Energy Tidbits

March 7, 2021

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Bullish Post Covid Oil, More Capex Shifts To Renewables While XOM Reminds Global Oil Declines 5-7% Every Year

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. Exxon reminded global oil declines at about 5-7% every year, especially bullish as more capex gets shifted from oil to renewables. (Click Here)

2. Kudos to Saudi Energy Minister Abdulaziz for surprising everyone to the upside with no Saudi increases, no OPEC+ increases other than Russia and Kazakhstan. (Click Here)

3. Big show of good will from US that they want JCPOA to return soon if they confirm the reports out of Iran that the US allowed the release of frozen Iran assets in Iraq. (Click Here)

4. Houthis warn Saudi of attacks on Saudi Aramco installations if Saudi keeps attacking at Marib. (Click Here)

5. Positive to LNG, India PM Modi reiterates India plans to take natural gas from 6% to 15% of the energy mix by 2030. (Click Here)

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

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

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Natural Gas – Natural gas draw of 98 bcf, storage now -277 bcf YoY deficit

YoY storage at -277 bcf YoY deficit

The EIA reported a 98 bcf draw (vs -137 bcf expectations) for the Feb 26 week, which was well above the 5-yr average draw of 81 bcf and last year's draw of 109 bcf. We continue to see support for storage draws from significantly lower YoY US natural gas production and a post freeze strong feedgas demand for LNG exports. Storage is 1.845 tcf as of Feb 26, decreasing the YoY deficit to 277 bcf from 298 bcf last week and storage is now 178 bcf below the 5 yr average. 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 (02/26/20)		Historical Comparisons: 5-year average (2016-20)	
Region	02/26/21	02/19/21	net change	implied flow	Bcf	% change	Bcf	% change
East	383	424	-41	-41	460	-16.7	415	-7.7
Midwest	465	508	-43	-43	567	-18.0	507	-8.3
Mountain	117	123	-6	-6	103	13.6	113	3.5
Pacific	210	218	-8	-8	197	6.6	191	9.9
South Central	670	670	0	0	795	-15.7	796	-15.8
Salt	159	150	9	9	233	-31.8	245	-35.1
Nonsalt	511	520	-9	-9	562	-9.1	552	-7.4
Total	**1,845**	**1,943**	**-98**	**-98**	**2,122**	**-13.1**	**2,023**	**-8.8**

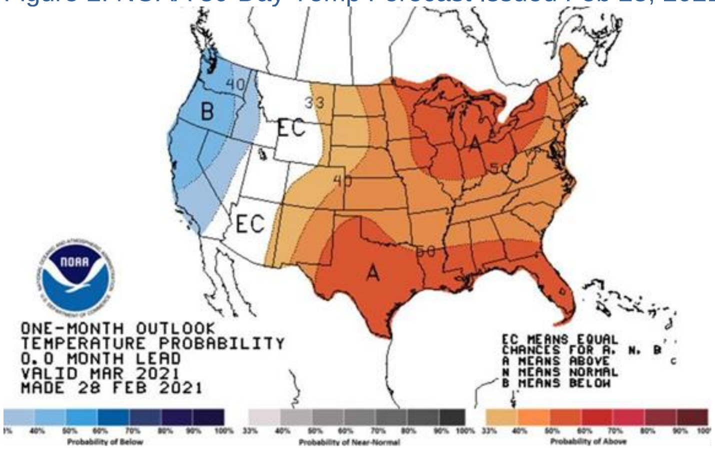
Source: EIA

Natural Gas – NOAA calls a warm end to winter

NOAA calls a warm end to winter

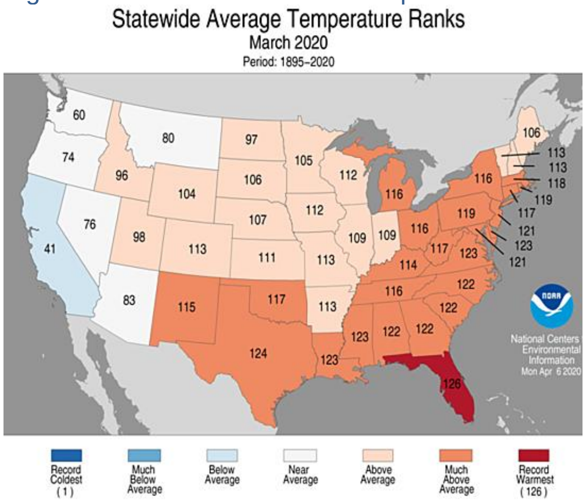
Besides the big freeze in mid February, winter temperatures across the US have been mainly average to above average, however still colder than last years record warm winter. Fortunately, this winter, there is the continuing significantly lower YoY US natural gas production and higher YoY US LNG exports providing downside support to HH prices and a buffer against a big collapse in winter gas prices. Last Sunday, the NOAA posted an updated 30-day ahead forecast which is continuing to call for a warm end to winter [LINK]. March 2021 may be similar to March 2020 which was the tenth warmest in the last 127 years.

Figure 2: NOAA 30-Day Temp Forecast Issued Feb 28, 2021



Source: NOAA

Figure 3: NOAA March 2020 Temperature Rankings



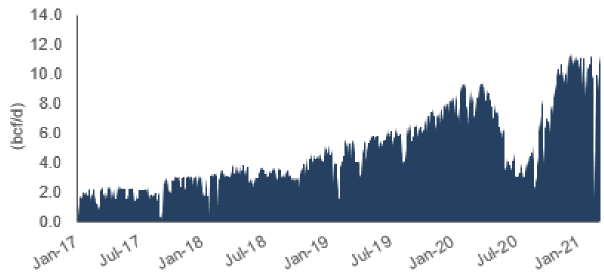
Source: NOAA

Natural Gas – US LNG export projects recovering post Texas big freeze

Flows to US LNG recovering

The big freeze in the US, not surprisingly, caused a massive decline in natural gas flows to US LNG export terminals. Flows to the terminals fell from 10 bcf/d on Feb 10 to a low of 1.4 bcf/d on Feb 16. LNG flows have recovered rather quickly post Feb 16 and reached 11.3 bcf/d on Mar 3, just 0.2 bcf/d lower than the daily record flow of 11.5 bcf/d set on Dec 11, 2020. Below is a chart of the Bloomberg data.

Figure 4: Net US LNG Flows to Export Terminals



Source: Bloomberg

Natural Gas – LNG Canada expects Coastal GasLInk to live up to its commitment

LNG Canada wants Coastal GasLink to deliver

No one knows exactly what is going on between LNG Canada and TC Energy on TC's Q4/20 that its Coastal Gaslink natural gas pipeline will cost more and be late. But no one should be surprised that LNG Canada didn't just come out and say no problem, how much more will it cost, when can you do it for, and how much will it cost to ship the gas to the LNG facility. Our Feb 21, 2021 highlighted TC's comments on its Q4 call that "*We are also working with LNG Canada on establishing a revised project plan for Coastal GasLink. We expect that project cost will increase and the schedule will be delayed."* But on Monday, the National Post reported on LNG Canada CEO Peter Zebedee comments In their interview "public response "*To be frank, I was disappointed with the comments that were made,"* and "*We do expect Coastal GasLink to live up to their commitments around costs and schedule".* The reality is that it will be tough for Coastal GasLink to make up time, especially with construction having to be impacted from different protocols since Covid than per the original construction plan.

But LNG Canada will be working to reduce allocated extra capital costs to the pipeline and keep any incremental tolling costs to a minimum. Our Supplemental Documents package includes the National Post report.

Natural Gas – Sounds like issues with Shell Prelude FLNG restart

Issues with Prelude FLNG restart?

We will want to watch the developments at Shell's Prelude FLNG (floating LNG) facility offshore NW Australia. Shell had just brought Prelude back on in Jan (see our Jan 10, 2021 Energy Tidbits) after onboard safety issues had forced an 11 month shutdown after being in operations for ~6 months. This week, Bloomberg reported that Shell is planning maintenance at its Prelude FLNG in March. And also reported "*Prelude remains at the early stages of start-up and it is expected to take some time to get to steady state operations," a company spokeswoman said in an emailed reply to queries without giving details".* It was interesting to see the company say it would take "*some time*" to get to steady state operations. But the reason why its worth watching is that the norm for oil and gas facilities is for other normal maintenance to take place during a shut down to avoid multiple shut downs. Think about what happens if there is an issue at a refinery or an oil sands project, the operator takes advantage of that downtime to do other normal maintenance. So it is not the norm and, linking back to the company comments, it is certainly implying there is a problem with the restart and that it will take enough time to fix such that the company believes is going to do other maintenance. Prelude has a capacity of 0.47 bcf/d and also produces condensate and LPG. Our Supplemental Documents package includes the Bloomberg report.

Natural Gas – Modi reiterates India wants natural gas 15% at energy mix by 2030

Modi reiterates natural gas 15% of energy mix

One of our key global oil and natural gas themes for the 2020s is that India, not China, is the primary region for growth in oil and natural gas demand. We started to emphasize this key 2020s trend in our Oct 23, 2019 SAF [LINK] *"Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030"*. On Friday, India PM Modi made the keynote speech at CERAWeek. We made a quick transcript of his natural gas and LNG comments and then tweeted [LINK] "P*ositive to #LNG. @narandramcdi keynote at @CERAWeek , 9:20 min "India is working to increase the share of #NatGas from the current 6% to 15% by 2030". Until India shows it can increase #NatGas production, increases in demand = increases in LNG imports*." Modi's speech [LINK] was on Paris and emissions and India "*is well on track to achieve its Paris targets well before the target date of 2050".* Its probably a good thing this was a remote conference as he might have got a few chuckles with one of opening lines "*There is no doubt that when it comes to the care for the environment, the people of India are leaders. This has been the case for centuries*". But the key for us that Modi reinforced that they are targeting natural gas to get to 15% of the energy mix from its current 6%. Basically, the reason for our Oct 23 2019 blog. In that blog, now 17 months old, we said *"Natural gas consumption in India is only now back to 2011 levels at 5.6 bcf/d and represents only 6.2% of its energy mix. If India hits its 15% target of its energy mix by 2030, it would add natural gas demand, on average, of >1.5 bcf/d per year. At the same time India's domestic natural gas production peaked in 2010 at 4.6 bcf/d, but has been flat from 2014 thru 2018 at ~2.7 bcf/d, which means the big winner will be LNG. The most important factor driving this expectation for natural gas consumption growth is likely price. Asian LNG landed prices are down about 50% YoY and, more significantly, the expectation is for future Asian LNG prices to be at lower levels than prior cycles. India, by itself, may not be a LNG global game changer, but it is another positive support for why we believe LNG markets will rebalance sooner than expected ie. in 2022/2023"*. The reality is that if Modi wants to get India to 15% natural gas by 2030, they need to be cranking up now. Our Supplemental Documents package has our India blog.

Increasing natural gas consumption will come from LNG, at least for now

In our tweet, we said "*Until India shows it can increase #NatGas production, increases in demand = increases in LNG imports*." This is the key, until India shows it can turnaround its domestic natural gas production, any incremental India natural gas consumption is likely to come from LNG. There are no international natural gas pipelines supplying India so any natural gas shortfall comes from LNG. India has been indicating they want to encourage higher domestic natural gas production. But India domestic natural gas production peaked in 2010 at 4.59 bcf/d, but fell quickly to 2.84 bcf/d in 2014 and has been fairly flat since then with 2.60 bcf/d in 2019. At the same time, India consumption was 5.70 bcf/d in 2010, declined to 4.63 bcf/d in 2015 and increased back to 5.77 bcf/d in 2019. India has been unable to grow its natural gas production and until India can show it can grow production, incremental demand will come from LNG.

Figure 5: India Natural Gas Consumption vs Production

India Natural Gas Consumption vs Production										
(bcf/d)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Consumption	5.70	3.83	5.37	4.74	4.69	4.63	4.90	5.20	5.62	5.77
Production	4.59	4.15	3.60	3.01	2.84	2.72	2.56	2.68	2.66	2.60
Net	1.11	-0.32	1.77	1.73	1.85	1.91	2.34	2.52	2.96	3.17
Source: BP										

Source: BP

Natural Gas – Gazprom to reduce gas volumes to Europe to record lows this summer?

Record lows gas deliveries to Europe?

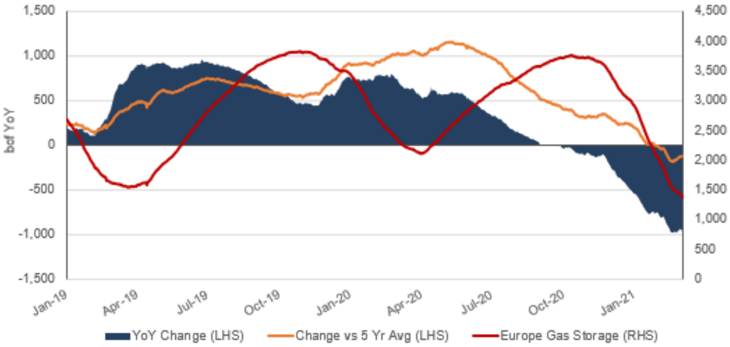
Interesting and not surprising BloombergNEF report this week that Gazprom is trying to build the narrative of concerns on energy security in Europe in an attempt to get the US to remove sanctions on Nord Stream 2. Bloomberg wrote "*Gazprom's short-term sales of natural gas to Northwest Europe and Slovakia, marketed on its Electronic Sales Platform launched in 2018, could fall to an all-time low in 2021. This would suggest that flows of Russian gas to Western Europe will remain low this summer, tightening the European gas market."* And "*Gazprom might delay booking extra capacity via Ukraine to have a stronger hand in advocating for its Nord Stream 2 project, which has long been delayed by U.S. sanctions."* Gazprom and Germany have been stuck in trying to get the US sanctions removed so Nord Stream 2 could be completed. We thought there was an opening three weeks ago, when on Feb 16 we tweeted [LINK] on a WSJ exclusive story that noted "*the Biden administration has opened talks with Berlin on the future of the pipeline, including "threats of sanctions against companies involved in the construction of Nord Stream 2," a German official said*." The key to us was that it sounded like there were talks going on to try to find a solution. and then on Feb 17, we tweeted [LINK] on Jen Psaki's Nord Stream 2 comments at the White House briefing because there looked like a clear different message on Nord Stream 2. Psaski did reiterate Biden's view it was a "*bad deal*". But she then noted that sanctions were but just one of the tools they could implement to ensure their priority – energy security. It looks like Gazprom is trying to help play the energy security narrative if BloombergNEF is right and they reduce gas deliveries to an all time low this summer. This will be pronounced given, as noted below, Europe gas storage is at low levels and will need to be refilled this summer. Our Supplemental Documents package includes the Bloomberg report.

