SAF GROUP

Energy Tidbits

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US Gives Chevron Go-Ahead to Restart Venezuela Oil Production and Import to Its Gulf Coast Refinery

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. Our target is to write on 48 to 50 weekends per year and to post by noon MT on Sunday. The Sunday noon timing was because PMs said they didn't have research to read on Sundays and Sundays are a day when they start to think about the investing week ahead.

This week's memo highlights:

1. US gives go-ahead for Chevron to import needed goods/inputs incl diluent, diesel to restart its Venezuela oil production and import that crude to its Gulf Coast refinery (Click Here)

2. Increasing China restrictions/lockdowns to fight increasing Covid cases (Click Here)

3. EU still not able to agree on either a Russia oil price cap or Europe natural gas price cap (Click Here)

4. Saudi, UAE, Kuwait, Iraq and others deny WSJ report that they have been discussing a 500,000 b/d increase for Dec 4 OPEC+ meeting (Click Here)

5. BP 160,000 b/d Toledo refinery that processes Cdn crude looks to be offline until late Q1/23. (Click Here)

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

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

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YoY storage at -62 bcf YoY deficit

Natural Gas – Natural gas draw of -80 bcf, storage now -62 bcf YoY deficit

We should see a return to widening the YoY deficit in gas storage primarily because last Nov and Dec were hot. This winter started with a YoY storage deficit of -101 bcf YoY on Oct 28 but had flipped to a +4 bcf YoY surplus for last week's Nov 11 storage data. This week is is back to a -62 bcf YoY deficit. The EIA reported a -80 bcf draw (-88 bcf expectations) for the Nov 18 week, which were much larger draws vs both the 5-yr average of a -48 bcf draw, and last year's draw of -21 bcf. Storage is 3.564 tcf as of Nov 18, with a now YoY deficit of -62 bcf YoY vs +4 bcf YoY surplus last week and is -39 bcf below the 5-year average vs -7 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (11/18/21)		5-year average (2017-21)	
Region	11/18/22	11/11/22	net change	implied flow	Bcf	% change	Bcf	% change
East	866	882	-16	-16	891	-2.8	883	-1.9
Midwest	1,063	1,084	-21	-21	1,068	-0.5	1,061	0.2
Mountain	203	208	-5	-5	210	-3.3	210	-3.3
Pacific	232	241	-9	-9	262	-11.5	289	-19.7
South Central	1,200	1,228	-28	-28	1,196	0.3	1,160	3.4
Salt	318	327	-9	-9	337	-5.6	317	0.3
Nonsalt	882	901	-19	-19	859	2.7	843	4.6
Total	3,564	3,644	-80	-80	3,626	-1.7	3,603	-1.1

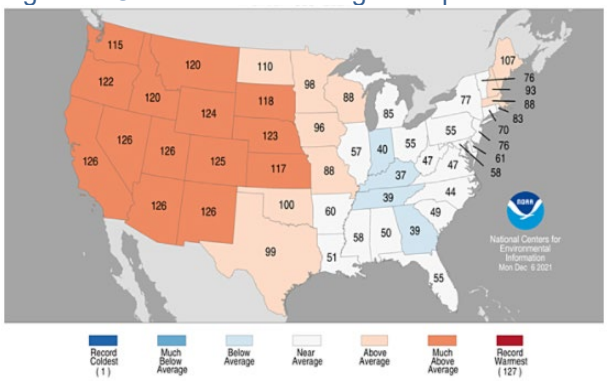
Source: EIA

Dec 2021 was the hottest on record

Natural Gas – Nov 2021 was 7th hottest Nov, and Dec 2021 was the #1 hottest Dec

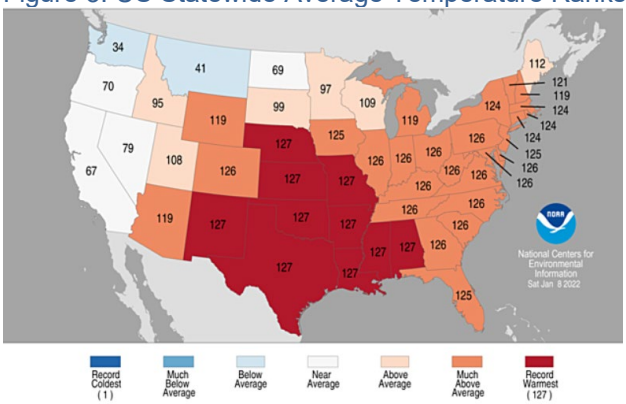
As noted above, we should see a widening of the YoY deficit in storage over the balance of 2022, but that will be driven by the fact that Nov 2021 and Dec 2021 were very hot. (i) Our Dec 19, 2021 Energy Tidbits memo noted NOAA's recap of Nov 2021 climate that showed Nov 2021 was the 7th hottest ion the last 127 years. [LINK]. The average temperature across all Lwer 48 states was 45.2 degrees F, 3.5 degrees F above the 20th century average for November (ii) Our Jan 16, 2022 energy Tidbits memo noted NOAA's recap of Dec 2021 climate that showed Dec 2021 was the hottest Dec in the last 127 years. [LINK]. The average temperatures across all Lower 48 states was 39.3 degrees F, 6.7 degrees F above the 20th century average for December. Below are the NOAA graphics for the state average temperature ranks for Nov 2021 and Dec 2021.

Figure 2: US Statewide Average Temperature Ranks November 2021



Source: NOAA

Figure 3: US Statewide Average Temperature Ranks December 2021



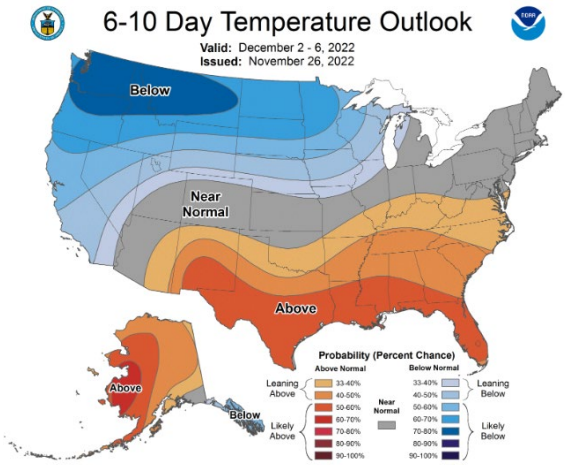
Source: NOAA

Natural Gas – Decent natural gas weather expected for 1st half of Dec in northern US

NOAA 6-10 & 8-14 day temp outlook

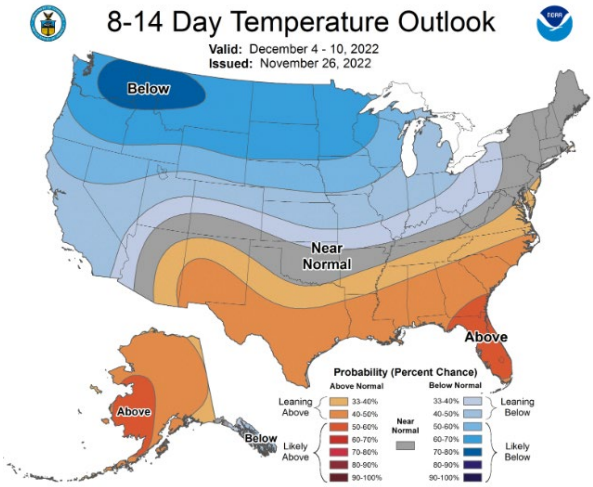
The short term weather forecasts have been reasonably solid. Yesterday, we tweeted [LINK] "*Looks like decent temperature outlook for #NatGas for first half of Dec. North half of Lower 48 expected to see normal to colder-than-normal temps. @NOAA's updated 6-10 day and 8-14 day outlook. #OOTT."* Below are NOAA's 6-10 day and 8-14 day temperature outlooks as of yesterday afternoon.

Figure 4: NOAA 6-10 day temperature outlook as of Nov 26



Source: NOAA

Figure 5: NOAA 8-14 day temperature outlook as of Nov 26



Source: NOAA

Natural Gas – Coastal GasLink pipeline mechanical-in-service in 12 months

Coastal GasLink mechanical in-service by end of 2023

Later in the memo, we review CAOEC's 2022 Cdn wells drilled forecast, which included the statement "*In 2023, tailwinds are expected with the completion of the Trans Mountain Expansion Project, a pipeline that will add 590,000 barrels per day to the market. Coastal GasLink is also anticipated to reach mechanical completion by the end of 2023, a project that will safely deliver natural gas to the first LNG export facility in Canada's history, LNG Canada.*" We continue to believe that an unappreciated major Cdn natural gas event is the start up of Alberta/BC natural gas to be supplied to the LNG Canada's Phase 1 LNG export project with 1.8 bcf/d capacity. One of the questions we ask investors is do you realize TC Energy's 2.1 bcf/d Coastal GasLink pipeline is on track for mechanical in-service in 12

months? Coastal GasLink is the new pipeline that is to bring gas for LNG Canada's 1.8 bcf/d Phase 1 LNG export that is supposed to deliver first LNG cargos by the middle of the decade. Most don't realize that Coastal GasLink is on track by the end of 2021 ie. 12 months away. Our Nov 13, 2022 Energy Tidbits memo highlighted TC Energy's Q3 call and how they were on track for mechanical in-services by the end of 2023. Shell and LNG Canada have not publicly committed to any firm start date for first LNG cargos to Asia. But have consistently said first LNG cargos would be by the middle of this decade. We have always interpreted this to mean before 2025 ie. sometime in 2024. From a natural gas supply perspective, it looks like Coastal GasLink would supply the natural gas to enable a potential early 2023 start of LNG exports assuming the LNG export facility is operational. This is for Phase 1 alone. We have consistently stated our expectation for a near term FID of LNG Canada Phase 2, which would add another 1.8 bcf/d of LNG export capacity for a total of 3.6 bcf/d.

LNG Canada Phase 1 sets up Cdn supply squeeze like in the US today

We don't believe most appreciate the significance of the 1.8 bcf/d LNG Canada Phase 1 is to BC/Alberta natural gas. Here is what we wrote in our June 12, 2022 Energy Tidbits memo. "*Yesterday, we also tweeted [LINK] a reminder that the under construction LNG Canada Phase 1 of 1.8 bcf/d sets up a similar natural gas supply squeeze as being seen today in the US. And this is just from the under construction LNG Canada Phase 1. We tweeted "#LNGCanada Phase 1 is 1.8 bcfd already sets up Cdn #NatGas supply squeeze like in US. >10% of BC/AB #NatGas supply 16 bcfd ie. like US #LNG exports now ~12 bcfd vs ~100 bcfd total supply. LNG Canada Phase 2 adds another 1.8 bcfd. Cdn nat gas looks very good thru 2030. #OOTT". The US currently exports ~12 bcf/d vs total US natural gas supply of ~100 bcf/d. LNG Canada Phase 1 is 1.8 bcf/d vs BC/Alberta natural gas supply of ~16 bcf/d. The math is very similar. LNG Canada and Shell have never been specific on the exact timeline but have noted that they expect first LNG by the middle of this decade ie. inferring late 2024. And our tweet reminded that LNG Canada Phase 2 is another 1.8 bcf/d for a total of the two phases being 3.6 bcf/d.*

Figure 6: TC Energy Coast GasLink Now ~75% Complete

Source: TC Energy

Natural Gas – Long-term LNG deal, Sinopec/QatarEnergy sign a 27-year agreement

There haven't been many long-term LNG deals over the past few months because most supply capacity pre 2025 seems to be getting contracted. On Monday, Sinopec and QatarEnergy announced their new agreement which will span 27 years and ship 0.53 bcf/d [LINK]. The two parties first signed a 10-year Sales and Purchase Agreement in March 2021 where both parties agreed to a 0.27 bcf/d supply to China. This new agreement adds 0.53 bcf/d to take the total of two existing deals up to 0.80 bcf/d. Chairman of Sinopec, Dr. MA Yongsheng explains *"the signing of the long-term LNG SPA with QatarEnergy is a milestone and an important part of the integrated cooperation between the two sides on the NFE project. Qatar is the world's largest LNG supplier, and China is the world's largest LNG importer. The two countries share inherent complementarities and a good foundation for energy cooperation."* Saad Sherida Al-Kaabi, CEO of QatarEnergy also commented on the deal stating *"we are pleased to enter into this agreement, which will further solidify the excellent bilateral relations between the People's Republic of China and the State of Qatar and help meet China's growing energy needs. In addition, it opens a new and exciting chapter in our relationship with Sinopec, one that is very special and spans a number of different areas, and which we are excited about further growing and expanding into the 2050s."* Both QatarEnergy and Sinopec are state owned energy companies on the forefront of the majority of long-term LNG agreements. This included nine of 38 deals we have tracked since July 1, 2021. Our Supplemental Documents package includes the QatarEnergy release.

Asia is still well in front of Europe in securing long term LNG supply

Our March 13, 2022 Energy Tidbits memo noted that Europe LNG buyers were starting 9 months behind the wave of Asian LNG buyers who started to lock up long term LNG supply starting in July 2021. The LNG supply crunch is not a 2022 development. Rather, it was clear in H1/21 that there was a major sea change in LNG outlook. We turned very bullish on LNG outlook for the 2020s once TotalEnergies went force majeure on its Mozambique LNG in April 2021. We posted our April 28, 2021 blog *"Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?"* as we thought the market had overlooked that this force majeure backed up 5.0 bcf/d of Mozambique LNG that was originally planned to start in phases in 2024. And that this would create an earlier and larger LNG supply gap in the mid 2020s. Then we started to see validation of this view when Asian LNG buyers in July made an abrupt change to their LNG contracting and pivoted to trying to lock in long term LNG supply. On July 14, 2021 we posted our 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* Here is an excerpt from the blog "*The last 7 days has shown there is a sea change as Asian LNG buyers have made an abrupt change in their LNG contracting and are moving to lock in long term LNG supply. This is the complete opposite of what they were doing pre-Covid when they were trying to renegotiate Qatar LNG long term deals lower and moving away from long term deals to spot/short term sales. Why? We think they did the same math we did in our April 28 blog "Multiple Brownfield LNG FIDs Now Needed To Fill New LNG Supply Gap From Mozambique Chaos? How About LNG Canada Phase 2?" and saw a much*

bigger and sooner LNG supply gap driven by the delay of 5 bcf/d of Mozambique LNG that was built into most, if not all LNG supply forecasts. Asian LNG buyers are committing real dollars to long term LNG deals, which we believe is the best validation for the LNG supply gap. Another validation, Shell, Total and others are aggressively competing to invest long term capital to partner in Qatar Petroleum's massive 4.3 bcf/d LNG expansion despite plans to reduce fossil fuels production in the 2020s. And even more importantly to LNG suppliers, the return to long term LNG contracts provides the financing capacity to commit to brownfield LNG FIDs. The abrupt change by Asian LNG buyers to long term contracts is a game changer for LNG markets and sets the stage for brownfield LNG FIDs likely as soon as before year end 2021. It has to be brownfield LNG FIDs if the gap is coming bigger and sooner. And we return to our April 28 blog point, if brownfield LNG is needed, what about Shell looking at 1.8 bcf/d brownfield LNG Canada Phase 2? LNG Canada Phase 1 at 1.8 bcf/d capacity is already a material positive for Cdn natural gas producers. A FID on LNG Canada Phase 2 would be huge, meaning 3.6 bcf/d of Cdn natural gas will be tied to Asian LNG markets and not competing in the US against Henry Hub. And with a much shorter distance to Asian LNG markets. This is why we focus on global LNG markets for our views on the future value of Canadian natural gas." Our Supplemental Documents package includes our April and July blogs.

There have been 12.56 bcf/d of long-term LNG supply deals since July 1, 2021

We first highlighted this abrupt shift to long term LNG supply deals in our July 14, 2021 8-pg "*Asian LNG Buyers Abruptly Change and Lock in Long Term Supply – Validates Supply Gap, Provides Support For Brownfield LNG FIDs".* We included a table of the deals done in that short two week period. We continue to update that table, which now shows 12.56 bcf/d of long term LNG deals since July 1, 2021. 65% of the deals have been by Asian LNG buyers, but we are now seeing rest of world locking up long term supply deals post Russia/Ukraine. China has been particularly active in this space, accounting for 75% of all Asian LNG buyers in long term contracts since July 1, 2021. Below is our updated table of Asian and Europe LNG buyers new long term supply deals since July 1, 2021.

