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Energy Tidbits

March 26, 2023

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900,000 b/d of Crude Demand Currently Hit by Strikes & Accidents Halting Major France Refinery Operations

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. Negative to oil right now is 900,000 b/d of France refineries being halted by strikes/accidents (Click Here).
2. Iraq wins arbitration case and then halts 445,000 b/d of oil exports thru Turkey, not clear for how long (Click Here).
3. Novak says Russia will extend its voluntary 500,000 b/d reduction thru the end of June (Click Here).
4. BloombergNEF says big decline in well productivity in Bakken, Eagle Ford and Permian wells (Click Here).
5. Equinor chief economist says energy transition ""this is a self-inflicted train crash in slow motion, because we don't have the investment." (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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Natural Gas – 72 bcf draw in US gas storage; now 504 bcf YoY surplus

YoY storage at 504 bcf YoY surplus

It's mid March so even though it was colder than normal, the storage draw wasn't huge.. So, for the week of Mar 17, the EIA reported a -72 bcf draw (vs expectations of -73 bcf), a -41% increase from the -51 bcf draw reported for the week of Mar 18 last year. This compares to last week's draw of -58 bcf, and the 5-year average draw of -45 bcf. Total storage is now 1.900 tcf, representing a surplus of +504 bcf YoY compared to a surplus of +521 bcf last week and is +351 bcf above the 5-year average vs +378 bcf above 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)				Year ago (03/17/22)		5-year average (2018-22)	
Region	03/17/23	03/10/23	net change	implied flow	Bcf	% change	Bcf	% change
East	355	391	-36	-36	271	31.0	299	18.7
Midwest	461	490	-29	-29	321	43.6	361	27.7
Mountain	84	87	-3	-3	87	-3.4	89	-5.6
Pacific	72	72	0	0	157	-54.1	163	-55.8
South Central	927	933	-6	-6	561	65.2	637	45.5
Salt	262	266	-4	-4	156	67.9	187	40.1
Nonsalt	664	667	-3	-3	405	64.0	449	47.9
Total	**1,900**	**1,972**	**-72**	**-72**	**1,396**	**36.1**	**1,549**	**22.7**

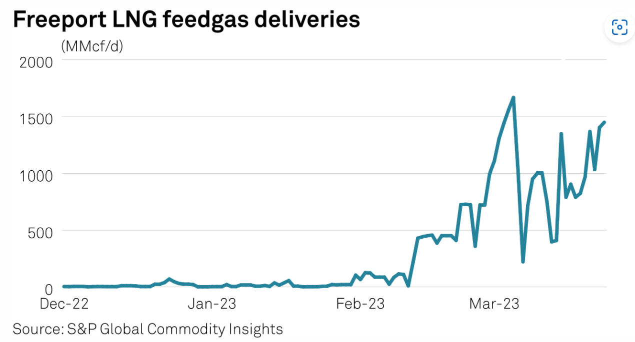
Source: EIA

Natural Gas – Freeport LNG's restart hasn't been smooth and is a little behind

Freeport LNG restart bumps

We recognize there are still five days to go until the end of March, but, as of news cut off at 7am MT, Freeport LNG looks like it won't hit its plan to get back to 2 bcf/d by the end of March. (i) On Wednesday, Reuters reported [LINK] "*The second biggest U.S. liquefied natural gas (LNG) export plant, Freeport, has canceled up to four shipments of LNG, due to restart snags after an eight-month-long outage, trading sources told Reuters. In addition, the facility has recently loaded another vessel with a lower amount of gas than originally planned, two of the sources added. "You arrive with your vessel to load at a given time and they say 'yes you can load', but then an hour later it doesn't. They blame the long shutdown for restart hiccups," a trading source familiar with the matter said."* (ii) On Friday, Platts reported [LINK] "*Gas markets keep watchful eye as feedgas to Freeport LNG returns in fits and starts*" and included the below graph. Our Supplemental Documents package includes the Reuters and Platts reports.

Figure 2: Freeport LNG feedgas deliveries.



Source: Platts

Natural Gas – Sempra FIDs 1.7 bcf/d Phase 1 of Port Artur LNG project

Sempra FIDs Phase 1 Port Arthur LNG project

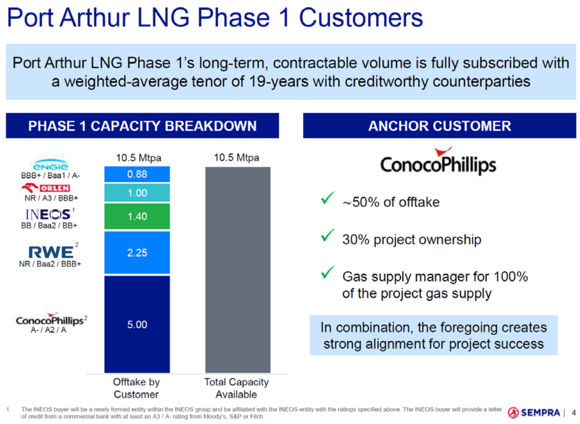
LNG markets have been expected the Sempra FID for the Port Arthur LNG given the prior announcements of long-term LNG contracts. We have been reporting on the Sempra long term contracts in our ongoing tracking of long term LNG deals signed since July 1, 2021. The FID came on Monday, when Sempra Infrastructure Partners announced the execution of its joint venture with ConocoPhillips, closed $6.8 billion non-recourse debt financing and subsequent final investment decision to move forward with the construction and development of the Port Arthur LNG Phase 1 project. Under the joint venture, ConocoPhillips purchased a 30% NCI in the project which entitles the company to 0.66 bcf/d of LNG offtake under a 20-year sale and purchase agreement along with optionality to participate in potential expansion projects. The fully permitted Port Arthur LNG project includes two natural gas liquefaction trains and LNG storage tanks with capacity of ~ 1.71 bcf/d, while Train 1 and 2 are expected to start commercial operations in 2027 and 2028, respectively. ConocoPhillips CEO, Ryan Lance commented, "*Our strategic LNG partnership with Sempra will help supply growing global demand for natural gas, a lower greenhouse gas emissions-intensity fuel expected to play a critical role in the energy transition and global energy mix going forward... we look forward to continuing to build our LNG portfolio and expanding our role in delivering a lower-carbon future that strengthens U.S. and global energy security.*" In addition, Sempra also announced that it has agreed to sell a 25%-49% non-controlling interest in the project to a KKR managed infrastructure fund. KKR Partner, James Cunningham commented, "*We are pleased to invest in this critical energy infrastructure project and extend our strategic partnership with Sempra and their world-class team… Phase 1 will create new jobs, support American economic growth and deliver reliable and cleaner energy during the global energy transition. Consistent with KKR Infrastructure's strategy of seeking stable and predictable returns for investors, our investment in Phase 1 is backed by robust cash flows through long-term contracts with high-quality counterparties.*" Our Supplemental Documents package includes the press release.

Figure 3: Port Arthur LNG phase 1 launch excerpt from Mar 20 release

Source: Sempra Infrastructure Partners

Port Arthur LNG supply is fully contracted, mostly to Europe
Sempra also posed a presentation on the Port Arthur LNG Phase 1 FID that included the below slide on the Phase 1 Customers. Sempra said “Port Arthur LNG Phase 1’s long-term contractable volume is fully subscribed with a weighted-average tenor of 19-years with creditworthy counterparties. Of the 10.5 mtpa, 5.5 mtpa is contracted to European customers, and the remaining 5.0 mtpa is taken by ConocoPhillips who have a 30% project ownership and are the gas supply manager for 100% of the project gas supply.

Figure 4: Port Arthur LNG Phase 1 Customers



Source: Sempra

Natural Gas – Tourmaline CEO’s gentle push for BC and Canada on LNG exports

Tourmaline CEO on LNG

On Monday, the Calgary Herald posted [LINK] “*Opinion: LNG is a hat trick for Canada*”, an opinion piece by Tourmaline CEO Mike Rose. It’s a well written good read recapping the opportunity and benefits, not just to Canada, of expanding LNG exports to the world. We have to wonder why and why now? Rose isn’t the type of person to write a piece like this as someone who wants to write a piece like this because he knows it’s a slam dunk just so he can say I told you so. Rather, it makes us feel what people suspect - BC needs a gentle push to tip the scales and likely Canada also. This is a well written polite piece that is more of a gentle push than an you have to do this. And it reiterates items like this is a huge financial benefit to the First Nations. There is much more in the opinion piece. Our Supplemental Documents package includes the Rose opinion piece.

Natural Gas – Vitol sees tight LNG market until 2026

Vitol sees tight LNG market

On Monday, Vitol posted its CEO, Russell Hardy, “*Vitol 2022 volumes and review*” [LINK]. It’s a good short read with many oil and gas outlook items. One of his highlighted comments was that Vitol sees a tight LNG market until 2026. Hardy wrote “*The supply of LNG is critical to ensuring near term energy security in many regions. High prices during 2022 pushed a number of Asian buyers and economies out of the market and resulted in increased coal burn. We expect this tightness in LNG to continue until 2026, when significant new production capacity will come online, equivalent to 50% of supply in 2022. This new supply, which will originate in the US, Qatar and Africa, will primarily be consumed by developing Asian* *economies, enabling them to underpin economic growth and move away from coal."* Then on Tuesday, Bloomberg reported on comments from Pablo Galante Escobar (Vitol's head of LNG and European Gas and Power) at a conference in Switzerland. Bloomberg wrote "*The recent slump in gas prices has made the fuel more attractive again globally and supplies remain tight. The European benchmark has dropped more than 85% from last year's records, and futures are trading near the lowest level in 20 months, around €40 a megawatt-hour. "The demand that we destroyed in Europe, and the demand that we destroyed in the rest of the world, is coming back," which could move prices higher in the longer-term, the Vitol official said. "Can the prices go above €100 per megawatt-hour again — yes, I think it's likely," he added, without specifying the time frame. The rebound in China's fuel purchases — the "big unknown" as the International Energy Agency said recently — is a major issue for Europe, which competes with Asia for LNG. Europe has made it through the winter without any severe disruptions despite dwindling Russian gas flows. That was because of mostly mild weather, energy-saving measures and strong LNG inflows, due in part to lower buying in Asia and particularly in China."* Our Supplemental Documents package includes the Hardy statement.

Natural Gas – India January natural gas production +1.88% YoY to 3.34 bcf/d

India natural gas production up 1.88% YoY

It looks like India's domestic natural gas production is up modestly from the recent 2020/21 trough, but the growth is still very small. India natural gas production peaked in 2010 at 4.6 bcf/d. Its 2018-2019 production averaged 3.18 bcf/d, declining to 3.02 in 2019-2020 and then further declined to average 2.78 bcf/d 2020-2021. But then natural gas production returned to growth in 2021-2022 but that growth has mostly stalled or is modest at best. There was a small MoM gain in February 2023 on higher demand for products. On Monday, India's Petroleum Planning and Analysis Cell released their monthly report for February's natural gas and oil statistics [LINK]. India's domestic natural gas production was up +1.88% YoY from 3.28 bcf/d in February 2022 to 3.34 bcf/d in February 2023 and down MoM from 3.39 bcf/d in January. Our Supplemental Documents package includes excerpts from the PPAC monthly package.

Natural Gas – India Jan LNG imports up +10.99% YoY to 2.84 bcf/d, up MoM

India LNG imports +10.99% YoY

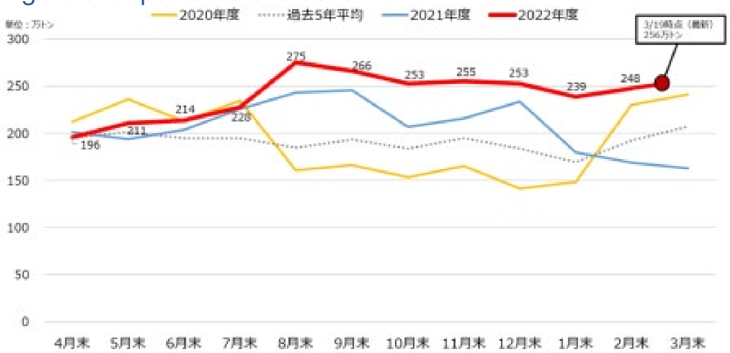
For the past several years, there has been increased India LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 has been the sky-high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we are seeing some modest increases in India's LNG imports. On Monday, India's Petroleum Planning and Analysis Cell released their monthly report for January natural gas and oil statistics [LINK]. The sky-high LNG prices resulted in India LNG imports declining from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. February's 2023 imports were up 10.1% MoM at 2.84 bcf/d, up +10.99% YoY.

