumptions would add 26.8 mmb/d, and then they build in reductions from efficiency improvement (-12.3 mmb/d), alternatives like EVs (-21.4 mmb/d), shared and autonomous (-11.6 mm/d), which leads to road fuel demand of 25.3 mmb/d in 2050. Below is their key graph. Our Supplemental Documents includes the BloombergNEF report.

Figure 35: BloombergNEF Change in Road Fuel Demand 2019-2050



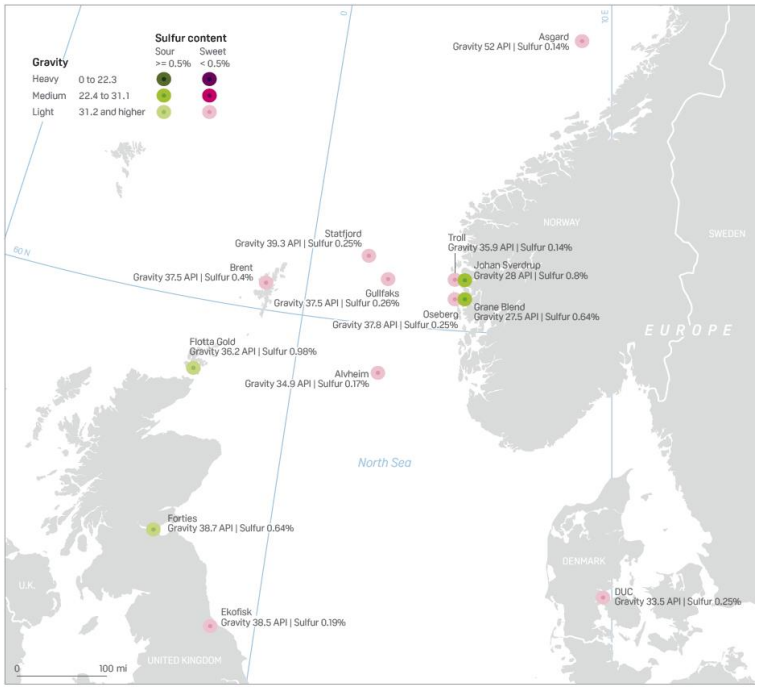
Source: BloombergNEF

Oil – Good Platts crude oil assay maps for North Sea, Urals/Med and West Africa

Platts crude oil assay maps

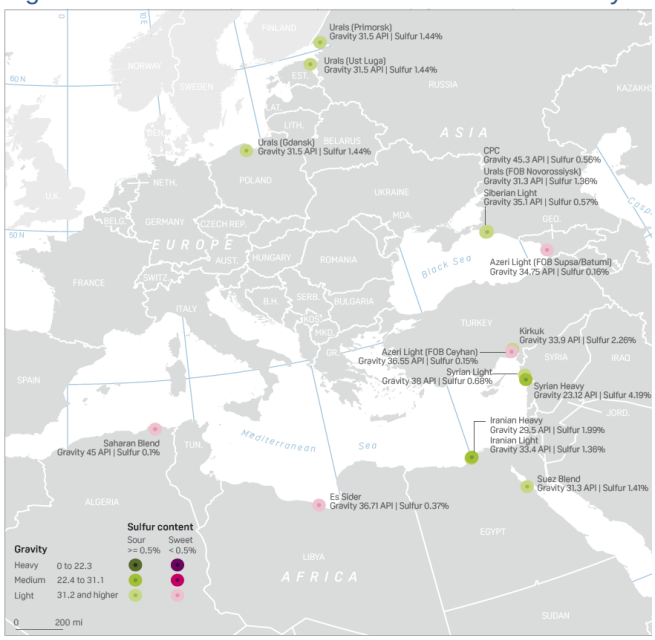
This month, Platts came out its "*Specifications Guide: Europe and Africa Crude Oil*" which notes all the various types of crude oil in these regions, and also includes excellent crude oil assay maps of the major types of crude oil in each region. Note the below maps of North Sea, West Africa and Urals/Mediterranean crude grades. The guide lists all the grades so is an excellent reference guide in looking at some lesser-known grades. The North Sea tends to have quite light oil, with all fields falling into gravity ranges of 33+, other than oil from Johan Sverdrup and Grane Blend, which have API of 28 and 27.5 respectively. The Urals are all light and sour, while the Mediterranean ranges from sweet in North Africa and Turkey to sour in the Middle East. Syrian and Iranian Heavy are still a gravity of over 23 API, so they are classified as Medium, and are quite sour – Syrian heavy 4.19%. In West Africa, crude is all sweet, apart from Hungo and Dalia, although they are right on the cusp at 0.59% and 0.51% sulfur respectively. We recommend adding the Platts recent "*Specifications Guide Europe and Africa Crude Oil*" [LINK] to reference libraries.

Figure 36: North Sea Crude Oil Assay Map



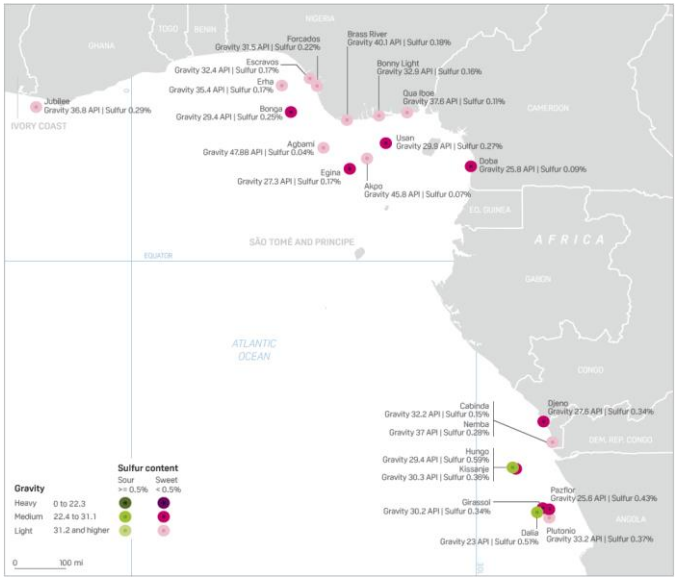
Source: Platts

Figure 37: Urals and Mediterranean Crude Oil Assay Map



Source: Platts

Figure 38: West Africa Crude Oil Assay Map



Source: Platts

Oil – China supplying 22 mmb from strategic reserves

China releases strategic oil reserves

China is approaching its strategic oil reserves differently than the US. The US has been releasing oil from its SPR more to raise funds for other programs, whereas China has been releasing its reserves of oil (and from other commodities) to try to cool off hot commodities markets. On Thursday, Bloomberg reported "*China offered millions of barrels of oil from its strategic state reserves this month in an unprecedented move to try and quell inflation brought on by rising costs of everything from food to fuel. The country will supply about 3*

million tons -- or 22 million barrels -- to major refineries, according to people with knowledge of the matter, who asked not to be identified as the information is sensitive. The decision is the latest in a slew of measures by the world's second-largest economy to rein in skyrocketing costs caused by a post-pandemic economic recovery." Our Supplemental Documents package includes the Bloomberg report.

