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Energy Tidbits

Nov 21, 2021

Produced by: Dan Tsubouchi

Did US Defense Secretary Austin Signal A Softening of US Position on Iran Just Before JCPOA Restarts?

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. US Defense Sec Austin moved off the standard US language on Iran to say "then we will look at all the options necessary to keep the United States secure." (Click Here)
2. Looks like Japan will give in to US and agree to release strategic oil reserves. (Click Here)
3. Cdn oil prices hit as BC flooding caused Trans Mountain to shut down, hope to restart "in some capacity" the end of this week (Click Here)
4. Nord Stream 2 is being required to transfer assets to a subsidiary, the expectation seems to be for a restart not until March (Click Here)
5. JERA, the world's largest LNG importer, is paying $2.5b to buy 25.7% in Freeport LNG Development (Click Here).
6. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

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Natural Gas – Natural gas injection of 26 bcf, storage now -310 bcf YoY deficit

US natural gas storage is starting winter 210 bcf lower YoY. The EIA reported a 26 bcf injection (vs 25 bcf injection expectations) for the Nov 12 week, which was below the 5-yr average draw of 12 bcf, and below last year's injection of 31 bcf. Storage is 3.644 tcf as of Nov 12, decreasing the YoY deficit to -310 bcf, from 308 bcf last week and storage is 81 bcf below the 5-year average vs 119 bcf below last week. The EIA STEO estimates Nov 30/21 storage at 3,547.1 bcf, which is 385 bcf lower YoY vs 3,932 bcf at Nov/20. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -310 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (11/12/20)		Historical Comparisons: 5-year average (2016-20)	
Region	11/12/21	11/05/21	net change	implied flow	Bcf	% change	Bcf	% change
East	900	897	3	3	951	-5.4	908	-0.9
Midwest	1,079	1,075	4	4	1,137	-5.1	1,091	-1.1
Mountain	212	213	-1	-1	241	-12.0	220	-3.6
Pacific	261	258	3	3	319	-18.2	303	-13.9
South Central	1,191	1,175	16	16	1,304	-8.7	1,202	-0.9
Salt	331	324	7	7	349	-5.2	330	0.3
Nonsalt	860	850	10	10	955	-9.9	871	-1.3
Total	**3,644**	**3,618**	**26**	**26**	**3,954**	**-7.8**	**3,725**	**-2.2**

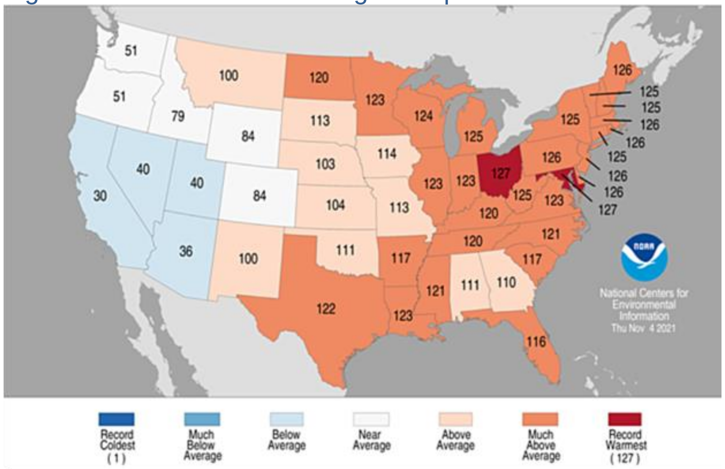
Source: EIA

Natural Gas – it was the 6th hottest October in last 127 years

The great demand for natural gas experienced this past summer persisted into October. However, October is shoulder season so hotter than normal temperatures in October don't have the same heat impact on natural gas demand as a hot September. NOAA posted its recap of October 2021 weather [LINK]. October was the 6th warmest in the last 127 years. October was near a record 1-month average across all states, posting the sixth hottest in the last 127 years. And it was hot in most of the US. The average temperature during meteorological summer for the contiguous U.S. was 57.0 degrees F, 2.9 degrees above average. Temperatures west of the Rockies were below average for October. Below are graphics depicting the state average temperature ranks.

Near record October temperatures

Figure 2: US Statewide Average Temperature Ranks October 2021



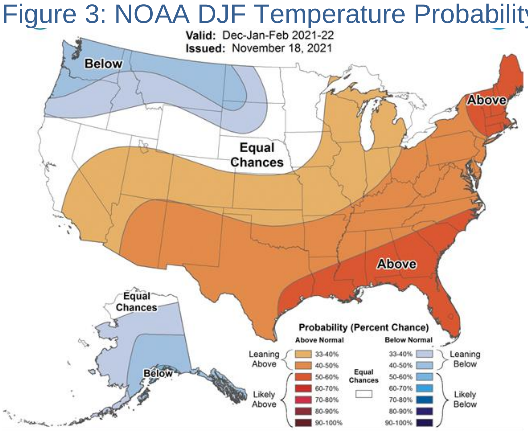
Source: NOAA

Natural Gas – NOAA expects a warmer than normal winter despite La Nina conditions

NOAA forecasts warm fall and winter

There was a good reminder from NOAA that all La Nina winters aren't necessarily expected to be cold. NOAA has been pretty consistent in calling for above normal temperatures for this winter, but almost all of the other earlier calls for winter have focused on the La Nina conditions and how that is more likely a colder winter. However, it is November is almost over ab d we are about to the peak cold winter months of Dec/Jan/Feb. On Thursday, NOAA posted its monthly update [LINK] to its seasonal temperature probability forecasts and NOAA is calling for a warmer than normal start NDJ to winter and a warmer than normal peak winter DJF. Last week's (November 14, 2021) Energy Tidbits memo highlighted the monthly update to the CPC/IRI El Nino/La Nina outlook [LINK]. This new probability forecast is 92% La Nina (was 87%), 8% Neutral (was 13%) and 0% El Nino (was 0%). Below are the are the new NOAA temperature probability maps for Nov/Dec/Jan and for Dec/Jan/Feb.

Figure 3: NOAA DJF Temperature Probability Forecast



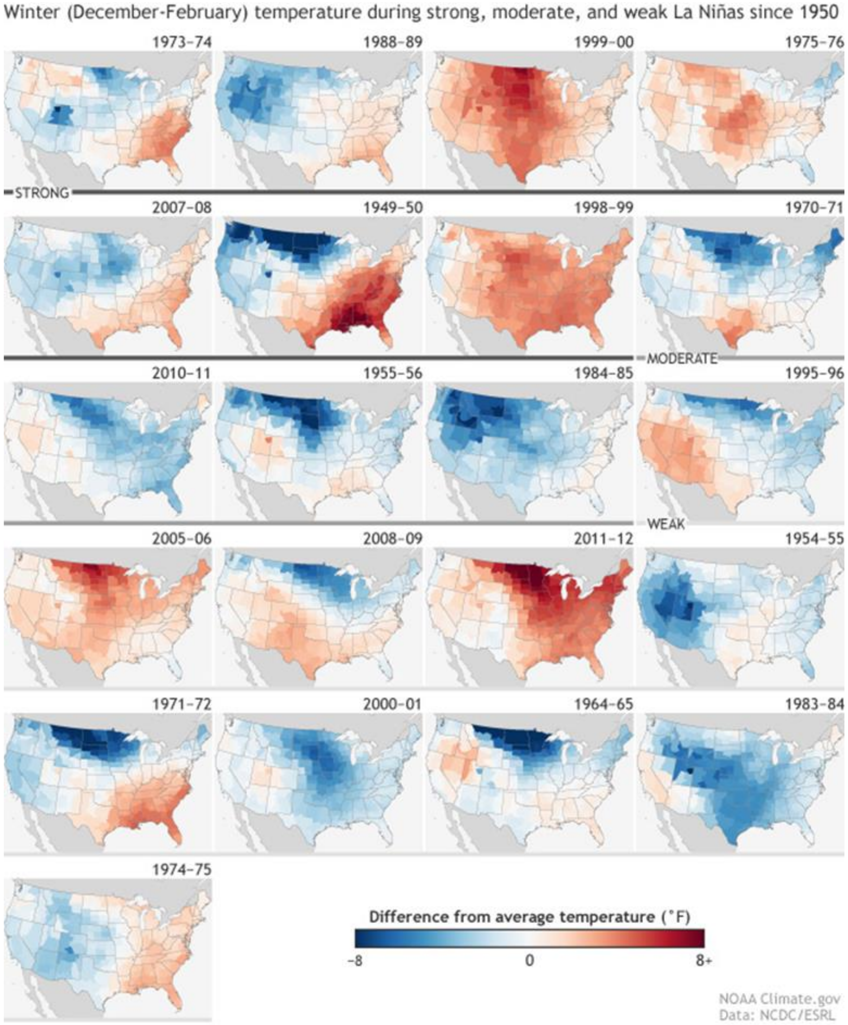
Source: NOAA

Natural Gas – La Nina correlations to cold winters are far from 100%

La Nina winters are unpredictable

La Nina winters are more often normal to colder than normal than a warmer winter. But we remind of a Oct 6, 2017 NOAA brief *"Temperature patterns during every La Niña winter since 1950"*, which looked at all La Nina winters from 1950 thru 2016/17, classified them as strong, moderate or weak La Ninas, and then showed the average winter (Dec thru Feb) temperature map. We checked this weekend and the link still works [LINK]. The bottom line is that it may slightly favor a normal to colder than normal winter, but there have some been near record high temperature La Nina winters. Below is the NOAA graphic.

Figure 4: Winter (Dec-Feb) Temp in Strong, Moderate And Weak La Ninas 1950 - 2017



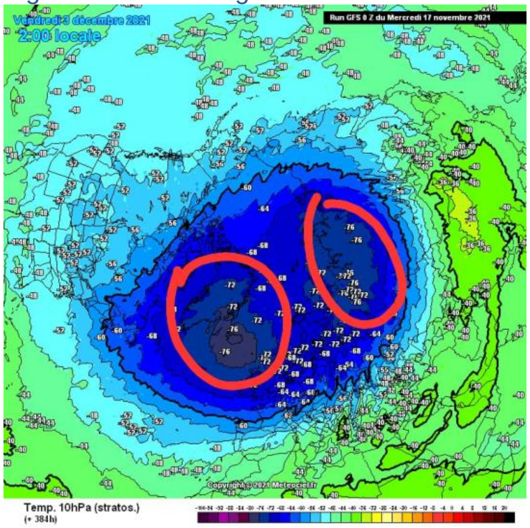
Source: CPC

Natural Gas – Sooner or later, we will hear the Polar Vortex is back with a vengence

Explaining polar vortex

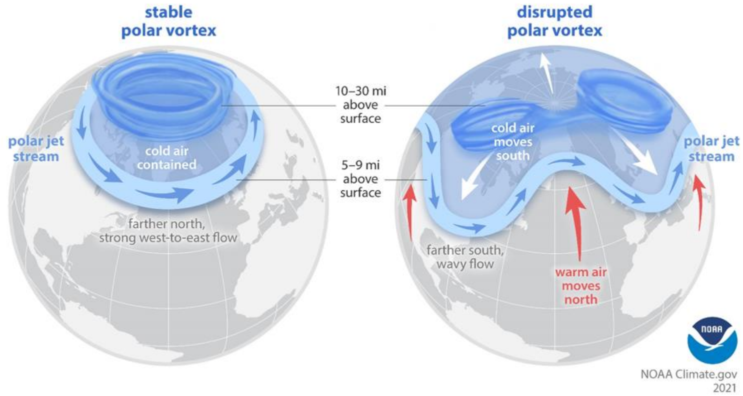
We should be prepared to hear polar vortex pop up soon as the reason for whenever a big blast of cold Arctic air hits the Lower 48. And like all weather, there is never a 100% certainty but we normally see indications suggesting conditions that look to predict near term probability for an polar votrex. On Wednesday, we saw a tweet [LINK] that included the below graph and, most importantly, said "*The supercharged frigid Arctic air bubble has slowed its circulation speed as the reduction of the temperature differential between Arctic and oceans has slowed the centrifugal forces. The bubble disintegrates and cold air will spill over the continents by early December.*" What caught our attention was the comment that it had "*slowed its circulation speed*" because it reminded us of the conditions that tend to set up a weakening of the polar vortex and then the rush of cold Arctic air south into the Lower 48. In our retweet [LINK], we attached NOAA's "*Understanding the polar vortex*" and we wrote "*Slowing Arctic circulation could be a good sign for near term #NatGas. @NOAA reminds when the #PolarVortex is strong & stable, this keeps cold air contained over the Arctic. Thx @LeopoldHeinrich for all your updates. #OOTT.*" We realize that some refer to the polar vortex as the wind that brings the cold air south. But, as NOAA explains, "*the Arctic polar vortex is a strong band of winds in the stratosphere, surrounding the North Pole 10-30 miles above the surface*". Think of winds high up and going in a circle around the north pole. So if there is a stable polar vortex, the polar jet stream stays further north and keeps the colder air to the north. But NOAA writes "*the polar vortex dramatically weakens. The vortex can be pushed off the pole or split into two. Sometimes the polar jet stream mirrors the stratospheric upheaval becoming weaker or wavy. At the surface cold air is pushed southward to the mid-latitudes."* Our Supplemental Documents package includes the NOAA understanding the polar vortex.

Figure 5: Weakening Arctic Air Circulation



Source: Heinrich Leopold

Figure 6: Polar Vortex Air Circulation



Source: NOAA

Natural Gas – EIA, US shale/tight natural gas shows increase O/N/D

Shale/tight gas up thru Dec

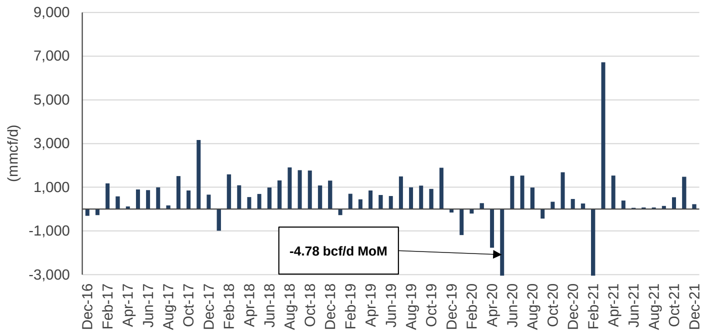
On Monday, the EIA issued its Drilling Productivity Report November 2021 [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case Nov) and the next month (in this case Dec). (i) The EIA forecasts Dec at 89.376 bcf/d which is +0.226 bcf/d MoM. (ii) Note US shale/tight gas production is above the all-time peak of 86.884 bcf/d in Nov 2019. (iii) This month, all basins increased except for the Anadarko (-0.03 bcf/d MoM); Haynesville, Permian and Eagle Ford basins posted the largest increases, up +0.111 bcf/d, +0.087 bcf/d and +0.031 bcf/d, respectively; all other basins remained relatively flat. (iv) All basins are up YoY, save for Anadarko and Appalachia, with most notable YoY changes being Haynesville +1.513 bcf/d YoY, Permian +2.483 bcf/d YoY, and Eagle Ford +0.347 bcf/d YoY. Total US shale/tight natural gas production is +4.018 bcf/d YoY for Dec. (v) Remember US shale/tight gas is ~90% of total US natural gas production. So whatever the trends are for shale/tight gas, are the trends for US natural gas in total. Below is our running table showing the EIA DPR data for the shale/tight gas plays, and the MoM changes in major shale/tight natural gas production. Our Supplemental Documents package includes the EIA DPR.