Natural Gas – Japan's LNG stocks up +7.1% WoW to 123 bcf

Japan LNG stocks +7.1% WoW

Japan had a warm end to Feb and winter and was able to escape any LNG shortages in the winter. It's shoulder season so there isn't any strong weather related natural gas demand. LNG stockpiles held by Japanese power producers continue to exceed both last year's level and the seasonal average. Japan's METI weekly LNG stocks data was released on Wednesday [LINK]. LNG stocks on Mar 19 were ~123 bcf +7.1% WoW from Mar 12 of ~114 bcf and well above the 5-year average of 99 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 5: Japan's LNG Stocks



Source: METI

Natural Gas – China LNG imports Dec 10.23 bcf/d, Jan 9.16 bcf/d, Feb 8.94 bcf/d

China natural gas imports

No one should have been surprised to see China natural gas imports down YoY in Jan-Feb with the mild weather, increasing domestic natural gas production, earlier Lunar New Year, etc. China's finalized natural gas import data for Jan-Feb was posted which provided the split of natural gas imports between pipeline imports and LNG imports. The data also provides a breakdown of individual monthly data for Jan and Feb. On Mar 18, Bloomberg reported on China import data for Jan and Feb that was posted on the General Administration of Customs website [LINK]. Bloomberg reported "*China Feb. Crude Oil Imports +12.1% Y/y, LNG +8.2% Y/y.*" (i) Natural gas pipeline imports for Jan were down -3.0% YoY to 4.45 bcf/d which is down -0.42 bcf/d from 4.88 bcf/d in Dec. In Feb, pipeline imports were down -7.2% YoY to 5.06 bcf/d which is up +0.61 bcf/d from 4.45 bcf/d in Jan. (ii) LNG imports for Jan were down -24.2% YoY to 9.16 bcf/d which is down -1.07 bcf/d from 10.23 bcf/d in Dec. In Feb, LNG imports were up +8.2% YoY to 8.94 bcf/d which is down -0.22 bcf/d from 9.16 bcf/d in Jan. (iii) Total natural gas imports (pipeline + LNG) were 13.61 bcf/d in Jan, down -1.49 bcf/d from 15.10 bcf/d in Dec while total imports for Feb were 14.00 bcf/d, up +0.39 bcf/d from Jan but down -1.10 bcf/d from Dec. We typically use bp's conversion factors, which are 1 million tonnes of natural gas = 41.071 bcf, and 1 million tonnes LNG =48.028 bcf.

China natural gas production for Jan-Feb up 6.8% YoY to 3.9 bcf/d

The overall China natural gas imports for Jan/Feb were -9.4% YoY and a decline was expected with increasing domestic natural gas production and mild weather. Here is what we wrote in last week's (March 19, 2023) Energy Tidbits memo. "*We have been highlighting a big change in China's natural gas and LNG dynamics over the past two years has been how China has been increasing its domestic natural gas production. We have been highlighting this plus China's increasing natural gas pipeline imports from Russia as these two items reduce the need for LNG imports. China continues to increase its domestic natural gas production in Jan/Feb 2023. China does not provide the separate data for Jan vs Feb. On Wednesday, China's*

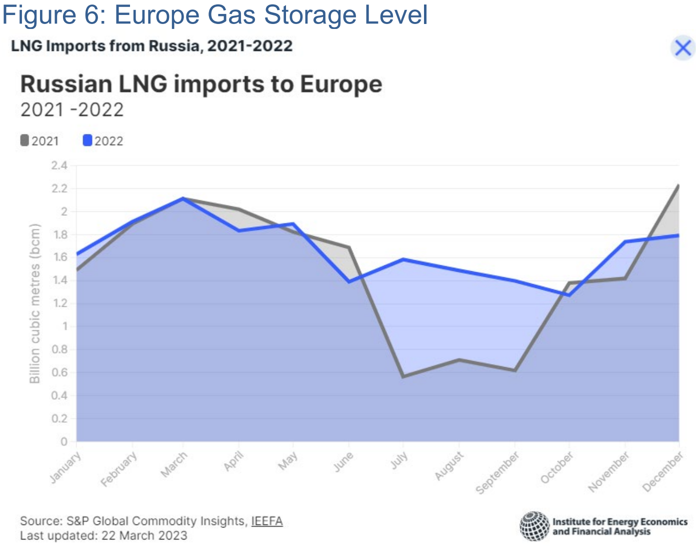
National Bureau of Statistics reported domestic production data for Jan-Feb. YTD domestic production was 3.9 bcf/d, up +6.8% YoY from 3.6 bcf/d in Jan-Feb 2022 and +1.9 bcf/d from 2.0 bcf/d reported for Dec 22."

Natural Gas – EU imports of Russian LNG +136% YoY from Q3/21 to Q3/22

IEEFA's European LNG tracker

We recommend reviewing the Institute for Energy Economics and Financial Analysis's quarterly update to its European LNG Tracker. The IEEFA provided its quarterly update on Wednesday. The IEEFA European LNG tracker provides the full range of Europe LNG data points. One that jumped out at us was the reminder that EU's imports of Russian LNG were up in 2022, especially in Q3/22. Yesterday morning, we tweeted [LINK] "*EU "imported Russian #LNG increased 136% between 3Q21 and 3Q22". Much more in @ieefa_institute European LNG Tracker 03/22 update. [LINK].*" On EU LNG imports from Russia, the IEEFA wrote "*While Russian piped gas exports to Europe have fallen, Russian LNG exports to Europe have been increasing. Europe is aware that the lack of diversification of energy suppliers for the last two decades greatly increased the dependency on Russian gas. LNG regasification terminals have been built with the aim of importing LNG from countries around the globe, but Europe continues depending on Russian gas that is imported as a liquid. Russian LNG imports increased 12% in 2022 (20.2 bcm) in comparison with 2021 (18.0 bcm). Imported Russian LNG increased 136% between the third quarters of 2021 and 2022.*" Our Supplemental Documents package includes the IEEFA March 22 update.

Figure 6: Europe Gas Storage Level



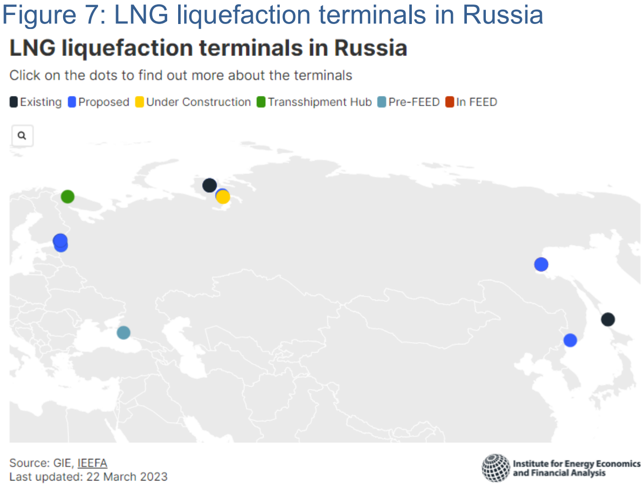
Source: Bloomberg

IEEFA has a good recap of Russian LNG export terminals

The IEEFA European LNG tracker has a good recap of Russia LNG export terminals. IEEFA writes "*Russia has four existing LNG terminals, three in the Atlantic basin (Yamal LNG, Portovaya LNG and Vysotsk LNG) and Sakhalin in the Pacific basin. Yamal LNG is the biggest export terminal with 17.44 Mtpa of liquefaction capacity, followed by Sakahlin with 10.8 Mtpa of liquefaction capacity. Portovaya LNG has 1.5*

Mtpa liquefaction capacity and Vysotsk LNG, 0.66 Mtpa. Yamal LNG started operations in 2018. Its owners are Novatek (50.08%), TotalEnergies (20.02%), CNPC (20%), Silk Road Fund (9.9%). An integrated project that includes natural gas production, liquefaction and shipping. Consists of construction of a LNG plant with an output capacity of around 16.5 million tons per year, using the South Tambey Field as a resource base. The Sakhalin-1 oil and gas development project is located off the coast of Sakhalin Island in the Russian Far East. It comprises three offshore fields: Chayvo field, which came online in October 2005, followed by the Odoptu and Arkutun-Dagi fields in 2010 and 2015. The partners are ExxonMobil (30%), SODECO (30%), ONGC Videsh (20%), and Rosneft (20%). It was operated by Exxon Neftegas (ENL), a subsidiary of ExxonMobil that holds a 30% participating interest, but Russian authorities temporarily re-nationalised the Sakhalin 1 oil and gas project in October 2022. There has been talk in the past of building an LNG liquefaction plant. Sakhalin-2 is the world's largest integrated oil and gas project and Russia's first LNG plant. It involves the development of two large offshore fields: Piltun-Astokhskoye (mostly oil) and Lunskoye (mostly gas). Shaklin-2 started operations in 2009. It's owned by Gazprom (50%), Mitsubishi (10%), Sakhalinskaya Energiya OOO (27.5%) and Mitsui (12.5%). Portovaya LNG started exporting LNG in September 2022 and serves as a floating storage unit for the project, which obtains feedgas from Russia's Unified Gas Supply System (UGSS), close to the Portovaya Compressor Station that pushes gas through Nord Stream I. It's owned by Gazprom. Vysotsk LNG started operations in 2018 and is co-owned by Novatek (51%) and Cryogas (49%). Novatek is a public company with shares traded on the London and Moscow stock exchanges. The major shareholders of Novatek are Leonid Michelson, the CEO, who holds about 24.76% of the shares. Gennady Timchenko owns 23.49%, France's TotalEnergies has 19.4%, and Gazprom owns 9.99%.

Figure 7: LNG liquefaction terminals in Russia



Source: IEEFA

Natural Gas – Vitol CEO, EU needs more investment in natural gas power generation

On Monday, we tweeted [LINK] "*Good read @vitolnews CEO Hardy statement. EU needs #NatGas generation investment to complement roll out of interruptible renewable power. #LNG tight until 2026. #Oil demand +2 mmbd in rest of 2023, grow until circa 2030. Africa is long term growth mkt for oil. And more. #OOTT.*" We could have put this in the Energy Transition section, but as Vitol CEO Hardy's comments on the need for more natural gas investment are linked to Europe's move to increase renewable power. On Monday, Vitol posted its CEO, Russell Hardy, "*Vitol 2022 volumes and review*" [LINK]. It's a good short read with many oil and gas outlook items. One of his highlighted coimments was how Europe needs more investment in natural gas power generation as it builds out intermittent renewable power. This was not to retain existing natural gas power generation, but to invest and add more natural gas power generation. Hardy wrote "*At the same time as investing in future energy solutions, policymakers have stressed the importance of energy security. This means different things in different markets. During 2022, the vulnerability of Europe's power supply became evident as maintenance in France's nuclear sector threatened power availability. The system of European interconnectivity held up, but prices reached unprecedented levels. This has to be addressed through investment; in renewables and the infrastructure required to support them but also, in the near term, investment in gas generation as a complement to the roll out of interruptible renewable power*."

