

# Energy Tidbits

Jan 16, 2022

Produced by: Dan Tsubouchi

## Vitol's Mike Muller's Oil Outlook – “So We Are Pushing Towards This Triple Top of the Market and Possibly New Highs”

**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. Bullish oil comments from Vitol's Mike Muller including “so we are pushing towards this triple top of the market and possibly new highs”. ([Click Here](#))
2. Have the US and Iran both backed off their early big demand for JCPOA? ([Click Here](#))
3. IEA's Faith Birol clearly points to higher oil demand forecasts in Wednesday's Oil Market Report ([Click Here](#))
4. More Asian LNG buyers move to lock up long term supply thru 2030 ([Click Here](#))
5. Liberals message to the world doesn't even acknowledge oil sands companies have a pathway to Net Zero ([Click Here](#))
6. Please follow us on Twitter at [\[LINK\]](#) for breaking news that ultimately ends up in the weekly Energy Tidbits memo that doesn't get posted until Sunday noon MT.
7. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [\[LINK\]](#).

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**Natural Gas – Natural gas draw of 179 bcf, storage now -199 bcf YoY deficit**

Gas draws increased this week after record temperatures in December and a smaller draw last week. The reality is that if we didn't have increasing US LNG exports, US gas storage would be a lot worse. The EIA reported a 179 bcf draw (vs 178 bcf draw expectations) for the Jan 7 week, which was massively below the 5-yr average draw of 167 bcf, and last year's draw of 134 bcf. Storage is 3.016 tcf as of Jan 7, decreasing the YoY deficit to -199 bcf, from 154 bcf last week and storage is 99 bcf above the 5-year average vs 96 bcf above last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [\[LINK\]](#).

**YoY storage at -199 bcf YoY deficit**

Figure 1: US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	01/07/22	12/31/21	net change	implied flow	Year ago (01/07/21)		5-year average (2017-21)	
					Bcf	% change	Bcf	% change
East	730	767	-37	-37	732	-0.3	688	6.1
Midwest	835	893	-58	-58	885	-5.6	823	1.5
Mountain	159	172	-13	-13	189	-15.9	168	-5.4
Pacific	204	219	-15	-15	279	-26.9	246	-17.1
South Central	1,088	1,143	-55	-55	1,131	-3.8	1,019	6.8
Salt	330	347	-17	-17	328	0.6	302	9.3
Nonsalt	759	796	-37	-37	803	-5.5	717	5.9
Total	3,016	3,195	-179	-179	3,215	-6.2	2,944	2.4

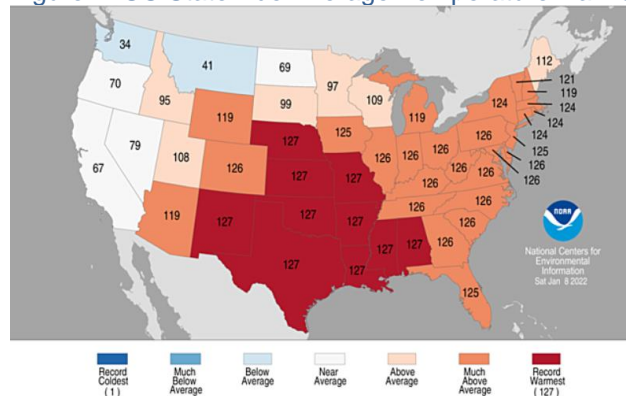
Source: EIA

**Natural Gas – it was the hottest December in the last 127 years**

It was a negative start to winter natural gas withdraw season. NOAA posted its recap of December 2021 weather [\[LINK\]](#), which was the hottest in the last 127 years. We tweeted [\[LINK\]](#) "Hottest Dec on record. Pre #LNG days, record warmth in 1 of 3 key winter demand months would have crashed HH #NatGas prices. But with US LNG exports currently #1 and ~11 bcf/d (~4 tcf/yr), HH is still above \$4. #OOTT". In the old days, HH would probably be \$2 with record hot Dec, but luckily there is LNG. The average temperatures across all lower 48 states was 39.3 degrees F, 6.7 degrees F above the 20<sup>th</sup> century average for December. Below is a graphic depicting the state average temperature ranks.

**Record December temperatures**

Figure 2: US Statewide Average Temperature Ranks December 2021



Source: NOAA

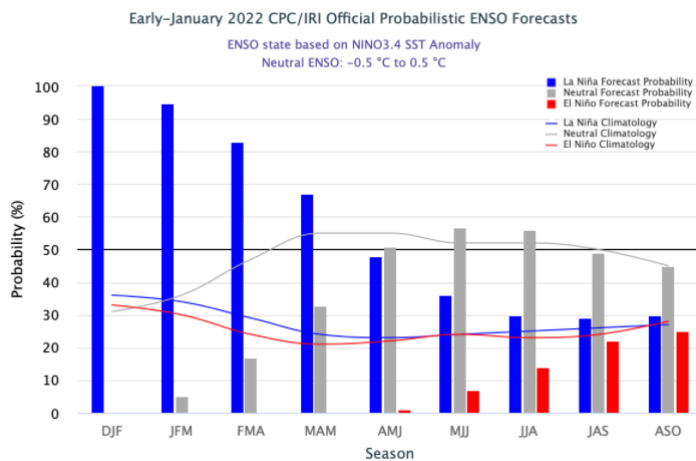
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**Natural Gas – 95% La Nina probability JFM, focus to now turn to summer outlook**

The CPC/IRI released its updated monthly El Nino/La Nina outlook is issued on the 2nd Thurs of every month [\[LINK\]](#). No real change vs last month’s forecast that confirms it’s a La Nina winter with DJF at 100% probability and JFM at 95%. Again, its not 100%, but coming into the winter, most associate La Nina winter with a normal or colder than normal US winter. As we have seen so far, it has been a cold start to winter. Focus on El Nino forecasts will now move to the summer. The new El Nino updates on the potential transition to ENSO-neutral conditions. The new forecast for ASO is 30% La Nina, 45% Neutral and only 25% for El Nino conditions. ASO is the peak period for Atlantic hurricane season. Again, weather is never 100% the same, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Below is the CPC/IRI official ENSO forecast.

**La Nina/El Nino focus to turn to summer**

Figure 3: Early-January NOAA El Nino/La Nina Outlook



Source: CPC/IRI

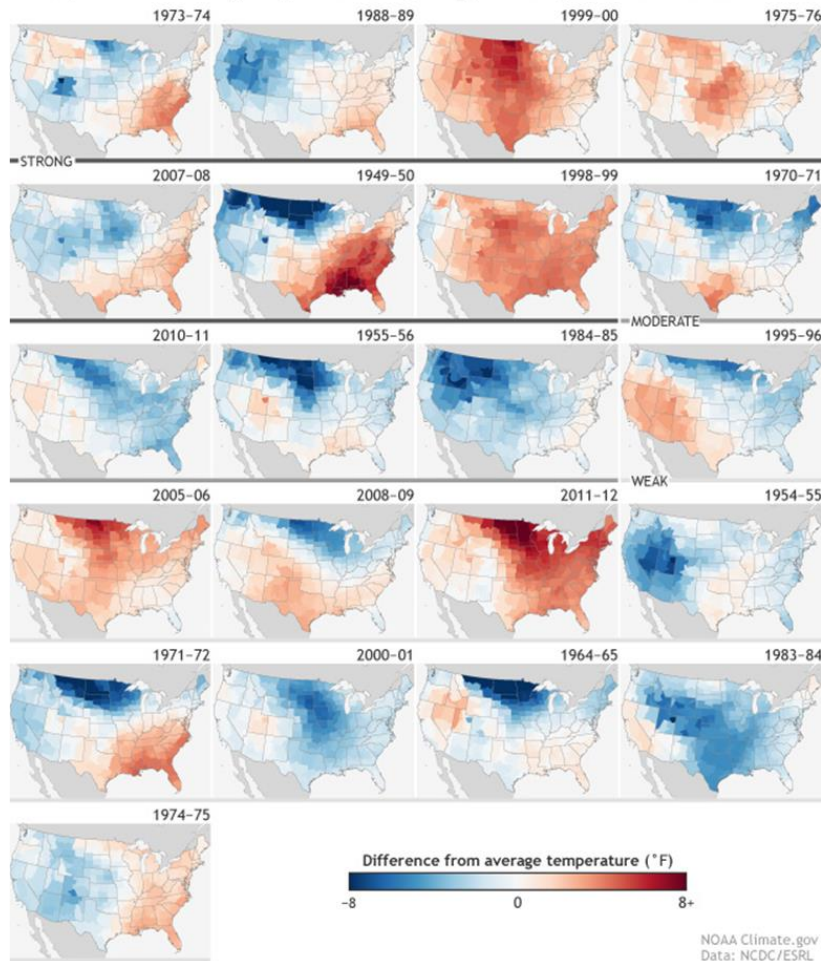
**Natural Gas – But La Nina correlations to cold winters are far from 100%**

As we are seeing so far this winter, La Nina conditions are not leading to a colder than normal winter. The US just finished an all time record hot December. While La Nina winters are more often normal to colder than normal than a warmer winter, it is far from a 100% correlation. 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. However, La Nina winters are far from 100% correlated to a cold winter. 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.

**La Nina winters are unpredictable**

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Figure 4: Winter (Dec-Feb) Temp in Strong, Moderate And Weak La Ninas 1950 - 2017  
 Winter (December-February) temperature during strong, moderate, and weak La Niñas since 1950



Source: CPC

**Natural Gas – EIA forecasts US gas production growth in 2022**

No surprise that, with continued stronger than expected natural gas prices, the EIA increased its US natural gas production forecasts for 2021. However, what is different from prior years is that the increase isn't from associated natural gas from oil plays but from dry gas plays. The EIA released its monthly Short Term Energy Outlook January 2022 [\[LINK\]](#), the EIA revised up both its 2021 and 2022 forecast for US natural gas production. (i) The EIA forecast shows US natural gas above the Q4/19 peak of 96.58 bcf/d, with Q4/22 US natural gas of 96.69 bcf/d (up 0.11 bcf/d from peak). (ii) For 2021, the EIA made downward revisions to Q3 and upward revisions to both Q2 and Q4. 2021 US natural gas production is forecast to average 93.49 bcf/d (up from 93.32 bcf/d previously). (iv) US natural gas production is expected to average 96.04 bcf/d in 2022 (95.97 bcf/d previously) and 2022 is up 2.55 bcf/d YoY. 2023 production estimates were released and see Q1/23 production entering at 96.71

**U.S. gas production +2.55 bcf/d in 2022**

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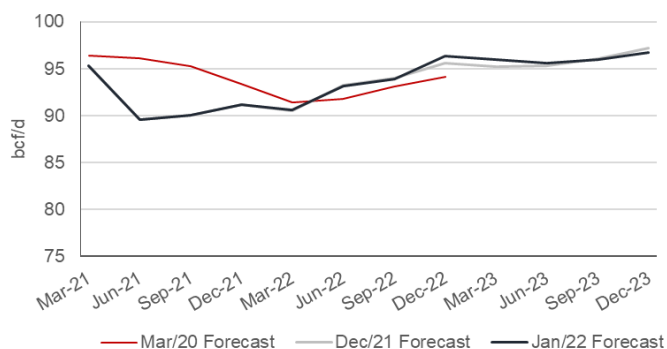
bcf/d and exiting in Q4/23 at 98.75 bcf/d for a 2023 average of 97.55 bcf/d. (v) The EIA wrote “U.S. dry natural gas production averaged 93.5 Bcf/d in 2021, up 2.0 Bcf/d from 2020. Natural gas production in the forecast averages 96.0 Bcf/d for all of 2022 and then rises to 97.6 Bcf/d in 2023.” Our Supplemental Documents package includes excerpts from the EIA STEO.

Figure 5: EIA STEO US Natural Gas Supply Forecasts by Forecast Month

bcf/d	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Jan-2022	95.29	89.59	89.99	91.14	91.50	90.59	93.15	93.89	96.33	93.49	95.94	95.55	95.96	96.69	96.04	96.71	97.13	97.89	98.45	97.55
Dec 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.01	95.59	93.32	95.22	95.35	96.1	97.21	95.97					
Nov 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.52	94.94	93.29	95.41	96.00	97.12	98.18	96.68					
Oct 2021	95.29	89.57	89.99	91.14	91.50	90.30	92.89	93.32	93.65	92.54	94.38	95.41	97.12	98.69	96.40					
Sept 2021	94.80	89.68	89.83	91.15	91.36	90.30	93.05	92.64	92.70	92.18	93.17	94.54	96.25	97.59	95.40					
Aug 2021	94.79	89.68	89.83	91.15	91.35	90.29	92.49	92.67	93.11	92.15	93.34	94.15	95.51	96.47	94.88					
July 2021	94.79	89.68	89.83	91.15	91.35	90.31	92.88	93.17	93.80	92.55	93.65	94.10	95.16	95.82	94.69					
June 2021	94.79	89.68	89.83	91.15	91.35	90.53	92.26	92.63	93.26	92.18	93.13	93.48	94.31	94.81	93.93					
May 2021	94.79	89.68	89.83	91.15	91.35	90.09	90.75	91.34	92.03	91.06	91.97	92.54	93.60	94.36	93.12					
Apr 2021	94.79	89.68	89.83	91.18	91.36	90.82	90.90	91.59	92.31	91.41	92.23	92.75	93.76	94.39	93.29					
Mar 2021	94.79	89.68	89.82	91.08	91.34	90.50	91.04	91.71	92.13	91.35	91.87	92.25	93.28	93.90	92.83					
Feb 2021	94.79	89.68	89.82	90.89	91.29	90.88	90.17	90.40	90.54	90.50	89.95	90.18	91.41	92.26	90.96					
Jan 2021	94.79	89.67	89.87	88.73	90.76	87.48	87.54	88.54	89.11	88.17	88.54	88.86	90.17	91.02	89.66					
Dec 2020	94.79	89.67	89.72	89.36	90.88	87.65	87.25	88.13	88.61	87.91										
Nov 2020	94.85	89.73	90.14	89.29	90.99	87.50	87.10	88.16	88.86	87.91										

Source: EIA STEO

Figure 6: EIA STEO US Natural Gas Supply Forecasts By Forecast Month



Source: EIA STEO

**Natural Gas – EIA STEO forecasts Nov 1/22 storage to be flat YoY**

The EIA STEO also forecasts US gas storage. It’s forecast is a bit of mixed bag. (i) Winter 2021/22. US gas storage started winter 2021/22 at 3.644 tcf, which was down 283 bcf YoY. But the EIA now forecasts end of winter (March 31, 2022) at 1.822 tcf, which is +21 bcf YoY and ~8% higher than the 5-yr average. (ii) Summer 2022. The EIA forecasts start of winter 2022/23 storage at 3.668 tcf, which is +24 bcf YoY ie. the YoY surplus is expected unchanged from March 31, 2022. The start of 2022/23 winter forecast is +1.2% over the 5-year average. (iii) The EIA wrote “For the 2022 April–October storage injection season, injections in our forecast do not keep pace with the five-year average rate. The lower-than-average injections reflect demand growth in the industrial sector and rising demand for U.S. exports. We expect that inventories will reach 3,668 Bcf at the end of October 2022, which would be within 1% of the five-year average for the end of October and nearly identical to inventory at the end of October 2021.”

**EIA STEO storage forecast**

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Figure 7: EIA STEO forecast US gas storage

	US Working Natural Gas in Storage (billion cubic feet)					
	Storage Level	2016-2021				
		Low	High	Range	Average	Deviation
Mar 2016	2486.3	1184.9	2486.3	1301.4	1835.6	35.4%
Oct 2016	4012.7	3236.3	4012.7	776.4	3624.5	10.7%
Mar 2017	2062.5	1184.9	2486.3	1301.4	1835.6	12.4%
Oct 2017	3816.5	3236.3	4012.7	776.4	3624.5	5.3%
Mar 2018	1390.3	1184.9	2486.3	1301.4	1835.6	-24.3%
Oct 2018	3236.3	3236.3	4012.7	776.4	3624.5	-10.7%
Mar 2019	1184.9	1184.9	2486.3	1301.4	1835.6	-35.4%
Oct 2019	3762.0	3236.3	4012.7	776.4	3624.5	3.8%
Mar 2020	2029.4	1184.9	2486.3	1301.4	1835.6	10.6%
Oct 2020	3928.5	3236.3	4012.7	776.4	3624.5	8.4%
Mar 2021	1800.6	1184.9	2486.3	1301.4	1835.6	-1.9%
Oct 2021	3643.6	3236.3	4012.7	776.4	3624.5	0.5%
Mar 2022	1822.1	1184.9	2486.3	1301.4	1835.6	-0.7%
Oct 2022	3668.2	3236.3	4012.7	776.4	3624.5	1.2%

Source: EIA

### Natural Gas – A “Saskatchewan Screamer” sends snow/cold south to US

We have written about Alberta Clippers on how they bring a rapid rush of cold air in a southeastward trend. But we haven’t ever referenced a “Saskatchewan Screamer” weather event until this week. On Wednesday, we tweeted [LINK](#) “Winter storm watches have been issued from North Dakota through Iowa ahead of a type of snowstorm sometimes called a “Saskatchewan screamer”. On Tuesday, AccuWeather [LINK](#) posted the below map and wrote “A substantial snowstorm is poised to unload hefty accumulations over parts of the Plains and Midwest late this week and early this weekend, and it won’t stop there. AccuWeather forecasters warn that it will likely go on to bring snow and ice, leading to the potential for dangerous travel conditions, across parts of the Southeast -- including as far south as Atlanta, which hasn’t seen measurable snowfall in just about four years. The storm will be what meteorologists refer to as a “Saskatchewan screamer” rather than an “Alberta clipper,” AccuWeather Meteorologist Matt Benz explained. The storm is forecast to dive nearly due south from the Saskatchewan province of Canada, hence the nickname, instead of the more traditional starting point in Alberta, Canada. Storms that originate from western Canada tend to move fast and have limited moisture available. Sometimes, though, high-ratio snow can unfold where a mere few tenths of an inch of moisture can yield 6-12 inches of snow.