Natural Gas – Europe storage 35.20% full vs 5 year average of 39.44%

Europe gas storage 35.20% full

Winter is coming to an end in Europe and our focus for Europe gas storage will be turning to how quickly it fills off the low point this winter. But 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. Europe gas storage started the winter (Nov 1) at basically full levels at 94.66% and has dropped by 59.5% to be 35.20% at Mar 4. This 59.46% decline since Nov 1 compares to the 5 yr average that would be down 49.94% in the same period or to last winter that was only down 38.51% in the same period. Storage at Mar 4 of 35.20% is 23.65% less than last year and 4.24% less than the 5 yr average. 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 Europe gas storage utilization and our graph of YoY change in net LNG flows to NW Europe.

Figure 6: Europe Gas Storage Level



Source: Bloomberg

Figure 7: Europe Gas Storage Utilization Comparison to Mar 4

	Nov 1	Mar 4	Mar 4 Less Nov 1
Winter 2020/21	94.7%	35.2%	-59.5%
Winter 2019/20	97.3%	58.8%	-38.5%
5 yr Average	89.4%	39.4%	-49.9%

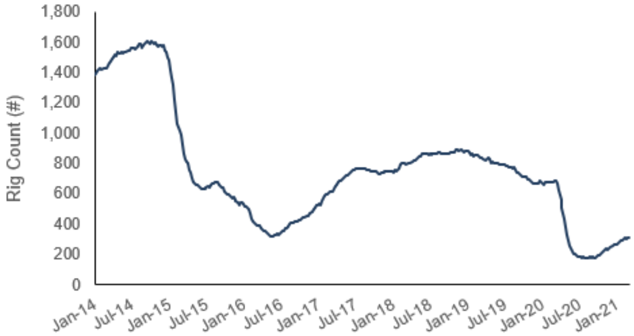
Source: Bloomberg

Oil – US oil rigs up 1 to 310 oil rigs

US oil rigs up 1 this week

Baker Hughes reported its weekly rig data on Friday. US oil rigs were up 1 to 310 oil rigs as of Mar 5. The increases were in the Permian +3 and Barnett +1 and decreases were in Others -2 and Williston -1. Oil rigs are +138 off the bottom of 172 in the Aug 14 week. There wasn't an apparent big drop in US rigs during the Texas freeze as we saw in frac spreads. But our reminder is that operators may have left the rigs on location, but that does not necessarily mean they were all drilling ahead. Additionally, recent strength in oil price along with optimistic demand recovery outlooks has helped to keep US oil rig count modestly increaseingh. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 373 to 310 oil rigs (-54.6%). Below is our graph of Baker Hughes US oil rigs.

Figure 8: Baker Hughes Total US Oil Rigs



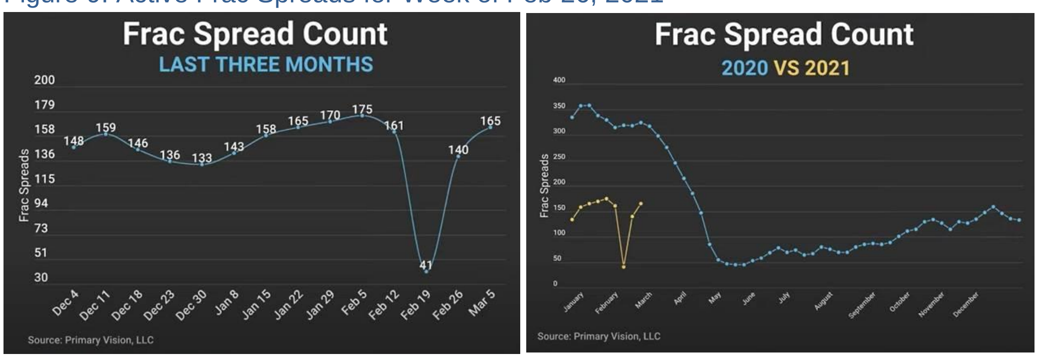
Source: Baker Hughes

Oil – Frac spreads +25 to 165 recovering from Texas big freeze

Frac spreads +25 to 165

Every week, Mark Rossano posts a YouTube recap of frac spreads for the week on the Primary Vision Network [LINK]. For the March 5 week, US frac spreads were +25 to 165, which followed the big +99 week post the Texas freeze. He expects to be 175 or a little above that next week. Looking ahead, once frac spreads get over 200 to the 230-250, there will be a horsepower and people problem that should lead to pricing pressure. He also highlighted that producers can hedge above $60 thru all of 2021 and above $55 thru all of 2022 ie. points to continuing increase in frac spreads. Below are his two key frac spread graphs.

Figure 9: Active Frac Spreads for Week of Feb 26, 2021



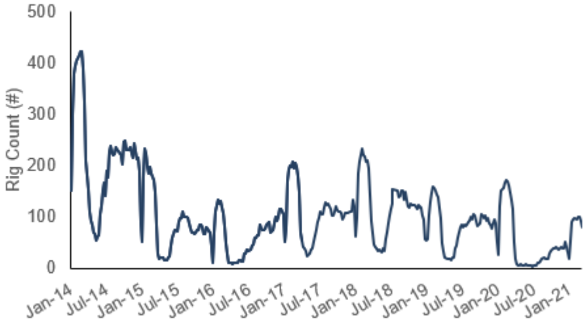
Source: Primary Vision

Oil – Total Cdn rigs down 22 to 141 total rigs and down 31% YoY

Cdn rigs -22 this week

Baker Hughes reported total Cdn rigs were down 22 this week to 141 total rigs. This week marked the start of the end of winter drilling and breakup. And, as noted below, we expect to see big declines in the next two weeks. Cdn oil rigs were down 12 to 80 rigs. Cdn gas rigs were down 10 to 61 gas rigs. Total rigs are now +145 since the June 26 all-time low. Cdn drilling is still down big vs prior years - Cdn rigs are down 31% YoY and down 25% vs two years ago. While Cdn drilling has recovered, a year ago Cdn oil rigs were 134 and Cdn gas rigs were 69 for a total Cdn rigs of 203, meaning total Cdn rigs are -62 YoY. Below is our graph of Baker Hughes Cdn oil rigs.

Figure 10: Baker Hughes Total Canadian Oil Rigs



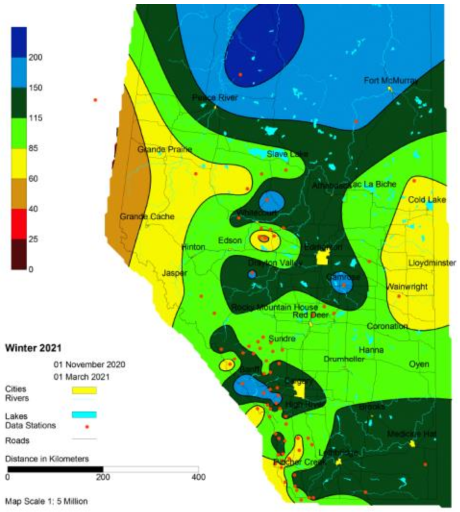
Source: Baker Hughes

Oil – Cdn oil rigs should show big drops the next two weeks

Less snowfall this winter

We have been warning that there has been very little accumulated snowfall this winter, especially in key oil and gas regions in west Central and NW Alberta. And that this means when the weather turns warm, there isn't a deep cover of snow to provide an insulating blanket to the frozen ground. Without a deep insulating blanket, when it turns warmer, the industry quickly moves into breakup. Its why we expect to see Cdn rigs show big declines the next two weeks that will likely be the two big decline weeks in Cdn rigs. Below is the Allberta % of normal precipitation map for Nov 1 to Mar 1. [LINK]

Figure 11: Alberta Precipitation % of Normal Nov 1-Mar 1



Source: Alberta

Oil – US weekly oil production +0.3 mmb/d WoW to 10.0 mmb/d

US oil production +0.3 mmb/d WoW

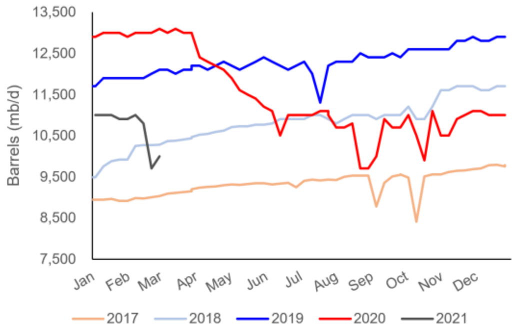
This week's data shows a partial recovery from the freeze, but production is still 1 mmb/d lower than 11.0 mmb/d in the Feb 5 week. Production increased 0.3 mmb/d to 10.0 mmb/d for the week and Lower 48 increased 0.3 mmb/d to 9.5 mmb/d. This puts US oil production down 3.1 mmb/d YoY, and is down 3.1 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The Texas big freeze impact also means that the recent EIA Feb STEO near term forecast for US oil production will be out of date, as will the EIA Drilling Productivity Report forecast for US shale/tight oil plays for Feb. The reality is that everyone is guessing (some more educated than others) as to the impact of the Texas big freeze on US oil production as to how much is off and for how long. Below we pasted an excerpt from the EIA weekly oil production data.

Figure 12: 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				

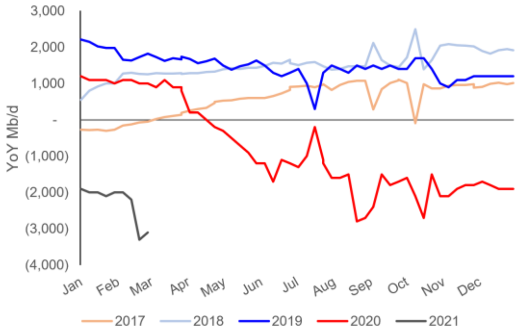
Source: EIA

Figure 13: US Weekly Oil Production



Source: EIA, SAF

Figure 14: YoY Change in US Weekly Oil Production



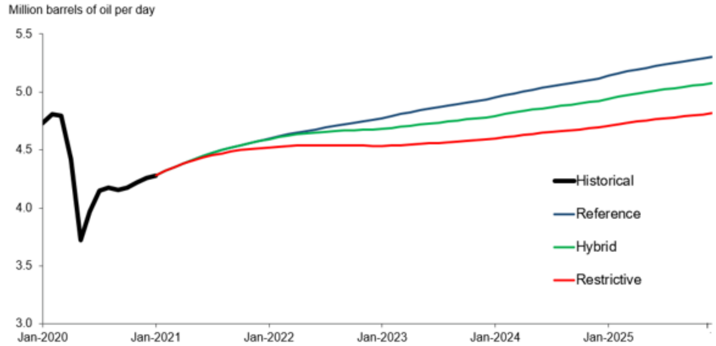
Source: EIA, SAF

Oil – Biden restrictions could reduce Permian growth 0.230-0.430 mmb/d by Dec 2025

Permian growth at risk with Biden

The big takeaway from Saudi Arabia's decision on oil production is that they are assuming a return to US oil growth isn't in the cards. One of the big quotes on this was Abdulaziz saying "'*Drill, baby, drill' is gone for ever."* We thought there was another reason why Abdulaziz feels that way about US oil growth potential – Biden's oil policies. It why, on Thursday, we tweeted [LINK] "*Another reason why KSA Abdulaziz is less worried about US shale. #DallasFed reminds Permian growth not just held back by capital. #POTUS federal land restrictions could reduce #Permian oil growth by 230-490,00 b/d by end of 2025. Thx @DallasFed."* This week, the Dallas Fed released an estimate this week on how Biden's federal lands policies could affect Permian production, on the New Mexico and Texas side, out to 2025 [LINK]. Production from the Texas side of the Permian was 3.3 mmb/d in 2020, all of which was on private lands, while the New Mexico portion produced 1.0 mmb/d, with half coming from federal lands. The Dallas Fed laid out three scenarios based on different levels of permitting and leasing restrictions. Overall, they expect production growth to be 230,000 b/d to 430,000 b/d less than current activity dictates. The reference case, which assumes little to no change from the current pace of leasing, permitting, and drilling from Q1/21 levels with Permian production growing from 4.3 mmb/d today to 5.3 mmb/d in Dec 2025, with 0.5 mmb/d growth for New Mexico to 1.5 mmb/d. Their hybrid case assumes no new federal leasing, but existing leaseholders continue to receive permits, however reviews are also more rigorous, causing slower approvals and higher costs beginning in 2022. Drillers would likely gradually move off federal lands under this scenario leading to Permian growth to 5.1 mmb/d by 2025, 0.2 mmb/d below the reference case, with New Mexico only reaching 1.1 mmb/d, 0.4 mmb/d lower than reference. The restrictive case assumes no new permits or extensions granted starting in 2023. They expect that production would then only grow to 4.8 mmb/d with New Mexico output dropping to 0.7 mmb/d, 0.8 mmb/d less than the reference scenario. With the expected lowered production, the Dallas Fed assumes between 3,500 to 6,600 workers would not be need in New Mexico through 2025. Our Supplemental Documents package includes the Dallas Fed blog.