Figure 7: Long Term LNG Supply Deals since July 1, 2021

Long-Term LNG Buyer Deals Since July 1, 2021							
Date	Buyer	Seller	Country	Volume	Duration	Start	End
			Buyer / Seller	(bcf/d)	Years		
Asian LNG Deals							
Jul 7, 2021	CNOOC	Petronas	China / Canada	0.30	10.0	2022	2032
Jul 9, 2021	CPC	QatarEnergy	Taiwan / Qatar	0.16	15.0	2022	2037
Jul 9, 2021	Guangzhou Gas	BP	China / US	0.13	12.0	2022	2034
Jul 12, 2021	Korea Gas	QatarEnergy	Korea / Qatar	0.25	20.0	2025	2045
Sep 29, 2021	CNOOC	QatarEnergy	China / Qatar	0.50	15.0	2022	2037
Oct 7, 2021	Shenzhen	BP	China / US	0.04	10.0	2023	2032
Oct 11, 2021	ENN	Cheniere	China / US	0.12	13.0	2022	2035
Nov 4, 2021	Unipec	Venture Global LNG	China / US	0.46	20.0	2023	2043
Nov 4, 2021	Sinopec	Venture Global LNG	China / US	0.53	20.0	2023	2043
Nov 5, 2021	Sinochem	Cheniere	China / US	0.12	17.5	2022	2040
Nov 22, 2021	Foran	Cheniere	China / US	0.04	20.0	2023	2043
Dec 6, 2021	Guangdong Energy	QatarEnergy	China / Qatar	0.13	10.0	2024	2034
Dec 8, 2021	S&T International	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 10, 2021	Suntien Green Energy	QatarEnergy	China / Qatar	0.13	15.0	2022	2037
Dec 15, 2021	SPIC Guangdong	BP	China / US	0.03	10.0	2023	2033
Dec 20, 2021	CNOOC Gas & Power	Venture Global LNG	China / US	0.26	20.0	2023	2043
Dec 29, 2021	Foran	BP	China / US	0.01	10.0	2023	2032
Jan 11, 2022	ENN	Novatek	China / Russia	0.08	11.0	2024	2035
Jan 11, 2022	Zhejiang Energy	Novatek	China / Russia	0.13	15.0	2024	2039
Feb 4, 2022	CNPC	Gazprom	China / Russia	0.98	30.0	2023	2053
Mar 24, 2022	Guangdong Energy	NextDecade	China / US	0.20	20.0	2026	2046
Mar 29, 2022	ENN	Energy Transfer	China / US	0.36	20.0	2026	2046
Apr 1, 2022	Guangzhou Gas	Mexico Pacific Ltd	China / Mexico	0.26	20.0	n.a.	n.a.
Apr 6, 2022	ENN	NextDecade	China / US	0.20	20.0	2026	2026
Apr 22, 2022	Kogas	BP	Korea / US	0.20	18.0	2025	2043
May 2, 2022	Gunvor Singapore Pte	Energy Transfer LNG	Singapore / US	0.26	20.0	2026	2046
May 3, 2022	SK Gas Trading LLC	Energy Transfer LNG	Korea / US	0.05	18.0	2026	2042
May 10, 2022	Exxon Asia Pacific	Venture Global LNG	Singapore / US	0.26	n.a.	n.a.	n.a.
May 11, 2022	Petronas LNG	Venture Global LNG	Malaysia / US	0.13	20.0	n.a.	n.a.
May 24, 2022	Hanwha Energy	TotalEnergies	Korea / France	0.08	15.0	2024	2039
May 25, 2022	POSCO International	Cheniere	Korea / US	0.05	20.0	2026	2036
June 5, 2022	China Gas Holdings	Energy Transfer	China / US	0.09	25.0	2026	2051
Jul 5, 2022	China Gas Holdings	NextDecade	China / US	0.13	20.0	2027	2047
Jul 20, 2022	PetroChina	Cheniere	China / US	0.24	24.0	2026	2050
Jul 26, 2022	PTT Global	Cheniere	Thailand / US	0.13	20.0	2026	2046
Jul 27, 2022	Exxon Asia Pacific	NextDecade	Singapore / US	0.13	20.0	2026	2046
Sep 2, 2022	Woodside Singapore	Commonwealth	Singapore / US	0.33	20.0	2026	2046
Nov 21, 2022	Sinopec	QatarEnergy	China / Qatar	0.53	27.0	2026	2053
Total Asian LNG Buyers New Long Term Contracts Since Jul/21				**8.16**			
Non-Asian LNG Deals							
Jul 28, 2021	PGNiG	Venture Global LNG	Poland / US	0.26	20.0	2023	2043
Nov 12, 2021	Engie	Cheniere	France / US	0.11	20.0	2021	2041
Mar 7, 2022	Shell	Venture Global LNG	US / US	0.26	20.0	2024	2044
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
Mar 16, 2022	NFE	Venture Global LNG	US / US	0.13	20.0	2023	2043
May 2, 2022	Engie	NextDecade	France / US	0.23	15.0	2026	2041
May 17, 2022	PGNiG	Sempra Infrastructure	Poland / US	0.40	20.0	n.a.	n.a.
May 25, 2022	RWE Supply & Trading	Sempra Infrastructure	Germany / US	0.67	15.0	n.a.	n.a.
Jun 9, 2022	Equinor	Cheniere	Norway / US	0.23	15.0	2026	2041
Jun 21, 2022	EnBW	Venture Global LNG	Germany / US	0.20	20.0	2026	2046
Jun 22, 2022	INEOS Energy	Sempra Infrastructure	UK / US	0.18	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Venture Global LNG	US / US	0.26	20.0	n.a.	n.a.
Jun 22, 2022	Chevron	Cheniere	US / US	0.26	15.0	2027	2042
Jul 12, 2022	Shell	Mexico Pacific Ltd	US / Mexico	0.34	20.0	2026	2046
Jul 13, 2022	Vitol	Delfin Midstream	US / US	0.07	15.0	n.a.	n.a.
Aug 9, 2022	Centrica	Delfin Midstream	UK / US	0.13	15.0	2026	2041
Aug 24, 2022	Shell	Energy Transfer	US / US	0.28	20.0	2026	2046
Oct 6, 2022	EnBW	Venture Global LNG	Germany / US	0.26	20.0	2022	2042
Total Non-Asian LNG Buyers New Long Term Contracts Since Jul/21				**4.40**			
Total New Long Term LNG Contracts since Jul/21				**12.56**			
*Excludes Asian short term/spot deals							
*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							
Prepared by SAF Group https://safgroup.ca/news-insights/							

Source: Company reports, SAF Group

Natural Gas – Tokyo's wear a sweater to save on electricity campaign is on

Tokyo's formal wear a sweater push

Tokyo's wear a sweater to save electricity campaign is on. Last week's (Nov 20, 2022) Energy Tidbits memo noted the Nov 18 BBC reporting "*Wear turtlenecks to cut energy bills - Tokyo governor".* [LINK] BBC wrote "*The governor of Tokyo has urged city residents to wear turtleneck jumpers this winter to reduce energy consumption. Yuriko Koike said turtlenecks can be a tool to help reduce soaring energy bills. Workers at city hall will be told to set an example by adopting the jumper. The Japanese capital has been setting guidance for how to reduce energy use this winter amid precarious supply and rising prices. Officials at meetings on the issue have been seen side-by-side all wearing turtlenecks."* Last Saturday night, the Tokyo Metropolitan Government Bureau of Environment] on its Tokyo Zero Emi Point official account tweeted [LINK] "*Electricity #HTT "H reduce T create T store" Winter is approaching and it's getting colder, but before you turn on the heater at home, you can try something new, such as wearing a turtleneck or using a blanket or throw! #TokyoWarmHome."* The turn your thermostat to lower temperature and wear a sweater will be a common theme in most countries in Europe. It is an easy way to have major savings in electricity/natural gas consumption in the winter and really isn't that much of a sacrifice.

Brings back memories of Jimmy Carter in the 1970's

Above we say that really isn't that much of a sacrifice to wear a sweater. And it was something that was done in the 70s'. Anyone who lived in the US in the 1970s knows what the US did post the Arab Oil Embargo to cut energy consumption. We have referenced President Jimmy Carter many many times as being the leader for energy conservation and efficiency. And we are still surprised that Biden, being a new Senator when Carter was President, didn't put the no brainer energy conservation as the first priority for energy. The Tokyo Governor wear turtlenecks is a direct reminder of Jimmy Carter's ways to cut energy consumption. It brings back memories of Jimmy Carter's first address on taking office to the nation on Feb 2, 1977 on the energy crisis. The interview opens with the wide angle view of Carter in his cardigan with a burning fireplace. And a clear part of the Carter need to save energy consumption was turning down the thermostat in the winter to reduce how much oil was burnt for furnaces. Don't forget the push to natural gas was still in a relatively early stage in the 1970s.

Figure 8: Jimmy Carter Address to Nation Feb 2, 1977

Source: C-Span

Japan sees sold-out long term LNG supply

Natural Gas – Japan says long-term LNG supply before 2026 is sold out

No one should have been surprised to see Japan warn that long-term LNG supply deals with stable linked pricing are all sold out for years. This has been our key LNG and natural gas theme for 19 months. Note this is for LNG supply on track for cargos ion before 2026. On Monday, Bloomberg reported "*Global LNG Supplies Are 'Sold Out' for Years, Top Importer Warns. Japan warns that global competition for liquefied natural gas is set to intensify over the next three years due to an underinvestment in supply. Long-term LNG contracts that start before 2026 are sold out, according to a survey of Japanese companies conducted by the trade ministry and released Monday. These types of contracts are essential for buyers, as they offer stable pricing and reliable supply for many years."* And because there aren't any available index-linked long-term LNG supply before 2026, it means buyers are forced into the spot market. Bloomberg wrote "*but there is little new supply coming online before 2026. Meanwhile, Europe is racing to replace Russian pipeline gas with LNG, further exacerbating the global shortage of fuel. This means importers will be forced to depend more on the volatile and expensive spot market, which is currently trading nearly three times higher than long-term contracts. Roughly 30% of all LNG deliveries were via the spot market last year, according to the International Group of Liquefied Natural Gas Importers."* Our Supplemental Documents package includes the Bloomberg report.

Sold out long term LNG supply = lack of many recent long term deals

Earlier in the memo, we provided our updated table of long-term LNG deals locked up since July 1, 2021. The big rush to tie up available long term supply was done in H2/21 before Ukraine and then basically polished off to tie up any remaining long-term supply after Russia invaded Ukraine. But because there really isn't any long-term supply available in the next few years is why there haven't been many long-term deals in H2/22. On Wed, were asked for our updated LNG long-term deals excel and tweeted [LINK] "*See 👇 for our LNG long-term deal update, but not yet updated for Qatar/Sinopec deal. There haven't been many recent long-term deals because the Asians moved early to lock up all or almost all of pre 2025 LNG supply. That was the theme of our 07/14/21 Asian LNG blog.*"

Japan didn't worry about long term deals in Nov 2021, but changed in Dec 2021

A year ago, Japan didn't seem to have any concerns on long term LNG supply risk. In Nov 2021, Japan wasn't prepared to lock up long-term LNG supply. But that changed in Dec 2021 when JERA highlighted it was increasingly important to secure a stable supply of competitive LNG. Japan had passed on renewing a long term LNG supply deal with Qatar in November. (i) Our Dec 12, 2021 Energy Tidbits noted JERA's Dec 8, 2021 press release that it would acquire a 12.5% stake in the Barossa/Caldita gas field offshore NW Australia and will then participate in the field development. JERA is the world's largest LNG importer and its release reminded that "*Securing a stable supply of competitive LNG, therefore, is becoming increasingly important".* (ii) We also highlighted that this was an abrupt change from November, when JERA decided to not renew the most stable supply of competitive LNG – Qatar. We then wrote "*JERA's press release noting that "Securing a stable supply of competitive LNG, therefore, is becoming increasingly important" reminds of an item*

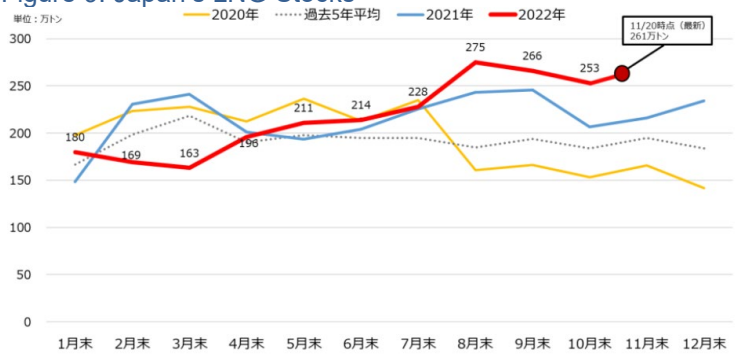
from our Nov 28, 2021 Energy Tidbits, when reports came of JERA not renewing a 0.7 bcf/d long term supply deal with Qatar. At that time we wrote "Is Qatar looking for tougher deals on its new long term LNG supply contracts? That isn't the direct message, but we can't help but wonder if that is the real message when see a report on JERA this week that, on the surface, seems to be a 180 from their stated comments last week. Something is off. On Thursday, Platts reported "Japan's JERA will not renew 5.5 mil mt/year of long-term Qatari LNG supply: president" [LINK]. Platts reports ""Currently we are not considering contracting [with Qatar] because we find it extremely difficult to extend the existing large contracts timing-wise," Onoda told an online press conference. "As for Qatar, [the contracts] are set to expire at the 25-year contract expiry," Onoda said, explaining that the company's issues with renewing were "due to developments in the global LNG markets, the progress of decarbonization, and the changing position of LNG in Japan because of liberalization of power and gas, among other factors, in the country." JERA, however, does not plan to give up all of its long-term LNG supply contracts, Onoda said, adding that its decisions would be based on an overall assessment of contractual terms and the situation when contracts come up for renewal." The reporting would point to JERA wanting to have less long term LNG contracts."

Natural Gas – Japan's LNG stocks up 4.0% WoW to 125 bcf

Japan LNG stocks +4.0% WoW

It's been very warm in Japan, way warmer than normal and it has meant no real weather-related demand for electricity and natural gas. But the risk for Japan in the winter is that they need full storage and continued LNG imports to avoid natural gas outages. That's because Japan's LNG stockpiles are not huge relative to LNG imports that have ranged from 7 to 14 bcf/d since Jan 1, 2021. A cold winter or interruption in LNG imports could easily lead to a shortage. LNG stockpiles held by Japanese power producers have exceeded both last year's level and the 4-year average. Japan's METI weekly LNG stocks data was released on Thursday [LINK]. LNG stocks at Nov 20 were ~125 bcf, +4.0% WoW from Nov 13 and above the 5-yr average of 104 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 9: Japan's LNG Stocks



Source: METI

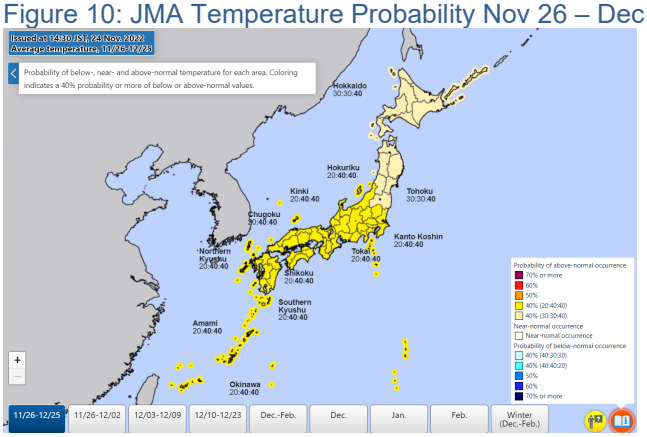
Natural Gas – Japan now sees more normal temperatures through Dec

Japan temperature outlook

It's not just that it's been warm in Japan in November, the forecasts for Dec have changed over the past month from a cold Dec to a more normal or just slightly colder than normal Dec.