A “Saskatchewan Screamer”

Figure 8: AccuWeather’s Jan 11 Saskatchewan Screamer forecast



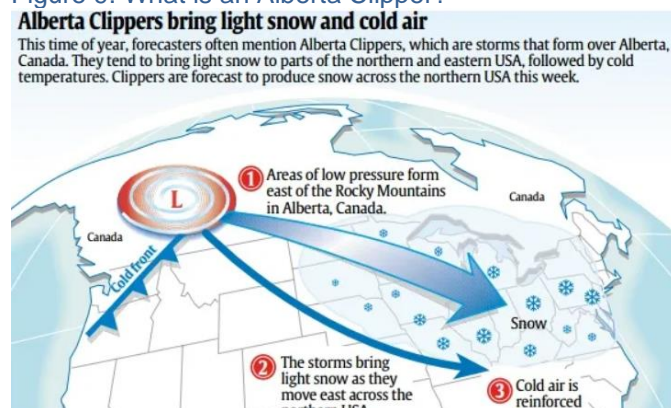
Source: AccuWeather

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### Typically more Alberta Clippers in La Nina winters

Our November 14, 2021 Energy Tidbits wrote on Alberta Clippers. We wrote “On Thursday, AccuWeather [\[LINK\]](#) reported Alberta Clipper to spread snow across the Midwest. AccuWeather wrote “Cold air will descend from Canada into the North Central states and bring another round of snowfall to the Dakotas, Minnesota and Great Lakes region this weekend,” said AccuWeather Meteorologist Alyssa Smithmyer. The storm system, known as an Alberta clipper, will move southeastward through North Dakota and into Minnesota on Saturday. To the north of where the clipper tracks, snow will fall, with a mix of rain and snow to the south. Most locations are expected to be above freezing, which will limit accumulation. However, cities such as Grand Forks and Fargo, North Dakota are likely to be near or below freezing, and 1-3 inches of snow could fall.” USA Today’s What is an Alberta Clipper? [\[LINK\]](#) writes “An Alberta Clipper is an area of low pressure that generally forms over the province of Alberta, Canada, east of the Rocky Mountains. They develop east of the Rockies because air flowing east over the mountains creates favorable conditions for these types of storms to develop. Once an Alberta Clipper forms, it usually moves very rapidly to the southeast across the USA’s northern Plains and then to the east off the mid-Atlantic coast.” As noted earlier, this is a La Nina winter and Alberta Clippers tend to occur more often in La Nina winters when the Jet Stream is pushed south across the Great Lakes.”

Figure 9: What is an Alberta Clipper?



Source: USA Today

### Natural Gas – RBN reminds on impact of start of LNG feedgas

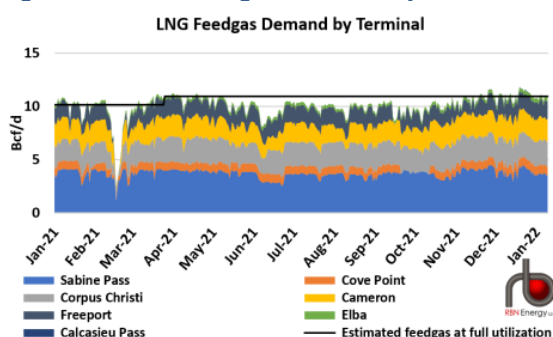
RBN posted another of their good recap blogs last Sunday “Higher And Higher - U.S. LNG Feedgas Demand Looks Primed To Build On Record Highs” [\[LINK\]](#). The blog highlights how increasing feedgas to US LNG export terminals has been the key to US natural gas price support. (i) The two feature LNG projects are the start up of Sabine Pass Train 6 and Calcasieu Pass LNG. (ii) In its lookback at 2021, RBN wrote “Much of the record feedgas demand has been from commissioning activity at Sabine Pass Train 6, which produced its first LNG in December and is on track to begin full service early this year. But beyond that, operators have been pushing the existing fleet of terminals to operate at peak levels and produce additional cargoes, likely for sale in the spot market or on short-term contract, an

**RBN on US LNG feedgas**

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extremely profitable endeavor given the prices in Europe, where most if not all destination-flexible cargoes have headed". (iii) Looking forward to 2022. RBN also expects to see US LNG export terminals going higher in 2022, and wrote "Deliveries to Sabine Pass will continue to climb, then stabilize, as Train 6 finishes commissioning and comes online, likely in the next few months. After that, feedgas demand will get another boost from Calcasieu Pass. Work on that new Louisiana terminal is slightly behind schedule, but it is progressing and will bring an additional 1.5 Bcf/d of feedgas demand by the end of the year. At that time, U.S. feedgas demand will be above 13 Bcf/d," Our Supplemental Documents package includes the RBN blog.

Figure 10: LNG feedgas demand by terminal



Source: RBN

### Sabine Pass Train 6 & Calcasieu Pass LNG feedgas are big to HH prices

The startup of feedgas at Sabine Pass Train 6 and Calcasieu Pass LNG is the major upside and downside protection support to US natural gas prices. We highlighted these in our July 25, 2021 Energy Tidbits, which was titled "Big Potential Upside to 2022 HH/AECO Prices, New US LNG Export Capacity Could Reduce Gas Storage By 1 Tcf in 2022". In July we wrote "Oil prices have been strong, but the bigger surprise to the upside in 2021 has been global LNG, HH and AECO gas prices. There was an excellent reminder from BloombergNEF's Monday US Gas Monthly, which is why we tweeted [\[LINK\]](#) that the takeaway therefrom is that there is big potential upside to 2022 and 2023 forward strips for HH (~\$3.40 for 2022 and ~\$2.90 for 2023) and AECO (~C\$3.10 for 2022 and ~C\$2.60 for 2023). BloombergNEF's forecast for US gas storage for Oct 31/2021 was 3.497 tcf (140 bcf lower YoY) is on the conservative side considering storage is currently 532 bcf lower YoY with expectations for strong US LNG exports in the summer/fall. But then BloombergNEF had a shock forecast for Oct 31/2022 for US gas storage to be 2.640 tcf. This is a hugely bullish storage number, basically at least 1 tcf less than normal and the last time Oct 31 storage was under 3 tcf was Oct 31/2000 when HH went over \$10 the winter 2000/2001. Even if storage is 3 tcf, its hugely bullish for HH and AECO gas prices. The key reason for this hugely bullish storage forecast is simple – BloombergNEF includes the start up of Calcasieu Pass LNG (1.3 bcf/d) and Sabine Pass LNG Train 6 (0.7 bcf/d) around year end 2021. This timing is consistent with Platts recent forecast [\[LINK\]](#). The assumption is that the global LNG markets will

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*absorb this additional LNG volumes of >700 bcf. We want to reiterate even if the global LNG markets don't absorb all the added LNG volumes and BloombergNEF's 2.64 tcf storage forecast isn't met, an Oct 31/2022 US storage forecast in the low 3 tcf's is very bullish to the forward strips of HH and AECO."*

### **Natural Gas – Drought/low hydro leads to record Petrobras LNG imports**

Drought conditions have hit hydro generation in Brazil and other south American countries and led to a record level of LNG imports in 2021 in Brazil. On Wednesday, Petrobras reported [LINK](#) they reached record LNG import levels in 2021. Petrobras purchased 2.2 mcf/d of LNG on October 10 with LNG representing around 30% of Petrobras total portfolio of natural gas supply. The statement noted *"The brand represents a volume around 200% higher than the amount acquired in 2020, of 7.5 million m<sup>3</sup>/day. Previously, the year with the highest volume of LNG imports was 2014, with 20 million m<sup>3</sup>/day. The 2021 record is the result of the initiatives adopted by the company to expand the supply of natural gas to the market, such as, for example, increasing the capacity of the regasification terminal in Rio de Janeiro."* Petrobras purchased imports from the US, Trinidad and Qatar. Our Supplemental Documents package includes the Petrobras press release.

**Record imports  
in 2021 for Brazil**

### **Natural Gas – More signs Mozambique still can't declare victory over terrorists**

The reason why we watch TotalEnergies force majeure on its Mozambique LNG is that it is the most important LNG supply event for 2022. But the story is the same this week, more reports out of Mozambique that make it hard for us to see how TotalEnergies could lift the force majeure in Q1/22. Recall Mozambique had hoped for this lifting by year-end 2021. This week, Bloomberg reported the SADC forces (Southern Africa Development Community soldiers) agreed to extend their military deployment to help put down the Islamic terrorist insurgency. The SADC along with Rwandan troops have been key to fighting the terrorists. The SADC had previously extended its troops from mid-Oct to mid-Jan. Bloomberg wrote *"The heads of state extended the mission's mandate "with associated budgetary implications" and will "continue to monitor the situation going forwards," according to a communique issued by the bloc after the meeting ended. It didn't say how long the latest extension would last, though Mozambique's state-owned Jornal Noticias reported it would be for another three months, citing Mozambican President Filipe Nyusi."* Extending the mandate for another three months. It fits with our report last week that terrorist attacks are continuing in Cabo Delgado province, albeit at a lesser rate. It seems like the big attacks aren't happening, which is a good thing. But the continuing attacks would fit why Mozambique President Nyusi is calling 2022 the decisive year in the fight against terrorism. And if they are still fighting, then its hard to see why TotalEnergies would feel this meets their security objectives for a lifting of the force majeure. Our Supplemental Documents package includes the Bloomberg report.

**Mozambique still  
fighting terrorists**

### **A 2022 restart would keep Mozambique LNG delays to 2 yrs behind original**

The TotalEnergies construction stoppage was a game changer to LNG markets because the delays to TotalEnergies Mozambique Phase 1 are more than just a delay to the 1.7 bcf/d Phase 1, its actually a delay of 5 bcf/d. This was the reason why, on April 28 2021, we posted a 7-pg blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* [LINK](#) We thought, and still think, there has been a major change to the outlook for LNG supply in the 2020s and one that is still being

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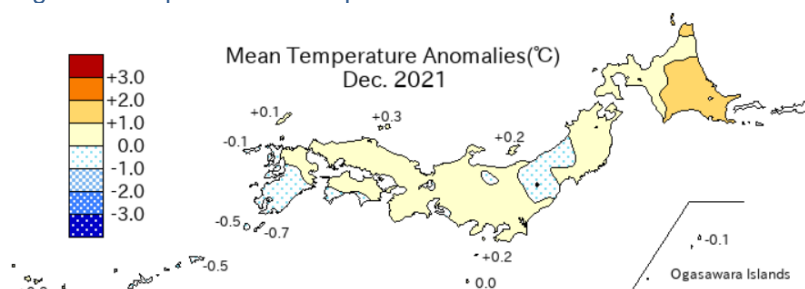
overlooked – there is a big new LNG supply gap starting around 2025 that is hitting faster and bigger than anyone expects. We saw Total's April 27, 2021 announcement of force majeure at its Mozambique Phase 1 LNG of 1.7 bcf/d was much more significant than viewed. We just didn't see market focused on the fact that this situation backs up an additional 3.3 bcf/d of LNG supply that is also being counted on in all LNG supply forecasts. Total's Phase 2 of 1.3 bcf/d was to follow, and Exxon's Rozuma Phase 1 of 2.0 bcf/d was originally expected to go FID in 2019 but is now not expected to have a FID decision until 2022 at the earliest. Mozambique is considered a premium LNG supply region for Asia and is in LNG supply forecasts. Total's original in service for Phase 1 is 2024. We had been warning that Mozambique has a major LNG market impact and its why we posted the April 28 blog. Our blog reminds that even if Total makes a restart development decision in 12 months, it will take months just to get back to where they left off including rehiring services so any return to where they were in the construction process is at least more likely 18 months at a minimum. This is going to create a bigger and sooner LNG supply gap and the reality is that the only projects that can step up in any reasonable time frame will be brownfield LNG projects. Its why we also said what about LNG Canada Phase 2. There is much more in the 7-pg blog. Our Supplemental Documents package includes our April blog.

### Natural Gas – It was a warm December in Japan

We have been noting the warm start to winter and how it has enabled Japan to have high LNG storage levels. Yesterday, the Japan Meteorological Agency posted its recap of December weather [\[LINK\]](#) and their mean temperature anomalies map (below) shows it was above average temperatures month in Japan. Their recap also noted how it got colder in late December “*Strong cold air inflow in late December resulted in heavy snowfall on the sea of Japan side of northern, eastern, and western Japan, and temperature fluctuations were significant over Japan.*”

**Warm December in Japan**

Figure 11: Japan Mean Temperature Anomalies December 2021



Source: Japan Meteorological Agency

### Natural Gas – Japan expects continued cold for Jan/Feb

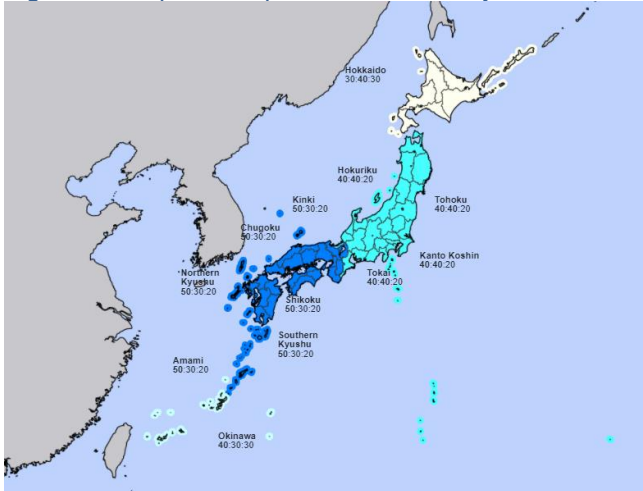
The colder weather in January was expected and looks like it will continue into February. The Japan Meteorological Agency posts its weekly temperature probability forecast for the next 4 weeks on Thursday mornings. [\[LINK\]](#). JMA forecasts that Japan will experience well below normal temperatures for the remainder of Jan and into early Feb. The northern regions of Japan are expected to have normal temperatures while the southern regions are expected to

**Japan below average temp next four weeks**

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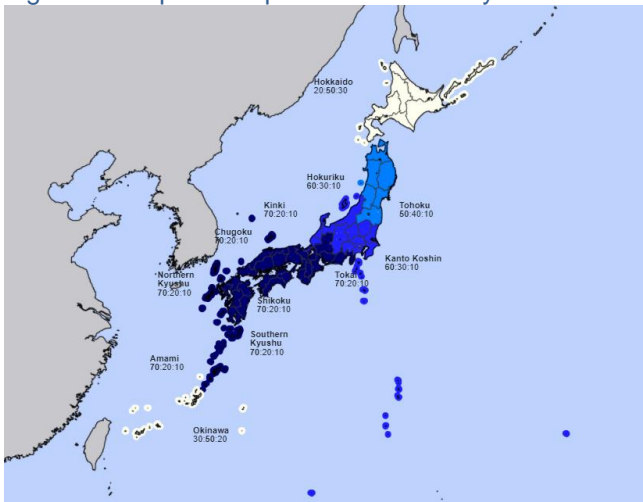
be colder especially in the next week. Below is the JMA forecast for the next four weeks of the forecast period (Jan 15 – Feb 14 and Jan 15 - Jan 1), which expects well below normal temperatures in the next week of January before warming slightly into February.

Figure 12: Japan Temperature Probability Forecast Jan 15 – Feb 14



Source: Japan Meteorological Agency

Figure 13: Japan Temperature Probability Forecast Jan 15 – Jan 21



Source: Japan Meteorological Agency

**Natural Gas – Japan’s LNG stocks remain high, down to 2.16 mm tons**

It's been a warm start to winter in Japan until late December, which has kept Japan LNG stocks at high levels. Japan METI data was released on Wednesday [\[LINK\]](#) and gave us insight into Japan’s LNG stocks. LNG stocks declined for the week ended Jan 9, from 2.34 mm tons the previous week, and are now at 2.16 mm tons (104 bcf); this is above last year’s

**Japan LNG stocks remain high**

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levels of 1.71 mm tons and 36% above the 5-year average of 1.67 mm tons. This much higher LNG storage is a positive, but we have to remember the absolute level of LNG storage is only about 10 days worth of LNG imports. Our Supplemental Documents package includes a Google Translate version of the METI update.

### **Natural Gas – More Asian buyer long term LNG deals, Two China deals with Novatek**

Since July 1, 2021, there have now been 17 deals of Asian LNG buyers locking up long term LNG supply past 2030. We continue to believe the best validation of a pending LNG supply gap in the 2020s is that more Asian LNG buyers are moving to lock up long term LNG supply thru the 2020s. On Tuesday, we tweeted [\[LINK\]](#) *“Two more Asian LNG Buyers now locked up 3.5 bcf/d long term LNG supply since 07/01, 16 & 17th Asian deals, China’s ENN 11 yr & Zhejiang 15 yr deals with #Novatek #ArcticLNG2 project. #LNG #NatGas looks good thru 2030s. See SAF Group 07/14 blog. #OOTT.”* Novatek issued two press releases on Tuesday indicating they have signed long term SPA agreements with China’s ENN and Zhejiang Energy. The ENN deal [\[LINK\]](#) stipulates the supply of 0.08 bcf/d over the 11 year duration of the contract. The LNG will be delivered on a DES basis to ENN’s Zhoushan LNG Receiving Terminal in China. The Zhejiang Energy deal [\[LINK\]](#) has a 15 year duration and is expected to deliver 0.13 bcf/d over the course of the contracts life; The LNG will be delivered on a DES basis to Zhejiang Energy’s LNG terminals in China. Novatek wrote in their release *“We have reached another milestone in successful marketing of NOVATEK’s share of LNG to be produced by our Arctic LNG 2 project,”* noted Leonid Mikhelson, NOVATEK’s Chairman of the Management Board. *“This is another LNG SPA for delivery to the Chinese market, which is in line with our LNG strategy to expand sales to the Asia-Pacific region with its growing demand for clean-burning natural gas.”* Our Supplemental Documents package includes both Novatek press releases.

**Two more Asian long term LNG deals**

### **Asian LNG buyers abruptly changed and moved to lock 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*

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*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.”* Below is our graphic noting recent Asian long-term LNG supply contracts. Our Supplemental Documents package includes our July blog.

### Updated list of new Asian LNG buyer long term contracts

We have now seen 17 deals since July 1, 2021 where Asian LNG buyers locked up long term LNG supply past 2030. Below is the updated table of Asian LNG buyer new long term supply deals since the end of June. This table was in our July 14 blog. Note the below table is for Asian LNG long term supply deals so it excludes a Poland 20 year supply deal, a France 11 year supply deal and JERA \$2.5b investment to buy 25.7% interest in the Freeport LNG supply. Our November 21, 2021 Energy Tidbits highlighted the JERA deal.

