Energy Tidbits

April 25, 2021

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Bad News For Natural Gas, Trudeau's Electricity Goal is Now 100% "Emissions Free" And Not "Net Zero Emissions"

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. Bad news for Cdn natural gas, unless he misspoke, Trudeau now says its electricity target are now for "emissions free" electricity and not "net zero emissions". (Click Here)

2. Trudeau says "will make it law to respect our new 2030 target" for emissions reductions ie. he will have no choice but to do more as it will be the law. (Click Here)

3. The Liberals budget looks like it is a pre-election call budget. (Click Here)

4. Comments from all sides point to continued positive progress to a JCPOA return, although still many big issues to be resolved. (Click Here)

5. Bloomberg's Vaccine Tracker shows world is now giving 18.3 million vaccine doses per day. (Click Here)

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

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

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Natural Gas – Natural gas injection of 38 bcf, storage now -251 bcf YoY deficit

YoY storage at -251 bcf YoY deficit

The EIA reported a 38 bcf injection (vs 47 bcf injection expectations) for the April 16 week, which was slightly above the 5-yr average injection of 37 bcf, but below last year's injection of 43 bcf. Storage is 1.883 tcf as of Apr 16, increasing the YoY deficit to 251 bcf from 242 bcf last week and storage is now 12 bcf above the 5 yr average. The YoY deficit along with the forecasted very 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 (04/16/20)		Historical Comparisons: 5-year average (2016-20)	
Region	04/16/21	04/09/21	net change	implied flow	Bcf	% change	Bcf	% change
East	325	311	14	14	400	-18.8	309	5.2
Midwest	421	414	7	7	492	-14.4	401	5.0
Mountain	118	118	0	0	96	22.9	109	8.3
Pacific	210	205	5	5	209	0.5	203	3.4
South Central	810	798	12	12	937	-13.6	849	-4.6
Salt	256	251	5	5	299	-14.4	268	-4.5
Nonsalt	554	547	7	7	638	-13.2	582	-4.8
Total	**1,883**	**1,845**	**38**	**38**	**2,134**	**-11.8**	**1,871**	**0.6**

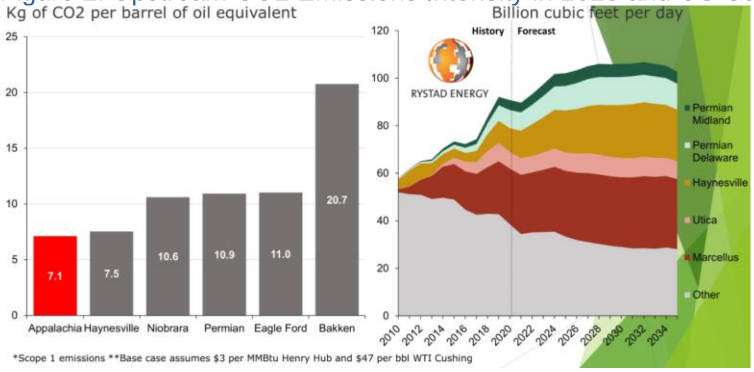
Source: EIA

Natural Gas – Rystad expecting >100 bcf/d US gas production in 2024

Rystad US gas production forecast

On Thursday, Rystad posted a new blog "*A gas boom is coming in the US; A closer look at Haynesville and Appalachia reveals records and a risk*" that included their forecast for a significant increase in US natural gas production levels over the next few years [LINK]. Rystad is forecasting US natural gas production to reach a new record of 93.3 bcf/d in 2022, before continuing to increase to top 100 bcf/d in 2024 vs the previous record of 92.1 bcf/d in 2019 which fell to 90.8 bcf/d in 2020. However, before the growth begins in 2022, Rystad is expecting a 1.1 bcf/d YoY decline with production in 2021 to average 89.7 bcf/d. A large portion of this output growth is expected to be fueled by Appalachia and Haynesville basins. The continued attraction of capital and therefore output growth to Appalachia is partly due to the relatively low CO_2 emissions intensity vs other US basins as it benefits from modern infrastructure along with the adoption of e-frac fleets. Rystad estimates the emissions intensity in Appalachia was 7.1 kg of CO_2 per boe in 2020 vs 7.5 in Haynesville, while the Bakken is 20.7 kg of CO_2 per boe. This along with strong capital efficiency with the expected 2021 reinvestment rate to maintain production at 67% improving massively over 147% seen in 2019. Overall, Rystad expects a 16% increase to Appalachia production before reaching it's plateau. They expect Haynesville to fuel the largest share of US output growth, increasing 10 bcf/d from 2020 to 2035. Rystad wrote *"A key factor in Haynesville's ability to sustain an advantage against the Appalachian region will be to maintain the relative ease with which operators can transport gas from wellheads to Gulf coast markets, compared to the bottlenecks and mid-stream project cancellations that producers in the Northeast have to grapple with".* Our Supplemental Documents package includes the Rystad blog.

Figure 2: Upstream CO2 Emissions Intensity in 2020 and US Gas Production Outlook



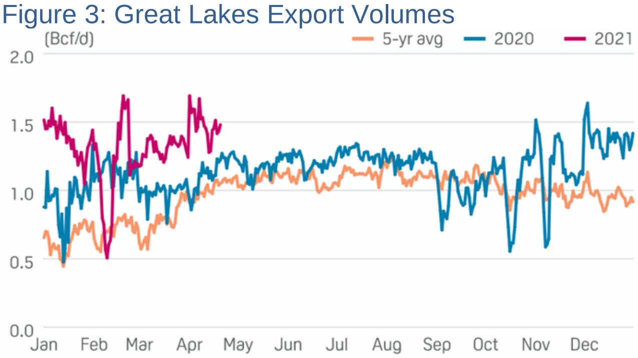
Source: Rystad

Natural Gas – Cdn exports to US on Great Lakes to hit a 10-yr high, positive for AECO

Platts expects Canadian AECO exports to hit a 10-yr high this summer

On Wed, Platts posted a report "*Canada exports to US on Great Lakes likely to average 10-year high this summer",* which notes how this will feed into weak injections into Alberta gas storage along with strong contracted exports will be providing significant support to AECO prices through the summer and into winter 21/22 [LINK]. The Great Lakes Transmission pipeline between western Canada and demand centers in the US upper Midwest is heavily contracted for exports this summer. There are currently 1.75 bcf/d of contracts on Great Lakes through April and 1.72 bc/f contracted for the rest of the summer post April. Platts wrote *"The 1.72 Bcf/d of contracts is likely to drive the strongest summer of exports on Great Lakes since pre-2010. Exports this injection season are already the strongest recorded in more than a decade. S&P Global Platts Analytics data shows month-to-date exports on the line are averaging 1.48 Bcf/d compared to 1.08 Bcf/d last year and 988 MMcf/d for the five-year average".* Further, builds have been about half of last summer's average, at around just 550 mmcf/d. If these weak injections continue, it will result in low inventories and higher prices for the upcoming winter. Our Supplemental Documents package includes the Platts report.

Figure 3: Great Lakes Export Volumes



Source: Platts

Natural Gas – India March natural gas production up 11.1% YoY to 3.057 bcf/d

India natural gas production +11.1% YoY and +8.4% MoM

Unfortunately, we are now in a period where YoY comparisons aren't necessarily relevant other than saying where we are relative to the how items, in this case India natural gas production, are doing relative to when Covid first hit. The theme for India LNG has consistently been that India natural gas production has been stagnate and that means that any increase in India natural gas demand leads to an increase in LNG imports. To date, India has not been able to turn around its domestic natural gas production. But India's Petroleum Planning and Analysis Cell released their monthly report for Mar natural gas and oil statistics on Thurs [LINK]. India's domestic natural gas production was up 11.1% YoY to 3.057 bcf/d, up 8.4% MoM from 2.818 bcf/d in February. The YoY increase is not necessarily reflective of significant growth, more so a return to pre-pandemic production, as April 2019 to Jan 2020 production averaged 2.963 bcf/d. India has consistently struggled to grow domestic natural gas production and overall current financial year (Apr-Mar) production is 8.1% lower YoY. 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 March LNG imports down 0.1% YoY to 3.48 bcf/d

India LNG imports -0.1% YoY and -4.4% MoM

India is extremely price sensitive in terms of its LNG imports, which was exemplified in their 2020-2021 import data. India had ramped up exports from June to October, taking advantage of low LNG prices to fill their stocks. Imports began to decline in November as LGN 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 import in Mar of 3.475 bcf/d, down 0.1% YoY and down 4.4% MoM from 3.637 bcf/d in Feb. Imports of LNG for India's current financial year are down 3% YoY.

Natural Gas – Japan LNG Imports in March 11.04 bcf/d, -1.1% YoY

Japan Mar LNG imports -1.1% YoY

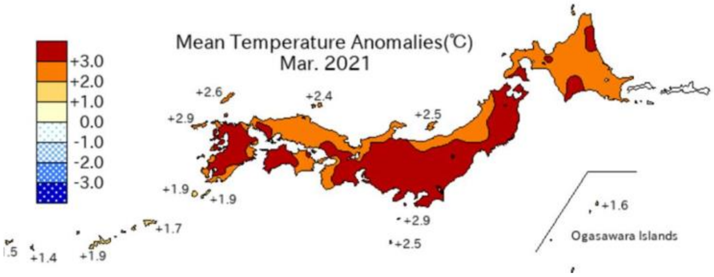
Japan Ministry of Finance released its March LNG import data on Monday [LINK]. Japan's March LNG imports were 11.04 bcf/d, down 1.1% YoY and down 20.2% MoM from 13.83 bcf/d in February. Though down YoY and MoM, the LNG imports outperformed big vs thermal coal (-12.8% YoY) and petroleum (-17.0% YoY). Japan was extremely hot in March so the LNG imports would normally have been even lower. However, we believe the reason why LNG imports significantly outperformed thermal coal and oil was that they likely reflect a rebuild of inventories following the extreme cold of Jan. Below is a temperature map of March and our table that tracks Japan LNG import data.

Figure 4: Japan Monthly LNG Imports

bcf/d	2015	2016	2017	2018	2019	19/18	2020	20/19	2021	21/20
Jan	13.06	11.22	12.85	12.79	11.69	-8.7%	11.63	-0.5%	12.48	7.3%
Feb	13.26	12.30	13.36	14.23	12.61	-11.4%	10.99	-12.8%	13.84	25.9%
Mar	12.60	12.62	12.61	12.28	11.30	-8.1%	11.16	-1.2%	11.04	-1.1%
Apr	10.56	10.21	10.52	8.97	9.00	0.3%	8.31	-7.7%		
May	8.91	8.55	9.66	9.92	8.62	-13.1%	7.09	-17.7%		
June	10.61	10.02	9.90	8.88	8.32	-6.3%	8.42	1.2%		
July	10.77	10.19	10.19	10.55	10.56	0.1%	9.35	-11.5%		
Aug	10.93	11.96	11.24	11.73	9.45	-19.5%	9.04	-4.3%		
Sept	11.06	10.67	9.31	10.04	10.30	2.6%	10.41	1.0%		
Oct	9.38	9.73	9.50	10.12	9.75	-3.6%	9.20	-5.7%		
Nov	10.71	12.07	10.26	10.15	10.03	-1.2%	9.63	-4.0%		
Dec	12.51	11.69	12.31	11.23	10.54	-6.2%	11.96	13.4%		

Source: Japan Ministry of Finance

Figure 5: JMA March 2021 Temperature Recap



Source: Japan Meteorological Agency

China natural gas imports

Natural Gas – China natural gas imports +20.7% YoY to 13.27 bcf/d

The General Administration of Customs of China released its final March import data last Sunday [LINK]. Total imports were very strong for March, with data showing a 20.7% YoY increase to total natural gas imports for the month at 13.27 bcf/d, but is down from February of 15.64 bcf/d. The MoM decreases were primarily driven by a warmer March than average [LINK] whereas the rather significant YoY increases were mainly caused by an LNG restocking following the cold Jan. March LNG imports were 8.74 bcf/d, +34.6% YoY and down 8.9% MoM, while March pipeline imports were 4.8 bcf/d, +12.8% YoY and down 28.3% MoM.