Figure 15: Permian Production Under Varying Degrees of Federal Restrictions



Source: Federal Reserve Bank of Dallas

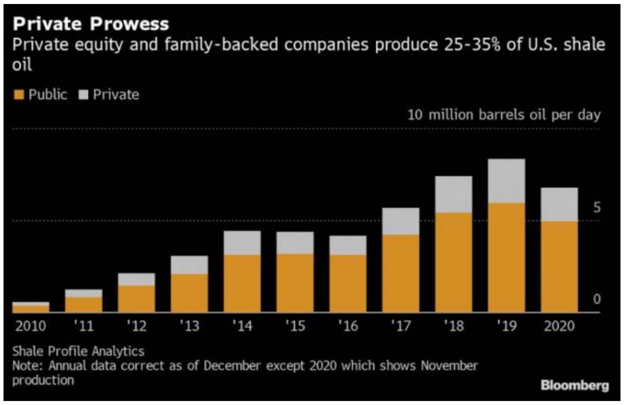
Oil – US private E&P will be increasing drilling with high oil prices

Privates to increase oil drillilng

We recognize that Abdulaziz "'*Drill, baby, drill' is gone for ever"* was referring to public US E&P. But private US E&P are increasing drilling with higher oil prices. Prior to the Abdulaziz comment, on Monday, we tweeted [LINK] *"#Shale #Oil #NatGas Public E&P may be forced (voluntarily or not) to focus on shareholder returns by capital providers. Note @DavidWethe est for private share of shale oil production, then chart of increasing oil rigs. Sets up increasing production over 2021. #OOTT".* Bloomberg's March 1 story "*Shale's Private Army*

Ramping Up Means Supply Wild Card for OPEC" highlighted the strong share of US oil rigs that were used by private E&P. And included the key graph (below) that shows roughly 2 mmb/d of US shale is from private E&P and not public E&P. Assuming the publics are primary focused on keeping production flat, we believe higher oil prices and the privates increasing drilling will help lead the US to modest US oil growth. Our Supplemental Documents package includes the Bloomberg report.

Figure 16: US Shale Oil Production Split Public vs Private Companies



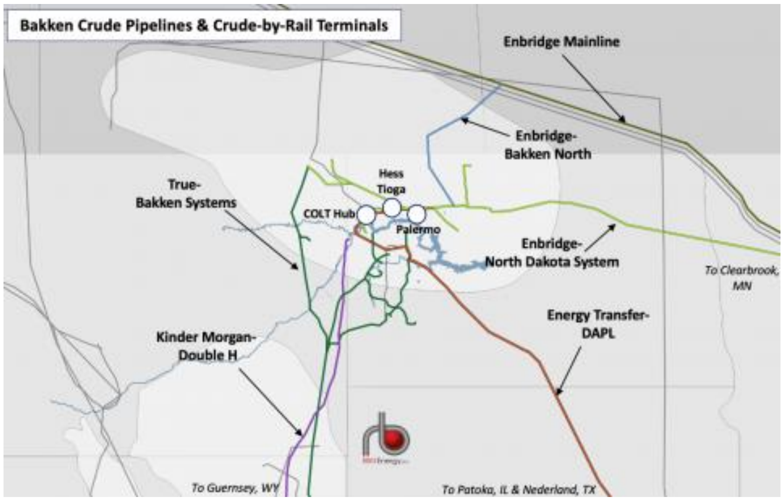
Source: Bloomberg

Crude transport capacity out of the Bakken

Oil – Good RBN blog on Bakken takeaway options

WTI over $65 thanks to Saudi Arabia, the last thing the Bakken needs is for the Dakota Access PipeLine to be shut down in early April. As it currently stands the ruling for the 570,000 b/d line is set for April 9, originally scheduled for Feb 10 but was delayed after the US Army Corps asked for a delay. If the easement for the crossing under Lake Ohae is ultimately revoked producers would need to find other takeaway for their Bakken crude. This week, RBN posted a good blog on the potential risks for North Dakota producer in the event of a DAPL shutdown [LINK]. We recommend reading this blog as it is a good reference guide for takeaway capacity and options out of the Bakken. First choice will be for producers to turn to the other three major networks out of the Bakken, Enbridge's 355,000 b/d system, True Companies' 240,000 Bakken-area system, and Kinder Morgan's 88,000 b/d Double H Pipeline. Alternatively, producers can switch to rail with Hess Midstream's 140,000 b/d Tioga Rail Terminal, Crest wood Equity Partners' 160,000 b/d Crude Oil Loading Terminal (COLT) Hub which also has 1.2 mmb of storage capacity, and Paradigm midstream and Phillip 66 Partners' jointly owned 100,000 b/d Palermo Rail Terminal which also offer 440,000 b of storage capacity. RBN wrote *"crude-by-rail isn't something Bakken producers and shippers only turn to when pipeline takeaway capacity is constrained, it's a takeaway option that is constantly employed, mostly due to the regular, generally steady demand for Bakken-sourced crude by refineries in PADD 5 (West Coast) and, to a lesser degree, in PADD 1 (East Coast)".* RBN expects that if there were to be a DAPL shutdown, the 500,000 b/d currently being transported on DAPL would try to find a home of the other 680,000 b/d of pipeline capacity. However connectivity along with capacity on theses lines and downstream lines will limit the amount of crude that can be absorbed. Our Supplemental Documents package include the RBN blog.

Figure 17: Bakken Takeaway Lines and Crude by Rail Terminals



Source: RBN

Oil – Oil sands turnarounds to take 450,000 b/d offline in Q2

Oil sands hit by 450,000 b/d

There will be up to ~450,000 b/d of Cdn oil sands off line at various times in Q2. (i) Last week's (Feb 28, 2021) Energy Tidbits noted two planned turnarounds in Q2 at Suncor's U2 upgrader (130,000 b/d) and Syncrude's 8-3 coker (70,000 b/d). On Friday, Suncor posted a more specific timing [LINK] on its website "*Our 2021 spring maintenance event is scheduled to begin in May at our Base Plant operation.*" (ii) This week Bloomberg noted another maintenance related cut from CNRL. Bloomberg wrote *"Co. will have roughly 250k b/d of upgrading capacity offline in April during 30 days of maintenance on Horizon oil-sands upgrader".* In total this brings the capacity offline for maintenance to 450,000 b/d during Q2.

Oil – Cdn crude by rail imports to Gulf Coast down 129,000 b/d YoY in Dec to 89,000 b/d

Cdn crude by rail imports to Gulf Coast

The EIA posted it's monthly "U.S. Movements of Crude Oil by Rail" [LINK] on Friday, which also had good insights on Cdn crude by rail. Canadian CBR volumes to PADD 3 (Gulf Coast) were 98,000 b/d in December, which is up 28,000 b/d MoM from November, however is still down big YoY being -129,000 b/d vs Dec 2019. As noted in the CER data last week, we have been expecting increasing CBR volumes in Q4/20 given the widening WCS-WTI differentials. Below is our graph of Cdn CBR exports to the Gulf Coast.

Figure 18: Canada CBR Exports to US Gulf Coast

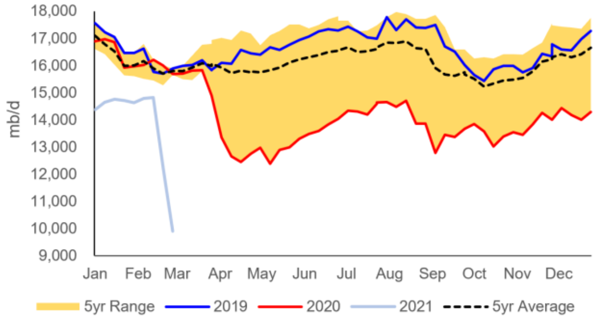
Source: EIA

Oil – Refiners show Texas freeze impact in Feb 26 week, down -5.793 mmb/d YoY

Oil inputs to refineries -5.793 mmb/d YoY

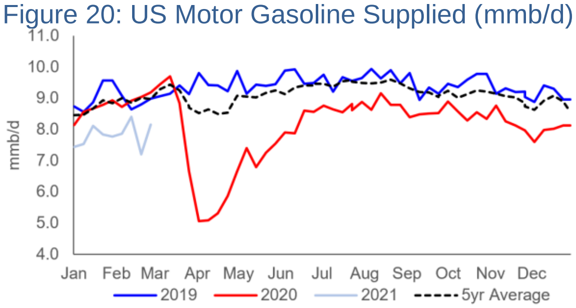
We expect to see crude oil inputs to refineries ramp up in the next EIA data with the return of more refineries to normal operations. For example, Bloomberg reported that Exxon restored its 369,000 b/d Beaumont refinery on March 4. But, for the Feb 26 week, the Texas freeze impact still had a huge impact on refineries. Crude inputs to refineries continued to decline this week and were -2.327 mmb/d to 9.903 mmb/d for the Feb 26 week, which is -5.793 mmb/d YoY and is 2.480 mmb/d below the 2020 low of 12.383 mmb/d. Refinery utilization decreased this week, being -12.6% to 56.0%, which is -30.9% YoY. Total products supplied (ie demand) increased this week and was +0.072 mmb/d to 18.759 mmb/d for the Feb 26 week, and motor gasoline demand increased, being +0.942 mmb/d to 8.148 mmb/d. Below is our graph of crude inputs to US refineries, along with a graph of US motor gasoline supplied.

Figure 19: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA, SAF

Figure 20: US Motor Gasoline Supplied (mmb/d)



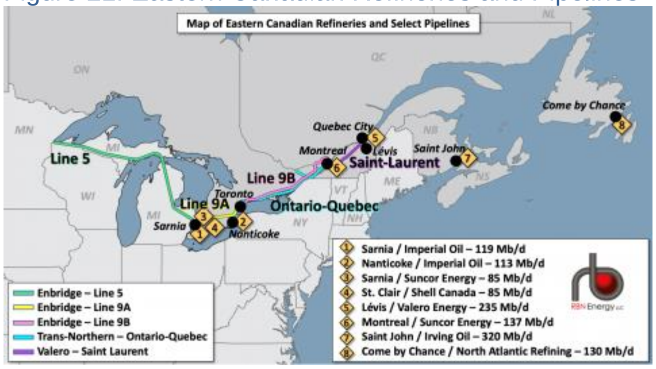
Source: EIA, SAF

Oil – RBN's blog reminds of Line 5 importance to Ont/QC refineries

Line 5 is primary crude conduit for ON/QC refineries

Despite Michigan Gov Whitmer recently declaring a state of emergency on propane supplies, we haven't seen any indication that it will change her objective to shut down Enbridge Line 5 in just under two months. We have noted numerous times the Endridge release detailing the impact of a Line 5 shutdown [LINK] but this week RBN put out a good blog on the makeup of refinery throughput in eastern Canada [LINK]. RBN wrote *"Let's begin with Ontario, which receives Western Canadian crude primarily via Enbridge's Line 5 conduit (green line in Figure 1 above). Ontario's refining sector has seen a steady rise in the use of Canadian crude (green bar segments in graph to far left in Figure 2 below) — from less than 80% in 2010 to an all-time high of 99% in 2015, before falling back to the 85-90% range in the past few years as crude imported from the U.S. (purple bar segments) gained a foothold. The primary conduit for transporting Western Canadian crude to Ontario is Enbridge's Line 5".* Over the past ten years, Eastern Canadian refiners have slowly been increasing reliance on Canadian crude and US imports rather imports from elsewhere, meaning that if Line 5 is shut, there would be a significant decline in demand for Western Canadian crude. Our Supplemental Documents package includes the RBN blog.

Figure 21: Eastern Canadian Refineries and Pipelines



Source: RBN

Liberals come out saying will work to keep Line 5 in service

It was good to see the Liberals come out with support to keep Enbridge Line 5 in service, although the comments we heard from some in the oilpatch were it was because of the impact on Ontario and Quebec. Regardless, the Liberals look to be throwing their support behind not letting Michigan shut down Line 5. Natural Resources Minister SeamusO'Regan tweeted his comments [LINK]. We made a transcript of his comments that were "*It is an operational pipeline that not only employs people in Ontario, Alberta and Quebec, but provides energy security to those provinces and to US states as well. We are fighting that on a diplomatic front and we are preparing to invoke what ever measures we need to in order to make sure that Line 5 remains operational. The operation of Line 5 is non-negotiable."* Our prior Energy Tidbits have noted Enbridge had previously outlined the impacts of a Line 5 shutdown on Michigan and the surrounding areas [LINK]. Line 5 supplies 65% of propane demand in Michigan's upper peninsula and 55 of Michigan's statewide propane needs. If Line 5 was to be shut, refineries in Michigan, Ohio, Pennsylvania, Ontario, and Quebec would be undersupplied vs demand by ~45%. Our Supplemental Documents package includes the Enbridge Line 5 shutdown impact piece.

Will Liberals fight on Line 5 if Biden joins Michigan to shut down Line 5

It is good to see O'Regan come out strongly in favor of fighting Michigan in its effort to shut down Line 5 now. We really hope Biden doesn't come out strongly onside with Michigan and make the case to shut down Line 5. Trudeau made it clear his priority is not worry about tension points, but rather spend time on areas that the US and Canada agree. At least that is why he said it wasn't worth advocating for Keystone XL. Perhaps the question links back to the comments we heard from some in the oil patch that the reason why O'Regan came out on Line 5 is the impact in Ontario and Quebec. It would be an interesting item to watch if Biden comes out strongly to shut down Line 5. After our news cut off for last week's Energy Tidbits, Trudeau was on NBC Meet the Press. NBC posted a transcript of the interview [LINK] including "*Does this mean you're done asking for -- are you going to stop advocating for it here? Do you feel as if the Keystone Pipeline is now dead? PRIME*

MINISTER JUSTIN TRUDEAU: I think it's fairly clear that the U.S. administration has made its decision on that, and we're much more interested in ensuring that we're moving forward in ways that are good for both of our countries. I think there's so much we can do together that I don't spend too much time worrying about the tension points. It'll always come up in our relationship, but we'll work through them, particularly given the alignment on so many things that we're able to bring with this new administration."