Figure 14: Long Term Asian LNG Supply Deals since July 1, 2021

Long-Term Asian LNG Buyer Deals Since July 1, 2021					
Date	Buyer	Seller	Country	Volume	Duration
			Buyer / Seller	(bcf/d)	Years
July 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0
July 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0
July 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0
July 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0
Sept 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0
Nov 4, 2021	Unipecc	Venture Global LNG	China / US	0.46	20.0
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0
Jan 11, 2022	ENN	Novatek	China/Russia	0.08	11.0
Jan 11, 2022	Zhejiang Energy	Novatek	China / US	0.13	15.0
<b>Total Asian LNG Buyers New Long Term Contracts Since Jul/21</b>				<b>3.50</b>	
*Excludes Asian short term/spot deals					
*Excludes non-Asian long term deals: Poland PGNiG 20-yr deal for 0.26 bcf/d w/ Venture Global					
*Excludes non-Asian long term deals: France Engie 11-yr deal for 0.16 bcf/d w/ Cheniere					
*on Dec 20, CNOOC also agreed to buy an additional 0.13 bcf/d from Venture Global for an undisclosed shorter period					
Source: Bloomberg, Company Reports					

Source: Bloomberg

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### Natural Gas – Beijing Gas rumored to buy 10 yr LNG supply at 12.7-12.9% slope

There is another good indicator of a tighter LNG market ahead – prices are going up on long term LNG deals. Please note that our above table of Asian LNG buyers on new long term LNG deals does not include the Bloomberg report of another Asian LNG buyer deal – Beijing Gas. If confirmed, it would be the 18<sup>th</sup> deal Asian LNG buyer long term deal since July 1. This deal is with an aggregator so not likely to see a press release from the seller and, as of our 7am MT news cut off, we have not seen any Beijing Gas confirmation. Bloomberg's Stephen Stapczynski had two reports (Tuesday and Wednesday) on this. On Tuesday, he wrote "*Beijing Gas signed an LNG deal with a portfolio supplier to purchase 1.5m tons/year for 2023-2032 delivery to China, according to traders with knowledge of the matter.*" This is equal to 0.2 bcf/d. Then on Wednesday, he provided more detail on price ie. that Beijing is paying a higher long term LNG price than deals done in early 2021. He wrote "*On Wednesday, China's Beijing Gas Group Co. recently signed a deal to buy LNG from a portfolio player at about 12.7% to 12.9% of the price of Brent crude. By comparison, Qatar was signing supply agreements to customers in Asia's largest economy in the low-10% range early last year.*" At Brent \$80, this would be a price of ~\$10.25, vs ~\$8.15. Our March 28, 2021 Energy Tidbits noted that week's Qatar deal with Sinopec that was reported done at a slope of 10.19.

**Beijing to buy 10 yr LNG supply**

### Explaining "slope" in LNG contracts

Our Sept 27, 2020 Energy Tidbits item noted above reference the slope of 10.19. Look at the slope very simply as a % of a reference oil price. Take whatever the reference price is and divide by the slope. The original Qatar and most other long term LNG supply deal were done at a slope of 16.7, or 1/6 the price of oil. Basically the energy equivalent of oil and natural gas. In our March 28, 2021 Energy Tidbits, we noted Qatar negotiated a lower slope with Sinopec, which was reported at 10.19. This week's rumored Beijing Gas deal is reported at 12.7% to 12.9%, which, at Brent \$80 is ~\$10.25, compared to a 10.19 slope of \$8.15.

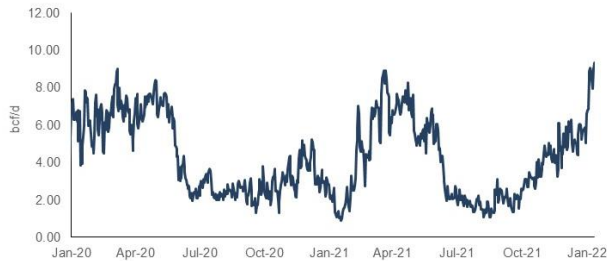
### Natural Gas – LNG flows to NW Europe up 0.97 bcf/d at 5.4 bcf/d from 4.53 bcf in Nov

LNG flows continue to move back to NW Europe in December and January. In the fall it was much more profitable to ship US LNG to North Asia due to strong Asia JKM prices (>\$14/mmBtu JKM vs ~\$12.50/mmBtu TTF) in September, though the TTF increased in December, trading at a premium to the JKM. For most of December the TTF traded at a premium to JKM, which began to attract more LNG tankers to Europe during the beginning of winter. Historically, LNG flows into Northwest Europe reached recent peaks at ~5 bcf/d in late November to early December, before declining rather quickly through December to mid January, where imports reached a low of 0.90 bcf/d on January 17. Since, LNG flows to Europe have been increased to peak to 8.92 bcf/d on March 22. Daily imports in April averaged 7.05 bcf/d, roughly flat to the March average of 7.08 bcf/d. In August, imports averaged 1.70 bcf/d. October averaged 3.18 bcf/d and November increased to 4.53. December LNG imports averaged 5.04 bcf/d. Roughly 2 weeks into Jan, imports are up significantly averaging around 8.27 bcf/d, approaching the March peak. European gas storage is at extremely low levels compared to seasonal averages, so LNG flows to Europe remains a key item to watch as we approach the heating season. Below is our graph of Net LNG Flows to NW Europe.

**LNG flows to NW Europe +0.97 bcf MoM**

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Figure 15: Net LNG Flows to NW Europe



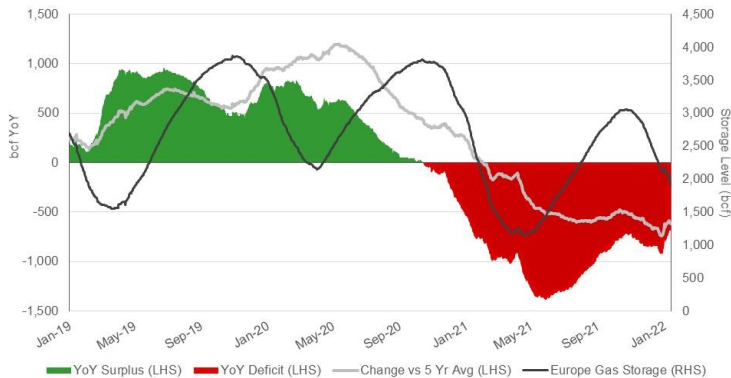
Source: Bloomberg

**Natural Gas – Europe storage still only 48.64% full vs last year of 64.96%**

The combination of a warm December and the massive increase in US LNG to Europe in January is having an impact on Europe gas storage. The YoY Europe storage gap has narrowed this week since the start of the winter natural gas season. Europe gas storage started down 18.52% YoY and is now down 15.08% as Europe has been experiencing warmer than normal temperatures in the past week. Draws to European gas storage units continued this week. It was a smaller draw due to the warmer weather and marked the ninth consecutive week of draws, indicating winter is underway. Europe inventories are at their lowest level at this time of the year in more than a decade. Europe gas storage started last winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr 1/21. Europe storage levels bottomed in late Apr at 29%, which was the lowest level since Apr 2018. This winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has widened since Nov 1. Despite the warm weather and US LNG, storage as of Jan 14 is still only at 48.64%, which is -15.73% less than last year levels of 64.37% and are -16.32% below the 5-year average of 64.96%. The set up for winter natural gas prices continues to support strong winter natural gas prices. Below is our graph of Europe Gas Storage Level.

Europe storage still only 48.64%

Figure 16: Europe Gas Storage Level



Source: Bloomberg

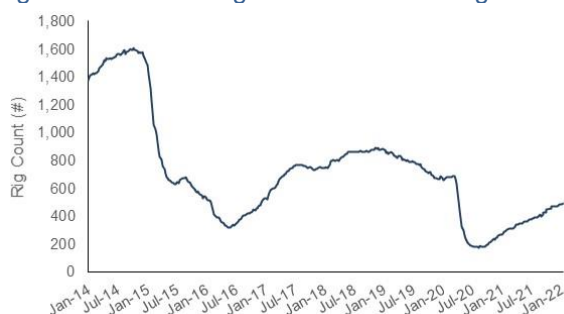
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### Oil – US oil rigs +9 WoW at 492 oil rigs at Jan 14

Baker Hughes released its weekly North American drilling activity data on Friday. It has not been the normal Xmas seasonal pattern for drilling rigs and frac spreads. But there is strong oil, NGLs and natural gas prices and industry is still just catching up in 2021 from an extremely low 2020 activity level. This week US oil rigs were up +9 WoW at 492 oil rigs. Oil rigs are +320 off the bottom of 172 in Aug14/2020 week. There were marginal basin changes this week; Permian was up +1 at 293 rigs this week while Bakken was flat at 27 rigs for the sixth consecutive week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 202 to 472 oil rigs (-28%). Below is our graph of US oil rigs since January 1, 2014.

**US oil rigs +9  
WoW**

Figure 17: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

### Oil – US frac spreads +10 to 254 for week ended Jan 14

Mark Rossano (C6 Capital Holdings) had his weekly US frac spread recap for week ended Jan 14 on the Primary Vision network. YouTube video at [\[LINK\]](#). For the week ended Jan 14, US frac spreads were +10 to 254. Increases were they were expected to be in the Appalachia, Permian, and another big jump in the western Gulf (we assume he means Eagle Ford). Seasonal drop really didn't come into the Permian, it was fairly flat in Nov & Dec, there was a little bit over Xmas/New Years, but that is back. Comparing the Permian to historical, its still at or above where it has been over the last 5 years. Overall, the big question is where is the next push going next. If look at horsepower, its being refurbished/rebuilt, there were some supply chain issues but those look to be caught up for the near term. The growth will be driven by Texas, New Mexico and Louisiana. Rossano still believes will get to the 270 spreads by next week or the week after. But then that next 25 or so, to get to 300 is going to be little bit slower, maybe the end of Feb but realistically the beginning of March. And then the push to 325 will depend on where physically are the spreads. ie. if there are 5 available in the Appalachia but zero in the Permian, will you spend the money to move the spreads.

**Frac spreads +10  
to 254**

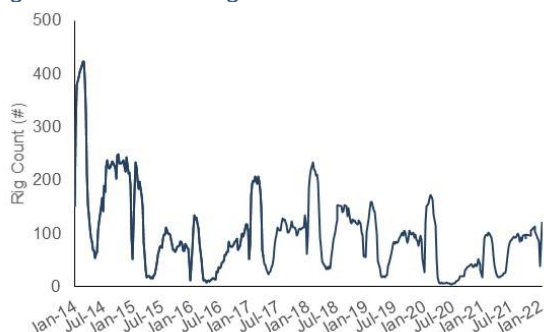
### Oil – Total Cdn rigs +50 to 191 total rigs, +30 rigs YoY

Cdn rigs have ramped up quickly after the holidays. Total Cdn rigs were up +50 this week to 191 total rigs. Cdn oil rigs were +43 at 121 rigs. Cdn gas rigs were up +7 to 70 gas rigs; no surprise as there is typically a large increase after the holidays. Total rigs are now +177 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 90 and Cdn gas rigs were 71 for a total Cdn rigs of 161, meaning total Cdn rigs are +30 YoY and total rigs are -18 vs 2019.

**Cdn rigs +50  
WoW**

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Figure 18: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

**Oil – US weekly oil production down 0.1 mmb/d at 11.7 mmb/d**

Weekly production in the US was down this week at 11.7 mmb/d for the week ended Jan 7. Lower 48 production drove total production and was down from last weeks level at 11.2 this week; US oil production is up YoY at +0.700 mmb/d and is still down significantly at -1.4 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. There is no explanation given for the small decrease in oil production but we expect the reason is the extreme cold weather in the Bakken. Absent weather impacts, we would expect US oil production to inch up a little higher in Q1/22.

**US oil production down WoW**

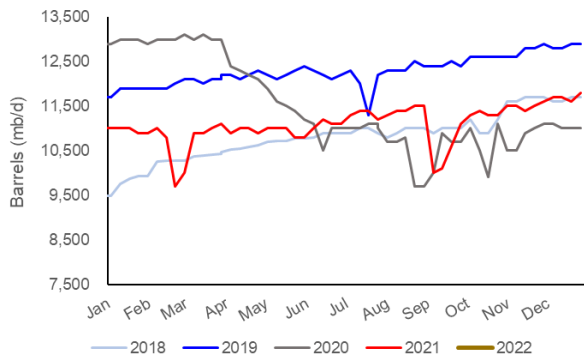
Figure 19: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2019-Jan	01/04	11,700	01/11	11,900	01/18	11,900	01/25	11,900		
2019-Feb	02/01	11,900	02/08	11,900	02/15	12,000	02/22	12,100		
2019-Mar	03/01	12,100	03/08	12,000	03/15	12,100	03/22	12,100	03/29	12,200
2019-Apr	04/05	12,200	04/12	12,100	04/19	12,200	04/26	12,300		
2019-May	05/03	12,200	05/10	12,100	05/17	12,200	05/24	12,300	05/31	12,400
2019-Jun	06/07	12,300	06/14	12,200	06/21	12,100	06/28	12,200		
2019-Jul	07/05	12,300	07/12	12,000	07/19	11,300	07/26	12,200		
2019-Aug	08/02	12,300	08/09	12,300	08/16	12,300	08/23	12,500	08/30	12,400
2019-Sep	09/06	12,400	09/13	12,400	09/20	12,500	09/27	12,400		
2019-Oct	10/04	12,600	10/11	12,600	10/18	12,600	10/25	12,600		
2019-Nov	11/01	12,600	11/08	12,800	11/15	12,800	11/22	12,900	11/29	12,900
2019-Dec	12/06	12,800	12/13	12,800	12/20	12,900	12/27	12,900		
2020-Jan	01/03	12,900	01/10	13,000	01/17	13,000	01/24	13,000	01/31	12,900
2020-Feb	02/07	13,000	02/14	13,000	02/21	13,000	02/28	13,100		
2020-Mar	03/06	13,000	03/13	13,100	03/20	13,000	03/27	13,000		
2020-Apr	04/03	12,400	04/10	12,300	04/17	12,200	04/24	12,100		
2020-May	05/01	11,900	05/08	11,600	05/15	11,500	05/22	11,400	05/29	11,200
2020-Jun	06/05	11,100	06/12	10,500	06/19	11,000	06/26	11,000		
2020-Jul	07/03	11,000	07/10	11,000	07/17	11,100	07/24	11,100	07/31	11,000
2020-Aug	08/07	10,700	08/14	10,700	08/21	10,800	08/28	9,700		
2020-Sep	09/04	10,000	09/11	10,900	09/18	10,700	09/25	10,700		
2020-Oct	10/02	11,000	10/09	10,500	10/16	9,900	10/23	11,100	10/30	10,500
2020-Nov	11/06	10,500	11/13	10,900	11/20	11,000	11/27	11,100		
2020-Dec	12/04	11,100	12/11	11,000	12/18	11,000	12/25	11,000		
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	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	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
2022-Jan	01/07	11,700								

Source: EIA

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Figure 20: US Weekly Oil Production

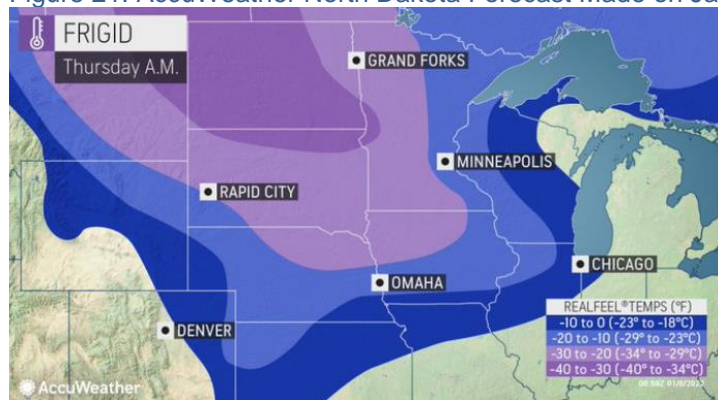


Source: EIA, SAF

**Its been very cold in the Bakken and weather delays were expected**

Last week’s (Jan 9, 2022) Energy Tidbits memo noted the cold weather in the Bakken and how we expected this to lead to production delays. Last week, we wrote “It’s been cold in western Canada and also in North Dakota over the past 10 days. On Thursday, AccuWeather tweeted [\[LINK\]](#) the below map with the caption “The AccuWeather RealFeel® Temperature plunged to 45 degrees below zero in Bismarck, North Dakota at 3 a.m. CST. Bitterly cold air will remain over the northern Plains and Upper Midwest through at least Thursday.” This is very cold. It’s why we tweeted a reminder [\[LINK\]](#) “#Bakken #Oil gets impacted when it’s this cold. Not just if any issue with existing wells but will slow down/delay new drilling/fracking a few days. #OOTT.” When it’s this cold, it raises safety issues. And why unless its critical issue, field operators may leave an item for a day or two. Plus when its this cold, completion crews may wait a day or two on a frack spread move. And similarly for a drilling rig move and set up.” It sounds like that warning will play out based on NDIC Lynn Helms’ comments on Friday afternoon as reported below by the Bismarck Tribune.

Figure 21: AccuWeather North Dakota Forecast Made on Jan 6



Source: AccuWeather

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### Oil – North Dakota November oil production up MoM with increased completions

North Dakota oil production had a slight increase in November driven by higher well completions. On Friday afternoon, the North Dakota Industrial Commission posted its Director's Cut, which includes November oil and natural gas production data [\[LINK\]](#). The headline on the Nov numbers was that North Dakota Nov oil production was 1.159 mmb/d, which was up 4.25% MoM from Oct 2021 production of 1.111 mmb/d. YoY production decreased -5.5% from November 2020 production of 1.227 mmb/d. The MoM increase was the largest the state has seen in over a year and was attributed to the increase in frac crews to 12 and 60 wells completed in November vs 41 in October. It isn't clear how cold weather will impact December production. The NDIC reports that well completions were up significantly in December to 81, up from 60 in Nov and 41 in Oct. In theory, more wells completed should mean higher oil production. But the NDIC Director, Lynn Helms, also flagged that December could be lower due to the cold weather. Our Supplemental Documents package includes excerpts from the Director's Cut.