Figure 6: China LNG Imports by Month

bcf/d	2016	2017	17/16	2018	18/17	2019	19/18	2020	20/19	2021	21/20
Jan	3.84	5.35	39.3%	8.03	50.0%	10.20	27.1%	10.31	1.1%	13.15	27.6%
Feb	3.10	4.10	32.3%	6.84	66.9%	7.46	9.1%	7.26	-2.7%	9.52	31.1%
Mar	2.60	3.06	17.7%	5.04	64.5%	6.28	24.8%	6.49	3.3%	8.74	34.6%
Apr	3.00	3.44	14.7%	5.43	57.8%	7.27	34.0%	8.16	12.3%		
May	2.20	4.50	104.5%	6.39	41.9%	6.87	7.6%	8.10	18.0%		
June	3.51	4.85	38.2%	6.31	30.1%	7.25	14.9%	9.27	27.8%		
July	2.46	4.80	95.1%	6.40	33.4%	7.56	18.1%	7.79	3.1%		
Aug	3.54	4.86	37.4%	7.26	49.2%	8.04	10.8%	9.23	14.8%		
Sept	4.05	5.54	36.8%	7.00	26.3%	8.16	16.7%	9.17	12.4%		
Oct	2.85	5.50	93.0%	7.13	29.6%	6.26	-12.2%	7.78	24.3%		
Nov	4.26	6.50	52.6%	9.59	47.5%	10.42	8.7%	10.58	1.6%		
Dec	5.80	7.80	34.5%	9.75	25.0%	10.01	2.7%	11.76	17.5%		
Full Year Avg.	3.43	5.03	46.3%	7.10	41.2%	7.98	12.5%	8.83	10.6%	10.47	18.6%

Source: Bloomberg, China Customs

Figure 7: China Pipeline Gas Imports by Month

bcf/d	2016	2017	17/16	2018	18/17	2019	19/18	2020	20/19	2021	21/20
Jan	4.3	3.7	-13.5%	4.0	8.2%	5.0	24.9%	5.2	3.5%	4.9	-4.5%
Feb	5.0	4.4	-12.9%	5.0	15.6%	5.5	9.0%	5.7	3.8%	6.1	7.2%
Mar	4.2	3.6	-15.6%	4.2	17.7%	4.5	6.4%	4.2	-5.2%	4.8	12.8%
Apr	4.5	4.7	4.1%	5.5	17.7%	5.0	-9.3%	4.2	-15.5%		
May	3.2	3.9	23.2%	5.1	30.4%	4.8	-4.3%	4.0	-16.6%		
Jun	3.3	4.1	22.1%	5.3	31.2%	4.8	-10.3%	4.1	-15.0%		
Jul	3.2	4.1	25.5%	4.7	14.5%	4.7	0.0%	3.6	-23.3%		
Aug	1.7	3.9	133.5%	4.7	21.3%	4.9	3.1%	5.3	7.9%		
Sep	5.1	4.0	-22.3%	5.2	30.7%	5.0	-4.2%	4.7	-6.0%		
Oct	3.1	3.5	13.2%	4.2	20.6%	3.8	-8.1%	3.9	1.0%		
Nov	3.1	4.0	27.4%	5.1	26.8%	4.7	-6.9%	4.1	-13.0%		
Dec	3.6	4.4	22.7%	4.6	2.8%	4.7	3.9%	5.6	18.9%		

Source: Bloomberg, China Customs

Natural Gas – World Bank doesn't see LNG playing a role in maritime fuel supply

Ammonia and hydrogen expected to be primary maritime fuels

The World Bank released their view of how they see the decarbonization of maritime fuel supply [LINK] to reach the IMO's goal of cutting shipping emissions in half vs 2008 levels by 2050. Through the World Bank study, they found that the two most promising fuels for shipping are ammonia and hydrogen. This is partly due to the fact that these fuels can be produced from natural gas with CCS, alleviating issues of scarce renewable electricity to produce green ammonia and hydrogen at the outset. The World Bank expects that these fuels will likely see wide and growing adoption from 2030 onward. Conversely the report ruled out LNG as a widely adopted transitional fuel, though it may have a small niche in the market. The World Bank wrote *"To reach these conclusions, the report looked at the potential of LNG to play either a transitional role, in which existing LNG infrastructure and vessels could continue to be used with compatible zero-carbon bunker fuels after 2030, or a temporary one, in which LNG would be rapidly supplanted by zero-carbon alternative from 2030. Neither option is likely to prove viable".* Part of the reason for this conclusion is because they don't see significant reductions in GHG emissions from LNG use. Additionally, is the risk of stranded assets and unnecessary build out of LNG infrastructure dedicated to maritime fuel as this infrastructure will likely not be compatible with future, zero carbon bunker fuels. Our Supplemental Documents includes the World Bank release.

Natural Gas – Others disagree with the World Bank on LNG in maritime fuel supply

Major shippers differing on LNG view

Despite the item from the World Bank above, some shippers and shipping customers have a differing view on the use of LNG powered ships. We believe that 2021-2023 will be the critical period for governments, companies, capital providers, etc to sort thru which energy transition ideas will be the big winners. And the differing views on LNG for shipping is a good example of an item that will be sorted thru as to either a big winner, an okay idea or a losing idea. Bloomberg reposted a good The Wall Street Journal report "*Shipowners Turn To Natural Gas to Meet Climate Goal – WSJ*", which noted *"Two of the world's biggest container lines have ordered vessels that will operate with LNG, while Royal Dutch Shell PLC and Australian miner BHP Group Ltd. have been offering long-term charters to shipowners willing to build natural gas-fueled tankers and bulk carriers over the past year".* The issue with switching fuel sources completely away from any fossil fuels is the cost, with an estimate of $3 trillion to convert the entire world's fleet, and the availability of new energy transition fuels. As such, some large shippers already are committed to LNG with French shipper CMA CGM currently operating 13 LNG powered container ships and will be receiving 13 more in the next year, additionally German shipper Hapag Lloyd ordered 6 LNG ships last year. The WSJ wrote *""These vessels will be highly efficient with 15% to 25% lower CO(2) emissions," said Tim Seifert, a Hapag spokesman. "We see LNG as a bridging technology on the way to carbon neutral fuels".* Though not all shippers are on board with LNG, with Maersk stating that they will opt for *"zero emissions alternatives"* rather than using LNG as a bridging fuel. WSJ wrote *""We don't believe that LNG will play a big role as a transition fuel because it's still a fossil fuel and we would rather go from what we do today straight to a neutral type of fuel," Chief Executive Søren Skou said in February".* Our Supplemental Documents package includes the Bloomberg repost.

Natural Gas – Butterfly Effect, insects led to 0.63 bcf/d Melkoeya LNG shut down

Melkoeya 0.63 bcf/d LNG shut down

We couldn't help tweet after seeing the reporting on the Petroleum Safety Authority Norway (PSA) conclusions for the breaches of the regulations and direct and underlying causes for the Sept 28, 2020 fire that led to the Equinor's 0.63 bcf/d Melkoeya LNG facility being shut down for 1 year. The plant is scheduled to restart on Oct 1, 2021. The reporting focused on the breaches of regulations. And we didn't see any reporting on the cause, which is why we tweeted [LINK] "*#ButterflyEffect? Were insects responsible for Sept 28 fire that took down Equinor's 0.63 bcf/d Melkoeya #LNG plant for a year? Worth reading the @psanorway analysis Direct and underlying highlighting the role of biomass buildups, primarily insects*." PSA says "*Direct and underlying causes. Technical fire tests and simulation of temperature development in the turbine's filter housing support the likelihood that the fire broke out because pre-filters in the air intake auto-ignited. The tests indicate that biomass buildups (primarily insects) in the pre-filters may have lowered their auto-ignition temperature*. *The control valve for hot-oil supply to the air intake's anti-icing panels had been opened manually to dissipate excess heat in the hot-oil circuit. This caused the temperature in the filter housing to rise sufficiently to auto-ignite the pre-filters*."

Figure 8: Equinor 0.63 bcf/d Melkoeya LNG Plant fire Sept 28, 2020

Source: @Folkebladet

Natural Gas – Nord Stream 2 could be completed in summer 2021

Nord Stream 2 completion and Biden-Putin Summit could coincide

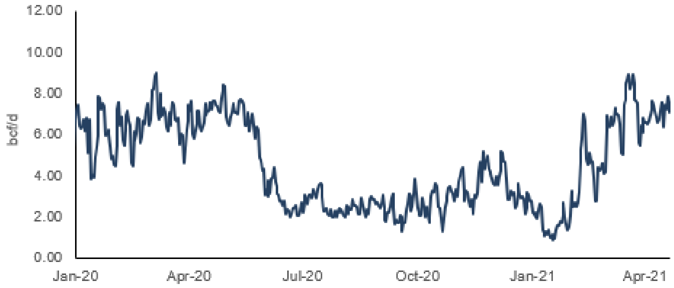
The expectations for Nord Stream 2 have been dialed back to potential completion later in H2/21 and not in time to necessarily impact the summer Europe gas storage refill season. On Friday, we saw a change in that potential timing. As we noted last week, we think there is a good possibility of US sanctions being lifted on Nord Stream 2 with a face-to-face meeting between Biden and Putin this summer in Europe. Based on Biden's comments last week, he reminds that he is against the pipeline, but stated that it is a complicated issue. But we do think it could be a possible give. Depending on when this summit is, Nord Stream 2 could be nearly complete or complete based on comments this week from Novak. On Friday, TASS Russian site reported [LINK] that Novak had stated the line will be completed in 2021, TASS wrote *""It will be this year, but the builders themselves will better tell the exact date," he said".* TASS also included comments from Pavel Zavalny *"The head of the State Duma Committee on Energy Pavel Zavalny, at a meeting with the deputies of the German Bundestag on April 15, said that Russia could complete the construction of the Nord Stream 2 gas pipeline this summer and let the first gas flow towards Germany".* If this is accurate, the completion could coincide closely with the Biden-Putin summit. And this means that Russian gas could flow thru Nord Stream 2 in time to impact the summer refill season for Europe gas storage. Merkel was widely reported this week reminding "*I would like to point out that the gas delivered through Nord Stream 2, which isn't yet flowing, is no worse than the gas from Nord Stream 1, that which flows through Ukraine, and that which comes across Turkey from Russia".* Our Supplemental Documents package includes the TASS report.

Natural Gas – LNG flows to NW Europe at ~7 bcf/d in April

LNG flows to NW Europe flat MoM so far in April

Europe is the key market for US LNG due to its close proximity. Though with the possible completion of Nord Stream 2 and first gas delivery this summer, this could take share away from US LNG exports. But with the record long Europe gas storage withdrawal season (see below) there should be strong demand through the injection season. 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 so far in April have averaged 7.05 bcf/d, roughly flat to the March average of 7.08 bcf/d.

Figure 9: Net LNG Flows to NW Europe



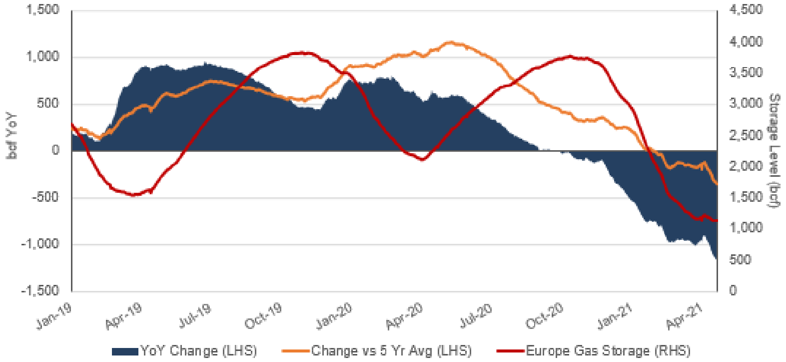
Source: Bloomberg

Natural Gas – Europe storage 28.99% full vs 5 year average of 38.75%

Europe gas storage 28.99% full

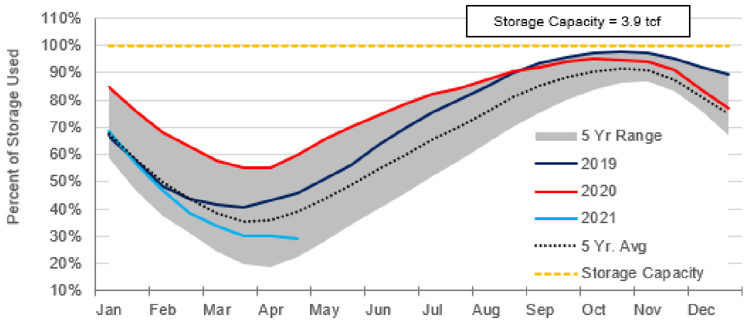
It was cold through March and now into April which had delayed the refill push. This winter has been another good reminder that Europe gas storage is the key indicator for the near term strength of global LNG markets. The big draw in Europe gas storage this winter was the indicator that it has been a good winter for LNG prices. Additionally, the significant YoY deficit in Europe gas storage at the end of winter indicates that there will be strong demand for European LNG imports during the refill push. And that this is a big positive indicator for US LNG exports this summer. Europe gas storage started the winter (Nov 1) at basically full levels at 94.66% and has dropped by 65.77% to be 28.89% at Apr 1. This 65.77% decline since Nov 1 compares to the 5 yr average that would be down 53.99% in the same period or to last winter that was only down 43.29% in the same period. So massive draw vs last year and the last 5 years. Storage at Apr 1 of 28.90% had looked to be the bottom for withdrawal season as the storge level subsequently increased 2.06% to 30.96% on April 6. However, cold weather continuing into the second half of April has further delayed the refill push as flows switch from injections between April 1-6, to draws once again. This has resulted in the longest withdrawals season in history, supporting Europe LNG cargo prices. Storage as of Apr 21 is 28.99%, 30.37% less than last year of 59.36% and 9.76% below the 5 yr average of 38.75%. 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

Figure 11: Europe Gas Storage Percent Utilization



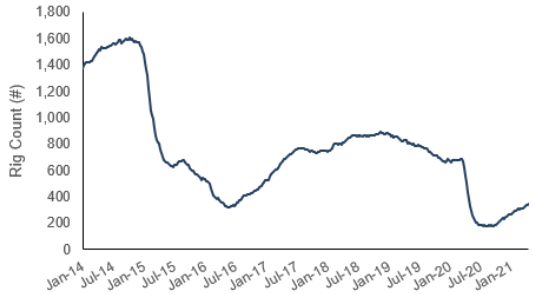
Source: Bloomberg

Oil – US oil rigs down 1 to 343 oil rigs

Baker Hughes reported its weekly rig data on Friday. US oil rigs were down 1 rig at 343 oil rigs as of Apr 23. There were no increases this week. There was one decrease on 1 rig at the Permian. Oil rigs have been on a strong recovery path and are +171 off the bottom of 172 in the Aug 14 week. Companies are seeing high oil prices and we expect privates to increase drilling. Additionally, the recent rise in oil prices to ~$60 has led to increasing rig activity in secondary basins, "Other" basins oil rigs are +8 oil rigs in the last month. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 340 to 343 oil rigs (-49.8%). Below is our graph of Baker Hughes US oil rigs.