Vitol: EU needs more natural gas power

Natural Gas – France LNG unloadings still halted at 3 or 4 France LNG terminals

The increasing strikes and protests in France over the raising of the retirement age continue to hit France LNG imports and Europe gas storage levels. Last week's (March 19, 2023) Energy Tidbits noted the strike ended at France's Dunkerque LNG terminal, but strikes were continuing to halt LNG unloadings at Elengy's three LNG import terminals. On Tuesday, Bloomberg reported the strikes will continue until at least March 28. Bloomberg wrote "*Three French LNG terminals operated by Elengy — Montoir, Fos Tonkin and Fos Cavaou — remain blocked as a strike there was extended to March 28, a spokeswoman for the company said by email. * NOTE: The terminals shut on March 6 because of labor action against France's pension reform.*" France has four LNG terminals with a LNG import capacity of ~3.5 bcf/d. We do not know their send-out capacity into France natural gas pipeline network

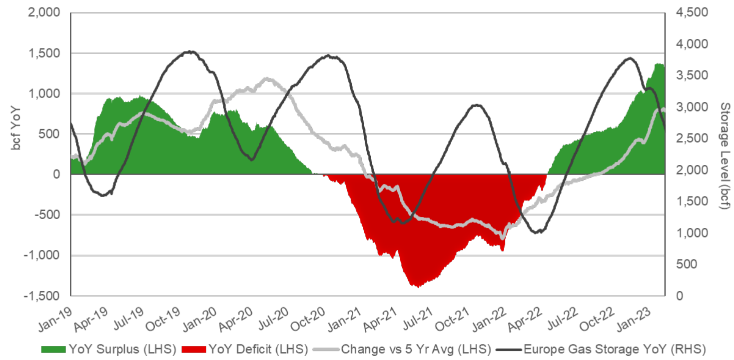
France LNG imports shut down by strikes

Natural Gas – Europe storage is now +21.32% vs 5-yr average, but within 5-yr range

The big global natural gas story for Q1/23 has been how the warmer than normal winter in Europe and Asia has been the key reason why Europe made it through winter without a natural gas shortage. There has been negligible weather driven demand for natural gas, which along with the continued industrial demand destruction, means storage levels are at still at high levels. However, we are seeing a narrowing of Europe gas storage surplus with the lower European natural gas price and strikes halting some France LNG imports. This winter (Nov 1/22) began with gas storage at 94.94% capacity, up 17.86% YoY and is now a YoY surplus of 29.87%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -0.23% WoW to 55.55% on Mar 24. Storage is now +29.87% greater than last year levels of 25.68% and is +21.32% above the 5-year average of 34.23%. But, the storage is now withing the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Europe gas storage

Figure 8: Europe Gas Storage Level



Source: Bloomberg

Oil – US oil rigs up +4 rigs to 593 oil rigs on Mar 24

US oil rigs up +4 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were up +4 rigs to 593 rigs as of Mar 24, and there were no real notable changes on a per basin basis. The total US oil rig count is now at 593 rigs, up +62 YoY, +112 from the 2022 low of 481 rigs in January and +421 since the 2020 low of 172 rigs on Aug 14. US gas rigs were flat WoW at a total of 162 rigs, an increase of +25 rigs YoY. We were surprised to see no change in gas rigs while HH prices showed further weakness throughout the week. However, we continue to expect that US gas rigs will decline over the coming weeks. Below is our graph of total US rigs.

Figure 9: Baker Hughes Total US Oil Rigs

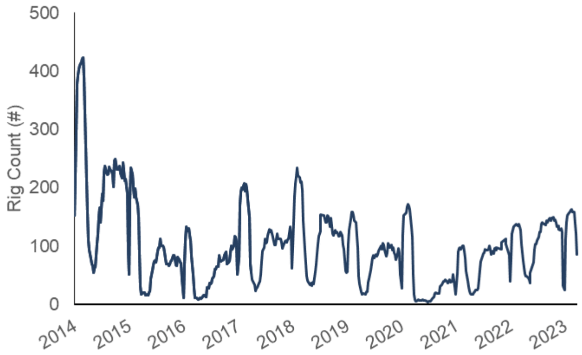
Source: Baker Hughes

Oil – Total Cdn rigs down -42 WoW to 165 total rigs, +25 rigs YoY

Cdn total rigs -42 WoW

The traditional winter drilling season in Canada is coming to an end and as expected Cdn rigs saw a large WoW decline. Moving forward, we expect to see additional rig declines in the next 1-2 weeks. Total Cdn rigs were down -42 WoW to 165 rigs as of Mar 24. Notably, the week of Mar 24 saw huge declines of -20 rigs in AB and -18 rigs in SK, while MB and BC saw smaller declines of -3 and -2 rigs, respectively. There is now a total of 165 active rigs, +84 vs the comparable Covid period of 81 rigs on Mar 26, 2021. Cdn oil drilling rigs accounted for the majority of the overall decline, falling by -36 rigs WoW to 86 rigs, up +10 YoY from 76 rigs a year ago. Cdn gas rigs were down -6 rigs WoW to 79 rigs. Below is our graph of total Cdn oil rigs.

Figure 10: Baker Hughes Total Canadian Oil Rigs



Source: Baker Hughes

Oil – US weekly oil production back to 12.3 mmb/d WoW, 1st time since Covid

US oil production up WoW

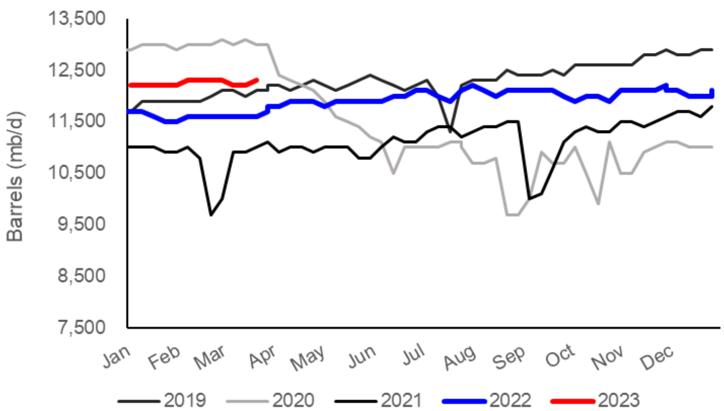
The EIA estimates US oil production was up +0.10 mmb/d WoW to 12.3 mmb/d for the week ended Mar 17 with the Lower 48 also up to 11.9 mmb/d and Alaska down to 0.441 mmb/d. US oil production, based on the weekly estimates, has been mostly range bound between 11.9 to 12.1 mmb/d since the 2nd week of May. But broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 as well as five weeks ago, the first time since it touched 12.2 mmb/d in the 1st week of August. Total US production reached its highest level since March 13, 2020 on Feb 3, 2023 at 12.3 mmb/d. Lower 48 production was up WoW to 11.9 mmb/d this week and Alaska was down to 0.441 mmb/d WoW. US oil production is up +0.700 mmb/d YoY at 12.3 mmb/d but is still down significantly at -0.800 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 11: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1 End Date	Week 1 Value	Week 2 End Date	Week 2 Value	Week 3 End Date	Week 3 Value	Week 4 End Date	Week 4 Value	Week 5 End Date	Week 5 Value
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	11/25	12,100		
2022-Dec	12/02	12,200	12/09	12,100	12/16	12,100	12/23	12,000	12/30	12,100
2023-Jan	01/06	12,200	01/13	12,200	01/20	12,200	01/27	12,200		
2023-Feb	02/03	12,300	02/10	12,300	02/17	12,300	02/24	12,300		
2023-Mar	03/03	12,200	03/10	12,200	03/17	12,300				

Source: EIA

Figure 12: US Weekly Oil Production



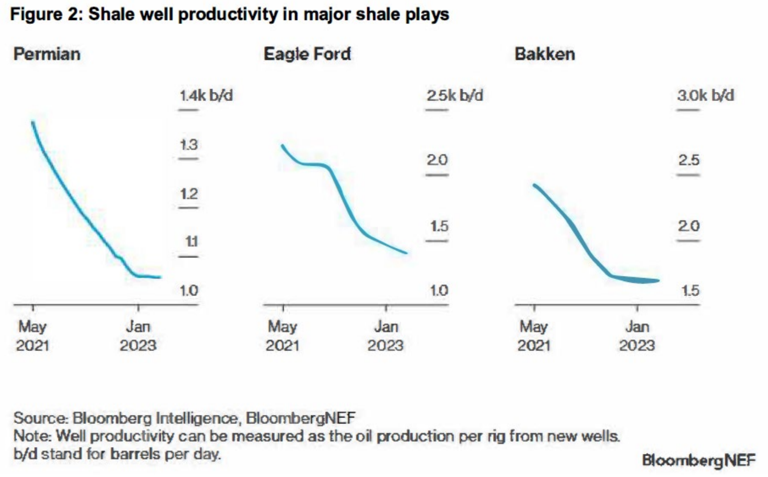
Source: EIA, SAF

Oil – BNEF shale well productivity going lower, "*this decline is cause for concern*"

Shale well productivity decllines

On Thursday, BloombergNEF posted a good blog on what may be the oil wildcard most likely to impact oil prices in the 2020s as well as Cdn oil and a range of other plays/items – how much growth is there in US shale? The BloombergNEF blog was *"No Silver Bullet in Sight as US Oil Production Slows*". BNEF models show US oil growth down to 0.6 mmb/d per year and big drops in shale well productivity. It doesn't mean that the declines can't be arrested or maybe even up a bit, but it points to the best days being over on a broad industry basis. And we continue to say it doesn't mean US can't grow, it just means it's growth will be limited and any growth will cost a lot more to grow. But it also means that US really can't be a "sustainable" swing producer. It may be able to ramp up quickly, but just not as much as in the past. Rather it reinforces the power swing back to OPEC in the 2020s. And it puts a higher floor into oil prices for the 2020s. And if the US can't grow its oil production, it sets up multiple North American implications. The intro writes "*As the world scrambles for more oil to shore up energy security and economic growth, the globe's top producer may have had its last hurrah when it comes to boosting output. The US's oil output growth rate is now decelerating. Three key factors underpin this slowdown: declining acreage productivity, oilfield cost inflation and supply-chain bottlenecks, and a structural shift in investment strategies. None of these factors are set to change in the short or medium term, making a reversal in the production-gain slowdown unlikely.*" The bullish graph is their graph on well productivity. This fits the general concepts of items we have been highlighting from companies such as the best wells were completed in 2020/21 given how tough it was, comments from Pioneer CEO on how many companies are down to tier 2 and 3 wells, etc. BNEF writes "*After years of intensive drilling on Tier 1 shale assets, these prime acreages are starting to mature, and well productivity and oil recovery rates are declining. Given that these basins are of the highest quality, with superior geological and subsurface formation properties that loan themselves to tracking, this decline is cause for concern. Based on Bloomberg Intelligence data, shale-well productivity, a measure of the oil production per rig from new wells, is trending downward. Productivity levels in the three largest shale plays – the Permian, Bakken, and Eagle Ford - dwindled by a quarter to a third between May 2021 and February 2023. Operating in these areas means more dollars spent per barrel produced*." Our Supplemental Documents package includes the BloombergNEF report.

Figure 13: Shale well productivity in major shale plays



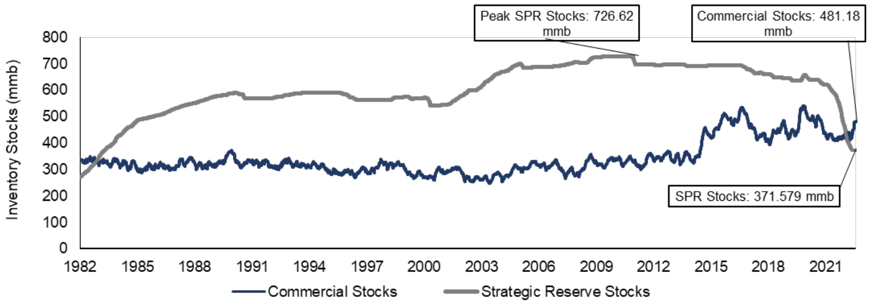
Source BloombergNEF

Oil – US SPR reserves now -109.601 mmb lower than commercial crude oil reserves

US SPR reserves

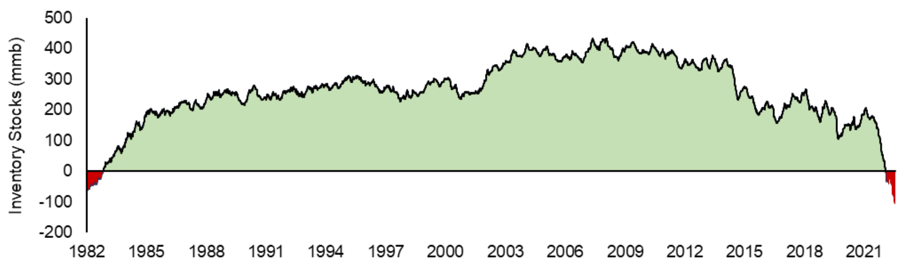
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit widening this week due to the build in commercial oil stocks. The EIA's new weekly oil data for Mar 17 has SPR reserves at 371.6 mmb vs commercial crude oil reserves at 481.2 mmb. The last time the SPR was down at this level was in Dec 1983 at 371.3 mmb. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 14: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 15: US Oil Inventories: SPR less commercial