### North Dakota oil production up MoM

Figure 22: 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%	1,114,020	-8.9%
Oct	1,043,693	1,183,810	1,392,369	1,517,936	1,231,048	-18.9%	1,111,910	-9.7%
Nov	1,034,484	1,194,920	1,375,803	1,519,037	1,227,138	-19.2%	1,159,778	-5.5%
Dec	942,322	1,182,836	1,402,741	1,476,777	1,191,429	-19.3%		

Source NDIC, NDPA

### North Dakota expects production decline in December amid frigid temps

It sounds like the cold weather in late December will impact December production levels. Every month, the NDIC has a press conference on the monthly report and there is reporting each month by the Bismarck Tribune and the Williston Herald. The Bismarck Tribune reported that North Dakota expects to see a return to see a slight decline in production amid cold December weather. They wrote "*North Dakota produced 1.16 million barrels per day of oil that month, a 4% increase from October. That's the most significant uptick in oil production the state has seen in over a year, Twelve frack crews operated in North Dakota during November, bringing online 60 new wells. Some were newly drilled and others had sat idle for a while after they were drilled. Bitterly cold temperatures hit the state in late December, however, and lasted until this past week. The below-freezing conditions have affected the rate at which natural gas can be produced and gathered in the oil fields. Oil companies do not want to wastefully flare off the gas at well sites because that could prompt the state to restrict their activities, so they are instead looking to scale back oil and gas production from wells where freezing is an issue, Helms said. That in turn could mean lower oil*

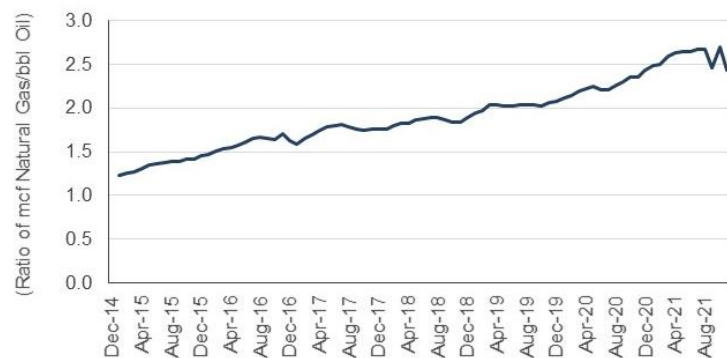
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production figures for December and early this year, he said.” Our Supplemental Documents package includes the Bismarck Tribune report. [\[LINK\]](#)

### 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 November was 2.43, vs November 2020 of 2.36, November 2019 of 2.06, November 2018 of 1.83, and November 2017 of 1.76. Below is our running graph of North Dakota gas-oil ratio updated for the new NDIC September production data.

Figure 23: North Dakota Gas-Oil Ratio



Source: NDIC, NDPA

### Oil – North Dakota crude by rail up MoM to 193,291 b/d in November

It looks like there were no impacts from the Washington floods on Bakken crude by rail in November. The key Washington refineries are close to the BC border, where there was extensive flooding. There is normally >100,000 b/d of Bakken crude by rail to the US West Coast including Washington state refineries. But it looks like no impact. The North Dakota Pipeline Authority also posted its monthly update “November 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 November was a low of 178,291 b/d and a high of 208,291 b/d for an average of ~193,291 b/d. This is up from October low of 154,134 b/d to high of 184,134 b/d for an average of ~169,134 b/d. Note that September’s numbers were revised up 3,280 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.

**North Dakota  
CBR up in  
November**

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Figure 24: Estimated North Dakota Rail Export Volumes



Source: North Dakota Pipeline Authority

### Oil – EIA STEO increasing its forecast for US oil production growth to Q4/22

One of the headlines from the EIA STEO was on its increasing its forecast for US oil production. (i) There was no change to the historical 2019 oil production of 12.29 mmb/d and 2020 at 11.28 mmb/d, down 1.01 mmb/d YoY. (ii) The EIA did not adjust the 2020 forecasted production numbers, same as last month. (iii) The EIA forecast slightly lowered its US crude expectations thru 2021, still not returning anywhere near the Q4/19 peak of 12.88 mmb/d, with Q4/21 US crude of 11.54 mmb/d (down 1.34 mmb/d from peak). Q4/21 of 11.54 mmb/d is +0.48 mmb/d YoY vs Q4/20. Full year 2020 US oil production is flat at 11.28 mmb/d and is down 1.01 mmb/d YoY from 12.29 mmb/d in 2019. (iv) Full year 2021 is decreased by 0.02 mmb/d vs December STEO to 11.63 mmb/d, which is down -0.36 mmb/d YoY from 2020. (v) The EIA forecasts a shift back to YoY growth in 2022 with production averaging 11.8 mmb/d, +0.64 mmb/d YoY (was 11.85 mmb/d previously), with Q4/22 production of 12.05 mmb/d, ie still down 0.83 mmb/d from Q4/19. (vi) The 2023 outlook was released and projects crude production to begin Q1/23 at 12.26 mmb/d and close the year in Q4/23 at 12581 mmb/d for an average of 12.41 mmb/d in 2023. (vii) In the US oil production commentary, the EIA wrote “U.S. crude oil production averaged 11.2 million b/d in 2021. We expect production to average 11.8 million b/d in 2022 and to rise to 12.4 million b/d in 2023, which would be the highest annual average U.S. crude oil production on record. The current record is 12.3 million b/d, set in 2019.”

**EIA forecasts US  
2022 oil exit at  
12.05 mmb/d**

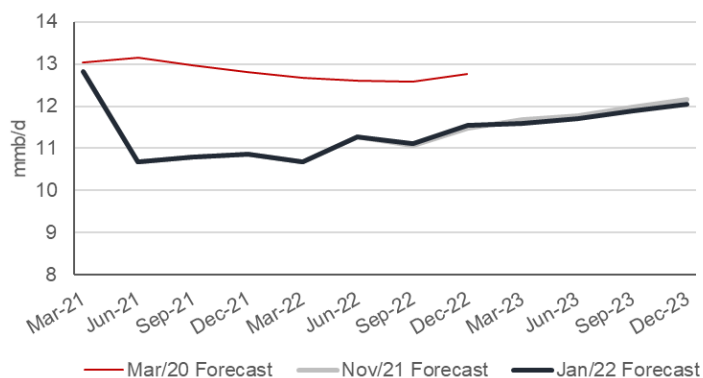
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Figure 25: Estimated US Crude Oil Production By Forecast Month

(million b/d)	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Jan-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.12	11.54	11.16	11.58	11.7	11.88	12.05	11.8	12.26	12.33	12.46	12.58	12.41
Dec-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.11	11.63	11.18	11.67	11.72	11.91	12.09	11.85					
Nov-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.07	11.47	11.13	11.69	11.77	11.97	12.16	11.90					
Oct-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	10.98	11.13	11.02	11.54	11.64	11.78	11.96	11.73					
Sept 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.06	11.28	11.08	11.42	11.58	11.81	12.06	11.72					
Aug 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.22	11.26	11.30	11.12	11.46	11.62	11.86	12.11	11.77					
July 2021	12.75	10.81	10.81	10.90	11.31	10.70	11.20	11.17	11.34	11.10	11.54	11.72	11.95	12.20	11.85					
June 2021	12.75	10.81	10.81	10.90	11.31	10.70	11.04	11.17	11.38	11.08	11.55	11.67	11.88	12.05	11.79					
May 2021	12.75	10.81	10.81	10.90	11.31	10.65	10.97	11.12	11.34	11.02	11.51	11.68	11.96	12.21	11.84					
Apr 2021	12.75	10.81	10.81	10.90	11.31	10.75	10.93	11.13	11.35	11.04	11.54	11.74	11.99	12.18	11.86					
Mar 2021	12.75	10.81	10.81	10.87	11.31	10.79	11.06	11.27	11.46	11.15	11.67	11.84	12.16	12.41	12.02					
Feb 2021	12.75	10.81	10.81	10.89	11.31	10.98	10.91	11.00	11.18	11.02	11.30	11.38	11.61	11.83	11.53					
Jan 2021	12.75	10.81	10.81	10.81	11.29	11.06	11.03	11.07	11.25	11.10	11.32	11.37	11.52	11.74	11.49					
Dec 2020	12.75	10.81	10.80	10.99	11.34	11.02	11.00	11.09	11.29	11.10										
Nov 2020	12.75	10.81	10.93	11.07	11.39	11.06	10.97	11.08	11.28	11.10										

Source: EIA STEO

Figure 26: Estimated US Crude Oil Production By Forecast Month



Source: EIA STEO

**Oil – Raymond James warns on correlation of US rigs vs oil production growth**

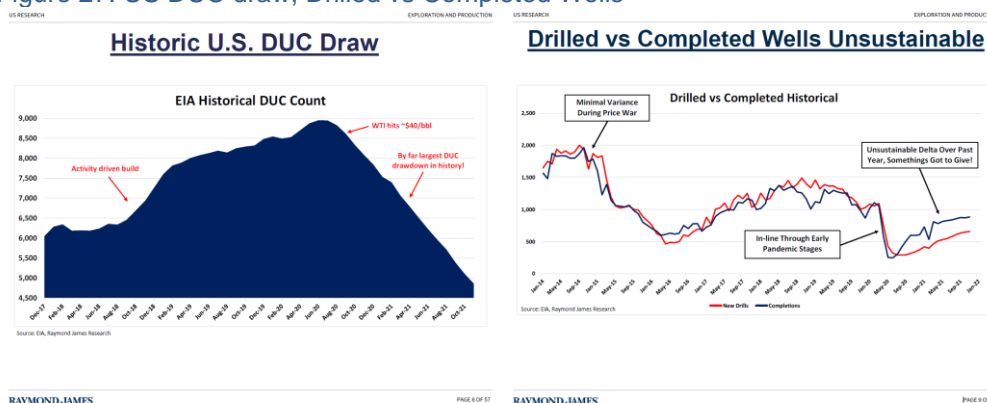
The Raymond James team held their webcast “*RJ Energy Market Outlook*” on Tuesday. There were many good insights but there was one, in particular, that caught our eye and led to our tweet [\[LINK\]](#) “*Biggest mistake in US #Oil growth fcast is correlation of rig count vs prod. Oil growth in 21/22 driven by historic DUC drawdown. Excess DUCs gone, higher rigs needed to replenish DUCs. It’s why higher rigs in 23 = lower growth rate. one of many insights from @RaymondJames #OOTT.*” It’s hard to miss when someone says this is the biggest mistake people make in forecasting US oil production. Or, at least, that’s a warning that you better at least think about it. We made a transcript of John Freeman’s comments on slide 8 and 9. “*when I see a lot of US supply estimates over the next couple years, the biggest mistake I see is this sort of extrapolation, where they take the US rig count relative to the growth in production last year and extrapolate that relationship. The US benefited from the largest build up of the largest drilled and uncompleted wells that we’ve every had. So to put in perspective from what you see in this chart. It took us over 3 years to build up over 3,000 drilled but uncompleted wells from the late 2017 until the peak, the early summer of 2020. We basically removed all of those DUCs, those excess DUCs that got build from 17 thru 2020. We removed those DUCs in about 12 months and those have continued to drop. So we don’t have the benefit of those drilled but uncompleted wells as we enter 2022 to the extent that we did in 2021. So a lot of the rig adds, they just had to happen, because if you go*

**RJ warns on rigs vs oil production correlation**

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to the next slide. The run rate that we were on in terms of the number of wells we were completing relative to the wells we were drilling. It's been an unsustainable rate for a good bit of the summer and fall last year, we were completing about 300 wells more each month than we were drilling. Obviously, that's not sustainable. So a lot of these rigs that are being added, that just had to happen to get back in balance now that the DUCs have been unwound."

Figure 27: US DUC draw, Drilled vs Completed Wells



Source: Raymond James

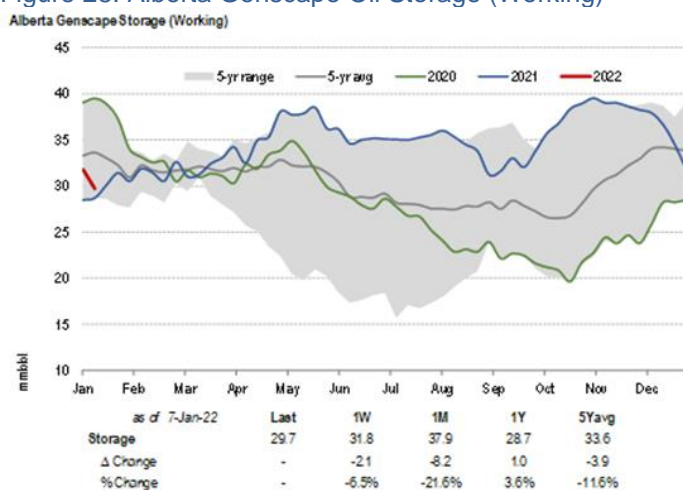
**Oil – A steep drop off in Alberta crude inventories thanks to the completion of Line 3**

It's a good thing Enbridge's Line 3 Replacement project is ramping up post its start in October as it is more than offsetting increasing oil sands production. On Thursday, we tweeted [\[LINK\]](#) "latest Genscape/Wood Mackenzie data shows a steep drop off in Alberta crude inventories. Over the last month, Alberta storage has dropped by 8 mmb to under 30 mmb with added egress (from L3R) seemingly outpacing incremental production volumes" NBF Energy Sales Josh Ochman #OOTT." Josh wrote "The latest Genscape/Wood Mackenzie data shows a steep drop off in Alberta crude inventories. Over the last month Alberta storage has dropped by 8 mmb to under 30 mmb with added egress (from L3R) seemingly outpacing incremental production volumes." Below is one of the graphs Josh put with his comment.

**Line 3 leads to decline in crude inventories**

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Figure 28: Alberta Genscape Oil Storage (Working)



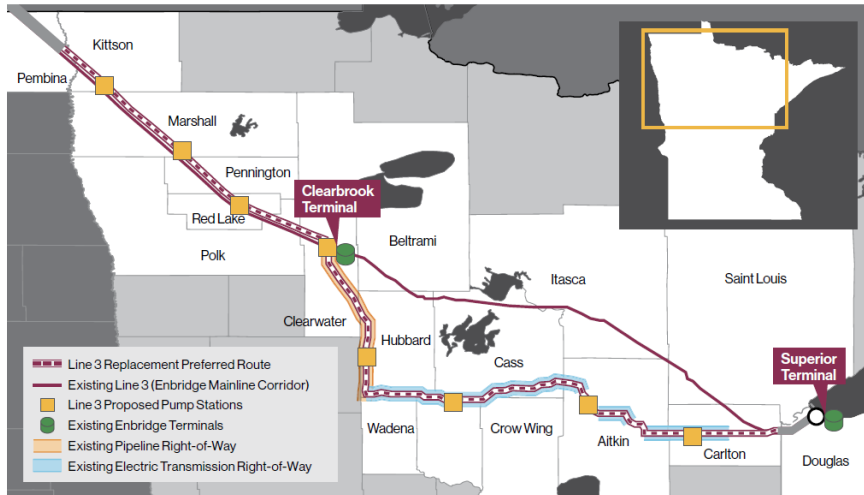
Source: NBF Energy Sales note

### Enbridge Line 3 Replacement Project Overview

The Enbridge Line 3 Replacement project was completed on October 1, 2021. Enbridge says the replacement of Line 3, which was built in the 1960's, is "to maintain [their] high safety high safety standards, reduce future maintenance activities and create fewer disruptions to landowners and the environment, and restore the historical operating capabilities of Line 3,"[\[LINK\]](#). In 2008, Enbridge implemented voluntary pressure restrictions to the pipeline reducing capacity of deliveries from 760,000 b/d to 370,000 b/d. The Line 3 replacement program includes a new 36-inch diameter pipeline, replacing the existing 34-inch diameter pipeline. The new 1,031-mile pipeline follows the existing Line 3 route from Joliette, North Dakota to Clearbrook, Minnesota, and then follows existing pipeline and transmission routes from Clearbrook to Superior, Wisconsin. The Program was a ~\$7.5bn private investment, making it one of the largest infrastructure programs in North America. Below is the map of the Line 3 Replacement project.

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Figure 29: Enbridge Line 3 Replacement Project



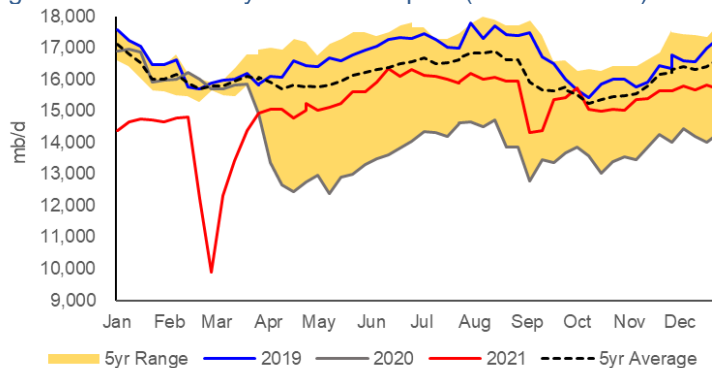
Source: Enbridge

**Oil – Refinery inputs -0.294 mmb/d WoW at 15.573 mmb/d**

The EIA crude oil input to refinery data is for the week ended Jan 7. Refineries normally ramp up oil processing to year end and then decline in the new year. The decline appears to be underway as the EIA noted a small WoW decrease in crude inputs to refineries, down -0.294 mmb/d this week to 15.573 mmb/d and are +0.923 mmb/d YoY. The normal ramp up is to still produce winter fuels before refineries go into the turnaround in Q1 to switch to more summer fuels. Refinery utilization was down at 88.4%, which is still +6.4% YoY as the typical seasonal decline over the holidays has continued into the new year. Total products supplied (i.e., demand) decreased WoW, up 1.164 mmb/d to 20.829 mmb/d. Motor gasoline was down -0.265 at 7.906 mmb/d from 8.172 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 8.697 mmb/d, up from last year.

**Refinery inputs down WoW**

Figure 30: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

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### Oil – CNQ major turnarounds in 2022 at Horizon and Scotford upgrader

We can expect major turnarounds at CNQ's Horizon and Scotford upgraders in the second quarter of 2022. Canadian National released their Investor Presentation on Tuesday, and we were interested in their comments concerning the Horizon and Scotford upgraders. The presentation noted that the Horizon upgrader has a planned total outage scheduled to begin in May 2022, lasting approximately 32 days, with an estimated 23,000 b/d impact on total 2022 production. This turnaround is to extend the major maintenance cycle from once a year to once every two years. The Scotford Upgrader is also expected to undergo a 65-day maintenance turnaround beginning in March with an estimated 12,000 b/d impact to total year production. Our Supplemental Documents package includes excerpt from the CNQ Investor presentation.