Oil – US "net" oil imports up 1.655 mmb/d to 3.941 mmb/d

US "net" oil imports +1.655 mmb/d WoW

Like all other weekly data, it is hard to draw any conclusions from the weekly oil import/export data for the Feb 26 week. Import and export data was heavily affected by the Texas freeze, causing the delay/cancellation of inbound and outbound shipments. In addition, its hard to trust the massive increase in imports given the reduced port operations. Imports increased massively, but the recovery of exports lagged. US "NET" imports were up 1.655 mmb/d to 3.941 mmb/d for the Feb 26 week. US imports were up 1.692 mmb/d to 6.292 mmb/d and US exports were up slightly, being 0.037 mmb/d to 2.351 mmb/d. The WoW decrease in US oil imports was driven by increases from Canada, Saudi Arabia, and Mexico. Some items to note on the by country data. (i) Canada was up this week, and was +0.817 mmb/d to 3.648 mmb/d for the Feb 26 week, which is now ~50,000 b/d below the average levels in Jan/Feb of 2020. Also note that PADD 2 imports were also up, being +687,000 b/d and Canada is almost all of this market. (ii) Saudi Arabia was up 0.225 mmb/d to 0.368 mmb/d this week. (iii) Colombia was up 85,000 b/d to 285,000 b/d. (iv) Ecuador increased and was +59,000 b/d to 114,000 b/d. (v) Iraq was up off zero to 68,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico increased 247,000 b/d to 0.602 mmb/d.

Figure 22: US Weekly Preliminary Oil Imports By Major Countries

	Jan 1/21	Jan 8/21	Jan 15/21	Jan 22/21	Jan 29/21	Feb 5/21	Feb 12/21	Feb 19/21	Feb 26/21	WoW
Canada	3,894	3,958	3,890	3,115	4,238	3,730	3,681	2,831	3,648	817
Saudi Arabia	0	328	135	206	180	282	237	143	368	225
Venezuela	0	0	0	0	0	0	0	0	0	0
Mexico	520	600	710	463	723	446	471	355	602	247
Colombia	337	0	358	73	305	336	346	200	285	85
Iraq	0	91	97	115	90	114	227	0	68	68
Ecuador	0	168	144	258	100	105	186	55	114	59
Nigeria	41	195	49	116	175	0	70	50	89	39
Kuwait	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0
Top 10	4,792	5,340	5,383	4,346	5,811	5,013	5,218	3,634	5,174	1,540
Others	577	899	662	718	696	844	680	965	1,118	153
Total US	5,369	6,239	6,045	5,064	6,507	5,857	5,898	4,599	6,292	1,693

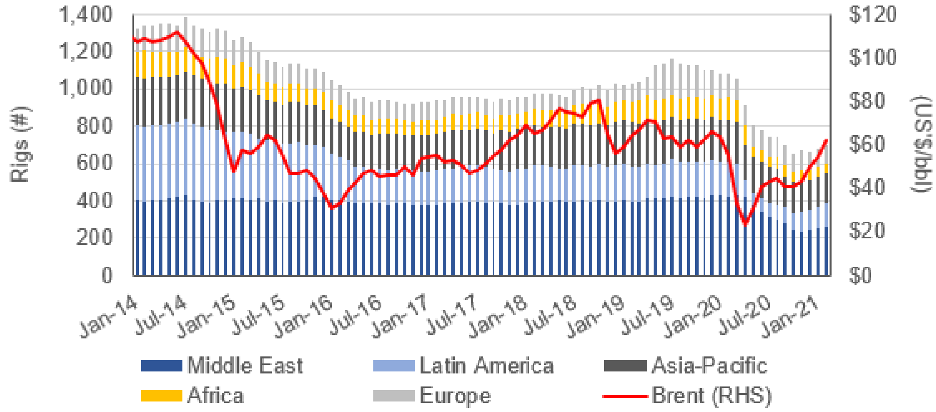
Source: EIA, SAF

Oil – Baker Hughes International rigs +24 MoM to 701 rigs in February

Middle East drove most of MoM increase

We don't think there is any major takeaway from Baker Hughes monthly updated international rig count. International activity is increasing modestly but is still down 35% YoY. We expect to see continued strengthening with oil prices >$60. Total international rigs increased 24 MoM to 701 in February. The MoM increase was mainly driven by a 9 rig increase in the Middle East, with Oman increasing 7 MoM. Rig counts in Latin America are continuing to recover well, being up 63 rigs from 62 in May 2020 to 125 in Feb. Colombia has increased 13 rigs in May to 14 rigs in Feb. Similarly, Argentina had bottomed at zero in April, and has since recovered to 30 rigs, while Mexico had bottomed at 35 in August and has since increased 11 to 46 rigs in February. However, while rigs have recovered to a reasonable level, all areas are still down big YoY. Total international rigs are down 35% YoY in February with the Middle East making up most of that decline. Rigs in the Middle East were -167 YoY to 260 in Feb. Saudi Arabia has had the largest YoY decline and is down 51 YoY. Below is our graph of international rigs by region and avg monthly Brent price.

Figure 23: Baker Hughes International Rig Count and Brent Price



Source: Baker Hughes, Bloomberg

Oil – Pemex says no need to reduce exports, but is it due to refineries using less oil?

Pemex refineries continue to disappoint

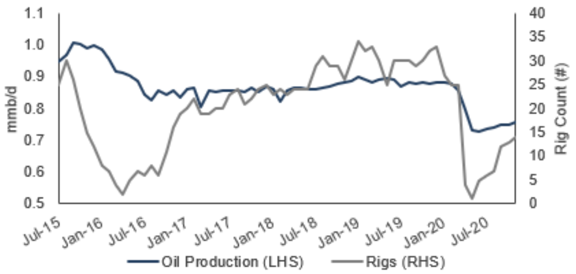
One of Pemex and AMLO's big pushes for Mexico is for rapid increase in Mexican oil processed in Pemex refineries, which would lead to a big drop in oil exports and Mexico becoming self reliant on fuels by the end of 2023. So it was interesting to see the Reuters report [LINK] of Pemex comments at CERAWeek. Reuters wrote ""*I'm looking beyond the crisis," Ulises Hernandez, general director of PMI which is in charge of most of Pemex' trading deals, said at IHS Markit's CERAWeek virtual energy conference. "Because of the low (production) costs and, of course, the blend of heavy and light oil that we produce has good demand in the international market, we have not had the need to reduce exports."* After seeing the comments, we tweeted [LINK] "*#Pemex says no need to reduce exports with good demand for MEX #Oil. But more likely due to less domestic demand, Pemex refinery processing well below fcast. Q4 584,000 b/d, 2020 591,000 b/d v Oct 5 fcast 681,000 b/d. Big miss to #AMLO priority."* We went thru the recent Pemex Q4 report, annex and slide deck and there was no real outlook for refining throughput expectations or plans for 2021. As we highlighted in Oct, Pemex made a big deal of ramping up refining volumes and reducing exports. And now it looks like silence. It is not the norm for oil companies to be silent when things are working well especially on a key goal of national importance. So the question is what is their revised target for 2021? The Pemex Oct 5, 2020 slide deck forecast was for refineries to process 681,000 b/d for 2020 average and 1.114 mmb/d for 2021. The Q4/20 actuals were nowhere near these targets with actuals of 591,000 b/d for 2020 and 584,000 b/d for Q4/20. Q4/20 also was way lower than what would have been expected based on Mexico Energy minister Rocio Nahle's comments on Oct 26, 2020. At that time we tweeted [LINK] on her comments that Mexican refineries were processing 697,000 b/d at Sept 30. If Nahle was right, then something happened to the negative for Q4/20 to only average 584,000 b/d. Maybe Hernandez is right and that there is "*no need to reduce exports*", but the data is showing there isn't the increasing demand from Pemex refineries to reduce the amount of crude oil available for export. Our Supplemental Documents package includes the Reuters report.

Colombia oil production 0.745 in Jan

Oil – Colombia oil production in Jan declined MoM to 0.745 mmb/d

On Wednesday, Bloomberg terminal reported Colombia Energy Ministry data for Jan showed Colombia oil production was 0.745 mmb/d. This is down 15.7% YoY from 0.884 mmb/d in Jan 2020, and down MoM from 0.759 mmb/d in Dec 2020. Jan shows the first MoM drop, as previously there had been 5 consecutive months of very small increases off the June 2020 bottom of 0.730 mmb/d that had dropped from pre-covid production of 0.878 mmb/d in February. The MoM drop in Colombia crude production was mainly due to shut-in wells in the Castilla and Castilla Norte fields as 123 wells were shut due to problems in water treatment which dropped crude production by ~17,000 b/d, according to Bloomberg. Oil rigs in Colombia had bottomed in May 2020 at 1 before increasing to 12 by Sept 2020. However since rigs have remained relatively flat at 12-14 since with Jan rigs falling 1 MoM to 13. Below is our table of Colombia monthly oil production.

Figure 24: Colombia Oil Production and Rig Count



Source: Bloomberg, Baker Hughes

Figure 25: Colombia Oil Production

million b/d	2015	2016	2017	2018	2019	19/18	2020	20/19	2020	20/19
Jan	1.036	0.986	0.860	0.860	0.899	4.5%	0.884	-1.7%	0.745	-15.7%
Feb	1.030	0.955	0.864	0.823	0.893	8.5%	0.878	-1.6%		
Mar	1.023	0.917	0.804	0.856	0.885	3.3%	0.857	-3.1%		
Apr	1.029	0.915	0.857	0.865	0.891	3.0%	0.796	-10.6%		
May	1.027	0.904	0.851	0.866	0.895	3.3%	0.732	-18.2%		
June	1.010	0.888	0.857	0.864	0.892	3.3%	0.730	-18.2%		
July	0.947	0.843	0.856	0.860	0.869	1.0%	0.735	-15.4%		
Aug	0.968	0.827	0.858	0.866	0.883	1.9%	0.742	-15.9%		
Sept	1.009	0.859	0.851	0.869	0.879	1.2%	0.749	-14.8%		
Oct	1.005	0.846	0.864	0.879	0.883	0.4%	0.751	-14.9%		
Nov	0.990	0.855	0.851	0.883	0.880	-0.3%	0.761	-13.5%		
Dec	0.999	0.837	0.870	0.889	0.882	-0.8%	0.759	-14.0%		

Source: Bloomberg

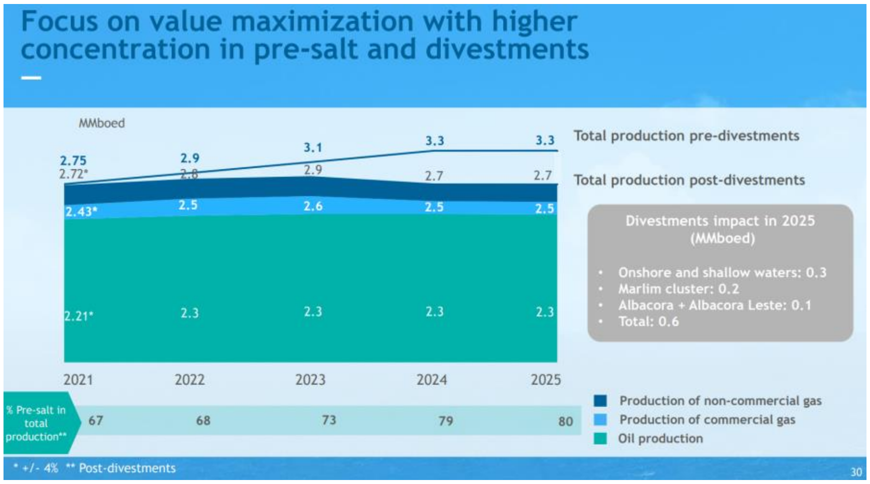
Board changes at Petrobras

Oil – More board chaos at Petrobras, how can they be focused on plan execution?

Its not just that the chaos at Petrobras is like a series of tabloid stories, this is important to oil markets as Brazil is expected to continue to be a key non-OPEC oil growth country. Chaos at the top has to lead to some impact on the operational plan focus and execution. Last week's board announcements were followed up by a Petrobras release of another board member departure. We couldn't help tweet [LINK] on the release as we couldn't believe any other large oil company would include in the release this type of a reason why a director wants out "*The change proposed by the majority shareholder, although in line with corporate precepts, is not in line with the best management practices, on which I try to base my business trajectory.*" There were more comments along this line. The board is changing, the CEO is changing and its far from a smooth transition. We just don't see how Petrobras can be focused on its operating plan execution. We believe that a change like this will only cause interruptions/delays or changes in plans, Putting Petrobras' Dec 1 growth plan at risk.

Ultimately this is a positive to global oil markets as Brazil is one of the key non-OPEC growth areas.

Figure 26: Petrobras Strategic Plan Oil Growth Expectations



Source: Petrobras

Oil – Cold weather meant Russia Feb oil production was ~34,000 b/d below quota

Cold impacts Russia oil production

In last week's (Feb 28, 2020) Energy Tidbits noted that crude and condensate production data for the first 25 days of Feb had fallen below their production quota due to cold weather. This week Bloomberg noted that the full month of data showed crude production to be below quota. Bloomberg wrote *"The nation produced 38.56 million tons of crude and condensate in February, according to preliminary data from the Energy Ministry's CDU-TEK unit. That equates to 10.095 million barrels a day, based on a 7.33 barrel-per-ton conversion ratio".* The official Russian data doesn't split out crude vs condensate, but if Russia's condensate production is in line with Jan, crude output would be ~9.155 mmb/d, ~34,000 b/d below their Feb quota of 9.189 mmb/d. If confirmed this would be the first month of underproduction from Russian since the supply curbs began. Bloomberg also gave more color on the cold temp effect and wrote *"The nation's crude pipeline operator, Transneft PJSC, regularly recorded lower crude flows at some Siberian intake points over the month, citing frigid weather as one of the reasons. The last time a severe winter led to cuts in Russian oil production was early 2017".* Our Supplemental Documents package includes the Bloomberg report.

Oil – Bloomberg OPEC survey data, OPEC February down to 24.870 mmb/d

Bloomberg OPEC survey for Feb

The Bloomberg survey of OPEC February oil production was released this week, which showed a MoM decrease in production, mainly due to the Saudi voluntary cut. Total production decreased 920,000 b/d in February to 24.870 mmb/d. As expected, the drop came from Saudi Arabia's voluntary cut of 1 mmb/d which would drop their quota for Feb to 8.119 mmb/d. Saudi Arabia produced 8.150 mmb/d, a 0.970 mmb/d MoM decrease, so was slightly above their quota taking into account the voluntary cut. Iran was down 30,000 b/d in Feb, but with production still over 2.1 mmb/d, they are continuing to get their barrels out into the market despite sanctions. Similarly, Venezuela was down 20,000 b/d MoM, but still at 440,000 b/d, up 100,000 b/d since the June 2020 low. Nigeria production rallied in Feb, being +130,000 b/d MoM to 1.600 mmb/d as Jan output had been effected by the force majeure at Exxon's Qua Iboe Terminal for nearly all of January. Libya was basically flat MoM in Feb, being -10,000 b/d to 1.150 mmb/d, likely due to the strike at the Hariga port persisting for the first two weeks of Feb. Iraq was up 40,000 b/d MoM to 3.910 mmb/d which is 53,000 b/d above their Feb quota of 3.857 mmb/d. Below is our table of the Bloomberg survey data.