Every Thursday, the Japan Meteorological Agency provides an updated 30-day temperature probability outlook. The expectation has been that the warmer than normal weather would continue in November, but then to give way to a cold. The new weekly JMA forecast changes that view and now calls for weather to move from much warmer than normal this week with more normal temperatures continuing December. Below is the JMA's Nov 24 updated 30-day outlook. [LINK]

Figure 10: JMA Temperature Probability Nov 26 – Dec 25

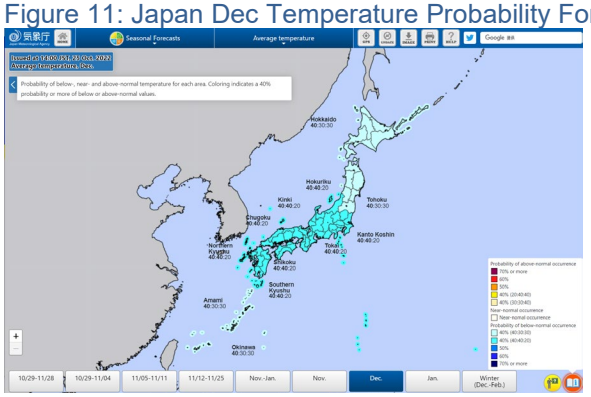


Source: Japan Meteorology Agency

Recall JMA's Oct 25 seasonal forecasts called for colder than normal Dec/Jan

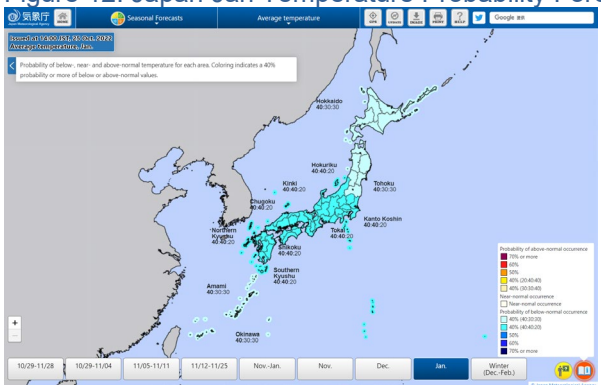
JMA's new 30-day forecast is a good reminder that forecasting weather is far from a 100% game. Thursday's 30-day forecast for Dec is a change from the JMA's Oct 25 seasonal forecast for Nov/Dec/Jan. Here is what we wrote in the Oct 30, 2022 Energy Tidbits memo. *"On Thursday, we tweeted [LINK] "Still early, but Japan Meteorological Agency 10/25 forecast calls for colder than normal Dec and Jan. Nov expected warmer than normal. #NatGas #LNG #OOTT". With winter right around the corner, Japan expects a warmer end to fall with November being warmer than normal, but then switching to below normal temperatures in December and January. On Thursday, the Japan Meteorological Agency posted its seasonal forecast for Nov 2022 – Jan 2023 and overall it is a positive indicator for electricity demand as residents look to heat their homes [LINK]. So far in 2022, Japan has been trying to maximize coal and petroleum products due to the sky-high prices of LNG. But a cold Dec/Jan should lead to increased natural gas/LNG consumption. The JMA forecasts that most of the country should expect colder than average winter temperatures, especially in the southern regions of the island. Below is the current JMA forecast for Dec 2022 and Jan 2023.*

Figure 11: Japan Dec Temperature Probability Forecast



Source: JMA

Figure 12: Japan Jan Temperature Probability Forecast



Source: JMA

Natural Gas – China finally moving to colder than normal temperatures

China forecasts a cold start to Dec

The most important swing factor every winter is temperature - is it a cold, normal or warm winter. And this year, it is even more important how cold is it in different parts of the world given Europe's push to ultimately eliminate consumption of Russian natural gas has pushed Europe into LNG markets. So, if it's cold in China and Japan and Korea, there will be less LNG available. But, to md-Nov, it's been warm in China, Japan and Korea so there have been LNG cargos for Europe and JKM LNG prices have been around $30/mmbtu November is the first month for winter weather, but it isn't as cold as Dec, Jan and Feb. But, it has been warm in Asia. On Friday, we tweeted [LINK] *"Finally, very hot temps in China should give way to cold temps. CMA update: past 10 days were 2-4C higher YoY. but cold wave coming in, expect to see key central/eastern regions of China drop 8-14C. Warm Asia and EU thru mid Nov was why JKM #LNG prices were "only" $30ish. #OOTT"*. Our tweet referenced the new China Meteorological Administration near term China weather forecast. The CMA noted that it's been very hot in China over the past 10 days, with average national temperatures at 2-4C higher than last year. But the CMA forecasts cold weather is finally coming. The CMA wrote "*It is expected that from the 26th to the 30th, the cold wave weather will sweep across China, the temperature in most areas will plummet, and the temperature in most areas will turn*

significantly lower than usual after the cold wave, and the weather will be cold." The CMA expects western areas of China to see temperatures drop 10-18C, and then that cold weather will keep moving to bring colder temperatures to central and eastern China with temperature drops of 8-14C. Our Supplemental Documents package includes the CMA forecast. [LINK]

Natural Gas – Gazprom reducing flows to Moldova by amount Moldova sent to Ukraine

Gazprom reduced flows to Moldova

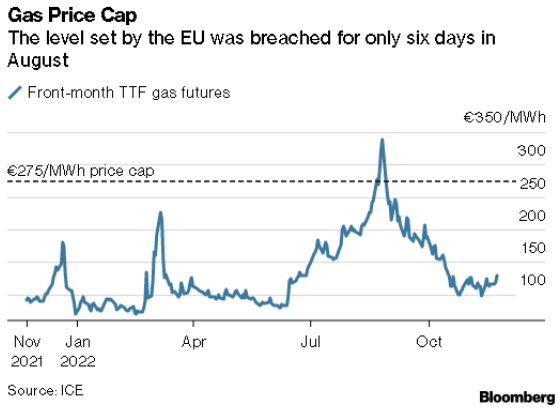
This week, no one was surprised to see the reports that Gazprom was reducing natural gas flows to Moldova. Basically, Gazprom is reducing the amount of natural gas to Moldova by the amount that Moldova is reportedly exporting to Ukraine. On Tuesday, Kommersant (Russian media) reported [LINK] "*Gazprom is ready to reduce gas supplies to Moldova next week due to the fact that the country, which itself is experiencing a shortage of fuel, has been selling part of the gas coming under the contract with Gazprom to Ukraine since the end of September. Although the Ukrainian side claims that we are talking about legal operations for virtual reverse, Gazprom called it the "settling" of transit gas and intends to achieve an end to this practice. The conflict may affect the supply of gas to Transnistria: according to analysts, in the event of a reduction in supplies to Moldova, the left bank of the Dniester will suffer first.*"

Natural Gas – EU natural gas price cap decision deferred now to Dec 13

EU natural gas price cap

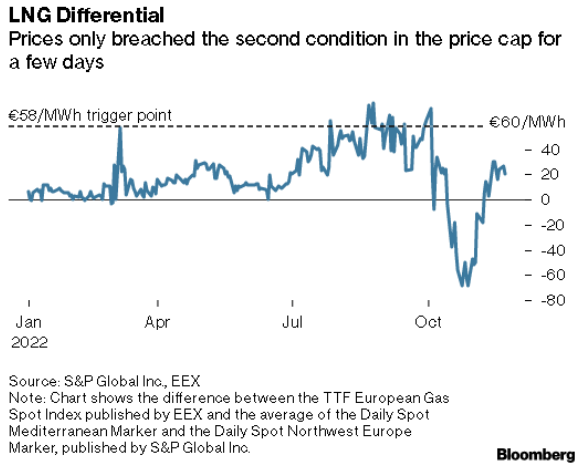
No one should have been surprised to see the EU not approved the EC recommended natural gas price cap at their emergency energy meeting on Thursday. They decided to reconvene on Dec 13. We say no surprise as given the Bloomberg posted interviews with some of the EU policymakers heading into the Thursday meeting who described the recommended natural gas price cap as "kind of a joke", it is "flawed", and more. On Wednesday, we tweeted [LINK] "*See 👇 good with graphs why EU's proposed #NatGas price cap unlikely to kick in. Only triggered IF two conditions are met, and it will take very very big TTF #NatGas and #LNG prices to happen. Thx @vanessadezem @E_Krukowska @a_shiryaevskaya. #OOTT".* The Thursday rejected natural gas price cap only kicked in IF two conditions were met – front-month contract on TTF exceeds €275 per megawatt-hour for more than two weeks, AND, the gap between TTF and regional LNG prices is greater than €58 per megawatt-hour for 10 trading days. It's why the proposed natural gas price cap was universally viewed as being toothless. Below are the Bloomberg charts. Our Supplemental Documents package includes Bloomberg's report on the proposal.

Figure 13: Europe gas price with $275/mwh line



Source: Bloomberg

Figure 14: EU LNG differential €58/mwh line



Source: Bloomberg

LNG tanker backlog in Spain has eased

Natural Gas – Backlog of LNG tankers waiting to unload in Spain has eased

Given the high natural gas storage levels in Europe, we don't see the key test for Europe's vulnerability to natural gas to come until Jan. But we are at least seeing some easing of the natural gas surplus that should continue to ease with any reasonable winter temperatures in Dec. One such test is clearing the backlog of LNG tankers waiting to unload in Spain. Yesterday, we tweeted [LINK] "*4 weeks longer than expected to clear up backlog at Spain's #LNG storage at ports. Finally, LNG tankers waiting offshore Spain can begin to unload. But key test for Europe #NatGas vulnerability not likely till Jan given high storage levels. Thx @bcarrebravo. #OOTT #NatGas.*" On Friday, Reuters reported that Enagas, Spain's system operator, said it was no longer necessary for LNG tankers to wait to unload, they can go ahead and unload. Enagas had stopped unloading on Oct 17 due to full LNG storage at the

Spanish ports due to the mild weather and industrial hits to natural gas demand. That backup was expected to be cleared in early Nov, but took four weeks longer. Our Supplemental Documents package includes the Reuters report.

Natural Gas – Spain Oct natural gas consumption -34.1% YoY

Spain natural gas demand -34.1% YoY

Yesterday, we tweeted [LINK] "*No wonder there was a #LNG tanker backlog waiting to unload in Spain. @enagas Oct update had #NatGas demand -34.1% YoY including immaterial draw on storage. #OOTT.*" After seeing the Reuters report on the LNG tanker backlog eased offshore Spain, we referenced Enagas's "*Progreso mensual de la demand: Octubre-2022*" [LINK], which is the Enagas recap of October demand. Enagas highlighted that natural gas demand was down 34.1% YoY and a key factor was that temperatures were +2.9C warmer than normal. With natural gas demand down, it's no wonder LNG tanks at Spain's ports were full and why Enagas had previously halted LNG tanker unloadings for over a month. Our Supplemental Documents package includes excerpts from the Enagas Oct update.

Figure 15: Europe gas price with $275/mwh line

1. Demanda de gas natural

Sectores de Mercado

Unidad: TWh

Demanda	Acumulado mes		Acumulado año		Total Anual Móvil	
	1 al 31 octubre 2022	% Δ s/1 al 31 octubre2021	1 enero al 31 octubre 2022	% Δ s/1 enero al 31 octubre 2021	TAM: 01 noviembre - 2021 - 31 octubre 2022	% Δ s/ 2021
Convencional	13,7	-34,1%	188,7	-18,8%	244,4	-15,2%
D/C + Pymes	1,7	-33,2%	40,3	-5,9%	57,9	-4,2%
Industrial	11,3	-34,5%	139,5	-21,5%	175,1	-17,9%
Cisternas	0,8	-30,1%	8,9	-25,4%	11,5	-20,9%
S. Eléctrico	14,3	+61,6%	119,7	+77,8%	142,8	+58,0%
TOTAL Demanda	28,0	-5,5%	308,4	+2,9%	387,2	+2,3%

- ✓ **DC+PyMES:** -0,8 TWh respecto a la registrada en oct-21
- ✓ **Sector industrial:** -5,9 TWh respecto a la registrada en oct-21.
- ✓ **Demanda de gas para generación eléctrica:** ha aumentado un **+61,6% (+5,5 TWh)** debido a una menor generación con cogeneración y un saldo internacional exportador.

3

Source: Bloomberg

Natural Gas – German Chancellor on Nord Stream 2, LNG with Qatar & hydrogen

Chancellor Scholz on natural gas

Yesterday, there was a lengthy Focus interview with German Chancellor Scholz yesterday. [LINK]. We couldn't see a video but loved the interviewing technique of having a flow of asking many short innocuous questions and then include a serious question. Kind of get the interviewee relaxed and responding quickly so they answer with the top of mind, honest answer. There were four natural gas related questions. (i) Earlier this morning, we tweeted [LINK] on two of them *"Remaining #NatGas pipe of #NordStream2 put into operation? Scholz "i find that hard to imagine" Why no DE #LNG deal with Qatar? Scholz "that's not true, DE companies are in very concrete conversations about which i could you more than i will" #OOTT."* (ii) Doesn't see last string of Nord Stream 2 going into operation. Nord Stream and Nord Stream 2 each had two strings/pipes. 3 of the 4 pipes were damaged in the explosion and one pipe of Nord Stream 2 remains operational. Question "*The last remaining tube of Nordstream 2 goes into operation* ... Scholz:... "*I find that hard to imagine*." (iii) Scholz infers Gemany/Qatar LNG deals are in the mix. Question *"The world's largest liquefied natural gas producer Qatar Energy and the Chinese state-owned company Sinopec this week signed an*

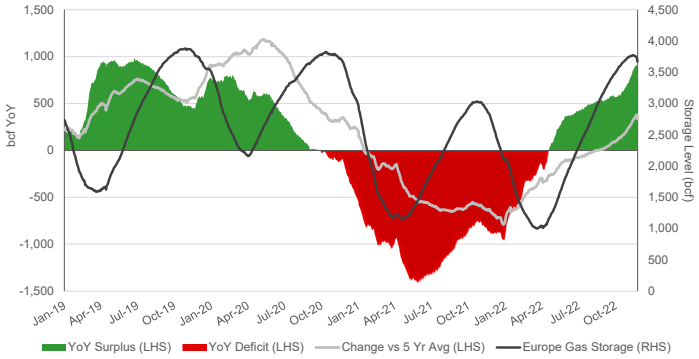
agreement on the export of liquefied natural gas worth 108 million tons over 27 years – one of the largest gas supply contracts ever. Why didn't that work out for Germany? Scholz "*That's not true. German companies are in very concrete conversations about which I could tell you more than I will*." (iv) Fracking makes little sense. Question "*Does Olaf want to allow fracking in Lower Saxony*?" Scholz "*Fracking makes little sense for us and, incidentally, has been discussed and rejected several times in Germany. Many conservative politicians have repeatedly rejected fracking and investors have also shown little interest in this business: Until the gas is squeezed out of the deep layers, we will be so far along with the expansion of renewable energies that effort, risk and return are far too poor."* (v) Germany will phase out fossil fuels by 2045. Follow up to the fracking answer, question "*So rather dependent on others than taking responsibility for yourself?"* Scholz "*No, but acting responsibly means not chasing chimeras. Germany will phase out the use of fossil resourcesby 2045 in order to protect the climate. We want a future without coal, gas and oil. For the processes in the local industry, this means massive changes, which require huge investments*." (vi) Wants to quickly replace natural gas with hydrogen. Question "*But gas remains the bridging technology*." Scholz "*Transitional yes. But we want to quickly replace natural gas with the gas of the future: hydrogen. We should concentrate our efforts on importing hydrogen and producing it here by electrolysis*."

Natural Gas – Europe storage is now +22.11% YoY ie. 92.91% full vs 70.80%

Europe storage now 92.91% full

It's been a very good Oct and start to Nov for lower natural gas consumption driven by warmer than normal weather and industrial demand destruction. But at least, this week draws started on gas storage and there was a reduction in Europe gas storage levels that are still at very high levels.. Europe gas storage began the year in a YoY deficit, but the YoY Europe storage deficit changed to a YoY storage surplus, and it continues to build this week. Europe gas storage started the winter 17.86% YoY and is now a YoY surplus of 22.11%. Inventories are rising all across Europe, as is normal during spring and early summer. Europe gas storage started 2020 winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr/21. Europe storage levels bottomed in late Apr/22 at 29%, which was the lowest level since Apr 2018. Last winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has turned to surplus after months of the deficit tightening. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY. Thanks to the warm weather and US LNG, storage as of Nov 24 is at 92.91%, which is +22.11% greater than last year levels of 70.80% and are +8.30% above the 5-year average of 84.61%. Below is our graph of Europe Gas Storage Level.

Figure 16: Europe Gas Storage Level



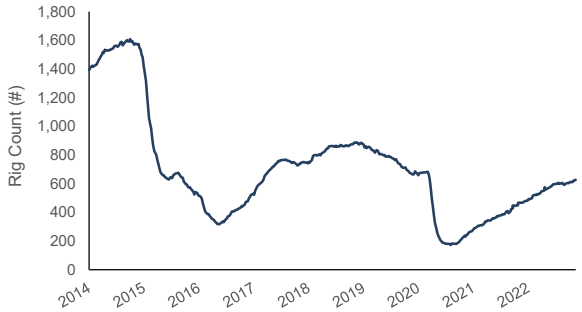
Source: Bloomberg

Oil – US oil rigs up +4 to 627 oil rigs at Nov 23

Baker Hughes released its weekly North American drilling activity data on Wednesday. US Thanksgiving was this week. It doesn't show on the graph but, normally, US rigs are normally fairly flat in Nov/Dec, which would be a positive for building DUCs if frac spreads have their normally seasonal decline. This week US oil rigs were +4 to 627 oil rigs. The big changes come from the smaller basins and the Permian which added +2 and +3 rigs, respectively. US oil rigs hit a 15-week low of 591 on September 9. US oil rigs are now +448 oil rigs since the Covid Sept 17, 2020 oil rigs of 179 oil rigs. And US oil rigs are +160 oil rigs YoY. US gas rigs were -2 WoW at 155 gas rigs.