**CNQ Upgrader  
turnaround in 2022**

### Oil – US “net” oil imports up +0.784 mmb/d WoW at 4.14 mmb/d

US “NET” imports were up +0.784 mmb/d to 4.114 mmb/d for the Jan 7 week. US imports were up +0.405 mmb/d to 6.069 mmb/d. US exports were down -0.699 mmb/d to 1.955 mmb/d. The WoW decrease in US oil imports was driven by US's Top 10 imports by country were down -0.51 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by -0.463 mmb/d to 3.340 mmb/d, which is now ~0.1 mmb/d above the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was down 124,000 b/d to 0.294 mmb/d this week. (iii) Colombia was up +0.177 mmb/d to 0.241 mmb/d. (iv) Ecuador decreased imports this week, down 0.037 mmb/d to 0.058 mmb/d. (v) Iraq was up +42,000 b/d to 317,000 b/d. (vi) Venezuela remained at 0 due to US sanctions. (vii) Mexico was up by 358,000 b/d to 0.584 mmb/d.

**US “net” oil up  
WoW**

Figure 31: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Oct 29/21	Nov 5/21	Nov 12/21	Nov 19/21	Nov 26/21	Dec 3/21	Dec 10/21	Dec 17/21	Dec 24/21	Dec 31/21	Jan 7/22	WoW
Canada	3,685	3,550	3,429	3,559	3,773	3,869	3,879	3,147	4,032	3,803	3,340	-463
Saudi Arabia	397	598	453	468	475	393	463	384	609	418	294	-124
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	439	365	499	460	657	625	569	503	648	226	584	358
Colombia	71	121	302	141	214	71	232	146	184	64	241	177
Iraq	187	51	42	131	221	248	29	359	268	226	317	91
Ecuador	92	117	103	149	112	0	265	195	308	95	58	-37
Nigeria	64	64	1	68	4	175	217	128	58	53	0	-53
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	4,935	4,866	4,829	4,976	5,456	5,381	5,654	4,862	6,107	4,885	4,834	-51
Others	1,237	1,242	1,362	1,460	1,148	1,118	817	1,332	652	779	1,235	456
Total US	6,172	6,108	6,191	6,436	6,604	6,499	6,471	6,194	6,759	5,664	6,069	405

Source: EIA, SAF

### Oil – Increasing oil and gas production on Norwegian shelf thru 2024

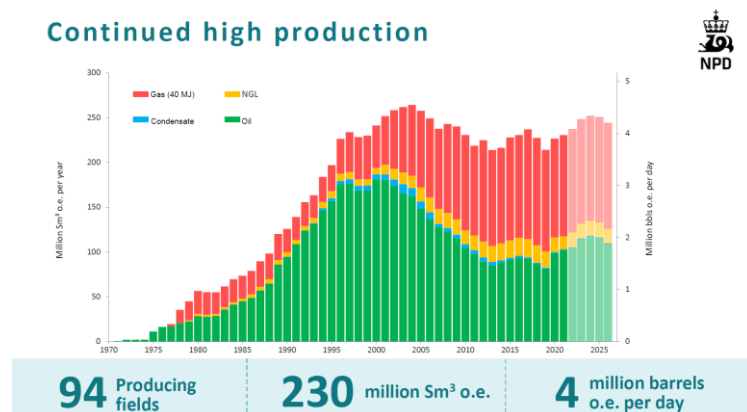
Norway returned to oil growth with the discovery and develop of the massive Johan Sverdrup field, but its growth is not over. On Thursday, the Norwegian Petroleum Directorate reported on the activity levels and forecast for the Norwegian Shelf. [\[LINK\]](#). The key takeaway looking forward is that there is more than Johan Sverdrup, investment was high in 2021 and the NPD sees growing oil and natural gas production thru 2024. There were record high revenues from the combination of high production of oil and gas from their 94 fields, significant demand and high commodity prices. Production came to 642 mmb of crude and 10.9 bcf/d of natural gas in 2021. Five fields started production last year; Duva, Yme (older field which was restarted), Solveig, Martin Linge in the North Sea and Ærfugl in the northern Norwegian Sea; With phase 2 of the Sverdup field expected to start up this year, it will account for 35% of oil

**Growth ahead  
for Norwegian  
oil**

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production in the Norwegian shelf. Additional fields are in the pipeline with eight development plans (PDOs) submitted in 2021, with multiple PDO's expected in 2022. Last years wildcat wells yielded 18 oil and gas discoveries, 40 wells were completed (31 wildcat and 9 appraisal wells). The NDP expects another 30-40 wells to be drilled in 2022. The resource growth in 2021 accounted to 510 mmbob, continuing the steady resource growth since 2014. There were major investments in the Shelf, the report noted "A total of about NOK 150 billion was invested in fields and the development of discoveries on the Norwegian shelf in 2021, which is somewhat lower than the previous year. The Norwegian Petroleum Directorate's (NPD's) forecasts show an additional reduction in investments in 2022, before they are expected to increase again leading up to 2025." The investments point to higher and profitable production towards 2030 at which point current reports expect production to decline; the speed of the decline will be dependant on how much additional oil and gas discoveries companies will make in the years to come. Our Supplemental Documents package includes the NDP activity update.

Figure 32: Norwegian Shelf oil and gas production forecast



Source: Norwegian Petroleum Directorate

**Oil – Another report Saudi pleads for missile defense resupply as arsenal runs low**

The Saudis have been aggressively attacking the Houthis in what almost seems like a final push to wipe them out, in particular air attacks on anything that could potentially be linked with Houthi missiles. The Saudis need to wipe out the Houthis missile capability. So no one should be surprised by the FT report [LINK](#) that Saudi Arabia is running out of Patriot missiles and could run out in a matter of months unless it can replenish from regional countries such as the UAE since its normal supply from the US "has been complicated by bipartisan criticism of the conduct of its war in Yemen, as well as concerns about human rights abuses under Prince Mohammed's leadership. Our December 12, 2021 Energy Tidbits noted the WSJ Dec 7 report [LINK](#) "Saudi Arabia Pleads for Missile-Defense Resupply as Its Arsenal Runs Low. Saudi Arabia is running out of the ammunition it uses to defend against weekly drone and missile attacks on its kingdom and is urgently appealing to the U.S. and its Gulf and European allies for a resupply, U.S. and Saudi officials said." Yesterday FT's report was similar with the added note that it will run out of missiles within "months". FT wrote "Saudi Arabia has appealed to regional countries for help to replenish the depleted stock of

**Saudi needs more Patriot missiles**

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*interceptor missiles for its US-made Patriot air-defence system as Yemeni rebels ramp up rocket and drone strikes on the kingdom. A senior US official said the Biden administration supported the moves to source missiles from the Gulf amid concerns that Riyadh's Patriot stocks could run out in "months" given the current rate of attacks on the kingdom by Houthi rebels. The US has to greenlight transfers of the interceptors." Our Supplemental Documents package includes the FT report.*

### **Oil – Why Saudi needs even more OPM – declining foreign investment**

More support as to why we continue to believe the primary financial theme for Saudi Arabia in the 2020s is getting Other People's Money to fund as much as possible in the country from helping Saudi Aramco cover its dividends to funding the hoped for transformation of the country in its Vision 2030. This is the theme for the 2020s. It's why we couldn't help note yesterday's WSJ report "*U.S. Businesses Sour on Saudi Arabia in Blow to Crown Prince's Growth Plans. Surprise tax hits, unpaid bills and stolen intellectual property undo government's effort to shift economy away from oil*". The WSJ report would link to why Saudi needs even more OPM if they are driving away US investment because it is leading to significantly lower levels of foreign investment. The WSJ reports foreign direct investment in Saudi was \$5.4b in 2020, less than half of a decade ago and "*well below the \$19 billion that the country as targeted*". It just means they will want to make up the OPM from other sources. The WSJ led off their report "*Saudi Arabia courted the world's top companies to modernize its economy. Instead, the business environment has grown more hostile and investors are souring on the oil-rich kingdom. Uber Technologies Inc., UBER -3.17% General Electric Co. and other foreign firms were hit by surprise tax assessments often totaling tens of millions of dollars. Construction company Bechtel Corp. sent some contractors home while it tried to collect on more than \$1 billion in unpaid bills. Bristol-Myers Squibb Co. BMY 0.51% , Gilead Sciences Inc. GILD -0.15% and other drugmakers have complained unsuccessfully for years that their intellectual property was being stolen.*" Our Supplemental Documents package includes the WSJ report.

**Why Saudi  
needs even  
more OPM**

### **Saudi MBS Nov 2017 corruption crackdown raised \$100.6b**

Perhaps the best and fastest OPM cash generation was the Saudi Arabia Nov 4, 2017 corruption crackdown that saw many wealthy locked up in the Riyadh Ritz. We recognize the WSJ report is not the same, but we couldn't help think about that when we saw the WSJ subtitle yesterday "*Surprise tax hits, unpaid bills and stolen intellectual property undo government's effort to shift economy away from oil*". Here is what we wrote in our Nov 4, 2018 Energy Tidbits "*Oil – Saudi's corruption crackdown raised ~\$110b, a big cushion against oil prices. One of the support cash flow items for Saudi Arabia to deal with volatile oil prices has been the Saudi crackdown on corruption. The Saudi Gazette and others reported that Saudi Crown Prince Muhammad Bin Salman has his final report on corruption reviewed by the King. The King reportedly approved the conclusion of the corruption task force that led to the recovery of Saudi Riyal 400 billion or \$106.6 billion from settlements with 87 individuals. That's an average of \$1.2 billion per individual. There is no question that this \$110b has provided a cushion against up and down oil prices. Its almost enough to cover a change of \$10/b for three years.*"

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### Oil – JCPOA, reports suggest US and Iran have both softened their asks

We recognize that many interpret the US highlighting this week that time is running out and they are working with partners on a plan for no JCPOA as reflecting a lower probability for a deal. The one point that everyone seems to agree on is that there is a deal or no deal in the next month. (i) There is no certainty of a deal or no deal and its often hard to determine who to believe, but we think the momentum is still towards a near term deal for the key reason that there seem to be signals that both the US and Iran have backed off their big initial demands. (ii) On Friday, we tweeted [\[LINK\]](#) on the TASS report on comments from Russia Foreign Minister Lavrov. [\[LINK\]](#) The headline was Lavrov saying “*There is real progress on the Iranian nuclear program <...>, there is a real desire, primarily between Iran and the United States, to understand specific concerns and understand how these concerns can be taken into account in the general package,*” and “*I am knocking on wood, but we expect that an agreement will be reached.*” The overlooked comment was Lavrov confirming the US has backed off its view that there be a broader agreement that would include trying to get Iran concessions on its ballistic/drone missiles and its support for regional actors. TASS wrote “*According to the head of the Russian Foreign Ministry, “quiet diplomacy” is needed here. “I will repeat it once again, it works,” he stressed. Lavrov also noted with satisfaction that it was possible to overcome the situation when the West began to put forward conditions for the resumption of the Iranian nuclear program, which related to the imposition of restrictions on Iran’s missile program, not fixed in the JCPOA, and conditions concerning the “behavior” of the state in the region.*” (iii) Yesterday, we tweeted [\[LINK\]](#) on the Al Jazeera Friday report [\[LINK\]](#) on comments that Iran’s Foreign minister made in an apparent softening of Iran’s views on sanctions removals. Al Jazeera wrote “*In an interview with Al Jazeera in early January, Iranian Foreign Minister Hossein Amir-Abdollahian said a return to the deal could be reached if “all forms of sanctions stipulated in the nuclear agreement” were lifted – an apparent softening of the government’s previous calls for a complete lifting of all sanctions, even those imposed on human rights grounds.*” Our Supplemental Documents package includes the TASS and Al Jazeera reports.

JCPOA progress

### Feb 11 is more likely the target date, not Biden’s 1 year anniversary on Jan 20

It looks like we picked the wrong anniversary date for the significant political data for a return to JCPOA or some sort of deal. In our Dec 12, 2021 Energy Tidbits, we thought Biden would want to push for a deal by Jan 20, which is the 1 year anniversary of his inauguration because he needs some successes to try to offset the bad news on inflation, Omicron, etc. We are probably right in thinking of an anniversary and we should have just thought there would be no way Iran would want to give Biden that satisfaction. But we probably picked the wrong anniversary, and should have picked Feb 11. It was on Feb 11, 1979 that marked the success of the revolution with the Shah overthrown and Khomeini taking control.

### Oil – Iran opens first super heavy oil refinery with 100,000b/d output potential

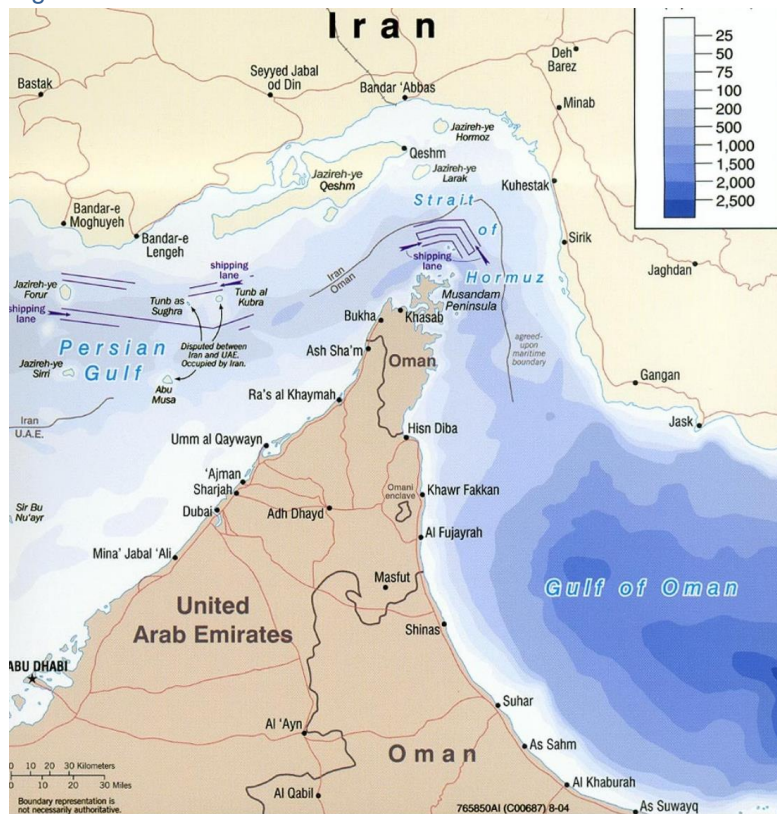
Qeshm Island in the Strait of Hormuz was in the news this week with the reports Iran has upgraded its oil infrastructure as the nations super heavy oil refinery is set to open. Press TV reported on Thursday [\[LINK\]](#) that Iranian President Ebrahim Raeisi is set to officially inaugurate the massive Qeshm Refinery facility despite recent US sanctions against the nation. According to the report, the capacity had been operating on a pilot basis and using half of its refining capacity in recent years, the facility has since reached its full capacity

Iran opens refinery

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70,000 b/d of crude. The facility will be fed by super heavy oil from Soroush and Nowruz oilfields in the Persian Gulf. Private owners of the Qeshm Refinery provided the \$220mm in investment construction and the supply of machinery and equipment to the facility. The refinery could potentially reach a refining capacity of 100,000 b/d within the next years. Qeshm in one of the world's largest islands that is in the Persian Gulf just few kilometers off the southern Iranian coast. The area is one of major special economic zones of Iran where regulations are lax compared to the mainland to encourage more investment in trade and manufacturing activities in the region. The refinery will become a major supplier of bitumen in Iran and the facility is expected to account for one fifth of Iran bitumen exports in the future. Our Supplemental Documents package includes the Press TV report.

Figure 33: Qeshm Island & Strait of Hormuz



Source: Wikimedia

**Oil – Libya Oil minister says oil production back to around 1.2 mmb/d**

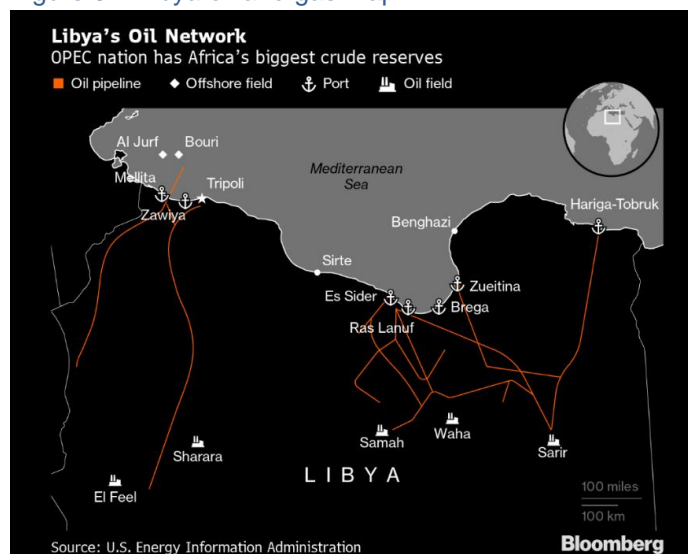
Earlier this morning, we tweeted [\[LINK\]](#) “Libya #Oil production restored. “output is around 1.2 million barrels a day, Mohammed Oun said in response to questions from Bloomberg on Sunday” reports @S\_Elwardany. #OOTT”. Bloomberg reported “Libya’s oil production has picked up again after a blockade of its western fields ended and ports in the east reopened, according to the OPEC member’s energy minister. Output is around 1.2 million barrels a day,

**Libya back to ~1.2 mmb/d**

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Mohammed Oun said in response to questions from Bloomberg on Sunday. That was its normal level before a round of closures hit the North African nation's oil facilities late last year, sending daily production as low as 700,000 barrels. Its biggest field, Sharara, was pumping about 280,000 barrels a day as of Saturday, near its capacity."

Figure 34: Libya oil and gas map



Source: Bloomberg

### Oil – CNOOC sees continued domestic oil & gas production growth in 2023/24

On Tuesday, CNOOC held its 2022 Strategy Preview [\[LINK\]](#) on Tuesday. The headlines were on how CNOOC expected oil prices to stay above \$70/b for the next three years. The qualifier is that the CNOOC slide on this was not a CNOOC forecast but a graph showing Wood Mackenzie, IHS and Bloomberg forecasts. And for their long term demand outlook, CNOOC just put the OPEC outlook. So there isn't any major macro oil insights. Rather, we thought the interesting data is that they see continuing trend of increasing CNOOC domestic oil and gas production in 2022, and growth, but at a slower rate, in 2023 and 2024. We remind that any growth in China's domestic oil and natural gas production means less import needs. CNOOC is an offshore China driven growth. They aren't a major onshore shale player and their "key project onshore China" is their onshore unconventional gas field that only has 328 wells with peak production of 9,500 boe/d – basically the size of a very small Cdn producer production levels. Our Supplemental Documents package includes excerpts from the CNOOC slide deck.