US oil rigs +7 this week

Figure 12: Baker Hughes Total US Oil Rigs



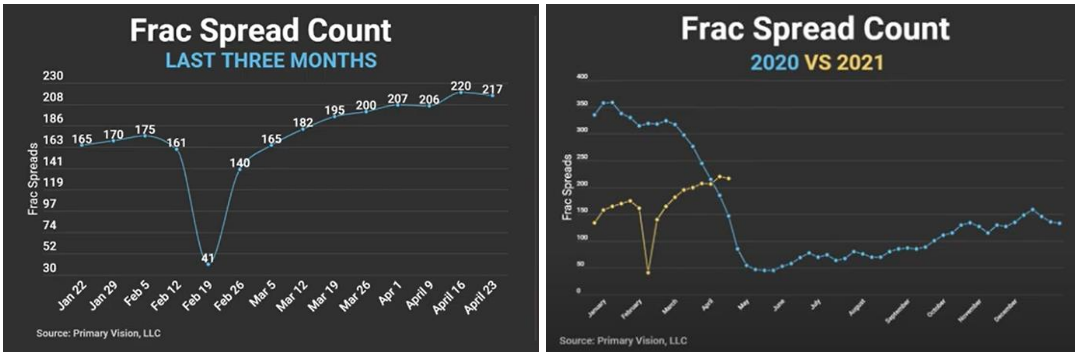
Source: Baker Hughes

Oil – Frac spreads -3 to 217 as of April 23

Frac spreads -3 to 217

Every week, Mark Rossano (C6 Capital Holdings) posts a YouTube recap of frac spreads for the week on the Primary Vision Network [LINK]. He reported US frac spreads were -3 to 217 as of April 23. He said there was a little bit of a dip in the Permian that was offset by increases in some of the smaller/fringe basins. As expected, starting to get to a pause point around the 220 level and also moving into the seasonal pivot that had some late season cold that impacted the Bakken. See this pause point (ie. 220 should be the high point for this short period) for the next 2-3 weeks, and then should see some acceleration into May and June. He looks to last summer as the type of modest increase to look for in the summer. Below are his two key frac spread graphs.

Figure 13 Active Frac Spreads as of April 23, 2021



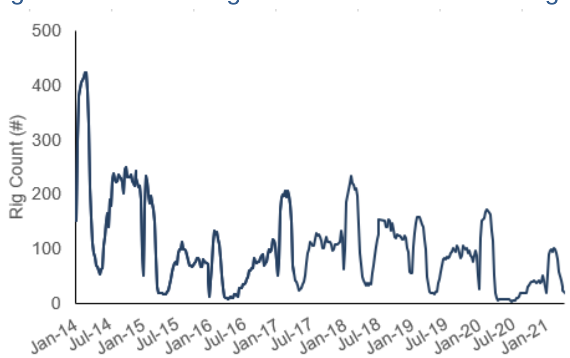
Source: Primary Vision

Oil – Total Cdn rigs down 1 to 55 total rigs and up 29 YoY

Cdn rigs -1 this week

Baker Hughes reported total Cdn rigs were down 1 this week to 55 total rigs. The continued decline this week was expected with the end of winter drilling, and we expect it to continue to modestly decrease. Typically the bottom for Cdn rigs is around the 1st week in May. Cdn oil rigs were flat at 17 rigs. Cdn gas rigs were down 1 to 38 gas rigs this week. Total rigs are now +42 since the June 26 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 8 and Cdn gas rigs were 18 for a total Cdn rigs of 26, meaning total Cdn rigs are +29 YoY but total rigs are down 8 vs 2019. Below is our graph of Baker Hughes Cdn oil rigs.

Figure 14: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat at 11.0 mmb/d

US oil production flat

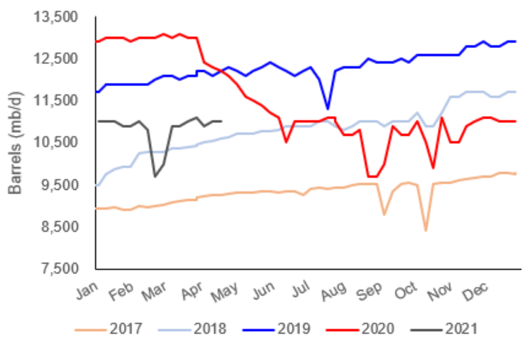
US oil production was flat at 11.0 mmb/d for the Apr 16 week. Lower 48 up 0.1 mmb/d to 10.6 mmb/d. This puts US oil production down 1.2 mmb/d YoY, and is down 2.1 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The EIA April STEO revised down US oil production for the remainder of 2021 by 0.11 mmb/d to 11.04 mmb/d, down 1.74 from Q4/19 peak of 12.78 mmb/d. YoY growth returns in 2022 with average production of 11.86 mmb/d, +0.82 mmb/d YoY with Q4/22 production of 12.18, down 0.6 mmb/d vs Q4/19. This reduction was mainly due to lower than expected activity levels outside of the Permian. The EIA DPR has the expectation of slight MoM increases in April and May. The EIA forecasts May at 7.612 mmb/d which is +12,000 b/d MoM. The EIA Form 914 actuals for December came in 38,000 b/d higher than the EIA weekly estimates for December, much closer than the 246,000 b/d over estimate in the actuals for November which had been due to hurricane activity in early Nov.

Figure 15: 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				

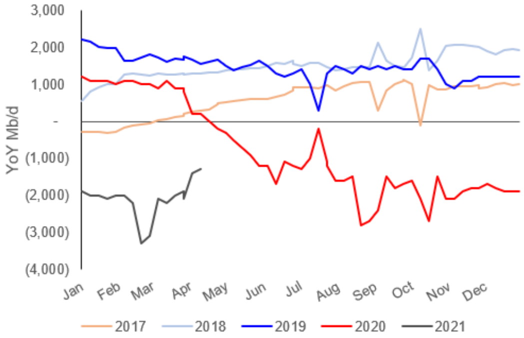
Source: EIA

Figure 16: US Weekly Oil Production



Source: EIA, SAF

Figure 17: YoY Change in US Weekly Oil Production



Source: EIA, SAF

Oil – DAPL ruling could come as early as this week

DAPL ruling could come any day

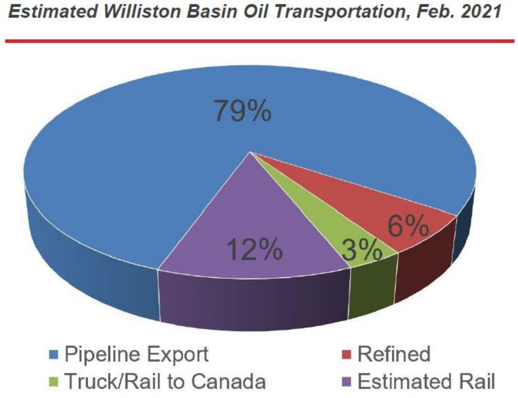
Looks like it is all coming down to District Court judge Boasberg to determine the fate of the Dakota Access Pipeline (DAPL), which could come as early as this week. (i) On Friday, the Bismarck Tribune reported on the federal appeals court ruling to deny a request from DAPL to reconsider the past ruling for a new environmental review. As a result, this means the Boarsberg ruling should decide its fate. The expectation is that this come as early as this week. (ii) Bismarck Tribune also reported the Standing Rock filed more arguments on Friday. We assume this is their final court brief that was to be due on or before April 26. We don't know if there will be a supplemental brief filed on Monday. (iii) The headline on the DAPL was on the Energy Transfer filings that included their view of the economic impacts that of a shut down of the line. Bloomberg wrote *"Fox said his tribe ships 60% of its oil on Dakota Access and would face losses greater than $160 million if the pipeline is offline for a year".* The decision possibly coming next week could determine if the pipeline is ordered to be shut until the environmental impact study is completed. Our Supplemental Documents package includes the Bismarck Tribune report. [LINK]

Oil – North Dakota offering free vaccinations to ~4,000 Canadian Truckers

North Dakota offering vaccinations to Canadian truckers

North Dakota announced this week that they will be offering free covid vaccines to Canadian truckers coming from Manitoba [LINK] as Canada continues to significantly lag the US in its vaccination efforts. The Wall Street Journal wrote *"Roughly 4,000 truckers could be vaccinated with the Pfizer Inc. and BioNTech SE or Moderna Inc. vaccines by American nurses and medical staff at clinics in the state, said North Dakota Gov. Doug Burgum. He said the program is a pilot, which could be expanded to include energy workers from the province of Saskatchewan who travel to North Dakota's Bakken oil fields".* Manitoba has only given one does to ~25% of its adult population while North Dakota has vaccinated over one half. Another reason why are doing this is that exporting oil via trucking is a significant to the Bakken. We don't have the split of how much of the oil exports are via truck vs rail, but if we assume that is 50/50, that means there are roughly 85 tanker trucks exporting North Dakota oil to Canada every day. In the most recent NDPA update, trucking oil to Canada was about 3% of overall transport or ~32,500 b/d. Half of that is 16,250 and each tanker truck normally carries 190 barrels per truck. We have to believe that a good percentage of the tanker trucks are driven by Cdn drivers, which is why it makes sense to offer the vaccine.

Figure 18: Estimated North Dakota Rail Export Volumes



Source: North Dakota Pipeline Authority

Oil – GoM production likely to remain low in 2021 with project delays and hurricanes

RBN GoM production expectations

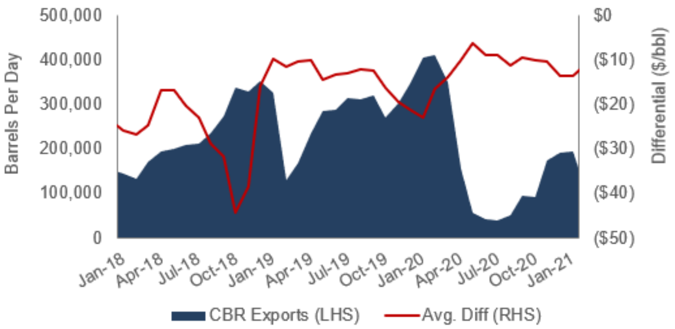
On Thursday, RBN posted a good reference blog "*What Do New Gulf Of Mexico Crude Oil Projects Mean For The Offshore Production Outlook?"* on new and planned offshore projects in the Gulf of Mexico [LINK]. GoM production had been hammered in 2020 not only because of covid related shut-ins but due to the record active hurricane season, falling 13% YoY in 2020 to 1.65 mmb/d. As a result, no major projects reached FID in 2020. Shell had been planning to announce on the Whale project FPU in the Alaminos Canyon area off the Texas coast but ahd pushed it back to 2021. The Whale project, operated and 60% owned by Shell (40% Chevron) is a significant project, which is expected to reach 100,000 b/d of production at its peak. The North Platte project (60% Total; 40% Equinor) was also delayed, with Total now expected to announce in in 2021 or 2022. A notable project expected to produce their first oil in 2021/22 include Shells 100,000 b/d Vito project off the Louisiana coast along with its 35,000 b/d Powernap subsea tieback project, and Bp's 140,000 b/d Mad Dog 2. But production from these projects will take a while to ramp up to peak, RBN wrote *"You might think that, as a group, these projects would give a big boost to GOM production this year and next, given that their peak output sums to more than 300 Mb/d. They will surely help increase offshore volumes, but it's important to point out that output from new projects typically starts low and ramps up only gradually".* Delayed additional projects along with the Colarado State University's initial hurricane forecast calling for an above normal hurricane season paints a picture of a slow ramp up of GoM offshore production. The EIA's forecast for 2021 GoM production is 1.71 mmb/d, only +60,000 b/d YoY and 2022 is expected to only be +40,000 b/d to 1.75 mmb/d. And an additional consideration is the results of the DOI federal leasing review and if it will result in a permanent ban of new leases. Our Supplemental Documents package includes the RBN blog.

Oil – Cdn crude by rail exports down 83,660 b/d MoM in February, down 73% YoY

Cdn crude by rail exports decrease MoM

The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were -83,660 b/d MoM in February to 111,871 b/d vs 195,531 b/d in January [LINK]. This puts February export volumes at -300,120 b/d YoY (-72.85%) vs February 2020 of 411,991 b/d. This is the first MoM decrease in 3 months. CBR volumes are +73,004 since the July bottom of 38,867 b/d. We expect CBR volumes to be similar in Mar, though the average WCS-WTI differential had lessened slightly. Below is our graph of Cdn crude by rail exports compared to the WCS – WTI differential.

Figure 19: Cdn Crude By Rail Exports vs WCS Differential



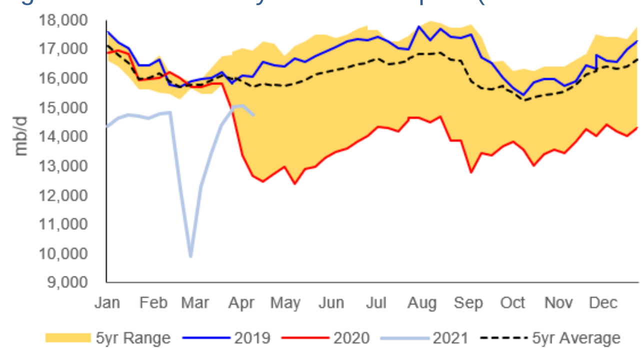
Source: Canadian Energy Regulator, Bloomberg

Oil – Refinery inputs -0.286 mmb/d YoY to 15.051 mmb/d

Refinery crude oil input still below 5 yr ave

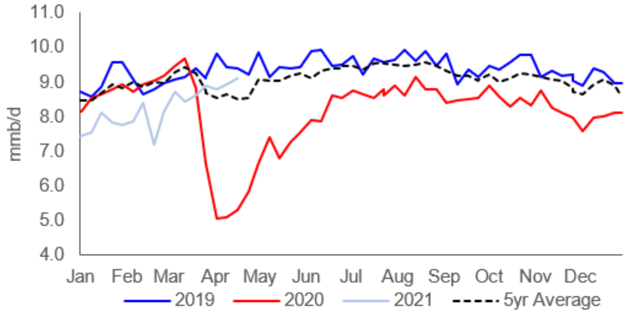
Crude inputs to refineries were down this week and were -0.286 mmb/d to 14.765 mmb/d, and are +2.309 mmb/d YoY, but still below pre Covid levels. Refinery utilization was flat this week, at 85.0%, which is +18.0% YoY. Total products supplied (ie demand) decreased this week and was -1.566 mmb/d to 18.762 mmb/d for the Apr 16 week, and motor gasoline demand increased, being +0.160 mmb/d to 9.104 mmb/d. Gasoline consumption in the US is expected to continue 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 20: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

Figure 21: US Motor Gasoline Supplied (mmb/d)



Source: EIA, SAF

Oil – Suncor upgrader maintenance delayed amid Covid outbreak

Suncor maintenance delayed amid Covid outbreak

It looks like Covid in the oil sands area is having an impact on Q2 turnarounds. This week, Bloomberg reported this maintenance has since been delayed to June amid a Covid outbreak in the area. On Monday, we tweeted [LINK] on the Bloomberg report that Suncor was delaying the start of the turnaround at its 130,000 b/d U2 upgrader that was originally schedule to start in May, but is now being pushed back to June "*Given the significant increase in COVID-19 cases in the Wood Buffalo region, the decision was made to stagger maintenance, with the bulk of the event beginning the first week of June".* Our March 7, 2021 Tidbits noted the initial Suncor notice [LINK] "*Our 2021 spring maintenance event is scheduled to begin in May at our Base Plant operation.*" Our April 11, 2021 Energy Tidbits warned on the risk for oil sands turnarounds to take a little longer than expected based on the Reuters story "*COVID-19 surge complicates busy maintenance season for Canada's oil sands*" that warns on the risk to the spring oil sands maintenance turnaround times are more likely to be longer than shorter. [LINK]. Our tweet noted the Fort McMurray Today report that the Covid outbreaks in the Wood Buffalo region (oil sands area around Fort McMurray) were now at 12, including 8 at oilsands sites and 1 at a work camp for oil sands workers. Its why our tweet also reminded that there is the likelihood that these oil sands turnarounds will take longer than expected. Our Supplemental Documents package includes the Bloomberg report on the delay.