Source: EIA

Oil – Reminder US SPR going 26 mmb lower over the coming months

SPR going 26 mmb lower

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. "*On Monday, Bloomberg reported "The Biden administration plans to sell more crude oil from the Strategic Petroleum Reserve, fulfilling budget directives mandated years ago that it had sought to stop as oil prices have stabilized. The congressionally mandated sale will amount to 26 million barrels of crude, according to people familiar with the matter. The sale is in accordance with a budget mandate enacted in 2015 for the current fiscal year, said a spokesperson for the Department of Energy. The Energy Department has sought to stop some of the sales required by 2015 legislation so that it can refill the emergency reserve, which currently has about 371 million barrels. After this latest release, the reserve will dip to about 345 million." The last time the SPR was 345 mmb was in Aug 1983 at 345.7 mmb.*

Oil – Granholm says "difficult" to look to refill SPR in 2023

Biden not refilling SPR in 2023

There were very few oil followers who actually believed Biden would do as promised and look to buy oil to refill the SPR if oil went below $70. And on Thursday, there was confirmation from Energy Secretary Granholm that the Administration wasn't going to buying oil to refill the SPR in 2023. On Thursday, we tweeted [LINK] "*Breaking. Biden won't buy #Oil for SPR in*

2023. "This year it will be difficult for us to take advantage of this low price," Granholm said. "But we will continue to look for that low price into the future because we intend to save the tax payer dollars." Reports @AriNatter. #OOTT." Bloomberg reported on comments by Granholm to a House panel, and wrote "*US Energy Secretary Jennifer Granholm said it will be "difficult" this year to refill government oil reserves, even as crude prices hovered within the agency's target buy-back range. Granholm, in testimony before a House panel, said maintenance at two Strategic Petroleum Reserve sites as well as an ongoing 26 million-barrel crude sale mandated by Congress make refilling a challenge. "This year it will be difficult for us to take advantage of this low price," Granholm said. "But we will continue to look for that low price into the future because we intend to save the tax payer dollars."*

Reality is that Biden won't buy to refill in 2024, an election year
We have to believe that if Biden is to buy an oil for the SPR, it will be a very small amount just to say he fulfilled a promise. However, we believe the reality is that Biden isn't going to refill the SPR in 2024 as it is an election year and the last thing he will want to do is anything that can impact gasoline prices. Biden has yet to declar but is now past the midpoint of his term and the focus is turning to 2024 election year.

Oil – AER says Obsidian disposal operations induced earthquakes

Alberta earthquakes linked to water disposal

Earthquakes linked to oil and gas operations are never good. Interestingly, there is a different Cdn oil and gas activity and earthquake issue than we have highlighted over the past several years – we have highlighted how fracking has been correlated to earthquakes in certain areas. And how this has been different than in Oklahoma/Texas where earthquakes to the most part were linked to wastewater injection and not fracking. On Thursday, the AER announced [LINK] "*On Thursday, March 23, 2023, the Alberta Energy Regulator (AER) issued an Environmental Protection Order under sections 113 and 241 of the Environmental Protection and Enhancement Act (EPEA) for Obsidian Energy Ltd (Obsidian). The AER has issued this order due to a series of induced seismic events that occurred between November 29, 2022, and March 16, 2023, in the Peace River region. An investigation conducted by the Alberta Geological Society (AGS), a branch of the AER, has concluded that Obsidian's disposal operation induced the seismic events. The disposal operation includes a well authorized for the disposal of water via injection into the Leduc Formation. The unique geological features of the area also contributed to the seismic events*." This is a situation similar to what is seen in Oklahoma/Texas. We don't want to downplay the situation, but, at least in the US, earthquakes linked to wastewater disposal haven't shut down fracking of wells. Rather they have led to increased wastewater disposal costs. Regardless, any earthquakes linked to oil and gas activity will inevitably cause restrictions in oil and operations in one way or another. Especially with the direct AER language that Obsidian's disposal operation induced the seismic events. Our Supplemental Documents package includes the AER announcement.

Our first Cdn oil and gas linked earthquake reporting was Jan 25, 2015
Here is our first writing on Canadian oil and gas activity and earthquakes that was highlighted in our Jan 25, 2015 Energy Tidbits memo. "*A report worthwhile reading, NE BC earthquake report caused by the Montney operations is different than US earthquake reports with the bigger correlation to fracking as opposed to water*

injection. The concept of earthquakes related to fracking is also going to pick up more attention in Canada, especially when you see reports like this one and a report that highlights earthquake activity around some of the active industry Montney areas (Caribou, Beg, Altares, Septimus and Doe/Dawson). A report that seemed to be below most radar screens that I only picked up this week in a more detailed scan of websites was the BC Oil & Gas Commission report "Investigation of Observed Seismicity in the Montney Trend, December 2014". Maybe it would have got more attention sooner if the title had used earthquakes instead of seismicity. BC started a study in the certain Montney areas, and recorded seismic events between Aug 2013 and Oct 2014. The report stated that "the investigation found that during this period 231 seismic events in the Montney were attributed to oil and gas operations – 38 induced by wastewater disposal and 193 by hydraulic fracturing operations. None of the recorded events resulted in any injuries, property damage or loss of wellbore containment." The key difference from this earthquake study and the ones in the US is that in the US, the correlation of earthquake events was more linked to wastewater disposal/injection as opposed to the fracking. The report says "Currently 450 wells are completed in the Montney each year. These wells average 14 hydraulic fracture stages per wellbore, totaling about 7,500 hydraulic fracture stages for the investigation period. Injected volumes of hydraulic fracturing fluid range from about 700-3,500 m3 per stage, depending on area and operator. During the investigation period, hydraulic fracturing operations triggered 193 induced events. Therefore, approximately 2.6 per cent of pumped stages triggered events. For wastewater disposal wells, of the 104 active in the province, only two have been linked to induced seismicity. Recorded ground motions associated with these events shows they are below damage thresholds for surface structures and no injuries or property damages were reported. induced seismicity in the disturbed belt of the Rocky Mountain foothills and in proximity to the Fort St. John Graben complex. This is attributed to the presence of pre-existing, stressed faults that are susceptible to reactivation. Hydraulic fracturing in the Lower Montney appears more prone to induced seismicity, although two events greater than 3.5 ML have been recorded in the Upper Montney. Fluid injection at the Lower Montney level may reactivate older, underlying structures more readily than Middle and Upper Montney fracture stimulations. So far, dense array data has shown fault re-activation induced by hydraulic fracturing can occur within the Montney target zone or up to 700 m below the Montney as a result of fluid injection. On the horizontal plane, re-activation can occur within 100 to 400 m of the injection point." We recommend adding the report to reference libraries."

Oil – Cdn oil differentials down $1.50 to close at $14.75 on March 24

WCS less WTI differentials

This is normally a normal seasonal narrowing of Cdn oil differentials every spring, and the WCS-WTI differentials have narrowed significantly in Q1/23. The differentials closed 2022 at $27.75, narrowed to $23.00 on Jan 31, and dropped to $18.50 a month ago on Feb 17 and closed at $16.50 on Feb 28. Differentials have bounced up and down in the first half of March closing at $16.25 on March 17, but were down $1.50 this week to close at $14.75 on March 24. For perspective, a year ago, the WCS-WTI differential was $11.25 on March 24, 2022. Below is Bloomberg's current WCS–WTI differential as of March 24, 2023 close.

Figure 16: WCS less WTI oil differentials including March 24 close

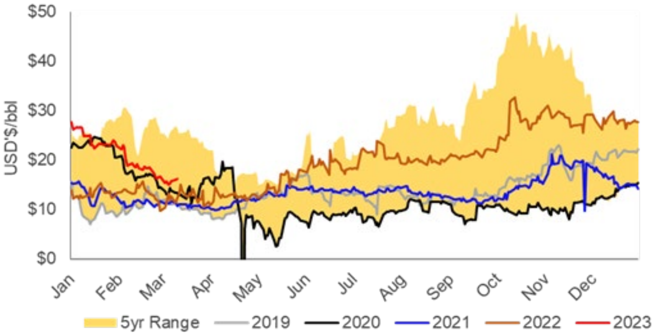
Source: Bloomberg

Oil – This is the normal season narrowing of Cdn heavy oil differentials

Unfortunately, there are often items like Keystone pipeline outage that impact Cdn heavy oil differentials. And the huge item are releases of mostly medium oil out of the SPR. It's not just unplanned events, but there are many items that impact Cdn heavy oil differentials, but we remind that we are in the time of the year that normally sees Cdn heavy oil differentials narrow. This is the time of year, when refineries tend to maximize production of asphalt ahead of the annual summer paving season. As is said in Canada, there are two seasons in Canada – winter and paving season. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials from Feb thru May.

WCS differentials normally narrow in spring

Figure 17: WCS less WTI oil differentials



Source: Bloomberg

Oil – Another delay to Enbridge Line 5 liquids pipeline approvals

Enbridge Line 5 liquids pipeline ongoing battle to get it thru final approvals is turning out to be a never-ending story and one that is starting to feel like a Keystone XL saga, where something always seems to come up to delay any decisions. There is another ~18 month delay and that assumes nothing else comes up in the next 2 and ¼ years. On Thursday, the US Army Corps of Engineers announced [LINK] "*Corps of Engineers revises Enbridge Line 5 EIS schedule to ensure thorough analysis"* and is adding ~18 months to the review period. They wrote "*"We greatly appreciate the meaningful input received throughout scoping and will use this information to shape studies and continuing consultations throughout*

Line 5 delayed again

development of our draft environmental impact statement" said Detroit District Commander Lt. Col. Brett Boyle. The Detroit District had originally planned to publish the draft environmental impact statement in late 2023 but is now projecting a Spring 2025 publication." Our Supplemental Documents package includes the US Army Corps of Engineers release.

Figure 18: Enbridge Line 5 Liquids Pipeline

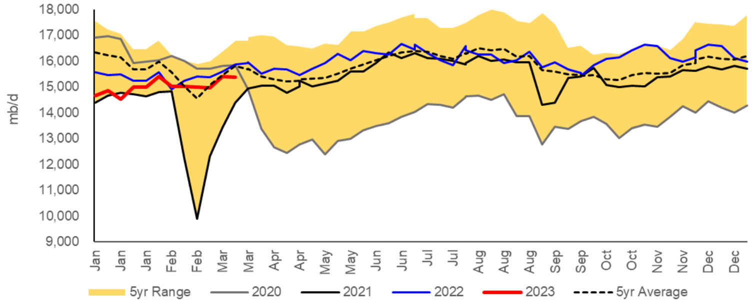
Source: Enbridge

Oil – Refinery inputs down -0.022 mmb/d WoW to 15.376 mmb/d

Refiners switching to summer fuel blends

Following last week's increase, refinery crude oil inputs decreased this week. There are always unplanned refinery issues and we remind Feb/early March is normally when we see refineries move into turnaround/maintenance i.e., crude oil inputs seasonally decline as refineries switch to produce more summer blend fuels. And normally, refineries come out of turnarounds in late March/early April to start their ramp up in refining of summer blend fuels. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended Mar 17. The EIA reported crude oil inputs to refineries were down -0.022 mmb/d this week to 15.376 mmb/d and are down -0.502 mmb/d YoY from 15.878 mmb/d for the week ended Mar 18, 2022. This week's refinery utilization was up to 88.6%, which is +0.4% WoW and -2.5% YoY. Total products supplied (i.e., demand) increased WoW, up +0.913 mmb/d to 20.026 mmb/d, and Motor gasoline was up +0.366 mmb/d to 8.960 mmb/d from 8.594 mmb/d last week. The 4-week average for Motor Gasoline was down -0.014 mmb/d YoY to 8.807 mmb/d. The 4-week average of Total demand was down -1.303 mmb/d YoY to 19.651 mmb/d.