Oil – Vortexa floating storage -8.3% WoW, down 49.8% YoY

Vortexa floating storage

We won't be surprised to see revisions and unexpected weekly changes in floating oil storage over the next two months. The strong backwardation in the market provides a big disincentive for oil to go into any mid term storage. The peak of crude oil in floating storage almost one year ago. Bloomberg reported on Vortexa floating oil data that showed a WoW decrease of 7.91 mmb or -8.3% WoW to 87.97 mmb on July 16 from 95.88 mmb on July 9. Note there was a significant revision to the July numbers as they were adjusted upwards from 93.12 mmb. Floating storage is down -59.35% since the June 26, 2020 peak of 216.42 mmb. While the amount of crude in floating storage has declined significantly from its peak last year, it has still not returned to normal levels. For reference, Jan 24, 2019 was 50.35 mmb, and the Q1/20 trough was at 54.11 mmb on Feb 17. The average amount of floating storage over 2019-2017 for the equivalent week is 53.9 mmb. Below is a graph of the Vortexa Global Floating Storage Level over the past 5 years and a table of the past 4 years' levels of floating storage during the same week and the price of Brent that week. Our Supplemental Documents package includes the Bloomberg Vortexa report.

Figure 39: Vortexa Global Floating Storage Level (5 yr)

Source: Bloomberg, Vortexa

Figure 40: Crude Oil Floating Storage & Brent Price

Date	Vortexa Crude Oil Floating Storage (million barrels)	Brent $/b
07/16/21	88.0	$73.59
07/17/20	175.1	$43.14
07/19/19	59.4	$62.47
07/16/18	37.1	$71.84
07/17/17	65.7	$48.42

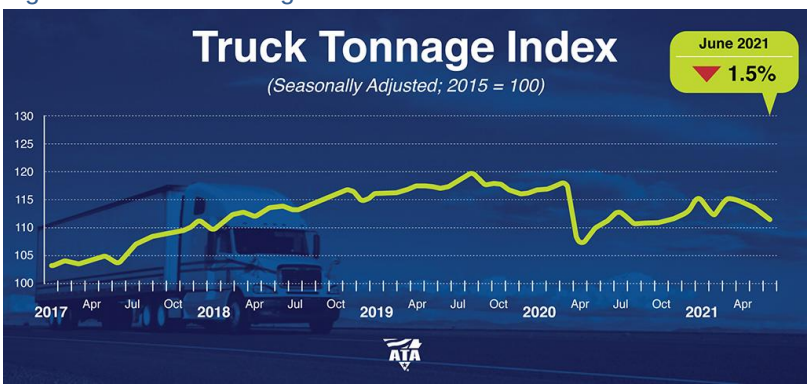
Source: Bloomberg, Vortexa

Oil – June truck tonnage -1.5% MoM, up 0.5% YoY, labor remains a big factor

Truck tonnage index -1.5% MoM in June

We have previously noted in our June 27 Tidbits that the tank truck driver shortage is impacting gasoline supplies to gas stations. This driver shortage is part of an overall truck/transport driver shortage impacting the supply chain in all sectors. And the US is accelerating out of Covid with the removal of most Covid restrictions with the big ramp up in vaccinations, but it is also exposing the supply chain shortages. This shows up in the monthly trucking data. Trucking tonnage serves as an important economic indicator for the U.S. economy. It has remained resilient throughout 2020 and into 2021, showing substantial improvements. The June index declined further after a slight decline in May, and no surprise, the supply side was cited as the big issue for trucking (namely finding qualified drivers) which other industries are also experiencing. This serves as a reminder that costs are increasing and as such supply chain times are getting worse. Labor costs have to go up in all sectors, including oil and gas. We know that everyone is calling these transitory, but labor has increasingly moved to a higher base pay in addition to temporary bonuses/incentives. On Tuesday, the American Trucking Association released its monthly Truck Tonnage Index which decreased -1.5% MoM in June after a -1% MoM decrease in May which had been revised down slightly from 0.7% as previously reported [LINK]. The June reading is +0.5% YoY vs May of +3.7% YoY. The ATA wrote *"Tonnage has definitely flattened out, on average, over the last six to nine months,"* said ATA Chief Economist Bob Costello *"The good news is that it remains slightly above 2020 levels. Supply chain issues are likely putting some downward pressure on tonnage. But it is also likely that tonnage isn't growing as much as it could because of industry-specific supply constraints. This index is dominated by contract freight, and the for-hire truckload carriers have seen their tractor counts fall because they are having difficulty finding qualified drivers. It is difficult to move more tonnage with less equipment, which is why we are seeing strong volumes in the spot market as shippers scramble to get loads moved."* Our Supplemental Documents Package includes the ATA release.

Figure 41: Truck Tonnage Index



Source: American Trucking Association

Oil and Natural Gas – Precision, Cdn public E&P do more with high prices vs US peers

Cdn public E&P advantage vs US

Precision Drilling released its Q2 early Thursday morning that included a very bullish outlook for Cdn oil and gas, but didn't get into how that was driven by Cdn public E&P. When we saw the release, we believed its because of the strength of the Cdn public E&P and tweeted [LINK] "*Outlook for overall Cdn #Oil #NatGas market over the next 12 months "remains exceptionally bright" says $PD in Q2 release. Look at rigs outlook, not just #Montney. Cdn E&P long established total return (income + growth) models only got stronger with high prices #OOTT*". As we saw in the Q2 call later, Precision highlighted this same point and we

tweeted [LINK] "*Note $PD why broad group of Cdn public E&P are able to increase drilling while being highly capital disciplined. Fits SAF Group view Cdn E&P long established total return models only got stronger with high prices. Big advantage to Cdn public E&P vs US E&P #OOTT*". Precision spent some time on the Q2 call discussing the strength of the Cdn public E&P and how years of building these models allowed them to take advantage of higher prices. Precision said *"Looking closer at our Canadian customer mix, while private equity producers play an important role over 2/3 of the demand we see comes from publicly listed producers. This group has seen has experienced several years of operating within capital constrained in fiscally disciplined framework. They've been focused on debt reduction and return of capital to shareholders. Since the middle of the last decade and driven cost efficiencies through all aspects of their business models. Additionally, we've seen several key consolidating transactions. Our customer space that further buildup up scale and efficiency. And now with the improving commodity fundamentals. The firm AECO gas and Western Canada Select oil prices and resilient NGL pricing. They have responded to quickly but modestly, increasing drilling activity, while remaining highly capital disciplined. This modest increase in spending has a meaningful impact when multiplied across the full producers producer space*."

Oil and Natural Gas – sector/play/market insights from Q2 calls

Sector insights from Q2 calls

This is our favorite time each time of each quarter as it is quarterly reporting and this is when we get the best insights into a range of oil and gas themes/trends, sectors and plays. This week marked the start of Q2 reporting for the large oi land gas services companies. As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks. Plus we tend to get the best E&P sector insights from services, pipelines, refineries and utilities and that was the case again this week.