Oil – BP Whiting 102k b/d coker remains offline, no timeline for return

BP Whiting coker shut since Apr 16

Last Friday (April 16, 2021) night, Bloomberg had reported that BP had shut the 102,000 b/d coker at its Whiting refinery. The coker had been shut for emergency heater repairs. We have been following this week and we still have yet to see a timeline for return as the coker remains offline. The BP Whiting refinery is in NW Indiana (right at the state line across from Chicago, Illinios) has a crude oil processing capacity of 435,000 b/d and is significant as a major destination for Cdn heavy/medium crude oil. And any extended downtime will impact Cdn differentials. The EIA estimates [LINK] BP Whiting imported ~287,000 b/d of Cdn crude oil in the Covid year of 2020 and 313,000 b/d in 2019.

Oil – US "net" oil imports down 0.417 mmb/d to 2.857 mmb/d

US "net" oil imports -0.417 mmb/d WoW

US "NET" imports were down 0.417 mmb/d to 2.857 mmb/d for the Apr 16 week. US imports were down 0.448 mmb/d to 5.405 mmb/d and US exports were down, being -0.031 mmb/d to 2.548 mmb/d. The WoW decrease in US oil imports was driven by decreases from Canada, Mexico, Iraq and Ecuador. Some items to note on the by country data. (i) Canada was down this week, and was -0.466 mmb/d to 2.901 mmb/d for the Apr 16 week, which is now ~0.800 mmb/d below the average levels in Jan/Feb of 2020. Also note that PADD 2 imports were also down, being -101,000 b/d and Canada is almost all of this market. (ii) Saudi Arabia was up 0.177 mmb/d to 0.358 mmb/d this week. (iii) Colombia down 98,000 b/d to 111,000 b/d this week. (iv) Ecuador was down 123,000 b/d to 172,000 b/d. (v) Iraq was down 189,000 b/d to 34,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico decreased 288,000 b/d to 0.451 mmb/d.

Figure 22: US Weekly Preliminary Oil Imports By Major Countries

	Feb 26/21	Mar 5/21	Mar 12/21	Mar 19/21	Mar 26/21	Apr 02/21	Apr 09/21	Apr 16/21	WoW
Canada	3,648	3,635	3,448	3,418	3,666	3,414	3,367	2,901	-466
Saudi Arabia	368	251	308	280	345	258	181	358	177
Venezuela	0	0	0	0	0	0	0	0	0
Mexico	602	362	278	618	494	635	739	451	-288
Colombia	285	286	0	92	122	258	209	111	-98
Iraq	68	141	165	105	88	245	223	34	-189
Ecuador	114	59	127	132	247	284	295	172	-123
Nigeria	89	0	44	161	86	161	129	71	-58
Kuwait	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0
Top 10	5,174	4,734	4,370	4,806	5,048	5,255	5,143	4,098	-1,045
Others	1,118	921	953	816	1,097	1,009	709	1,307	598
Total US	6,292	5,655	5,323	5,622	6,145	6,264	5,852	5,405	-447

Source: EIA, SAF

Oil – AMLO reminds Mexico plans to stop exporting oil

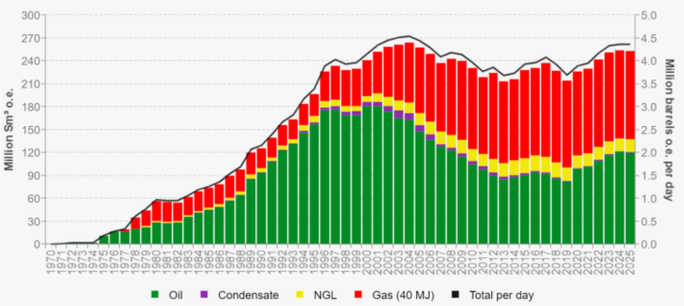
AMLO's speech at Biden climate summit

We have been highlighting Mexico President AMLO's stated plan is for Pemex refining crude oil inputs to increase to levels that will mean that all Mexico crude oil production will be refined in Mexico and thereby eliminating all Mexico oil exports. We don't think AMLO hits his target, but he is putting Mexico on a path to eliminate Mexico oil exports and this trend, even if the timing is a little slower, is a positive for Cdn heavy/medium oil. Our Dec 27, 2020 Energy Tidbits wrote "*On Wed, we tweeted [LINK] on the big potential relative upside to Cdn heavy oil in 2021/2022 from Mexico's target to effectively eliminate oil exports by the end of 2022. It didn't get much attention, but we thought Mexico President Obrador (AMLO) Wed morning press conference included him boldly stating that Pemex was on track to meet his #1 oil objective – eliminate the need for Mexico to import gasoline (distillates, etc) before the end of 2022*." AMLO's speech at the Biden climate summit raised some eyebrows for how it opened. AMLO said "*I begin by explaining that, although we have discovered three large hydrocarbon deposits, the oil that we are discovering will basically be used to meet the demand for fuels in the domestic market and the practice of exporting crude oil, crude oil, and buying gasoline will end. In this way, we will help avoid the excessive use of fossil fuels*." Climate changers were shaking their head. Our Supplemental Documents package includes the AMLO transcript. [LINK]

Oil – Norway oil production of 1.773 mmb/d, 0.7% lower than forecast

The Norwegian Petroleum Directorate released its March production figures [LINK] of 1.792 mmb/d of oil, which is +3.9% YoY, but -1.1% MoM from February at 1.773 mmb/d. This was only a slight deviation from the forecasted amount of 1.785 mmb/d, and 0.7% lower than the forecast so far this year. The story for Norway was that its oil production returned to growth in the last 3 years because of the Johan Sverdrup oil field and that Johan Sverdrup oil is expected to produce at higher than expected levels. Below is the NPD's historical and forecast production graph as of Feb 17 [LINK]. Our Supplemental Documents package includes the NPD update.

Figure 23: Historical and expected production in Norway, 1970-2025



Source: Norway Petroleum Directorate

OPEC+ meeting Apr 28

Oil – Next OPEC+ meeting is Wed Apr 28

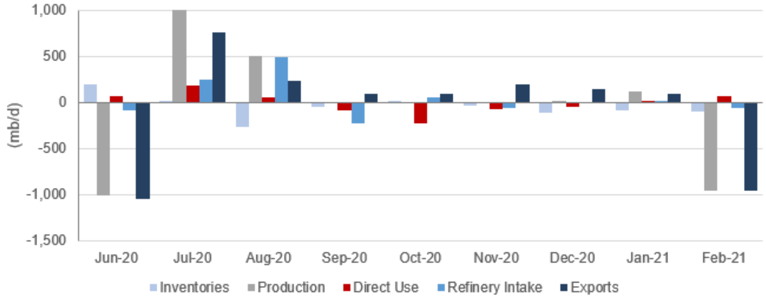
There was some chatter that OPEC+ would not have a full ministerial meeting as planned this week with the market chatter that there was no need to change the decision of the planned increases in oil production. But Novak squashed that chatter by confirming OPEC+ would have both its Joint Ministerial Monitoring Committee (JMMC) and full ministerial meeting on Wed Apr 28. Novak was widely quoted saying "*We met a month ago, we discussed our action plan for the (next) three months. So, if nothing extraordinary happens, our task will be to confirm these plans and to tweak the new ones*.,"

JODI data for Feb

Oil –Saudi oil stocks 134.6 mmb at Feb 28, lowest level seen in our 17 yrs tracking

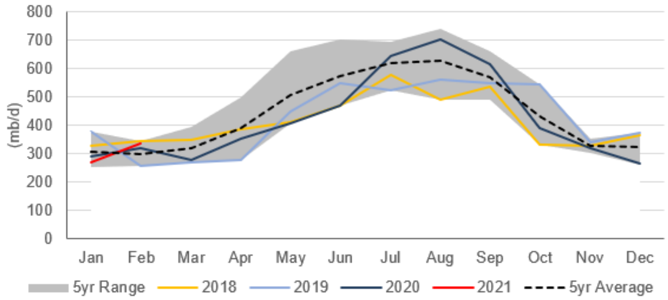
We couldn't help tweet [LINK] on the JODI data for Saudi Arabia oil production, exports, oil used for electricity and oil stocks as of Feb month end. It wasn't because there were surprises in the data. Rather we tweeted "*Kudos to @MoEnergy_Saudi Abdulaziz for leadership in rebalancing of #Oil markets. #JODI data Saudi crude oil inventories 134.6 mmb at Feb 28/21. Vs pre #OPEC+ cuts 156.2 mmb at Mar 31/20. vs recent peak 329.4 mmb at Oct 31/15. Lowest since our Jan 1/04 tracking #OOTT*." Basically its that Saudi Arabia has done an amazing job of leading the oil market to rebalance. And the data supports that they are delivering on lower oil production. The JODI data update for February, as expected, showed a decline of ~1 mmb/d in production and exports as Feb was the first month of the Saudi voluntary 1 mmb/d cut. Again, there is +91,000 b/d of unaccounted for supply based on the JODI data, slightly lower than the +110,000 b/d unaccounted for supply in the Jan data. (i) Production was -956,000 b/d MoM to 8.147 mmb/d due to Feb being the first month of the additional 1 mmb/d voluntary cut. Exports were down in lock step with production, being -957,000 MoM to 5.625 mmb/d. Direct use for electricity was up with warmer MoM temps, being +66,000 b/d to 335,000 b/d. Inventories declined 2.632 mmb or 94,000 b/d to 134.575 mmb. Refinery intake for Feb fell 62,000 b/d to 2.281 mmb/d. (ii) Production in Jan was down -956,000 b/d to 8.147 mmb/d. With production being -956,000 b/d, we would assume exports would be down and they were at -957,000 b/d. However, there is +91,000 b/d of net supply (production + inventory changes) that is unaccounted for in the reported data. MoM decrease of net supply consists of production -956,000 b/d and inventories down 94,000 b/d MoM. Net uses were direct use for electricity +66,000 b/d MoM, refinery intake - 62,000 b/d MoM. Net supply is -862,000 b/d MoM, yet exports are -957,000 b/d MoM which means 91,000 b/d of net supply is unaccounted for. Below are our updated graphs for the Saudi JODI data for Feb.

Figure 24: MoM Saudi Inventories, Production, Direct Use, Refinery Intake & Exports



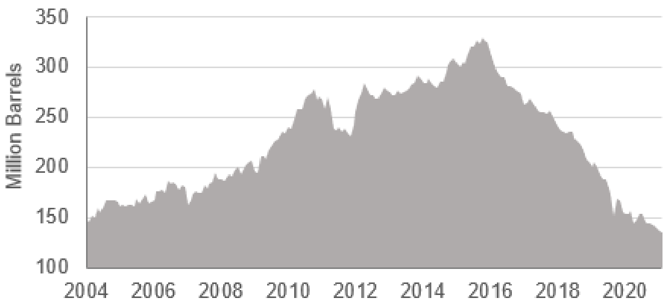
Source: JODI, Bloomberg

Figure 25: Saudi Arabia Direct Use of Crude Oil For Electric Generation



Source: JODI

Figure 26: Saudi Arabia Crude Oil Inventories (million barrels)



Source: JODI

Oil – Reminder even Israel's Iron Dome doesn't have 100% success

We have seen in Saudi Arabia that missile defense systems are not 100%. Israel's Iron Dome is thought to be the best missile defense system, but we saw a reminder this week that even the Iron Dome is not 100% successful. On Thurs, a Syrian missile apparently made its way thru the Iron Dome and exploded in mid-air over Israeli airspace [LINK]. The reports were that the missile hit nearby but not at the nuclear reactor in Dimona. Pieces of the SA-5 surface to air anti aircraft missile had landed some 40 km from a nuclear reactor in Dimona. Syrian air defence units had fired a large number of anti-aircraft missiles in response of Israeli airstrikes. Israel had attempted to intercept the missile, but failed to do so. The Israeli radar detected that the missiles was on a trajectory to land in the Northern Negev desert which prompted air defence troops to fire an interceptor missile at it, which had missed. The military is launching an investigation into how the interceptor failed and does not believe the incident was a deliberate attack on the country or the nuclear reactor. While it is fortunate

Reminder even Israel's Iron Dome doesn't have 100% success

there were no injuries or significant damage from the debris, the incident is a reminder that even the Israeli Defence Forces' interceptor fails. Our Supplemental Documents package includes the Times of Israel report.

Oil – Continued progress towards a return to the JCPOA

Continued progress to the JCPOA

As of our news cut off at 7am MT, there really haven't been any major developments or changes of views as to the potential for a return to the JCPOA. Rather, all of the reports this week from all sides were essentially the same – discussions have been positive, items are being resolved, there are still key items to be resolved but the parties seem to be pointing to a return to the JCPOA potentially in May. We have been highlighting the key developments that seemed to start 9 days ago with the Biden's comments that were then followed by reports of the US making some movements. And then all the comments from EU officials, Russia and Iran all seem to point to this continued progress towards a return to the JCPOA. We still believe that the likely result is a return to the JCPOA and additional Iran barrels back on the market in the summer.