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



Source: EIA

Oil – Negative to oil, France now has 0.9 mmb/d of refinery capacity shut-in

France refinery shut-ins

One of the negatives to oil in March is the increasing amount of France refinery capacity that is shut-in due to strikes or accidents. There is now 900,000 b/d of France refinery capacity off line, which is a big hit to oil demand. It's almost 1% of total global oil demand. (i) Yesterday, we tweeted [LINK] " 👇*must read @adamporterargus report. negative to #Oil, 0.9 mbd France refineries are down re strikes (XOM 236 kbd Port Jerome, TTE 247 kbd Gonfreville, Petromeos 207 kbd Lavera) and accident (TTE 219 kbd). bad timing for drivers with summer ramp in #Diesel #Gasoline. #OOTT."* Our tweet included the Argus Friday report "*Another French refinery to shut: Union"* that noted Exxon's 236,000 b/d Port Jerome refinery in northern France is to be closed due to strike action at the nearby port of Le Havre. Argus also listed the other France refineries that have been shut-in due to strikes or accidents. In total, it's now up to 0.9 mmb/d. Argus noted strikes have now shut down 683,000 b/d of France refineries: ExxonMobil 236,000 b/d Port Jerome, TotalEnergies 246,900 b/d Gonfreville, and UK Chinese venture Petromeos 207,100 b/d Lavera. Argus also noted an accident before the strikes shut down TotalEnergies 219,000 b/d Donges. Our Supplemental Documents packaged includes the Argus report. [LINK]

Oil – Saudi Aramco begins construction on greenfield 300,000 b/d China refinery

New 300,000 b/d China refinery

Earlier this morning, Saudi Aramco announced [LINK] "*Saudi Aramco Joint Venture (Aramco Huajin) begins construction on China's mega refinery and petrochemical complex."* This is a greenfield project that includes the 300,000 b/d refinery and where Saudi Aramco will supply up to 210,000 b/d of feedstock for the refinery. The complex is more than just a refinery and the Aramco release said "*Aramco Huajin Petrochemical Company, a joint venture between Saudi Aramco (30%), Norinco Group (51%) and Panjin Industrial Group (19%), is developing the Greenfield complex project, which will include a refinery with a production capacity of 300,1 barrels per day, a petrochemical plant with an annual production capacity of 65.2 million metric tons of ethylene and <> million metric tons of paraxylene*." Aramco expects the project to be "fully operational by 2026". Our Supplemental Documents package includes the Aramco release.

Oil – US "net" oil imports up +0.051 mmb/d WoW to 1.240 mmb/d

US net oil imports

US "NET" imports were up +0.051 mmb/d to 1.240 mmb/d for the Mar 17 week. US imports were down -0.044 mmb/d to 6.172 mmb/d. US exports were down -0.095 mmb/d to 4.932 mmb/d. The WoW decrease in US oil imports was driven mostly by "Others" while the Top 10 had an increase of +0.113 mmb/d. Some items to note on the by country data. (i) Canada was down this week -0.131 mmb/d to 3.240 mmb/d. (ii) Saudi Arabia was up +0.098 mmb/d to 0.483 mmb/d. (iii) Colombia was down -0.050 mmb/d to 0.244 mmb/d. (iv) Ecuador was down -0.046 mmb/d to 0.00 mmb/d. (v) Iraq was down -0.202 mmb/d to 0.144 mmb/d. (vi) Mexico was up +0.485 mmb/d to 1.118 mmb/d.

Figure 20: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Dec 30/22	Jan 6/23	Jan 13/23	Jan 20/23	Jan 27/23	Feb 3/23	Feb 10/23	Feb 17/23	Feb 24/23	Mar 3/23	Mar 10/23	Mar 17/23	WoW
Canada	2,949	3,737	3,707	3,419	3,587	3,856	3,556	3,197	3,605	3,780	3,371	3,240	-131
Saudi Arabia	479	464	453	433	640	384	262	545	310	476	385	483	98
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	428	668	909	511	758	913	690	683	725	556	633	1,118	485
Colombia	357	246	245	244	216	70	143	284	143	222	294	244	-50
Iraq	354	150	201	195	469	230	322	251	290	265	346	144	-202
Ecuador	87	137	0	69	243	207	156	145	97	55	46	0	-46
Nigeria	141	143	211	114	317	248	75	256	98	243	170	129	-41
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	4,795	5,545	5,726	4,985	6,230	5,908	5,204	5,361	5,268	5,597	5,245	5,358	113
Others	917	805	1,135	920	1,053	1,150	1,028	965	940	674	971	814	-157
Total US	5,712	6,350	6,861	5,905	7,283	7,058	6,232	6,326	6,208	6,271	6,216	6,172	-44

Source: EIA

Oil – Chevron loading 132,000 b/d of Venezuela crude to US Gulf Coast in March

Chevron increasing Venezuela oil into US

Imagine if Chevron wasn't on a rolling 6-month licence and Chevron really got after it and moved to crank up Venezuela oil production and exports. But there have been no indications for any change to the end of Nov 2022 licencing. But even still, Chevron continues to increase Venezuela oil to the Gulf Coast. On Friday, Bloomberg reported "*Chevron's Venezuelan Oil Exports to US Soar 49% in March. Chevron's exports of Venezuelan crude oil to the US rose by almost half from the previous month as the company continues to ramp up operations after getting a partial US reprieve of oil sanctions, according to shipping reports compiled by Bloomberg. * Co. scheduled to load ~132k b/d in March, from 88.6k b/d in February.*" Bloomberg also highlighted that more US refineries on the Gulf Coast are taking Cheveron's Venezuelan crude. Bloomberg wrote "*Valero, which initially only took Boscan oil to its Corpus Christi refinery in Texas, recently took Hamaca oil to the St. Charles plant in Louisiana ** Phillips 66 now processing Venezuelan oil at the Lake Charles refinery in Louisiana, in addition to the Sweeny plant in Texas.*"

Huge Chevron Venezuela oil production capacity without drilling a single well

We aren't surprised that Chevron is cranking up Venezuela oil exports even if they aren't getting at it with a big drilling program. Here is an item from our Dec 25, 2022 Energy Tidbits memo. "*There was an overlooked Argus report on Wed [LINK] "High hurdles to grow Chevron's Venezuela oil output." It was likely overlooked for the title of the report. (i) But, yesterday, we tweeted [LINK] "Tip of the Iceberg! Chevron VEN Nov production is ~90,000 b/d, 1,400 wells, ~65 b/d ave well. Note 👇category 2: ~8,700 wells need ~$0.5 mm/well to become operational. At 65 b/d ave = ~550,000 b/d capacity add without drilling one well. Thx @ArgusMedia Carlos Camacho! #OOTT." (ii) The Argus report reminds of the huge near term upside For Chevron to add production in Venezuela without drilling one well. (iii) Recall that the US only gave a waiver for six months. It s a rolling six-month waiver as the current month ends so it's basically saying to Chevron you have six months from today, but no guarantee for longer. This lack of visibility beyond the six-month window is why*

Chevron CEO said they aren't planning to do any drilling within six months. Rather working to move the existing oil in inventory and do some well reworking. (iv) Chevron's go-slow plan looks to add >110,000 b/d in the next six months in the Occiente basin. I think most refer to it as the Oriente Basin. Production was 150,000 b/d early this year and is down to 90,000 b/d in Nov. Argus reports "An internal Chevron plan to increase Venezuelan oil production to 200,000 b/d by mid-2023 relies on efforts to rehabilitate some 18,000 wells in various states of disrepair in the country's once-prolific Occidente region". This addition makes sense given the rolling six-month term and what we call the go-slow plan. (v) Adding >110,000 b/d by mid-203 is the Tip of the Iceberg. (vi) We believe Chevron could crank up to add another 200,000 b/d by end of 2023, and a further 200,000 b/d or likely a lot more in 2024. We don't think it's unreasonable to see this up at 500,000 b/d to 1,000,000 b/d in two years if Chevron moves from a go-slow to a get-at-it plan. And this is without drilling one new well. This Argus report shows these elements. (vii) There is so much low-hanging fruit to Chevron to grow Venezuela oil production without drilling any wells. It's all existing wells that need some sort of work or power. (viii) Remember, this is apart from the previously reported 1.79 mmb of oil in storage ready for export. (ix) Argus reporting on an internal Chevron plan. Says "Occidente" region was 150,000 b/d earlier in 2022, but is now down to 90,000 b/d in Nov. Says there are 18,000 wells in total. But only 1,400 producing wells, that is ~65 bpd per well on average. Remember, this is in an industry starved for capital, equipment and basic operating efforts. The question is how much would these 1,400 producing wells be producing with proper maintenance, etc? we suspect a lot more than 65 bpd, would guess something over 100 bpd on average. Category 1 is producing wells. ~7% or 1,400 wells producing oil "but many at decline rates". As noted, these are on average producing 65 bpd. They don't say it, but these heavy oil wells are all likely now or soon to be candidates to reworking so we would expect also some upside here to effectively hold production if not increase. Category 2 is the huge low hanging fruit with "About 8,700 wells fall into Category 2, which includes non-operating wells that may just need minor work to become operational. These wells may need around $500, 000 each in new investment to be viable, according to sources familiar with the field." If we use the current producing average of 65 bpd, that is ~550,000 b/d of incremental production capacity for $4.35 billion. That assumes the 65 b/d average. Is it reasonable to assume the average as these are wells that down for some reason? If Chevron is prepared to spend $500,000 per well, it's safe to say these aren't stripper wells that produce a very low amount of production. Rather, we can't believe Chevron would put in this category any wells that aren't capable of a decent level of production and we suspect much more than the average well of 65 b/d. Again, this is not drilling, rather we expect well cleanouts, reworking, etc. If use 100 bpd, that is 870,000 bpd of incremental production capacity. Category 3 "are more than 7,900 wells that need between $5mn-$6mn of investment each to be commercially viable". We are not clear what is required here. Plus upside from wells that don't fit in to category, 1, 2 or 3. Argus notes 'Hundreds of wells in the PdV report are reportedly shut down just for a lack of reliable electricity, which plagues many parts of the country". This is where something like diesel power generation comes into play. The reality is that reliable power is something that is also involved in *the above categories. Our Supplemental Documents package includes the Argus report."*

Oil – Norway February oil production of 1.776 mmb/d, up +0.4% MoM

Norway oil production

The Norwegian Petroleum Directorate released its February production figures [LINK] of 1.776 mmb/d of oil, which is -0.2% YoY but up +0.4% MoM from January production of 1.769 mmb/d. February production was down -2.8% (-0.051 mmb/d) from the forecast amount of 1.827 mmb/d. The NPD does not provide any explanations for the MoM changes. The theme for Norway through 2022 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 is expected to be up modestly in 2023.

Figure 21: Norway February 2023 production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm³/day	Total MSm³ o.e/day
Production	**February 2023**	**1.776**	**1.994**	**353.9**	**0.671**
Forecast for	February 2023	1.827	2.036	358.1	0.682
Deviation from forecast		-0.051	-0.042	-4.2	-0.011
Deviation from forecaset in %		-2.8 %	-2.1 %	-1.2 %	-1.6 %
Production	January 2023	1.769	1.999	356.8	0.675
Deviation from	January 2023	0.007	-0.005	-2.8	-0.004
Deviation in % from	January 2023	0.4 %	-0.3 %	-0.8 %	-0.6 %
Production	February 2022	1.780	1.996	348.3	0.666
Deviation from	February 2022	-0.004	-0.002	5.6	0.005
Deviation in % from	February 2022	-0.2 %	-0.1 %	1.6 %	0.8 %

Source: Norwegian Petroleum Directorate

Oil – Putin says Russia to deploy tactical nuclear weapons in Belarus

Russia to deploy nukes in Belarus

Oil markets really haven't responded to any potential Russia risks re any hints or even potential for Russia to use nuclear weapons. So we wouldn't expect to see any big oil price move to Putin's comments yesterday. We have a news cut off of 7am MT so haven't seen any of the Sunday cable news political talk shows to see what the Biden Administration will say regarding Putin's comments yesterday. Yesterday, we tweeted [LINK] *""Putin: Russia will deploy tactical nuclear weapons in Belarus" reports Kommersant. Should get Biden Administration comments on Sunday cable news talk. #OOTT."* Yesterday afternoon (MT), Kommersant (Russia media) reported [LINK] *Putin: Russia will deploy tactical nuclear weapons in Belarus President of Belarus Alexander Lukashenko has already raised the issue of deploying Russian nuclear weapons in the republic. President Vladimir Putin said this in an interview with the author of the program "Moscow. Kremlin. Putin" to Pavel Zarubin. On July 1, the construction of a storage facility for tactical nuclear weapons will be completed in Belarus, Mr. Putin also said. "As for our talks with Alexander Grigoryevich Lukashenko, the reason was probably the statement of the British Deputy Defense Minister that they are going to supply shells to Ukraine with depleted uranium, but, I repeat, this is somehow connected with nuclear technologies," the Russian president said. "Even outside the context of these events, this statement, Alexander Grigoryevich Lukashenko has long raised the question of* *deploying Russian tactical nuclear weapons on the territory of Belarus. Here, too, there is nothing unusual, "said Vladimir Putin, recalling that the United States has been doing this for decades, deploying its tactical nuclear weapons on the territory of its allied countries, NATO countries, in Europe - in six states*."