Baker Hughes – Expects strong international growth, modest US growth

Baker Hughes held its Q2 call on Wednesday. (i) General outlook from the release. They expect *"spending and activity levels to gain momentum through the year as the macro environment improves, likely setting up the industry for stronger growth in 2022"*, as well a better outlook for natural gas/LNG than oil *"we believe that the oil price environment looks constructive with demand recovering and operators largely maintaining spending discipline. In the natural gas and LNG markets, fundamentals are equally as strong, if not better than oil."* (ii) Baker Hughes is bullish on natural gas. More color on natural gas and LNG in the near and long term. Baker Hughes did not get into specifics or say there was an LNG supply gap, saying *"Given the strong pace of current growth and the increasing demand for cleaner sources of energy, we maintain our positive long-term outlook for natural gas and LNG".* (iii) Based on early reports, the takeaway is Baker Hughes is more bullish on international markets than North America. They highlighted international growth *"we do see a solid step up in growth internationally over the second half of the year.* They most clearly demonstrated their view of only modest growth in North America when they said *"North America, we generally expect the rig count to continue to trend a little higher over the second half, maybe adding an additional 50 rigs or so by the end of the year. So that would imply a modest improvement in the third quarter and fourth quarter. When you look at 2022, again, we anticipate solid growth with the prices holding at the range they are now. But similar to this year, we expect some of the privates to be active and at these prices that some of the public E&Ps also will*

continue to be only increasing their spending modestly as they continue to adjust some of their operating cash flow to some of the other areas of capital spending." (iv) Baker Hughes has seen some pricing power come back. (v) Baker Hughes commented that deep water is being focused on a small number of areas and noted that they expect offshore to be challenged. (vi) On the energy transition, BH sees a ramp up in CCUS and strong long term growth *"also the next 5 to 10 years we expect to see significant growth around our energy transition initiatives, most notably hydrogen CCUS."* They also said *"And in our last call we mentioned the addressable markets of hydrogen by 2030 being $25 billion to $30 billion and CCUS being $35 billion to $40 billion for Baker Hughes"* Further, they highlighted their increased focus into synthetic natural gas *"During the quarter, we also announced the 15% investments in Electrochaea to expand Baker Hughes CCUS portfolio with power to gas and energy storage solutions. Baker Hughes will combine its post-combustion carbon capture technology with Electrochaea's bio-methanation technology to transform CO2 emissions into synthetic natural gas, a low carbon fuel capable of being used across multiple industries*". Our Supplemental Documents package includes the Baker Hughes Q2 Call Transcript.

Haliburton – Expects "an unfolding multi-year upcycle"

Haliburton held its Q2 call on Tuesday. (i) Headlines from the Q2 call come from its Q2 release sent out on Tuesday morning, with Haliburton writing *"The positive activity momentum we see in North America and International markets today, combined with our expectations for future customer demand, gives us conviction for an unfolding multi-year upcycle".* They also said that they *"believe commodity prices will remain structurally supported with both demand resurgence in many economies and increased vaccine availability, we anticipate the global demand will continue to exceed supply, particularly to the extent OPEC plus manages supply additions over the near term. As OPEC plus spare capacity returns to normalized levels over the next year. We believe sufficient pent up global oil demand will support a call on both international and US production".* (ii) Haliburton sees a building up of DUCs. In their H2/21 outlook, they said "*we believe activity in North America inches higher with drilling outpacing completions as operators build up well inventory for 2022*". (iii) They also see a slower sequential growth occurring in the US. *"We expect a steady increase in activity as the rig counts continue to recover. In North America we anticipate modest pricing improvement and continued activity momentum in both completions and drilling, but sequential activity growth will be slower than in prior quarters".* While they do see US oil production growth in 2022, they expect it to be at a lesser rate. In the Q&A, mgmt. replied *"Well, we're up 10% year-on-year and I think the expectations are that production is largely flat for this year. Yeah, I would expect that there would be a call of it at 500,000 barrels, some number like that, some level of growth that would be called on in 2022 that the price clearly supports, which would then drive more activity for us. Certainly. And we have to, in that mix is stemming the decline curve that is always working on North America production. So those are the things that underpin our outlook".* (iv) Haliburton doesn't see budget exhaustion in 2021. A common issue with other oil and gas companies is spending their capex too quickly or having oil prices turn down, both of which cause them to run out of budget. (v) No surprise, they anticipate being able to push through higher costs ahead for O&G companies. Note it's not just higher costs – we think the inference from Haliburton's comments on *"client urgency"* is that equipment may not be available for some customers. (vi) Finally, Halliburton highlighted Argentina as a growth area. *"So where does that come from, I think that that alone increasing and we see that sort of*

across the Middle East, but we also see it in Argentina." Our Supplemental Documents package includes excerpts the Haliburton Q2 Call Transcript.

Precision Drilling – Outlook for Cdn O&G mkt "remains exceptionally bright"

Precision Drilling held its Q2 call on Thursday. (i) Earlier we noted Precision's view why Cdn public E&Ps are doing more with higher oil and gas prices than US E&P. (ii) The overall message from the call was PD's bullish outlook for the Canadian oil and gas market, saying *"Our Canadian operations produced second quarter activity up three-fold from 2020 levels and the strength of the market continues to surprise to the upside. Currently, we are running 52 rigs, well above both our 2019 pre-pandemic levels and in-line with our 2021 first quarter activity peak."* Their comments on the call fit nicely with our tweet on the Q2 release [LINK] "*Outlook for overall Cdn #Oil #NatGas market over the next 12 months "remains exceptionally bright" says $PD in Q2 release. Look at rigs outlook, not just #Montney. Cdn E&P long established total return (income + growth) models only got stronger with high prices #OOTT".* (iii) Interesting dichotomy between Canada and the US: Canadian public companies are driving the rig increases, whereas in the US privates are driving it. *"Looking closer at our Canadian customer mix, while private equity producers play an important role over 2/3 of the demand we see comes from publicly listed producers."* (iv) Turning to the US, PD is expecting steady growth, *"We expect steady U.S. activity growth to continue throughout 2021 and are gaining confidence in accelerated rig additions to start 2022 as customers deploy fresh budget capital for drilling projects to address declining drilled but uncompleted well inventories"* (v) They noted that really small producers who can only commit to a well a going to have a tough time getting equipment. In the Q&A, mgmt said *"Obviously, if a customer wants a rig for one well for seven days. We might not do that but any kind of meaningful program we've, I think we'll build stuff up our crews for that industry-wide. I think it will vary certainly I can. I can go back to David[ph] actually. That is just let or the tougher environments. I've seen for recruiting I guess. Fortunately, our brand carries a lot of weight of out there".* (vi) PD also highlighted a labor shortage – they are basically hiring labor as they get contracts. In the Q&A, mgmt said "*So typically when we start room working with our customers will have anywhere from two weeks to a month… The rig managers and drillers already booked for Precision so leadership teams are on staff right now working on a rig somewhere else, so we'll pull those guys to the rigs are being reactivated and then we'll backfill the positions that we have opened and will recruit for the positions we need to fill. We've got a very sophisticated staffing model at a really sophisticated recruiting model we typically keep anywhere from 500 to 1000 people on kind of a call back list I'd admit we've worked our way down that call backlist a long way and now we're out recruiting the kind of be on that list."* (vii) Expect more Deep Basin consolidation. In the Q&A, mgmt replied *"I do think that brings an appropriate level of rational thinking to the market space and the way I say that is that the, in Canada, for example, the Montney play in the Deep Basin and Duvernay are our unconventional resource plays with large pad horizontal drilling, these are very much industrialized operations they require drillers of scale with high-quality technology driven assets to operate those as economically possible. So I think this rationalization, we're seeing, we're seeing among the customer base and being echoed in the supply base is constructive it creates frankly does create a better pricing environment for our services, but probably a more appropriate pricing…But we do expect to see very rational behavior over the long term on particularly on the Deep Basin in Canada. I think the same thing will develop in the US as that consolidation play takes place also."* (viii) They

added a teaser comment that makes us wonder what Kuwait and Saudi Arabia really think about their decline curves. In the Q&A, mgmt. was asked what was taking time to get the Kuwait and Saudi Arabia tenders completed, and mgmt. replied *"I think it's hard to make a strategic decision international oil company when you're still operating remotely or partly remotely but I also think that they are, they understand their production depletion curves quite well they're shut in capacities and drilling activity in both countries is down for oil and they need to time the restart with when they expect their wells that they've got shut to come back on again.* Our Supplemental Documents package includes the Precision Drilling Q2 Call Transcript.