Oil – Libya experiencing some interruptions in its return to normal

Libya production dropped to <1 mmb/d

The last week has seen multiple signs that the new fight in Libya has moved away from guns and back to a fundamental problem – how to get a fair allocation of money. As a result, this is causing a pull back in oil production and other items. (i) The initial ramp up of Libya oil production and exports in late 2020 was at a rapid pace, however the pace slowed dramatically as the low hanging fruit was picked and issues stemming from neglected infrastructure began to limit production. On Monday, the Libya NOC announced [LINK] force majeure at it's 110,000 b/d Hariga port in eastern Libya. The NOC wrote in its release *"this announcement comes due to the Central Bank of Libya's refusal to liquidate the oil sector budget for long months, which led to an exacerbation of the indebtedness of some companies and It was headed by the "Arab Gulf Oil Company", which made it lose the ability to fulfill its financial and technical obligations and forced it to reduce the country's production of crude oil by about 280 thousand barrels per day".* Additionally, Bloomberg reported that Sirte Oil Co's production has dropped ~20,000 b/d due to lack of funds for maintenance. The delayed funding release has caused Libya oil production to fall below 1 mmb/d from ~1.29 mmb/d prior to the closure of Hariga. Additionally, the Libya NOC wrote *"It is noteworthy that what has been received to date is less than 2% of the needs of the corporation and its companies to achieve the targets set for the year 2021".* Libya is targeting production of 1.45 mmb/d for 2021, which now looks doubtful. Also, reports that the PFG (Petroleum Facilities Guard) are also having pay disputes but haven't yet shut production. (ii) Yesterday, the Libya Observer reported [LINK] "*the Head of the Audit Bureau, Khaled Shakshak said on Friday that state officials were incapable of persuading certain hostile forces present in Sirte to permit straightforward maintenance of transmission lines, in order that the General Electricity Company of Libya (GECOL) could begin to transfer 600 megawatts from Al-Sarir station. Shakshak stated that this energy will, unfortunately now be lost in the coming summer peak season for electricity demand."*

Oil – India oil imports down 6% YoY to 4.47 mmb/d in March

India March crude imports down 6% YoY

This week, India's Petroleum Planning and Analysis Cell released crude oil import data for March [LINK]. Total crude oil imports decreased 6% YoY in March to 4.47 mmb/d and up from 3.99 mmb/d February. Crude imports since April are down 12.7% YoY. Petroleum products demand for April 2020 to March 2021 year was ~91% of the previous years demand. Refiner throughput in March was -1.0% YoY to 4.97 mmb/d, up slightly from Feb of 4.87 mmb/d which was -11.8% YoY. Processing volumes are 12.8% below YoY level for April to Mar 2021.

Oil – Vitol keeps its peak oil demand not until 2030 view

Vitol bullish on near term oil

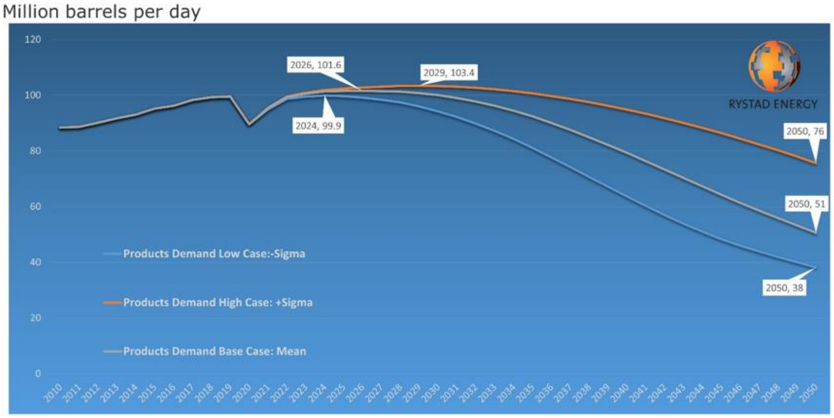
The accelerating energy transition push has brought many peak oil demand calls recently, notably in 2020. Our April 11, 2021 Energy Tidbits noted that Vitol stated in their 2020 volumes and review report which had stated *"We continue to believe that demand for oil will not peak for another decade".* Blooomberg posted two stories on their interview with the Vitol CEO including the commentary "*Looking ahead, Vitol is still expecting oil demand to increase; "we've got it peaking around 2030," before decline sets in: Hardy * "If you fast-forward to 2050, the oil market's going to look very different" amid the energy transition."* And Vitol remains very bullish on the near term prospects for oil markets. They expect demand to increase 7-8 mmb/d by the end of 2022 from its estimated current level of 3.5 mmb/d below pre-covid levels, which may be a challenge for producers. Bloomberg wrote *""We will need all eight cylinders to get through 2022," Hardy said. "We believe $70 to $75 a barrel is an entirely sensible outcome for the third quarter," he said, making a rare specific call on oil prices".* They expect demand to rebound by year end but are still uncertain given increasing cases in India and elsewhere. Vitol expects jet fuel demand to remain down 1.5 mmb/d vs pre-covid with the 1.5 mmb/d hole being filled by an increase in demand for other products like petrochemicals. Additionally, on Vitol's call for storage, Bloomberg wrote *"Hardy said more than half of the 1 billion barrels of excess oil stocks squirreled away in response to the market collapse in 2020 have already been drained".* As noted above, Vitol believes that the expected demand growth means that producers will have to be growing production even with the ~1.5 mmb/d of Iran production currently hitting the market. Our Supplemental Documents package includes the Bloomberg reports.

Oil – Rystad calls for peak oil demand in 2026 at 101.6 mmb/d

Rystad peak oil demand call

Another updated peak oil demand call was put out this week, with Rystad calling for peak oil in 2026 [LINK], but this time, it was Rystad moving forward their estimate of when peak oil demand will hit. Rystad now expects that oil demand will peak at 101.6 mmb/d in 2026 before plateauing and declining below 100 mmb/d post 2030. Rystad wrote *"Oil demand will evolve in three phases. Through 2025, oil demand is still affected by Covid-19 impacts and EVs are still slow to take off, then from 2025-2035, structural declines and substitution impacts -especially in trucks - take hold, and then finally, towards 2050, the recycling of plastics and accelerated technologies in maritime will be the final transition leg bringing oil demand further down towards 51 million bpd in 2050 in our Mean Case".* The road transport demand slice is expected to be the quickest and largest decline for oil demand, with Rystad expecting that EV penetration in the passenger vehicle market is expected to reach 96% by 2050 from the estimated 6% currently. Trucking is expected to be electrified slower, with adoption meaningfully picking up in mid 2030s. Petrochemical demand is also expected to continue to grow to the mid 2030s alongside per caipta plastic consumption until plastic recycling rates grow significantly from 5% currently to 75%-80% as observed in glass and metals. What is interesting to note is that Rystad expects that jet fuel demand will continue to grow till at least 2050 as no viable substitutes have been developed. Rystad's previous peak oil demand forecast released in Oct 2020 had peak demand of 102.2 mmb/d in 2028 and prior to covid had peak demand at ~106 mmb/d in 2030. Our Supplemental Documents package includes the Rystad blog.

Figure 27: Rystad Long-Term Oil Demand Forecast



Source: Rystad

Oil – Vortexa floating storage +3.4% WoW, down 48% from June 2020 peak

Vortexa and Braemar floating storage

Bloomberg reported on Vortexa floating oil data that showed a WoW increase of 6.09 mmb or +3.40% WoW to 111.99 mmb on April 16 from 108.28 mmb on April 9. Vortexa revised up the previous week's level from 105.81 mmb to 108.28 mmb, so would have been +5.8% vs the original. Floating storage is down 48.24% since the June 19, 2020 peak of 216.38 mmb. The U.S. Gulf Coast was down 58% WoW to 0.855 mmb, while West Africa was up 91% WoW to 6.20 mmb. Bloomberg later reported on the Braemar data. Braemar doesn't estimate the barrels of oil in floating storage but notes there was an increase of 15 VLCC in floating storage to 45, which is the highest since late January. Total tankers of 229 as of Apr 19 is flat WoW. Our Supplemental Documents package include the Bloomberg Vortexa report.

Figure 28: Vortexa Global Floating Storage Level (5yr)

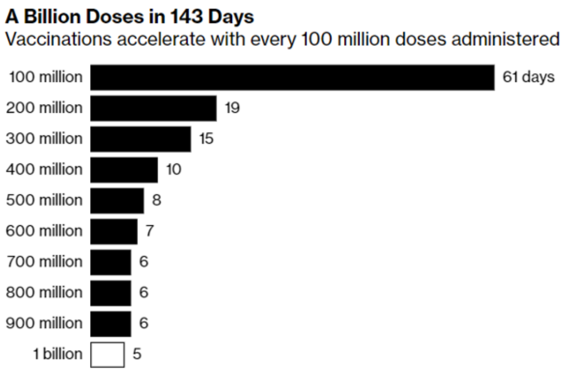
Source: Bloomberg, Vortexa

Oil – Global vaccinations now ~18.3 mm doses/day

Vaccinations now ~18.3 mm doses per day

Earlier this morning, we tweeted [LINK] on an excellent Bloomberg global vaccination update yesterday "The First Billion Doses" [LINK]. No question that the exploding Covid cases in India are hitting India's people and economy, and this will impact global oil demand. But the reason why oil markets are looking thru India is global vaccinations are now averaging 18.3 mm doses per day. Bloomberg also highlighted there were 100 mm doses in the last 5 days. Its why we tweeted "*Here is why #Oil markets believe a return to normal is coming in 2021 despite #Covid breakouts in India, Brazil. Global vaccinations now average 18.3 mm/day. Must read and great recap by @tsrandall @cedricsam @andretartar #OOTT* ". It something we forget in Canada as we badly lag other western economies in vaccinations and are not showing any indications for a reopening. But oil markets can see what is happening in the US with broader vaccinations and realize that 18.3 mm doses per day is a reason to see a return to normal in 2021. Bloomberg noted the acceleration of doses per day, which makes sense as there are more vaccines available and countries continue to improve their vaccination doses per day processes. There is still risk, or at least we believe the biggest risk is that a massive outbreak in India leads to variants that are resistant to the vaccines. But if or until that risk emerges, increasing global doses per day will lead to a reopening. Our Supplemental Documents package includes the Bloomberg report.

Figure 29: Bloomberg's Recap of First Billion Doses

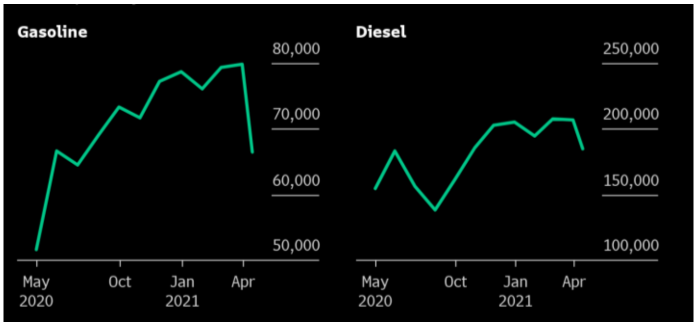


Source: Bloomberg

Oil – Bloomberg Oil Demand Monitor: India fuel demand dropping with Covid increase

We recommend reading the weekly Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. While gasoline demand in India rose to a four-month high in March and was trending upwards, first-half April gasoline sales were down 5% MoM. Due to lockdowns in multiple cities, driving has decreased in the country. Diesel, LPG and aviation fuel sales have also decreased, with India's airline seat capacity falling by 9% this past week, now 23% below its 2019 equivalent week. Due to India's massive population, vaccination has been a difficult task. Only 8% of India's population has been given at least one dose of the COVID-19 vaccine vs 40% in the US has received at least one dose. US traffic volume on interstate highways during the first week of April was marginally above the same 2019 week, and gasoline demand is now only 5% below 2019 levels. In Europe, demand continues to be mixed. London was the only major capital in Europe in which congestion levels surpassed the equivalent 2019 week, and this showed up in gasoline consumption. Gasoline consumption on April 11 was +14% MoM. The 5 largest cities in Western Europe experienced a modest increase in congestion after the Easter Holiday, but since then have dropped due to coronavirus restrictions hindering commuter movements. Again, we are seeing vaccine rates influence oil demand: 49% the UK population have had at least one dose of the vaccine, whereas the proportion in France, Germany and Italy is about 20%. In China, congestion remains above 2019 levels, and levels in NYC and LA on Monday morning were both 40% below. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 30: Indian Fuel Sales (tons per day)



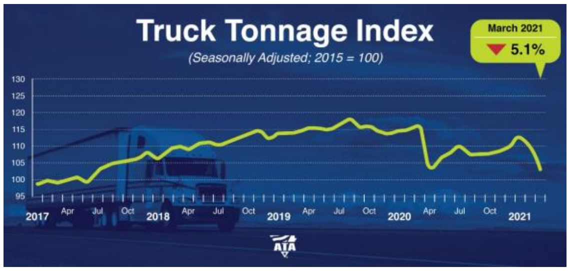
Source: Bloomberg

Oil – March truck tonnage -5.1% MoM, down 9.5% YoY

Truck tonnage index -5.1% MoM in Mar

We have to believe supply chain issues are the reason for the surprise MoM decline in trucking tonnage. The US success in vaccinations is opening more of the economy and this should lead to increasing trucking tonnage, not MoM declines. 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. However, the March data was a surprise and down MoM, the Chief Economist of the ATA remains constructive on tonnage going forward. On Tuesday, the American Trucking Association released its monthly Truck Tonnage Index which decreased 5.1% MoM in March after a 2.3% MoM decrease in February which had been revised up from a decrease of 4.5% as previously reported [LINK]. The March reading is -9.5% YoY vs Feb of -3.8% YoY. The ATA wrote *"March's drop comes as somewhat of a surprise,"* said ATA Chief Economist Bob Costello*. "I certainly heard from many fleets that the end-of-quarter rush was good, but early March was soft. Truck freight volumes were also negatively impacted by supply chain issues from the lack of microchips and other inputs. That said, this surprise to the downside does not change my positive outlook going forward."* Our Supplemental Documents package includes the ATA monthly update.