Figure 7: MoM Change – Major Shale/Tight Natural Gas Production

mmcf/d	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Dec YoY	Dec less Nov
Anadarko	6,627	6,598	6,411	5,257	6,163	6,082	5,992	5,919	6,129	6,192	6,139	6,107	6,203	6,173	-425	-30
Appalachia	34,829	35,653	35,587	34,894	34,823	34,685	34,619	34,586	34,364	34,366	34,783	34,838	35,601	35,608	-45	7
Bakken	2,919	2,918	2,888	2,747	2,916	2,851	2,787	2,732	2,798	3,005	3,003	3,004	3,012	3,020	102	8
Eagle Ford	5,725	5,634	5,729	5,036	5,723	5,660	5,610	5,589	5,842	5,971	5,990	5,994	5,950	5,981	347	31
Haynesville	12,099	12,376	12,488	11,302	12,564	12,699	12,826	12,942	13,337	13,413	13,415	13,514	13,778	13,889	1,513	111
Niobrara	5,385	5,277	5,211	5,104	5,014	4,967	4,922	4,882	4,960	5,032	5,090	5,183	5,308	5,320	43	12
Permian	17,285	16,902	17,510	14,164	17,461	17,499	17,543	17,602	18,030	17,947	18,700	19,027	19,298	19,385	2,483	87
Total	84,868	85,358	85,824	78,503	84,664	84,444	84,300	84,252	85,460	85,926	87,120	87,667	89,150	89,376	4,018	226

Source: EIA, SAF

Figure 8: MoM Change – Major Shale/Tight Natural Gas Production



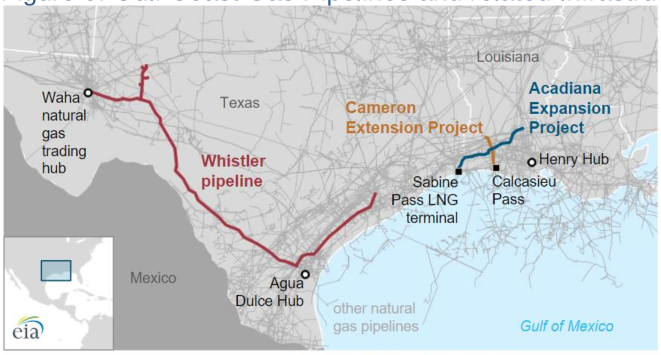
Source: EIA, SAF

Natural Gas – Multiple natural gas pipeline projects entered into service in Q3 2021

EIA Natural Gas Pipeline Projects Tracker

On Wednesday, the EIA posted a good reference blog "*New natural gas pipeline capacity expands access to export and Northeast markets*" that provides a good recap the new natural gas pipeline projects in the Gulf Coast have added ~4 bcf/d of new capacity that entered service in Q3/21. The key for these projects is as per the title, get more US natural gas to export markets or NE US. These new projects include the 2 bcf/d Whistler pipeline, the 0.894 bcf/d Acadiana Expansion project and the 0.75 bcf/d Cameron Extension project. The Whistler pipeline connects the Permian basin with the Waha Hub in Texas and the Acadiana project connect the Haynesville basin with the recently upgraded Sabine Pass LNG Terminal; the Cameron Project will deliver feedgas into to the Calcasieu Pass LNG terminal. The increased capacity to provide feedgas to the expanded Sabine Pass LNG terminal and the new Calcasieu Pass LNG have set up ~2 bcf/d of added US LNG export pull on US natural gas supply. Below is a graphic of Gulf Coast pipelines. Our Supplemental Documents package includes the EIA Natural Gas Pipeline Projects Tracker. [LINK]

Figure 9: Gulf Coast Gas Pipelines and related Infrastructure



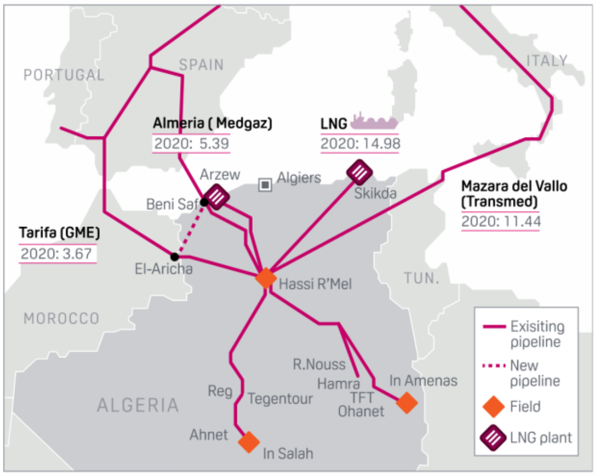
Source: EIA

Natural Gas – Morocco looking at new gas pipeline from Nigeria after Algeria dispute

Possible Morocco-Nigeria natural gas pipeline

Last week's (November 14, 2021) Energy Tidbits memo noted Morocco was having to look at LNG imports to replace the lost natural gas pipeline gas that was coming from Algeria. On Tuesday, Bloomberg reported [LINK] that Morocco is considering a downstream division of state ONHYM to manage natural gas infrastructure that includes a project that delivering gas by pipeline from Nigeria to Morocco. The pipeline will run along the Atlantic coast and must go thru 13 countries to reach Morocco via a new natural gas pipeline known as MNGP, and then on to European markets. We have trouble believing a pipeline thru 13 countries will get done and have to wonder if its simply being thrown out there as a reminder Morocco has options on how to get natural gas. We just don't think it will be much of a negotiating leverage if the ultimate plan is to try to resolve the dispute with Algeria. Our Supplemental Documents package includes the Bloomberg report.

Figure 10: Algeria's EGPDF (El Aricha to Beni Saf) Pipeline Inaugurated May 7, 2021



Source: Platts

Figure 11: Possible pipeline route from Nigeria to Morocco

Source: Platts

Natural Gas – Another unplanned interruption at Chevron Gorgon LNG

Chevron Gorgon LNG unplanned interrupton

There was a good reminder this week of a factor that has helped get LNG prices so high – unplanned LNG supply interruptions especially it seems at Chevron's Gorgon LNG project. Chevron's big Gorgon LNG project just can't seem to catch a break with the reports of another unplanned LNG supply shutdown saw Chevron shut one of the three Gorgon LNG trains this week. On Tuesday, Reuters reported ""*Train 1 was shut down due to a small gas leak," the spokesperson said, adding that it was too early to tell how long the unit would be down. "We are preparing plans for investigation and repairs." The leak was detected on piping associated with the dehydration unit on Train 1 and the unit was shut down as a precautionary measure, he said."* As of our 7am MT news cut off, we have not seen any firm estimate for the restart date. Note there were a number of reports referencing Gorgon LNG at 2.1 bcf/d from the three trains, but Gorgon LNG produced 2.3 bcf/d in 2019 before they started to have unplanned problems.

Natural Gas – India is rapidly building out is natural gas distribution infrastructure

India's natural gas build out

We continue to believe India's move to increase natural gas to 15% of its energy mix is a game changer for LNG markets. There was an excellent 12:45 min Al Arabiya interview (and report thereon) with India's energy minister Puri posted this morning. It wasn't clear exactly what day this week for the interview, but Al Arabiya only posted the story and video this morning [LINK]. Later in the memo, we note Puri's clear comments that India is in the process of building up (increasing) its strategic oil reserves. We listened to the interview and edited/added the Al Arabiya quotes where needed. Puri is talking about the actions India is taking on the energy transition, starts on biofuels and then moves to natural gas. At 3:23 min mark, *Puri says "Gas. Pipelines. We are expecting 60 billion dollars of investment into gas pipelines. "We started in 2014 when he [Narendra Modi] became prime minister at 14 thousand kilometers. Today, we are 18.5 thousand kilometers, [and in the] next four months we will get another four thousand to [achieve] 22.5 thousand kilometers and we will take that up to 34 thousand kilometers to have the whole country be covered by gas pipelines. I could go on!"* Puri is simply reinforcing what he said recently on India is actively expanding the natural gas pipeline/distribution system to make natural gas available to the whole country. Build out of infrastructure is the key and its happening. Our Supplemental Documents package includes the Al Arabiya report.

India has been serious to expand natural gas infrastructure

The biggest change in the past 2 years is that India is getting serious about increasing natural gas consumption including the infrastructure. Our September 19, 2021 Energy Tidbits memo wrote "*Natural Gas – India to expand natural gas distribution to cover 96% of population. LNG buyers better hope that the security picture in Mozambique get settled to an acceptable level for TotalEnergies, Exxon and others to get back to moving on 5 bcf/d of LNG capacity that has been held up now for several months. Because we continue to see support for the major LNG demand theme for the 2020s – India's target to double the share of natural gas in its energy mix to 15% by 2030. Yesterday, we retweeted [LINK] "Positive to #LNG. India to expand #NatGas distribution to cover 96% of population. Fits move to double #NatGas share of energy mix to 15% by 2030, which #Petronet CEO est adds 13 bcf/d #LNG demand. See [LINK]." Our retweet was of an India Ministry of Petroleum and Natural Gas tweet [LINK] on the new 11th round of bidding for city distribution of natural gas, and that "once completed, the CGD network in India shall cover 86% of the Country's area and 96% of the population". This will take years to roll out but covering 86% of India and 96% of its population is a good indicator for a strong ramp up in natural gas uses post 2025. And we expect that the industrial/commercial coverage ratio is much the same ie. call it 90% of India."*

Remember Modi's highlighted India "should be a gas-based economy"

Our August 15, 2021 Energy Tidbits memo highlighted Modi's 75th anniversary of India independence speech. Modi has been stressing the importance to increase natural gas share of India's energy mix from 6% to 15% by 2030. India posted the Modi speech transcript at [LINK]. This is a big picture speech about the future for India and Modi's tries to set a vision for the next 25 years to the 100th anniversary. It's a general speech but it is also good reminder to people in the west that India still has a long way to go to catch up. Modi notes how they *"have made authentic efforts to construct toilets in 100% households*". One of his major themes was that India should be a gas based economy but targets to be energy independent in 25 years. Modi didn't get into his policy to increase natural gas share of the energy mix from 6% to 15% by 2030 and only gave gas a glancing mention, but the mention is significant – India "should be a gas based economy". Our August 15, 2021 Energy Tidbits had more detailed on the other Modi speech themes.

Petronet sees India LNG imports +12.4 bcf/d to reach 15.8 bcf/d in 2030

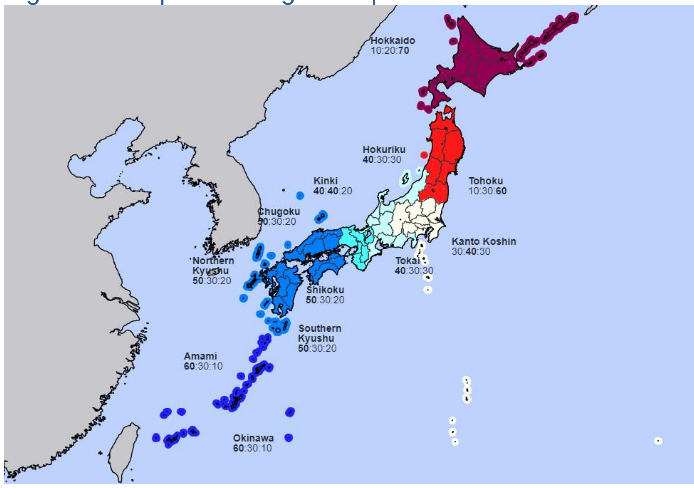
The best illustration of the impact was from Petronet. Our October 24, 2021 Energy Tidbits memo wrote "*We continue to believe India's moves to increase natural gas to 15% of its energy mix by 2030 is a game changer for LNG markets in the 2020s. Especially as we have seen clear signs of action toward that target. On Friday, there was very bullish for India's LNG import growth from Petronet CEO Singh at the India Energy Forum on Friday. As soon as we saw the reports, we tweeted [LINK] "Bullish for #LNG #NatGas in 2020s. #Petronet CEO fcasts India LNG imports +12.4 bcfd to reach 15.8 bcfd (120 MTPA) in 2030. In line with his June est, see below SAF Group June 20 Energy Tidbits #Petronet sees LNG imports +13 bcfd to 2030. Thx @JournoDebjit @rajeshsing13 #OOTT". Bloomberg's India energy team reported "India's import of natural gas is expected to hit 120 million tons/year by 2030 as the nation targets an energy mix goal, Akshay Kumar Singh, CEO of Petronet LNG, said at the India Energy Forum by CERAWeek. NOTE: India aims to boost use to natural gas to 15% of primary energy mix from about 6% now. * India's current annual LNG import is about 26 million tons". Singh is forecasting India's LNG imports to grow* *from current 26 MTPA (3.4 bcf/d) to 120 MTPA (15.8 bcf/d) in 2030. That is an increase of 12.4 bcf/d to 2030. This is very bullish for LNG and natural gas in the 2020s. Our Supplemental Documents package includes the Bloomberg report."*

Natural Gas – No major weather related Japan natural gas demand ahead of Dec

Japan to be colder in Dec

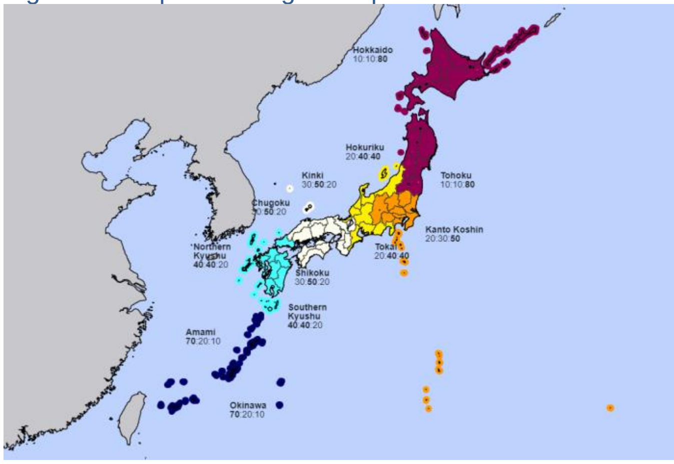
The Japan Meteorological Agency posted its 4 week temperature outlook on Tuesday [LINK]. The forecast calls for an overall shift to colder than normal temperatures over the course of the month, especially in the southern regions of Japan. And the remainder of November is expected to be above average, specifically in the northern regions. The southern regions are expected to cool faster. Temperatures are expected to drop to below seasonal norms for the south through the remainder of the month and the beginning of December. The North is expected to remain above seasonal norms for the next 4 weeks. Below is the 4-week forecast for Japan concluding on Dec 19.

Figure 12: Japan Average Temperature Forecast Nov 20-Dec 19



Source: Japan Meteorological Agency

Figure 13: Japan Average Temperature Forecast Nov 20-Nov 26



Source: Japan Meteorological Agency

Natural Gas – Japan LNG Imports in Oct -22.1% YoY to 7.17 bcf/d

Japan Oct LNG imports -22.1% YoY

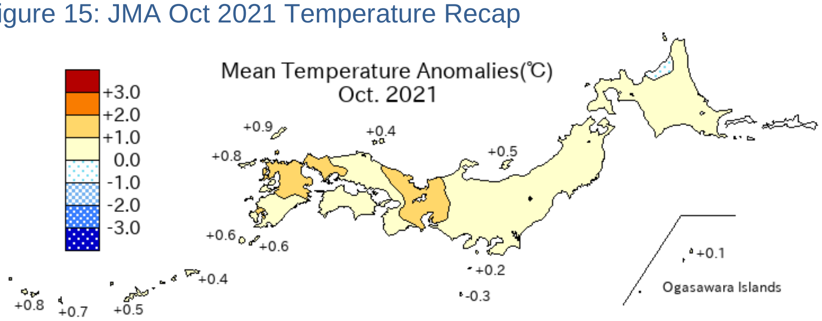
On Wed, Japan's Ministry of Finance posted its import data for Oct. No one should be surprised with the lower YoY and MoM LNG imports for two reasons. Our October 3, 2021 Energy Tidbits highlighted that Japan's power utilities LNG stocks were at record highs for this time of year and this allowed the utilities to redirect LNG cargos to China. And Japan was minimizing high cost LNG to favor using coal, oil and petroleum products. Also Japanese utilities have been trying to conserver electricity to minimize LNG requirements. Japan Ministry of Finance released its October LNG import data last Thursday [LINK]. Japan's October LNG imports were 7.17 bcf/d, down 22.1%% YoY and down 17.2% MoM from 8.66 bcf/d in September. Plus it was also a mild temperature month in Japan, which would have reduced natural gas demand to end the summer. Below is a temperature map of October and our table that tracks Japan LNG import data.

Figure 14: Japan Monthly LNG Imports

bcf/d	2015	2016	2017	2018	2019	2020	20/19	2021	21/20
Jan	13.06	11.22	12.85	12.79	11.69	11.63	-0.5%	12.48	7.3%
Feb	13.26	12.30	13.36	14.23	12.61	10.99	-12.8%	13.84	25.9%
Mar	12.60	12.62	12.61	12.28	11.30	11.16	-1.2%	11.04	-1.1%
Apr	10.56	10.21	10.52	8.97	9.00	8.31	-7.7%	7.96	-4.3%
May	8.91	8.55	9.66	9.92	8.62	7.09	-17.7%	7.67	8.1%
June	10.61	10.02	9.90	8.88	8.32	8.42	1.2%	9.13	8.5%
July	10.77	10.19	10.19	10.55	10.56	9.35	-11.5%	9.58	2.5%
Aug	10.93	11.96	11.24	11.73	9.45	9.04	-4.3%	9.75	7.8%
Sept	11.06	10.67	9.31	10.04	10.30	10.41	1.0%	8.66	-16.8%
Oct	9.38	9.73	9.50	10.12	9.75	9.20	-5.7%	7.17	-22.1%
Nov	10.71	12.07	10.26	10.15	10.03	9.63	-4.0%		
Dec	12.51	11.69	12.31	11.23	10.54	11.96	13.4%		

Source: Japan Ministry of Finance

Figure 15: JMA Oct 2021 Temperature Recap



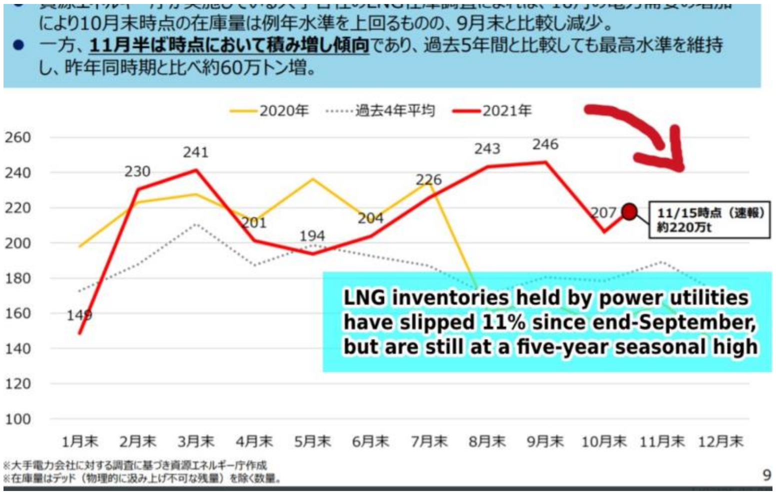
Source: Japan Meteorological Agency

Natural Gas – Japan's LNG stocks remain high

Japan LNG stocks remain high

On Wed, we retweeted [LINK] Bloomberg's Stephen Stapczynski's tweet on the new Japan Ministry of Economy, Trade and Industry (METI) LNG presentation on the supply and demand outlook for the winter. [LINK] Stapczynski tweeted *"Some Japanese utilities are curbing gas-fired power generation to save LNG for winter, according to a government report Japanese utilities are urged by the gov't to keep LNG stockpiles high before winter, which is tough with spot prices at a record. Supply is down 10% from end-Sept."* Stapczynski included the below graph showing Japan LNG inventories as of Nov 15, 2021. The Google Translation is "*Due to this, the inventory amount as of the end of October exceeded the usual level, but decreased compared to the end of September. On the other hand, it has been increasing as of mid-November, and has maintained the highest level compared to the past five years. However, it increased by about 600,000 tons compared to the same period last year."*