Schlumberger – Less growth in US vs International durable investment growth

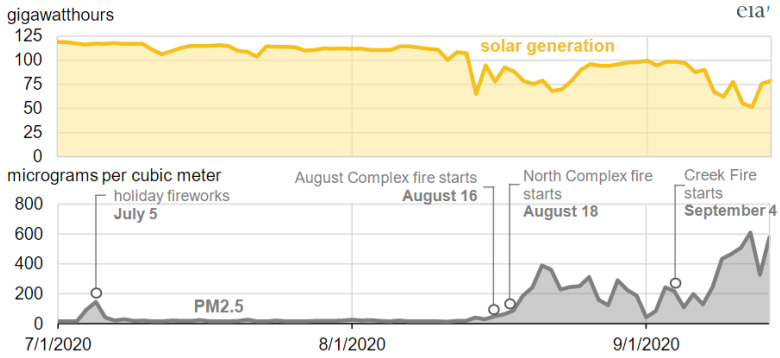
Schlumberger held its Q2 call on Friday. (i) "Structurally smaller" US growth. Schlumberger is like the other big service companies and sees lesser growth in the US vs international markets. They don't say moderate growth but that is the interpretation. Mgmt said "*In North America, this supply response is reflected in the rig count and frac fleet trends, with sustained strong growth through the first half of the year, private operators led activity growth which resulted from the acceleration of DUC completion and increased drilling activity to replenish DUC inventory. By contrast, the embrace of capital discipline by the public operators is highlighted by the rig count still being significantly below the Q1 2020 total, despite WTI price exceeding pre-pandemic levels. In this context, despite a solid activity growth outlook, we maintain our view that the North American market will be structurally smaller than in previous cycles as a consequence of capital discipline and industry consolidation".* (ii) Durable investment growth in international. Mgmt said "*Moving to international markets. The deficit of investment needed to deliver the required oil supply represents a sustained growth opportunity, particularly in the low-cost, advantaged basins. We remain constructive on the structural pull on international supply and the resulting activity impact. This was already visible in the second quarter with a strong seasonal rebound and offshore recovery despite the impact of COVID disruption in part of Asia and in the Middle East. This also marked the second consecutive quarter of international rig count growth. Looking further out, we see favorable conditions for durable investment growth driven by the combination of actions by NOCs, internationally focused investment by public E&P operators and the expectation of continued supply discipline by OPEC+, all in response to the steady evolution of demand*. (iii) Middle East countries committing to natural gas supply growth. This is not just Qatar expansion. Mgmt said *"And I think Qatar was the first to expand their commitment, and we have benefited greatly from that rebound in activity for the last couple of quarters, and this will extend also to a couple of other countries, including Saudi. And lastly, as we turn into 2022, we have heard some signal from a couple of countries in GCC that have signaled that they will commit to production capacity increase to fulfill their opportunity to gain share as there will be a pull on international supply*." (iv) Re Palliser Block JV with Torxen, also called APS Project. Mgmt said "*So look, Neil, hi, we -- as it relates to the divestitures we disclosed last quarter, first, the APS asset in Canada, it's -- both are progressing as planned by the way. So in Canada, we have more than 10 parties actively looking at the information in our data room, and we plan to receive first round offers by the end of next month. Good news is that the economics keep on improving. So we are hopeful we can achieve a successful transaction."* Our Supplemental Documents package includes excerpts from the Schlumberger Q2 call transcript.

Electricity – Wildfire smoke reduces solar generation efficiency

Wildfire smoke hurts solar efficiency

After we posted our last week's (July 18, 2021) Energy Tidbits memo, 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 remined 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 42: Daily CAISO solar generation and California peak air particulate matter level



Source: EIA

Electricity – PG&E to bury 10,000 miles of power lines to reduce wildfire risk

PG&E to bury 10,000 miles of power lines

There was a big PG&E announcement on Wednesday "*PG&E Announces Major New Electric Infrastructure Safety Initiative to Protect Communities from Wildfire Threat; Undergrounding 10,000 Miles of Power Lines in Highest Fire-Threat Areas"* [LINK]. PG&E says "*Today, PG&E maintains more than 25,000 miles of overhead distribution power lines in the highest fire-threat areas (Tier 2, Tier 3 and Zone 1)—which is more than 30% of its total distribution overhead system. 10,000 miles of PG&E lines represents approximately the distance of 11 round trips from Chico to Los Angeles or almost half way around the world."* PG&E calls this a multi-year exercise and it is as 10,000 miles of power lines is a lot of lines. The issue on burying transmission lines has always been cost, its expensive. We think it is even more significant for PG&E and for industry in total. There has to be pressure being put on PG&E to do more than just the "*highest fire-threat areas*" or at least there will be once there is a fire in an area that is below the highest fire-threat level. Plus remember one of the most expensive energy transition items will be adding high voltage transmission from renewable generation to demand centers. Do you not think approvals for these new transmission lines are going to

have more areas to be buried? And there will be pressures on other states to do the same. Our Supplemental Documents package includes the PG&E announcement.

Energy Transition – Energy security is primary concern for India, but not developed world

India vs developed world

There were some blunt comments on Friday from India Oil Corp that reinforce the massive gulf between India and the G7 countries on the energy transition, emissions and getting rid of fossil fuels. And that the developed countries have different priorities than India. This won't be any surprise to the US and others and they have already been downplaying their expectations for India on emissions. Last week's (July 18, 2021) Energy Tidbits memo noted US Energy Secretary Granholm comments on CNBC Squawk Box that the US doesn't expect China, India, etc to do as much on reducing emissions, they just want to make sure they live up to their own commitments. Yesterday, we tweeted [LINK] on Indian Oil Corp. Chairman Vaidya blunt reminder that India has different priorities on oil. Bloomberg reported IOC's plan to increase crude oil processing by 1/3 over the next 5 years to increase gasoline and diesel production. Bloomberg reported "*I firmly believe all forms of fuel will have a place to stay - fossil fuels will be there," said Vaidya. "There's going to be demand for whatever we invest in. Consumption is going from leaps and bounds and energy security is the primary concern for me, which may not be the concern to the developed world."* The US, Canada and EU know they aren't going to force India or China into making firm emissions reduction commitments any more than India or China want. And clearly, that is why Granholm is already started her messaging. But this is also why we see the US, Canada and EU talk more about the G7 having to do more than their fair share. They won't say fair share, but say do more. Its also part of the reason why the US and Canada can't or won't say how much it will cost to get to Net Zero. Our Supplemental Documents package includes the Bloomberg report.

Energy Transition – AU Deputy PM says first show me plan & costs for Net Zero

AU Deputy PM wants to know the cost for Net Zero

We have been checking Australian news daily given the recent LNG issues so there is no way we could have missed Australia Deputy Prime Minister Barnaby Joyce's comments on signing off on Net Zero. Joyce is leader of The National Party and is in a coalition government with Prime Minister Scott Morrison's Liberal party. Most of the reports were making a little fun of Joyce for his comparing the decision to sign off or not on Net Zero with going to a restaurant. We listened to the full interview and made a transcript of his comments. Yes, he says its like going to a restaurant and wanting to see the menu and how much things cost. But he is really just doing what some like us expect of our politicians – have some idea of the plan and some idea of what it will cost to get to Net Zero. We tweeted [LINK] "*#PipeDream for AU Deputy PM @Barnaby_Joyce wants rational process for #NetZero approval - show the plan, show the costs, then decide. @ScottMorrisonMP @POTUS @JustinTrudeau don't have plan & costs, or don't want to reveal cost estimates. Hmm! #EnergyTransition will cost more."* We called it a Pipe Dream. Our fear is that the politicians either don't have any idea of how much it will cost to get to Net Zero or carbon neutral or Paris or whatever or, even worse, they know and don't want to tell people because the costs are so high. The transcript is worth a read because he is really just taking a common sense approach to decision. Our Supplemental Documents package includes the transcript we made of his comments.