US oil rigs +4 WoW

Figure 17: Baker Hughes Total US Oil Rigs



Source: Baker Hughes

Oil – Weekly US frac spreads recap is now behind a pay wall

We won't be including any weekly frac spread recap as the weekly frac spread recap is now behind a pay wall. The weekly recap was provided by C6 Capital Holdings and they advised a month ago that this pay wall move was happening.

Frac spreads now behind pay wall

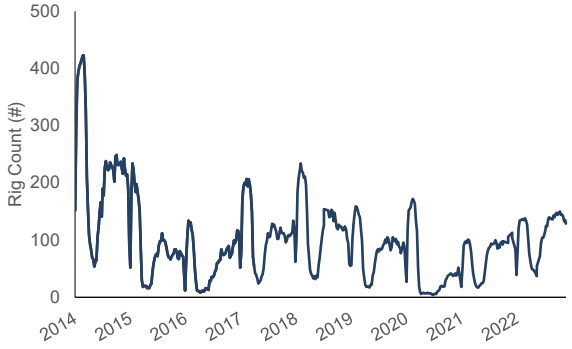
Oil – Total Cdn rigs up -7 WoW to 194 total rigs, +23 rigs YoY

Total Cdn rigs were -7 to 194 rigs as of Nov 23, 2022. Cdn oil rigs were -6 to 129 oil rigs. Cdn gas rigs were -1 to 65 rigs. Normally rigs are fairly flat in early Nov although there can be down weeks. Total rigs are now +92 vs the comparable Covid period of 102 rigs on Nov 25,

Cdn rigs -7 WoW

2020. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 106 and Cdn gas rigs were 65 for a total Cdn rigs of 171, meaning total Cdn oil rigs are +23 YoY to 129 oil rigs and Cdn gas rigs are flat at 65 gas rigs.

Figure 18: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production flat at 12.1 mmb/d

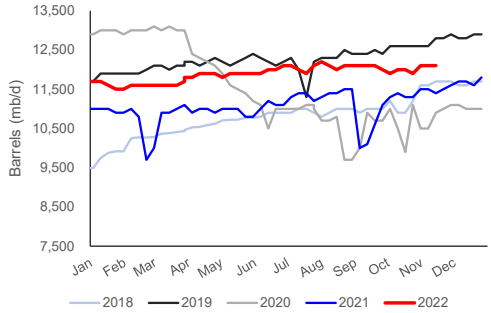
The EIA provides weekly estimates of US oil production, which was flat at 12.1 mmb/d for the week ended Nov 18. US oil production has been range bound between 11.9 to 12.1 mmb/d since the 2nd week of May other than when it touched 12.2 mmb/d in the 1st week of August. Lower 48 production was flat WoW at 11.7 mmb/d this week and Alaska was flat WoW at 0.4 mmb/d. US oil production is up +0.600 mmb/d YoY at 12.1 mmb/d but is still down significantly at -1.0 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 19: EIA's Estimated Weekly US Oil Production

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

Source: EIA

Figure 20: US Weekly Oil Production



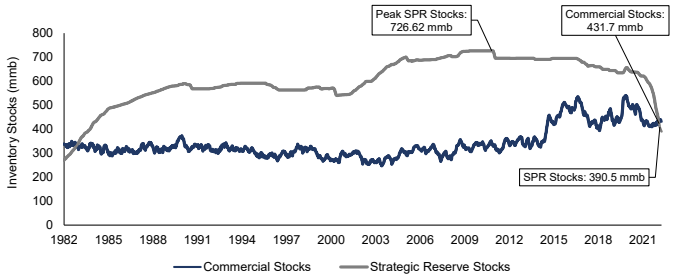
Source: EIA, SAF

Oil – US SPR reserves now 41.1 mmb less than commercial crude oil reserves

SPR reserves remain lower

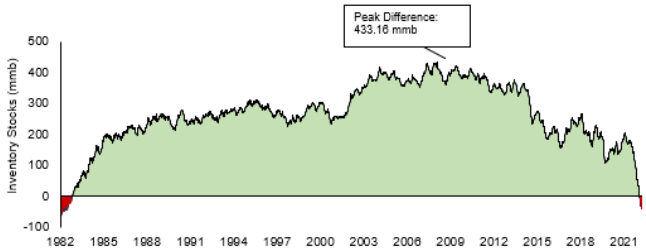
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit slightly narrowing this week. The EIA's new weekly oil data for Nov 18 has SPR reserves at 390.52 mmb vs commercial crude oil reserves at 431.67 mmb. The below graph highlights the difference between commercial and SPR stockpiles.

Figure 21: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 22: US Oil Inventories: SPR less commercial



Source: EIA

Oil – Oil sands 2023 maintenance schedule

Oil sands 2023 maintenance

Two weeks ago, Local Union 488 (Piping Professionals) posted the tentative 2023 shutdown schedule for oil sands maintenance/turnarounds [LINK]. It's a tentative schedule, but the oil

sands players typically don't provide maintenance schedules until sometime in 2023. But it still gives an indication of the length of turnarounds at each oil sands project.

Figure 23: Tentative 2023 Shutdown Schedule for Oil Sands Projects

2023 Shutdown Schedule- Updated November 10th, 2022

Tentative Spring Shutdown Schedule ***Subject to change**

Job Site	Approximate Expected Duration	Pre Shutdown Approximate date	Approximate Start Date	Approximate End Date	Approximate Total Manpower All Trades
Syncrude	55 days		01-Apr-23	26-May-23	3500
CNRL Horizon	30 days	16-Apr-23	16-May-23	16-Jun-23	2600
CNRL Jackpine	30 days		28-Mar-23	28-Apr-23	1250
Muskeg River	30 days		06-May-23	08-Jun-23	1000
Suncor Base plant	50 days		May	July	3000
Edmonton Suncor	35 days		May	June	500
Suncor Firebag	40 days		TBD	TBD	600
Fort Hills	60 days		TBD	TBD	1200
Scotford	64 days		01-Apr-23	04-Jun-23	2600
Albian	45 days		April	June	1000
IOL	TBD		April	TBD	500
Nutrien (ft.sask)	TBD		May	TBD	350
Nutrien (Redwater)	13 days		April	April	20-30 (UA)

(Please note: all information is subject to change and will be updated as new information becomes available.) Total Manpower is all trades. Click the link below to view as a PDF

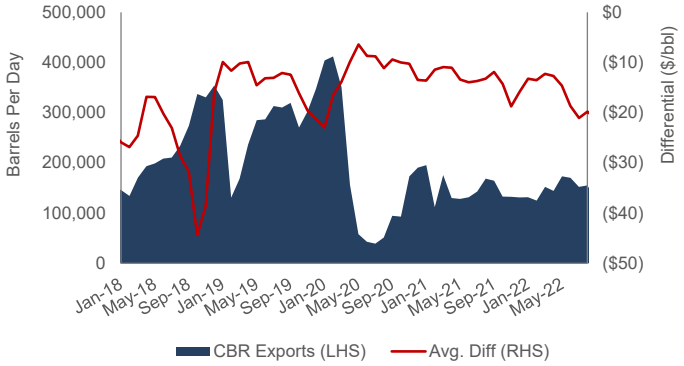
Source: Local Union 488

Oil – Cdn crude by rail exports at 127,060 b/d in September, down -23.1% YoY

Cdn crude by rail exports

The Canadian Energy Regulator (successor to NEB) reported Canadian crude by rail exports were down -28,086 b/d MoM in September to 127,060 b/d vs 155,146 b/d in August [LINK]. This puts September export volumes at -38,076 b/d YoY (-23.1%) vs September 2021 of 165,136 b/d. CBR volumes are +88,193 since the Covid July 2020 bottom of 38,867 b/d. September WCS-WTI differentials increased to -$21.26, and an increase YoY provides economic incentive to ship Cdn crude by rail into US markets. Below is our graph of Cdn crude by rail exports compared to the WCS–WTI differential.

Figure 24: Cdn Crude by Rail Exports vs WCS Differential



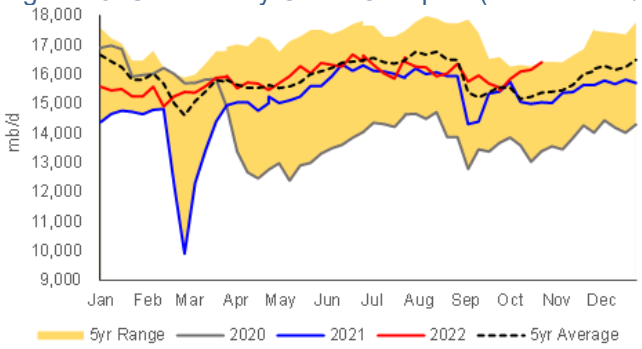
Source: Canadian Energy Regulator, Bloomberg

Oil – Refinery inputs +0.258 mmb/d WoW to 16.410 mmb/d

Refinery inputs up WoW

It's Nov, which is normally the start of the seasonal increase in crude oil inputs to refineries as they have finished their normal Sept/Oct seasonal refinery maintenance period as refineries change from summer to winter fuel blends. Crude oil input into refineries tends to slightly increase in Nov and Dec. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended Nov 18. The EIA reported crude oil inputs to refineries up +0.258 mmb/d WoW to 16.410 mm/d, which is +0.770 mmb/d YoY from 15.640 mmb/d for the week ended Nov 19, 2021. Note last year's week ended Nov 19, refineries continued to recover from the impacts of Covid and Hurricane Ida and we observed inputs increase as refineries progress through regularly schedules seasonal maintenance. Total products supplied (i.e., demand) decreased WoW, down -1.210 mmb/d to 19.878 mmb/d, and Motor gasoline was down -0.416 mmb/d at 8.327 mmb/d from 8.742 mmb/d last week. The 4-week average for Motor Gasoline was down -0.650 mmb/d YoY to 8.685 mmb/d.

Figure 25: US Refinery Crude Oil Inputs (thousands b/d)



Source: EIA

Oil – BP 160,000 b/d Toledo refinery restart doesn't seem likely until late Q1/23

BP's 160,000 b/d Toledo refinery shutdown continues

A continued negative impact on Cdn oil differentials is BP's 160,000 b/d Toledo refinery continues to be down as it processes Cdn medium/heavy crude. BP has not given an updated timeline but it seems that BP's 160,000 b/d Toledo refinery will be down until late Q1/23. On Tuesday, we tweeted [LINK] *"Continued pressure on Cdn #Oil differentials from longer shut-down of #BP 160,000 b/d Toledo refinery that runs Cdn crude. 'may not be able to restore normal operations until late 1Q 2023 or even later people familiar with operations said' reports @barbarajpowell8. #OOTT."* The start-up of the refinery will be slow and done in phases, as safety inspectors need to approve each step. In the Q&A section of the BP q3 call, mgmt. was asked how long Toledo would be down. Mgmt didn't give a timeline and no indication/hint that a restart could happen before Xmas. Mgmt replied "*on Toledo, I can't really guide you on anything right now. The site is shut down as we talked about the investigations continue and we need to complete the investigations we learn lessons and then multi side how we move forward but, I can't really give you guidance until we're through that process*." A restart in late Q1/23 would be consistent with what we wrote in our Oct 2, 2022 Energy Tidbits and in our Sept 27 tweet [LINK] "*#BP Toledo refinery shut down. @barbarajpowell8 reports repairing & restarting @bp_plc Toledo refinery "may not be*

completed until early 2023, people familiar with operations said." Negative to Cdn #Oil diffs, See 👇WCS/WTI diffs hit ~$1.25 since 160,000 b/d refinery fire. #OOTT." And in our Sept 28 tweet [LINK] "*More indicators #BP Toledo 160,000 b/d refinery will be shut down for extended time. @LauraSanicola reports BP laid off most contractors according to sources indicating will experience a prolonged shutdown following last week's explosion and fire." #OOTT [LINK]."* Our Supplemental Documents package contains the Bloomberg report.

Oil – US "net" oil imports up +1.124 mmb/d WoW to 2.821 mmb/d

US "net" oil imports up WoW

US "NET" imports were up +1.124 mmb/d to 2.821 mmb/d for the Nov 18 week. US imports were up +1.504 mmb/d to 7.063 mmb/d. US exports were up +0.380 mmb/d to 4.242 mmb/d. The WoW increase in US oil imports was driven Top 10 with a increase of +1.283 mmb/d and "other" posting a smaller increase of +0.221 mmb/d. Some items to note on the by country data. (i) Canada was up significantly this week by 0.768 mmb/d to 3.844 mmb/d. (ii) Saudi Arabia was up +0.474 mmb/d to 0.685 mmb/d this week. (iii) Colombia was up +0.027 mmb/d WoW to 0.170 mmb/d. (iv) Ecuador was down this week -0.059 mmb/d to 0.042 mmb/d. (v) Iraq was up +0.244 mmb/d to 0.385 mmb/d. (vi) Mexico was down -0.033 mmb/d to 0.495 mmb/d.

Figure 26: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Sep 16/22	Sep 23/22	Sep 30/22	Oct 7/22	Oct 14/22	Oct 21/22	Oct 28/22	Nov 4/22	Nov 11/22	Nov 18/22	WoW
Canada	3,868	3,775	3,298	3,300	3,372	3,483	3,410	3,235	3,076	3,844	768
Saudi Arabia	489	422	398	370	230	325	533	519	211	685	474
Venezuela	0	0	0	0	0		0	0	0	0	0
Mexico	855	598	539	759	747	509	748	503	528	495	-33
Colombia	212	72	360	242	214	215	218	341	143	170	27
Iraq	120	202	275	109	130	220	134	503	141	385	244
Ecuador	319	191	203	136	134	201	0	102	101	42	-59
Nigeria	0	0	0	0	29	42	81	119	181	43	-138
Kuwait	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0
Top 10	5,863	5,260	5,073	4,916	4,856	4,995	5,124	5,322	4,381	5,664	1,283
Others	1,084	1,189	874	1,147	1,052	1,185	1,081	1,132	1,178	1,399	221
Total US	6,947	6,449	5,947	6,063	5,908	6,180	6,205	6,454	5,559	7,063	1,504

Source: EIA

Oil – Chevron gets US license to restart Venezuela production & import to US

Chevron gets go ahead in Venezuela

Yesterday, we tweeted a few times on the big breaking oil news that the Office of Foreign Assets (Treasury Department) issued General License No. 41 that authorizes Chevron to restart its operations with PDVSA in Venezuela. [LINK]. It is very important to read the license because it allows Chevron to basically do what it needs to do to ramp up its production and import Venezuela oil to Chevron refineries in the Gulf Coast. This includes items like bringing in the necessary goods and services, including needed diluent and condensate, to increase its production and oil to the Gulf Coast. Politics aside, this is a significant negative to Cdn oil differentials as Chevron ramps up production and brings Venezuela oil to its Gulf Coast refinery. More Venezuela oil to the Gulf Coast is expected to hurt Cdn oil differentials. (i) Our first tweet was [LINK] "*Negative to Cdn #Oil differentials, puts at risk Cdn oil to PADD 3. #Chevron can export needed diluent to blend w/ VEN heavy & import oil to CVX refineries, 350 kbd Pascagoula. Automatically renews on 1st day of mth & valid for 6 mths therefrom. #OOTT [LINK]."* (ii) Our second tweet was [LINK] "*Here's why letting #Chevron restart in Ven puts Cdn #Oil differentials at risk in 2023. See linked 👇03/22/22 tweet. CVX reportedly told Biden Admin could double VEN 800,000 b/d production "within months". Thx @cmatthews9*

@Jose_deCordoba. #OOTT." Note that we would expect the limited conditions of General License 41 do not allow for a near term doubling of Venezuela oil production, but an increase of even 100,000 or 200,000 b/d would be significant to Cdn oil as these incremental barrels will come into PADD 3. Certain things will happen quickly such as what will Chevron being able to bring stable diluent/condensate for immediate blending opportunities, and brining diesel do for providing needed power to drive operations. These impacts can be very impact. We were linking to the below item on Chevron's reportedly saying they could double production. (iii) Our third tweet [LINK] was a reply to a tweet that said "*this is a real problem for WCS*". Our reply was "*key is US allows CVX to buy & import into VEN goods or inputs needed to produce, repair, service, export crude, health/safety of operations incl diluents, condensates, petroleum or natural gas products. ie. spend/do what they need to do. #OOTT*". The license is basically saying o Chevron do what you have to do and get what you have to get to increase production and exports. This will not be like Venezuela trying to increase production without diluent, without equipment, without people, etc. This is why we believe it is important to read the license. Supplemental Documents package includes the Office of Foreign Assets General License 41.