Figure 16: Japan Monthly LNG Imports



Source: Japan Ministry of Finance

Natural Gas – Japan's power utilities curbing power to conserve LNG

Japan utilities conserving power

There is no question that high LNG prices are impacting consumption behaviour at the utility level in Japan. The other factor that minimizing Japan's LNG consumption is that the utilities are deliberately conserving LNG ahead of the winter. On Thursday, Bloomberg's Stephen Stapczynski reported "*Some of Japan's regional utilities are curbing power output to conserve liquefied natural gas supplies for winter. Four companies including Chugoku Electric Power Co. and Kyushu Electric Power Co. are reducing generation from gas-fired plants through the remainder of this month, according to a report released Thursday by the Ministry of Economy, Trade and Industry. The move comes as the utilities are urged by the government to keep LNG inventories high before winter, a challenging task with spot prices of the fuel at a record high. LNG inventories held by power utilities have slipped 11% since end-September, but are still at a five-year seasonal high, METI said. The nation's wholesale electricity rate spiked due in part to the fuel conservation effort, showing shows how a global shortage is placing even the most well-prepared importers at risk of a power crunch this winter. Generators in Japan were forced to increase gas use to replace earlier outages at coal-fired plants. Higher than expected electricity demand has also eaten into LNG inventories.*"

Natural Gas – JERA secures stable LNG supply, purchases 25.7% Freeport LNG

Japan's JERA acquires stake in Freeport LNG

We have been highlighting how, post Mozambique LNG force majeure, there has been an abrupt change in Asian LNG buyers contracting as they have moved to lock up long term LNG supply. We have said this is the best indication that Asian LNG buyers see the LNG supply risk in the 2020s. However, we saw an even stronger indicator with Monday's announcement by Japan's JERA [LINK] that they will spend $2.5b to acquire a 25.7% interest in Freeport LNG Developments. JERA is the world's largest LNG importer and putting up $2.5b to acquire an interest in Freeport LNG export projects is a big validator to the concern of Asian LNG buyers for LNG supply thru 2030. JERA will be involved in the entire Freeport LNG project, made up of three trains with an annual production capacity of approximately 1.74 bcf/d; JERA will work on advancing the new LNG projects with the expansion and development of Train 4. With the recent in Asian demand for both decarbonization and a stable energy supply, it is increasingly important for there to be a stable supply of competitive LNG. The new Freeport LNG developments boast low development risk due to the existing 3 train LNG project. The release noted "*by leveraging the knowledge and expertise it has accumulated through its global LNG value chain business and power plant operations, JERA will work together with FLNG on its various businesses—such as operation of the existing Freeport LNG project, development of new LNG projects, and flexible LNG transactions—as it strives to improve the competitiveness of the Freeport LNG project.* Our Supplemental Documents package includes the JERA release.

Asian LNG buyers have abruptly changed, are now locking in long term supply
We have been highlighting that the best validation for a LNG supply gap in the 2020s is that Asian LNG buyers have made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas."* Our Supplemental Documents package includes our July 14 blog.

Natural Gas – China's natural gas imports up 22.9% MoM in Oct

China LNG and pipeline imports

China customs posted China's October natural gas imports split by pipelines vs LNG. The customs data is at [LINK]. The customs data reports China Oct LNG imports of 9.56 bcf/d, +22.9% YoY and +11.6% MoM. And China natural gas pipeline imports of 5.0 bcf/d, +28% YoY and -24.6% MoM. Below are our running tables of China LNG and pipeline imports.

Figure 17: China LNG Imports

bcf/d	2016	2018	18/17	2019	19/18	2020	20/19	2021	21/20
Jan	3.84	8.03	50.0%	10.20	27.1%	10.31	1.1%	13.15	27.6%
Feb	3.10	6.84	66.9%	7.46	9.1%	7.26	-2.7%	9.52	31.1%
Mar	2.60	5.04	64.5%	6.28	24.8%	6.49	3.3%	8.74	34.6%
Apr	3.00	5.43	57.8%	7.27	34.0%	8.16	12.3%	10.77	32.0%
May	2.20	6.39	41.9%	6.87	7.6%	8.10	18.0%	10.89	34.4%
June	3.51	6.31	30.1%	7.25	14.9%	9.27	27.8%	10.76	16.1%
July	2.46	6.40	33.4%	7.56	18.1%	7.79	3.1%	8.78	12.7%
Aug	3.54	7.26	49.2%	8.04	10.8%	9.23	14.8%	10.30	11.6%
Sept	4.05	7.00	26.3%	8.16	16.7%	9.17	12.4%	10.81	17.8%
Oct	2.85	7.13	29.6%	4.09	-42.6%	7.78	90.0%	9.56	22.9%
Nov	4.26	9.59	47.5%	10.42	8.7%	10.58	1.6%		
Dec	5.80	9.75	25.0%	10.01	2.7%	11.76	17.5%		
Full Year Avg.	3.43	7.10	41.2%	7.80	9.9%	8.83	13.1%		

Source: Bloomberg, China Customs

Figure 18: China Pipeline Imports

bcf/d	2016	2017	17/16	2018	18/17	2019	19/18	2020	20/19	2021	21/20
Jan	4.3	3.7	-13.5%	4.0	8.2%	5.0	24.9%	5.2	3.5%	4.9	-4.5%
Feb	5.0	4.4	-12.9%	5.0	15.6%	5.5	9.0%	5.7	3.8%	6.1	7.2%
Mar	4.2	3.6	-15.6%	4.2	17.7%	4.5	6.4%	4.2	-5.2%	4.8	12.8%
Apr	4.5	4.7	4.1%	5.5	17.7%	5.0	-9.3%	4.2	-15.5%	5.5	30.1%
May	3.2	3.9	23.2%	5.1	30.4%	4.8	-4.3%	4.0	-16.6%	5.1	26.2%
Jun	3.3	4.1	22.1%	5.3	31.2%	4.8	-10.3%	4.1	-15.0%	5.6	37.4%
Jul	3.2	4.1	25.5%	4.7	14.5%	4.7	0.0%	3.6	-23.3%	5.7	58.9%
Aug	1.7	3.9	133.5%	4.7	21.3%	4.9	3.1%	5.3	7.9%	5.9	11.5%
Sep	5.1	4.0	-22.3%	5.2	30.7%	5.0	-4.2%	4.7	-6.0%	6.2	32.1%
Oct	3.1	3.5	13.2%	4.2	20.6%	3.8	-8.1%	3.9	1.0%	5.0	28.0%
Nov	3.1	4.0	27.4%	5.1	26.8%	4.7	-6.9%	4.1	-13.0%		
Dec	3.6	4.4	22.7%	4.6	2.8%	4.7	3.9%	5.6	18.9%		

Source: Bloomberg, China Customs

Natural Gas – Nord Stream 2 certification will be delayed as process is suspended

Nord Stream 2 certification delayed

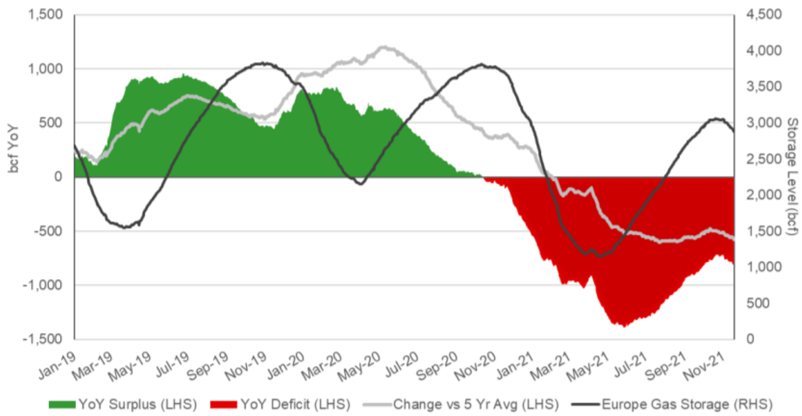
The big news for Europe natural gas markets this week was that the German regulator process of a 4-month timeline to review Nord Stream 2's certification would be delayed. Pro Prior to this week, the 4-mth clock would have ended on January 8. The Federal Network agency has temporarily suspended the process for certification of Nord Stream 2 AG, an independent transport network operator, after identifying issues with the subsidiaries legal form under German law. The key word is suspended. The German report noted "*The certification process remains suspended until the transfer of the essential assets and human resources to the subsidiary has been completed and the Federal Network Agency will be able to check the newly submitted documents of the subsidiary as the new applicant for completeness."* On Tuesday, we tweeted [LINK] "*DE regulator "certification process remains suspended until ..if requirements are met..can contine its examination with the remainder of the 4-month period provided by law" Infers Jan 8 deadline extends for # days takes for #NordStream2 to comply. Thx @Wattwurm73! #NatGas #OOTT."* Suspension infers the clock is stopped on the 4-mt timeline and that the clock resumes once the Nord Stream 2 gets the requirements met. The various media reports since then seem to think the revised 4-mth clock will be from Jan 8 to sometime in March ie. two months later than expected. Our Supplemental Documents package the Germany announcement.

Natural Gas - Europe storage 73.05% full vs 5 year average of 88.88%

Europe gas storage down YoY

Draws to European gas storage units continued this week as we enter the heating season for natural gas. It was a larger draw and marked the fourth consecutive week of draws, indicating winter is beginning. Europe inventories are at their lowest level at this time of the year in more than a decade. The set up for winter natural gas prices continues to support strong winter natural gas prices. Russian pipeline import variability continues to deliver uncertainties to European gas storages, though the recent announcement from Gazprom announcing flows to German gas storage units is likely to alleviate some of the high gas prices this season. With the key indicator for winter Europe natural gas prices, and global LNG prices is Europe storage. Europe gas storage started last winter (Nov 1) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1. This winter began (Nov 1) with gas storage at 77.14% capacity, down 18.52% YoY. Europe storage levels bottomed in late Apr at 29%, which was the lowest level since Apr 2018. Storage as of Nov 18 is 73.05%, which is -19.89% less than last year levels of 92.94% and are -15.83% below the 5-year average of 88.88%. Europe storage levels over the next few weeks will be the key item to watch for indications on LNG markets going into the winter. Below is our graph of Europe Gas Storage Level.

Figure 19: Europe Gas Storage Level



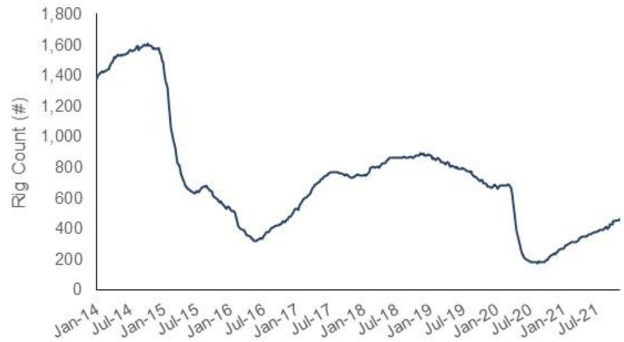
Source: Bloomberg

Oil – US oil +7 WoW at 461 oil rigs

US oil rigs +7 WoW

Baker Hughes released its weekly North American drilling activity data at 11am Friday. This week US oil rigs were up +7 rigs WoW at 461 rigs. Oil rigs are +289 off the bottom of 172 in Aug14/2020 week. Permian was flat this week and is the oil basin expected to drive growth. We expect that US rigs will reach their peak soon with the typical decline occurring after Thanksgiving weekend. With oil prices up 69% so far this year and expectations that consumers will switch to oil products with high gas prices, producers are increasing active rigs to boost production to accommodate demand and to rebuild DUCs inventory. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 222 to 461 oil rigs (-34%). The biggest contributor to the decrease is the Permian being down 141 oil rigs from the March 13, 2020 peak (-33%), although we are seeing it continue to ramp up slightly. Below is our graph of US oil rigs since January 1, 2014.

Figure 20: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – US Frac spreads +1 to 270 as of Nov 19

Mark Rossano (C6 Capital Holdings) provided his US frac spread recap for week ended Nov 19 on the Primary Vision network. The YouTube video is at [LINK]. US frac spreads were +1 to 270 for week ended Nov 19. His target has been 275 and thinks there will be an increases. However, this normally the time that frac spreads roll over so this 270 may end up being the peak and he may have missed it by 5 spreads. Was some reduction in the Appalachia and western Gulf but thinks that is mostly moving of spreads. Saw an increase of 4 spreads in the Permian. Finishing up strong and still looking to break out in 2022. But the continuing issue in 2022 is equipment, steel availability, pipe availability, labor availability. Note Rossano is taking off next week with US Thanksgiving.

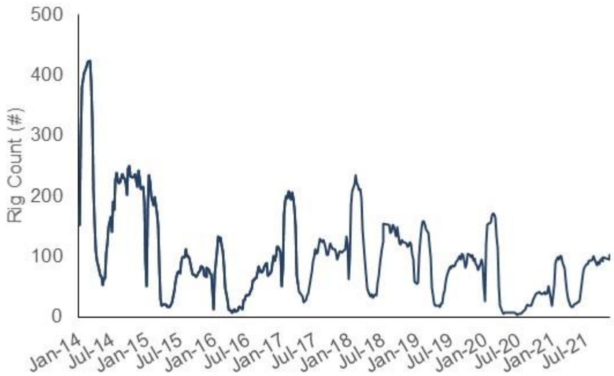
Frac spreads +1 to 270

Oil – Total Cdn rigs -1 to 167 total rigs and +70 rigs YoY

Total Cdn rigs were -1 this week to 167 total rigs. Cdn oil rigs were +1 at 102 rigs. Cdn gas rigs were -2 to 65 gas rigs with strong natural gas prices. Total rigs are now +158 since the June 26, 2020 all-time low. There has been a bit of pull back in the last two weeks despite very strong oil and natural gas prices. We expect to see this ramp up continue over the next month before pulling back with the normal Christmas break. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 42 and Cdn gas rigs were 59 for a total Cdn rigs of 91, meaning total Cdn rigs are +76 YoY and total rigs are up +30 vs 2019.

Cdn rigs -1 WoW

Figure 21: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production down at 11.4 mmb/d

US oil production were slightly down from pre-Hurricane Ida levels. Weekly production in the US was down this week at 11.4 mmb/d for the week ended Nov 12. Lower 48 production drove total production, down from last weeks level of 11.1 mmb/d to 11.0 this week; Alaska saw a slight 0.01 mmb/d decrease as refineries conclude their maintenance season. US oil production is up YoY at +0.500 mmb/d and is still down significantly at -1.7 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. The EIA DPR has expectations of a slight increase for Nov/Dec for the major shale/tight oil plays.

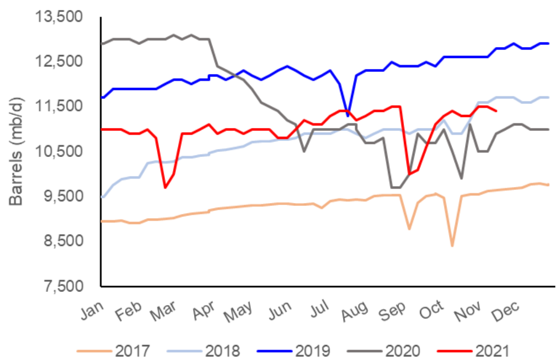
US oil production down WoW

Figure 22: EIA’s Estimated Weekly US Oil Production

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2019-Jan	01/04	11,700	01/11	11,900	01/18	11,900	01/25	11,900		
2019-Feb	02/01	11,900	02/08	11,900	02/15	12,000	02/22	12,100		
2019-Mar	03/01	12,100	03/08	12,000	03/15	12,100	03/22	12,100	03/29	12,200
2019-Apr	04/05	12,200	04/12	12,100	04/19	12,200	04/26	12,300		
2019-May	05/03	12,200	05/10	12,100	05/17	12,200	05/24	12,300	05/31	12,400
2019-Jun	06/07	12,300	06/14	12,200	06/21	12,100	06/28	12,200		
2019-Jul	07/05	12,300	07/12	12,000	07/19	11,300	07/26	12,200		
2019-Aug	08/02	12,300	08/09	12,300	08/16	12,300	08/23	12,500	08/30	12,400
2019-Sep	09/06	12,400	09/13	12,400	09/20	12,500	09/27	12,400		
2019-Oct	10/04	12,600	10/11	12,600	10/18	12,600	10/25	12,600		
2019-Nov	11/01	12,600	11/08	12,800	11/15	12,800	11/22	12,900	11/29	12,900
2019-Dec	12/06	12,800	12/13	12,800	12/20	12,900	12/27	12,900		
2020-Jan	01/03	12,900	01/10	13,000	01/17	13,000	01/24	13,000	01/31	12,900
2020-Feb	02/07	13,000	02/14	13,000	02/21	13,000	02/28	13,100		
2020-Mar	03/06	13,000	03/13	13,100	03/20	13,000	03/27	13,000		
2020-Apr	04/03	12,400	04/10	12,300	04/17	12,200	04/24	12,100		
2020-May	05/01	11,900	05/08	11,600	05/15	11,500	05/22	11,400	05/29	11,200
2020-Jun	06/05	11,100	06/12	10,500	06/19	11,000	06/26	11,000		
2020-Jul	07/03	11,000	07/10	11,000	07/17	11,100	07/24	11,100	07/31	11,000
2020-Aug	08/07	10,700	08/14	10,700	08/21	10,800	08/28	9,700		
2020-Sep	09/04	10,000	09/11	10,900	09/18	10,700	09/25	10,700		
2020-Oct	10/02	11,000	10/09	10,500	10/16	9,900	10/23	11,100	10/30	10,500
2020-Nov	11/06	10,500	11/13	10,900	11/20	11,000	11/27	11,100		
2020-Dec	12/04	11,100	12/11	11,000	12/18	11,000	12/25	11,000		
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400						

Source: EIA

Figure 23: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA DPR continues to forecast increasing shale/tight oil production

US shale/tight oil production

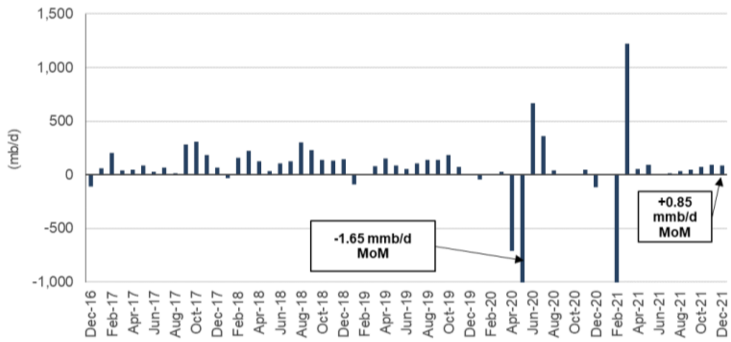
The EIA issued its Drilling Productivity Report Nov 2021 on Monday [LINK], which is the EIA's forecast for oil and natural gas production from the major shale/tight oil and gas basins for the current month (in this case Nov) and the next month (in this case Dec). (i) The takeaway is that US shale/tight oil started to return to growth in July and that steady modest growth is expected to continue thru December. This is expected with the increase rig count, frac spread count and significantly higher than budgeted oil and gas cash flows. (ii) The EIA forecasts December at 8.316 mmb/d, up +85,000 b/d MoM and 0.564 mmb/d YoY. (iii) No surprise, the growth is driven in the Permian, which is +67, 000 b/d MoM. YoY most basins are down, with Permian continuing to ramp up at +0.645 mmb/d YoY. The total US shale/tight oil production is now +0.564 mmb/d YoY. (iv) US shale/tight oil production peaked at 9.158 mmb/d in Nov 2019. (v) Note that shale/tight oil is approx. ~70% of total US production, so whatever the trends are for shale/tight oil are the trends for US oil in total. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production. Below is our table of running DPR estimates of shale/tight oil production and our graph of MoM changes in major shale/tight oil production.