Energy Transition – Quebec rejects Saguenay LNG is a preview of future Liberal views

Note why Quebec rejected Saguenay LNG

There is a must-read press release – the Quebec press release rejecting the Saguenay LNG export terminal. Our July 4, 2021 Energy Tidbits (see below item) continued our warnings to the Cdn oil & gas sector that the Liberals will be hitting them harder in the coming months during the next election campaign and moreso if the Liberals return as government. On Wednesday, Quebec rejected the Saguenay LNG export terminal and their reasoning is the

type of reasoning we expect to see the Liberals apply to future oil and gas projects requiring federal approval. And, if so, why it will be pretty near impossible for new export oil, natural gas or LNG export projects. Its why we see this as a must-read. On Wednesday, we tweeted [LINK] "*QC rejects #SaguenayLNG as can't demonstrate positive effects in favor of the energy transition & the net reduction of global GHG. Negative to Cdn #Oil #NatGas as likely previews #Trudeau #Liberals decisions, its now The Law to stay on track to #NetZero emissions target. #OOTT".* The key here is that Quebec is looking at this LNG project on a global basis, not a Cdn basis. So it won't be enough to somehow offset emissions generated natural gas production, transmission and liquefaction, the LNG project has to "*guarantee*" the LNG is replacing higher emitting coal or oil use. Quebec said "*The initiator of the project, GNL Québec, was not able to demonstrate that it complied with the requirements set by the government to authorize the project, that is, positive effects in favor of the energy transition and the net reduction of global emissions greenhouse gases (GHGs)." "Reasons for the refusal. Like the BAPE, whose conclusions were based, among other things, on the expertise of the International Energy Agency, the MELCC concludes that the implementation of a project like that of GNL Québec could have the long-term consequence of slowing down the energy transition of the client countries of the project. MELCC experts are also of the opinion that the government could not count on a net reduction in GHG emissions on a global scale, since the initiator of the project cannot guarantee the use of liquefied natural gas as an alternative energy to sources that emit more GHGs, such as coal and fuel oil. The MELCC also considers that the project initiator could not sufficiently guarantee that GHG reduction measures would actually be applied upstream for the exploitation and transport of gas or that it could adequately compensate its own. GHG emissions*." Our Supplemental Documents package includes the Quebec release. [LINK]

> **Negative to Cdn oil & gas, Its now the law in Canada to hit climate targets**
> Here is what we put in our July 4, 2021 Energy Tidbits. "*Its official, there is now no turning back from a major Liberals negative to the Cdn oil and gas sector. Its now the law for the Cdn government to be on track to meet 2030 emissions targets. We are surprised that this Bloomberg report received no headlines. On Wednesday, Bloomberg reported the Canadian Net-Zero Emissions Accountability Act received Royal Assent, which means the bill is now law. We have warned on this bill since last year because it is now the law for the government (Liberals) to lay out the specific plans to meet emissions reduction targets by 2030 so they can ensure Canada is on track for Net Zero 2050. Our concern is that this means the Liberals have to take big emissions reduction actions right now. And the bill obligates them to have 2023, 2025 and 2027 progress reports so they can see where they are and adjust the emissions reduction plan. As we have been warning, it means the Liberals will be taking more aggressive action and their defence is "it's the law" "we have to do it", "we are following the law, we have to stay on track or get back on track". We have been warning that the oil and gas sector have to be prepared for more aggressive emissions reduction hitting them as part of the Liberals upcoming election platform. Our Supplemental Documents package includes the Bloomberg report."*

Energy Transition – Quebec is using IEA Net Zero scenario for policy decisions

Quebec uses IEA Net Zero scenario

There are some key words in the Quebec release that must be noted. Quebec said "*Like the BAPE, whose conclusions were based, among other things, on the expertise of the International Energy Agency".* We find it impossible to believe the IEA gave their opinion to Quebec on why to reject the Saguenay LNG project. Rather, Quebec saying they relied on the expertise of the IEA is what we feared when we saw the IEA May 18 "Net Zero by 2050: a Roadmap for the Global Energy Sector". After it was released, the IEA backtracked because

they were getting hammered as coming up with a totally unrealistic plan. Their backtrack was that this wasn't a plan or forecast, rather a scenario the IEA was requested by the UK President for COP-26 to lay out a pathway to get to Net Zero. The IEA are sharp people and In our May 23, 2021 Energy Tidbits we noted the IEA is not an oil agency or at least has pivoted away from its founding mandate. It will be lost in the message, but you have to give the IEA credit for maintaining its status as the global oil agency while having pivoted to position itself for a new longer term mandate as the Net Zero expert. They are well aware that this scenario was going to be used by policymakers as a guide. And we noted our fear that no one expects the IEA pathway to be adopted 100% but a lot of it will be used by policymakers and that is what it looks like Quebec did by referencing the IEA's expertise.

Japan hits LNG

Energy Transition – Japan's new 2030 energy mix hits LNG more than coal. Why?

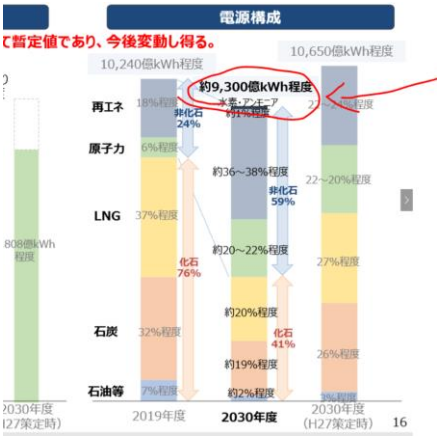
We have to say right off the get go that something doesn't seem right in the big Energy Transition news on Wed, when Japan released its new energy mix targets for 2030, which are hit LNG the hardest, even harder than coal. Clearly, the top priority is not reducing emissions otherwise why make the biggest hit to LNG relative to its prior Energy Mix targets. The only logical answer can be that Japan has concerns on the relative supply and cost of LNG vs coal for the mid/long term. Regardless, on Wednesday, we tweeted [LINK] "*Great thread to read. Negative to #LNG for 2020s. Japan new 2030 target for power generation sees big cut to electricity from LNG #NatGas. To 2030, share of power generation, #Renewable +18-20%, LNG -17%, #Coal -13%. #Nuclear +14-16% will be key for 24/7 power. Thx SStapczynski".* Some of Stapczynski's key points from his Twitter thread [LINK] were (i) "*The biggest loser? LNG. Under the draft plan, annual LNG power generation is slated to fall roughly 50% by the end of the decade. That's more than coal".* (ii) "*This is a surprising shift for Japan, the world's top LNG importer that pioneered the industry (see attached thread). Japan will require less LNG in 2030 than its previous plan, posing a potential dilemma for its suppliers from Qatar to Australia."* (iii) *Nuclear power's role in Japan's energy mix remains unchanged from the previous plan: 20-22% of power generation by 2030. Japan will require 27 of its remaining 36 reactors to resume operations to hit this target. That won't be easy. only 10 have restarted."* Note the following item in the memo. (iv) *"The renewable energy target is just as ambitious. Japan wants renewables (solar, wind, hydro) to make up 36-38% of the power mix by 2030. That's nearly double current levels and will require solar panels on millions of rooftops. The old target was 22-24%."* (v) One other critical assumption to Japan's new energy mix is that Japan assumes power generation in 2030 is 9% less than today. Stapczynski later tweeted [LINK] "*Lastly, Japan sees annual power generation falling to 930 terawatt hours in 2030. That's about 9% lower than today's levels, and 13% lower than their previous forecast."*