**CNOOC expects to grow domestic production**

### Oil – China's oil imports down 0.58 mmb/d YoY to 10.3 mmb/d in 2021

It wasn't a big surprise to see China's oil imports in 2021 were down YoY. Its not that covid wasn't better, rather recall that China took advantage of the oil price crash in 2020 to import big volumes of oil to put into strategic reserves. This 2020 buying spree is the key reason for lower YoY oil imports in 2021. And China made a great economic win by buying big oil in 2020 at lower oil prices. December inflows increased MoM to 10.6 mmb/d. China imported

**China preliminary oil imports**

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an average of 10.3 mmb/d in 2021, down 0.58 mmb/d from 2020. Inbound shipments dipped in 2021 as the Brent surged in the second half of the year, prompting buyers to hold purchases after a stockpile build in 2020. Bloomberg expects China's crude purchases to increase in 2022 as new refineries begin to come online. The ramping up of Shenghong Groups 0.32 mmb/d facility and PetroChina's 0.4 mmb/d complex is expected to boost crude demand and increase refinery throughput by 4% in 2022. The Bloomberg report noted *"Consultant FGE sees potential run rate cuts causing limited upside for imports in the early months of 2022 as China strives to curb pollution ahead of key events such as the Winter Olympics in Beijing. Additionally, the reduction in crude-import quotas for independent refiners may also cap daily imports, which it forecasts at about 11 mmb in January and February."* Our Supplemental Documents package includes the Bloomberg report.

### **Oil – Wind down in China refineries is starting for Olympics and Chinese New Year**

It looks like the wind down in Chinese heavy industry ahead of the Olympics and New Year has started. We first mentioned the early Chinese New Year in our Aug 8, 2021 Energy Tidbits to give an early warning that there will be some different factors this winter impacting China's oil and natural gas demand and import patterns. First, Chinese New Year (also known as Spring Festival) is almost two weeks earlier this year falling on Feb 1 vs Feb 12, 2021. The public holidays is for 1 week, ie. from Jan 31 to Feb 6, 2022. But the spring festival is 16 days, which in theory should be from Jan 31 thru Feb 14. But things seem to wind down ahead of New Years ie. in late Jan. Secondly, with the closing of the Tokyo Olympics, it's a reminder that the next winter Olympics is in Beijing from Friday Feb 4 thru Sun Feb 20, 2022. Normally, there is a demand surge a month ahead (ie. in Dec this time) and then a slow down in the weeks before new year. But we warned that one wildcard will be to expect more factories, steel, etc shut downs ahead of and thru the Olympics in the Beijing region to keep pollution/smog down. It's what happens for when the party meets so any international coverage shows as clear a sky as possible. But given there will be an even bigger global audience, we expect an even bigger pressure to try to have clear sky. And it will also mean China will reduce coal power around Beijing unless absolutely necessary, which means a boost for LNG for power in the lead up to and during the Olympics. On Wednesday, Bloomberg reported *"China ordered some independent oil refiners to reduce crude processing ahead of the Winter Olympics, according to industry consultant JLC, as authorities seek to ensure blue skies for the games. Some processors in the eastern province of Shandong received notices to curb operating rates by about 20% from Jan. 30 to Feb. 20, according to a note from JLC on its WeChat account, citing people it didn't identify. A combined refining capacity of 20 million to 35 million tons a year could be affected, JLC said. Beijing is ramping up pollution controls ahead of the Olympics starting on Feb. 4, which could curtail the supply of commodities from chemicals to fertilizers. A handful of refiners in Dongying, Shandong, -- which is about 400 kilometers (248 miles) southeast of Beijing -- have already completely halted operations due to strict environmental requirements for the games, JLC said. Industrial activity typically slows around the Lunar New Year holiday, which starts Feb. 1 in China, while independent processors usually start maintenance work from the second half of March. The buying of crude cargoes for delivery in February and March is likely to remain sluggish due to the curbs, JLC said."* Our Supplemental Documents package includes the Bloomberg report.

**Beijing Olympics starts Feb 4**

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### Oil – IEA sees “increasingly well-supplied world markets” for oil & natural gas

We are still nowhere near finished reviewing the IEA's >260-pg report “*IEA Canada 2022: Energy Policy Review*” [\[LINK\]](#), but couldn't help tweeting yesterday [\[LINK\]](#) on their how their warning to Canada included their view of “*increasingly well-supplied world markets*” for oil and natural gas. Let's not forget IEA is Paris based so has been living thru the joys of the Europe energy crisis. We tweeted “*Canada must focus on significantly decarbonising its oil and gas sectors while at the same time ensuring competitiveness in increasingly well-supplied world markets*” warns @IEA. Doubt #Macron & others see increasingly well supplied #Oil #NatGas markets. #OOTT”. We just don't know how they can make that statement of increasingly well supplied markets for oil and natural gas. Here is the full quote “*Moreover, Canada should pay close attention to shifting demand for oil and gas globally, as countries around the world undertake their own energy transitions and put in place net zero targets. Canada must focus on significantly decarbonising its oil and gas sectors while at the same time ensuring competitiveness in increasingly well-supplied world markets*”. We referenced Macron because he was the first major leader to come out and warn that Europe was building a system where fossil fuels will cost more in the medium and long term, not just the energy crisis this winter.

IEA “increasingly well-supplied world markets”

### Oil – IEA's OMR forecast next week should see an increase in oil demand

The IEA issues its monthly Oil Market Report on Wednesday morning (~2am MT) but it looks like they will be increasing their oil demand forecast. CNBC's Brian Sullivan interviewed IEA Executive Director Faith Birol, Sullivan asks for a sneak peak at the OMR and he got a pretty clear answer from Birol that demand dynamics are “significantly stronger” than a few weeks ago ie. at the time of their last monthly OMR., On Friday, we tweeted [\[LINK\]](#) “*Asking a direct question works. “when I look at different indicators around the world, I would say that the oil demand dynamics now are significantly stronger than it was a few weeks ago” says @fbirol to @SullyCNBC ask for sneak peak @IEA Jan OMR. See SAF Group transcript. #OOTT.*” Our tweet included the transcript we made of this exchange. “SAF Group created transcript of excerpts from CNBC World Wide Exchange, Brian Sullivan, interview with IEA Executive Director, Faith Birol on Jan 14, 2022. [\[LINK\]](#). Items in “*italics*” are SAF Group created transcript. At 7:45 min mark. Brian Sullivan “*I know you've got your latest estimates coming out on Wednesday, maybe you can kind of give us a sneak peak. Do you think the world, not Europe or the US necessarily, but the world is underestimating near term demand growth for oil, because the market seems to be saying it is?*” Faith Birol “*As you rightly mention, our assessment of the markets, oil markets, we are going to release it in a few days of time. But, when I look at different indicators around the world, I would say that the oil demand dynamics now are significantly stronger than it was a few weeks ago. And this is driven, among other things, mainly the Omicron impacts are considered softer than many of the analysts thought before. But at the same time, I wouldn't be surprised, the production increase, strong increase coming from US and elsewhere. What is of course is not good news is there is a lot of outages in Nigeria, in Libya, Ecuador, these are all hurting on the supply side.*”

IEA to increase oil demand forecast

### Oil – Vitol oil “pushing towards this triple top of the market & possibly new highs”

Our favorite morning podcast is from Gulf Intelligence [\[LINK\]](#) and it resumed this morning following a long holiday break. Earlier this morning, we tweeted [\[LINK\]](#) on comments from Mike Muller (Vitol Head Asia) “*#Oil is looking to pop towards 90 & maybe through that level*”. see below SAF Group transcript, many more oil insights in just this one @michaelwmuller

Oil possibly hitting new highs

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reply to @sean\_evers. worth listening to his other comments in 30 min @gulf\_intel podcast. #OOTT". Our tweet included his lengthy opening answer, there was much more in the 30 min call. Some of his quotes from the SAF Group created transcript. "you have to go back to 2014 when prices fell of that plateau they had established to about 4 or 5 years of \$100 to \$115 per barrel. So we are pushing towards this triple top of the market and possibly new highs" "If you look at global inventories of oil and you look at the success of the OPEC+ concerted action to take inventories down to pre-pandemic levels. OPEC succeeded many months ago but continue to forge on with their policy so much so that many of their producers can't really put their share of the 400,000 b/d monthly increase into the market any longer", "But global inventories are below pre-pandemic levels and in many cases, there are pockets of tightness which would have you say that a front end backwardation and a strong market is very much justified", "So it is a very tight fundamental market, which underpins the backwardation we are seeing at the front of the market which is 50, 70 cents at the very prompt, but then 80, 90 cents per barrel per month going into the back months. I think Yes, these prices are justified and I think the fact that we've had a lot of risk-off mindset at the end of the year, there's a lot of managed money sitting on the sidelines that might say, hang on oil is looking to about to pop towards 90 and maybe even through that level, let's not miss out. And if that money, which is currently on the sidelines comes back into oil, there is a very real prospect of us making [he was cut off from finishing the sentence]". Our Supplemental Documents package includes the transcript we made of Muller's reply.

#### Oil – Vortexa est 72.72 mmb at Jan 14, -27.42 mmb WoW vs revised up Jan 7

Note that we are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 1pm MT yesterday and that these estimates get revised over the weekend and next week. Note we do not check daily for the revisions so our comments are compared to the Jan 7 and Dec 31 estimates that were posted on Sat Jan 8 at 3pm MT. (i) Note there is a bit of a change in our general comments. There is a massive 27.42 mmb WoW drop in floating storage. We always say we can't rely on one week data, especially as it gets revised each week. So we are just being a little cautious on the massive WoW drop. And it is because we saw upward revisions to each of the last several weeks. We think our comment from last week that there may be some creep in the numbers still looks valid, of course, other than the Jan 14 data. If you look at the prior several weeks, they are all revised up. So even though the Jan 14 of 72.72 mmb is well below the ~85 mmb when OPEC+ had their big production increases in July, the prior several weeks all look to be showing a little creep in floating storage. So we think it is still a trend to watch. Below, we pasted the weekly data from the estimates today as of 1pm MT today and last week as of 3pm MT on Jan 8. (ii) One key reminder is that floating oil storage is the smallest component of global oil storage relative to land storage. (iii) As of 1pm MT Sat, Bloomberg has posted a massive drop in Vortexa crude oil floating storage as of Jan 14 at 72.72 mmb, which is down 27.42 mmb WoW from the upwardly revised Jan 7 of 100.14 mmb. Note Jan 7 was originally estimated at 93.78 mmb as of Sat Jan 8 at 3pm MT. There was a big upward revision to Jan 7, and a small upward revision to Dec 31 vs what was originally estimated last Sat Jan 8 at 3pm MT. Jan 7 was estimated at 93.78 mmb vs 100.14 mmb as of 1pm MT today. Dec 31 was estimated at 100.72 mmb last Sat Jan 8 at 3pm MT vs 101.38 mmb as of 1pm MT today. Jan 14 estimate of 72.72 mmb is down 149.78 mmb from the June 26, 2020 peak of 222.50 mmb. Jan 14 estimate of 72.72 mmb is up 13.16 mmb vs the pre-Covid Jan 13, 2020 estimate of

#### Vortexa floating storage

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59.56 mmb. Below is the Bloomberg posted Vortexa crude oil floating storage data for the past two years as was posted yesterday at 1pm MT.

Figure 35: Vortexa Floating Storage Jan 14 Posted on Bloomberg 1pm MT Sat



Source: Bloomberg, Vortexa

Figure 36: Vortexa Estimates Jan 15 1pm MT vs Jan 8 3pm MT

FZWWFST VTXA Inde (94) Sug					FZWWFST VTXA Inde (94) Sug									
01/13/2020 - 01/14/2022					01/06/2020 - 01/07/2022									
1D	3D	1M	6M	YTD	1Y	5Y	1D	3D	1M	6M	YTD	1Y		
Date					Date					Date			Date	
Mid Px					Mid Px					Mid Px			Mid Px	
Fr 01/14/2022					Fr 01/07/2022					Fr 12/31/2021			Fr 12/24/2021	
72720					100.139k					100.715k			95632	
Fr 01/07/2022					Fr 12/31/2021					Fr 12/24/2021			Fr 12/17/2021	
100.139k					101.377k					99808			91527	
Fr 12/31/2021					Fr 12/24/2021					Fr 12/17/2021			Fr 12/10/2021	
101.377k					99808					94753			85689	
Fr 12/24/2021					Fr 12/17/2021					Fr 12/10/2021			Fr 12/03/2021	
99808					94753					93011			83841	
Fr 12/17/2021					Fr 12/10/2021					Fr 12/03/2021			Fr 11/26/2021	
94753					93011					90672			90115	
Fr 12/10/2021					Fr 11/26/2021					Fr 11/19/2021			Fr 11/12/2021	
93011					90672					100.755k			100.522k	
Fr 12/03/2021					Fr 11/26/2021					Fr 11/19/2021			Fr 11/12/2021	
90672					100.755k					113.539k			104.878k	
Fr 11/26/2021					Fr 11/19/2021					Fr 11/12/2021			Fr 11/05/2021	
100.755k					113.539k					110.236k			91462	
Fr 11/19/2021					Fr 11/12/2021					Fr 11/05/2021			Fr 10/29/2021	
113.539k					110.236k					111.433k				
Fr 11/12/2021					Fr 11/05/2021					Fr 10/29/2021				
110.236k					111.433k									
Fr 11/05/2021					Fr 10/29/2021									
111.433k														

Source: Bloomberg, Vortexa

**Oil – Bloomberg Oil Demand Monitor, Gasoline sales remain resilient against Omicron**

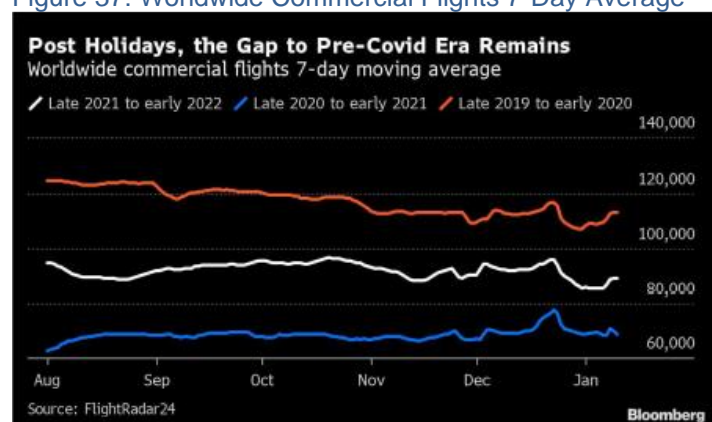
We recommend reading the weekly Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Gasoline sales have remained resilient in the face of the Omicron variant as countries like India, Spain and the US have noted increases in city traffic in recent weeks. Flight data has also maintained its levels around the world, approximately down 17% from 2019 levels. As the holiday season ends, city road traffic has begun to pick up, most notably in Europe, though the congestion levels still remain below the early December readings; London was the closest to 2019 levels, down just 3% while New York congestion was down 40% from 2019 for the week ended January 10. As

**Bloomberg’s Oil Demand Monitor**

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demand remains robust and oil prices persist appears to justify the OPEC+ decision to stick to their scheduled increase of 400,00 b/d in February. Jet fuel demand remains below 2019 levels in the US, Spain, Brazil, Portugal and Italy as travel restrictions continue to impact airlines, though the impact varies between countries; the US showed a deficit of 8.9% for December compared to 2019 while India and Spain are down nearly 25% for the same period. Airline seat capacity fell in almost all major markets this week except China. Majority of the reduction is in Europe where the Omicron variant has continued to impact travel. Refinery utilization across the US was up 9.1% compared to 2019 for the week ended Dec 31; all refinery regions posted increases with US east refineries continuing to post the greatest increase of 24%. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 37: Worldwide Commercial Flights 7-Day Average



Source: Bloomberg

### Oil – Global air travel was continue to recover in November ie. prior to Omicron

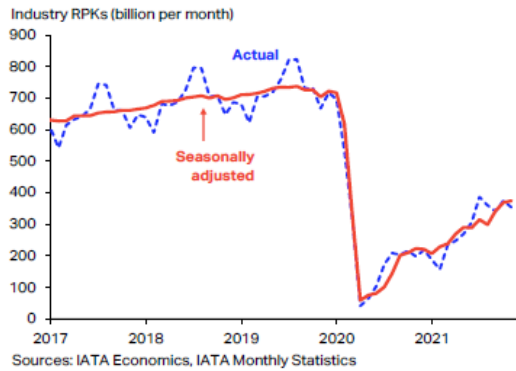
On Monday, the International Air Transport Association (IATA) released its update for global air travel [\[LINK\]](#). The data only goes until November, when air travel was still recovering before the ramp up of Omicron cases around the world. Global air travel recovery continued in November but was slower than in previous months, with revenue passenger kilometers (RPKs) down 47% versus November 2019. International RPKs all continued their upward trend save for China who implements lockdown restrictions over the course of the month. Passenger numbers are expected to differ from previous years as the holiday season tends to bring increased travel though the surge of the Omicron variant has seen a decline in sales for the month. Global domestic RPKs deteriorated slightly in November after two consecutive months of improvement, down 24.9% vs 2019 from 21.3% decline in October. European airlines posted the most resilient international air travel outcomes in November, RPKs down 43.7% from 2019. North America saw international RPKs down 44.8% from 2019. Latin America, Africa and the Middle East were down 47.2%, 54.4% and 56.8% from 2019 respectively, with recovery remaining gradual in all regions. Global air passenger capacity continued its slow recovery for the third consecutive month. Industrywide available seat-kilometers (ASKs) fell by 39.7% in November 2021 versus November 2019, following a 40.8% decline in October. Our Supplemental Documents package includes the IATA report.