Figure 27: Bloomberg Survey Of OPEC Production

thousand b/d	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	**Feb**	MoM	YoY	Feb Quota	Feb vs Quota
Algeria	1,020	1,010	1,020	820	810	810	870	870	870	860	860	880	**880**	0	-140	876	4
Angola	1,360	1,400	1,360	1,270	1,240	1,180	1,250	1,270	1,230	1,180	1,180	1,180	**1,100**	-80	-260	1,267	-167
Congo	310	310	320	290	300	280	290	310	260	290	270	270	**260**	-10	-50	269	-9
Equatorial G.	120	110	140	100	130	120	120	100	110	110	130	130	**100**	-30	-20	105	-5
Gabon	190	200	210	190	220	160	160	180	200	190	190	170	**190**	20	0	155	35
Iran	2,050	2,030	1,960	1,950	1,940	1,960	1,920	1,950	1,930	1,970	2,020	2,140	**2,110**	-30	60		
Iraq	4,610	4,620	4,600	4,210	3,910	3,790	3,690	3,710	3,870	3,810	3,880	3,870	**3,910**	40	-700	3,857	53
Kuwait	2,680	2,750	2,900	2,290	2,150	2,220	2,270	2,310	2,300	2,240	2,270	2,330	**2,350**	20	-330	2,329	21
Libya	150	100	90	90	110	100	80	150	450	1,090	1,210	1,160	**1,150**	-10	1,000		
Nigeria	1,930	1,930	1,910	1,630	1,510	1,510	1,520	1,490	1,610	1,540	1,520	1,470	**1,600**	130	-330	1,516	84
Saudi Arabia	9,740	9,990	11,590	8,660	7,530	8,450	8,920	8,940	8,990	8,990	9,000	9,120	**8,150**	-970	-1,590	8,119	31
UAE	3,000	3,430	3,680	2,500	2,430	2,450	2,990	2,680	2,490	2,560	2,540	2,610	**2,630**	20	-370	2,626	4
Venezuela	750	750	660	550	340	360	310	310	340	430	410	460	**440**	-20	-310		
Total OPEC	27,910	28,630	30,440	24,550	22,620	23,390	24,390	24,270	24,650	25,260	25,480	25,790	**24,870**	-920	-3,040	21,119	51

Source: Bloomberg

Oil – Next OPEC+ meeting is Wed March 31

OPEC JMMC Mar 31

As a reminder, OPEC+ ministers have agreed to meet monthly cycle and the agreement on Thurs is for the month of April production levels. The OPEC release also advised that the next OPEC+ JMMC meeting is Wed March 31, and the next full OPEC+ ministerial meeting is Thurs April 1. Good thing that the monthly meetings are remote as we hate to think of the logistical challenges they would have in the good old days of physical meetings in Vienna.

Oil – OPEC+ and Saudi surprise with no increase other than Russia/Kazakhstan

OPEC+ Ministerial Meeting

Oil companies around the world should be giving Saudi Energy Minister Abdulaziz big kudos for how he surprised everyone with a big upside results from the OPEC+ meetings. No wonder he is always smiling, he deserves it. Oil bulls were happy when OPEC+ surprised the market with its decision to extend current output cuts largely at the same level for another month. Saudi Arabia has also extended its additional 1 mmb/d voluntary cut to now include April, keeping their quota at 8.119 mmb/d for the third month in a row. Again, Russia was allowed to increase its monthly production quota for April by 130,000 b/d to meet growing and seasonal domestic demand for oil products bringing their quota to 9.379 mmb/d for April. Kazakhstan was also allowed to increase their quota by 20,000 b/d to meet seasonal demand bringing their quota to 1.457 mmb/d. Since the original cuts in April 2020, OPEC+ cuts have held 2.3 billion barrels out of the market. Below is a list of the new OPEC+ quotas inclusive of the Saudi voluntary cut. Our Supplemental Documents package includes the OPEC+ release.

Figure 28: OPEC+ Quotas as of March Ministerial Meeting

mmb/d					
OPEC	Aug-Dec 2020	Jan 2021	Feb 2021	March 2021	April 2021
Algeria	864	876	876	876	876
Angola	1,249	1,267	1,267	1,267	1,267
Congo	266	269	269	269	269
Equatorial G.	104	105	105	105	105
Gabon	153	155	155	155	155
Iran	n.a.	n.a.	n.a.	n.a.	n.a.
Iraq	3,804	3,857	3,857	3,857	3,857
Kuwait	2,297	2,329	2,329	2,329	2,329
Libya	n.a.	n.a.	n.a.	n.a.	n.a.
Nigeria	1,495	1,516	1,516	1,516	1,516
Saudi Arabia	8,993	9,119	8,119	8,119	8,119
UAE	2,590	2,626	2,626	2,626	2,626
Venezuela	n.a.	n.a.	n.a.	n.a.	n.a.
Total OPEC	21,815	22,119	21,119	21,119	21,119
Non-OPEC	Aug-Dec 2020	Jan 2021	Feb 2021	March 2021	April 2021
Russia	8,993	9,119	9,184	9,249	9,379
Kazakhstan	1,397	1,417	1,427	1,437	1,457
Oman	722	732	732	732	732
Azerbaijan	587	595	595	595	595
Malaysia	486	493	493	493	493
Bahrain	168	170	170	170	170
Sudan	61	62	62	62	62
South Sudan	106	108	108	108	108
Brunei	83	85	85	85	85
Total Non-OPEC	12,603	12,781	12,856	12,931	13,081
Total OPEC+	34,418	34,900	33,975	34,050	34,200

Source: Bloomberg

Oil – Did the US approve unfreezing Iranian assets in Iraq?

Is Iran getting its frozen assts in Iraq?

As of our 7am news cut off, we haven't seen any confirmation from the US on Friday's report from Iran that the US allowed the release of frozen Iranian assets in Iraq. We think this may not make the Sunday morning news talk given the topics are more likely focused on the just approved stimulus bill and the reopening of Texas/Mississippi. The reports did not say how much of the estimated >$6b of frozen Iranian assets were released. Last night, we tweeted [LINK] "*#Oil story to watch. Iran says US approved release of frozen Iranian assets in Iraq. No US confirmation yet. But if so, not clear how much of >$6b is released, would be a big good faith signal from US that want return to #JCPOA sooner than later. #OOTT*". We have trouble believing that, if true, the US would sign off on a total release of the estimated >$6b. But if there is any reasonable level released, we believe it would be a very big sign of good faith by the US that they are serious about getting both sides back to the JCPOA in a timely basis. Definitely a story to watch. Our Supplemental Documents package includes the Al Arabiya (Saudi Arabia news) reporting.

Oil – Correcting oil market is absorbing more Iran barrels being snuck on the market

More Iran oil on the market

One of the overlooked items in the correcting oil supply/demand balance is that global oil markets are being able to absorb more Iran barrels being snuck on to global markets. No one knows exactly how many barrels is sneaking out there, but the general consensus is that they have been able to continue to increase oil exports despite sanctions. This week, Bloomberg's Julian Lee posted a story "*Iran Tanker Tracker: Ships Vanish as Diplomatic Strains in Focus*", which noted the large number of tankers that have turned off signals. Bloomberg noted the below table of Iran oil tankers with the latest signals as of March 1, but highlighted that the vast majority of the tankers remain dark. And that "*Most of the vessels that have disappeared from tracking were last seen in, or near, the Persian Gulf and may be either transporting crude with their transponders switched off, or used for floating storage".* If we take the total barrels for all tankers, its 93 million barrels that are in gone dark tankers. Our Supplemental Documents package includes the Bloomberg report.

Figure 29: Iran Tanker Tracker March 2, 2021

	VLCC	Suezmax	Total
Not seen for more than 1 month	31	7	38
Last seen in past month, but not last week	5	6	11
Last seen within the past week, but not in last 48 hours	1	1	2
Last seen with the past 48 hours	2	1	3
Total Fleet	39	15	54

Source: Bloomberg

Oil – Saudi's Nest Egg Still Big But Being Depleted Faster Than Most Understand

Saudi net foreign assets down

On Tues, we tweeted [LINK] on the updated Saudi Arabia Net Foreign Assets as of Jan 31, 2021. We look at Net Foreign Assets for someone like Saudi Arabia as their nest egg to help them thru the Energy Transition. Saudi is far from going broke, but the data supports that their nest egg is being depleted at a faster rate than most expect. Saudi net foreign assets are now $445.5 b at Jan 31, 2021, which is basically unchanged since April 30, 2020. But its down from a peak of $737b on Aug 31, 2014. In the 77 months since the peak, Saudi net foreign assets have declined by $3.8b, on average, per month. Or call it $45b per year on average decline. The reality for Saudi sources and uses of cash is that there were at couple visible "one time" sources of cash that added ~$130b to Saudi coffers and this meant Saudi didn't have to dip into their nest egg. We say "one time", but our tweet reminded "*supports why KSA wants stronger for longer #Oil prices, also more Aramco share sales ahead?*" The one time items were the Saudi Aramco IPO that raised $25.6 b in 2020, and Saudi Arabia raised $106 b in 2018 from the wealthy in their corruption crackdown. [LINK} Without those two one time events, Saudi's net foreign assets would be significantly lower than $445.5b at Jan 31, 2021. And their nest egg burn rate would be much more. We are a little surprised that we haven't seen others talk about a higher than expected burn rate, but we think its just math. The effective burn rate would be higher if they didn't have the one-off items that raised ~$130b. Saudi Arabia isn't going bankrupt, and we have to believe there is a level they are going to defend to avoid any views that their nest egg is being depleted too quickly. We suspect the defending level isn't much different than current levels. And its also why we expect to see Saudi Aramco share sales, perhaps infrastructure deals, more outside investment in Vision 2030, etc.

Figure 30: Saudi Arabia Net Foreign Assets

Source: Bloomberg

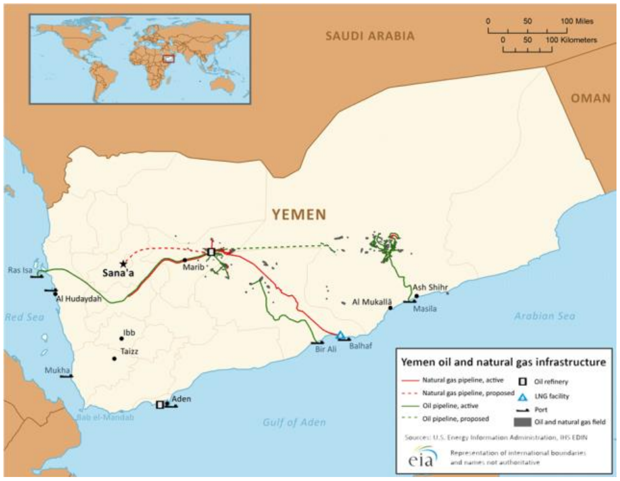
Sounding like a second Aramco issue could be coming
As noted above, we fully expect to see a Saudi Aramco share issue sometime soon as a way to help them defend keeping their nest egg. This week, MEES [LINK], and others similarly, reported on comments from Saudi officials that a Saudi Aramco share issue would be coming when the market was a little stronger. Makes us wonder if the timing in within the next month or two. MEES reported on comments from Yasir Al-Rumayyan (Governor of the Public Investment Fund (PIF) and Chairman of Saudi Aramco) during CERWeek saying ""*I think once we see market conditions improve and more appetite from different investment institutions and investors, we will definitely consider selling more shares."* Our Supplemental Documents package includes the MEES report.

Oil – Houthi's threaten Aramco if Saudi keeps attacking Marib

Houthis threaten Aramco facilities

We need to keep an eye on the Saudi/Houthi war, in particular with the escalating Houthi/Saudi coalition battle for Marib. We believe this is likely the major battle that signals the end may be nearing for the Saudi/Houthi war. (i) Marib is a significant location as it is the traditional Yemen oil and natural gas region/hub (see below EIA map). Marib was early established as key for Saudi to control in its original plan to resume control of all of Yemen for the Saudi supported Yemen government. The Houthis have escalated their push to gain control of Marib. As of our 7am news cut off, the Houthis push continues. (ii) The other big Houthis/Saudi news this week was an escalation of Houthis drones attack on targets in Saudi Arabia. This is not a surprise and we expect this escalation is linked to Marib. Earlier this week, on Tuesday the Jerusalem Post reported [LINK] on the Houthis *"will strike at Saudi Arabia's Aramco if Saudi Arabia or UAE "fighters or supporters" commit "aggression" in certain areas. The Houthis pointed to the "Safer oil fields", as an example. It was not clear where this red line was or what specific infrastructure they don't want targeted." "The most important message is to warn the Saudi regime not to think of attacking Ma'rib oil structures ....Therefore, if the Safar oil sectors are targeted by Saudi or Riyadh-based fighter jets, the Sanaa forces will also use 'UAVs and missiles will bomb Saudi oil structures in a large-scale operation.'" He warned of another Abqaiq-style attack".* (iii) The escalation of Houthi missile attacks continues including this morning. Saudi media widely reported that they were able to intercept 10 Houthi missiles but did not say where. Earlier this morning, we tweeted [LINK] "*Note often get more specifics on Houthi missile attacks from @USAinKSA security alerts. this morning, said reports of suspected attacks and explosions today near Jeddah and Khamis Musheit. #OOTT".* We referenced the US Embassy in Riyadh website as often giving added details. In this case, they posted [LINK] that two targets were Jeddah and Khamis Musheit. Our Supplemental Documents package includes the Jerusalem Post report.