Figure 24: MoM Change – Major Shale/Tight Oil Production

Thousand b/d	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Dec YoY	Dec less Nov
Anadarko	444	432	423	309	386	373	361	353	354	370	369	363	366	368	-64	2
Appalachia	122	126	128	123	126	126	127	128	131	129	125	118	122	124	-2	2
Bakken	1,237	1,204	1,166	1,106	1,129	1,118	1,108	1,102	1,116	1,139	1,139	1,131	1,137	1,142	-62	5
Eagle Ford	1,111	1,075	1,054	882	1,062	1,045	1,032	1,027	1,043	1,054	1,053	1,076	1,078	1,083	8	5
Haynesville	34	35	34	28	33	33	32	32	34	34	34	34	34	34	-1	0
Niobrara	588	574	571	556	544	534	524	516	540	555	576	594	608	612	38	4
Permian	4,359	4,308	4,354	3,546	4,471	4,510	4,555	4,607	4,647	4,756	4,773	4,826	4,886	4,953	645	67
Total	7,896	7,752	7,729	6,549	7,751	7,739	7,738	7,765	7,865	8,037	8,069	8,142	8,231	8,316	564	85

Source: EIA Drilling Productivity Report

Figure 25: MoM Change – Major Shale/Tight Oil Production



Source: EIA Drilling Productivity Report

Oil – EIA DUC's worked down by 222 in October

DUCs continue to work down

Our biggest concern in the past on EIA's Drilling Productivity Report [LINK] estimate of Drilled UnCompleted wells was that the data had been constantly revised and sometimes significantly. However, the EIA DUC data shows a clear trend since August 2020, of a continued work down of DUCs and we expect that trend is correct. It also reinforces the need for drilling rigs to pick up to replenish the DUC inventory if the US to have strong oil growth in 2022. (i) The EIA estimates DUCs are down another 222 MoM in October, meaning a total 3,770 DUCs were worked down since the Jun/20 peak of 8,874. The largest work downs are coming from the Permian (-1,658) and Eagle Ford (-454). With DUCs being worked down so significantly we will need to see rig counts go up to replenish DUCs in the near future. (iii) Bakken DUCs. As per the NDPA presentation on April 22, 2021, they estimate there are only 395 economic DUCs at April 30. This is 268 DUCs or ~40% lower than the EIA estimate of 663 as of April. Bakken DUCs were worked down 71 since then and in 2021 DUCs have dropped ~23 per month. This means that at this rate, the Bakken has ~14 months of economic DUC inventory. Below is our running table of the EIA Drilling Productivity Report DUCs. Below is our running table of the EIA Drilling Productivity Report DUCs.

Figure 26: EIA - Estimated Drilled UnCompleted Wells

						2021										
Drilled UnCompleted	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Oct YoY
Anadarko	1,022	1,002	982	965	952	932	921	901	880	863	856	838	824	812	799	-183
Appalachia	678	661	648	645	641	623	616	603	590	598	595	590	588	557	533	-115
Bakken	865	832	805	786	760	731	710	688	663	656	619	590	566	541	512	-293
Eagle Ford	1,340	1,288	1,252	1,220	1,181	1,152	1,135	1,102	1,071	1012	954	912	869	833	798	-454
Haynesville	393	395	383	374	380	375	389	387	385	392	399	402	406	396	389	6
Niobrara	783	767	713	663	621	575	530	489	448	402	373	380	379	375	368	-345
Permian	3,622	3,507	3,363	3,227	3,116	2,988	2,955	2,852	2,731	2598	2,419	2,249	1,994	1,812	1,705	-1,658
Total	8,703	8,452	8,146	7,880	7,651	7,376	7,256	7,022	6,768	6,521	6,215	5,961	5,626	5,326	5,104	-3,042

Source: EIA, SAF

Oil – North Dakota August oil and natural gas production up MoM

We aren't seeing major increase in Bakken oil production in 2021. On Tuesday afternoon, the North Dakota Industrial Commission posted its Director's Cut, which includes September oil and natural gas production data [LINK]. The headline on the Sept numbers was that North Dakota Sept oil production was 1.113 mmb/d, which was up 0.55% MoM but from August 2021 production of 1.107 mmb/d. YoY production decreased -9% from September 2020 production of 1.223 mmb/d. North Dakota September natural gas production was up MoM. Our Supplemental Documents package includes excerpts from the Director's Cut.

North Dakota production up MoM

Figure 27: North Dakota Oil Production By Month

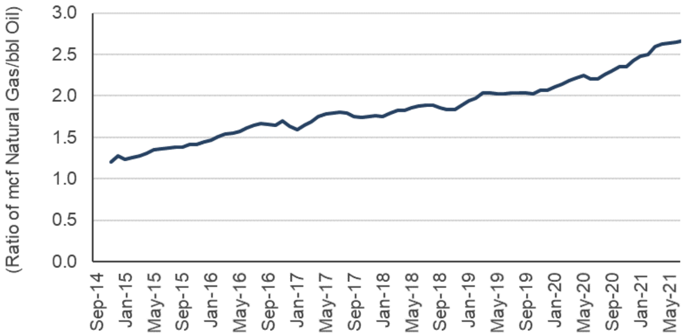
(b/d)	2016	2017	2018	2019	2020	2020/2019	2021	2021/2020
Jan	1,122,462	981,380	1,179,564	1,403,808	1,430,511	1.9%	1,147,377	-19.8%
Feb	1,119,092	1,034,248	1,175,316	1,335,591	1,451,681	8.7%	1,083,554	-25.4%
Mar	1,111,421	1,025,690	1,162,134	1,391,760	1,430,107	2.8%	1,108,906	-22.5%
Apr	1,041,981	1,050,476	1,225,391	1,392,485	1,221,019	-12.3%	1,123,166	-8.0%
May	1,047,003	1,040,995	1,246,355	1,394,648	859,362	-38.4%	1,128,042	31.3%
June	1,027,131	1,032,873	1,227,320	1,425,230	893,591	-37.3%	1,133,498	26.8%
July	1,029,734	1,048,099	1,269,290	1,445,934	1,042,081	-27.9%	1,076,594	3.3%
Aug	982,011	1,089,318	1,292,505	1,480,475	1,165,371	-21.3%	1,107,359	-5.0%
Sept	971,760	1,107,345	1,359,282	1,443,980	1,223,107	-15.3%	1,113,410	-9.0%
Oct	1,043,693	1,183,810	1,392,369	1,517,936	1,231,048	-18.9%		
Nov	1,034,484	1,194,920	1,375,803	1,519,037	1,227,138	-19.2%		
Dec	942,322	1,182,836	1,402,741	1,476,777	1,191,429	-19.3%		

Source NDIC, NDPA

North Dakota gas-oil ratio increases as Bakken matures

One of the long-term trends that we have been highlighting for all of the US tight/shale oil plays that produce associated natural gas and NGLs is that, over time, the percentage of natural gas increases in the production. This is the case for all the oil plays with associated natural gas, not just the Bakken. We see this clearly in North Dakota where the gas-oil ratio continues to increase. The gas-oil ratio in September was 2.54, vs September 2020 of 2.3, September 2019 of 2.04, September 2018 of 1.86, and September 2017 of 1.76. Below is our running graph of North Dakota gas-oil ratio updated for the new NDIC September production data.

Figure 28: North Dakota Gas-Oil Ratio



Source: NDIC, NDPA

Oil – North Dakota crude by rail down MoM to 164,630 b/d in September

North Dakota CBR down in September

Please note that there is the risk for lower crude by rail volumes in November due to the flooding in SW BC and spilling over into NW Washington. We haven't seen any reports of an impact, but we have to believe there will be some impact. The North Dakota Pipeline Authority also posted its monthly update "*September 2021 Production & Transportation*" [LINK]. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority for more detailed numbers of crude by rail out of North Dakota. The NDPA Monthly Update (graph below) report only provides rounded numbers, and these rounded numbers are not accurate enough to match the graphs. In the backup excel, the NDPA estimates crude by rail in September was a low of 149,630 b/d and a high of 179,630 b/d for an average of ~164,630 b/d. This is up from August low of 155,023 b/d to high of 185,023 b/d for an average of ~170,023 b/d. Note that August's numbers were revised up 6,038 b/d. Below is a chart from the NDPA monthly update showing the crude by rail volumes since 2013. Our Supplemental Documents package includes excerpts from the NDPA monthly update.

Figure 29: Estimated North Dakota Rail Export Volumes

Source: North Dakota Pipeline Authority

Oil – Colonial Pipeline allocates to Line 2 for first time since 2020

Colonial Line 2 is full

S&P Platts reported on Tuesday [LINK] that the Colonial pipeline has allocated distillate shipments to its 1.16 mmb/d distillates only Line 2 pipeline for the first time since May of 2020. We tweeted [LINK], "*US #Oil demand has recovered. @Colpipe allocates Line 2 for*

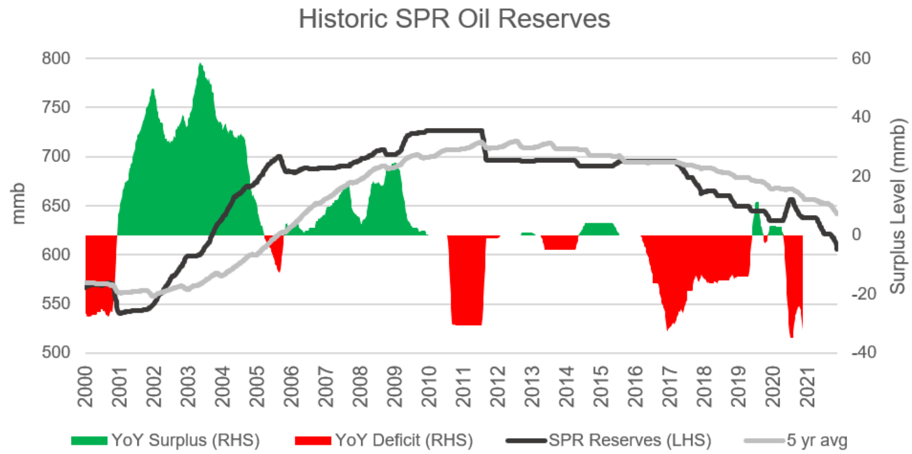
1st time since May 2020, Line 2 carries #JetFuel, ULSD & heating oil. Line 1 carries #Gasoline & was allocated for 1st time since Aug 2020. Thx @SPGlobalPlatts Matthew Kohlman #OOTT." The report noted, *"In a notice to shippers, Colonial said for input north of Collins, Mississippi, will be frozen on shipping cycles 63 through 65 and allocated for its 66th shipping cycle for the line, which carries jet fuel, ULSD and heating oil. It follows similar restrictions a month ago for the 1.37 million b/d, gasoline-only Line 1, which was the first allocation since August 2020. The last time Line 2 was allocated was May 18, 2020, for its 31st shipping cycle."* Line 2 carries distillate products from the US Gulf coast to North Carolina before merging with Line 1 to become Line 3. Our Supplemental Documents package includes the Platts report.

Oil – US Strategic Petroleum Reserves are down 15.155 mmb over past 10 weeks

As a reminder, every week, the EIA posts both the WoW changes in commercial crude oil stocks and in Strategic Petroleum Reserves. The market focus is on changes in commercial crude oil stocks. What some overlook is that the changes in commercial crude stocks effectively build in the impact of changes in the SPR as that oil flows into the US oil supply system. And the impact of weekly changes in commercial crude inventories is the net result of weekly changes in US supply and consumption. In the last 10 weeks, US SPR is down 15,155 mmb from 621.302 mmb on Sept 3 to 606.147 mmb on Nov 12. Below is our running chart of SPR reserves.

US SPR down 15.155 mmb since Sept 3

Figure 30: US Strategic Petroleum Reserves Volumes



Source: EIA

Oil – Line 5 case moves to federal court

There was more big news this week surrounding Enbridge's Line 5 that the Michigan state government is trying to be shut down. We noted the Whitehouse's statements in last weeks (November 14) Energy Tidbit, that the federal government had no intention of shutting down Line 5. On Tuesday, Reuters reported [LINK] that a judge dismissed Michigan's motion to have the case sent back to state court, indicating that the case will be heard at the federal level. In October, Ottawa invoked a 1977 pipeline treaty with the US that triggered negotiations over the fate of the pipeline. Enbridge commented *"Enbridge is pleased with the decision and agrees that this case belongs in federal court as we've asserted all along. This is both a federal and international law issue and the federal court will now handle the case."* '

Michigan judge dismisses state's appeal

Oil – Trans Mountain hopes to restart "in some capacity" by end of this week

Trans Mountain update

The big Canada news story this week was the BC floods, which also became the biggest Canadian economic and oil story with the impacts of the flooding cause massive supply disruptions from highways, rail and pipeline stoppages. This is having a huge impact on people on the west coast and we hope everyone can be safe. Cdn oil prices were hammered as Trans Mountain was shut down and, as of 7am MT news cut off, still no firm time for restart. Trans Mountain was shipping about 300,000 b/d, with the vast majority being light oil volumes. But Trans Mountain said they hope to restart by the end of this week "*in some capacity*". On Friday afternoon, Trans Mountain announced [LINK] "*If all planning and work continues to progress and no further issues with the pipeline are assessed, Trans Mountain is optimistic that we can restart the pipeline, in some capacity, by the end of next week. Key to successful execution of the restart plan will be access for equipment, fair weather, and no new findings of concern."* The question is what does "*in some capacity*" mean in terms of volumes. The other key part of the update was that "*The pipeline remains safely in a static condition and there is no indication of any loss of containment*." Our Supplemental Documents package includes the Trans Mountain release.

Oil – Down to one Covid outbreak area in oil sands facilities

Covid in oil sands

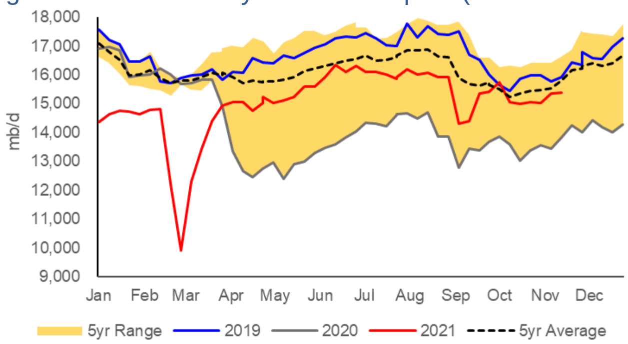
We saw the biggest drop in oil sands facilities this week in the Alberta Covid update as of Nov 12 for the oil sands facilities that are considered outbreak areas. [LINK] All but one oil sands facilities were removed from the outbreak list. The only remaining facility is Suncor Fort Hills. Last week's Nov 12 update had seven facilities - Cenovus Foster Creek/Cold Lake, CNRL Albian, CNRL Horizon, CNRL Kirby Jackfish, CNRL Primrose-Wolf Lake, MEG Christina Lake, and Suncor Fort Hills.