**Air travel was recovering pre Omicron**

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Figure 38: Global RPKs Indexed to Jan 2020



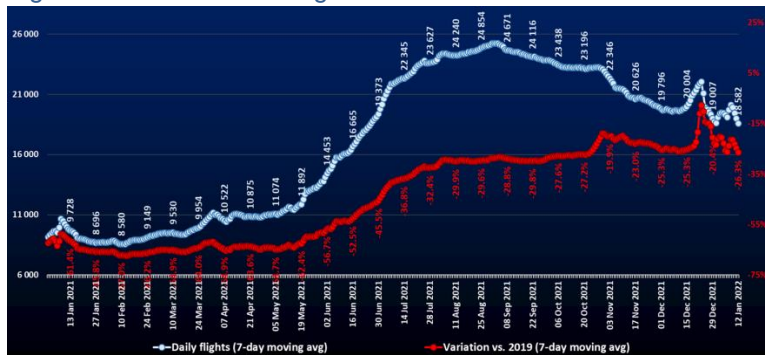
Source: IATA

**Oil – Eurocontrol update: Omicron continues to cut flight numbers across Europe**

The IATA data above was to the end of November so really didn't pick up the impact of Omicron. So no surprise, the current air travel data is showing Omicron cutting air travel. On Thursday, Eurocontrol posted its updated slide deck "*Covid 19 Impact on European Aviation*" [\[LINK\]](#). It is an excellent slide deck for a recap of Europe air travel and also some insights on international travel. The gap between current flight numbers in Europe and pre-pandemic levels have widened in recent days. Eurocontrol data continues to signal that the Omicron variant is pushing air traffic lower. On January 12 the 7-day moving average for air traffic was -26.3% from 2019. This is the fourth consecutive day the measure has dropped, and it is the lowest so far of the year in 2022. Intercontinental flows (flights to/from Europe) are at -31% vs 2019 on Jan 12. Domestic air traffic in Europe is down -39% vs 2019 while the US, China and the Middle East are down -21%, -24% and -13% vs 2019 respectively. The Italy posted the biggest decline in flights for the first two weeks of 2022, down 36% while the UK and Spain were down 33% and 30% respectively; Germany was down 15% from 2019. Jet fuel prices recorded an 11% rise between 24 Dec 2021 and 7 Jan 2022. Our Supplemental Documents package includes excerpts from the Eurocontrol report.

**Eurocontrol air traffic update**

Figure 39: Eurocontrol: Flights since Jan 2021



Source: Eurocontrol

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**Oil – FAA says Boeing 787s to take added landing precautions in wet/snow due to 5G**

This shouldn't impact jet fuel demand, but we thought we would put it here as it is related to air passenger travel and it's a FAA warning related to wet/snow landings ie. right now. And its another item directed only at Boeing, in this case its 787 Dreamliner that is also in Air Canada and WestJet fleets. On Friday, the Federal Aviation Administration issued its statement on 5G [\[LINK\]](#) and "will require operators of Boeing 787s to take additional precautions when landing on wet or snowy runways at airports where 5G C-band service is deployed. During the two-week delay in deploying new 5G service, safety experts determined that 5G interference with the aircraft's radio altimeter could prevent engine and braking systems from transitioning to landing mode, which could prevent an aircraft from stopping on the runway". The FAA also posted its letter to Civil Aviation Authorities [\[LINK\]](#), which included "The FAA determined anomalies on Boeing Model 787-8, 787-9, and 787-10 airplanes due to 5G C-Band interference which may affect multiple airplane systems using radio altimeter data, regardless of the approach type or weather. These anomalies may not be evident until the airplane is at low altitude during approach. Impacted systems include, but are not limited to: autopilot flight director system; autothrottle system; engines; thrust reversers; flight controls; flight instruments; traffic alert and collision avoidance system (TCAS); ground proximity warning system (GPWS); and configuration warnings. During landing, this interference could prevent proper transition from AIR to GROUND mode, which may have multiple effects. As a result, lack of thrust reverser and speedbrake deployment and increased idle thrust may occur; and brakes may be the only means to slow the airplane. Therefore, the presence of 5G C-Band interference can result in degraded deceleration performance, increased landing distance, and runway excursion." Our Supplemental Documents package includes the FAA letter.

**Boeing 787s  
impact from 5G**

**Oil – Air cargo still above 2019 levels, but slowed in Nov due to supply chain issues**

Air cargo continues to be above 2019 levels. On Monday, the International Air Transport Association (IATA) released its update for global air cargo market [\[LINK\]](#). The data only goes until November and cites a slow down of the air cargo growth due to supply chain issues. As demand continues to recover there has been a prolonged period of strong performance with CTKs growing by 8.2% in October vs 2019; this trend slowed down in November to just 3.7% above 2019 levels and was somewhat unexpected. Congestion of airports and a lack of capacity continue to create supply chain issues decelerating growth through various regions around the world though some regions still noted strong gains. CTK's dropped 1.7% MoM mainly due to congestion issues resulting from a labor shortage with workers forced to quarantine with increasing COVID-19 cases. International CTKs deteriorated in all the main regions while North America had the strongest performance with an 11.4% increase in November vs 2019; Inflation in the US continues to hurt consumers and congestion issues at key gateways have added to the headwinds for cargo volume. Asia pacific remained resilient in November posting a 5.2% rise in international CTKs vs 2019, marginally below 5.9% increase in October. Carriers in the middle East noted a deterioration from 9.7% in October vs 2019 to 3.7% in November. There was a 13.6% decline in international CTKs carried by Latin American airlines in November vs 2019.

**Air cargo above  
2019 levels**

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Figure 40: Actual and SA CTK Levels



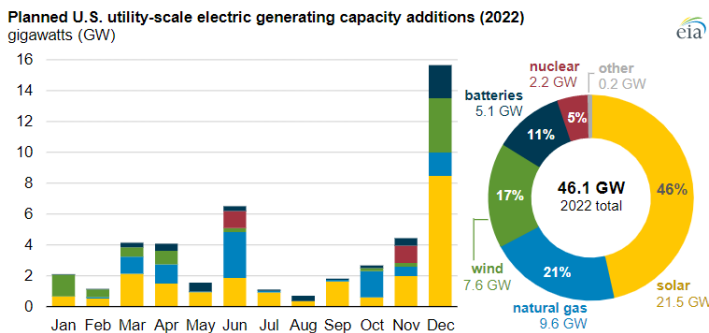
Source: IATA

**Electricity – Solar to account for 50% of new US generating capacity**

On Monday, the EIA released their Today in Energy Blog [LINK](#) which was titled “Solar power will account for nearly half of new U.S. electric generating capacity in 2022”. The EIA highlights for 2022, their expectation of 46.1 gigawatts (GW) of new utility-scale electric generating capacity to be added to the U.S. power grid. Almost half of the planned 2022 capacity additions are solar, followed by natural gas at 21% and wind at 17%. The EIA expects U.S. utility-scale solar generating capacity to grow by 21.5 GW in 2022. The planned new capacity would surpass last year’s 15.5 GW of solar capacity additions. Most planned solar additions in 2022 will be in Texas (28% of the national total), followed by California (4.0 GW). 9.6 GW of new natural gas-fired capacity is expected to come online in 2022; followed by another 7.6 GW of wind capacity is scheduled to come online in 2022, following a record 2021 year in which 17,1 GW of capacity was introduced to the US power grid. The Traverse wind energy project in Oklahoma is the largest expected project and should be operational by April of this year. In regard to nuclear projects, 5% of the country’s planned electric capacity additions in 2022 will come from two new reactors at the Vogtle nuclear power plant in Georgia. U.S. utility-scale battery storage capacity to grow by 5.1 GW, or 84%, in 2022; numerous factors have aided in the expansion of battery storage including the reduction in cost of battery storage and the added value of regional transmission organization markets. Below is a graphic depicting all planned US electric generating capacity additions in 2022. Our Supplemental Documents package includes the EIA blog.

**Big US solar additions in 2022**

Figure 41: Planned 2022 Electric Generating Capacity Additions



Source: EIA

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### Reminder solar typically generates, on average, only at ~25% of capacity

There is no question renewable power generation additions are leading the way in most OECD countries. But as we are seeing this weekend in Europe, when the wind is low, it means that Europe has to draw on natural gas and coal. When we saw the EIA tweet on the solar additions, we tweeted [\[LINK\]](#) “Reminder renewable is intermittent so need multiples more capacity to replace equivalent #Coal, #NatGas or nuclear. @EIAgov data, #Solarpower generates at ~25% of capacity, #Windpower at 35% of capacity. US #Nuclearpower is ~92%. #OOTT.” The reality is that solar and wind is intermittent power. We referenced the average capacity factors over a year, but they can go to zero when the wind doesn’t blow or the sun doesn’t shine. We just referenced the EIA’s most recent monthly data for “Capacity Factors for Utility Scale Generators Primarily Using Non-Fossil Fuels” and used the annual capacity factors for 2020. But in reviewing the capacity factors for the last decade, they have been fairly consistent. Solar ranged from 19.0% to 25.6%, but the low years were in 2011 and 2012, and the range was tighter from 24.2% to 25.6% for 2013 thru 2020. Wind had a tighter range for the decade at 31.8% to 35.3%, with an even tighter range of 34.4% to 35.3% from 2016 thru 2020. Our Supplemental Documents package includes the EIA capacity factors table for the last decade.

### Energy Transition – Liberals message to the world in IEA’s report is worth a read

We still believe the Cdn oil and gas sector has to be prepared for ongoing increasing emissions actions from the Liberals. (i) On Thursday, the IEA released its >260-pg report on “Canada 2022: Energy Policy Review”. [\[LINK\]](#) We expect to write on details in the report over the coming months. (ii) A must read is the foreword written by Canada’s Natural Resources Minister Wilkinson. This is the one place where Canada decides what its message to the world on Canada’s energy in the IEA report. This is their message to the world. (iii) Think what Wilkinson could have said to the world about Canada vs what he said. No one would know from Wilkinson that Canada is a major oil and gas exporter or that its oil and gas sector has a plan to move to Net Zero. (iv) Rather, reading the Wilkinson reminds us of the Trudeau comments post the G7 press conference, when Trudeau was asked about the oil sands pathway to net zero, Trudeau didn’t even acknowledge there was such a thing. Interestingly, IEA Executive Director Faith Birol’s foreword at least notes the oil sands commitment to reduce emissions. But Wilkinson makes zero acknowledgement of the oil sands pathway to Net Zero or that the Cdn oil and gas sector is doing anything voluntarily to reduce emissions. Rather his foreword is all about what the Liberals are “requiring” ie. “requiring the oil and gas sector to be net-zero by 2050 and setting interim five-year targets; • requiring oil and gas companies to reduce methane emissions by at least 75 percent below 2012 levels by 2030”. This is the way the Liberals have chosen to message to the world about the oil and gas sector in their one place to include a message in the IEA report. (v) Note the reminder on the interim 5-yr targets for oil and gas emissions. See below item on what we have previously written. This is the item that is coming by March 31, 2022. (vi) One other thing that jumps to mind, probably because we hadn’t noticed this priority before. Wilkinson starts off his foreword “The twin crises of climate change and biodiversity loss pose enormous threats to long term global security and economic well-being around the world”. We don’t recall biodiversity loss being up there, but it may well have been. This is interesting. And it also links to the concept of reforestation and protecting forests. Or at least we think it

**Liberals IEA message**

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can, which we believe should be an opportunity for oil and gas and mining. Our Supplemental Documents package includes the Wilkinson foreword.

### **Liberals hard targets for oil & gas emissions reductions coming by Mar 31**

*Here is what we wrote in the Dec 12, 2021 Energy Tidbits. “The oil and gas sector will know in the next few months what are the hard targets the Liberals are setting for emissions reductions for 2025. Don’t forget the Liberals are now legally obligated to check on a year basis that they are on track to hit those hard targets. This is our big concern that the worst is still to come for the oil and gas sector. The Liberals Friday afternoon Dec 3 press release didn’t get any coverage so we didn’t see it until we did our Sunday afternoon what did we miss search of websites. We take advantage of NFL football for a leisurely afternoon of searching news. And that is when we saw the Liberals Dec 3 release “Canada to launch consultations on new climate commitments this month, establish Emissions Reduction Plan by the end of March 2022”. [\[LINK\]](#) (i) ERP is the 2030 Emissions Reduction Plan. Liberals confirmed it will be established by March 31, 2022. This is the plan will set the emissions reductions targets for the oil and gas sector including the 5 year targets for the pace and scale needed to keep the oil and gas sector on track to be net zero by 2030. They previously announced the first hard target is 2025 for how much emission reductions are needed to keep the oil and gas sector on track. This all links to the Canadian Net-Zero Emissions Accountability Act, which also included that there will be yearly checks to make sure they are on track for the 5-yr targets. This remains our big concern – reductions are needed right away. (ii) This progress tracking will be made even stricter. The release said “Canada’s 2030 Emissions Reduction Plan is the first of many requirements under the Canadian Net-Zero Emissions Accountability Act. The Government of Canada is considering more formal, ongoing, and consistent engagement processes for the establishment of future emissions reduction targets, plans, and reports.” (iii) Note the classic political speak saying something that sounds sincere that, in reality, means nothing. “The ERP will be informed by early consultations on these new commitments.” They will be doing a lot of consultations. But all this means is that they will consult and “be informed”. All it does is to tick the box that they consulted and didn’t just drive thru what they wanted without consulting. (iv) Positive for CCS. They don’t say it, but that is the likely interpretation that they need or CCS. The Liberals are talking about “net-zero emitting electricity” vs “non-emitting electricity”. There was what looks like a different position in Trudeau’s COP26 speech that we did not highlight but jumped out in the Friday release. On Friday, the Liberals said “At COP26 in Glasgow in November 2021, Prime Minister Trudeau announced on the world stage Canada’s commitment to cap and cut emissions from the oil and gas sector and to achieve net-zero emitting electricity in Canada by 2035.” This was shift from their June 11 policy statement [\[LINK\]](#) that said “Canada’s electricity grid is over 80% emissions-free—one of the cleanest in the world—and is on track to meet its goal of having 90% non-emitting electricity generation by 2030.” (v) This release came out on Friday so ahead of the Environment Minister Guilbeault meeting in Calgary with big oil and gas companies. If you haven’t heard Guilbeault’s interviews, it’s worth doing so. He is very smooth at saying things that sound accommodative to industry but, if you listen closely, he does stick to his strong climate views. So if you look at the Friday release, we saw some*

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*of this smooth set up in the Friday release as we think this is one of the first Liberal releases (or maybe the first) that they acknowledged the oil sands efforts. The release said “Many of Canada’s oil and gas producers have made their own net-zero commitments. Canadian Natural Resources, Cenovus Energy, Imperial, MEG Energy, and Suncor Energy—collectively accounting for around 90 percent of Canada’s oil sands production—have each committed to achieving net-zero emissions from their oil sands operations by 2050.” Our Supplemental Documents package includes the Liberals release. “*

### **Trudeau’s post G7 refusal to acknowledge oil sands pathway to Net Zero**

No one should be surprised that Wilkinson did not even acknowledge the oil sands pathway to Net Zero. If his boss refused to acknowledge it at the G7, it would be naïve to assume Wilkinson would do so in his message to the world. And as everyone knows, the boss calls all the shots in politics. Yes, Mr. Prime Minister. Here is what we wrote in our June 20, 2021 Energy Tidbits. *“We are surprised that Alberta or the Cdn oil patch didn’t at least criticize Trudeau, let alone raise up their arms, after hearing Trudeau’s post G7 press conference. Our immediate reaction after hearing Trudeau was that this is not good and it is foretelling bad news to come from the Liberals. Last Sunday, we tweeted [\[LINK\]](#) “#OilSands. Note #Trudeau wouldn’t even acknowledge the oil sands pathways to net zero, or say positive move but need to do more or move faster. not a good sign. have to worry it links to prior tweet #G7 May 21 warning re stranded assets risk. #OOTT” Trudeau is asked point blank on the new oil sands Net Zero by 2050 pathway and its good enough as a lot it is based on technology not yet available in scale and on sequestration. He gives a lengthy answer that doesn’t even acknowledge the oil sands pathway, let alone whether it is good enough or realistic. No question he is ducking even any acknowledgement that it exists, which would seem to signal that he is not interesting in trying to work with that plan in any way. This seems to signal something tougher is coming. Politicians of all stripes never miss an opportunity to take credit for driving change. In reality, this was a lay up question for Trudeau to do so. He could have easily said I am glad the oil sands listened to what I am trying to build for Canada, they have jumped on board committing to a pathway to Net Zero by 2050, it’s a good start but they need to move even faster and my government will be working with them to get them to be even more ambitious. But he didn’t, rather he refused to even acknowledge any pathway to Net Zero existed. Clearly not a good sign.”*

### **Energy Transition – Deloitte, Most Americans won’t pay >\$500 vs ICE to buy an EV**

This week, Deloitte posted its 2022 Global Automotive Consumer Study [\[LINK\]](#). We recommend reading the survey as it gives automotive perspectives from different regions of the world. Deloitte says *“From September through October 2021, Deloitte surveyed more than 26,000 consumers in 25 countries to explore opinions regarding a variety of critical issues impacting the automotive sector, including the development of advanced technologies.”* (i) Based on the survey, it’s hard to see how EVs can have broad penetration across all income groups unless they are priced to the consumer after subsidies at basically the same price as ICE vehicles. On Thursday, we tweeted [\[LINK\]](#) *“53% of US won’t pay >\$500 for alternative engine solutions (#EVs), 69% prefer ICE vs 5% EVs for next vehicle. It’s why EVs are still mostly for higher income & need even bigger subsidies. Much more in*

**Deloitte global car consumer study**

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@Deloitte 2022 Global Automotive Consumer Study. Thx @KarenBowman #OOTT". (ii) Our tweet referenced US survey results that 53% won't pay >\$500 for alternative engine solutions (EVs) and that 69% prefer ICE vehicles for their next car purchase vs 5% for EVs. (iii) It isn't clear why they picked >\$500 as that seems very close to no difference in price even on a US\$30,000 car price. We have to believe the 53% would be way higher if they had used a \$1,000 or \$2,000 or whatever marker. And when it's that close a price, it seems like the interpretation is that there can't be a price difference. (iv) Deloitte's first takeaway from the survey was "Willingness to pay for advanced tech remains limited. A majority of consumers are unwilling to pay more for advanced technologies in most global markets as they have been trained to expect new vehicle features as a cost of doing business for brands looking to differentiate themselves from their competitors." (v) Deloitte's second takeaway was "Interest in EVs driven by lower running costs and better experience. Consumer interest in electrified vehicles (EVs) centers on the perception of lower fuel costs, environmental consciousness, and a better driving experience. However, driving range and lack of available charging infrastructure remain barriers to adoption." (vi) No surprise, Deloitte wrote "Consumers who said they are not considering an EV as their next vehicle cited range anxiety and a lack of public charging infrastructure as their biggest concerns." The third rated concern was generally cost/price premium. (vii) There is much more in the survey. Our Supplemental Documents package includes excerpts from the survey.