Figure 31: Truck Tonnage Index



Source: American Trucking Association

Oil – US State Dept posts Do Not Travel to a massive list of countries

US Travel Advisories

On Tuesday, the US State Department published an updated massive list of do not travel advisories [LINK]. The list was not just comprised of countries like India, who is currently experiencing a large outbreak, it included basically every country in the world – including Canada. Everyone is assuming that international air travel will pick up, albeit slowly. And we think the massive list of do not travel new countries for US travellers will support that slow pick up scenario for international air travel. Our Supplemental Documents package includes the list of countries included in the travel advisory.

Energy Transition – Trudeau's climate speech is a big warning to oil & gas

Trudeau's speech at Biden summit

We believe Cdn oil and gas companies should be aware that the Liberals are setting up for much more emissions reductions actions beyond what was in their Monday budget. Later in the memo, we provide some comments on the budget. But our concern is what wasn't in the budget. Its not so much that the Liberals didn't put their new climate ambitions in the Monday budget, but saved the announcement for the global stage of Biden's climate summit on Thursday. We just thought Canadians needed to hear this ambition in the budget and how it affected the budget and not have to wait for Biden's summit. Trudeau announced "*Our new climate target for 2030 is to reduce our 2005 emission levels by 40 to 45%."* The part that is most disappointing is that there is much more in the Trudeau speech that wasn't in the budget and it can only be interpreted as indicating there will be more hits on oil and gas to come. Just look at what Trudeau said, he isn't hiding this intention. Its why we tweeted [LINK] "*1/2. Cdn #Oil #NatGas note what wasn't in the budget. @JustinTrudeau @POTUS summit "we will make it law to respect our new 2030 target and* achieve net-zero emissions by 2050" "we will continually strengthen our plan .... #OOTT" and [LINK] "*2/2 ".. and take even more actions on our journey to net zero" "not going to stop until we get to 100%" emissions free electricity. Its why there will be more hits to come on #Oil #NatGas, they will say its the law. #OOTT*". Walk thru his statements. They plan to make it the law that Canada has to be on track for the Liberals 2030 emissions targets. This means that the future messaging will be that the Liberals have no choice but to take harder future emissions actions as it is the law. They will be just obeying the law as they will be obligated to obey the law. Then after introducing the new 2030 targets, he clearly says they will continually strengthen their plan and take even more actions to their Net Zero. And then he *says "In Canada, we've worked hard to get to over 80% emissions-free electricity, and we're not going to stop until we get to 100%."* Note this last comment, these speeches are written carefully especially a speech on a major global stage, and he said "*emissions free*" and not net zero emissions electricity. It seems like this language is carefully written to exclude any fossil fuels as they are not emissions free even if they are linked to CCS. Recall in Liberals big Dec 2020 climate announcement [LINK], Liberals said ""*Work with provinces, utilities and other partners to ensure that Canada's electricity generation achieves net-zero emissions before 2050*." There is no way Trudeau changed the language unless he meant to do so. And this is a major change as it would seem to indicate his plan to eliminate all fossil fuels used for electricity. Our Supplemental Documents package includes the Trudeau speech. [LINK]

Energy Transition – IEA warns "gap is getting wider" in meeting emissions reduction

IEA warns on energy transition

We are surprised by how many are now just realizing that world is nowhere it needs to be to reach Net Zero emissions reduction targets. Maybe everyone just needed to hear it said by multiple people this week at Biden's climate summit. This is despite the IEA hammering the table on this point for the past year. On Friday, we tweeted [LINK] on the blunt but politely delivered comments from IEA Executive Director Faith Birol at Biden's climate summit on where the IEA sees the world in terms of moving to Net Zero – its nowhere near where it needs to be to hit 2050 emissions reductions targets. Birol made two key points on the status for emissions reductions – "*Right now, the data does not match the rhetoric – and the gap is getting wider"* and "*However, IEA analysis shows that about half the reductions to get to net zero emissions in 2050 will need to come from technologies that are not yet ready for market. This calls for massive leaps in innovation. Innovation across batteries, hydrogen, synthetic fuels, carbon capture and many other technologies".* This should not be a surprise to anyone. A year ago, the IEA identified that the world was far behind in most of the critical energy technologies to reach the emissions reduction targets under the Paris Agreement and now the Net Zero emissions reduction targets are tougher. Birol also noted that the IEA will be releasing its new roadmap on May 18 and our tweet said we expect it will have a similar status report on emissions reduction targets as it did in their May 2020 analysis. Our Supplemental Documents package includes the Birol speech. [LINK]

IEA warned a year ago the world was far behind on energy transition

Our Friday tweet also referenced the IEA's work from a year ago noting the world was behind on critical energy technologies need to reach Paris Agreement targets and that Net Zero targets are even tougher. Our tweet included an excerpt from our June 11, 2020 blog "*Will The Demise Of Oil Take Longer, Just Like Coal? IEA and Shell Highlight Delays/Gaps To A Smooth Clean Energy Transition*". [LINK] Our June 11 blog wrote "*The IEA reminds the energy transition has many "critical energy technologies", the vast majority of which are not on track. There was an excellent illustration of the many significant areas, or major pieces of the puzzle, involved in an energy transition by the IEA last week. The IEA also noted the progress of each of the major pieces and the overall conclusion is that the vast majority of the pieces are behind or well behind where they should be to meet a smooth timely energy transition. It is important to note that these are just what the IEA calls the "critical energy technologies" and does not get into the wide range of other considerations needed to support the energy transition. The IEA divides these "critical energy technologies "into major groupings and then ranked the progress of each of these pieces in its report "Tracking Clean Energy Progress" [LINK] by on track, more efforts needed, or not on track*". Our blog included the below IEA table. Our Supplemental Documents includes our June 11, 2020 blog.

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

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

Source: IEA

🟢 On Track 🟡 More Efforts Needed 🔴 Not on Track

Source: IEA

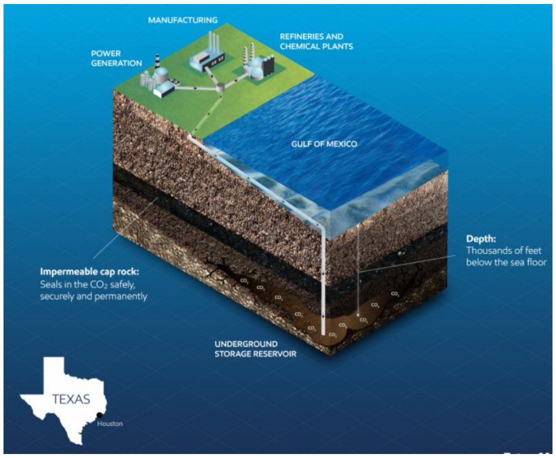
Energy Transition – Exxon proposes $100b CCS project in Houston

Exxon proposes massive co-invest CCS project

We have been waiting to see CCS linked to the Gulf of Mexico and, on Monday, Exxon announced that they are exploring the possibility of a massive CCS project in the Houston

Ship Channel tied in to various refineries and plants along the channel [LINK]. The system would be a multi-user CCS hub that would gather and transport the emissions into from the Houston industrial area to formations under the Gulf of Mexico. Exxon wrote *"It would be a huge project, requiring the collective support of industry and government, with a combined estimated investment of $100 billion or more".* Given the massive dollar investment for this and the call from Exxon for the *"collective support of industry and government"* its likely no accident that this was announced the same week as Biden's climate summit. Exxon also wrote *"It will need collaboration among federal, state and local officials – the "whole of government" approach the Biden Administration has championed. It will need business support from across industries and community support. It will need government and private-sector funding, as well as enhanced regulatory and legal frameworks that enable investment and innovation".* Exxon expects that this project could capture and store ~50 mm metric tons of CO2 annually by 2030, and 100 mm metric tons by 2040. As we have highlighted in the past, there is the issue of economics/cost competitiveness for CCS so for a project like this significant policy support for CCS would be needed. Exxon wrote *"Government should establish a durable regulatory and legal environment, and implement policies to enable CCS to receive direct investment and incentives similar to those available to other efforts to reduce emissions".* Our Supplemental Documents package includes the Exxon release.

Figure 33: Exxon-Proposed Houston CCS Project



Source: ExxonMobil

Energy Transition – US army looking at going all electric combat vehicles

US Army planning 225,000 electric vehicle fleet

This may not be a passenger EV development but we are gong to watch with interest what the US does on electrifying its armed forces of mobile vehicles. Its not clear if this includes tanks (we think not), but it does include the Humvees, etc. Because if the US Army can be comfortable with the range, performance and dependability, it will be a big confidence boost. The US Army operates in every climate in the world and the last thing the US Army can have is an inability to fuel its vehicles. On Thursday, the US Army announced that they have picked a consortium of companies to help advance the future electrification of the Army's ground vehicle fleet [LINK]. Defense News wrote *"the service tries to tackle how to power a future fleet of roughly 225,000 electric vehicles while operating out in the field where infrastructure for such capability would likely not exist".* The companies chosen specialize in a wide range of EV related technology including electrical control systems, energy consumption reduction, and fast charging. Part of the reason for this push from the Army is to limit the burden associated with the movement of fuel through the battlefield and other logistical challenges with parts and maintenance.

Energy Transition – UK study: EVs still too expensive to make the switch

EVs too expensive to make the switch

Despite the massively accelerated push from governments and companies for the energy transition, there remains reluctance among consumers who are ultimately going to bear some of the transition costs. According to a study by the AA-Yonder Driver Poll [LINK], a significant amount of UK drivers do not plan on switching to electric vehicles ahead of the 2030 UK ban on petrol cars. Among those who wouldn't consider buy EVs, 87% of drivers cited that current models were too expensive. Price was not the only stumbling point, 52% of those refusing to make the switch were concerned that the national grid would not be able to handle the demand if everyone drove EVs, and 70% said that charging an EV took too long. This reluctance is apparent in the numbers, as according to the RAC, only around 80,000 of the 23 million licensed vehicles (less than 0.5%) on the UK's roads are privately-owned electric vehicles [LINK].

Energy Transition – Many emissions cuts are actually passing on emissions to others

Emissions cuts are often just passed on to others

We continue to highlight that the underappreciated aspect of Net Zero commitments is that it sets interim emissions reduction targets and that action is needed to be taken starting right now. And the related reality check is that its hard to make any significant immediate emissions reductions from basic changes in operations. Rather any significant immediate reduction comes from asset sales. Last week's memo noted Shell's base line reference for carbon will be 2016, which is the year before they sold their Cdn oil sands to CNQ. This week, "*Alaska Airlines commits to carbon, waste and water goals for 2025, announces path to net zero by 2040*" [LINK] fit exactly this concept. Alaska commits to reduce its *"carbon emissions to net-zero by 2040, and commitments across carbon, waste, and water impacts by 2025."* No surprise that the road map includes fleet renewal. Its why we tweeted [LINK] "*#NetZero. Reality check on how one company makes near term sizeable cuts in emissions - pass emissions to others. #BigOil sells #Oil production. Unless $ALK scraps a young fleet, replacing older planes w/ fuel efficient planes will mean a sale #OOTT."* Alaska said "*With a recent Boeing 737 MAX order, Alaska's newest aircraft have 22% better fuel-efficiency on a seat-by-seat basis than the aircraft they replace*". The reason for our tweet was that we looked at Alaska Airlines Jan 2021 fleet recap and it showed a relatively young fleet, which meant that it was highly unlikely they would be scrapping the replaced planes, rather likely selling the less fuel efficient planes to someone else to fly. Our tweet included the Alaska Airlines fleet update as of January 2021. Interestingly in the last two days, Alaska updated it to an April 2021 fleet recap that doesn't look significantly different in terms of average age of fleet. Our Supplemental Documents package includes the Alaska Airlines announcement and January 2021 fleet recap.

Energy Transition – ~50% of waste incineration emissions are unaccounted for

Europe is questioning its support of Waste to Energy

It was interesting to see the Treehugger negative story on waster to energy. Treehugger is an environmental website and tends to be positive on most everything that isn't fossil fuels. We have noted before and we continue to be surprised how items like biomass burning and waste to energy have been getting such strong support from the climate change side. The energy transition push has been a very significant item for European countries, however emissions from incinerators (or waste-to-energy) has been largely ignored [LINK]. Denmark has over 22 WTE plants and imported a million tonnes in waste from the UK and Germany in 2018 to burn for electricity. The catch is that half of the CO2 produced by waste-to-energy facilities are ignored in reported data. Treehugger wrote *"This doesn't "count" because, as the International Energy Agency explains, "burning fossil fuels releases carbon that has been* *locked up in the ground for millions of years while burning biomass emits carbon that is part of the biogenic carbon cycle." Plastics, on the other hand, are treated as fossil fuels that took a short side trip through your water bottle".* According to the Environmental Protection Agency, burning municipal waste puts out more CO2 per tonne than burning coal. As a result, Denmark has decided to reduce its waste burning and increase its recycling. However, WTE is continuing to expand elsewhere, and it is projected to grow at a CAGR of 6% from 2020 to 2027. Our Supplemental Documents package includes the Treehugger report.

Energy Transition – Many tidbits from the global leaders opening statements

Leaders at Biden's summit

The leaders speeches at the Biden summit more or less were divided in to three categories. One was to announce new emissions targets like Canada and the US at the summit. The second was speeches that sounded defensive of where a country was on the energy transition. The third was more common and we have to give the world leaders credit for making the most of their 5 minutes. These other speeches noted their country's climate progress/ambitions but then made sure to appeal either directly or indirectly for why energy transition capital should come to their country. We made a point of listening to he opening session at the Biden climate summit to hear all the leaders speak and give their 5 minutes sales pitch on their country's role in dealing with climate change. We saw a number of announcements of new targets such as Brazil, Canada, etc. But there was also many great insights on dealing with emissions that will be some of the most important emissions reduction themes/capital allocation areas, areas that are trying to be elevated into that category, areas that countries are setting up to defend their emissions reduction focus, etc. There were many excellent insights. Below we note a few of them. Most of all, these will be items that are prominent in the emissions reductions discussion in the lead up to COP-26 in Glasgow in Nov. Note that we ran out of time this weekend so were only able to write up some of the insights ie. we didn't get good comments from Putin.