Oil – Refinery inputs +0.031 mmb/d YoY at 15.397 mmb/d

Refinery inputs up WoW

Refineries continue to recover from the impacts of Covid, Hurricane Ida and normal seasonal maintenance; we observed inputs increase as refineries progress through regularly scheduled seasonal maintenance. There was a notable increase as Alaskan refineries completed their seasonal maintenance. Crude inputs to refineries were up +0.030 mmb/d this week to 15.397 mmb/d and are +1.556 mmb/d YoY. Refinery utilization was up +1.2% to 87.9%, which is still +10.9% YoY with the maintenance season coming to an end across the nation. Total products supplied (i.e., demand) was up +2.304 mmb/d to 21.629 mmb/d. Motor gasoline was down -0.018 at 9.241 mmb/d from 9.259 mmb/d last week. Gasoline supplied, a proxy for demand, was down last week. Gasoline stockpiles are at their lowest levels with demand for gasoline at a 4-week high. The four-week average of production supplied decreased to 9.332 mmb/d, up from last year.

Figure 31: US Refinery Crude Oil Inputs (thousands b/d)



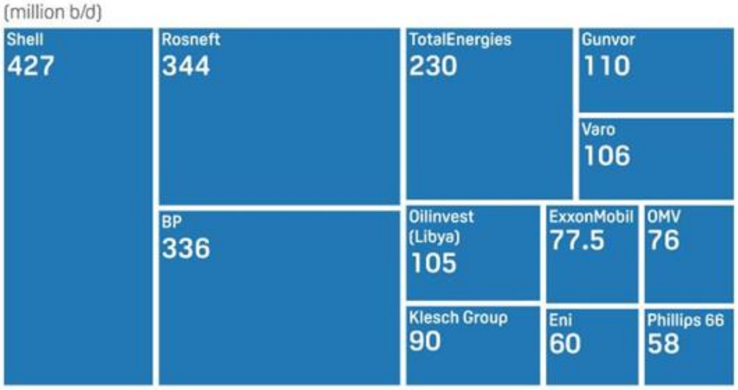
Source: EIA

Oil – Good Platts recovery of Germany oil refining capacity

Rosneft number 2 refiner in Germany

On Wednesday, S&P Globall Platts released a good recap of German oil refinery capacity and the operators [LINK]. Platts highlighted the big change in refinery operatorship with the Rosneft acquisition of Shell's minority stake in the PCK Schwedt refinery in Northeastern Germany. This acquisition makes Rosneft the second largest refiner in Germany, behind Shell and now moving past German refiner BP. The stake in the refinery boosts Rosneft's capacity by +230,000 b/d and increases its shareholding in the plant from 54.17% to 91.67%. The refinery is located 120 km northeast of Berlin and is supplied with Russian Urals Crude through the major Druzhba oil pipeline. Rosneft commented *"Increasing the share of PCK refinery is testament to the strategic importance of the German market for Rosneft. The company builds long-term relationships with its German partners, provides timely and uninterrupted crude supplies, and modernizes key refinery units."* Germany's diesel and gasoline demand are expected to return to pre-pandemic levels of 1.1 mmb/d and 500,000 b/d this year. Our Supplemental Documents package includes the Platts report.

Figure 32: German Refining Capacity by Ownership



Source: S&P Global Platts

Oil – US "net" oil imports down 0.490 mmb/d WoW at 2.656 mmb/d

US "net" oil down WoW

US "NET" imports were down 0.490 mmb/d to 2.565 mmb/d for the Nov 12 week. US imports were up +0.083 mmb/d to 6.191 mmb/d. US exports were up +0.573 mmb/d to 3.626 mmb/d. The WoW decrease in US oil imports was driven by US's top 10 imports by country were down -0.037 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by -0.121 mmb/d to 3.429 mmb/d, which is now ~0.271 mmb/d below the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was down 145,000 b/d to 0.453 mmb/d this week. (iii) Colombia was up +0.181 mmb/d to 0.302 mmb/d. (iv) Ecuador increased imports this week, down 0.014 mmb/d to 0.103 mmb/d. (v) Iraq was down -9,000 b/d to 42,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico was up by 134,000 b/d to 0.499 mmb/d.

Figure 33: US Weekly Preliminary Oil Imports by Major Countries

	Sept 03/21	Sept 10/21	Sept 17/21	Sept 24/21	Oct 1/21	Oct 8/21	Oct 15/21	Oct 22/21	Oct 29/21	Nov 5/21	Nov 12/21	WoW
Canada	3,580	3,200	3,143	3,034	4,039	3,441	3,254	3,472	3,685	3,550	3,429	-121
Saudi Arabia	296	369	399	561	622	304	319	336	397	598	453	-145
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	372	538	835	764	652	316	462	631	439	365	499	134
Colombia	145	0	212	255	0	382	211	141	71	121	302	181
Iraq	106	50	42	0	31	188	239	155	187	51	42	-9
Ecuador	0	174	102	235	59	208	0	222	92	117	103	-14
Nigeria	116	82	95	64	133	211	137	0	64	64	1	-63
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	4,615	4,413	4,828	4,913	5,536	5,050	4,622	4,957	4,935	4,866	4,829	-37
Others	1,195	1,348	1,637	1,639	1,499	944	1,203	1,297	1,237	1,242	1,362	120
Total US	5,810	5,761	6,465	6,552	7,035	5,994	5,825	6,254	6,172	6,108	6,191	83

Source: EIA, SAF

Oil – Pemex oil production down marginal MoM in October

Mexico oil production down marginal

We are waiting on Pemex to post their monthly production and export data for October. But, on Friday, El Universal [LINK] noted that according to the National Hydrocarbons Commission, Pemex and private operators total oil production was down marginally in October to 1.646 mmb/d, down 19,000 b/d from 1.666 mmb/d in Sept. No surprise, Pemex looks to be behind on its 2021 forecast. El Universal wrote "*The production results during the first 10 months of 2021 make it difficult for Pemex to reach the goal set by director Octavio Romero*". El Universal also reported "*Regarding natural gas, the results were similar. National production registered a decrease of 0.6%, equivalent to 31 million cubic feet less in the same period.*" Our Supplemental Documents package includes the El Universal report.

Oil – Norway October oil production of 1.815 mmb/d, up +2.02% MoM

Norway oil production

The Norwegian Petroleum Directorate released its October production figures [LINK] of 1.815 mmb/d of oil, which is +12.4% YoY and +2.02% MoM from September of 1.779 mmb/d. October production was up slightly (+0.049 mmb/d) with the forecast amount of 1.766 mmb/d. The NPD does not provide any explanations for the MoM changes, but we expect it was because of the timing of turnarounds. The story for Norway has been that its oil production returned to growth in the last 3 years because of the Johan Sverdrup oil field. Our Supplemental Documents package includes the NPD October release.

Figure 34: Norway October 2021 production

		Oil mill bbl/d	Sum liquid mill bbl/d	Gas MSm³ /d	Total MSm³ o.e/d
Production	**October 2021**	**1,815**	**2,062**	**336,4**	**0,664**
Forecast for	October 2021	1,766	2,085	331,3	0,663
Deviation from forecast		0,049	-0,023	5,1	0,001
Deviation from forecast in %		2,8 %	-1,1 %	1,5 %	0,2 %
Production	September 2021	1,779	2,033	296,8	0,620
Deviation from	September 2021	0,036	0,029	39,6	0,044
Deviation in % from	September 2021	2,0 %	1,4 %	13,3 %	7,1 %
Production	October 2020	1,615	1,878	289,4	0,588
Deviation from	October 2020	0,200	0,184	47,0	0,076
Deviation in % from	October 2020	12,4 %	9,8 %	16,2 %	12,9 %

Source: Norwegian Petroleum Directorate

Oil – IEA OMR: OECD stocks at lowest levels since 2015 but a build in Oct

IEA Oil Market Report

The IEA released its monthly Oil Market Report for November at 2am MT Tuesday. They only release very limited public info, but Bloomberg provided tables and added color from the report. So big thanks, as usual, to the Bloomberg team.(i) We tweeted [LINK] "*US #Oil production back to pre-Covid levels at end of 2022. @IEA Oil Market Report "US is set to account for 60% of 2022 non-OPEC+ supply gains, now forecast at 1.9 mb/d. Even so, the*

US will not return to pre-Covid rates until the end of 2022". #OOTT." This was a bullish OMR that was largely unchanged from last month. (ii) The IEA left its oil demand largely unchanged with only minor rounding revisions. 2021 forecast remained at 96.3 mmb/d with 2022 slightly revised upwards at 99.7 mmb/d from 99.6 mmb/d last month. The IEA wrote "*Global oil demand is strengthening due to robust gasoline consumption and increasing international travel as more countries re-open their borders. However, new Covid waves in Europe, weaker industrial activity and higher oil prices will temper gains".* The IEA further warns that higher energy prices are adding inflationary pressures which could lead to lower industrial activity and a slowdown in economic recovery. (iii) Non-OPEC supply growth saw upwards revisions to both 2021 and 2022. Non-OPEC supply is now forecasted at 63.7 mmb/d from 63.6 mmb/d in 2021 and 66.6 mmb/d from 66.6 mmb/d in 2022. (iv) There were nocomments in the IEA forecasts global spare capacity. Last month noted that global spare capacity was to be less than 4 mmb/d by 2022 and the capacity is held primarily in Saudi Arabia, the UAE and Kuwait. The IEA wrote, "*with OPEC+ currently on track to pump 700 kb/d below the call for its crude during 4Q21, inventories will continue to decline. As the bloc ramps up production, its spare capacity will dwindle. Compared with a cushion of 9 mb/d in 1Q21, effective spare capacity could fall below 4 mb/d by 2Q22 and be concentrated in only a few Middle Eastern countries, although supply is expected to exceed demand. Shrinking global spare capacity underscores the need for increased investments to meet demand further down the road."* (v) OPEC October production up +0.24 mmb/d MoM. Bloomberg wrote *"In Africa, Nigerian output slid to 1.24m b/d amid operational issues and maintenance. In Angola, production was unchanged at 1.11m b/d. Output in Libya -- also exempt from cuts -- crept up to 1.16m b/d."* The IEA revised September production to 27.18. The major difference in OMR at 27.42 vs OPEC MOMR at 27.45 is Nigeria which had +11,000 b/d to 1.24 mmb/d in October; MOMR had Nigeria at 1.35 mmb/d (vi) On refined products draw the IEA wrote *"Global refinery runs are expected to cross the 80m b/d mark for the first since January 2020 this month as China and India increase throughputs, the IEA said in its monthly oil market report."* (vii) There was no detailed discussion on OECD stocks. The IEA saw a marginal stock build in October following a sizeable draw in September. The IEA wrote, *"OECD total industry stocks plunged by 51 mb in September, with crude oil and middle distillate holdings accounting for most of the declines. In terms of regions, Europe led the draw-down. At 2 762 mb, total OECD industry stocks stood 250 mb below the five-year average and at their lowest level since the start of 2015. Preliminary data for October point to a marginal stock build."* (viii) Call on OPEC crude for 2022 was revised to 27.4 mmb/d from 27.5 mmb/d; 2021 saw a call to 27.3 mmb/d from 27.4 mmb/d. Our Supplemental documents package includes the IEA release and the Bloomberg report.

Figure 35: IEA Global Demand Forecast By OMR Report Month

mmb/d	2019	2020	20-19	Q1/21	Q2/21	Q3/21	Q4/21	2021	21-20	Q1/22	Q2/22	Q3/22	Q4/22	2022	22-21
Nov-21	99.7	91.0	-8.7	93.3	95.2	97.7	98.9	96.3	5.3	98.5	99.2	100.6	100.3	99.7	3.4
Oct 21	99.7	91.0	-8.7	93.4	95.2	97.8	98.9	96.3	5.3	98.6	99.1	100.5	100.2	99.6	3.3
Sep 21	99.7	91.0	-8.7	93.4	95.1	97.2	98.8	96.2	5.2	98.2	98.9	100.3	100.7	99.5	3.3
Aug 21	99.7	91.0	-8.7	93.4	94.9	97.4	98.9	96.2	5.2	98.0	98.8	100.1	100.2	99.3	3.1
July 21	99.7	91.0	-8.7	93.6	94.7	98.1	99.4	96.4	5.4	98.2	98.7	100.3	100.6	99.5	3.1
June 21	99.7	91.0	-8.7	93.3	94.9	98.0	99.3	96.4	5.4	98.3	98.6	100.3	100.6	99.5	3.1
May 21	99.7	91.0	-8.7	93.1	94.6	98.3	99.6	96.4	5.4	-	-	-	-	-	-
Apr 21	99.7	91.0	-8.7	93.7	95.1	98.3	99.5	96.7	5.7	-	-	-	-	-	-
Mar 21	99.7	91.0	-8.7	93.9	95.0	97.8	99.2	96.5	5.5	-	-	-	-	-	-
Feb 21	99.6	91.0	-8.6	93.7	94.9	97.9	99.2	96.4	5.4	-	-	-	-	-	-
Jan 21	99.9	91.2	-8.7	94.1	95.2	98.1	99.0	96.6	5.4	-	-	-	-	-	-
Dec 20	99.9	91.2	-8.7	94.7	95.4	98.0	99.2	96.9	5.7	-	-	-	-	-	-
Nov 20	99.9	91.3	-8.6	94.9	95.8	98.4	99.1	97.1	5.8	-	-	-	-	-	-

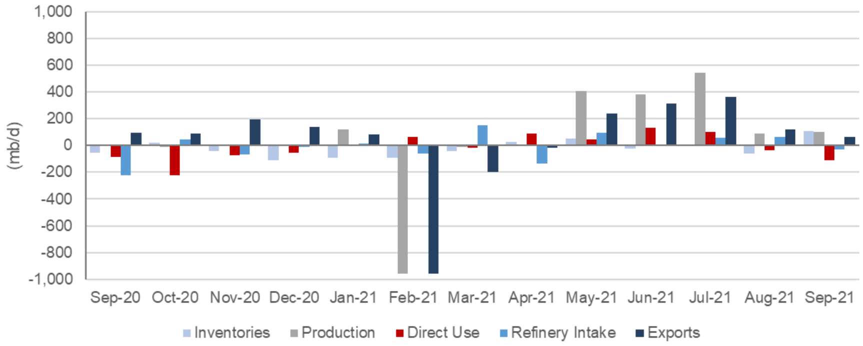
Source: IEA, SAF

Oil – Saudi use of oil for electricity is now in seasonal decline, more for export

Saudi to have more oil for export

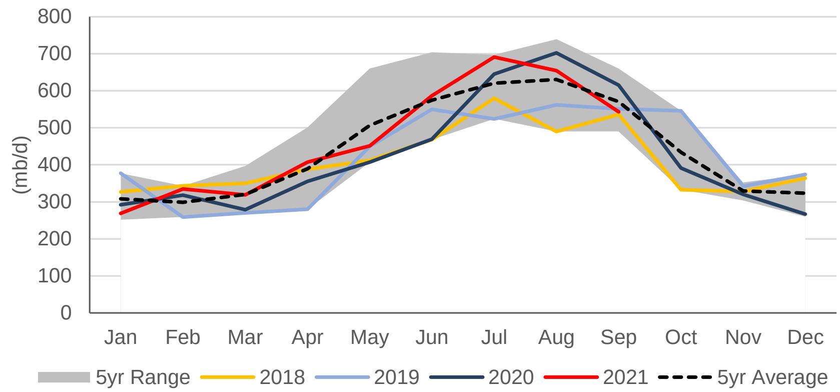
The JODI data for September was updated on Thursday [LINK]. (i) The key reminder from the JODI data is that Saudi's use of oil for electricity has in its normal seasonal decline and that will free up more oil for export. The peak summer use was July at 691,000 b/d, that declined to 654,000 b/d in Sept and now reported -111,000 b/d MoM to 543,000 b/d for Sept. Sept 2021 is down 72,000 b/d YoY from Sept 2020 of 615,000 b/d. Sept was also below the 5-yr average of 570,000 b/d. (ii) The normal seasonal decline in Saudi use of oil for electricity would see a peak to trough decline of >400,000 b/d to under 300,000 b/d. (iii) On the overall JODI data for Sept, there was 276,000 b/d of unaccounted supply. There was a significant build to inventories, up 3.378 mmb this month. For September, Production was +109,000 b/d MoM to 9.662 mmb/d, with the continued gradual return from its voluntary 1 mmb/d production cuts. Exports also rose, but at a slower rate than production, being +66,000 b/d MoM to 6.516 mmb/d. Direct use for electricity was -111,000 b/d to 543,000 b/d. (iii) Inventories increased significantly up +3.378 mmb from 133.164 mmb to 136.542 mmb. Inventories remain at historically low levels, sitting below 150 mmb for the first time since Apr 2004, which was 149.8 mmb. (iv) Below are the AccuWeather Temp maps for Riyadh for Sept, Oct and Nov MTD. Careful they are different scales but look for oil for electricity to decrease as we continue to get away from peak season.. Below are our updated graphs for the Saudi JODI data for July.