Figure 31: Yemen Oil and Natural Gas Infrastructure



Source: EIA

Yemen likely to return to old North South divide

As we have previously noted, we believe that the end game of the war will result in a return to the old North and South Yemen divide. In our Feb 21, 2021 Energy Tidbits, we noted comments from Houthi leader Abdul-Malik al-Houthi speech [LINK] where he stated *"We do not want to be under the guardianship of Saudi Arabia, the United Arab Emirates (UAE), the US, Israel, or any foreign country; we are free, and our faith identity compels us to strive to achieve our independence".* So what is now significant is if this is direction the war is heading is where the borders will end up. Marib had previously been part of North Yemen (Yemen Arab Republic). So if the Houthi's had a goal of recreating North Yemen, they will want to control Marib, especially as it is the key oil and gas region.

Figure 32: Yemen 1967-1990 Pre Unification

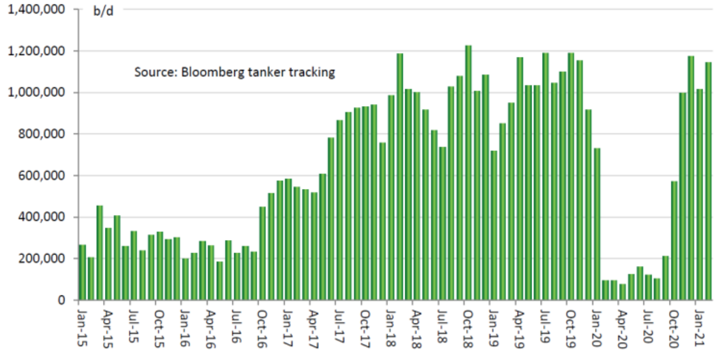
Source: Wikipedia

Oil – Libya crude and condensate exports up 13% MoM to 1.14 mmb/d in February

Libya crude and condensate exports back to pre-blockade

Despite the nearly month long strike at the 110,000 b/d Hariga Port in Libya that would have limited exports from the port for the first half of February, exports increased 13% MoM. Libya crude and condensate exports reached 1.14 mmb/d in February, up from 1.02 mmb/d in January according to Bloomberg. With crude and condensate exports now reaching and holding a level roughly equivalent to pre-blockade exports, the key now for Libya is to bring back production from their shut-in fields. Along with necessary repairs and maintenance to neglected infrastructure that has slowed the gap up in Libyan production. Our Supplemental Documents package includes the Bloomberg report.

Figure 33: Libya Crude and Condensate Exports



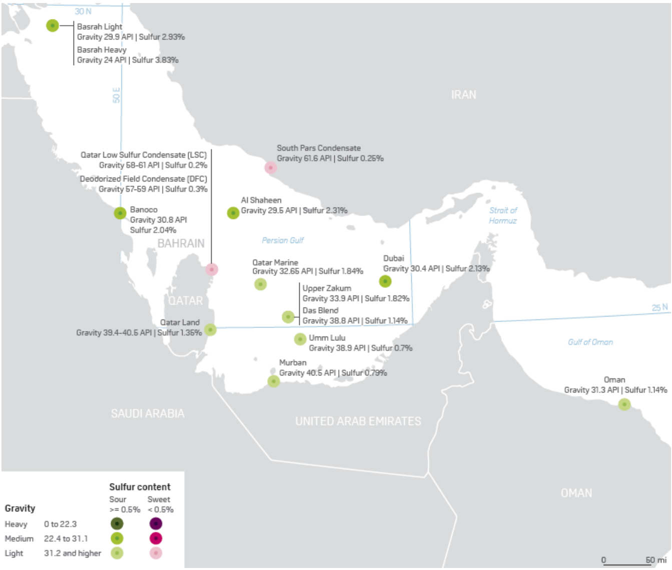
Source: Bloomberg

Oil – Good Platts crude oil assay maps for Persian Gulf and Asia Pacific

Platts crude oil assay maps

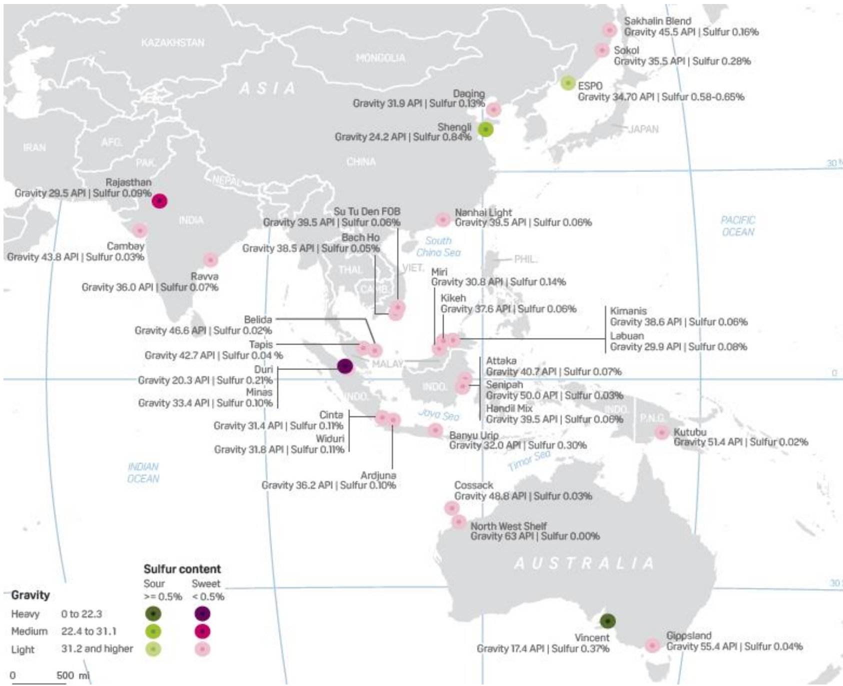
This week, Bloomberg reported on more Russia far east crude coming to the US as refiners continue to ramp processing back up. US refiners have started to show interest in Sokol, a medium crude with 35.5 API and 0.28% sulphur and ESPO, also a medium crude with 34.70 API and sulphur content of 0.58-0.65%. Both grades are produced near the eastern coast of Russia and rarely make their way to the US. However these grades are prices against the currently cheaper Dubai benchmark rather than WTI or Brent helping the economics. But seeing flows of these lesser known grades is a good reminder that Platts has excellent crude oil assay maps like the below maps of Persian Gulf and Asia Pacific crude grades. We recommend the Platts recent "*Specifications Guide Asia Pacific and Middle East Crude Oil*" [LINK] for a reference guide on crude oil assays in the these regions.

Figure 34: Persian Gulf Crude Oil Assay Map



Source: Platts

Figure 35: Asia Pacific Crude Oil Assay Map



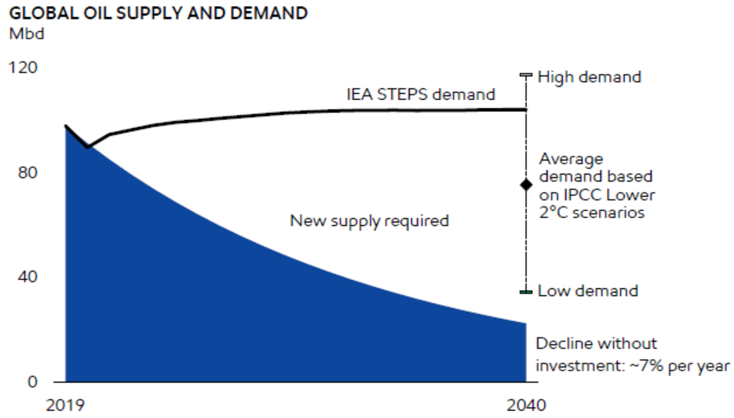
Source: Platts

Oil - Exxon sees global oil declines “about 5-7%” per year

XOM global oil decline 5-7%

There were many energy insights from the Exxon investor day, but, for us, the key oil insight or factor that will shape the post Covid post 2022 oil view is global oil decline rates. No one has cared about global oil declines during the Covid period with OPEC+ having to take millions of barrel of supply off the market when demand collapsed. But we continue to believe it remains the overlooked factor for post Covid and why we believe oil is for a higher for longer period. No surprise, Exxon highlighted their views on global oil declines As soon as the slide deck was public, we tweeted [LINK] “*Bullish to post Covid oil. $XOM CEO just said global oil decline of "about 5 to 7%" per year. a little lower than his below Oct comment, but just as bullish considering even more capital is moving from #Oil to renewable.”* At 5 to 7% decline, it means that global oil supply declines approx. 5 to 7 mmb/d per year. And as our tweet noted, that is especially bullish considering how the outlook for global oil investment is much less today than a year ago as supermajors spend less on oil and shift more capital to renewables.

Figure 36: Oil and gas investment needed to meet demand

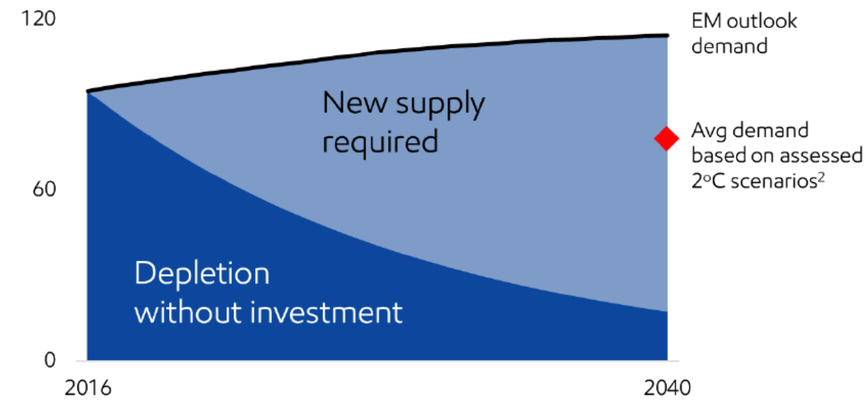


Source: Exxon Investor Day March 3, 2021

Exxon's new about 5-7% decline is less than its >7% in Oct but make sense
Our Oct 25, 2020 Energy Tidbits highlighted Exxon CEO Woods 5-pg letter to employees, which included Exxon's estimate the decline rate in global oil is >7%. The CEO wrote "*Our outlook projects oil demand to groww at 0.6 percent a year and gas demand to grow by 1.3 percent. With depletion rates, new oil production needs to increase by nearly 8 percent per year and natural gas by 6 percent. Under any demand scenario, depletion supports the need for significant investments*." The implied decline rate in oil is 7.4%. At that time we said whether its 7% or lower at 6% or 5%, its very bullish for mid term oil even if think oil demand has reached peak demand. The world still needs to replace 5 to 7 mmb/d every year. In Oct, we said to make up for the annual decline is only going to be harder with the lower investment in oil and gas. The impact isn't being felt because the lower capex and declines is masked by the need for OPEC quotas and the demand crash of 20% in 2020.

Exxon's view on decline rates is not new
It is important to note that Exxon didn't just come up with this view of global oil decline rates in 2020 or 2021 because capital has moved away from oil or to counter criticism they aren't moving as quickly on energy transition as the European supermajors. Rather, we first noticed their global oil decline rate views in June 2019 and we posted our June 20, 2019 blog "*Exxon's math calls for overall global oil decline rate of ~7%, a very bullish argument for post 2020 oil prices".* In looking at that blog from 21 months ago and if we knew that Covid would hammer demand in 2020 and continue to impact 2021, the only change we would make to the title is to say post 2022 and not post 2020. The Covid impact on demand pushed back the time for when we see this decline rate noticeably impacting the challenge for oil markets to replace declines. Even though Covid has impacted the timeline, it doesn't change the thesis. If the world has to replace 5 to 7 mmb/d every year to stay flat, it will be bullish for oil. If anything, Covid makes it an even tougher challenge as oil and gas investment is expected to be even less going forward. Below is the Exxon June 2019 graph that was in our blog. Our Supplemental Documents package includes out June 20, 2019 blog. [LINK]

Figure 37: Oil Supply/Demand (moebd)



Source: Exxon US Sellside Conference Presentation June 18, 2019

Oil – Bloomberg Oil Demand Monitor, global air travel showing positive trend

Bloomberg's Oil Demand Monitor

We recommend reading the weekly Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Commercial flights around the globe have begun to pick up since mid February. According to the TSA, 1.05 million passengers passed through US airports on March 1, the first time this has topped 1 million since Jan 4 and is only the third Monday to reach that threshold since March 2020. Along with a strong increase in scheduled flights in China. However, jet fuel demand Continues to lag with demand in the US -32% YoY, -41% YoY in India, and -68% YoY in Portugal. However, Shell CEO Ben Van Beurden stated *"Unsurprisingly, the biggest gap is still in jet fuel volumes, but also that is probably going to restore itself more or less by the second half of the year".* Again, Bloomberg reminded that YoY comparisons will become less useful in the coming weeks as virtually all nations were under strict lockdowns by the end of March. In terms of road fuel demand, the UK has seen a strong recovery over the last month, increasing 9%. Additionally, road congestion in Shaghai and Beijing is once again above 2019 levels with Shanghai +25% and Beijing +20% vs 2019 after dipping below during the LNY holiday. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 38: China Air Travel Data

China Air Travel Weekly View:

China (Scheduled amounts)	Jan. 11	Jan. 18	Jan. 25	Feb. 1	Feb. 8	Feb. 15	Feb. 22	March 1
Flights (thousands)	87.0	85.6	77.5	73.7	54.3	77.4	81.2	93.2
Flights (y/y % chg)	-13.3	-12.3	-21	+2.2	+47.3	+170	+123	+70
Seats (millions)	14.7	14.4	13.0	12.3	9.0	12.9	13.6	15.8
Seats (y/y % chg)	-15.1	-14.7	-23.2	-1.3	+46.8	+176	+126	+76
Source: OAG								

Source: Bloomberg, OAG

Oil – Caixin General Manufacturing PMI to 50.9 in Feb from 51.5 in Jan

Caixin PMI falls for third consecutive month

The big positive for oil in 2020 (aside from vaccine news) was the strong and timely recovery of oil/products demand in China. Growth continues in China, although the growth rate has slowed. This growth but at a slow rate is also reflected in sentiment and manufacturing activity. The Caixin China General Manufacturing PMI data for February [LINK] shows a

MoM decline, however the index still remains in expansionary territory. We recommend reading the short release as opposed to just seeing the headlines as there is more color on China. Last Sunday, we tweeted [LINK] *"Caixin manufacturing PMI hits 9 month low in Feb at 50.9 vs 51.4 est. companies recorded slower rises in both output & new work for 3rd mth running, new export work declined for 2nd mth running. Worth a read for good China recap Thx @IHSMarkitPMI #OOTT".* While the index is still reading in expansionary territory, this is the third consecutive MoM decline. A Sr. Economist at Caixin stated *"To sum up, the momentum of the manufacturing recovery further weakened as the supply and demand both rose at a slower clip, adding pressure on employment. The prices of raw materials continued to increase and inflationary pressure continued to grow. Despite the headwinds mentioned above, manufacturers became more optimistic about the outlook for their businesses".* Our Supplemental Documents package includes the Caixin release.