Figure 43: Japan's New Energy Mix Target for 2030

Energy	FY2030 (Revised)	FY2030 (Previous)	FY2019
Renewables	36%-38%	22%-24%	18%
LNG	20%	27%	37%
Coal	19%	26%	32%
Oil	2%	3%	7%
Nuclear	20%-22%	20%-22%	6%
Hydrogen/ Ammonia	1%	0%	0%

Source: Bloomberg

Figure 44: Japan Annual Power Generation



Source: Bloomberg

Japan's Takahama #1 & #2 reactors in-service pushed back from 2021 to 2023

We have to believe one of the biggest risks to Japan's new target 2030 energy mix is the timely return of nuclear. This week, we had a real life example of the risk to the timing for nuclear rectors to return to service. In this case, two reactors that were supposed to be back in service in 2021 will now be delayed two years to in service in 2023. On Tuesday, Bloomberg's Stephen Stapczynski tweeted [LINK] "*Japan's Takahama No. 1 and 2 nuclear reactors may not resume operations until at least May 2023 due to required safety upgrades, Fukui Shimbun reports Flag of JapanRadioactive sign That's a big delay to restart the units, which were originally planned to resume this year".*

Energy Transition – Japan, ammonia to replace 20% of fuel at 7 coal plants, Hmmm!

Japan ammonia in coal plants

This also the other head scratcher from the new Japan energy mix target that makes us wonder if the reason for Japan hitting LNG the hardest has to do with relative cost/supply of LNG vs coal for the mid/long term. Clearly, their new energy mix targets are not with the priority to reduce emissions. Earlier this morning, we tweeted [LINK] "*Japan to use #Ammonia to replace 20% of fuel at 7 #Coal power plants. How does this fit in push to reduce emissions as coal is 2x #NatGas emissions? Hmmm! Or is it Japan practical approach & worried about mid/long term relative #LNG vs coal prices/supply? Thx @SStapczynski*". We only follow 81 people on Twitter, but one is Bloomberg's Stephen Stapczynski in Singapore. He reported on a Nikkei report [LINK] that is under subscription and tweeted [LINK] "*Japan plans for ammonia and hydrogen to make up 1% of its 2030 power mix Flag of Japan. How will they achieve that? Mix it with fuel at coal power plants. Ammonia will replace 20% of the fuel at seven coal-fired power plants by 2030, according to Nikkei calculations."* This is a good indicator that reducing emissions isn't the priority. Coal plants produce about 2x the CO2 emissions vs a natural gas plant. Replacing 20% of the coal burned still leaves a huge relative gap on CO2 emissions vs natural gas. Natural gas power can do everything coal can in providing 24/7 power generation and power intensity to fuel heavy industry. Japan is a practical country so we just have to wonder if this is all about their view on the mid/long term cost of LNG relative to coal, and the mid/long LNG supply availability? Hmmm!

Figure 45: How much carbon dioxide is produced when different fuels are burned?

Pounds of CO_2 emitted per million British thermal units (Btu) of energy for various fuels

Coal (anthracite)	228.6
Coal (bituminous)	205.7
Coal (lignite)	215.4
Coal (subbituminous)	214.3
Diesel fuel and heating oil	161.3
Gasoline (without ethanol)	157.2
Propane	139.0
Natural gas	117.0

Source: EIA June 1, 2021

Energy Transition – France's new climate legislation cracks down on emissions

Things are getting even more expensive in France

On Tuesday, France's Parliament definitively adopted new climate legislation *"La loi climat et resilience"*, or in English *"The Climate and Resilience Bill*" [LINK]. This law was created through the proposals of an assembly 150 citizens who were randomly selected by President Macron. This new law comes almost three years after the Yellow Vest movement started, which was a string of often violent protests lasting from November 2018 and ending May 2021 due to COVID lockdowns, against Macron's push for higher environmental taxes on gasoline and diesel. Now ahead of next year's presidential election, Macron is at is again with a new sweeping climate law [LINK]. There are 15 areas which will be targeted by the new bill, but overall, it cracks down on emissions linked to transport, manufacturing and housing. Some big reforms are as follows. (i) A ban on domestic flights when there is a train alternative of less than 2.5 hours. (ii) There is also a ban of advertising for all fossil fuel energy. (iii) After 2025, in urban areas of over 150,000 inhabitants, low emission zones will be created which will restrict access or limit speed for polluting vehicles. (iv) Another big move for housing is sanctions for poorly insulated housing. There are around five million dwellings in France which have such poor insulation they are known as "thermal sieves". Rent will be capped for these dwellings. (v) Further, from 2025, any dwelling with an energy efficiency score of F or G (the worst scores) is no longer deemed "decent housing" and as such landlords will no longer be permitted to legally rent them out until they are renovated. Another interesting aspect is the integration of the plant-based diet in French school cafeterias. By 2023, school cafeterias will be required to have an exclusively vegetarian menu at least once a week. While this law seems like a big step in the right direction, many environmental groups have criticized it for not doing enough. One example of a criticism is that the flight route ban only affects about 2% of domestic flights.

Energy Transition – Shell to appeal, but will accelerate its transition to Net Zero

Shell to accelerate Net Zero efforts

No one outside of Shell probably knows what too Shell so long to announce they would appeal the District Court in Hague ruling, but they did so on Tuesday. Shell wrote "*"We agree urgent action is needed and we will accelerate our transition to net zero," said Royal Dutch Shell Chief Executive, Ben van Beurden. "But we will appeal because a court judgment, against a single company, is not effective. What is needed is clear, ambitious policies that will drive fundamental change across the whole energy system. Climate change is a challenge that requires both urgent action and an approach that is global, collaborative and encourages coordination between all parties."* There were two key reminders in the release. (i) Shell is going to go faster than their published plan. Shell said "*we will accelerate our transition to net zero*" and "*Shell is working on a plan to scale-up and accelerate these efforts within its Powering Progress strategy*." (ii) Reminds that dispositions are a key part of their plan and, as we continue to stress, dispositions are the only way for an oil and gas company to make

any significant dent in emissions in a short period. Our Supplemental Documents package includes the Shell release.

Energy Transition – Chevy bolt recall reminds lets hope for battery quality control

Battery quality control needed

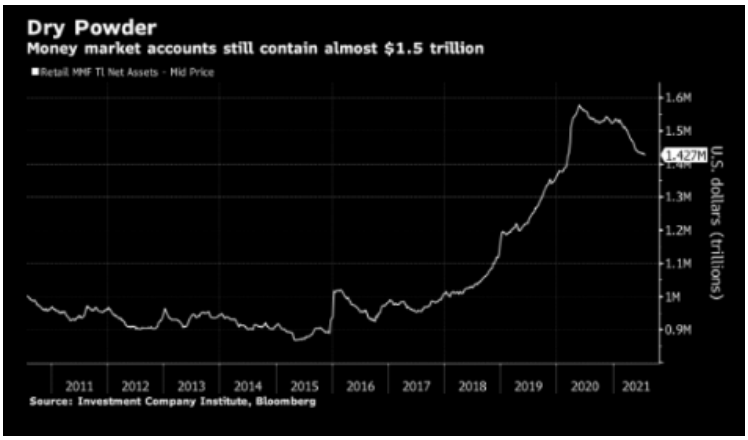
Last week's July 18, 2021 Tidbits noted that we can't help wonder about future quality control on batteries as the world is forced to switch from ICE vehicles to EVs and the need for hundreds of millions batteries to power new EVs and for replacement in existing EVs in the 2020s. It took 9 days but this week, we saw the Chevrolet recall notice foe the Chevy Bolt. 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 Friday, WSJ reported [LINK] on the recall. Chevy is asking owners of the 2017-2019 Bolts not to charge their Bolts over 90%, not to drive over 70 miles, and not to change overnight. Similar to the NHTSA's waring, it also cautioned owners not to park the car inside after charging it. We had to think – good thing it's not winter. The previous recall in November 2020 advised owners to get a software update, but it clearly was not sufficient, as there has been *"at least one"* battery fire since. Chevy's spokesman said "*The company is aware of eight fires total and two related injuries but no deaths".* Our Supplemental Documents package includes the NHTSA warning and the WSJ report.