Figure 36: MoM Saudi Inventories, Production, Direct Use, Refinery Intake & Exports



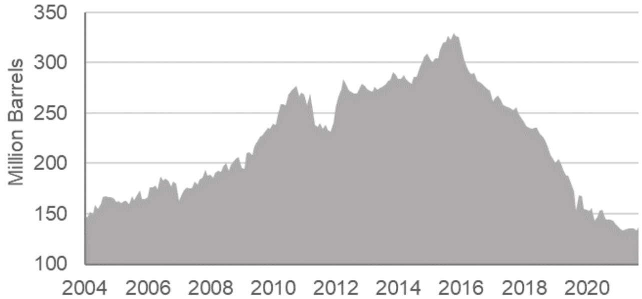
Source: JODI, Bloomberg

Figure 37: Saudi Arabia Direct Use of Crude Oil For Electric Generation



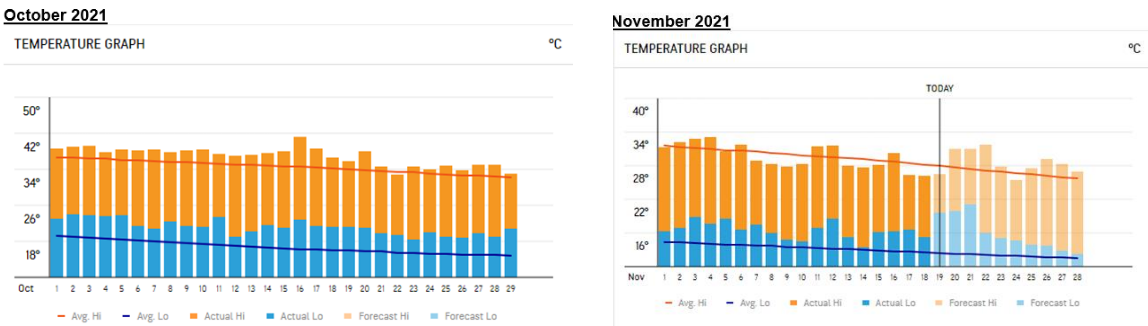
Source: JODI

Figure 38: Saudi Arabia Crude Oil Inventories (million barrels)

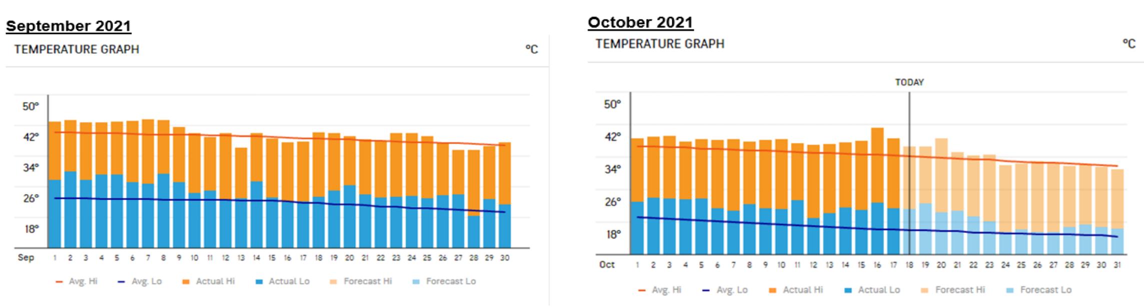


Source: JODI

Figure 39: Riyadh Temperature Recaps for Sept, Oct and Nov



Source: AccuWeather



Source: AccuWeather

Oil – Saudi and Kuwait keep tossing the ball back to the US on increasing oil supply

Saudi/Kuwait toss it back to US

On Monday, we tweeted on the Platts report [LINK] on comments from Saudi Arabia and Kuwait on increasing oil supply including the US suggestion that some OPEC members (Saudi, Kuwait, UAE) produce more to compensate for OPEC members that can't produce to quota. We tweeted [LINK] "*Saudi/Kuwait toss ball back in @POTUS court - you want more #Oil above #OPEC plans, then use your SPR or get your oil co's to produce more. & Saud's Abdulaziz reminds its not an oil issue, its an issue of #NatGas #LNG #Coal & availability of #Electricity. thx @HermsTheWord #OOTT.*" Saudi Energy Minister Abdulaziz must be getting tired of saying the same thing over and over. Platts reported Abdulaziz "*told S&P Global Platts that the kingdom has "very comfortable" spare production capacity but that he saw no need to put additional supplies onto the market beyond what OPEC and its allies have already agreed. The recent gas and electricity crunch in Europe and Asia has been* *pulling up crude prices with some power plants switching fuels to oil, but there is no shortage of oil in the market, he said on the sidelines of the ADIPEC conference in Abu Dhabi. "Saudi Arabia has demonstrated to the world that we always come to the rescue of the world if it is needed," he said. "The problem is, it is not an issue of oil, it is an issue of gas, LNG, coal, and the availability of electricity. This is the most unfortunate part that people are not relating to. And they are trying to throw the problem on oil when oil is the least source of the problem."* Our Supplemental Documents package includes the Platts report.

Oil – Did US relax its position on Iran ahead of JCPOA negotiations on Nov 29?

Did US relax Iran position?

Yesterday morning, we tweeted [LINK] *"#Oil price watch. Is US relaxing Iran position? @SecDef "we will look at all the options necessary to keep the US secure". hard to believe it was slip of the tongue vs normal keep IR from getting nuclear weapon. #JCPOA starts 11/29, Hmm! #OOTT."* The US has been pretty disciplined on their message that they are trying to prevent Iran from getting a nuclear weapon and they have also been disciplined about their use of keep all options on the table. So it jumped out at us to see Reuters reporting on comments from US Defense Secretary Austin in a speech. This is in a speech and not off the comments remarks. And we have to believe Austin was reading the speech so these were prepared remarks. Reuters reported "*He said the United States was committed to countering Iran, even as Washington works to revive the 2015 nuclear deal. "We remain committed to a diplomatic outcome of the nuclear issue," he said. "But if Iran isn't willing to engage seriously, then we will look at all the options necessary to keep the United States secure."* Austin adding "*to keep the United States secure*" just seems to be a relaxation in position and one coming just ahead of the Nov 29 restart of JCPOA negotiations. On Oct 31 CNN State of the Union, Blinken said "*If -- if it isn't, if it won't, then we are looking together at all of the options necessary to deal with this problem.*" At the Oct 13 joint press conference with Israel and UAE, Blinken said "*We're united in the proposition that Iran cannot be allowed to acquire a nuclear weapon, and President Biden is committed to that proposition." "And so as the foreign minister said, we -- we are discussing this among -- among ourselves and we will look at -- at every option to -- to deal with the challenge posed by Iran*." In his Sept 21 address to UN general assembly, Biden said "*The United States remains committed to preventing Ira- — to preventing Iran from gaining a nuclear weapon.*" We don't recall the US ever saying their objective is to keep the US secure. As of our 7am MT news cut off, we have not seen any backtracking of the Austin comments. It just can't be a slip of the tongue and we have to believe it's a signal to Iran (and also Israel and Saudi Arabia) that the US is serious about trying to get a return of the JCPOA. Our Supplemental Documents package includes the Reuters report.

Oil – US asks China, India, Japan, South Korea & others to release oil reserves

US asking others for oil reserves

The big negative to oil markets this week were the reports that the US asked China, India, Japan and South Korea to release strategic oil reserves to help lower oil prices. Its not clear what other countries were asked. However, at Friday's White House press conference, White House spokesperson Jen Psaki was asked "*Has the U.S. heard back from China, Japan, South Korea and India on a coordinated release of emergency stockpiles?"* Psaki seemed to infer there were other countries in her reply "*I don't have any update to provide to you today. I would reiterate, for those who weren't following this as closely, we have been in touch with a range of officials and leaders from countries, including China, including other countries around the world, that are oil producers about -- about ensuring there is adequate supply out there, but I don't have any update for today."*

China sounds like a Yes but really just what they previously said they were doing. On Thursday, Bloomberg reported "*China is releasing some oil from its* *strategic reserves days after the U.S. invited it to participate in a joint sale, suggesting the world's two biggest oil consumers are willing to work together to keep a lid on energy costs. U.S. President Joe Biden and Chinese President Xi Jinping had discussed the merits of releasing oil from strategic reserves during their virtual summit this week, and Beijing's decision will be seen as a win in Washington's campaign to bring down prices*." And ""*The bureau is carrying out crude oil release work at the moment," said a spokeswoman at the National Food and Strategic Reserves Administration via phone. It's unclear if Chinese authorities are doing so in response to Washington's invitation, or whether they had prior plans to do so*." Recall that China had previously announced it would be selling strategic reserves, but also that it hasn't done what it said it would do. We tweeted [LINK] "*Will China actually release strategic #Oil reserves as per mkt reports? On 11/7, @vitolnews Mike Muller to @sean_evers highlighted only did 4 of 7 mmb Oct release, hadn't tendered for Nov release (ie. too late for a release) or Dec release. See SAF Group transcript. #OOTT."* Our Nov 7, 2021 Energy Tidbits included the transcript we made of China insights from Vitol's Mike Muller (Head, Vitol Asia) that morning including his update on China's announced release of oil reserves. Muller said "*And then there is the oil you refer to. China was going to release about 27 million barrels of oil in three phases. In three chunks of 7 million barrels each, in the months of October, November and December. And we saw the first cycle where only four and bit million barrels of the seven million barrels were awarded. only domestic companies can partake in this of course. And there is no sign of the second release, at present. And there always tends to be a bit of an overtone on price on this, but, if China had a conviction of sticking to what they were going to do , we would have seen the second tender by now. And we have not yet seen it*."

India sounds like a No. The Times of India reported [LINK] ""*Strategic oil reserves weren't ever intended for a situation like this… It's for a force majeure situation, if there's an earthquake, a global outbreak of hostilities, and oil supplies are shut," India's oil minister Hardeep Singh Puri told Bloomberg TV on Wednesday when the news broke*.." Earlier this morning, we tweeted [LINK] on a great 12:45 min Al Arabiya interview with Puri at ADIPEC this week. It wasn't clear exactly what day this week for the interview, but Al Arabiya only posted the story and video this morning [LINK]. Puri was pretty clear on India's strategic oil reserves saying ""*We have been replenishing out strategic reserves and I think the agreement you are referring to… we are in the process of augmenting our reserves to take it to the global prescribed levels by the international energy agency," India's minister said. "I think we are at 86 days of consumption and the consumption is going up also. We need to go a little farther to make it at 100 days. We are in the process of doing that."* Note there is much more in this report. When we heard Puri's comments, it reminds that, even if India were to release some strategic reserves now, it is more of a trade on price as they are in a trend/objective to increase strategic reserves. Our Supplemental Documents package include the Al Arabiya report.

Japan initially looked like a No, but Kishida is trying to make it work. On Wednesday, Bloomberg reported "*Japan is unlikely to release oil from its strategic reserves to counter soaring prices and inflation, as stockpiles are meant as a buffer against supply shocks and emergencies, according to the government division in charge of state inventories. According to Japanese laws, the reserves can only be used in the event of an acute supply disruption, according to an official at the Ministry of Economy, Trade and Industry. The country has been closely cooperating with*

American-led efforts to lobby for a quicker return of supplies from OPEC and its allies." Yesterday, The Japan Times reported [LINK] that "*Japan is considering releasing oil from its reserves along with the United States and other countries to help curb rising crude oil prices, Prime Minister Fumio Kishida said Saturday. "We are considering what we can do," Kishida told reporters in Matsuyama."* After seeing the report, we tweeted [LINK] ""*We are considering what we can do" says Japan PM Kishida re US request to release strategic #Oil reserves. Is the only legal option to do so by lowering their required level of oil reserves? #OOTT."* Last night, we tweeted on how Japan can release the oil reserves under their laws. Yomiuri Shinbun reported [LINK] that Japan's existing oil reserves are well above the legally required minimum level of strategic reserves. And therefore should be able to release oil reserves and not need to change legal limits. Yomiuri wrote "*Japan's oil stockpiling includes national petroleum stockpiling owned by the government and private petroleum stockpiling required by law for oil companies. As of the end of September, the national stockpile is for 145 days of domestic daily consumption, and the private stockpile is for 90 days. The Oil Stockpiling Law stipulates that national stockpiling is for 90 days or more of imports and private stockpiling is for 70 days or more of consumption. Currently, the minimum target amount has been exceeded, and there is a plan to sell a part of the surplus stockpile and release it to the market."* Our Supplemental Documents package includes The Japan Times and Yomiuri reports.

South Korea looks like a No. On Wednesday, Reuters reported [LINK] "*South Korea has received a request from the United States to release oil reserves in response to rising oil prices, an official at South Korea's industry ministry said on Thursday. "We are thoroughly reviewing the U.S. request, but we do not release oil reserves because of rising oil prices. We could release oil reserves in case of supply imbalance, but not to respond to rising oil prices," the industry ministry official told Reuters."*

Oil – BloombergNEF China oil markets monthly

BloombergNEF China oil insights.

One of our favorite BloombergNEF monthly reports is its China Oil Markets Monthly, which is a good snapshot of China demand and supply. On Wednesday, we tweeted [LINK] "*China low refinery #Diesel #Gasoline stocks = increased refinery runs + halt diesel exports. #Oil demand travel indicators down due to Covid. Usual great insights from @BloombergNEF China Oil Markets Monthly. Thx stang237@bloomberg.net #OOTT."* No one should be surprised that the look ahead to near term demand indicators is weak given the increasing Covid cases. BloombergNEF wrote "*Jet fuel has taken another blow from fresh coronavirus outbreaks in Sep 2021 November. The flight departures index fell to 39% on November 16, erasing the 25 percentage point gain in the short-lived recovery last month",* and "*Gasoline demand faces headwinds in the upcoming months as new Covid-19 cases discourage mobility, and the cold weather dampens travel enthusiasm."* On refineries, BloombergNEF wrote "**.** *State refineries have ramped up operations since October, encouraged by the energy crunch which pushed diesel prices to multi-year highs. Sinopec and PetroChina",* and "*Diesel exports come to a halt • Oil companies plan to halt diesel exports until the end of this year as domestic supply security is prioritized*." Our Supplemental Documents package includes excerpts from the BloombergNEF report.

Figure 40: BloombergNEF China Oil Markets Monthly

China oil markets monthly snapshot

	Indicator	Value	Change		Last update	Comment
Demand	**Traffic**		**M-o-M**	**Y-o-Y**		• Jet fuel has taken another blow from fresh coronavirus outbreaks in November. The flight departures index fell to 39% on November 16, erasing the 25 percentage point gain in the short-lived recovery last month. • Diesel demand remains strong as road freight receives a boost from the seasonal shopping season, which starts in November. However, diesel usage in the power sector will likely decline as power supply from other sources like coal and gas returns on lower prices. • Gasoline demand faces headwinds in the upcoming months as new Covid-19 cases discourage mobility, and the cold weather dampens travel enthusiasm. For more details, see the ***demand*** section from page 3.
	Road freight volume	620 bln tons-km	+4%	+1%	Sep 2021	
	Air passenger traffic	54 bln ppl-km	+59%	-23%	Sep 2021	
	Port cargo throughput	1.3 bln tons	-5%	-2%	Sep 2021	
	High frequency index		**W-o-W**	**M-o-M**		
	Road congestion index	90%	+0 ppt	-14 ppt	Nov 10, 2021	
	Airport departures index	39%	-1 ppt	-25 ppt	Nov 16, 2021	
	Subway traffic index	96%	+2 ppt	-1 ppt	Nov 10, 2021	
Refining	**Refinery utilization**		**M-o-M**	**Y-o-Y**		• State refineries have ramped up operations since October, encouraged by the energy crunch which pushed diesel prices to multi-year highs. Sinopec and PetroChina, China's two biggest refiners, both pledged to boost diesel production through increased run rates and a shift of product yields. • BloombergNEF expects high run rates to continue in the following months despite a softer demand outlook. Independent refiners can benefit from the fourth batch of crude import quotas, and current gasoline and diesel inventory levels are below their five-year averages in Shandong, driving restocking demand. For more details, see the ***refining*** section from page 7.
	Country-wide throughput	13.80 m b/d	+1%	-2%	Oct 2021	
	State-owned refineries	77%	+3 ppt	+4 ppt	Nov 12, 2021	
	Independent refineries	71%	-1 ppt	-4 ppt	Nov 12, 2021	
	Stocks					
	Crude - Shandong ports	36.5m barrels	-15%	-17%	Nov 12, 2021	
	Gasoline – Shandong independents	4.8m barrels	-26%	-32%	Oct 2021	
Trade	**Crude imports**		**M-o-M**	**Y-o-Y**		• The crude import quota for 2022 (maximal allowed volume) is set at 243 million metric tons, or 1.78 billion barrels. This is the same level as in 2021, but this year saw just 73% of the quota granted to independent refiners and the remaining 27% scrapped. • The energy crunch is tightening the domestic diesel market, with refiners planning to halt diesel exports until the end of the year. BNEF expects fuel exports to extend declines seen in earlier months. For more details, see the ***trade*** section from page 11.
	National total	8.94m b/d	-11%	-11%	Oct 2021	
	Selected routes (BBG)	5.04m b/d	-1%	-7%	Oct 2021	
	Independent refinery	3.43m b/d	+5%	-15%	Oct 2021	
	Quota usage	64%			Jan-Oct 2021	
	Fuel exports	0.93m b/d	-8%	-32%	Oct 2021	

1 China Oil Markets Monthly: November 2021 BloombergNEF

Source: BloombergNEF

Oil – Vortexa est 90.00 mmb at Nov 19, note big upward revision to Nov 12 estimates

Vortexa floating storage

Note that we are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 3:30pm MT yesterday and that these estimates often get revised over the weekend, and then again for the next week. Note we do not check daily for the revisions so our comments are compared to the Nov 12 and 5 estimates that were posted on Sat Nov 13 at 5:30pm MT. It was another week of significant revisions to the prior week estimates. However, if we look at the last few months, float oil storage looks rangebound. It is important to remember floating storage is the smaller part of the global oil storage outlook and, as noted earlier in the memo, IEA OOMR highlighted the massive correction to global oil inventories since June 2020. As of 3:30pm MT Sat, Bloomberg has posted Vortexa crude oil floating storage as of Nov 19 is estimated at 90.00 mmb, which is down 4.95 mmb WoW from the revised Nov 12 estimate of 94.95 mmb. There was a large upward revision to the Nov 12 estimates. Last Sat at 5:30pm MT, it was estimated at 83.48 mmb, which is 11.47 mmb lower than yesterday's 3:30pm estimate of 94.95 mmb for Nov 12. There was an immaterial revision to the Nov 5 estimates yesterday vs last week. Nov 19 estimate of 94.0 mmb is +13.6 mmb vs the recent June 25 trough of 76.4 mmb. Nov 19 estimate of 94.0 mmb is down 130.51 mmb vs the June 26, 2020 peak of 224.51 mmb. There was an immaterial revision to the June 26, 2020 peak. Nov 19 estimate of 94.0 mmb is +38.95 mmb vs the Pre-Covid of 55.05 mmb as of Nov 18, 2019. Below is the Bloomberg posted Vortexa crude oil floating storage data for the past two years as was posted yesterday at 3:30pm MT.