Oil – BHP to blend renewable fuels with diesel, not rely on renewable electricity

BHP's diesel emissions approach shifting

Our view on Energy Transition has not changed over the past few years – its going to happen, it will just take longer, be bumpy and cost more than expected. For 2021, we are see increasing data points reinforcing this view. This week, there was a mostly overlooked Bloomberg story "*BHP Looking to Low Carbon Liquid Fuels for Energy Transition"* that we thought has implications to the energy transition ie. not as easy to get rid of fossil fuels (in this case diesel), but also why there will be an increased push to renewable/clean fuels. And it reminds of one of the big shortfalls of renewable electricity – it really can't handle heavy industry requirements. Its why we had a 3 part tweet [LINK] on the story. Bloomberg reported *"The company is seeking to help drive down emissions with the use of electrification, or hydrogen; BHP has also been looking at blending renewable fuels with fossil fuel diesel * Liquid fuels have an advantage as it would complement the co.'s current supply chain infrastructure, such as its diesel tanks*". Note the two key parts, BHP is looking at blending renewable fuels with diesel and it will complement its current supply chain infrastructure. Diesel is one of the big emissions issues for BHP and we suspect all mining companies. its 40% of BHP's emissions. The significance is that in its big Sept Climate Change Report, BHP highlighted that its focus to reduce diesel was from renewable electricity. It didn't mention renewable fuels. But now, they are looking to blend in renewable fuels instead of the focus on renewable electricity. And it also reminds of reality check that want to minimize infrastructure overlap. Don't want infra to support both renewable and diesel if possible. Our Part 3 tweet [LINK] tried to sum up the implication "3/3 *Reminds practical reality of #RenewableEnergy shortfall for heavy industry & transportation. Seems inconsistent but mean longer life for #Diesel & larger market for #RenewableFuels at BHP. Another reality check why #EnergyTransition will take longer than expected."* Our Supplemental Documents package incudes the Bloomberg report and excerpts from BHP's Sept Climate Change Report.

Energy Transition – American railroads not focusing on biofuels/alternative fuels

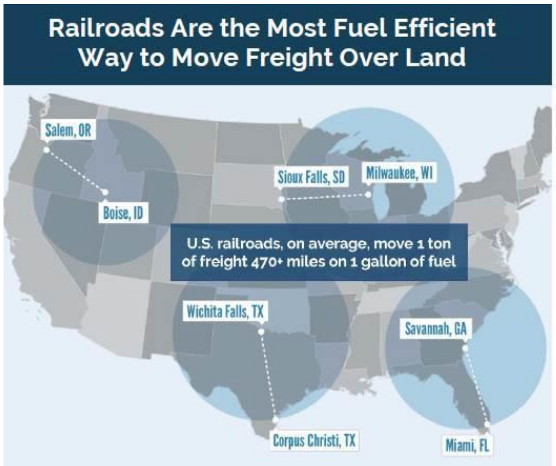
American railroads climate pitch

There were some oil and gas relevant items in Monday's Association of American Railroads "Freight Railroads & Climate Change" report [LINK], which forms the basis of their lobbying to the Biden administration for support to the US railway sector. (i) CCS. There is no doubt that CCS is one of the big energy transition pushes and capital allocations areas. The AAR is another pushing its critical role in the fight against emissions. But there is one other important reminder in the AAR push – its not just the CCS project, it's the transportation of CO2 for the CCS project and, no surprise, the AAR says rail is the way to go ie. there is more than pipelines that can move the CO2. (ii) Good news is the omission or no mention of crude by rail anywhere. But that is not unexpected as oil and products are only 2% of total carloads. (iii) They didn't really push biofuels or any alternative fuels very hard. We were surprised by this given what we saw last week with Maersk's view on tankers. AAR notes but raises equipment manufacturers. This didn't come up in Maersk but we assume the issue here is the manufacturing process of building thousands of locomotives vs the process of ship building ie kind of like the challenge for a car company to build an EV vs ICE. (iv) We have to love the way American industry push their sector, its not just push why their sector is better, but also here is what you should do to other sectors. They go after trucking on a couple of specific policy recommendations.   They highlight a valid problem – pending insolvency of the Highway Trust Fund. Suggest both a short term "temporary" fuel tax increase and also a longer term vehicle miles traveled fee (get all cars to pay for highways incl EVs) along with an emissions surcharge (make ICE pay more). (v) We don't get the feeling that the industry has a common view yet on how they will replace diesel. As noted above, we wonder if one of the reasons to not push biofuels is manufacturing and the number of locomotives. But as noted earlier, another example besides Maersk of heavy industry moving to renewable fuels to blend with diesel is BHP. Our Supplemental Documents package includes the AAR report.

Many good rail facts/tidbits in the report

The AAR "Freight Railroads & Climate Change" report is also a good reference report for facts/tidbits on US rail freight transportation. We recognize they are speaking to their book and this is a climate change report comparing and contrasting to trucking, and that rail doesn't deal with the last mile challenge, but the tidbits are interesting. One example is railroads account for 40% of US freight but only 2.1% of US transportation related greenhouse gas emissions. Below is one of their graphics.

Figure 39: How Total Gets Renewables To >10% IRR



Source: Association of American Railroads

Energy Transmission – Warren Buffet on challenge to build electricity transmission'

Warren Buffet annual letter

One of the key reasons why we believe the Energy Transmission will take longer, be bumpy and cost more than expected is that we believe there will be inevitable delays in building out transmission across the US. It won't be there on a timely basis to bring renewable power from remote areas to demand centers. Two of the massive requirements for the transition to renewable energy are a the grid expansion and electricity transmission. This concern was reinforced by Warren Buffet last weekend. We expect many read Warren Buffet's annual letter released last weekend. While most look at it for capital markets insights, we look at it for energy insights from two of his major businesses: BNSF railway and BHE Energy. Last

Sunday night, we tweeted [LINK] "*Need to move on #Transmission to match increasing #Wind #Solar in 2020s. @WarrenBuffett reminds best #renewableenergy sites often in remote areas & transmission takes long time. Risk, each state has a say, NIMBY is bipartisan. Delays = need for #NatGas* . Buffet didn't include our comment that NIMBY is bipartisan, but did highlight the challenge to get transmission approvals. Part of his comments are "*Transmission lines had to cross the borders of states and other jurisdictions, each with its own rules and constituencies. BHE would also need to deal with hundreds of landowners and execute complicated contracts with both the suppliers that generated renewable power and the far-away utilities that would distribute the electricity to their customers. Competing interests and defenders of the old order, along with unrealistic visionaries desiring an instantly-new world, had to be brought on board.*" Our Supplemental Documents package includes the Buffet letter.

Energy Transmission –Exxon investor insights on energy transition

XOM insights on energy transition technology

We watched the Exxon investor day this week. And there were many insights on the key components of the energy transition. It was a major news week and we ran out of time this weekend to followup with more detail on some of our tweets. Fuel cell technology, we tweeted [LINK] "*$XOM investor day ongoing. Interesting highlighting fuel cell technology with step change potential. an overlooked theme. worth watching their Netherlands trial. #OOTT*." CO2 potential, we also tweeted [LINK] "*Add #FuelCell to #EnergyTransition must watch list. Note $XOM low key #17 below doesn't tell the story, then see SAF transcript. Exciting CO2 potential, reminds carbon neutral #OIl #NatGas could solve key #RenewableEnergy shortfalls.*" The Exxon investor slide deck also reinforces why it is important to listen to what mgmt says on expanding on a slide. The good news and bad news of a remote conference is that mgmt read a script fairly quickly on the slides because the camera wasn't on them. The good news is that it means they said a lot more on each slide than would be done in the normal walk around and make eye contact comments on a slide. Slide 17 on CO2 is an excellent example and we encourage readers to note the transcript we made of the mgmt comments that we attached to our tweet. Anyone looking at the slide would not get the same potential. There is much more in the Exxon investor day and we will find time to write over the coming weeks. Our Supplemental Documents package includes Slide 17 and the SAF transcript thereon.

Energy Transition – Europe continues to show the way in EVs

EVs dominate ICE sales in UK and Germany

No one can deny Europe is the leader in the energy transition, whether its from governments driving policy and regulations leading to rapidly increasing penetration of EVs. As we have been highlighting, EV adoption, especially in Europe, has been gaining big momentum and has been continuing thru the first months of 2021 as the "green recovery" push continues. PEVs represented 13% of registrations in the UK for the month for February, up from 5.7% a year ago [LINK], while diesel powertrain sales volume fell by 61% YoY and are only hold 0.2% more share than PEVs. While overall sales volume of all categories was down 35.5%, PEV volume was up 46%. And given the UK ban on new ICE vehicle sales by 2030, this share will likely continue to rise. PEV's in Germany, the world's 4th largest auto market, hit 20.7% market share in February which represents a 3x increase from February 2020's 6.9% share [LINK].

Energy Transition – Germany local grid limitations delay home wallbox EV hargers

Need for Germany grid expansion

Europe is not just the leader from a positive side on the energy transition, by being first out of the gate in trying to accelerate, Europe also shows on some potential shortfalls or reinforces some concerns. Our concern is that there will be gaps and gaps that cause major issues for people. Last week's (Feb 28, 2021) Energy Tidbits highlighted the Bill Gates comment that

"*In fact, we're going to have to almost triple the size of the electric grid and build all that transmission.*" On Wed, we tweeted [LINK] on an overlooked Argus story "*Calls for Germany to bolster grid ahead of EV surge*" [LINK]. Argus reported that some local electricity grid limitations in Germany are stopping some grid operators from providing home EV charging wallboxes ie. the grid needs to be upgraded. This is not a huge issue, but we looked at this as a good real life example of the reminder there is a long way to go to upgrade the grid. One item not in the Argus story was our second tweet [LINK] that said there are these home wallbox delays are at a time when EVs are ~1 mm in Germany versus total passenger cars in Germany of >47 mm cars. Maybe the Germany grid situation doesn't tie exactly to Bill Gates view that the US will need to triple the grid, but its an example that points to why there will need to be a big increase to the Germany electricity grid. One other question it raises is do governments look at the full cycle costs of EVs ie. for grid upgrading? Our Supplemental Documents package includes the Argus report.

Another reason why Merkel also wants Nord Stream 2

One other thought that came to mind as we thought about the bigger picture implications is that it also reinforces a key reason why Merkel wants Nord Stream 2. Maybe they don't need to triple the grid as Gates thinks the US does, but there is a big increase required in the grid and Merkel is smart enough to not want to be stuck without the natural gas generation capacity that came come from natural gas supplied by Nord Stream 2

Energy Transition – FAST Company reminders on greenwashing

Greenwashing

We didn't get around to writing on the FAST company story last week "*How to tell if a company's 'net zero' goals are serious—or just greenwashing*" [LINK]. The story is a more general story, but we took away some good reminders relevant to oil and gas companies. (i) The main reminder is that there will be increased scrutiny of ESG plans/targets to ensure they are meaningful and not just greenwashing. It will create a new group of disclosure review experts to try to differentiate real ESG plans vs greenwashing. It means all companies have to be more serious about what they are writing. (ii) The concept of interim targets on the road to Net Zero will be the emerging focus in 2021. Companies have to be prepared and be looking ahead because investor views on emissions plans is moving to higher standards in 2021. Our concern is that companies that build their climate plans based on Paris and write their disclosure relative to what they are doing relative to Paris will find themselves passed by in 2021 by a new standard. Paris is focused on 2050, and one area reminded by FAST is that there is the need or push to interim targets ie. don't tell just tell investors what you are doing to get 2050, give interim targets. Its hard to disagree with the concept that need interim goal. (iii) FAST has a good comment that the quickest way to reduce emissions is to switch from fossil fuels to renewable for energy. It makes sense and supports why so many companies are, as the first priority, trying to switch from fossil fuels power to renewable power. Our Supplemental Documents package includes the FAST story.

Reminded us of our mini nukes for oil sands view

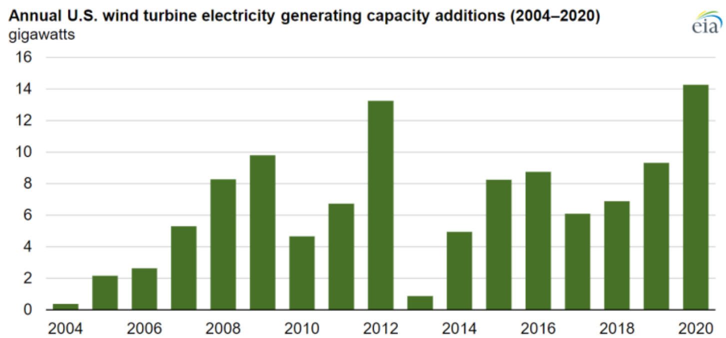
The first thought that came to mind on the FAST comment about renewable replacing fossil fuels is the fastest way to cut emissions is that this ties right into our view why mini-nukes make sense in areas like oil sands. When you think about the oil sands process that is the area that can make the biggest difference with a reasonably high probability of being able to execute. They will still have to do a range of other things like moving to hydrogen powered heavy trucks, etc. Last week's (Feb 28, 2021) Energy Tidbits included an item "*Will emissions reductions targets push oil sands to* *use mini nukes?"* We expect to see the oil sands players come out with looking mini-nukes for oil sands, and we believe it has a reasonable probability of happening. There really isn't any other way to make a big cut to emissions related to oil sands that won't hurt performance/efficiency. And the oil sands consume >3 bcf/d of natural gas. Our Supplemental Documents package includes what we wrote last week on oil sands and mini-nukes.