Australia aims to have cheapest clean hydrogen

Australia PM Morrison's sale pitch focused on hydrogen. Australia already has hydrogen supply chain projects with Japan such as the Hystra pilot project [LINK]. Morrison was giving the sales pitch that included a key advantage – Australia's ambition is to have the cheapest clean hydrogen in the world. Morrison said "*We are investing around $20 billion to achieve ambitious goals that will bring the cost of clean hydrogen, green steel, energy storage and carbon capture to commercial parity. We expect this to leverage more than $80 billion in investment in the decade ahead. In Australia our ambition is to produce the cheapest clean hydrogen in the world, at $2 per kilogram Australian. Mr President, in the United States you have the Silicon Valley. Here in Australia we are creating our own 'Hydrogen Valleys'. Where we will transform our transport industries, our mining and resource sectors, our manufacturing, our fuel and energy production."* Morrison didn't say it, but Australia will have one other key advantage vs other countries aspiring to be hydrogen exporters to Asia – just like for LNG, Australia is closest by a significant distance. Australia is probably 40% less distance to China and Japan markets than Saudi Arabia. Saudi Arabia aspires to be a global hydrogen leader. Below is a table we have used before on relative LNG shipping distances. Saudi Arabia distance to Japan and China is essentially the same as Qatar. Our Supplemental Documents package includes the Morrison speech. [LINK]

Figure 34: Comparative Shipping Distances

LNG Shipping Distances (nautical miles)

	Japan (Tokyo)		Korea (Inchon)		India (Hazira)		London (Kent)		Spain (Huelva)	
Origin	Distance	Days	Distance	Days	Distance	Days	Distance	Days	Distance	Days
Kitimat	4,056	13.0	4,785	15.3	9,395	30.1	9,049	29.0	8,589	27.5
Mozambique (Quelimane)	7,514	24.1	7,190	23.0	3,476	11.1	6,202	19.9	7,370	23.6
Qatar (Doha)	6,538	21.0	6,178	19.8	1,252	4.0	5,090	16.3	6,259	20.1
Nigeria (Bonny)	10,681	34.2	10,357	33.2	7,052	22.6	4,263	13.7	3,278	10.5
GOM (Sabine)	9,214	29.5	10,003	32.1	9,615	30.8	4,822	15.5	4,556	14.6
Australia (Broome)	3,398	10.9	3,445	11.0	3,931	12.6	9,522	30.5	8,353	26.8
Australia (Gladstone)	3,683	11.8	4,082	13.1	5,945	19.1	11,572	37.1	10,404	33.4

Source: AXSMarine (Distance calculator http://www1.axsmarine.com/distance/)

Distances uses shortest possible route ie. GOM via Panama Canal to Asia, Qatar/Mozambique, Australia via Suez Canal to UK/Spain

Source: AXSMarine

Brazil moves up net zero timeline by 10 years to 2050

Brazil also joined in the fanfare, committing Brazil to net zero emissions by 2050 [LINK]. This timeline for net zero is 10 years shorter than previously announced. Additionally pledged was a goal to double funding for environmental enforcement efforts, mainly aimed at preventing deforestation. Last week, Brazil had requested $1b in aid from western countries which Brazil's environment minister said would be used to help reduce deforestation by 40% over the next 12 months [LINK].

Indonesia, Mangrove forests absorb 4x carbon vs tropical forests

One of the big emissions reductions themes will be tree planting. But we hadn't appreciated (and should have realized) that not all tree planting is created equal. Makes perfect sense. Indonesia President Jokowi's speech certainly fit into the category that they are open for investment. Earlier this morning, we tweeted [LINK] "*Did you know carbon absorption of mangrove forests is multiples higher than tropical forests? Indonesia Pres @jokowi says 4 times higher. Makes sense not all plants absorb the same amount of carbon. Good for ID, MEX, others. #OOTT #NetZero.*" In his Biden climate speech, Jokowi said "*We are currently rehabilitating 620 thousand hectares of mangrove forests until 2024, the largest in the world with carbon absorption reaching fourfold higher than that of tropical forests*". Currently rehabilitating sounds like an invitation for capital. 620,000 hectares is ~2,400 square miles. Our Supplemental Documents package includes the Jokowi speech.

Japan increases 2030 emissions cut by 20%

Japan's increased emissions cut pledge was the first major item to come out of the summit on Thursday. Japan's Prime Minister, Yoshihide Suga announced that Japan is now targeting a 46% cut to GHG emissions by 2030 vs 2013 levels [LINK]. This is a 20% increase to their original target to reduce emissions by 26% by 2030 originally pledged in 2015. What is interesting to note is that the Japan Times wrote *"Japan was initially planning to unveil new 2030 reduction goals ahead of the key U.N. COP26 meeting in Glasgow, Scotland, in November".* Looks like Joe is stealing the thunder from COP-26.

Kenya – "better off countries" need to help developing countries

One of the other big themes at the climate summit was that it seemed like all leaders from developing countries made sure to say that the developed countries need to financially support developing countries climate change ambitions. Kenya Prime Minister Kenyatta said "*The better off countries, working in collaboration with private* *sectors should support developing countries secure financial resources required to implement climate adaptation programs*."

Mexico – AMLO, Biden could finance tree planting to provide citizenship path

Earlier we noted AMLO's comments on cutting oil exports as a way to cut fossil fuels excessive use – climate changers have to love that logic. But AMLO's speech received big headlines for other reasons. He was another to ask developed countries to help finance climate change initiatives. But what was different is that he had a specific ask of Biden. He asked Biden to finance a tree planting program in Guatemala, Honduras and El Salvador, and that "*the United States government could offer those who participate in this program that, after sowing their land for three consecutive years, they would have the possibility of obtaining a temporary work visa, and after another three or four years they could even obtain residency in the United States. United States or their dual citizenship*."

South Korea – Starting to increase renewable, but a long way to go

South Korea Moon Jae-in's speech was more in the category of defending where South Korea is on the energy transition. South Korea has been criticized, like China, for its growing coal electricity generation. Moon's speech highlighted how South Korea was moving away from coal saying "*Since the launch of my government, Korea has stopped issuing permits for building new domestic coal power plants, shut down ten aged units earlier than scheduled and, as a result, drastically reduced its reliance on coal for power generation. Instead, we are swiftly moving to ramp up the production of renewable energy such as solar and wind power*." No one questions Moon's actions on this front. But when we saw Moon's speech, we thought it was a great reminder that the energy transition takes longer than expected. We tweeted [LINK] "*Reality check #EnergyTransition doesn't happen quickly. KR Pres Moon at @POTUS summit drastically reduced reliance on #Coal for power, instead swiftly moving to ramp up #Renewable energy such as #Solar and #Wind power". Note @BP data to Dec 31/19 #NatGas".* Our tweet included the below BP data for South Korea energy mix to the end of 2019. Our Supplemental Documents package includes the Moon speech.

Figure 35: South Korea energy mix

Primary energy: Consumption by fuel*

Exajoules	Oil	Natural Gas	Coal	Nuclear energy	Hydro electric	Renew-ables	2018 Total	Oil	Natural Gas	Coal	Nuclear energy	Hydro electric	Renew-ables	2019 Total
South Korea	5.37	2.08	3.63	1.19	0.03	0.24	**12.55**	5.30	2.01	3.44	1.30	0.02	0.29	**12.37**
% share	42.8%	16.6%	28.9%	9.5%	0.2%	1.9%	**100.0%**	42.9%	16.3%	27.8%	10.5%	0.2%	2.3%	**100.0%**
Source: BP														

Source: BP

Tree planting is the next big emissions theme

As we were about 2/3 the way through the leader's speeches at Biden's climate summit on Thursday, we had to tweet on perhaps the most mentioned emissions reduction themes – planting trees. We had to tweet [LINK] "*#NetZero. one group that should be happy f/ leader commitments at @POTUS climate summit is the plant a tree, save a life movement. lost count of how many billion trees are being committed to be planted, but has to be at least 1 tree for the 7.9 billion people in the world."* We didn't do a final count, but we suspect the commitments were more like 2 trees for every person in the world. This won't just be countries, but also companies will be jumping in on the tree planting.

UK – "optimistic on about new technology and new solutions"

We thought there were two items overlooked in UK PM Johnson's speech at the Biden climate summit [LINK] and rightly so as they weren't specifically stated. (i) To meet the Net Zero commitments, it will require technologies that either aren't yet known or where there will have be big step change to make available at scale. That doesn't take into account the issue of costing more. Johnson doesn't say this specifically, but points to it saying "*To do these things we've got to be constantly original and optimistic about new technology and new solutions whether that's crops that are super-resistant to drought or more accurate weather forecasts like those we hope to see from the UK's new Met Office 1.2bn supercomputer that we're investing in*.". (ii) Another item that wasn't specifically said but seems obvious to us is that it seems naïve to simply assume cutting emissions won't impact growth. Or the other bogeyman that isn't talked about is that it will add costs. Johnson says UK has grown despite cutting emissions. We believe the reason why the UK didn't lose growth with emissions cut is that it was relatively painless. Renewables have been up until the last year or so on the margin or at least not depended on to carry the base load. And the cut in emissions was driven by the switch from coal to natural gas. There is no real change to business by that switch. We are already seeing this winter how UK power prices have been increasing with more volatility now that renewables are a bigger piece and like we saw in Texas last week, there are calls to cut back on power in times that are not normally peak power demand. for the UK, its on bad wind days with no sun. Switching to renewables fully means change in the way businesses operate and people live. Johnson said "*Don't forget that the UK has been able to cut our own CO2 emissions by about 42% on 1990 levels and we've seen our economy grow by 73%, you can do both at once."* Below is a table from our Jan 5, 2020 Energy Tidbits. Our Supplemental Documents package includes the Johnson speech.

Figure 36: UK Power Generation By Fuel

Generation source	Coal + Other	Gas	Nuclear	Wind + Solar + Hydro	Biomass & Waste	Imports	Fossil fuels	Zero carbon	Biomass & Waste
1990	75.0%	0.1%	18.8%	2.3%	0.0%	3.8%	75.5%	24.4%	0.1%*
2019	2.1%	38.4%	16.8%	26.5%	8.2%	8.0%	43.0%	48.5%	8.5%

*Note actual figure is 0.02% rounded to 0.1%.
Source: National Grid (UK)

US doubles 2030 emissions cut target

Biden committed to reducing US emissions by at least 50%-52% by 2030 from 2005 levels, which more than doubles its prior 2015 commitment with the Paris climate agreement [LINK]. The Whitehouse release wrote *"The United States is not waiting, the costs of delay are too great, and our nation is resolved to act now. Climate change poses an existential threat, but responding to this threat offers an opportunity to support good-paying, union jobs, strengthen America's working communities, protect public health, and advance environmental justice. Creating jobs and tackling climate change go hand in hand".* Reinforcing the theme that the transition efforts are only accelerating from this point forward. The National Climate Task Force is expected to issue their national climate strategy later this year, which will detail the standards, incentives, programs and support for innovation in line with the goals espoused.

Energy Transition – Amazon signs deal for RNG supply

Amazon securing RNG supply for its fleet

Clean Energy Fuels announced on Monday that it has signed a supply agreement with Amazon for low and carbon neutral renewable natural gas [LINK]. The RNG will be provided from Clean Energy Fuels 27 current fueling stations, with another 19 planned be the end of 2021. The volume to be provided was not disclosed. Clean Energy also issued warrants to Amazon alongside the agreement, with the first tranche vesting at the agreement close. Clean Energy derives its RNG from methane collected at landfills, farms, and wastewater plants.

Capital Markets – Liberals budget looks like a pre-election budget

Liberals pre-election budget

It looks like the Liberal budget on Monday was pretty well as expected. There has been a lot of reporting on details so our recap will be on takeaways and items not included in the budget. (i) Our key takeaway is that there will be a number of details to be revealed in the coming weeks or as part of the Liberals election platform. The Budget has many items that could have been announced or are being reviewed or just quiet that we expect to be revealed in the coming weeks. (ii) We are in the camp that call this an election budget for two reasons. First, the one surprise is what wasn't in the budget and that was any focus on broad personal and corporate income taxes. Second, but at the same time, that fits this is an election budget. One of the big criticisms of the budget is that there is a lack of specifics even when allocating capital. The expectation is that the Liberals would announce more specifics as part of their election platform ie. what they will ask for wealthier Canadians to help. (iii) The spending commitments were so large that there was no focus on the Liberals committing $1.4b for international climate change fight. The Budget said "*That is why Canada intends to build on its ambitious plan to reduce greenhouse gas emissions in Canada with an ambitious commitment to combat climate change and biodiversity loss around the world in the coming months leading up to the international COP conference*s." And "*That is why Budget 2021 commits an additional $1.4B over five years in international assistance to support developing countries and vulnerable populations respond to this crisis and to meet growing humanitarian needs around the world*." There were other allocated dollars to international items. (iv) Environment was a major focus although it was disappointing that they didn't introduce their new climate targets as part of the budget, but held back the announcement until the global stage on Thurs. The Budget said "*That is why Canada intends to build on its ambitious plan to reduce greenhouse gas emissions in Canada with an ambitious commitment to combat climate change and biodiversity loss around the world in the coming months leading up to the international COP conferences. These commitments will Protecting Our Shared Values particularly help those already being affected by climate change to adapt, with a focus on those in low and middle income countries. This is part of Canada's contribution to ensure 2021 is a transformative year for ambitious global climate action and COP26 is a success."*
(v) There were a number of items included in the budget (ie tax on luxury item purchases), but there were a large number of items for consultation that we expect will end up in the Liberals election platform or be announced in the coming weeks. One example is on border carbon adjustments. The budget says they will launch a consultation process, but we suspect they didn't want to get ahead of whatever Biden will do on border carbon adjustments. (vi) The budget didn't include any detail commentary on a key Liberal climate theme – carbon free electricity. This was obvious by its omission and one that will dramatically change Canada's natural gas industry. Our concern is that this becomes part of their election platform and a reason they need a new mandate. (vii) One of the big overall themes from the budget is that their big capital allocation to infrastructure is to a great deal allocated to items that aren't hard capital dollars. One of many examples is soft dollars on infrastructure in the section titled Charging and Fueling Zero-emission vehicles, their budget provides $56.1 mm over 5 yrs to develop a set of codes and standards for retail ZEV charging and fueling

stations. There is nothing to fund charging stations. (viii) Implies renewable energy costs more than fossil fuels. The Liberals clearly don't say this, but the Budgets says they are having all federal building have electricity from clean sources, if possible, and then says they need to provide $14.9mm over 4 years to purchase renewable energy certificates for all federal buildings. We assume this means the renewable power to get a certificate and not for a certificate itself. But the point is that if costs money to do this, then it must mean it costs more. (ix) Multiple cases of allocating dollars for consultants to study items as opposed to the department officials. We have to wonder who will win these contracts. One good example is in the "*better understanding our environment*" and the Budget allocates $25.6 mm over 5 years to create a "*Census of the Environment to help monitor environmental trends and better inform decision making*". Isn't monitoring environmental trends something the Environment officials are already doing? The problem is that in a massive spending budget, no one reads the details so overlook what appears to be a $25.6mm consulting contract for something the department should be doing. Our Supplemental Documents package includes excerpts from the Budget.