Figure 41: Vortexa Floating Storage Nov 19, Posted on Bloomberg 3:30pm MT Sat

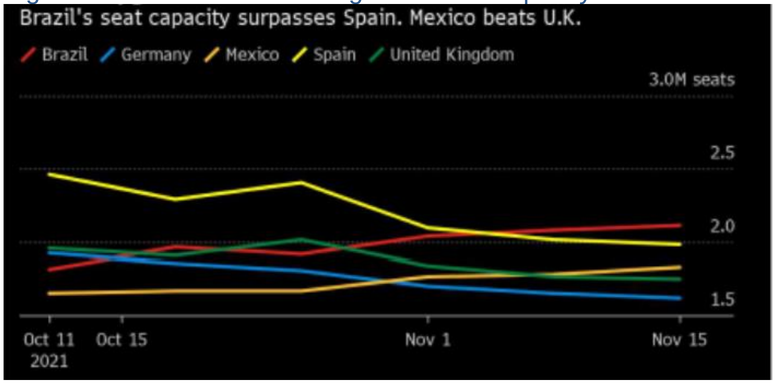
Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor, Latin America air travel increases

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. Demand for jet fuel in Latin America has observed significant growth in recent weeks as air travel begins to pickup. Brazil has surpassed Spain for the fifth worldwide in seat capacity; Mexico has surpassed both Germany and the UK. Airline traffic declined in Europe in November, down 23% this past week from just 19% at the end of October. Australia was the only country to show significant increase in scheduled seat capacity, opposed to other markets showing minor gains. The US continues to narrow the flight capacity deficit with 2.01 million passengers passing through turnstiles, just 2.9% below 2019 levels. Jet fuel demand is expected to recover in 2022 to just 19% below 2019 levels. China continues to be plagued by Covid restrictions with a seat capacity of 12.3 million, 3 million seats below the equivalent week in October; previously highlighted as the closest to matching 2019 levels, China's seat capacity is now 22% below 2019 levels. City roadway congestion was up around the world with New York, London, Rome, and Paris all above 2019 levels. Toll roadway volumes from six countries around the world were up across the board, with France, Chile and Spain observing the largest increases when compared with the equivalent week in 2019. Refinery utilization is slightly down from 2019 levels at 86.7%, though remains unchanged MoM; both US east and Midwest refineries were up since 2019, though Permian was down slightly at 1.1% below 2019 levels. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 42: International Changes in Seat Capacity



Source: Bloomberg

Oil – Retail jet fuel prices fairly flat MoM in November

Retail jet fuel

Our October 24, 2021 Energy Tidbits notes some real examples of how retail jet fuel prices were gong up. We noted real fill up prices by one of our Calgary small jet pilot friends for some real life jet fuel prices. The example he used was for round trips from Calgary to Los Cabos in mid July vs mid October and now mid November. At the Calgary YYC airport, jet fuel in July was US$1.26/litre, then +7.1% to US$1.35/litre in October, and now +3.0% MoM to US$1.39/litre in November. At the San Jose del Cabo airport, jet fuel in July was US$0.98/litre in July, +18.4% to US$1.16/litre in October, but flat MoM in November at US$1.16/litre.

Oil & Natural Gas – Liberals say haven't singled out the oil & gas industry

Liberals haven't singled out oil and gas?

Unless we missed it, we are surprised we didn't see the oil and gas industry associations, companies, Alberta and Saskatchewan government call out Canada Natural Resources minister Wilkinson for his Monday interview in the National Post. Wilkinson said ""*Some people say that we've singled out the oil and gas space and to that I actually say that's just not true*: And then to justify that position he said "*If you read the rest of the climate plan, for example, in the in transportation space, we said hard stop of the sale of internal combustion engine vehicles after 2035 for the same reasons*." Perhaps he should have pointed out all the industries that the Liberals will be giving hard emission reductions targets starting in 2025 and be reviewing the progress thereon yearly to ensure they keep the oil and gas sector on track for those hard targets. Our Supplemental Documents package includes the Wilkinson interview [LINK].

Oil & Natural Gas– Shell to change share structure, move head office from Netherlands

Shell to simplify share structure

We recognize that most are looking at Shell's announcement to move head office from the Netherlands as a bit of sour grapes. Rather we think Shell decision is, as Shell put it, creating value. We expect others to follow suit from the concept of moving tax jurisdictions. On Monday, Shell announced [LINK] that it asked shareholders to vote on a special resolution to amend Articles of Association and allow the simplification of the company's structure. The proposal comes to eliminate the A/B share structure and establish a single line of shares. This would also align Shell's tax residence to the UK after 16 years of residing in the Netherlands. A statement from Shell noted *"At a time of unprecedented change for the industry, it's even more important that we have an increased ability to accelerate the transition to a lower-carbon global energy system. A simpler structure will enable Shell to speed up the delivery of its Powering Progress strategy, while creating value for our shareholders, customers and wider society."* The simplified structure will allow for Shell to compete more effectively by accelerating share buy backs, strengthening Shell's ability to manage its portfolio amongst the rising challenges posed by the energy transition, and reduce global shareholders risk by normalizing its share structure with that of its competitors. Shell's projects and technology division, global upstream oil and integrated gas businesses and renewable energies hub will remain in the Hague. Shell is likely to drop the Royal designation, after bearing for 130 years, as it no longer anticipates it will meet the conditions under the proposed changes.

Oil & Natural Gas – Many comments from ADIPEC

Comments from ADIPEC

This week, we saw the return of an in-person attendance at the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC) began on Monday. This is a major conference for oil anywhere in the world, but especially significant because the Middle East location has all the major OPEC players and major global oil companies. We saw a range of reports on quick comments from ADIPEC..

Eni – Very possible that oil will reach $100/bbl

The ongoing discussion in the oil market is that it is very possible oil will reach $100/bbl in the near term. Italian producer Eni stated that this was due to a lack of investment among companies to meet the rising demand that is expected to get back to pre-pandemic levels. Eni's CEO stated, *"Maybe it can reach that. But not for a long time. When the price is that high, it would lead to consumers cutting back on energy use. We are investing more or less 50% of what we invested in 2013," he said. "There is a gap between supply and demand. It'll take some time before oil companies start investing again."*

Equitorial Guinea's Energy Minister – Poor Nations need access to O&G

Poor nations are likely to struggle with the costs associated with the energy transition. Oil & Gas development is necessary for these nations to efficiently make the eventual transition away from fossil fuels. The Energy Minister noted, *"We aren't going to allow oil and gas not to be developed because of the energy transition. We are a small and poor country. If the U.S. and others won't help us develop it, maybe China, Brazil, the Middle East or Turkey will."*

Occidental – US should not look abroad for production increase

Occidental CEO stated the president Joe Biden should shift his focus from pressuring OPEC to raise production amid rising oil prices, and instead focus on raising US production. We listened to a clip of CEO Vicki Hollub and made a transcript *"If the administration wants more supply, they should ask U.S. producers first, if I were gonna make a call, it wouldn't be long distance, it would be a local call. And I think that we could do it cheaply in the United States, as other countries can do, I think first you, you stay home, you ask your friends, and you ask your neighbors to do it. And then if we can't do it, you call some other countries."*

Vitol – US SPR release won't fundamentally affect prices

With recent speculations that the US may begin draws from the SPR to combat the rising oil prices and increasing demand, Vitol expects that any draw will have little impact on global prices of oil. Vitol CEO stated, *"Any release of oil from the U.S. strategic petroleum reserves wouldn't dampen the market or change things fundamentally in terms of prices."* Vitol does not expect that supply will significantly increase beyond what OPEC is scheduled to produce.

Oil & Natural Gas– GoM sale dominated by supermajors in deepwater

Supermajors won in GoM sales

We have to believe the bidders at the GoM sale are assuming there will be less sales under Biden as he faces increasing pressure to stop fossil fuels. So no surprise, the big players were bidders. The US Department of the Interior Bureau of Ocean Energy Management released their sale of statistic report on Wednesday [LINK] for the GoM region. It noted the sum of all bids on deep-water projects to be $198.51 million. We were interested by the bidding statistics by water depth. 0–200-meter projects saw 140 bids for a sum of 23.5 million, 200-400m projects had 3 bids with the sum of all totalling just over $1 million, 400-800m had 23 bids and a sum of all bids equating to $20.95 million. 800-1,600 meters had 89 bids for a total $105.69 million and 1,600+ metera had bids equating to $47.12 million. The top companies involved in the bidding were Chevron at $47 million, Andarko $39 million and BP with bids totalling $29 million.

Oil & Natural Gas – Liberals Natural Resources Minister wants to "put elbows down"

New Liberals natural resources minister was in Alberta this week and, at least based on the press reports, he made a good impression and his words were encouraging to many in the oil patch. Calgary Herald reported "*What I heard from the CEOs, as well as others in the energy sector today, was that they really want to collaborate, they want a partner, they want us to work together," Wilkinson said in an interview. "I hope that both sides are prepared to put their elbows down." Similarly, Savage said they talked about areas of mutual interest. "I take Minister Wilkinson at his word," she said. "There is a willingness to work together."* After seeing the report, we tweeted [LINK] "*No one disputes @JonathanWNV is a good person, like predecessor @SeamusORegan. But aren't @JustinTrudeau & his advisors calling the shots? #Liberals Canadian Net-Zero Emissions Accountability Act requires them to ensure emissions cutting is on track to meet Net Zero. #OOTT".* Trudeau has made sure he puts good guys in as Natural Resources minister like Wilkinson and O'Regan, but the reality of politics is that Trudeau and his closest advisors are the one calling the shots. The Calgary Herald also quoted Whitecap CEO Grant Fagerheim who brought a reality check to the meetings. The Calgary Herald reported ""*I'd walk away from it and say (to Ottawa), 'If you do what you say you're going to do, and actually listen to industry …' then you feel very encouraged," said Whitecap Resources CEO Grant Fagerheim, who was in Thursday's meeting with Wilkinson."Historically, that's not been the case. It's been empty promises."* Our Supplemental Documents package includes the Calgary Herald report. [LINK]

Wilkinson doing his calm down tour

New Liberals law they have to stay on track to hit emissions reduction target

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

Electricity – NERC expects sufficient capacity for winter electricity

The North American Reliability Corporation released their Winter Reliability Assessment for the December to February period [LINK] which evaluates *"generation resource and transmission system adequacy necessary to meet projected winter peak demands and operating reserves"*. The main finding of the assessment is that all areas have sufficient planned and existing resources to manage capacity under normal conditions. However, the NERC report was different than the older years in that they featured the risk to reliability by unplanned events in critical supply factors for each region ie. a natural gas disruption or weather event. This should not surprise as they want to be able to say they warned

NERC Winter Reliability Assessment

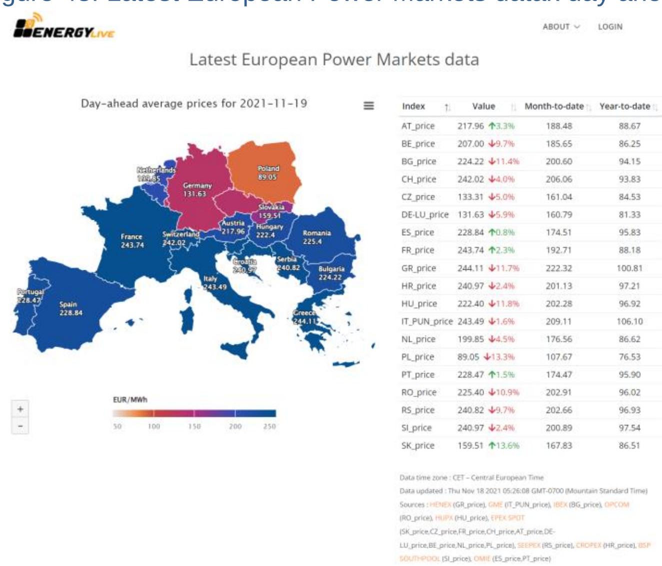
Americans in case there is another Texas weather event. The biggest risk this winter is gas supply disruptions in infrastructure limited areas. Though there are two problem areas seen by NERC, in New England and California. The issue in New England is that generation may be limited at times due to the limited natural gas infrastructure. Therefore, a severe and prolonged winter event may lead to generation loss. For California and the southwestern area, the issue relates to the lack of storage capacity and limited redundant supply infrastructure, as this area relies on natural gas fired generation for over 60% of their on-peak demand. Therefore disruptions to supply chains may cause a significant issue for this area. Additionally, NERC included a general issue across the entire power system on extreme weather. NERC wrote *"Extreme weather events, including extended durations of colder than normal weather, pose a risk to the uninterrupted delivery of power to electricity consumers: Winter weather that exceeds projected conditions can expose power system generation and fuel delivery infrastructure vulnerabilities and challenge electricity system operators' ability to maintain reliability of the BPS. Although Anticipated Reserve Margins meet or surpass the Reference Margin Level in all areas as shown in the Resource Adequacy section, harsh conditions characterized by extreme or prolonged cold temperatures over a large area create unique challenges in maintaining grid reliability in many parts of the North American BPS.* Our Supplemental Documents package includes excerpts from the NERC assessment.

Europe electricity prices

Energy Transition – Europe electricity prices >2x YTD, Poland isn't due to coal %

High electricity prices continue to be the big energy story in Europe and the hope for the winter is warm weather and the wind blows. On Thursday, we tweeted [LINK] "*Most Europe power prices are >2x vs YTD. Big exception is Poland as #Coal supplies 42% of its energy mix. Thx @JavierBlas for highlighting the EnergyLive [LINK] data. #NatGas #OOTT."* Our tweet included the column of YTD prices and it jumped out at us that current prices are more than 2x YTD prices for almost all of the countries. Our tweet included BP data that reminds Poland has the largest, by far, coal share of total energy at 42% of its energy mix. We recommend bookmarking the EnergyLive [LINK] for a live by country electricity price look. Our Supplemental Documents package includes the BP energy mix by country data.

Figure 43: Latest European Power Markets datak day ahead prices for of Nov 19



Index	Value	Month-to-date	Year-to-date
AT_price	217.96 ↑3.3%	188.48	88.67
BE_price	207.00 ↓9.7%	185.65	86.25
BG_price	224.22 ↓11.4%	200.60	94.15
CH_price	242.02 ↓4.0%	206.06	93.83
CZ_price	133.31 ↓5.0%	161.04	84.53
DE-LU_price	131.63 ↓5.9%	160.79	81.33
ES_price	228.84 ↑0.8%	174.51	95.83
FR_price	243.74 ↑2.3%	192.71	88.18
GR_price	244.11 ↓11.7%	222.32	100.81
HR_price	240.97 ↓2.4%	201.13	97.21
HU_price	222.40 ↓11.8%	202.28	96.92
IT_PUN_price	243.49 ↓1.6%	209.11	106.10
NL_price	199.85 ↓4.5%	176.56	86.62
PL_price	89.05 ↓13.3%	107.67	76.53
PT_price	228.47 ↑1.5%	174.47	95.90
RO_price	225.40 ↓10.9%	202.91	96.02
RS_price	240.82 ↓9.7%	202.66	96.93
SI_price	240.97 ↓2.4%	200.89	97.54
SK_price	159.51 ↑13.6%	167.83	86.51

Data time zone : CET – Central European Time
Data updated : Thu Nov 18 2021 05:26:08 GMT-0700 (Mountain Standard Time)
Sources : HENEX (GR_price), GME (IT_PUN_price), IBEX (BG_price), OPCOM (RO_price), HUPX (HU_price), EPEX SPOT (SK_price,CZ_price,FR_price,CH_price,AT_price,DE-LU_price,BE_price,NL_price,PL_price), SEEPEX (RS_price), CROPEX (HR_price), BSP SOUTHPOOL (SI_price), OMIE (ES_price,PT_price)

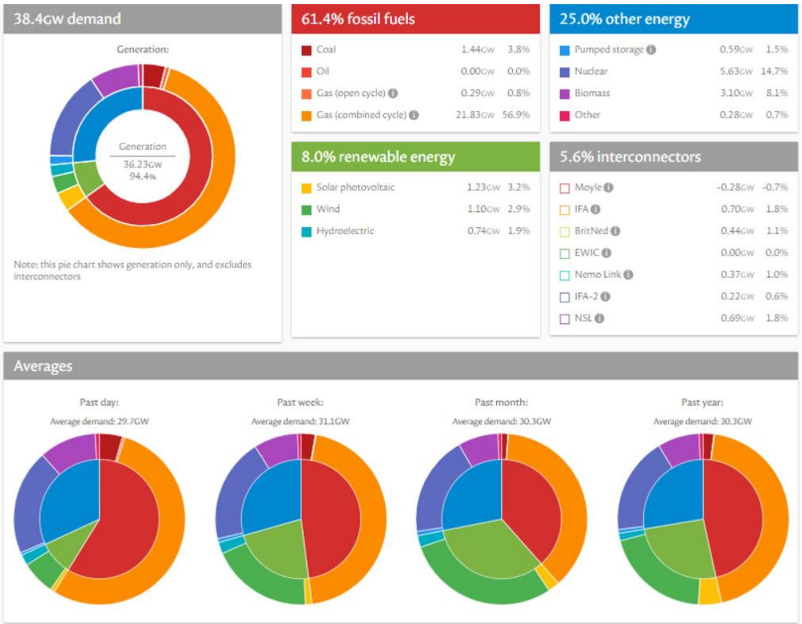
Source: EnergyLive

Energy Transition – Reminder that low wind is the driver for UK power price spikes

Vortexa floating storage

We don't care where anyone is on the scale of the energy transition, but everyone has to admit that the critical item for electricity prices in countries like the UK is wind speed for wind power. On Monday, we tweeted on the Bloomberg report that UK power prices had soared to the 2nd highest level on record driven by low wind. We tweeted [LINK] "*UK #PowerPrices soared to 2nd highest level on record today as low wind levels exposed the market to a supply crunch report @JesperStarn @rachelmorison. Wind currently 2.9% of grid vs 27% past mth & 18% past yr. #NatGas stepping in to save the day. #OOTT.*" Our tweet included the UK Met Office wind speed map in miles per hour and it was no question a low wind day. The link is at [LINK]. Our tweet also included the live UK National Grid power supply graphs, which, at that time, note that wind was only providing 2.9% of the UK electricity grid right now vs 27% over past month and 18% over past year , Link to live UK National Grid power supply [LINK]. Our Supplemental Documents package includes the Met Office wind map and UK National Grid then live electricity mix.