Figure 42: % of consumers unwilling to pay more than US\$500 for advanced tech in cars

Advanced technology category	US	Germany	Japan	Rep. of Korea	China	India	Southeast Asia <sup>1</sup>
Safety	56%	70%	66%	58%	31%	48%	59%
Connectivity	65%	77%	83%	72%	39%	48%	65%
Infotainment	69%	82%	86%	78%	39%	57%	72%
Autonomy	61%	69%	56%	42%	31%	37%	48%
Alternative engine solutions	53%	56%	57%	41%	31%	35%	46%
Unwilling to pay more than...	\$500	€400	¥50,000	₩500,000	¥2,500	₹25,000	Local currencies <sup>2</sup>

Source: Deloitte

### EV buyers are mostly higher income people

Our Thursday tweet on the Deloitte survey included our reminder that EV buyers are mostly higher income people. Our Dec 12, 2021 Energy Tidbits noted this, when we wrote "The reality is that EVs are the most visible component to reducing emissions and the assumption is that EVs will move from something higher income people own to a broad adoption from middle and even lower income groups. On Friday, we asked the question via a tweet [\[LINK\]](#) "Would there be any new car #EV purchases by <\$50k or <\$75k income if there weren't purchase incentives? what will it take and how long will it take to get these groups to increase new EV purchases and not new ICE purchases and used car purchases? #OOTT." Our tweet included the recent

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Hedge & Company “New Car Buyer Demographics 2022 (Updated)” data [\[LINK\]](#). This is the challenge, there are economic incentives to buy EVs in all states, yet it's hard for new EV sales to penetrate less than \$100,000 income groups. Hedges & Company estimates 60% of the new EV buyers have household income >\$100,000. There is going to have to be increased regulatory/economic incentives for EVs to penetrate other income groups if EV penetration is going to grow as quickly as NetZero aspirations. And the other reality is that there will be increasing regulatory/economic costs assigned to ICE vehicles. Our Supplemental Documents package includes the Hedge & Company update. “

Figure 43: New Battery Electric Vehicle Buyers by Household Income

Under \$50,000	20%
\$50,000 to \$74,999	16%
\$75,000 to \$99,000	4%
\$100,000 and up	60%

Source: Hedges & Company

### Energy Transition – EV sales likely to be affected by cost of lithium in 2022

The reality is that all car prices are going up, but it seems like there will be a bigger relative price increase for EVs. Given what we just saw in the Deloitte survey above, we have to believe the increasing relative prices of EVs will keep EV buyers in the higher income groups. On Thursday, Rystad reported [\[LINK\]](#) that EV producers and suppliers could face major headaches as the cost of battery-grade lithium is set to increase in 2022. Lithium is an essential material for EV batteries and the price is forecasted to increase by 50% within a year. Prices of lithium are already trading at \$35/kg in Asia and are likely to reach \$50/kg in 2H22. Chinese producers are hesitant to sell lithium salts on the spot market due to constraints caused by a slowdown in lithium carbonate production in Qinghai province in recent months. The report noted “Interest in lithium iron phosphate (LFP) batteries has taken off among manufacturers since early 2021. Rystad Energy therefore expects the supply of lithium salts to remain tight through the first half of 2022 at least, due to lagging production in China and South America. Producers appear reluctant to sell significant volumes on the spot market, as supply constraints and the ongoing logistical issues caused by the pandemic create bottlenecks in the trading market for lithium salts.” We expect the price increase to have a significant effect on EV sales as it will hurt the chance for broad EV buying, unless there are increased incentives in purchasing EVs. Our Supplemental Documents package includes the Rystad release.

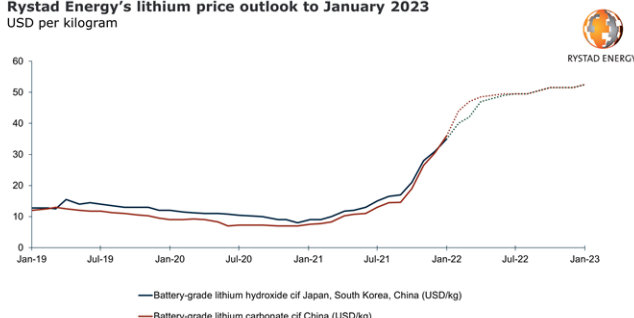
**Lithium prices to hurt EV sales in 2022**

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Figure 44: Lithium Price Outlook Through 2023

Rystad Energy's lithium price outlook to January 2023  
USD per kilogram



Source: Rystad

### Energy Transition – Maersk orders 4 more ships that can run on methanol or fuel oil

On Monday, Bloomberg reported “Maersk Orders Four More Ships to Run on Methanol Maersk will take delivery of four large container vessels from Hyundai Heavy Industries, the firm said in a statement. \* Ships will be able to run on carbon-neutral methanol and will be delivered in 2025 \*\* Four ships are in addition to eight similar vessels the firm had already ordered.” Bloomberg said these are similar vessels to the 8 already ordered. That is the key disclosure in the report – these ships are similar to the 8 ordered in August, Our Aug 29, 2021 Energy Tidbits highlighted that original 8 ship announcement and a big part of that announcement was that these ships are dual fuel ships that can run on methanol and also regular fuel oil. They are not ships that run only on methanol. On Monday, we tweeted [\[LINK\]](#) “#Maersk orders 4 more dual fuel (#Methanol & fuel oil) ships reports @JWittels. Remember why dual fuel? note 08/24 below release - sourcing enough “proper carbon neutral methanol” from day 1 will be “challenging”. #Oil will be needed for longer than #NetZero aspirations. #OOTT.” Our Supplemental Documents package includes the Bloomberg report.

Maersk’s new carbon neutral tankers

### Maersk warned it will be challenging to source enough methanol

The reason why we highlighted the dual fuel aspect is because of the warning from Maersk’s original Aug 23 announcement. In our Aug 29, 2021 Energy Tidbits, we wrote “On Tuesday, Maersk made a major announcement “A.P. Moller - Maersk accelerates fleet decarbonisation with 8 large ocean-going vessels to operate on carbon neutral methanol” [\[LINK\]](#). The announcement received major Net Zero kudos as, in Q1/2024, they plan to introduce “the first in a groundbreaking series of 8 large ocean-going container vessels capable of being operated on carbon neutral methanol. The vessels will be built by Hyundai Heavy Industries (HHI) and have a nominal capacity of approx. 16,000 containers (Twenty Foot Equivalent - TEU). The agreement with HHI includes an option for 4 additional vessels in 2025. The series will replace older vessels, generating annual CO2 emissions savings of around 1 million tonnes. As an industry first, the vessels will offer Maersk customers truly carbon neutral transportation at scale on the high seas.” No question these new vessels have the potential to be significant to the reducing emissions. However, we were surprised that it seemed like the caveats to the Maersk announcement were either overlooked or just didn’t want to be heard by the Net Zero side. Its why we

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tweeted [\[LINK\]](#) “#Maersk orders 8 container vessels "capable" of operating on #Carboneutral #methanol. however vessels have "dual fuel engine setup" so can run on conventional low sulphur fuel oil as sourcing enough "proper carbon neutral methanol" from day 1 will be "challenging" #OOTT”. Maersk gave some very clear caveats to the use of the carbon neutral methanol vessels. The same press release said “the vessels come with a dual fuel engine setup. Additional capital expenditure (CAPEX) for the dual fuel capability, which enables operation on methanol as well as conventional low Sulphur fuel, will be in the range of 10-15% of the total price” And “Maersk will operate the vessels on carbon neutral e-methanol or sustainable bio-methanol as soon as possible. Sourcing an adequate amount of carbon neutral methanol from day one in service will be challenging, as it requires a significant production ramp up of proper carbon neutral methanol production, for which Maersk continues to engage in partnerships and collaborations with relevant players.” This sounds like Maersk will be operating the new vessels using conventional low sulphur fuel for some period. Our Supplemental Documents package includes the Maersk announcement. “

### Capital Markets – RJ sees long only interest in E&P calls now 7/8 to 1 vs hedge funds

Last week's (Jan 9, 2022) Energy Tidbits highlighted the Morningstar report “10 Top Performing Canadian Mutual Funds in 2021” [\[LINK\]](#) and the huge returns of the top 2 performing funds in 2021 that focus on E&P stocks – Eric Nuttall of Ninepoint and Rafi Tahmazian of Canoe. Eric's Ninepoint Energy Series D had a 138.18% return to Dec 8. That's a fund return, not a single fluke stock return. Rafi was #2 with a 89.79% return to Dec 8 in his Canoe Energy Portfolio Class F. Being early in E&P was a huge win for Ninepoint and Canoe because they were the big winners as generalist money started to come back to the E&P stocks. This week, the Raymond James team gave some insight on the return of long only generalists to E&P stocks that was likely a key reason for the Ninepoint and Canoe huge years. On Friday, we tweeted [\[LINK\]](#) “Positive for E&P stocks. Generalist interest in E&Ps has completely flipped on its head. Pre-Covid, 6 or 7 to 1 ratio hedge funds to long only interest. This yr, it's 7 or 8 to 1 ratio long only generalists vs hedge funds. Thx @RaymondJames John.Freeman @RaymondJames.com #OOTT.” We created a transcript of John Freeman's response to the question on inbound interest from generalist institutional investors. Freeman said “on the E&P side, it's been a pretty dramatic change. Pre-Covid, probably like a 6 to 1, 7 to 1 ratio hedge fund to long only interest in my sector. That's completely flipped on its head, this year it's probably 7 or 8 to 1 ratio, long only generalists money vs hedge fund incoming calls that I get. The majority of those incoming calls on the long only side are value investors.”

Long only  
interest in E&P

### Capital Markets – Record Calgary office vacancy despite high oil/gas prices

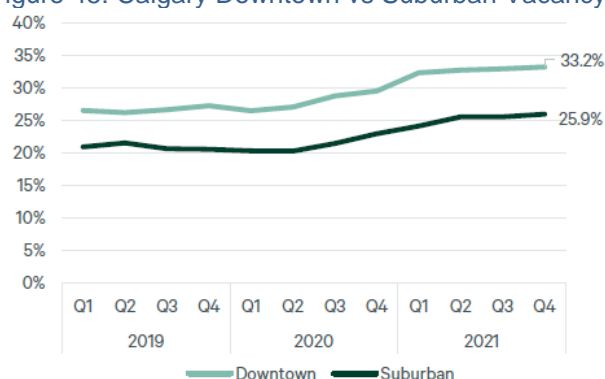
There was a good indirect reminder this week on how different oil and gas is in the 2020s vs all prior cycles. In all prior cycles, high oil and natural gas prices, especially with an outlook for multi-year strong prices, would have led to quick and big increase in capex. And the big capex would signal strong multi year oil and gas production growth. The way to higher stock prices was growth. And big spending and big growth would lead to more hiring and more office space. Not this time. There probably are very few people who would think that very high oil and gas prices would see record Calgary office vacancy. This week, CBRE released their Canadian Office market report for Q4 2021 [\[LINK\]](#). Vacancy rates in Canada saw a

Record Calgary  
office vacancy

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minor increase of 10 basis points to 15.8%, marking the smallest quarterly increase since the onset of the pandemic. The suburban market posted a modest recovery while downtown markets saw new office supply outpace net absorption, remaining at a vacancy rate of 15.8%. Toronto Vancouver and Ottawa all noted vacancy rate declines. Net absorption was highest in the Toronto, Vancouver, and Ottawa markets, where the delivery of new office towers with high levels of pre-leasing played a key role in boosting occupancy gains. In all, Canada recorded 2.4 million sq. ft. of new supply in the fourth quarter, of which 70.0% was pre-leased upon completion. Calgary continues to note high vacancy rates in both downtown and suburban buildings. Downtown has a 33.2% vacancy rate while Suburban offices are sitting at 25.9% at the end of Q4 2021 despite the strong oil and gas prices to close out the year. Further M&A activity in the energy sector is expected as we exit the downturn and commodity prices stabilize. An uptick in asset sales by major oil and gas firms is expected as foreign companies looking to exit Canada capitalize on improved pricing. Our Supplemental Documents package includes excerpts from the CBRE report.

Figure 45: Calgary Downtown vs Suburban Vacancy Rates



Source: CBRE

**Demographics – Top 1% in Canada Net Wealth Threshold was \$6.3mm in 2019**

In December, the Office of the Parliamentary Budget Officer posted its report “*Estimating the Top Tail of the Family Wealth Distribution in Canada: Updates and Trends*” [\[LINK\]](#), which, based on 2019 data, provides the Family Net Wealth levels for the different percentiles in Canada. The PBO estimates the Family Net Wealth Threshold to be in the top 10% to be 1.5917 million families with \$1.6 million, the top 1% to be 160.6 thousand families with \$6.3 million, the top 0.1% to be 16.0 thousand families with \$28.8 million, and the top 0.01% to be 1.6 thousand families with \$129.5 million. This is 2019 data, and we would have expected to see higher thresholds for each group. We are also surprised that the share of total net worth by the top 0.01% wasn’t higher than 5.0% of total net wealth. We mustn’t have as many super rich people in Canada. Our Supplemental Documents package includes excerpts from the PBO report.

**\$6.3mm wealth to be in the top 1%**

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Figure 46: Family Net Wealth distribution

Percentile of family net wealth	Net wealth threshold (\$ millions)	Number of families (thousands)	Total net wealth (\$ billions)	Share of total net wealth (per cent)
Top 0.01%	129.5	1.6	583	5.0
Top 0.1%	28.8	16.0	1,309	11.2
Top 0.5%	9.9	80.2	2,285	19.5
Top 1%	6.3	160.6	2,903	24.8
Top 5%	2.4	800.4	5,088	43.5
Top 10%	1.6	1,591.7	6,653	56.9
Top 20%	1.0	3,183.7	8,643	73.9
Middle 40%	0.1-1.0	6,365.6	2,931	25.1
Bottom 40%	under 0.1	6,365.7	123	1.1

Source: PBO High-net-worth Family Database

Source: PBO

### Demographics – Book reading didn't go up much more during Covid

On Thursday, Pew Research posted its blog “Three-in-ten Americans now read e-books” [\[LINK\]](#), but it was based on survey results a year ago, from Jan 25 to Feb 8, 2021. The headline is the focus “Americans are spreading their book consumption across several formats. The share of adults who have read print books in the past 12 months still outpaces the share using other forms, but 30% now say they have read an e-book in that time frame.” At first, the part that seemed to surprise was that the % of Americans reading books hasn't really changed much over the past decade and only went up a little bit during Covid. Pew wrote “Overall, 75% of U.S. adults say they have read a book in the past 12 months in any format, whether completely or part way through, a figure that has remained largely unchanged since 2011”. But it makes sense that the % hasn't changed much as it is already high at 75% and the reality is that 25% or so that don't read books just aren't book readers and weren't likely to start during Covid.

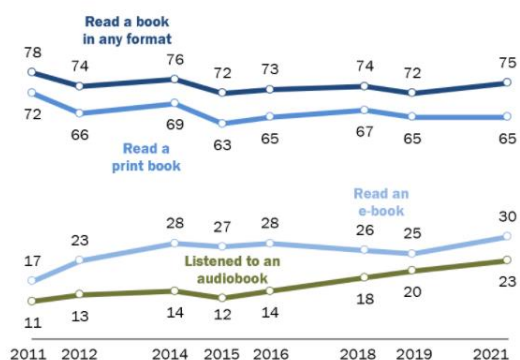
**~75% of  
Americans are  
book readers**

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Figure 47: Survey of Americans book reading

**Print books continue to be more popular than e-books or audiobooks**

% of U.S. adults who say they have \_\_\_\_ in the previous 12 months



Note: Those who did not give an answer are not shown.  
Source: Survey conducted Jan. 25-Feb. 8, 2021.

PEW RESEARCH CENTER

Source: Pew Research

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

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

**@Energy\_Tidbits  
on Twitter**

**LinkedIn – Look for quick energy items from me on LinkedIn**

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

**Look for energy  
items on LinkedIn**

**Misc Facts and Figures.**

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

**Classic Matt Damon “Rounders” quote**

Was listening to Good Morning Football on Tuesday or Wednesday and they were the new wave of head coaching interviews/hiring, how some are better in interviews so can sell themselves better and perhaps get hired over the better candidate especially as the decision makers are the owners who really aren't football people. We know its not exactly the same but, for some reason, the thought that came to

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mind was the classic Matt Damon “Rounders” 1998 line “Listen, here's the thing. If you can't spot the sucker in your first half hour at the table, then you are the sucker.”

### **Australia Deputy Prime Minister on not allowing Novak Djokovic to stay**

Earlier this morning, the Australian Open tweeted [\[LINK\]](#) that it “respects the decision of the Federal Court. As per Grand Slam rules, the No. 1 position in the draw has been filled by a Lucky Loser”. Grand Slam rules “Lucky Losers are those players who have lost in the final round of the Qualifying competition or, if more Lucky Losers are required, those players who have lost in the previous qualifying rounds. Lucky Losers shall be selected based on the computer rankings used for the determination of qualifying seedings as follows:” As usual, it's Australia's Deputy Prime Minister Barnaby Joyce who has the best comments on not allowing Djokovic to stay. On Thursday, Joyce said “I think, you have to be frank; the vast majority of Australians said [they] didn't like the idea that another individual, whether they're a tennis player or the king of Spain or the queen of England, can come up here and have a different set of rules to what everybody else has to deal with.” We haven't quoted him since our July 25, 2021 Energy Tidbits with his comments on not giving a blank check on Net Zero emissions program until he knows what is to be done. At that time, we created this transcript. ABC “will you support any sort of Net Zero by 2050 emissions target?”. Joyce “well this question is put up, just here beside me is the Walcha hotel and in the Walcha hotel they have a restaurant. Now, generally how restaurants work is you go in and get a menu and they have got what's on the menu for lunch and what the price is. Now that is how a competent decision is made and that's what we're looking for. What's on the menu and what the price is.” what the labor party's approach is from what I see is they don't care”.

### **Bill Parcels reminder rarely if ever do things end the way you want**

When I listen to sports people talk about sports, I can't help but think some of the advice would be good to businesses where there are very high income earners or where there are cash windfalls. Early Monday morning, Scott Pioli (former NFL exec) was on GMFB talking about the human aspect of what was to come on Black Monday with the expected head coach and GM firings. He said he always remembers advice that Bill Parcels gave him, rarely if ever do things end the way you want referring to NFL firings. I always think back to how people made huge money in the 2000s in the market and how some just thought it was a reinforcement that it was relatively easy to do and that it would continue indefinitely. The thought never crossed their mind that it might not end the way they wanted or assumed.

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