Oil – Novak says Russia "will reach" its 500,000 b/d cut in March, down to 9.7 mmb/d

Russia "will reach" its 500,000 b/d cut

There seems to have been a fairly even split of opinions on whether Russia will or will not actually cut its production by 500,000 b/d in March. We have been in the camp that it will do so. But on Thursday, Russia Deputy Prime Minister Novak said Russia will reach that cut in March and that it means Russia's oil production will decrease from 10.2 mmb/d in Feb to 9.7 mmb/d in March. On Thursday morning, we tweeted [LINK] "*#Oil. Russia Deputy PM #Novak says "in March, we will reach 500 thousand barrels of reduction to the level of February. In February, we had 10.2 million bpd" ie. 9.7 mmb/d. Last week, he said 500,000 b/d reduction to continue thru June. #OOTT.*" TASS had reported [LINK] "*Russia in March will reduce oil production by 500 thousand barrels per day (bpd) from the level of February, when production amounted to 10.2 million bpd, Russian Deputy Prime Minister Alexander Novak told reporters. Thus, the volume of oil production after the decline will be 9.7 million bpd. "In March, we will reach 500 thousand barrels of reduction to the level of February. In February, we had 10.2 million bpd," he sa*id."

Oil – Novak says Russia to extend voluntary 500,000 b/d reduction thru end of June

Russia extends cuts thru June

No one should have been surprised to see the TASS report on Tuesday that Russian Deputy Prime Minister Novak say Russia will be extending its voluntary 500,000 b/d reduction in oil production thru the end of June. When it was first announced in Feb, it was only thru March and that Russia would decide if they want to extend or not as he wanted to see how the market unfolded. The This decision is for a three-month extension. TASS wrote [LINK] "R*ussia has decided to extend its decision on voluntary oil production cuts by 500,000 barrels per day through June 2023, Russia's Deputy Prime Minister Alexander Novak told reporters. "In accordance with the current market situation, the decision to voluntarily reduce production in the amount of 500,000 barrels per day will be valid through June 2023," he said. Novak added that Russia is close to reaching the target level of reducing oil production by 500,000 barrels per day (bpd) and will reach it in the coming days. "Russia maintains its position of total rejection of illegal restrictive measures and has voluntarily announced 500,000 barrel per day production cuts since March. Russia is currently on the verge of meeting the target level of reduction - it will reach it in the coming days," he said.*" Our Supplemental Documents package includes the TASS report.

Oil – Is Russia 500,000 b/d cut "voluntary" really just cutting non-profitable barrels?

Voluntary or non-profitable barrels?

We don't disagree that Russia is making "voluntary" cuts to their crude oil production, but we also believe these that these voluntary cuts are being driven by Russia by having unprofitable barrels especially with Brent in the $70s, the Russian price discount with sanctions, and increased shipping/insurance costs. So, when we saw the TASS report of Russia extending the voluntary 500,000 b/d cut in crude oil production, we tweeted [LINK] "*Still wonder if RUS's 500,000 b/d cut is "voluntary" or just cutting non-profitable barrels. #Novak says will extend 500,000 b/d cut thru end of June. See linked tweets 02/26 on RUS high op costs & 09/02/21 & 01/27/21 tweets, admitted had a lot of marginal #Oil. #OOTT.*" Our tweet linked to two prior tweets that we highlighted in our Feb 26, 2023 Energy Tidbits memo. Here is what we wrote in that memo.

No wonder RUS is shutting in 500,000 b/d, Its oil operating costs $44/b in 2022
Here is an item from our Feb 26, 2023 Energy Tidbits memo. "*There was an overlooked and underreported huge Russian oil story this week that provides support for our view that Russia's voluntary 500,000 b/d cut for March isn't voluntary but driven by the high-cost oil not being profitable with high operating costs, price discounts, higher shipping/insurance costs, etc. Most of the Russian media reporting, such as TASS, on the RosStat (official Russian data) reporting focused only on Russian oil production data, and did not report on the RosStat data on Russian oil operating cost data. However, Kommersant did report so. And that led to our tweet earlier this morning [LINK] "why RUS 500,000 b/d "voluntary" cut is likely = non-profitable. Official RosStat data, RUS oil operating costs. 1 RUB= US$0.013. Q1/22: $59/b. Q2/22: $45/b. Q3/22: $38/b. Q4/22: $33/b. 2022: $44/b. Then add on price discount, higher shipping/insurance. See 👇09/02/21 thread. #OOTT." Note our tweet used 1 RUB = US$0.013, whereas the Kommersant report used a different exchange rate. But Kommersant reported [LINK] ""The average cost of oil production in Russia in 2022 increased to 24.6 thousand rubles. per ton (rubles / ton), which is 19% more than in 2021 (20.69 thousand rubles), follows from the data (.xls) published on the website of Rosstat. Taking into account the average dollar exchange rate last year (67.46 rubles), the average cost of production per barrel of oil in the Russian Federation was $ 50. According to statistics provided by the department, during 2022, the cost of oil production decreased. In the first quarter, it was 33.1 thousand rubles / ton, in the second - 25.1 thousand rubles / ton, in the third - 21.4 thousand rubles / ton, in the fourth - 18.6 thousand rubles / ton." There is no explanation as to why, but we have to believe this is reflecting the impact of sanctions on input costs and withdraw of western services/equipment. Q1 is also the peak of winter, which we would normally expect to see some seasonal price impact. Throw in the impact of price discounts on Russian crude, increased shipping/insurance costs, etc, we believe it supports our view that the 500,000 b/d cut isn't necessary "voluntary", but driven by unprofitable oil. Our Supplemental Documents package includes the Kommersant report.*"

Novak says Russia's 500,000 b/d voluntary cut is only for March, at least so far
Here is another item from our Feb 26, 2023 Energy Tidbits memo. "*Note the above item that we believe supports our view that the voluntary cut wasn't necessarily voluntary. One of the big oil stories this week was TASS reporting [LINK] "Russia has only made a decision on voluntary reduction of crude production by 500,000 barrels per day for March so far, Deputy Prime Minister Alexander Novak told reporters, adding that the policy would be extended later depending on the situation. "We will see how the market situation will unfold, and depending on this, decisions will be taken on the market," he said, adding that "the present decision has only been made for March." It wasn't clear why Novak made the statement or if he thought it would have a major market impact. However, the TASS report also noted :Meanwhile, a TASS source in the industry specified that the reduction in production would be calculated from the real volume of production, and not from Russia's*

production quota under the OPEC+ deal. According to the deal, from November 2022, Russia is to produce 10.478 mln barrels per day. In January 2023, as Novak said earlier, Russia produced approximately 9.8-9.9 mln barrels per day." Perhaps the purpose od the TASS contact was to let the market know that Russia can get back to 9.8 to 9.9 mmb/d of crude oil if they are cutting 500,000 b/d therefrom. It makes us wonder if Russia is inferring they couldn't get to the Nov 1-Dec 31, 2023 quota of 10.478 mmb/d. We are skeptical on how much oil Russia can produce on a sustainable basis given the price discounts, increased shipping, insurance costs, etc. This is why, when we saw the TASS report, we tweeted [LINK] "Novak says Russia's "voluntary" reduction of 500,000 b/d is only for March so far, will see how market unfolds as to extend or not. Will want to see if can add back easily, See 👇02/10 thread, RUS's prior admission on a lot of marginal #Oil. #OOTT." If Russia inferring they have lost ~500,000 b/d of economic oil (ie. can only get back to 9.8 to 9.9 mmb/d), we think that makes sense. We still want to see them get back to 9.8 to 9.9 mmb/d if they decided to do so. Our tweet referenced Russia's admission that ~half of their reserves aren't profitable at $50 and that was before sanctions added cost and price discount. So is today's $80 Brent or so really the equivalent of $50 to Russia with the price discount and increased shipping/transportation costs, etc? It's why we wonder how much more of their production doesn't make money at Brent $80? Our tweet referred to Russia's 2021 comments on their high-cost oil base. Below is what we wrote in last week's (Feb 19, 2023) Energy Tidbits memo on the high-cost oil base. Our Supplemental Documents package includes the TASS report."

Two years ago, Russia said only half of its reserves were profitable at $50

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. "*There have been a number of different views on why Russia said they were voluntarily reducing production by 500,000 b/d in March. We have had a much simpler view because we have been following and highlighting Russia's own comments that half of their reserves aren't profitable at $50. So our approach has been that their voluntary cut is because they have production that isn't worth producing given the hit to their revenue per barrel from how sanctions have forced Russia to discount their oil prices, increased shipping and insurance costs, etc. After seeing a range of views on why Russia is doing the voluntary cuts, we retweeted our Feb 10, 2023 tweet that started off "Voluntary = non-profitable?". On Wed, we tweeted [LINK] "see 👇thread how two years ago russia acknowledged, at least in russian media, half of their oil reserves weren't profitable at $50. no one should be surprised they are shutting in 500,000 bpd given price discounts etc #OOTT." Our Feb 10 tweet was "[LINK] "Voluntary = non-profitable? Russia's "voluntary" reduction of 500,000 b/d. Makes sense, See 👇09/02/21 & 01/27/21 tweets, admitted had a lot of marginal #Oil. Then add forced price discount & higher shipping, insurance costs from sanctions. #OOTT". Russia's 2021 comments makes believe their voluntary cut is really just an acknowledgement that some of its oil production wasn't profitable given the impact of forced price discount, added shipping and insurance costs from sanctions. Long before sanctions, Russia openly acknowledged, at least in Russia press, that half of its reserve weren't profitable at $50. Now that was referring to reserves and not* *necessarily production, but given how Russian oil exports are being hit by price discounts, higher shipping and insurance costs, we have to wonder if the 500,000 b/d is really just shutting in production that isn't profitable*."

Sept 2, 2021, Russia said only half of its oil reserves were profitable at $50

Here is what we also wrote in our Feb 19, 2023 Energy Tidbits memo. "*Our Friday tweet linked to a Sept 2, 2021 tweet [LINK] "Only half of Russia's #Oil reserves are profitable at $50 says Deputy Energy Minister Sorokin. Fits Jan 27 linked tweet. Bullish for mid/long term oil prices. Detailed comment in SAF Group Jan 27, 2021 Energy Tidbits memo https://safgroup.ca/news-insights/ #OOTT." Our Sept 5, 2021 Energy Tidbits memo was titled "Only Half of Russia's Oil Reserves are Profitable at $50 says Deputy Energy Minister Sorokin." We then wrote ""We will ask the same rhetorical question as we did in our Jan 31, 2021 Energy Tidbits – imaging what markets would say if Exxon were to come out in their year end reporting and say only 50% of its existing oil reserves are profitable at $50? On Thursday, we tweeted [LINK] "Only half of Russia's #Oil reserves are profitable at $50 says Deputy Energy Minister Sorokin. Fits Jan 27 linked tweet. Bullish for mid/long term oil prices. Detailed comment in SAF Group Jan 27, 2021 Energy Tidbits memo". There was a typo in the tweet as we should have said the Jan 31, 2021 Energy Tidbits memo that was titled "Russia Says Increasing Water Cut, Deteriorating Development, Etc Mean Only 36% of Its Oil Reserves are Profitable." This week, Russia's Deputy Energy Minister Sorokin came out with almost identical comment as he did on Jan 27, 2021 saying "even in our current structure of reserves, a significant part of it is unprofitable at a price of $50 – about half there. There is a very large layer of opportunities for working with the current resource base: with small fields, with depleted, with tailing assets, with deeper and more difficult layers. What you need to concentrate on". Sorokin's Jan 27 comments were basically overlooked as they were only in the TASS Russian news version. But we thought then and still think know that this is a significant admission from Russia as to the mid/long oil supply and we believe a bullish comment for oil in the 2020s. One difference is that Sorokin gave much more insight into the uneconomic oil reserves in his Jan 27 comment in Russia. Below is what we wrote in our Jan 31, 2021 Energy Tidbits on his comments. Our Supplemental Documents package includes the TASS Sept 2 report on Sorokin's comments."*