Liberals have delivered on asking wealthiest Canadians to pay a little bit more

To the most part, the Liberals have delivered on their 2019 election perform that they would be "*asking the wealthiest Canadians to pay a little bit more*". Their 2019 platform focus on the items in the Monday budget: modernize anti avoidance, crack down on corporate loopholes, introduce a 10% tax on luxury cars, boats and personal aircraft, put in place a national ax on vacant residential properties owned by non-Canadians who don't live in Canada. Our Supplemental Documents package includes the excerpt from the Liberals 2019 election platform.

Capital Markets – European investors want banks to stop lending to oil and gas

European investors push banks on oil and gas lending

The other big hit for oil and gas companies in the Net Zero push is the increasing focus of investors to want oil and gas companies to have plans that show a path to Net Zero, But there is also another push from large investors and that is to pressure banks to stop lending to oil and gas companies. And for the banks to set interim targets on how they will do so. The FT reported [LINK] "*Coalition of big investors pushes banks to defund carbon emitters." The group of 35 big investors managing $11tn in assets, which include Amundi, Legal and General Investment Management, the Church Commissioners for England and Nordea Asset Management, have called on the banks to align their financing with a goal of net zero emissions and to ensure that executive pay is linked to this target. The move is the latest sign that investors' climate focus is shifting from big carbon emitters, such as oil and gas groups, to those providing the finance for carbon-intensive projects."* This is another European led ESG focus but we remind that these ESG items tend to come to Canada a lot faster than most realize. There is one other item to highlight. The FT reported "*The investors want the banks to withdraw finance from projects that fail to meet the goals of the Paris agreement much faster than under their current plans and to set firm interim targets."* Having interim targets is consistent with Net Zero and we still believe it is the underappreciated aspect of Net Zero - interim targets get set and actions have to be started now by companies. Our Supplemental Documents package includes the FT report.

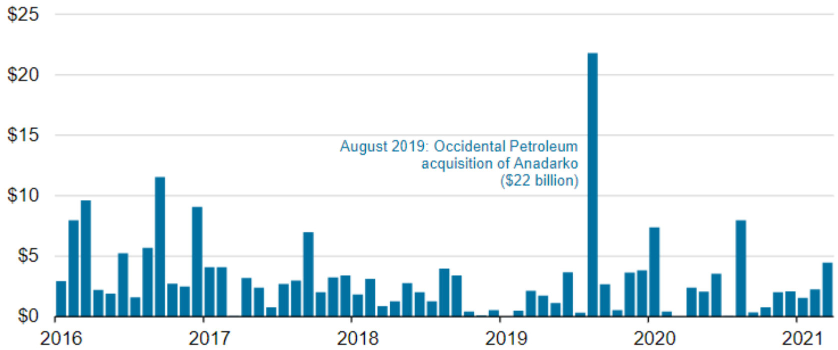
Capital Markets – US E&P's new debt and equity issuances totaled $4.4bn in March

Rising US E&P debt and equity issuances

With the rising oil prices and increasing optimism on demand with vaccine rollouts, E&P's have been increasing capital raises. The EIA released a report on Friday [LINK], which shows increasing debt and equity issuances by publicly traded independent U.S. E&P companies. In March 2021, total debt and equity issuances totaled $4.4bn, the most since August 2020, to take advantage of rising crude oil prices and low interest rates. However the

EIA report does not split out the debt vs equity amount. Since September 2020, the amount of debt and equity issued by US publicly traded E&P has increased MoM in all but one month. Our Supplemental Documents package includes the EIA blog.

Figure 37: Debt and equity issued by US E&P companies by month (billion $)



Source: EIA

Capital Markets – Haynes and Boone: Small producers led bankruptcy filings in Q1/21

Haynes and Boone bankruptcy recap

Haynes and Boone has been tracking bankruptcies since the 2014 oil price crash in the US and Canada. They provide an excellent recap of bankruptcies. (i) Bankruptcy Monitor for producers to March 31, 2021. [LINK] Looks like small producers didn't get the benefit of return of WTI $60 oil in March. Rather, Q1 bankruptcies were a factor of 2020. Haynes and Boone reported "*Eight producers filed in Q1 2021, which is the highest Q1 total since 2016 when 17 were filed."* However, the bankruptcies were on smaller producers. There were no billion dollar bankruptcies in Q1, which hasn't happened since Q3/18. The aggregate debt for filed bankruptcies was >$1.8b, the second lowest Q1 after $1.6b in Q1/19. (ii) Bankruptcy monitor for oilfield services. [LINK] Haynes and Boone reported "*five oilfield services companies filed in Q1 2021, which is the third lowest Q1 total since 2015. The aggregate debt for oilfield services companies that filed in Q1 2021 is over $7.2 billion, which is the third highest Q1 total since 2015. However, one company, Seadrill Limited, accounted for 99.8% of the aggregate debt for this quarter."* Interestingly, Seadrill also filed in 2017 when $5.7b in bank loans were restructured. (iii) Bankruptcy monitor for midstream. [LINK]. Haynes and Boone reported "*Three midstream companies filed in Q1 2021, which is average for years in which there have been filings in Q1. The aggregate debt for midstream companies that filed in Q1 2021 is $6.7 million, which is the lowest total since 2015 in years when there have been filings in the first quarter."* Our Supplemental Documents package includes excerpts from the Haynes and Boone updates.

Demographics – No surprise, study says working from home will increase productivity

WFH increases productivity by 2.7%

We say this is a no surprise and that is because the study was based on the views of workers and not employers. A study associated with Stanford University [LINK], examined the effects of working from home on overall productivity and whether remote working would continue in a post-pandemic world. After surveying 22,500 Americans, responses showed that about 22% of all full workdays will be worked from home, in contrast to just 5% before the pandemic. Many workers reported being more productive while working from home than they were on business premises, and after aggregating responses, the survey estimates that worker productivity will increase 2.7% as a result of the new-normal. Some contributing factors to WFH's staying power are lingering fears of crowds and contagion, technological innovations and investments in remote-work capabilities and a better-than-expected experience from the impromptu change. The survey also predicts that that the shift to work from home will directly reduce spending in major city centres by 5-10%.

Demographics – Full WFH transition could reduce GHG emissions by 8.6 megatons

Full WFH transition could reduce GHG emissions by 8.6 megatons

Its interesting to see the data and estimates on what happens as people remote work. It makes sense that there should be less travel for the vast majority of people that do no live close to work. And some of these will have huge savings. Even in city like Calgary, we know of people who commute approx. 120 km each way from Canmore. So it makes sense to see the Stats Canada study on Thursday [LINK], which looked into the implications of the increase in telework on public transit and greenhouse gas emissions. Stats Can estimates that approximately 36.3% of workers in Canada hold jobs that could plausibly be done from home. A full transition to work from home for that 36.3% of the workforce could reduce annual GHG emissions by 8.6 megatons of carbon dioxide equivalent, which represents 6% of GHG emissions of Canadian households in 2015, and 11% of their transportation-based emissions that year. The study also stated that if a full-telework model was implemented, the demand for public transit would be halved, and it would reduce the average time commuting for those not working from home by nearly an hour per day.

Demographics – WSJ: less sleep linked to higher dementia risk

WSJ: less sleep linked to higher dementia

The Wall Street Journal reported on Monday on a UK study on sleep, which found that sleeping six hours or less is linked to a higher risk of dementia [LINK]. The study examined the sleeping habits of nearly 8,000 people in the UK over 25 years, and found that, even after controlling for any cardiac, metabolic and mental-health issues, 50-year-olds that got fewer than 6 hours a night had a 22% higher risk of developing dementia later in life. The risk was even higher for 60-year-olds, who experienced a 37% risk if they slept less than 6 hours a night. Participants in the study were surveyed every 4 to 5 years and reported their sleep duration while sleeping with sleep trackers. While the study's findings alone cannot establish a causal link with sub-6-hour sleep and dementia, the authors said that "*the new study adds to shorter-term research showing that too little sleep is linked to the development of the disorder*."

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

Volkswagen ID.4 named car of the year

On Tuesday, the World Car Awards announced the Volkswagen ID.4 as the 2021 World Car of the Year [LINK]. The ID.4 is a mid-priced, all electric SUV which looks quite sleek.. apart from the snub-nose looking front end. Ralf Brandstätter, CEO Volkswagen Cars said *"We are particularly pleased about our ID.4 being named "World Car of the Year". Not only because it is one of the most important car awards in the world – but because the jury also honored a great idea and a great team. The first ID. Model for the key markets of Europe, China and the U.S. carries our electric offensive around the world. A convincing car, a great idea - and the "World Car of the Year" award? That goes well together for us!"* We hadn't followed the ID.4 but on checking Volkswagen's website [LINK], one key factor jumped out at us – Volkswagen says there is an estimated charging time at a public DC fast charger of up to 100 km in approximately 10 minutes.

Figure 38: Volkswagen ID.4

Source: Automobile Magazine

No one tried to link ICE vehicles to the Great Horse Manure Crisis of 1894

One of the good things about the Biden climate summit is that the speakers had very short time allotment so they didn't have a chance to wander. They had to be short and sweet and focused and we listened to most of the summit and that was clearly the case. It also meant that no one felt the need to paint a negative picture of how ICE vehicles are impacting the air. We suspect that all the speakers believe that they no longer need to paint that picture. Its too bad because we have been waiting for someone to draw the analogy of ICE vehicles to the Great Horse Manure Crisis of 1894. [LINK] "*By the late 1800s, large cities all around the world were "drowning in horse manure". In order for these cities to function, they were dependent on thousands of horses for the transport of both people and goods. In 1900, there were over 11,000 hansom cabs on the streets of London alone. There were also several thousand horse-drawn buses, each needing 12 horses per day, making a staggering total of over 50,000 horses transporting people around the city each day."* Fortunately, Henry Ford introduced the Model T bringing affordable transportation and that was basically the start of the end of the horse drawn vehicles in cities.

Local politicians also think they know better how to make money

We were speaking with an investor on the Liberal budget and how their policies are reshaping Canada ie. on the energy transition. The investor isn't a fan of the Liberals and said, in less complimentary language, that the Liberals belief only they know what is right for Canada is causing local politicians to have the same "know it all" view for business. He referred me to the Calgary Herald report "*Corbella: Druh Farrell sends hardworking family's dreams up in smoke"* [LINK] that noted how a

Dairy Queen restaurant burned down on Oct 8, 2019 and the owner hasn't been able to get a permit to rebuild the same business. Rather one of the local city councillors strongly recommended refusal of the development permit writing "*We are sympathetic to the owner and the franchisee, but this situation actually represents an opportunity for them to build something so much better on the site than what is proposed*," suggesting ""*a mixed-use, high-density development at this location, either with this site alone or combined with the adjacent parcel that is prime" for redevelopment."* And "*"Such a project could even include a new Dairy Queen, but of course without a drive-thru. This is a tremendous opportunity for the owner to extract significantly more financial value out of the site than with what is proposed."* I know people who have been city councillors and they confirm it is very unusual for a city to not approve a rebuild of the same business. The question will be if the bad publicity forces the city to dig in on any details to prevent a rebuild or they rethink their approach. Our Supplemental Documents package includes the Calgary Herald story.

Shout out to Brooke Henderson for her 10th LPGA win

Our big push in writing the memo is Friday noon until 10am this morning, which means that i can have something other than business news on in the background, which normally means sports. I am not a huge TV golf fan except when the Canadians are in the hunt so it was great TV on Sat night to see Brooke Henderson win her 10th LPGA tour event, which includes 2 majors. In case you missed it, note this great clutch chip [LINK] she made on 18 for a tap in to win.

UK PM Johnson "cake have eat is my message to you"

We thought we had heard UK PM Johnson incorrectly so wanted to check the official UK transcript of his Biden climate speech. And in re-listening to the speech, the transcript is accurate. Johnson said "*Don't forget that the UK has been able to cut our own CO2 emissions by about 42% on 1990 levels and we've seen our economy grow by 73%, you can do both at once. Cake have eat is my message to you*." Not quite as clear as the normal saying you can have your cake and eat it too. Rather its more like one of my old hockey coaches use to say in 70s era of Broad Street Bullies and Big Bad Bruins – see the body, hit the body.

Another Tokyo Covid emergency 89 days before Tokyo Olympics start

It must be very difficult for the athletes trying to be ready to have their ultimate performance at the Tokyo Olympics. On Friday, Japan announced emergency Covid measures in Tokyo and, as of today, there are only 89 days to go until the planned start of the Olympics. The measures are to stay in place until May 11. In addition to Tokyo, Japan announced emergency measures for Osaka, Kyoto and Hyogo. Japan sounds a bit like other areas like Ontario and this is the third state of emergency over the past 13 months. We hope that this lockdown is more focused on being a preventative measure as the lockdown covers "Golden Week" holiday, a major holiday period from late April to the 1st week in May ie. a typically very busy travel period.