Chevron reportedly said could double Venezuela's 800,000 b/d within months

Our tweet yesterday referenced Chevron's comments from March. Here is what we wrote in our March 27, 2022 Energy Tidbits memo. "*On Tuesday, we tweeted [LINK] on the WSJ report "Chevron, Waiting It Out in Venezuela, Tells U.S. Now Is the Time to Pump Oil Company pledges to make up for fall in Russian exports". [LINK]. Chevron reportedly is telling the administration they can double Venezuela's oil production within months. The WSJ wrote "For months, Biden administration officials snubbed top executives and lobbyists for Chevron Corp. who had pressed officials in Washington to ease sanctions so the company could boost production in Venezuela, where the U.S. has banned such activities since 2019. Then Vladimir Putin invaded Ukraine. Now the Biden administration is listening closely to Chevron, say people familiar with the conversations, which says it can help double Venezuela's 800,000 barrels-a-day production within months. That could replace the loss of roughly 700,000 barrels a day the U.S. was importing from Russia before it attacked Ukraine. And it could help lower gasoline prices—a major concern for the Biden administration in a tough election year." Our Supplemental Documents package includes the WSJ report.*

Chevron bringing diluent and diesel should have a quick impact

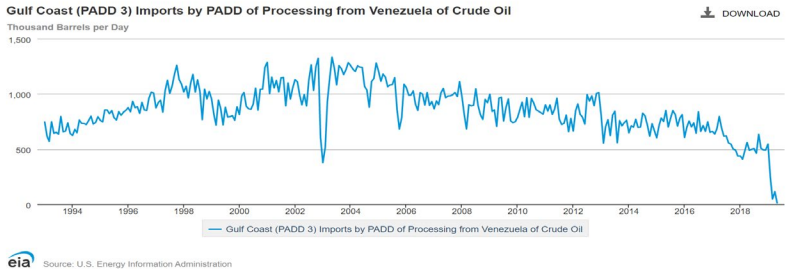
We recognize that the vast majority of the quick views on Chevron's return are to not expect any response for a long time. We reiterate its worth reading the details of the license. There are items that should have a quick impact on production and exports, in particular diluent for blending and diesel to provide power. Our view is unchanged from what we wrote in our March 27, 2022 Energy Tidbits – we believe Venezuela could double its production in a matter of a year or two with access to equipment, people, diluent, diesel, etc. As noted above, we expect there will very quick production gains from items such as the ability for Chevron to bring stable flows of diluent, condensate and diesel to Venezuela. We have seen over the past year how Venezuela production increased in great part to getting diluent from Iran. Diluent is needed to blend with the Venezuela extra heavy oil to make it moveable via pipeline.

A steady access to diluent would be a key factor to increasing Venezuela oil production. Diesel will also be a quick impact. Plus reliable power, oil and gas operations need power and Venezuela has been hit for several years with power outages and unreliable power. Bringing in diesel and generators to provide power can have a very quick impact Plus recall the reports from a couple years ago on how some PDVSA oil workers were selling their tools so they could put food on the table. We suspect there are hundreds of wells that are shut-in because of a pump jack went down and there are no replacement parts. We suspect there are hundreds of wells that could use workovers, they need equipment parts, tools to service and people. These are a just a few of the likely reasons why it's likely that Venezuela could double its oil production within a reasonably short period. Venezuela was double current production 4 years ago.

A return of Venezuela is negative for Cdn differentials

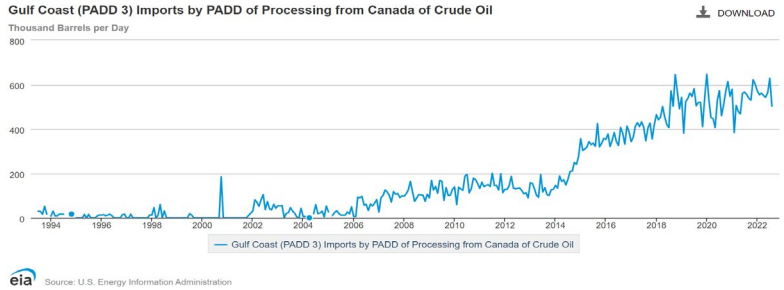
Our tweet reminded that more Venezuela oil to the Gulf Coast is a negative to Cdn oil differentials. Our tweet included the below EIA crude oil imports in PADD 3 (Gulf Coast) graphs, which remind how Cdn heavy/medium crude was able to penetrate PADD 3 (Gulf Coast) because there was a need with declining Mexico and Venezuela crude oil. Conversely, if Venezuela increases, it will mean more Venezuela crude to the Gulf Coast and less need/increased pressure on Cdn differentials.

Figure 27: Gulf Coast PADD 3 Crude Oil Imports From Venezuela



Source: EIA

Figure 28: Gulf Coast PADD 3 Crude Oil Imports From Canada



Source: EIA

Especially since Chevron has 460,000 b/d of refining capacity in Gulf Coast

Our tweets yesterday reminded that Chevron has its 350,000 Pascagoula refinery that could take Venezuelan crude oil. The General License 41 says "*Sale to, exportation to, or importation into the United States of petroleum or petroleum products produced by the Chevron JVs, provided that the petroleum and petroleum products produced by the Chevron JVs are first sold to Chevron;"* Chevron has two refineries in the Gulf Coast, one of which would take Venezuelan crude. (i) Pascagoula (Mississippi) refinery. [LINK] "*Chevron's Pascagoula Refinery processes 350,000 barrels (14.742 million gallons) of crude oil a day - an amount equivalent to the size of a football field covered to a depth of 41 feet. Chevron Pascagoula Refinery is primarily a fuels refinery, in that we mainly manufacture motor gasoline, about 130,000 barrels per day (BPD); jet fuel, 50,000 BPD; and diesel fuel, 68,000 BPD. Our other products include fuel oils such as Liquefied Petroleum Gas (LPG), aviation gasoline, petroleum coke and sulfur."* (ii) Pasadena Refinery (Texas) processes light sweet crude so would not process Venezuelan crude. [LINK] "*From gasoline, gasoline components, and distillate oils, to fuel gas and liquefied petroleum gas, the Chevron Pasadena Refinery manufactures products people use every day. Capable of processing up to 110,000 barrels of crude oil per day, we refine 100 percent Texas light, sweet crude, including Chevron-produced oil from the Permian Basin."*

Oil – Colombia signals a go slow or rethink on stopping oil and gas exploration

Colombia go-slow on stopping exploration

No one should be surprised to see the reports that Colombia may be on a go-slow path on new President Petro's campaign promise to stop oil and gas exploration. It's a reality check that Petro realizes he needs to have a strong Colombia financial position to be able to try to move on his green aspirations. Like other pro-climate change leaders, we do not expect him to abandon his aspirations to cut out oil and gas, but he will be forced to go slow or some effective indefinite pause. Last Sunday, FT reported [LINK] "*Colombia signals rethink on pledge to curb oil and gas exploration*". FT wrote "*Colombia's leftist government has signalled it could row back on its pledge to halt new oil and gas exploration projects, saying it would first examine existing contracts as part of an overhaul of its fossil fuel industry. Gustavo Petro, a former guerrilla fighter who took office as president in August, made the promise during his election campaign. But finance minister José Antonio Ocampo said in an interview that the government would analyse the 180 contracts before deciding whether to fulfil the pledge. "Then we will see if new contracts are necessary," he said. Any energy transition that reduced exports "would have to be gradual" and prioritise gas self-sufficiency, Ocampo added."* Our Supplemental Documents package includes the FT report.

Oil – Norway October oil production of 1.745 mmb/d, up +6.4% MoM

Norway oil production

The Norwegian Petroleum Directorate released its October production figures [LINK] of 1.745 mmb/d of oil, which is down -4.0% YoY and up 6.4% MoM from September of 1.642 mmb/d. October production was down -7.3% (-0.137 mmb/d) from the forecast amount of 1.882 mmb/d. The NPD does not provide any explanations for the MoM changes. The theme for Norway through 2021 was that Norway oil production returned to growth because of the Johan Sverdrup oil field, and tax breaks from the government allowing increased capex in the energy sector. Norway oil production was still expected up modestly in 2022.

Figure 29: Norway October 2022 production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm³/day	Total MSm³ o.e/day
Production	**October 2022**	**1.745**	**1.950**	**316.1**	**0.626**
Forecast for	October 2022	1.882	2.141	352.4	0.693
Deviation from forecast		-0.137	-0.191	-36.3	-0.067
Deviation from forecaset in %		-7.3 %	-8.9 %	-10.3 %	-9.7 %
Production	September 2022	1.640	1.835	303.3	0.595
Deviation from	September 2022	0.105	0.115	12.8	0.031
Deviation in % from	September 2022	6.4 %	6.3 %	4.2 %	5.2 %
Production	October 2021	1.818	2.065	344.4	0.673
Deviation from	October 2021	-0.073	-0.115	-28.3	-0.047
Deviation in % from	October 2021	-4 %	-5.6 %	-8.2 %	-7 %

Source: Norwegian Petroleum Directorate

Oil – Still no EU agreement on a Russia oil price cap

No EU Russia oil price cap deal yet

As of our 7am MT news cut off, Europe was unable to reach a deal on a Russia oil price cap and it's not clear when or if a deal can be concluded. There seems to be a big chasm between those that want a very low Russia price cap (ie. Poland) vs those that want a very high price and/or compensation for lost business (Cyprus, Greece, Malta). On Thursday morning, we tweeted [LINK] "*Breaking: @mariatad just reported from #EU energy meet. #NatGas price cap "nothing is agreed until everything is agreed so they've decided to reconvene on Dec 13". EU Price cap on RUS #Oil "we are being told that a deal is within reach & potentially coming today".* Bloomberg was reporting from EU's emergency meeting on energy was being told a deal might be coming. The chatter that morning was for a price cap on Russian oil around $65. But no deal came on Thursday night (local time) with the reports almost all just calling it a disagreement on the price cap level. But the only reporting we saw with some better insight on Thurs night was the Cyprus Mail report. We tweeted [LINK] "*No EU Russia oil price cap deal yet. Good @cyprusmail report notes disagreement is not just on how or low for the price cap $/b, it is also big tanker shipping countries, Cyprus, Greece & Malta, want a higher price but also comp for loss of business or more time to adjust. #OOTT."* It makes sense as Cyprus, Malta and Greece are the big tanker shipping countries. Cyprus Mail reported "*Cyprus, Greece and Malta, countries with big shipping industries that stand to lose most if Russian oil cargoes are obstructed, argue the cap is too low and want compensation for the loss of business or more time to adjust, reports from Brussels said.Cyprus is especially concerned about tankers sailing under its flag changing their registration to flag-of-convenience countries outside the EU like Panama or Liberia. EU sources told CNA on Thursday that the concerns of the three countries were raised at the start of the discussion and include the need for clarity on how the risk of non-compliance would be avoided, as well as what compensatory measures would be put in place in relation to the deletion of ships from their registers after the implementation of the package."* Our Supplemental Documents package includes the Cyprus Mail report. [LINK]

Oil – OPEC+ members quickly deny WSJ saying discussing 500,000 b/d increase

OPEC denies WSJ report

There was quite a stir in the market and an immediate oil price drop on Monday morning with the WSJ report "*Saudi Arabia Eyes OPEC+ Output Increase Ahead of Restrictions on*

Russian Oil. Raising oil production would partially reverse the group's contested decision to cut supplies in October." [LINK]. Oil price dropped ~$4 before quickly jumping back up when reports immediately came out that Saudi Arabia was not considering any output increase. And within short order, there were denials from UAE, Kuwait, Iraq, Algeria and other OPEC+ members. The WSJ wrote "*An oil-production increase of up to 500,000 barrels a day is now under discussion for OPEC+'s Dec. 4 meeting. Saudi Arabia and other OPEC oil producers are discussing an output increase, the group's delegates said, a move that could help heal a rift with the Biden administration and keep energy flowing amid new attempts to blunt Russia's oil industry over the Ukraine war. A production increase of up to 500,000 barrels a day is now under discussion for OPEC+'s Dec. 4 meeting, delegates said. The move would come a day before the European Union is set to impose an embargo on Russian oil and the Group of Seven wealthy nations' plans to launch a price cap on Russian crude sales, potentially taking Moscow's petroleum supplies off the market. Any output increase would mark a partial reversal of a controversial decision last month to cut production by 2 million barrels a day at the most recent meeting of the Organization of the Petroleum Exporting Countries and their Russia-led allies, a group known collectively as OPEC."* There was a lot of criticism on the WSJ reporting when Saudi Arabia, Kuwait, Iraq, UAE, Algeria and other OPEC+ members came out and said there was no such discussion. Our Supplemental Documents package includes the WSJ report.

Was the WSJ report actually a trial balloon?

We don't think many have wondered if the WSJ report was actually a trial balloon sent out by OPEC+ to see how the market would respond? We hadn't thought of that until we heard comments from Jamie Ingram (Senior Editor, Middle East Economic Survey) on Thursday's Gulf Intelligence Daily Energy Markets podcast [LINK]. Ingram said "OPEC+ trial balloon of testing the market appetite for production increases went down like a lead balloon". If it was a trial balloon, OPEC+ would have seen the immediate drop of $4/b in the oil price.

Another potential Saudi IPO

Oil – Another potential Saudi Aramco IPO, its Base Oil Co (lubricants)

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 Saudi Arabia's hoped for transformation of the country in its Vision 2030. This is the financial theme for the 2020s. On Thursday, Bloomberg reported Saudi Aramco Base Oil Co., a unit of Luberef, received regulatory approval for an IPO in Riyadh [LINK]. Base Oil Co makes base oils used in lubricants for motor vehicles, ships and industrial machinery. Bloomberg reported that the potential IPO would be expected to raise $1b. We have to assume the potential IPO timing is a spring window. Earlier this morning, Bloomberg separately reported they hired SNB Capital as lead manager, financial advisor, book-runner, global coordinator and underwriter.

Khamenei on JCPOA

Oil – Looks like Iran won't give in on US added requests re JCPOA

We have to believe Iran's nuclear advancement has to become a security and oil wildcard in 2023 with the failure to get back to JCPOA. Plus there is the added wildcard of Netanyahu's return as Israel PM. The US has maintained it's up to Iran to accept what is on the table. And yesterday, it seemed like Supreme Leader is saying Iran can't go back into a JCPOA especially as the US wants to somehow wrap in Iran's missiles/drones. Earlier this morning,

we tweeted "*Back to Iran nuclear wildcard in 2023? Khamenei "JCPOA 2 means that Iran completely abandons its regional presence, & JCPOA 3 means Iran commits not to produce any strategic and important weapons such as missiles & drones and becomes empty-handed in the face of aggression". #OOTT."* PressTV (Iran) reported on Khamenei's address yesterday and Khamenei seems pretty clear that Iran can't go back to JCPOA especially with the US wanting to somehow wrap missiles/drones into the equation either directly or indirectly. That would not be a new US position, rather Biden has always wanted to somehow link Iran's missiles/drones into the equation. PressTV wrote "*Ayatollah Khamenei said the enemy's insistence on the second and third JCPOAs, which some people inside the country were also regurgitating probably out of negligence, can be explained. "JCPOA 2 means that Iran completely abandons its regional presence, and JCPOA 3 means Iran commits not to produce any strategic and important weapons such as missiles and drones and becomes empty-handed in the face of aggression." No zealous Iranian, even those who possibly do not like the Islamic Republic, will submit to paying such ransoms, Ayatollah Khamenei said. "Therefore, negotiating with America will not solve any problem unless ransom is paid in all basic issues and all red lines are crossed.""*

Oil – Can Iran stomp down the escalating domestic unrest & problems?

Iran's domestic problems

Based on comments yesterday by Khamenei and the IRGC, there isn't any indication the regime plans to go easier on the protestors. PressTV reported [LINK] "*Leader of the Islamic Revolution Ayatollah Seyyed Ali Khamenei says Iran's battle is not with a bunch of rioters who have recently wreaked havoc in the country, adding that "the main confrontation is with the global hegemony". "These few people are either oblivious, ignorant, or mercenaries," the Leader said in a meeting with members of the volunteer Basij force in Tehran on the occasion of Basij Week."* So the question will soon become will the protests continue to escalate and can the regime stomp out the protests. On Thursday, we tweeted [LINK] "*Caged dog risk? 4 min mark @DanialRahmat12 "every province of Iran is now engaged in those protests & seemingly, Iranian establishment has somehow failed to control that", "very very high rates of inflation", prices +300% since oct/20 & JCPOA return unlikely. @sean_evers. #OOTT."* We listen to the Gulf Intelligence daily podcast almost every morning and, on Thursday [LINK], there was a good food for thought commentary by Danial Rahmat on how "the Iranian establishment is facing several challenges on many fronts right now". Rahmat highlighted the increasing protests as the key challenge. He said "*every province of Iran is now engaged in those protests. And seemingly, the Iranian establishment has somehow failed to control that*". We don't think most appreciate that the protests are widespread. Plus, he noted how Iran's citizens pocket books are getting hit hard as they are facing huge price inflation issues with prices up ~300% in the last two year ie. since Oct 2020. These issues looks to be escalating. But what gets us thinking was Rahmat reminding that the Iranian establishment hasn't been able to control the protests. This feels very different than in the past when the regime would be able stomp out and prevent protests from spreading. Now the protests are in every protest. Its feels different. So the question becomes what does the Iran regime do? And that is big wild card guess for pretty well everyone. It's why we tweeted caged dog risk? In the immediate term, we have to believe it adds risk (positive support for oil) that there could be interruptions to Iran oil supply if the protests keep spreading.