Capital Markets – Still lots of cash on the sidelines to drive markets

Lots of cash on the sidelines

Last week's (July 18, 2021) Energy Tidbits memo highlighted the BlackRock CEO Larry Fink comments on CNBC on June 14 on why he is still positive on markets. We tweeted [LINK] "*the amount of cash sitting on the sidelines has never been greater. the amount of monetary stimulus has never been greater, the amount of fiscal stimulus has never been greater" #BlackRock CEO Fink to @BeckyQuick on @SquawkCNBC right now #OOTT".* Yesterday, Bloomberg's report "*Stock Bulls Look Toward $17 Trillion Burning a Hole in Pockets"* noted how cash may be down in some accounts in June, the cash on the sidelines is still huge and the driving force for markets. Bloomberg included the below graph and led off their report "*In the stock market, the refusal of retail investors to back down from every macro threat has become the only story. When will it end? Judging by the size of all the pools of cash lying around, it could be a while."* Bloomberg also noted "*Still, other measures of retail prowess show a mixed picture. Data from Charles Schwab shows that the percentage of cash in their clients' brokerages accounts in June fell to 10.5%, the lowest since 2018. "That probably suggests that the dry powder has been put to work over the course of the year, but maybe it's not entirely out of fuel for further investment," said Jeffrey Kleintop, chief global investment strategist for Charles Schwab & Co. "There's still a good bit of momentum and desire to put money to work and look for alternatives to the bond market which remains relatively unattractive."* Our Supplemental Documents package includes the Bloomberg report.

Figure 46: US Retail Money Markets Accounts Still Hold Almost $1.5 trillion



Source: Bloomberg

Capital Markets – No question, investor equity/debt capital accelerating into ESG

Capital accelerating into ESG

Its interesting to see how the challenges for oil and gas sector have dramatically changed. Its no longer if there is a good outlook for oil and natural as prices, its now that are accelerating amounts of investor equity and debt capital that is being shifted to ESG irrespective of the strength in oil and gas prices. On Wednesday, we tweeted [LINK] "*No question, capital is going to ESG. Great #ESG AUM recap/outlook. ESG AUM >$35T, fcast >$50T by 2025 & 1/3 of global AUM. US ESG AUM 40% growth to $17T. ESG debt starting to pick up, now $3T fcast $11T by 2025. Thx @Bloomberg @diabline @GinaMartinAdams*." No one should be surprised, rather it was a good Bloomberg reminder on investor equity and debt capital has accelerated into ESG and is expected to continue that big ramp up for the foreseeable future. On Wednesday, Bloomberg posted its "*Midyear Outlook: ESG Assets Under Management" "Global ESG assets surpassed $35 trillion in 2020 and are on track to exceed $50 trillion by 2025 -- one-third of the $140 trillion in projected total assets under management globally. The pandemic and race to net-zero emissions helped send interest into orbit, with the surge reshaping the financial industry. U.S. ESG assets have jumped in front of Europe's as debt and ETFs lead growth among investing strategies."* Our Supplemental Documents package includes the graphs from the Bloomberg report.

Capital Markets – IFIC: Mutual funds and ETF assets +2.8% in June

Mutual Fund & ETF assets increase MoM

On Thursday, the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for June. 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 June, the IFIC reported *"Mutual fund assets totalled $1.950 trillion at the end of June 2021. Assets increased by $53.3 billion or 2.8% compared to May 2021. Mutual funds recorded net sales of $12.6 billion in June 2021. ETF assets totalled $306.8 billion at the end of June 2021. Assets increased by $9.4 billion or 3.2% compared to May 2021". ETFs recorded net sales of $5.0 billion in June 2021.*Our Supplemental Documents package includes the IFIC release.

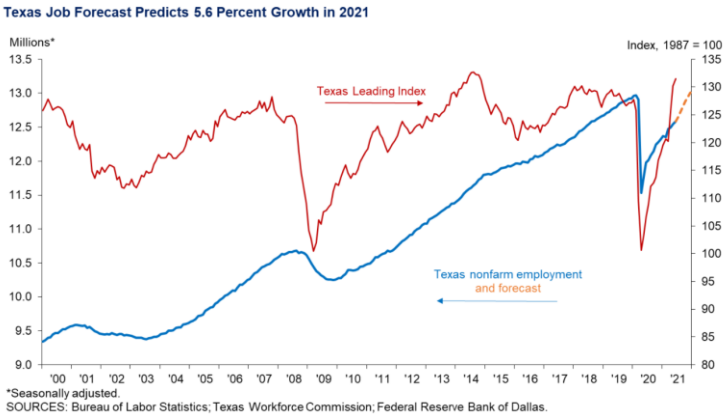
Capital Markets – Texas economy indicator almost back to when oil was >$100

Texas economy outlook is bullish

We couldn't help notice this graph from the Dallas Fed in its July 16 "*Texas Employment Forecast*" [LINK]. It looked like the Texas Leading Index was even higher than when oil hit $100. We checked the data backup. The peak was 132.7 in Aug 2014, and the June 2021 is

131.5, so close but not quite there. The Dallas Fed says "*The Texas Leading Index is a single summary statistic that sheds light on the future of the state's economy. The index is a composite of eight leading indicators—those that tend to change direction before the overall economy. They include the Texas value of the dollar, U.S. leading index, real oil price, well permits, initial claims for unemployment insurance, Texas stock index, help-wanted index and average weekly hours worked in manufacturing*".