Energy Transition – US adds 14.2 GW of wind generation in 2020

2020 a record year for US wind turbine capacity additions

The EIA posted a blog with some good data on wind generation capacity editions [LINK]. Annual wind turbine capacity additions had a record year in 2020 adding 14.2 GW, surpassing the previous record of 13.2 GW added in 2012. Total wind turbine capacity in the United States is now 118 GW. In absolute terms, Texas has the most installed wind capacity at 30.2 GW, making up 20% of the overall generation mix in Texas. Iowa and Kansas, though both with a fraction of overall power generation vs Texas, have the highest proportion of wind generation at 58% in Iowa and 43% in Kansas. Our Supplemental Documents package includes the EIA blog.

Figure 40: Annual Wind Generation Capacity Additions



Source: EIA

ESG – Whistleblower gets $22MM in NY recovery from hedge fund manager

Whistleblower gets $22MM in NY recovery

On Tuesday, New York Attorney General Letitia James (Southern District) and New York City Corporation Counsel James E. Johnson y announced the recovery of $105 million in back taxes and damages from a hedge fund manager who defrauded New York state and New York City out of taxes on deferred-compensation income in 2017. [LINK]. This fine was the largest of its kind in the state, and under the New York False Claims Act, the whistleblower reportedly received $22MM. The investigation, triggered by a 2018 lawsuit by the whistleblower, alleged that Sandell dodged more than $50mm in taxes. The tax dodging had been on $450mm of deferred fee income that had been accrued from 1998-2008. And due to a change in the treatment on recognition of deferred fee income was required to be recognized in 2008. However, he used a tax strategy utilizing offshore investments to push the tax to 2017, before he tried to dodge the tax by relocating to London, opening a shell co with three employees on Boca Raton which was filed as the firm's only US operations, and funneling his payroll and property expenses through a third party. Our Supplemental Documents package includes the SDNY release.

Capital Markets – Elizabeth Warren's Ultra millionaire wealth tax is back

Warren's wealth tax may be back

Elizabeth Warren's Ultra Millionaires Wealth tax was back in the news with it being reintroduced. It is likely a long shot at best given that Biden's $15 minimum wage couldn't get across the goal line. Recall that this was one of her big run for President campaign platforms and she continued her messaging that it was only 2 or 3 cents. Her plan is for a wealth tax with a 2% annual tax on wealth above $50 mm, and an 3% annual tax for wealth above $1 billion. In her plan, she estimates this would apply to roughly 75,000 households. We would have thought the number would be more. The Knight Frank report (see a later item) only estimated for wealth >$30 mm and that was 180,000 in the US. So maybe its only 100,000 households, we just would have thought more. The Warren proposal is for all assets included in the calculation including personal property with a value of >$50,000. Her proposal also includes items like a 40% "exit tax" on the net worth >$50 mm of any US citizen that renounces their citizenship. One thing her plan didn't address [LINK] was newly divorced couples. We have to believe there will be some "divorces" for those less than $100 mm wealth. We don't think it gets done this year, but we believe it is a trend that is likely to happen sometime in the next few years. Our Supplemental Documents package includes the Bloomberg report on this and the Warren Ultra-Millionaire Tax plan.

Demographics –Are more wealthy Californians leaving the state?

California study: are people leaving CA?

We have all seen high profile moves of wealthy like Elon Musk leaving a high tax state like California to low tax state Texas prior to year end 2020 so they could file taxes for 2020 in a lower tax state. And been wondering if there is a broader movement of wealthy doing this since Covid. The California Policy Lab posted its "*CalExodus: Are People Leaving California?"* [LINK] that used residential locations for all Californians wit credit history as the dataset. And tracks the data from March thru the end of 2020. (i) It was interesting to see that the CPL went out of their way to assure that the wealthy aren't leaving on mass, the data seems to suggest that mor of the wealthy are leaving. (ii)One of the CPL key conclusions is "*Despite concerns about tax revenue impacts, there is little evidence that wealthy Californians are leaving en masse*." We guess the issue is what do they mean by "en masse". (ii) But the data seems to suggest more of the wealthy are leaving. CPL writes "*the rates at which people exit the state from the wealthiest 10% of California ZIP codes, as well as the rates at which people move into those ZIP codes from out of state, have closely tracked patterns of mobility in the bottom 90% of ZIP codes (see Figure 4, below) over the past five years. This pattern largely appears to have held during the pandemic. Note that, although the wealthiest 10% of ZIP codes saw departures relative to the prior year increase more than did the bottom 90% of ZIP codes, these changes still parallel each other*." The CPL includes the below graphs that seem to support more of the wealthy are leaving. (iii) Tied to the above point, the CPL wrote "*Drilling down, however, we find that net exits from the Bay Area have increased during the pandemic, particularly in San Francisco, where exits in the second through fourth quarters of 2020 were 31% higher than during the same period in 2019, and new entrances were 21% lower."* (iv) The other interesting data point was the Q4 exodus ie. in time to establish another state residence for filing 2020 taxes. The CPL wrote "*Historically, the number of people leaving California tracks the number of people entering California, but this pattern deviated in Q4 2020, when 267,000 people left the state and only 128,000 entered."* Our Supplemental Documents package includes the CPL report.

Demographics – Stress, boredom, loneliness lead to increased alcohol/cannabis use

Alcohol and cannabis consumption increased

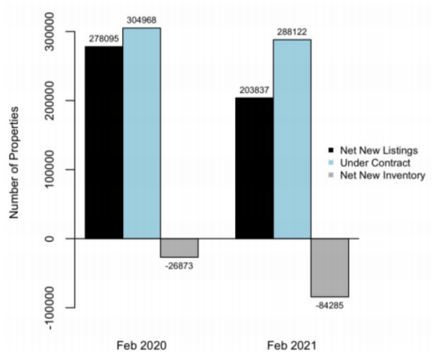
A survey of the Canadian Perspectives Survey Series by Stats Canada [LINK] found that of those who had previously consumed alcohol, almost a quarter (24%) said their consumption had increased during the pandemic. They cited stress (58%), boredom (60%), convenience/lack of schedule (53%), loneliness (37%) and insomnia (17%) as contributors to the increase. Close to 1 in 5 people reported consuming five or more drinks on the days they had consumed alcohol in the previous month, a higher proportion than what was recorded before the pandemic. For cannabis, among Canadians who had previously consumed cannabis, 34% had increased their consumption compared with the pre-pandemic period. Their cited factors were similar those who increased their alcohol consumption.

Demographics – Continuing low home inventory lead to high home prices

Continuing low home inventory lead to high home prices

House Canary released its latest Market Pulse report with some key insights into rising US house prices [LINK]. The housing market in the US is experiencing a major supply crunch, with new listing volume falling 32% YoY. In February 2021, net new listings were down 26.7% from February 2020. The biggest detractor to net new listings have been in homes at the <$200,000 price point (-23.3%) and $200,000-$400,000 which was down 3.8%. This supply shortage coupled with strong interest from buyers has contributed to price inflation across the US. As a result, the median price of single-family closed listings is up 20% YoY.

Figure 41: Net New Listings, Under Contracts, and Net New Inventory: Feb 2020 vs. Feb 2021



Source: HouseCanary analysis, MLS source data

Demographics – Dip in Covid birth rates unlikely to be temporary

Dip in Covid birth rates unlikely to be temporary

This week, the Wall Street Journal published an article detailing the falling birthrates in many advanced countries [LINK]. One year into the pandemic, early data and surveys are indicating a baby bust in many advanced countries, often exacerbating existing falling birthrate levels. Demographers caution that the dip is unlikely to be temporary. The Brookings Institute has estimated that there will be 300,000 fewer births in the US than 2020 due to the pandemic. In France, births have fallen 13.5% YoY in January, however Italy has had the steepest decline. Births in December had fallen 21.6% YoY, compared to an average decline in the first 10 months of 2020 of 3.3%. The Wall Sreet Journal wrote *"Overall in 2020, nearly twice as many people died in Italy than were born there".* Many researchers believe that the longer a crisis lasts, the higher the chances that potential births that were postponed are just abandoned all together, as was the case post global financial crisis. Our Supplemental Documents package includes the WSJ report.

Demographics – Knight Frank "The Wealth Report 2021"

The Wealth Report 2021

Last week's (Feb 28, 2021) Energy Tidbits noted the teasers that were in the news on the Knight Frank "The Wealth Report 2021" that was released on March 2. It's a fun read. We suspect some are surprised that there are 1.10 millionaires in Canada, but we thought it might be higher with real estate values. We also thought there would be significantly more Canadians with >UJS$30 mm wealth than the estimates 10,025. The other surprise was the answer to the question *"what are the three biggest issues affecting the wealth that will most worry your clients in 2021?"* There is a North America and not a Canada split, but the biggest worries in order were Ongoing disruption by Covid-19 at 82%, Domestic government policy

50%, Tax issues 50%. We would have expected most of the wealthy didn't see any hurt to their wealth during Covid-19 and that it would be nowhere near 80%. And that we would have thought Tax issues would have been #!. Our Supplemental Documents package includes excerpts from the report. [LINK]

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

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

@Energy_Tidbits on Twitter

LinkedIn – Look for quick energy items from me on LinkedIn

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

Look for energy items on LinkedIn

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

Fukushima nuclear reactor disaster was March 11, 2011

One of the tragic events that shaped the energy industry in the last decade was the 10 years ago, on March11, 2011, the huge 9.0 earthquake offshore Japan sent a huge 15 metre tsunami that killed over 15,000 people and 3,000 people missing. And from the energy side, it hit Fukushima and its three Daichi nuclear reactors. The World Nuclear Association [LINK] previously wrote "*causing a nuclear accident on 11 March 2011. All three cores largely melted in the first three days. The accident was rated 7 on the INES scale, due to high radioactive releases over days 4 to 6, eventually a total of some 940 PBq (I-131 eq). Four reactors were written off due to damage in the accident – 2719 MWe net. After two weeks, the three reactors (units 1-3) were stable with water addition and by July they were being cooled with recycled water from the new treatment plant. Official 'cold shutdown condition' was announced in mid-December. Apart from cooling, the basic ongoing task was to prevent release of radioactive materials, particularly in contaminated water leaked from the three units. This task became newsworthy in August 2013. There have been no deaths or cases of radiation sickness from the nuclear accident, but over 100,000 people were evacuated from their homes to ensure this. Government nervousness delays the return of many. Official figures show that there have been well over 1000 deaths from maintaining the evacuation, in contrast to little risk from radiation if early return had been allowed."* It reshaped the energy industry putting a halt on most nuclear momentum (only now being regained) and led to acceleration of LNG.

A gracious gentleman, Walter Gretzky, passed away

I was sad to see the news that Walter Gretzky, father of Wayne Gretzky, passed away at the age of 82. I only had the chance to meet Walter once back in the early 90s. It was only the chance to shake his hand and say hello, I watched him in this social setting. Everyone wanted to say hello to him, and my thought was what a gracious gentleman. And he is a man who probably didn't get his fair due. Yes, he was the Great One's dad, but I have always been under the impression he was the originator of the famous saying. The one expression used most commonly by politicians (like seen recently by new US Energy Secretary Jennifer Granholm used in her nominations hearing that she would follow the advice of Wayne Gretzky and skate to where the puck is going. I thought Walter was the originator of that and that he was told his Wayne when he was a kid.

Maple syrup season in Ontario and Quebec

I saw a tweet on Friday that reminded beginning of March is a great time in Ontario and Quebec - its maple syrup season in Ontario and Quebec. I have no idea if they still do it, but baby boomers who grew in Ontario probably also had the public school field trip to a Maple Syrup producer as part of the science class. Growing in the very NE of Toronto, our trip was up near Stouffville. It wasn't as fancy a maple syrup sap collection as today piped or in plastic buckets, but rather in galvanized steel buckets similar to the below picture. For anyone wondering why pure maple syrup costs more than something like Aunt Jemima original "syrup", the Ontario Maple Syrup Producers Association writes [LINK] "*It takes approximately 40 litres of maple sap to make 1 litre of maple syrup. The maple sap is collected in either buckets or by way of a pipeline that brings sap from the tree to the processing area. The sap, which comes out of the tree with a sugar content of approximately 2%, is boiled until it reaches between 66% and 67.5% sugar content. So you can see that a lot of hard work and dedication goes into each litre of maple syrup produced!*

Figure 42: Galvanized Steel Bucket Collecting Sap From Maple Tree

Source: Ben's Sugar Shack

Many probably don't even know Alexander Graham Bell

We wonder how many people still have a land phone line. And we suspect many don't know that Alexander Graham Bell, but 135 years ago on March 7, 1876, he had his patent for his invention of the telephone. Its pretty amazing to think his telephone really didn't get taken over until close to 2000.

EVs will make the autobahn scarier

Anyone from North America who has driven the Autobahn knows what its like when you are going some relatively fast speed of 150 km/h and then see in your mirror a big Mercedes or BMW getting closer at a steady speed, and you remember you better get over in the right lanes. But its not like the big engine car surprises you quickly. This is where EVs are going to be different and that will make the Autobahn scarier because the EVs acceleration will surprise drivers and being surprised at +150 km/h is not a good thing. We saw a YouTube video [LINK] making the rounds this week of a testing of the Audi RS e-tron GT (637 HP and over 600 lb-ft of torque) being tested for acceleration on the Autobahn with a reasonably full charge. He did the classic 0-100 km/h in 3.2 seconds, but the scary one for the Autobahn went from 100 to 200 km/h in ~7 seconds. And to do so quietly.

1 yr since first Alberta began its shut down over Covid

Its been both a fast and a long one year since Alberta health announced the first Covid case on March 5, 2020. It was later determined the case was on Feb 24. March 11 when the World Health Organization declared Covid a pandemic. March 12, Alberta banned gatherings of >250 people. And then March 15, Calgary joined other Alberta cities in declaring a state of emergency and closed non-essential businesses and services. Alberta closed schools. We suspect that very few expected this to have the lasting impact..