Even Iran's football team publicly protested at World Cup

We were surprised by the very public stance taken by Iran's football team in their support for protestors at the World Cup on Monday. It was embarrassing enough that the football team was the only team to not sing their national anthem at the start of the match, which was surprising. But then we were shocked to see Iran's football team captain talk to the world press before the match on their support for the protests. There were videos tweeted with translations, but we did not know the sources. Rather we went to the BBC reporting [LINK] "I*ran captain Ehsan Hajsafi spoke out against the situation in his home country before his nation's opening game against England at the World Cup. Mass anti-government protests in Iran have been met with a fierce crackdown in recent months. Speaking to reporters ahead of Monday's game in Qatar, the 32-year-old said the players "support" those who have died. "We have to accept that the conditions in our country are not right and our people are not happy," he said. Human rights activists have said more than 400 protesters have been killed and 16,800 others arrested in a crackdown by security forces. Iran's leaders say the protests are "riots" orchestrated by the country's foreign enemies. "Before anything else, I would like to express my condolences to all of the bereaved families in Iran," defender Hajsafi said at the start of the news conference. "They should know that we are with them, we support them and we sympathise with them." "We cannot deny the conditions - the conditions in my country are not good and the players know it also," the AEK Athens full-back added. "We are here but it does not mean that we should not be their voice, or we must not respect them. "Whatever we have is from them. We have to fight, we have to perform the best we can and score goals, and present the brave people of Iran with the results. "And I hope that the conditions change to the expectations of the people."*

Oil – China Covid cases increasing, its economy hit by more lockdowns/restrictions

China Covid restrictions

As of our 7am MT news cut off, the takeaway from China is that Covid cases are increasing and the local govt restrictions continue to slow down activity and economy. But the overnight China Covid story was on increasing protests against Covid restrictions and protests aren't the norm in China. (i) Shanghai held its marathon yesterday, but also added some Covid restrictions. It was like they wanted to make sure the world saw the marathon. (ii) Yesterday, Global Times (communist party media) highlighted "*Urumqi announces clearance of COVID cases in communities, to resume normal life in low-risk areas."* [LINK] Urumqi is a city of 4 million in the very NW tip of China sitting between Mongolia onteh east and Kazahkstan on the west. (iii) Rather we see more signs that China's local governments Covid restrictions/lockdowns are continue to hit China's economy and that China expects to see increasing Covid cases. Yesterday we tweeted [LINK] "*Don't expect quick uptake in China. Friday Communist party media. can't return smooth transportation as some regions "impose barriers at every level & excessively control the flow of trucks". Covid cases to increase as many cities still haven't seen tipping point. #OOTT*." (iv) Shout out to CNBC's Eunice Yoon, who warned on Monday lockdowns were worse than the west realizes. The increasing China Covid restrictions/lockdowns was the market story picking up concern over the week. It seemed like most didn't want to believe that the lockdowns were fierce. On Monday morning (Calgary time but in early Tuesday morning hours Beijing time), there was a great warning from Yoon for the most of the week. It seemed to catch people off guard. We tweeted [LINK] "*great report just now by @onlyyoontv doesn't feel covid policy has changed substantively,*

feels like it's getting tighter & more confusing, local govt wants to comply w/ new rules but is prioritizing zero covid, just leading to chaos. negative to #Oil. #OOTT." By Thursday, markets knew the Covid lockdowns were fierce and, earlier Thurs morning, we tweeted [LINK] "*She warned us 👇. Just now, @onlyyoontv - cases near 33k, more than when saw the "very brutal lockdown in Shanghai back in Apr", "leadership appears to be tolerating these higher numbers, officially. But unofficially, the lockdowns have been very fierce and inconsistent". #OOTT."* Our Supplemental Documents package includes the Global Times report.

Local govt restrictions overrule China's 20 optimized measures

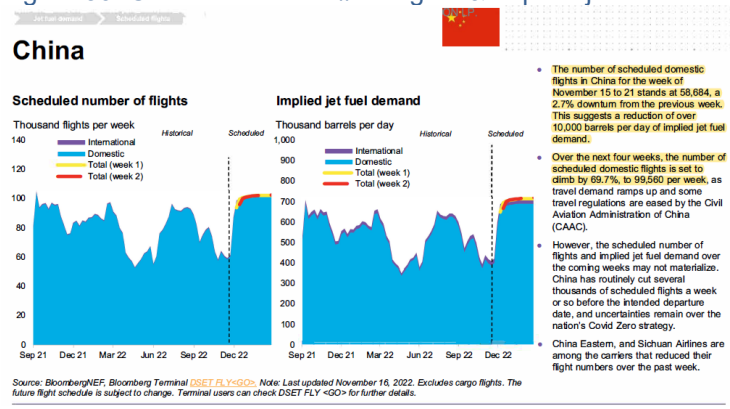
China's local govt restrictions in the face of increasing Covid cases have trumped any ambition by China leadership for a steady reopening of China from Covid. When China announced the optimized measures on Friday Nov 11, they sent markets and oil up. But that didn't last because, as highlighted in last week's (Nov 20, 2022) Energy Tidbits memo, local governments weren't cooperating with the intention of the 20 optimized measures. The local governments not cooperating with increasing Covid cases continues to be the story of Covid in China. Our Supplemental Documents package includes the Global Times initial reporting of the 20 optimized measures.

Oil – Chinese domestic flights continue to decrease WoW

Scheduled China air flights

All the oil demand indicators in China switched to negative in November with the acceleration in Covid restrictions and lockdowns. A good example was China scheduled domestic air flights that had a modest uptick for the Nov 1-7 week, but that was an anomaly. Rather scheduled air flights for Nov 15-21 were down 2.1% WoW. On Monday, we tweeted [LINK] "*Another sign China is slowing and not reopening. 2nd consecutive week of declining China scheduled domestic air flights: -2.7% WoW to 58,684 flights for Nov 15-21, followed -5.3% WoW to 60,331 flights for Nov 8-14. Thx @BloombergNEF Claudio Lubis. #OOTT."* Given the increasing Covid restrictions/lockdowns, it's hard to see how there can be any sustained near-term pickup in scheduled domestic air flights. Scheduled domestic airflights were -2.7% WoW to 58,684 flights for the Nov 15 to 21 week. The prior Nov 8-14 week was a decline of -5.3% WoW, but the prior week was +10.2% WoW. The number of scheduled domestic air flights is supposed to increase by 69.7% to 99,560 per week. Our tweet included the below BloombergNEF graph from its Aviation Indicators Weekly report.

Figure 30: China Scheduled # of flights & Implied jet fuel demand Nov 15-21 week



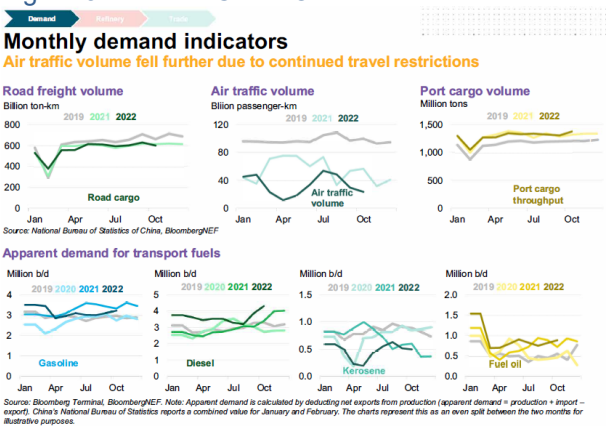
Source: BloombergNEF

Oil – BNEF: All China oil demand indicators are now reflecting Covid restrictions

China oil demand indicators are negative

On Thursday, BloombergNEF posted its China Oil Markets Monthly, which is a good recap of the key China oil factors. On Thursday we tweeted [LINK], *"China key #Oil demand indicators reflecting new record China Covid. @BloombergNEF China Oil Markets Monthly - subway rides plunged, road congestion down, Chinese airport flight department schedules almost down to April 2022 low when last peak Covid hit. Thx BNEF Sisi Tang. #OOTT"*. Our tweet included a few of the BNEF charts, all of which showed how the major oil demand indicators were negative – air traffic, road congestion, road freight, subway rides. This should not surprise given the increasing Covid restrictions and lockdowns over the past couple weeks. And, it's hard to see any near term change given the comments from Chinese health officials and Vice Premier this week. Our Supplemental Documents package contains excerpts from the BNEF report.

Figure 31: BNEF: China Oil Demand Indicators



Source: Bloomberg

Vortexa crude oil floating storage

Oil – Vortexa crude oil floating storage 94.76 mmb as of Nov 25, -5.60 mmb WoW

There was a big upward revision to last week's Nov 18 storage level of 86.16 mmb, which was revised +14.20 mmb to 100.36 mmb. We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 10am MT yesterday. Note that these estimates get revised over the course of the week and the revisions can go back months. We do not check daily for the revisions, so our comments today on the new estimates are compared to the prior weeks Vortexa estimates posted on Bloomberg on Nov 19 at 10am MT. (i) As of 10am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Nov 25 at 94.76 mmb, which is -5.60 mmb WoW vs big upwardly revised Nov 18 of 100.36 mmb. Note Nov 18 of 100.36 mmb was revised +14.20 mmb vs 86,16 mmb posted on Bloomberg at 10am MT on Nov 19. (ii) Interestingly, other than the big upward revision to Nov 18, the prior several weeks were all revised down. The revisions from the estimates posted today at 10am MT vs the estimates posted on Bloomberg at 10am on Nov 19 were: Nov 18 revised +14.20 mmb. Nov 11 revised -4.85 mmb. Nov 4 revised -2.70 mmb. Oct 28 revised -4.99 mmb. Oct 21 revised -4.62 mmb. Oct 14 revised -2.46 mmb. Oct 7 revised -2.47 mmb. (iii) With the big revision to Nov 18, it's hard to pick a number in such a wide range of floating storage over the past six weeks. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) Nov 25 estimate of 94.76 mmb is -125.61 mmb vs the post-Covid peak on June 26, 2020 of 220.37 mmb. (vi) Note that the below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period in Q2/20 as Covid started to have a huge impact. Nov 25 estimate of 94.76 mmb is +35.89 mmb vs pre-Covid Nov 25, 2019 estimate of 58.87 mm. Nov 25 estimate of 94.76 mmb is -0.52 mmb YoY vs Nov 26, 2021 of 95.28 mmb. (vii) Below are the last several weeks of estimates posted on Bloomberg as of 10am yesterday, 10am on Nov 19, and 11am on Nov 12.

Figure 32: Vortexa Floating Storage posted on Bloomberg Nov 26 at 10am MT

Source: Bloomberg, Vortexa

Figure 33: Vortexa Estimates Posted Nov 26 10am MT, Nov 19 10am MT, Nov 12 11am MT

Posted Nov 26, 10am MT

FZWWFST VTXA Inde 94) Sug

11/24/2019 - 11/25/2022

1D 3D 1M 6M YTD 1Y 5Y

Date	FZWWFST VT... Last Px
Fr 11/25/2022	94763
Fr 11/18/2022	100.361k
Fr 11/11/2022	79153
Fr 11/04/2022	87680
Fr 10/28/2022	102.227k
Fr 10/21/2022	90045
Fr 10/14/2022	85100
Fr 10/07/2022	81244
Fr 09/30/2022	85521
Fr 09/23/2022	100.327k
Fr 09/16/2022	87396

Nov 19, 10am MT

FZWWFST VTXA Inde 94) Sug

11/17/2019 - 11/18/2022

1D 3D 1M 6M YTD 1Y 5Y

Date	FZWWFST VT... Last Px
Fr 11/18/2022	86163
Fr 11/11/2022	83996
Fr 11/04/2022	90384
Fr 10/28/2022	107.216k
Fr 10/21/2022	94673
Fr 10/14/2022	87563
Fr 10/07/2022	83714
Fr 09/30/2022	88639
Fr 09/23/2022	105.268k
Fr 09/16/2022	89773
Fr 09/09/2022	82131

Nov 12, 11am MT

FZWWFST VTXA Inde 94) Sug

11/10/2019 - 11/11/2022

1D 3D 1M 6M YTD 1Y 5Y

Date	FZWWFST VT... Last Px
Fr 11/11/2022	73025
Fr 11/04/2022	85848
Fr 10/28/2022	102.944k
Fr 10/21/2022	94914
Fr 10/14/2022	87931
Fr 10/07/2022	84311
Fr 09/30/2022	90252
Fr 09/23/2022	105.552k
Fr 09/16/2022	89540
Fr 09/09/2022	84530
Fr 09/02/2022	79960

Source: Bloomberg, Vortexa

Oil – BNEF, congestion levels down globally WoW

Mobility down globally WoW

On Thursday, BloomergNEF posted its Global Road Traffic Indicators which included a WoW decrease in mobility across the globe. The report was titled "*Congestion levels wane around the world after four-week upswing".* Congestion levels, apart from China, had trended up for the four prior weeks in the world. But this week saw a decline around the world so it will be worth watching to see if there is a continuation of this trend outside of China. We expect to see continued negative congestion data out of China with the increased Covid restrictions and lockdown. BNEF reported TomTom congestion index showed Europe down 0.8%, Asia Pacific down 3.6%, China down 2.4%, and North America down 2.1% from last week. Our Supplemental Documents package includes excerpts from the BNEF Global Road Traffic Indicators report.

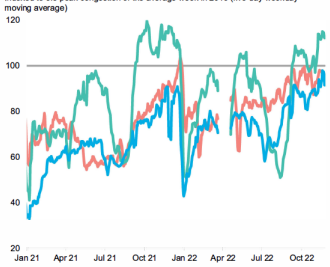
Figure 34: BloombergNEF Mobility Indicators

Comparing the two mobility indicators

Congestion levels drop across the board

TomTom congestion index

Indexed to the peak congestion of the average week in 2019 (five-day weekday moving average)

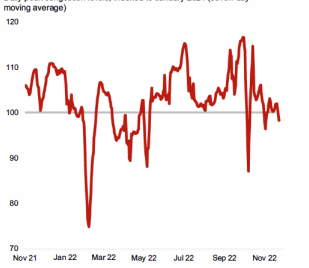


	Latest	Week Δ	Four-week Δ
Europe	112.2	-0.9 (-0.8%)	10.2 (+10.0%)
Asia Pacific	94.3	-3.6 (-3.8%)	4.3 (+4.8%)
North America	91.5	-2.0 (-2.1%)	2.4 (+2.7%)

*Source: TomTom road congestion data, BloombergNEF. Note: **Asia Pacific excludes China. Data updated to November 23, 2022.** Δ = change.*

China-15 (Baidu) congestion index

Daily peak congestion levels, indexed to January 2021 (seven-day moving average)



	Latest	Week Δ	Four-week Δ
China-15	98.29	-2.39 (-2.37%)	-7.82 (-7.37%)

*Source: BloombergNEF, calculated from Baidu data. Note: Data updated to **November 23, 2022**. Δ = change.*

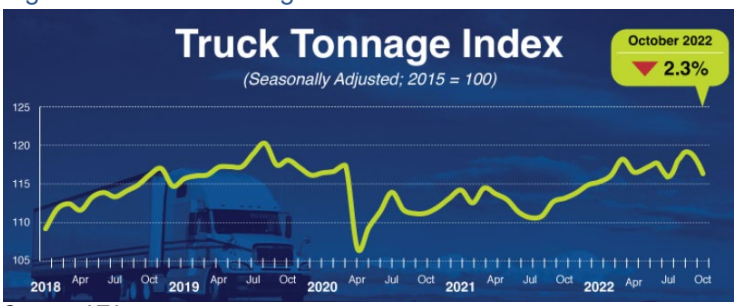
Source: BloombergNEF

Oil – October truck tonnage fell 2.3% MoM, up 2.8% YoY

Truck tonnage index -2.3% YoY in October

Lower freight volumes in the US led to a demand for truck haulage down in October vs stronger strong August and September numbers. Truck tonnage was down 2.3% in October and is back to negative after only two months of positive numbers. It is worth noting that the index fell by 4.6% from April to July and numbers are still not quite back to the levels observed in 2020. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for October on Tuesday [LINK]. October observed a 2.3% decrease MoM from September, after increasing 0.5% last month. Chief Economist Bob Costello noted, *"The decrease fits with the anecdotal reports of a muted fall freight season. It also coincides with a slowing economy. Housing is a weak spot in freight in addition to a slowing in personal consumption of goods. While factory related freight is holding up better than other areas, it is also decelerating"*. The index is up 2.8% YoY from October 2021, with a fourteenth consecutive YoY gain. Trucking serves as a barometer of the U.S. economy, representing 72.2% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 10.93 billion tons of freight in 2021. Motor carriers collected $875.5 billion, or 80.8% of total revenue earned by all transport modes. Our Supplemental Documents package includes the ATA release.