Figure 47: Texas Leading Index & Texas non-Farm Employment



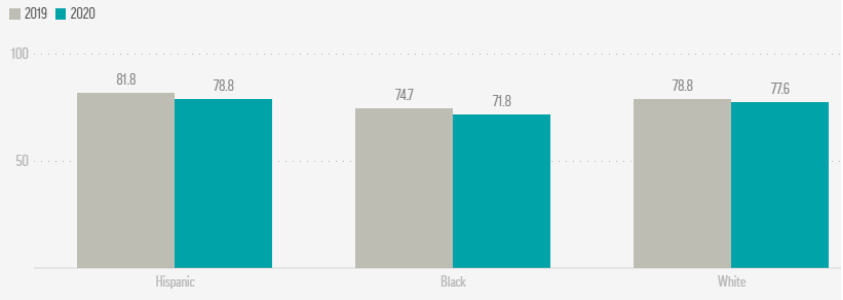
Source: Dallas Fed

Demographics – Largest drop in US life expectancy since WWII

Life expectancy falls 1.5 year to 77.3

The US National Center of Health Statistics released a study this week with provisional life expectancy estimates based on data from January to June 2020 [LINK], updated from its last February release, which we highlighted in our Feb 21 Tidbits. As we anticipated based on the big ramp up in Covid deaths in H2/20, there was an even larger drop to the life expectancy in this update. The release in February had life expectancy at 77.8, which was a drop of 1 year from 78.8 in 2019. This new update puts life expectancy in the US for 2020 at 77.3, which represents a 1.5 year decrease from 2019 and a further 0.5 year drop since last update. This decline was even more significant for Black Americans and Hispanic Americans as they were disproportionately affected by the COVID-19 pandemic; the life expectancy for both groups decreased by 3 years. This is a staggering drop – Black life expectancy has not fallen so much in one year since the Great Depression. While health officials have not tracked Hispanic life expectancy for as long, the 2020 decline was the largest recorded one-year decline. According to the report, *"Covid was responsible for 90% of the decline in life expectancy among Hispanics, 68% among white people and 59% among Black Americans"*. Other than Covid a large factor in the life expectancy decline were drug overdoses, especially for whites. The life expectancy gap between women and men widened further as well in 2020, falling 2 years for men and just about 1 year for women. This resulted in 74 yrs 6 months life expectancy for men and 80 years, 2 months for women. After other major devastating events in history, the life expectancy has bounced back, but some say that in this case it could take years. Noreen Goldman, a Princeton University researcher said "*We can't. In 2021, we can't get back to pre-pandemic*" life expectancy [LINK].

Figure 48: Life expectancy decreases in 2020 by race



Source: NCHS, AP News

@Energy_Tidbits on Twitter

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

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

Look for energy items on LinkedIn

LinkedIn – Look for quick energy items from me on LinkedIn

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

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.

Jeff Bezos successful ride in his "vehicle"

Notwithstanding the US networks doing their best to drum up excitement on the Jeff Bezos space launch on Tuesday, it didn't seem to reach the level of enthusiasm that we expected. We wouldn't call it a poll but in speaking with people in the couple days after the launch, we suspect most didn't watch it live. Maybe that's just the way it is in an on demand world, everyone knows it will be on video and they can watch it when they want. We watched it live and one thing that struck us was the rocket was only ~60 feet. But we had to love Bezos line before the launch and we tweeted [LINK] "*great @JeffBezos line just now in the #BlueOrigin capsule on why he is going on 1st manned launch. "if the vehicle isn't safe for me, it's not safe for anyone". never heard it called a vehicle before. don't care how wealthy he is, it's impressive."* It was actually said when he was in the capsule but just not directly before launch. As we put in the tweet, we don't care how wealthy he is, it was impressive that he had the confidence to be in the first manned launch for Blue Origin. That takes a lot of confidence.

NHL 1st round of the draft done remotely again this year

Fridays and Saturdays are the big push days to finish off the Energy Tidbits memo and, since markets are mostly closed, it means sports in the background. Its been mostly Tokyo Olympics. One of the things that is great about watching Olympics is that you end up watching sports that you never do other than Olympics like volleyball. But on Friday night, also flipped back and forth to the 1st round of the NHL Draft. Besides the pretty amazing feat of having three University of Michigan Wolverines in the top 5 picks, the thought that came to mind was that its really unfortunate for these draft classes to have a remote draft. It was great they were surrounded by their family and friends. But they lost all the excitement of the experience of draft week in the draft city, they would have been on media tours during the week, seen all the NHL people around, being in the stands with their family, hearing their name called and then going down to the stage. Lets be clear, it must be an amazing experience for these young men when they get that call from the NHL GM saying he is their first round pick. But its too bad they lose their once in a lifetime chance to have the whole draft week experience. Regardless, can't wait to see these future NHL superstars in the NH.

Interesting Tokyo Olympics opening ceremony tidbit

I wasn't doing the normal pre market flipping of channels between BNNBloomerg's The Open and CNBC Squawk Box on Friday morning, rather I had on the Tokyo Olympics opening ceremony. My #1 priority was to see Team Canada enter the stadium and tweeted [LINK] a video clip of their entering the stadium. I can't image how pumped they must have felt as they walked in as Olympians knowing they are going to have the thrill of their life. Can't wait to watch them compete! But there was an interesting tidbit from the performance prior to the athletes walking into the stadium. I tweeted [LINK] "cool tidbit from opening ceremony that athletes at 64 olympics planted seeds and some of the resultant trees are used in @Tokyo2020 opening ceremonies. I assume in the wood for the rings. athletes planting seeds again". So 57 years after the Tokyo 1964 Olympics, wood from trees planted from seeds brought by athletes around the world were used in the massive wood Olympic rings in the opening ceremonies.

Figure 49: Wood Olympic Rings At Tokyo Olympics Opening Ceremony

Source: TSN

Middle track lanes aren't the fastest, its just where more fast runners line up

The women's 200 metre final is on Aug 3 and men's on Aug 4 at the Tokyo Olympics. We didn't expect to see this on MarketWatch, but there was an Olympics opinion piece "*Which track lanes will be fastest at the Olympics? Data from 8,000 races disprove a myth*" [LINK]. For track fans, it was a good piece. Basically, it dispels the myth that the fastest lanes for the 200 and 400 are the middle lanes. That's the standard line – the middle lanes are the fastest. He notes that the inside lanes are tough because the sprinters have to make tighter turns. No question that the winners more often come from the middle lanes, but that is more a function that the fastest qualifiers are put in the middle lanes. He found "*The most striking counterpoint to the "middle is best" assumption is the 200. I found that it is in fact outside lanes that are associated with faster race times – on average lane eight is roughly 0.2 seconds faster than lane two. This is sizable for a race in which the world record is 19.19 seconds. Faster outside lanes make sense biomechanically as tighter corners produce slower race times. But the result seems to disprove the idea that not seeing competitors can slow a runner down."*

Heinz has no dog in this fight, but picks hot dog makers over bun makers

We couldn't help note this Heinz tongue-in-cheek petition to get hot dog bun makers to go to packs of 10 instead of 8. We had to check this was a real Heinz item and it is. And most of us have probably seen a situation at someone's backyard barbecue where there were less hot dog buns vs hot dogs and, inevitably, see the hosts or someone eat their hot dog like the below picture that was part of the Heinz video on the petition. Heinz has started a petition [LINK] "*The Heinz Hot Dog Pact. 10 Wieners. 10 BUNS. IT'S TIME. Hot dog wieners come in packs of 10. Hot dog buns come in packs of 8. WHY?! As the condiment that has been bringing foods together for over 150 years, we've decided enough is enough. That's why we started the Heinz Hot Dog Pact. We're calling on Big Bun and Big Wiener companies to find the answer to this hot dog packaging mismatch, once and for all. We need your signatures more than ever. Let's change hot dog history together."* There are now over 30,000 signatures to the petition.

Figure 50 What Happens When You Run Out of Hot Dog Buns

Source: Heinz

Australia wants shark attacks to be called "bites" & negative encounters

We couldn't help think of the scene from the 1975 movie Jaws where police chief Brody (Roy Scheider) pleas with the Martha Vineyard's mayor to close the beach due to a shark attack. And wonder how exasperated he would have been if he had to call the shark attack a shark bite or negative encounter. But that is what is happening in major parts of Australia such as Queensland. We have been reading a lot of Australia news given the big LNG developments, but also saw this Sydney Morning Herald July 14 report "*Scientists urge encounters with sharks to be called 'bites' not 'attacks'* [LINK]. The SMH wrote "*Authorities in Queensland and NSW are signalling a shift away from describing encounters between sharks and humans as "attacks", a move scientists say is both welcome and well overdue. A senior Queensland official told a Noosa shark symposium in May the state's communications would preference "bites" over "attacks" based on social research, three scientists attending the meeting have told The Sydney Morning Herald and The Age. Its SharkSmart website lists how to minimise risks "of a negative encounter with a shark".*