Figure 44:UK National Grid Electricity by Type



Source: UK National Grid

Energy Transition – Adnoc CEO "*the world has sleepwalked into a supply crunch*"

Adnoc CEO on why an oil supply crunch

There was a classic line from Abu Dhabi state owned Adnoc CEO Sultan al-Jaber this week from the big ADIPEC conference. Argus reported "*If we are to successfully transition to the energy system of tomorrow, we cannot simply unplug from the energy system of today. We cannot just flip a switch," he said. "While the world has agreed to accelerate the energy transition, it is still heavily reliant on oil and gas. As economies bounce back from the Covid-19 pandemic at the fastest rate in 50 years, demand has outpaced supply and after almost a decade of underinvestment in our industry the world has sleepwalked into a supply crunch. It is time to wake up*." We have to give him credit for some restraint by not specifying that it was the world other than the oil and gas sector. The oil and gas sector, in particular Saudi Arabia, Exxon and others have warned on the reality of declines and the need to invest to replace reserves and productivity capacity.The other reality check was his view on needed capex. Argus reported al-Jaber said that the global oil and gas industry needs to invest more than $600 billion per year for the rest of this decade to meet expected demand growth.Our Supplemental Documents package includes the Argus report. [LINK]

Energy Transition – Leaders are messaging the energy transition plan isn't working

Macron turns realistic on Energy Transition

We can't stress enough that a clear indicator that the energy transition plan isn't working is just by watching how Net Zero leaders are changing their messaging on the energy transition. Long term readers/investor friends will remind of their view that the energy transition is working and it is important to not just pay attention to what OPEC, Exxon, etc say. We agree with the latter part and then remind that the comments we note the most are the comments from the Net Zero leaders. We believe the cold water in the face moment comes when you see these leaders change their tune. And they are changing their tune. They aren't changing their tune on the energy transition is happening. But their comments fit our long stated view that the energy transition is happening, it will just take longer, be a bumpy road and cost more. The leaders know this, albeit late, and now want to be on the record that they knew this and told their constituents. There are two camps of these messages. (i) It's not working and the reality that the plan needs to change. The most vocal is Macron who warns the energy transition aspiration has to be modified/reduced or else there will be years of an energy crisis. And, even more importantly, he wants to bring a more pragmatic Energy Transition plan to the EU. On Nov 9, we tweeted [LINK] on Macro's address to the nation [LINK] that closed with his call for a more practical approach to the CO2 emissions and one that will include Europe. Macron said "*But France will not be strong alone. With the European Union:* ➜ *We will be able to build a credible strategy for reducing our CO2 emissions, compatible with our industrial and technological sovereignty."* The Macron release had at the bottom a reminder "*Next January, it is a new model of investment and growth that the President will defend with the French presidency of the Council of the European Union."* The day before COP26 started, we tweeted [LINK] on Macron's comments to the FT [LINK] that was a clear view on higher fossil fuel prices for the foreseeable future. Macron said "on demand for fossil fuels isn't going away for the foreseeable future. Macron said "*What is happening now is ironic, because we are building a system where in the medium and long term fossil energy will cost more and more, that's what we want [to fight climate change]."* he said." Japan is another calling for a pragmatic time frame ie a change in the plan. On Nov 9, we tweeted [LINK] on Japan's release [LINK] on its conference with IEA Executive Director Faith Birol. Japan wrote "*The two sides also exchanged views on acceleration of decarbonization efforts following COP26, and shared the importance on measures with pragmatic time frame based on individual circumstances that each countries face including its renewable energy potentials".* (ii) Others just want to be able to say they warned people it would be expensive for years to come. The US is the best example. On Nov 8, we tweeted [LINK] on Energy Secretary Granholm's MSNBC Morning Joe comments. Biden never warned votes that the energy transition will happen but will lead to higher prices on oil, natural gas and electricity for years to come.   We created a transcript of her saying "*So the long term strategy is that. and yes we have a short term cost issue because the economy is still coming back on . we have a supply, demand that does not, the supply doesn't meet the demand. that is an issue we are going through. The president is all over this both in the short term and in the long term*."

Energy Transition– TerraPower selects site for advanced reactor demonstration plant

TerraPower announces new plant

TerraPower continues to move ahead on its advanced nuclear reactor demonstration project. Our June 6, 2021 Energy Tidbits highlighted the big news that week that Terrapower (the Bill Gates backed venture) is working towards the first small scale nuclear reactor demonstration project in Wyoming. We believe this is significant to be moving to a demonstration project and not just talking about the theory. At that time, Wyoming Governor Mark Gordon said the demonstration project would be on a still to be disclosed retiring coal plant. The Terrapower project will reportedly feature a 345 megawatt sodium-cooled fast reactor with molten salt-based energy storage that could boost the system's power output to 500 MW during peak power demand. There was no formal cost estimate but prior estimates are for a cost of approx. $1 billion. This week, on Tuesday, TerraPower announced Kemmerer Wyoming as their preferred site to replace a retiring coal generation site with a new advanced Natrium Power Plant [LINK]. The advanced reactor demonstration project is supported by the DOE and the company selected the location near the Naughton Power Plant, following an extensive evaluation process and meetings with community members. The Natrium Project's preferred siting is subject to change pending the finalization of definitive agreements on the site, and applicable permitting, licensing and support. The plant is expected to submit the projects construction permit by mid-2023 and the plant is expected to be operational within the next seven years, aligning with a schedule set by Congress. TerraPower's CEO commented "*People across Wyoming welcomed us into their communities over the past several months, and we are excited to work with PacifiCorp to build the first Natrium plant in Kemmerer. Our innovative technology will help ensure the continued production of reliable electricity while also transitioning our energy system and creating new, good-paying jobs in Wyoming.*" The project is expected to employ 2,000 construction workers and employ 250 full time workers once the plant becomes operational. Our Supplemental Documents package includes the TerraPower press release.

For the past 20 yrs, we have been big believers mini-nukes were inevitable

One of the big future energy themes to emerge at COP26 was that mini-nukes for power generation would be needed for the Energy Transition. Long term readers know that we have been big believers in mini-nukes or small scale nuclear reactors since the early 2000's when we first wondered about the potential to fuel oil sands. Its not just Terrapower, its clear that many world leaders came out of COP26 with a a new priority on min-nukes.

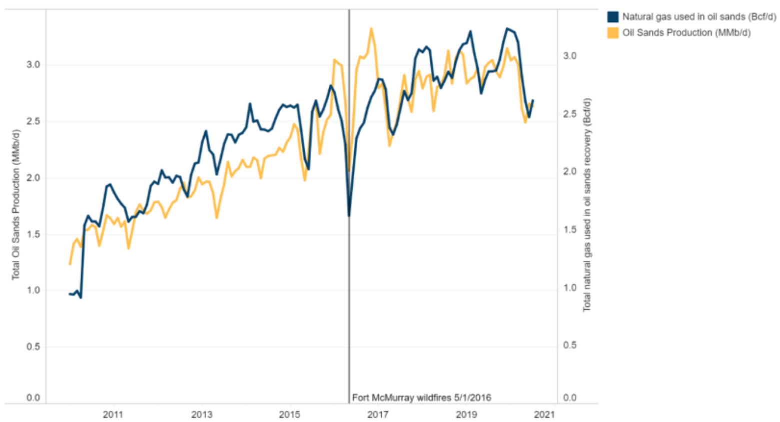
We still think mini-nukes make sense for oil sands to reduce emissions.

Last month, there were a number of reports on the investigation to use geothermal generation to be a Net Zero friendly source of power for oil sands mines. We didn't even bother writing on that (we probably should have) as we have trouble believing that would get more traction than mini-nukes. Our Feb 28, 2021 Energy Tidbits asked the question if emissions targets will push oil sands to use mini nukes. In that memo, we noted our Feb 26, 2021 tweet [LINK] that noted the Daily Oil Bulletin story "*Suncor Eyeing Small Modular Nuclear Reactors In Oilsands Extraction*" [LINK] that reported Suncor *" would be "super interested" in a nuclear reactor technology that could replace the energy intensive natural gas fired boilers and steam generators in its oilsands extraction, a company executive said Wednesday. "The place where small modular reactors really, really shine is in heavy industry providing a very high temperature heat that can be used in various ways, including the extraction of oil and gas," he said. This offers the potential to create a less carbon intensive and increasingly competitive product in Alberta and in the Alberta oilsands."* Our other Friday tweet [LINK] on the DOB report linked to some of our prior reporting on mini nukes for the oil sands. We also noted one item that wasn't in the DOB reporting – the advantage that mini nukes can be buried deep underground. Our only surprise is that it has taken this long for the major oil sands players to come out publicly in favor of mini nukes. They have had this in their potential playbook for almost 20 years. Long term Energy Tidbits readers might remember we first started writing on using mini-nukes to power the oil sands in the early 2000's when the former Cameco CFO told me this was something they were trying to get people up in Fort McMurray to do to power the oil sands for electricity to run upgraders and to power steam generation at SAGD projecs. There was some interest, but there was more fear on nuclear at that time. It looks like those fears are gone, or at least rank below the fear that aggressive new emissions reductions targets will impact future reserve life of oil sands unless the oil sands operators take a more aggressive emissions reductions action plan. We expect to see mini nukes be part of the formal messaging of oil sands players in the coming months.

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

We have not updated the below data. But we have previously warned that the oil sands moving to mini nukes is a potential long term (>2030) negative to natural gas. The reason is that oil sands is one of the major consumers of western Canadian natural gas. CER's Sept 9, 2020 blog "*Market Snapshot: Oil sands use of natural gas for production decreases considerably in early 2020"* [LINK] highlighted how the Covid production shut ins reduced oil sands use of natural gas. But its below graph also highlighted that oil sands were using >3 bcf/d of natural gas prior to Covid.

Figure 45: Natural Gas Used in Recovery of Oil Sands & Total Oil Sands Production



Source: CER, AER

Capital Markets – Our SAF Group CEO named to Top 40 Under 40 Cdn leaders list

Canada's Top 40 under 40 Leaders

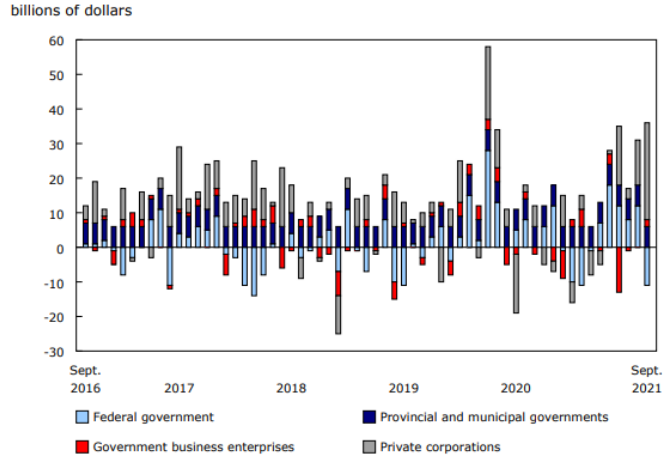
Our Energy Tidbits memos very seldom write anything about our SAF Group, but it was exciting news within our firm when Caldwell Partners and PwC announced the 2021 Canada's Top 40 Under 40 Honourees [LINK] that included SAF Group CEO and founder, Ryan Dunfield. There are many great things about SAF Group, but one of the things that jumps out is how we describe the firm on or website "*Proudly Canadian Alternative Investment Management Firm With A Global Presence*". Being "proudly Canadian" is a wonderful thing to see when you think of our firm. We don't issue press releases so stay under the radar, but we have allocated over $3.0 billion in 40+ completed transaction in a range of sectors and not just within Canada. But anyone who knows SAF Group knows that it's not just the success of the firm, its the brand and what the brand stands for is what sets us apart. I had the good fortune to be with the old Griffiths McBurney & Partners/GMP Securities in their heyday and I see one key common denominator – Ryan and COO Aaron Bunting have built a team of bright young talent in their 20s & 30s. As successful as our firm have been, all of these people are just going into their peak years including Ryan and Aaron.

Capital Markets – Canadian investors acquire $15.2 bn in foreign securities

International transactions in Cdn securities

Statistics Canada released Canada's international transactions in securities for September 2021 on Thursday [LINK]. Foreign investors acquired $20.0 bn of Canadian securities in September with corporate debt securities leading purchases. This marks the largest investment since April 2020 when a record investment was incurred at the outset of Covid. Non-residents added $16.6 bn of Canadian debt securities to their portfolios in September. Non-resident investors acquired $14.0 billion of Canadian government debt securities in September, a sixth consecutive month of investment for a total of $90.2 billion. Over the month, foreign investors purchased $3.5 bn of Canadian equity securities following a $668 million divestment in August. Long term interest rates continued their upward trend this month. Canadian investors acquired $17.2 bn of foreign securities in September, up from $15.2 bn in August. The investment activity was split almost evenly between foreign bonds and equities. The report stated, "*The investment in September mainly targeted foreign shares. Canadian investors added $13.2 billion of US shares to their holdings in the month, following an investment of $9.5 billion in August. Investment activity focused on shares of large capitalization technology firms. US share prices, as measured by the Standard and Poor's 500 composite index, decreased by 4.8%, a first decline since January. In addition, Canadian investors purchased $3.4 bn of non- US foreign shares in the month.*" Below is a graph illustrating foreign investment in Canadian debt securities.

Figure 46: Foreign Investment in Canadian debt securities



Source: Statistics Canada

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

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 and often comment on sports.

Home field advantage helped Canada beat Mexico

It was a great Canada/Mexico match on Tuesday in the World Cup Qualifying CONCACAF group and not just because Canada won 2-1. We have to give credit both sides for playing in a match that started off at -8c (before the wind chill was added) in Edmonton. Both sides were troopers to play in those conditions. It was interesting to see some of the Canadians with only their normal shorts and short sleeves. Kind of reminded of the big offensive lineman playing in the snow in the CFL or NFL with only short sleeves. We were a little surprised the Mexicans didn't arrive until Monday so didn't have a chance to train in the cold. Mexico didn't tie it up until the xx min mark, had some good chances to tie but Cdn keeper Milan Borjan made some huge saves in stoppage time to protect the win. We weren't alone in thinking the referee made a number of questionable calls on the Canadians and seemed to turn a blind eye to clear fouls made directly in front of him. But Canada is now top of the group with 16 points, followed by US with 15 points and Mexico at 14 points.

Not the first time 3 QBs on an NFL team threw picks in the same game

The NFL Thursday night game between the Falcons and Patriots was one of the few prime time games that didn't keep you glued to your seat. The Falcons had their 3 quarterbacks all throw picks in the game – starter Matt Ryan, he was pulled late with the game out of hand, then his backup Josh Rosen threw a pick on his first pass, and finally third stringer Feleipe Franks threw a pick on his first and only NFL pass so far. The broadcasters were quick to note the last time that happened was in 2000 when the then San Diego Charges had 3 quarterbacks (Ryan Leaf, Jim Harbaugh and Moses Moreno) throw picks in the same game.

Even golfers have to believe this is a bad look for their homes

The downside of connectivity is that you look for a golf tip video and then you get golf related ads especially now that we are moving into the gift shopping Xmas peak. Normally, you just ignore these ads/promotions, but every now and then one strikes you as wondering who would buy these? Or in this case, who would think an area rug with the course layout of Augusta National would look good in their home? [LINK] Or maybe this is in the gift section because its what a non-golfer would think a golfer would want in their home? If that's the case, a better suggestion would be a dozen Titleist Pro VI golf balls.

Figure 47: Limited Edition Rug Christmas Gift

Source: WorkArtIdea

Be a good week to be in Montreal if you can't be in Europe

Anyone who has traveled to the Europe that it is the place for the best sardines. And what is great is that you can get great sardines in the cheapest restaurants and also the more expensive. But if you can't be in Europe, the place to be is in Montreal to Ferreira Café on Peel by de Maisonneuve. I haven't been for several years but probably dined there a dozen times. The sardines were amazing, fresh caught that morning in Europe. It was a client favorite in the 2000's and who were we to argue with the clients.