Figure 35: Truck Tonnage Index



Source: ATA

Oil & Natural Gas – CAOEC drilling forecast calls for +14.8% YoY in 2023

2023 drilling forecast calls for +14.8% YoY

On Wednesday, CAOEC (Canadian Association of Energy Contractors) released its Q4/22 and 2023 drilling forecast [LINK]. The CAOEC forecasts a +14.8% YoY increase in wells drilled to 6,409 wells in 2023, up from an estimated 5,582 wells in 2022. And a +14.8% YoY increases in projected operating days to 70,495 operating days, up from estimated 61,404 operating days in 2022. The higher drilling levels lead to the CAOEC forecasting an increase in jobs by 5,437 YoY jobs to a total of 42,350 direct and indirect jobs. The CAOEC warns "*After years of lower activity levels, labour recruitment and retention remain a challenge to overcome in the energy industry. The Association fully accounts for this barrier in the forecast, and anticipates more people will join the industry as it proves to offer competitive career opportunities for young people, Indigenous communities, and newcomers from coast to coast to coast."* The CAOEC highlighted the tailwinds to drilling from the upcoming completion of the Trans Mountain Expansion Project and Coastal GasLink natural gas pipeline. Our Supplemental Documents package includes the CAOEC forecast release.

Putin's push on Arctic strength

Oil & Natural Gas – Putin strengthens "Russia's status as a great Arctic power"

Everything Putin says is getting more attention these days so his Tuesday speech got some western coverage. Putin spoke, of course remotely, at a ceremony to launch another nuclear-powered icebreaker, Ural. It seems like more are waking up to his long game strategy, implemented years ago, to be the dominant Arctic power. He noted how the nuclear-powered icebreaker expanding fleet was "*strengthening Russia's status as a great Arctic power*". Russia's nuclear-powered icebreaker fleet is: Arktika and Sibira are in-service. The Ural is entering service now. Yakutia is on track for in-service by year end 2024. Chukotka is scheduled for 2026. The "Rossiya super-powerful nuclear icebreaker should be completed in 2027. Russia sees cargo shipped on its Northern Route to be about six times by 2035. Putin concluded his remarks "*I am not even talking about the broader development of the Arctic or the fact that the future of our country largely depends on the progress in developing our northern regions. Just the development of this route is extremely important for our country at this moment, especially in view of the changing climate. In the near future, its importance will increase many times over. And so, I would like to thank all of you very much. Of course, I would like to repeat again that we are ready for cooperation with all friendly nations, with all those who want to work with Russia. We know that there is great interest in taking part in this joint work."* Our Supplemental Documents package includes the Putin speech.

Russia is sending an oil tanker thru Northern Sea route in Arctic right now

The Northern Sea route is not a new future possibility, it is being used right now. There is an oil tanker moving thru the Arctic right now on its way to Asia. Here is what we wrote in our Nov 13, 2022 Energy Tidbits. "*We are a little surprised the Russian oil tanker being sent thru the Northern Sea route in the Arctic didn't get more attention. On Tuesday, Bloomberg reported "Russia sent its second-ever crude oil shipment east through the Arctic Circle toward China, a route that could one day give the country a faster way to buyers in Asia. The Vasily Dinkov, a specialized ice-breaking tanker, is traveling along the Northern Sea Route after loading crude late last month from a storage tanker moored at Murmansk, vessel tracking data compiled by Bloomberg show. The ship, hauling a relatively tiny cargo, crossed Russia's northern coast and passed through the Bering Strait, separating the country from Alaska, over the weekend. It's due to arrive at the Chinese port of Rizhao on Nov. 17." We were impressed that they are doing it in November and not in Aug/Sept or early Oct when the ice is at its lowest. Sending a tanker thru in Nov is a great extension of a potential tanker season thru this route. This was a small tanker with only 0.5 mmb capacity vs 2 mmb for the big tankers. But we wouldn't expect the super tankers to use this route. Recall the Northern Sea route is a Putin priority for Russia's future. Our Supplemental Documents package includes the Bloomberg report*."

For years, Putin has highlighted Northern Sea Route is the shortest sea route

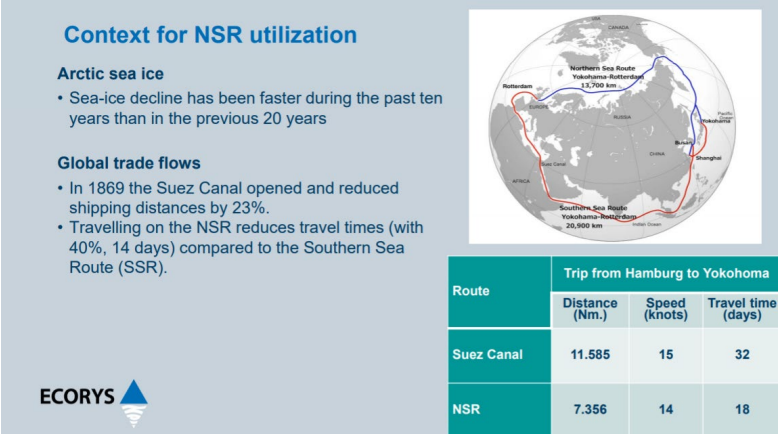
We have followed the Northern Sea route and Canada's Northwest Passage route for 20 years or so as sea routes that will play an increasing role over the coming decades. Here is what we wrote in our Oct 17, 2021 Energy Tidbits as one example. "*There should be no surprise that Putin's Oct 14 speech to UN transport conference*

highlighted Russia's Northern Sea route. Putin confirmed that Russia has been transporting cargoes along the unique route and believes the role of the passage will continuously grow as the needs to ship goods between east and west along the shortest and most cost-effective route grows; specifically; with the industrial growth of the Asia Pacific region and the changing climate. Putin said "we intend to increase freight traffic along the entire 10,500 km Northern Sea Route multiple times over, build infrastructure, including for reliable communications and navigation, and promote port development. We are also working hard to develop the nuclear-powered icebreaking fleet of Russia. In the process, we are inviting all interested partners, including our Chinese friends, to use more actively the opportunities of the Northern Sea Route for expanding trade transactions with Europe." Putin concluded his comments on this topic by inviting all interested parties, with emphasis on China, to use more actively the opportunities the Norther Passage presents in expanding trade."

Russia's Northern Sea Route shortens shipping time by 14 days

Our primary highlighting of the Northern Sea route in 2021 was in our April 4, 2021 Energy Tidbits at the time of the Suez Canal shutdown. The Northern Sea route is a much sorter and faster sea route. Time is money and this is a huge savings in time and cost even if there could be added insurance costs in the northern route. This was very topical as at the time of writing the Evergiven was stuck, blocking the Suez Canal. We noted that we had to believe that the Suez Canal stoppage got shippers thinking more about the utilization of Russia's Northern Sea Route. We also noted in our Jan 24, 2021 Energy Tidbits that Russia would be attempting the earliest ever LNG shipment to Asia through the Northern Sea Route in May, as the transit season is getting longer for the NSR. The NSR is a much shorter route from Europe to Asia than through the Suez, with a trip from Hamburg to Yokohoma taking 14 days less using the NSR and is ~4,000 Nm shorter. Below is a good graphic from the ECORYS discussion paper at the International Transport Forum. [LINK]

Figure 36: Suez Canal vs. Northern Sea Route



Route	Trip from Hamburg to Yokohoma		
	Distance (Nm.)	Speed (knots)	Travel time (days)
Suez Canal	11.585	15	32
NSR	7.356	14	18

Source: International Transport Forum, ECORYS

Oil & Natural Gas – EIA India country brief

EIA's country brief on India

We continue to recommend adding the EIA's country analysis briefs to reference libraries as good quick references, in this case its new EIA country executive summary [LINK] on India. India is the 3rd largest energy consumer in the world following China and the US. Plus, it is expected to have greatest population growth and growth in energy consumption in the coming decades. It is expected to have the largest growth in oil consumption over the next decade. Plus it has set ambitious target to get natural gas consumption to 15% of its energy mix by 2030. They aren't on track to do so, but even getting there halfway is a big plus for LNG markets in the 2020s. Our Energy Tidbits memos regularly report on India's natural gas production and how growth has stalled in 2022. This is significant because if India isn't growing its domestic natural gas production, any increases in natural gas consumption has to be met by increased LNG imports. India's oil demand was 4.77 mmb/d in 2021, but is up in 2022. India only has small strategic petroleum reserves, which currently can only hold 39.0 mmb (ie. 6 days of demand) but there are plans to add an additional 48.0 mmb. Currently, India is the second-largest coal consumer in the world, behind China. Our Supplemental Documents package includes the EIA country brief.

Oil & Natural Gas – EIA Eastern Mediterranean Energy brief

EIA's Eastern Mediterranean energy brief

We continue to recommend adding the EIA's country analysis briefs to reference libraries as good quick references, in this case its an EIA executive summary [LINK] on Eastern Mediterranean Energy. Countries in the Eastern Mediterranean include Egypt, Greece, Israel, Jordan, Lebanon, Cyprus, and Turkey. There is significant oil production, over 2 mmb/d from the group. But the importance of this area is the potential for near term natural gas supply growth. This is one of the hot regions for natural gas exploration/development as it is probably the fastest natural gas discovery to natural gas supply and it is right there to supply Europe. The Eastern Med is one of Chevron's key natural gas growth regions. The EIA notes there have been several significant natural gas discoveries in the Eastern Mediterranean with estimated start dates all the way to 2038, estimated to produce a total of 9.2 bcf/d. This will be one of the big natural gas growth areas in the 2020s. Our Supplemental Documents package includes the EIA brief.

Eni's offshore Egypt Zohr natural gas discovery was huge

The best example of a massive natural gas discovery was the Eni Zohr field offshore Egypt, which turned out even better than expected and it had huge expectations. Here is what we wrote in our April 10, 2022 Energy Tidbits memo. "*Eni was right in calling Zohr a "supergiant" natural gas discovery in Sept 2015.Long term readers know that we very seldom highlight individual oil and gas discoveries unless we think they are material and impactful to oil and gas such as Eni's Zohr's offshore Egypt gas discovery, Exxon's Liza offshore Guyana oil discovery, and even Lundin Petroleum's offshore Norway oil discovery Alvadnes that has ultimately been named as Johan Sverdrup. In Zohr's case, Eni was right when it made the discovery and called it a "world class supergiant" discovery. Here is what we wrote in our Sept 6, 2015 Energy Tidbits. "Natural gas – ENI makes a "supergiant" deepwater natural gas discovery offshore Egypt in the Mediterranean Sea. We generally don't note many international natural gas discoveries , unless there is the big near term production potential. This week, ENI made what they call a "world class supergiant gas*

discovery at its Zohr Prospect, in the deep waters of Egypt. The discovery could hold a potential of 30 trillion cubic feet of lean gas in place covering an area of about 100 square kilometres. Zohr is the largest gas discovery ever made in Egypt and in the Mediterranean Sea". ENI also stated that it "will immediately appraise the field with the aim of accelerating a fast track development of the discovery that will utilise at best the existing offshore and onshore infrastructure". The key to this discovery is that it is big AND it can be brought on stream quickly. ENI didn't give a timeframe in the press release, but we also listened to the CNBC interview where CEO Claudio Descalzi said "It is close to the facilities so the time to market will be very good… that is part of our strategy to…continue to do our exploration in the mature area where we have a deep geographical knowledge and we can take advantage of our facilities and that will make the unit cost in terms of capital very positive," and "I don't want to put a date now but it is a question of a few years to have production—then a full production, that will be a very quick fast track development". This is viewed as a multi bcf/d project and can be on stream, to some level, in a few years. Its still early but you would have to expect that some of the early natural gas will go domestically as Egypt basically uses almost 100% of its natural gas produced in domestic markets with only very small amounts of LNG exports. BP Amoco estimates that Egypt natural gas consumption was 4.6 bcf/d in 2014. But it is a large discovery and could have surplus natural gas to export via LNG."

Energy Transition – Alberta Premier Smith wants mini-nukes to power the oil sands

Mini-nukes to power the oil sands?

We are surprised that new Alberta Smith's Nov 10 mandate letters to ministers didn't get more attention or at least that there were many items that didn't get attention. One was her clear goal to have mini-nukes to power the oil sands. In her Nov 10, 2022 mandate letter to Minister of Energy Guthrie, she includes "*Work with other provinces to further develop small modular reactor technology and pave the way for its usage and generation in oil sands operations.*" [LINK] That seems like a pretty clear desire to have mini-nukes power the oil sands instead of natural gas. This is not a new idea, but it may well be one that has now found its time over the next couple years. But it will take time to execute and one that isn't likely to have any impact on natural gas consumed by oil sands for at least a decade.

Mini-nukes for oil sands will also reduce emissions

We first wrote on using mini-nukes to power oil sands approx. 20 years ago in our Energy Tidbits memo. At that time, it was because natural gas prices had spiked and were expected to stay stronger for long – emissions reductions were not part of the major business case to do so 20 years ago. Smith did not mention in her mandate letter there will be an emissions reduction benefit if mini-nukes power oil sands and not natural gas. Here is what we wrote 21 months ago in our Feb 28, 2021 Energy Tidbits memo. "*We have to believe that, after this week's Liberal surprise comment on electricity in the above item, there are very few who don't believe the Liberals are going to drive ahead more aggressive emissions reduction targets in their upcoming announcement before April 22. Its why, on Friday, we tweeted [LINK] that this pre April 22 announcement is likely a key reason why we saw the Daily Oil Bulletin story "Suncor Eyeing Small Modular Nuclear Reactors In Oilsands Extraction" [LINK] that reported Suncor " would be "super interested" in a nuclear reactor technology that could replace the energy intensive natural gas fired boilers and steam generators in*

its oilsands extraction, a company executive said Wednesday. "The place where small modular reactors really, really shine is in heavy industry providing a very high temperature heat that can be used in various ways, including the extraction of oil and gas," he said. This offers the potential to create a less carbon intensive and increasingly competitive product in Alberta and in the Alberta oilsands." Our other Friday tweet [LINK] on the DOB report linked to some of our prior reporting on mini nukes for the oil sands. We also noted one item that wasn't in the DOB reporting – the advantage that mini nukes can be buried deep underground. Our only surprise is that it has taken this long for the major oil sands players to come out publicly in favor of mini nukes. They have had this in their potential playbook for almost 20 years. Long term Energy Tidbits readers might remember we first started writing on using mini-nukes to power the oil sands in the early 2000's when the former Cameco CFO told me this was something they were trying to get people up in Fort McMurray to do to power the oil sands for electricity to run upgraders and to power steam generation at SAGD projecs. There was some interest, but there was more fear on nuclear at that time. It looks like those fears are gone, or at least rank below the fear that aggressive new emissions reductions targets will impact future reserve life of oil sands unless the oil sands operators take a more aggressive emissions reductions action plan. We expect to see mini nukes be part of the formal messaging of oil sands players in the coming months. "

Alberta and Sask had put mini nukes on their study plan in 2020

Here is what we put in our Aug 9, 2020 Energy Tidbits. "*Yesterday, we tweeted [LINK] "Alberta to look at mini-nukes. Specifically notes potential for #OilSands, exactly what @Kim_Goheen said Cameco pitched in early 2000s. Think this will have traction especially as world realizes mini nukes can help speed up transition to #CleanEnergy." Alberta announced it was had signed a letter of intent "to enter into a memorandum of understanding with Ontario, Saskatchewan and New Brunswick to support the development of versatile and scalable small modular reactors (SMRs). SMRs are smaller than traditional nuclear reactors and scalable to suit local needs, with lower upfront capital costs and enhanced safety features. This new and versatile technology could supply non-emitting, low-cost energy for on-grid and off-grid communities in Alberta, including remote and rural areas of the province, as well as industries with a significant need for steam, such as Alberta's oil sands." Our June 28, 2020 Energy Tidbits noted Saskatchewan's announcement that week to look into the potential of small nuclear reactors for power generation. Mini-nukes are not a new idea. Long term Energy Tidbits readers might remember we first wrote on using mini-nukes to power the oil sands in the early 2000's when the former Cameco CFO told me this was something they were trying to get people up in Fort McMurray to do to power the oil sands for electricity to run upgraders and to power steam generation at SAGD projecs. There was some interest, but there was more fear on nuclear at that time. Earlier this morning, Premier Kenney tweeted [LINK] "This could be a game changer in providing safe, zero-emitting, baseload power in many areas of the province - including in the oil sands where we could use the steam". Basically what Cameco suggested almost 20 years ago. Mini nukes make a lot of sense in various settings. Our Aug 19, 2018 Energy Tidbits had an item "Mini nukes for powering China's South China Sea islands makes sense". Our Nov 3, 2019 Energy Tidbits*

reviewed Saudi's plan to reduce emissions and we said "makes us wonder about nuclear power, especially mini nukes" for Saudi. The Alberta release said "A typical SMR would generate between two and 300 megawatts of electricity, which could provide power for a village or small city." We also see mini-nukes getting more traction in 2020 in the leadup to COP26 in Glasgow in Nov. As we have been highlighting, the world is behind in it capital allocation and progress to a clean energy transition, and we see mini-nukes as way to help it catch up."