Jan 27, 2021, Sorokin said 64% of oil reserves not profitable

Here is what we also wrote in our Feb 19, 2023 Energy Tidbits memo. "*Our Friday tweet also linked to a Jan 27, 2021 tweet. Here is what we wrote in our Jan 31, 2021 Energy Tidbits memo on that tweet. "Imagine what markets would say if Exxon were to come out in their year end reporting and say that 64% of its existing oil reserves are not profitable at >$50 oil. The stock would be creamed as markets would think Exxon wouldn't have oil growth potential and its oil production had likely peaked. This is what Russia said this week for their oil reserves. We were surprised by a TASS Russian news story on Wed morning and would have thought it was a fake if it wasn't on TASS as we would never have thought Russia's #2 oil official (after Novak) would be saying what he did. We tweeted [LINK] "1/2. must read, bullish for oil @tass_agency story "only 36% of oil reserves in Russia are profitable". multiple* *indicators of maturing oil supply ie. deeper, smaller pools, etc. Effectively says RUS has more or less reached peak oil supply unless #Oil prices are higher #OOTT ..” and [LINK] “2/2. surprising RUS lays this out, but fits to Novak's Dec comments and why they would want higher oil prices for 2020s sooner. see SAF Group blog Russia Says its a Price Taker at $45 in 2021, May Be the New Strategy Needed for OPEC+ to Fix Post Covid OIl Prices For 2020s. #OOTT”. TASS wrote “Only 36% of 30 billion tons of oil reserves in Russia are profitable, which is associated with the deterioration of development conditions and a drop in the quality of reserves, writes the Deputy Minister of Energy of the Russian Federation Pavel Sorokin in an article for the Energy Policy magazine. "According to the data of the inventory of the economics of field development, carried out on behalf of the Russian government, out of 30 billion tons of recoverable oil reserves in Russia, only 36% is profitable in the current macroeconomic conditions. This is due to the deterioration of development opportunities: an increase in water cut, the need to permeability and compartmentalization of reservoirs, withdrawal into marginal zones and strata with small thicknesses, and so on, "Sorokin explained.” This is significant, Sorokin is basically saying Russia has more or less reached peak oil supply, or at least peak oil supply unless prices are going higher. Maybe there is some growth but Russia has to first arrest declines. This is very different than what we see in the Middle East. Russia is saying its maturing oil production/reserves base needs higher oil prices as its oil base is maturing and they are going after smaller pools (higher cost per barrel), deeper zones (higher costs per barrel) and need new technology (we wonder if this means shale, although Putin has been negative). And also very different than Saudi Arabia. Their costs are going up to, but they aren’t saying their oil production/reserves needs higher oil prices to be economic. Rather they and others like we saw with Kuwait this week need higher oil prices to balance their govt budget. They don’t say they need higher oil prices to develop its oil reserves. One reminder, producing oil reserves isn’t like drinking a glass of water, where you turn the cup down and the water flows out at the same rate until the glass is empty. As oil reserves produce more from a reservoir that is economic today, the oil recovery rate declines over time and the future barrels become more expensive to produce. This is more than food for thought. If peak oil demand isn’t here until 2030, then its bullish for oil post Covid. Even if oil demand only recovers to pre Covid, its bullish or at least supportive of higher prices. Our Supplemental Documents package includes the Google Translate version of the TASS Russian story.”*

Oil – Didn’t see usual warnings this year on potential terrorism during Ramadan

Ramadan started Thurs, ends Apr 20

Ramadan started Thursday and ends the evening of Thurs April 20. Normally most years in the run up to Ramadan, we will see security threat warnings. We look to the US Overseas Security Advisory Council [LINK] for Security Alerts that typically refer to Ramadan and, in prior years, have noted that “*martyrdom during the month may hold a special allure to some*”. It’s normally a reminder they make just like we see reminders of terrorist risk on certain anniversaries. We checked again on Friday and there still haven’t been any Ramadan warnings. Let’s hope that is a good sign. Ramadan is described by the LiveScience [LINK] “*Ramadan is the most sacred month of the year in Islamic culture. Muslims observe the month of Ramadan, to mark that Allah, or God, gave the first chapters of the Quran to the Prophet Muhammad in 610, according to the Times of India. During Ramadan, Muslims fast,* *abstain from pleasures and pray to become closer to God. It is also a time for families to gather and celebrate*

Oil –Does Houthis push on Marib signal the end is near for the Saudi/Houthi war?

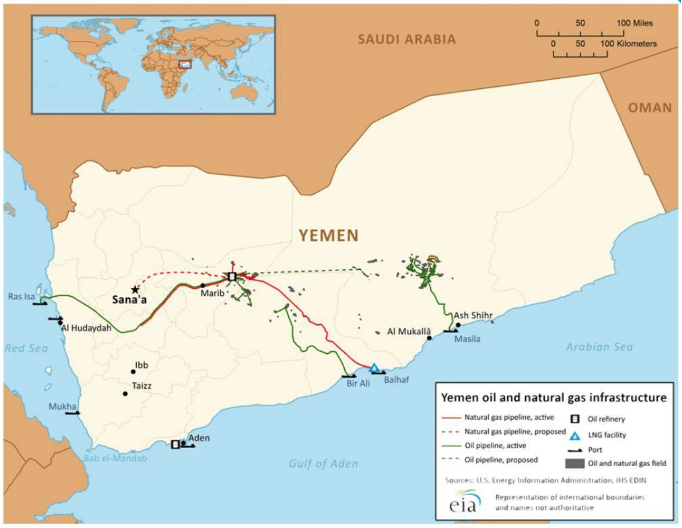
Battle for Marib, Yemen

Today marks the 8th anniversary of the start of the Saudi coalition attacks on the Houthis in a war that MBS expected to last a matter of weeks. Last Sunday morning, we only saw one report (Xinhua) on the Houthis attacks in Marib, which is Yemen's oil province and also was part of the old Northern Yemen. This week, we saw more reports of increasing Houthis attacks from news agencies such as Al Jazeera. On Wednesday, we tweeted [LINK] *"Fighting picking up in Marib reports Al Jazeera. See 👇03/19 tweet, makes sense for #Houthis to try to capture what used to be in Northern Yemen before any deal. Seems to point to deal is not too far away. Possession is 9/10th of the law. #OOTT [LINK].* We thought there is significance to the reports that the Houthis have carried out attacks on Marib because of the Saudi/Iran deal two weeks ago. If the Houthis think some sort of forced peace deal will be happening soon, it makes sense that they would want to capture Marib. Marib is the capital of the oil producing region, and this oil producing region was part of the old North Yemen before they and South Yemen joined together to form Yemen. It makes sense the Houthis want to be the ones in control before any peace talks/deal. Our tweet included the Al Jazeera report that said "*A new bout of front-line fighting in Yemen has disrupted diplomatic efforts to expand a United Nations-brokered truce deal that has largely held since its expiry six months ago. Military and government sources told news agencies that the clashes erupted late on Tuesday when the Houthi rebels, who control most of northern Yemen, launched an attack on Harib district, in the oil-rich Marib province. The Houthis "made progress on that front, causing the displacement of dozens of families", one of the sources told AFP, speaking on condition of anonymity."* From an oil market perspective, it doesn't seem like oil prices have reflected any geopolitical risk premium from the Houthis/Saudi coalition war so any deal in the near term shouldn't have an impact on oil prices But we tend to see this push as a push to control more territory before any deal is forced upon the Houthis.

Figure 22: Yemen 1967-1990 Pre Unification

Source: Wikipedia

Figure 23: Yemen Oil and Natural Gas Infrastructure



Source: EIA

Oil – Iraq reportedly halts 445,000 b/d oil exports via Turkey, not clear for how long

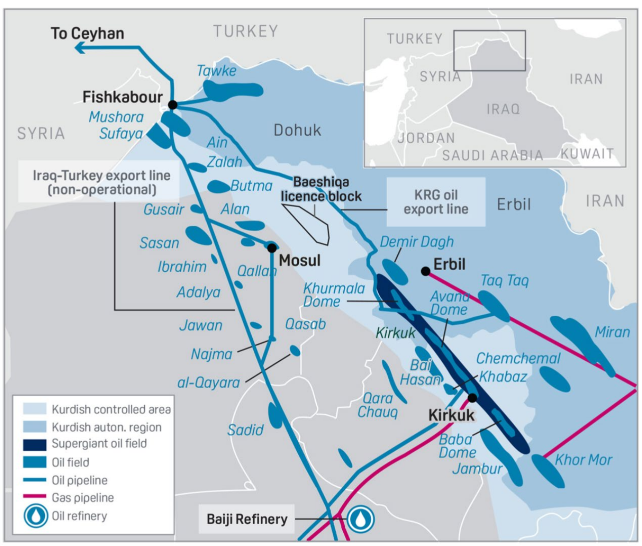
Iraq halts 445,000 b/d oil exports

Breaking news yesterday that Iraq reportedly halted 445,000 b/d of crude oil exports thru its north on the export pipeline to Ceyhan, Turkey. Iraq won an arbitration with Turkey, which means that Turkey has to deal with Iraq's oil marketing arm for approval of all Iraq oil exports, including oil from Kurdistan. It's not clear how long it will take to get to a mechanism for Iraq dealing with Turkey on the oil exports. Don't know if's wishful thinking but Kurdistan media was pointing to not too long to get an understanding. Regardless, until Iraq resumes oil exports via Turkey, it means there will be ~445,000 b/d of crude oil off the market. Yesterday, we tweeted [LINK] *Iraq reportedly halts 370 kbd KRG + 75 kbd federal oil thru export pipeline thru Turkey reports @Ahmed_Rasheed_R @RowenaCaine. Positive for #Oil until Iraq resumes northern exports ie. agrees on mechanism to export Iraq oil thru Turkey in line with its arbitration win. #OOTT."* Yesterday, Reuters reported [LINK] *"Iraq halted crude exports from the semi-autonomous Kurdistan region and northern Kirkuk fields on Saturday, an oil official told Reuters, after the country won a longstanding arbitration case against Turkey. The decision to stop shipments of 450,000 barrels per day (bpd) of crude relates to a case from 2014, when Baghdad claimed that Turkey violated a joint agreement by allowing the Kurdistan Regional Government (KRG) to export oil through a pipeline to the Turkish port of Ceyhan. Baghdad deems KRG exports via Turkish Ceyhan port as illegal. The International Chamber of Commerce ruled in favour of Iraq on Thursday, Iraq's oil ministry confirmed on Saturday. Turkey has informed Iraq that it will respect the arbitration ruling, a source said. Turkish shipping officials told Iraqi employees at the Ceyhan oil export hub that no ship will be allowed to load Kurdish crude without the approval of the Iraqi government, according to a document seen by Reuters. Turkey subsequently halted the pumping of Iraqi crude from the pipeline that leads to Ceyhan, a separate document seen by Reuters showed. On Saturday, Iraq stopped pumping oil through its side of the pipeline which runs from its northern Kirkuk oil fields, an official told Reuters. Iraq had been pumping 370,000 bpd of*

KRG crude and 75,000 bpd of federal crude through the pipeline, according to a source familiar with its operations. "A delegation from the oil ministry will travel to Turkey soon to meet energy officials to agree on new mechanism to export Iraq's northern crude oil in line with the arbitration ruling," a second oil ministry official said." Kurdistan region Prime Minister Masrour Barzani expects this to be quickly resolved. Yesterday Kurdistan 24 news reported [LINK] "*Kurdistan Region Prime Minister, Masrour Barzani, on Saturday reiterated the Kurdistan Regional Government's (KRG) good relations with the Iraqi federal government. "Our recent understandings with Baghdad have laid the groundwork for us to overcome the arbitration ruling today," PM Barzani wrote in the tweet. "A team from the KRG will visit Baghdad for talks tomorrow to build on the goodwill of our discussions," Barzani added."* Below is a Platts Northern Iraq's oil infrastructure map from 2020 [LINK]. Our Supplemental Documents package includes the Reuters report.