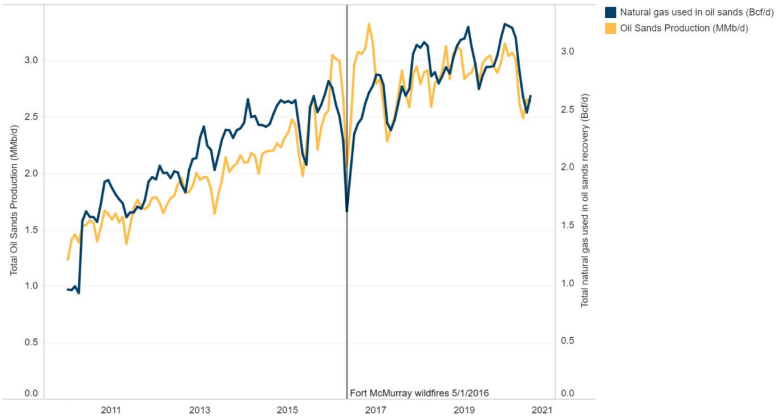
Reminder mini-nukes can be buried deep underground in cement bunkers

Here is the other part of the mini nuke advantage we put in our Aug 9, 2020 Energy Tidbits. "*On June 26, we tweeted on the Sask mini nukes initiation and the June 25 Forbes story [LINK] "The Small Canadian Province That Could Lead The Future Of Energy'." The reason for our tweet was that we hadn't seen anyone mention one of the key reasons why we think mini-nukes have significant potential – they are small enough to be buried deep underground in cement bunkers. Our tweet [LINK] said "Also key reason why mini-nuke power generation can be game changer not just for Sask. @Kim_Goheen exCameco reminds small 50MW modular reactor can be buried deep underground in cement bunker. Very small above ground footprint. Out of sight, out of mind". Nuclear has many benefits, its clean energy and its provide the intense power needed to be able to power all industrial needs ie. make steel. Our Supplemental Documents package includes the Forbes story*."

Pre-Covid, oil sands used over 3 bcf/d of western Cdn natural gas

We also previously warned that the oil sands moving to mini nukes is a potential long term (>2030) negative to natural gas. The reason is that oil sands is one of the major consumers of western Canadian natural gas. CER's Sept 9, 2020 blog "*Market Snapshot: Oil sands use of natural gas for production decreases considerably in early 2020"* [LINK] highlighted how the Covid production shut ins reduced oil sands use of natural gas. But its below graph also highlighted that oil sands were using >3 bcf/d of natural gas prior to Covid.

Figure 37: Natural Gas Used in Recovery of Oil Sands & Total Oil Sands Production



Source: CER, AER

Capital Markets – IFIC: Big acceleration in redemptions in Cdn active equity funds

Big redemptions in active Cdn equity funds

One of the big Cdn equity stories in 2022 continues to play out – the massive net redemptions from active Cdn equity fund managers. On Tuesday the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for October. IFIC reported net redemptions for mutual funds balanced funds were $5.66b in Oct, up from $4.99b in Sept and YTD Oct 31 of 19.96b. IFIC reported net redemptions for mutual funds equity funds was $1.89b in Oct, down from $2.89b in Sept, which flipped net sales into a net redemptions for YTD Oct 31 of $2.31b. For October, the IFIC reported "*Mutual fund assets totalled $1.796 trillion at the end of October 2022. Assets increased by $40.4 billion or 2.3% compared to September 2022. Mutual funds recorded net redemptions of $8.0 billion in October 2022. ETF assets totalled $300.5 billion at the end of October 2022. Assets increased by $12.9 billion or 4.5% compared to September 2022. ETFs recorded net sales of $3.4 billion in October 2022".* Our Supplemental Documents package includes the IFIC release.

Figure 38: Cdn mutual fund net sales/net redemptions ($ millions)

Mutual Fund Net Sales/Net Redemptions ($ Millions)*

Asset Class	Oct. 2022	Sep. 2022	Oct. 2021	YTD 2022	YTD 2021
Long-term Funds					
Balanced	(5,660)	(4,986)	3,340	(19,964)	57,316
Equity	(1,887)	(2,891)	1,881	(2,306)	34,116
Bond	(1,662)	(1,914)	384	(10,432)	15,151
Specialty	(2)	1	431	1,213	5,178
Total Long-term Funds	(9,210)	(9,790)	6,037	(31,489)	111,761

Source: IFIC

Capital Markets – USDA consumer price index for food +10.9% YoY in October

USDA consumer price index for food

The USDA's official food price data keeps going up, but we continue to believe it is nowhere as much as what Americans feel when they go to the grocery stores in the US. This feels like what we heard last summer about inflation being transitory, the real food price increases that

people pay at the grocery store are way higher than the consumer price index for food. The USDA posted its consumer price index for food data for October on Tuesday [LINK], which is +0.7% MoM and +10.9% YoY, compared to August at +11.2%; while it is up over 10%, it still seems very low. Whenever we ask US friends what they think their grocery bills have increased YoY, we have never heard anyone say something like 11% YoY. Rather, most tend to think up at least 20%. The +10.9% YoY is for the overall food price index, which has a relative weighting for the various food categories. Some of the YoY % increases that just don't sound anywhere near reality are fats/oils +23.4% YoY, pork +4.0% YoY, fresh fruits & vegetables +7.4% YoY, and fish & seafood +7.4% YoY. We wonder what their forecasts are used for as they forecast overall food price escalation of 3.0% to 4.0% for 2023.

Capital Markets – Eric Nuttall's fund is 3rd largest active global energy fund

Eric Nuttall's Ninepoint fund

We were a little surprised to turn on our CNBC Street Signs Asia on Monday night to hear them say Eric Nuttall (Ninepoint) was next up. Eric gave his well know views on why he sees a multi-year positive oil outlook. But something we didn't know was the size of his fund relative to other active energy fund managers and that his Ninepoint Energy Fund was now the 3rd largest active energy fund in the world. We tweeted [LINK] "*Sent congrats to @ericnuttall watching @StreetSignsCNBC. Didn't know 4 min mark "as the manager of the 3rd largest energy fund [active not passive] in the world". @MorningstarInc - BlackRock World Energy Fund $4.7b, Fidelity Select Energy $3.4b, Ninepoint Energy Fund $2.0b. #OOTT."* For those that don't know his oil views, the CNBC video clip is at [LINK].

Capital Markets – US Housing market slowdown may ease in the coming months

Pending home sales post record drop

On Monday, Redfin news released an article "Pending Home Sales Post Record Drop in October as Deal Cancellations, Price Cuts Hit Record High" [LINK]. Lily Katz writes, *"Pending home sales fell the most on record in October and deal cancellations and price cuts hit record highs as buyers were spooked by the biggest mortgage-rate jump in over four decades."* An important note is that Redfin's records began in 2013, so although 32.1% YoY is the largest on Redfin's record, bigger drops could have been experienced in the past. Homes experienced price drops at 23.9%, or double the rate seen last year. Homes were less likely to be sold even under contract in October with 17.9% of home-purchase agreements falling through. Chen Zhao, Redfin Economics Research Lead was quoted, *"there are early but promising signs that inflation is cooling, which caused mortgage rates to drop last week. If that progress continues, buyers who recently backed out of deals may return to the market and sellers may be less inclined to slash their prices."* The median home sale price is $397,549 in the US, down 1.4% MoM but still up 4.9% YoY.

Demographics – 29% of American households are one-person households

Women make up 80% of single-parent families

Last Thursday, the US Census Bureau released new estimates on America's families and living arrangements [LINK]. The release highlighted that the percentage of one-person households has been increasing, up to 37.9mm households or 29% of all households, versus only 13% in 1960. But there were a number of other metrics that reinforce some of the demographic trends over the past decades. More young adults living at home - Of adults ages 18 to 24, 56% still lived at home, compared to 16% of adults aged 25 to 34. Less married households - 34% over 15 have never been married, up from 23% in 1950. It is also reported that the median age to marry was 30.1 for men and 28.2 for women in 2022, this is up from ages 23.7 and 20.5, respectively in 1947. Living arrangements have shifted, possible

due to the cost of living. Mothers make up 80% of all single-parent family groups and 44% of single-parent families had two or more children under 18 living with them, 67% had at least one child under 12, and 51% had at least one child between 12 and 17.

Demographics – Five Canadian cities rank in world's top 100

World's best cities rankings

The Best Cities Organization released the top 100 cities in the world for 2023 [LINK]. It is nice to see Canada making the list five times with Toronto (24), Montreal (57), Calgary (65), Vancouver (69), and Ottawa (96). London, United Kingdom takes the top of the list for 2023 based on the six metrics of Place, Product, Programming, People, Prosperity, and Promotion. The metrics contain a wide array of attributes from natural environment to shopping and culture, to economic status. Kyiv, Ukraine was awarded the 2023 most honorary city in the report, stating *"The historic Ukrainian capital is the urban beacon of courage and resilience leading a defiant nation against a murderous aggressor. It is, like the rest of Ukraine, a place of inexhaustible courage in the face of daily tragedy."* Below is a table highlighting both the top and bottom ten countries in the report. Our Supplemental Documents package contains the city rankings by category tables from the World's Best Cities report.

Figure 39: Top and Bottom 10 cities in the top best cities 00

Rank	City	Rank	City
1	London, United Kingdom	100	Marseille, France
2	Paris, France	99	Cologne, Germany
3	New York, USA	98	Sendai, Japan
4	Tokyo, Japan	97	Hanoi, Vietnam
5	Dubai, UAE	96	Ottawa, Canada
6	Barcelona, Spain	95	Stuttgart, Germany
7	Rome, Italy	94	Baltimore, USA
8	Madrid, Spain	93	Nagoya, Japan
9	Singapore, Singapore	92	Glasglow, United Kingdom
10	Amsterdam, Netherlands	91	Perth, Australia

Source: Best Cities

Demographics – Russian poll says Putin has 78.7% level of trust among Russians

Putin's high trust level in Russia

We were surprised that the number wasn't higher from a poll of 1,600 Russians conducted by All-Russian Center for the Study of Public Opinion (VTsIOM) on Russian's confidence in Putin. TASS wrote [LINK] "*The level of trust of Russians in Russian President Vladimir Putin over the past week increased by 0.7 percentage points and is 78.7%, according to the All-Russian Center for the Study of Public Opinion (VTsIOM), publishedon Friday. "The question of confidence in Putin was positively answered by 78.7% of the survey participants (plus 0.7 percentage points per week), the level of approval of the president's activities was 75% (plus 1.3 percentage points per week)," the center said in its materials."* We have to assume the poll is meant to give some reminder to the west that Putin has support within Russia, but suspect most will just ignore the poll or wonder what the real answer would be in a poll.

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

@Energy_Tidbits on Twitter

For new followers to our Twitter, we are trying to tweet on breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. Our Twitter handle is @Energy_Tidbits and can be followed at [LINK]. We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos

for over 20 consecutive years. Please take a look thru our tweets and you can see we aren't just retweeting other tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

Look for energy items on LinkedIn

LinkedIn – Look for quick energy items from me on LinkedIn

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

Misc Facts and Figures.

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

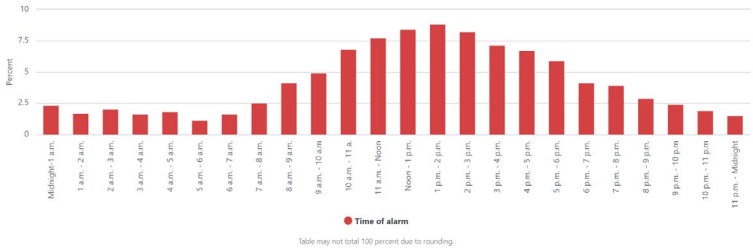
Scholz 's memory gaps

Earlier we noted how we liked the style of the Focus interview with German Chancellor Scholz on rapid fire, short questions and answers. Get the interviewee in the mode of rapid one word answers to try to get an off the top of the head answer. But it is fun but doesn't always work. Lead up questions like "human or artificial intelligence", "in the corridor or at the window", "right or left rudder arm", "trump or desantis", "Habck or Baerbock", "which Bowie song better describes the first year of the traffic light government, heroes or under pressure", and then closing question "chancellor in this conversation, you do not seem like a man who forgets a lot. Why did you so often refer to memory gaps in the several hours of questioning on the Ex affair"" Scholz "because I was asked the same question very often and it was a very short issue". Good try on the question though.

More home fires on Thanksgiving than any other day by a large margin

Didn't realize this until we saw some of the safety ads on US Thanksgiving, which seemed mostly to focus on the warning don't fry your turkey in the house and be really careful even if frying outside. But the statistic was that home fires on Thanksgiving were more than double the amount of fires on other days. The fires tended to be smaller with less fatalities, injuries and dollar loss because they tend to be during the daytime and started in the kitchen with cooking for the big turkey dinner. The U.S. Fire Administration [LINK] writes "*Cooking fires in residential buildings occurred more often on Thanksgiving Day than any other day of the year. Cooking was, by far, the leading cause of all Thanksgiving Day fires in residential buildings at 74% followed by heating at 8%. By comparison, cooking was the cause of 51% of residential building fires that occurred on all days of the year other than Thanksgiving*." And "*Over half (54%) of Thanksgiving Day fires in residential buildings occurred from 10 a.m. to 5 p.m., when many people are preparing Thanksgiving dinner. Fires then declined throughout the evening. This stands in contrast to the rest of the year, when residential building fires peaked during "normal" dinnertime hours of 5 to 8 p.m."*

Figure 40: Time of fire alarm on US Thanksgiving 2017-2019



Source: U.S. Fire Administration

Milwaukee had >10,000 car thefts in 2021 and 2/3 were Kia or Hyundai cars

We hadn't realized the there was this risk with Kia and Hyundai 2011-2021 models until seeing a report of a class action lawsuit against Kia and Hyundai alleging that a defect in their 2011 to 2021 models makes them easy to operate with a key and hassled to a serious theft problem. Of course, it doesn't help that people have reportedly posted videos about how to go steal the cars in less than a minute using a USB charging cable. The interesting data point that would support that risk was that there were apparently >10,000 car thefts in 2021 in Milwaukee and approx. 2/3 were Kia or Hyundai cars. Car and Driver posted a Dec 11, 2021 report [LINK] on the Milwaukee car thefts and wrote "To address the problem, Hyundai and Kia say they are working with the local police department, which is distributing free steering-wheel locks to Milwaukee Hyundai and Kia owners through the end of the year. Starting with the 2022 model year, Kia said, it will make immobilizers standard on all trim levels of all models, a spokesperson said. Hyundai told C/D that all its new vehicles at every trim level have the immobilizers now. These have a transponder in the key fob to prevent a vehicle from being started by someone without the right key."

Airlines reportedly pushing to have just one pilot flying passenger planes

We were surprised to see Bloomberg's report last Sunday night that "*Airlines and regulators are pushing to have just one pilot in the cockpit of passenger jets instead of two. It would lower costs and ease pressure from crew shortages, but placing such responsibility on a single person at the controls is unsettling for some. Over 40 countries including Germany, the UK and New Zealand have asked the United Nations body that sets aviation standards to help make single-pilot flights a safe reality. The European Union Aviation Safety Agency has also been working with planemakers to determine how solo flights would operate and preparing rules to oversee them. EASA said such services could start in 2027.*" We have to believe there will be huge passenger resistance, but the reality maybe that passengers will have no choice. It's kind of like you may not be comfortable flying in an Boeing MAX but, if so, too bad or you don't fly. We heard a proponent talk about private jets often only having one pilot because of the technology in the planes. Many new private jets over the past 20 years have the traditional two pilot cockpit seats but only need one one pilot. That is true, but we also know people who have bought these type of jets but would only fly with two pilots. There is going to have to be a big don't worry campaign before they start flying big passenger planes with only one pilot.