Figure 24: Northern Iraq's oi infrastructure map from 2020

NORTHERN IRAQ'S OIL INFRASTRUCTURE



Source: S&P Global Platts, PolGeoNow

Source: Platts

Oil – Vitol, oil demand + 2 mmb/d thru to yr-end, peak oil demand "circa 2030"

Vitol CEO on oil demand

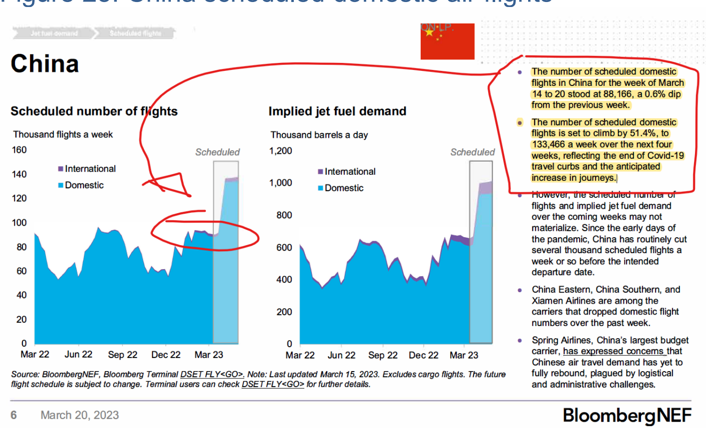
The comments from Vitol CEO Hardy's statement that got the most attention were his comments on strengthening oil demand would increase by 2 mmb/d thru to the end of 2023, oil demand should keep growing until "circa" 2030, and a reminder that Africa will be a major future growth area in oil demand. Hardy wrote "*Looking forward to the rest of 2023, we expect oil demand to grow by 2 m b/d, driven primarily by the aviation sector globally and recovering demand in China." "We expect oil demand to grow until circa 2030. Road vehicles will lead the transition to electricity and cleaner fuels, such as biogas and hydrogen fuel cells, but it is essential that other sectors, such as shipping, address decarbonisation." "Longer term, Africa will continue to be a growth market as per capita oil consumption, currently 9% that of Europe, increases in line with economic development."*

China domestic flights

Oil – China domestic air flights, 6th week of flat or small WoW declines

There have now been six consecutive weeks of slight WoW declines or basically flat WoW changes in China's scheduled domestic flights. It seems like a pause before a seasonal uptick in Q2 and Q3. Last week's (March 19, 2023) Energy Tidbits noted Cathay Pacific CEO saying that they are ramping up by the Hong Kong/London routes for the summer season, which he said was the end of this month ie. March. This means we should be seeing the summer ramp up start in April. On Monday, we tweeted [LINK] "*Pause continues. 6th wk slight WoW decline China domestic flights. Mar 14-20: -0.6%. Mar 7-13: -0.8%. Feb 28-Mar 3: -2.6%. Feb 21-27: +0.01%. Feb 14-20: -0.5%. Feb 7-13: -0.7%. Jan 31-Feb 6: +10.9%. Jan 24-30: -9%. Jan 17-23: +7%. Jan 10-16: +20%. Thx @BloombergNEF Claudio Lubis #OOTT.*" BloombergNEF wrote "*The number of scheduled domestic flights in China for the week of March 14 to 20 stood at 88,166, a 0.6% dip from the previous week. • The number of scheduled domestic flights is set to climb by 51.4%, to 133,466 a week over the next four weeks, reflecting the end of Covid-19 travel curbs and the anticipated increase in journeys*". Not sure if significant but, just like the prior two weeks, BNEF didn't highlight the bums in the seat, whereas the prior weeks, BNEF included the increasing passenger load factors ie. BNEF "*passenger load factors have increased to at least 68%* …..". That has now not been in the last three weeks of Aviation Indicators Weekly reports. Below is the NEF China scheduled domestic flights.

Figure 25: China scheduled domestic air flights



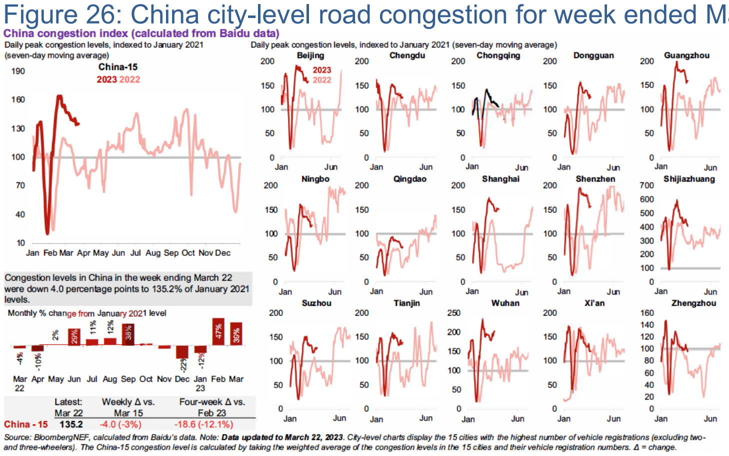
Source: BloombergNEF

China road traffic congestion

Oil – 5th consecutive WoW decline in China traffic. But traffic is "exceptionally high"

No one can deny that China's traffic surged in 2023 following the removal of Covid restriction, but with five consecutive WoW declines in traffic congestion, we have to wonder if China has found a general post-Covid traffic level ie, its post-Covid gap up is done. China traffic congestion surged with the reopening in Jan, but we now have seen five consecutive WoW declines in traffic congestion, although the traffic "remains exceptionally high". On Thursday, we tweeted [LINK] "*#EU traffic down, still >2019. NA, Asia excl China, up YoY but <2019 levels. China "traffic in Feb & Mar has been exceptionally high". BUT 5th consecutive WoW down in traffic -4.0% for Mar 22 to 135% of Jan 2021. Thx @BloombergNEF. Global Road Traffic Indicators Weekly. #OOTT.*" BloombergNEF's Global Road Traffic Indicators Mar 23, 2023 described China's city-level road congestion as "*exceptionally high*" based on the Baidu data "*Traffic in China stabilizes, shedding increasingly small margins every week*". Our tweet also included the below BloombergNEF graphic on China road congestion.

Figure 26: China city-level road congestion for week ended Mar 22



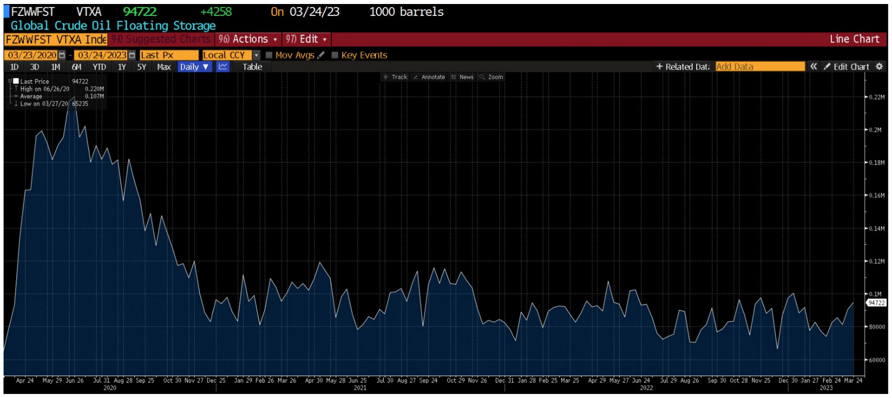
Source: BloombergNEF

Oil – Vortexa crude oil floating storage at Mar 24 was 94.72 mmb, +4.26 mmb WoW

Vortexa floating storage

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of 9am 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 on the new estimates are compared to the prior week's Vortexa estimates posted on Bloomberg on March 18 at 10am MT. (i) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for March 24 at 94.72 mmb, which is +4.26 mmb vs the big upwardly revised March 17 of 90.46 mmb. Note March 17 of 90.46 mmb was revised +11.15 mmb vs 79.31 mmb posted on Bloomberg as of 10am MT on March 18. (ii) Other than the big upward revision to March 17, All of the other revisions for the prior seven weeks were revised down. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 10am MT on March 18 are as follows: March 17 revised +11.15 mmb. March 10 basically unrevised at +0.01 mmb. March 3 revised -2.64 mmb. Feb 24 revised -2.19 mmb. Feb 17 revised -2.31 mmb. Feb 10 revised +0.37 mmb. Feb 3 revised -1.85 mmb. (iii) Floating storage was up the last two weeks. A simple average for the past seven weeks is 83.62 mmb, which is up vs last week's average of 81.53 mmb. (iv) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (v) March 24 estimate of 94.72 mmb is -125.21 mmb vs the post-Covid hitting peak on June 26, 29020 of 219.93 mmb. (vi)The below graph goes back 3 years and not just 2 years as floating oil storage was in the big ramp up period started at the first week of April 2020 as Covid started to have a huge impact. (vii) March 24 estimate of 94.72 mmb is +29.48 mmb vs pre-Covid of 65.24 mmb on March 27, 2020. (viii) March 24 estimate of 94.72 mmb is +7.42 mmb YoY vs 87.30 mmb on March 25, 2022. (ix) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT March 25, 10am MT March 18, and 10am MT March 11.

Figure 27: Vortexa Floating Storage posted on Bloomberg Mar 25 at 9am MT



Source: Bloomberg, Vortexa

Figure 28: Vortexa Estimates Posted Mar 25 9am MT, Mar 18 10am MT, Mar 11 10am MT

Posted Mar 25, 9am MT

FZWWFST VTXA Inde — 03/23/2020 - 03/24/2023

	Date	Last Px
Fr	03/24/2023	94722
Fr	03/17/2023	90464
Fr	03/10/2023	81143
Fr	03/03/2023	85349
Fr	02/24/2023	82377
Fr	02/17/2023	74055
Fr	02/10/2023	77236
Fr	02/03/2023	82529
Fr	01/27/2023	77450
Fr	01/20/2023	91765
Fr	01/13/2023	88125

Mar 18, 10am MT

FZWWFST VTXA Inde — 03/16/2020 - 03/17/2023

	Date	Last Px
Fr	03/17/2023	79305
Fr	03/10/2023	81152
Fr	03/03/2023	88034
Fr	02/24/2023	84569
Fr	02/17/2023	76366
Fr	02/10/2023	76873
Fr	02/03/2023	84377
Fr	01/27/2023	76881
Fr	01/20/2023	92745
Fr	01/13/2023	88877
Fr	01/06/2023	101.041k

Mar 11, 10am MT

FZWWFST VTXA Inde — 03/09/2020 - 03/10/2023

	Date	Last Px
Fr	03/10/2023	69574
Fr	03/03/2023	80876
Fr	02/24/2023	83764
Fr	02/17/2023	75787
Fr	02/10/2023	75999
Fr	02/03/2023	80687
Fr	01/27/2023	73921
Fr	01/20/2023	88707
Fr	01/13/2023	84955
Fr	01/06/2023	96742
Fr	12/30/2022	94617

Source: Bloomberg, Vortexa

Oil – Vortexa's team specializes in tracking the "*so-called dark fleet*"

Vortexa tracking the "dark fleet"

There was a great commentary on March 10 from Vortexa's Senior Market Analyst Pamela Munger on how Vortexa has focused on tracking the growing dark fleet of tankers who turn off transponders. The dark fleet has had a huge growth with Russian sanctions adding to Iran dark fleet and others. And Vortexa has focused on tracking this dark fleet. We tweeted [LINK] "*Why we like & follow @Vortexa weekly crude oil floating storage! "we do a lot of tracking for the so-called dark fleet" "we have a great team that specializes in analyzing signals & gaps in the signals & where vessels appear" @Vortexa Pamela Munger on*

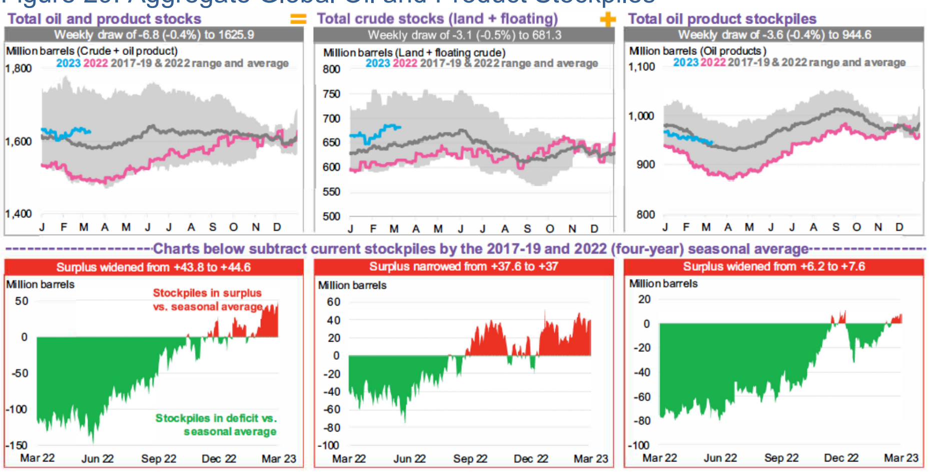
@gulf_intel podcast. #OOTT.”* Our tweet included the transcript we made of Munger’s comments on the Gulf Intelligence PODCAST: Daily Energy Markets – March 10th. [LINK]. At 24:30 min mark, Munger *“… we do a lot of tracking for the so-called dark fleet, if you want to call it. There is a certain set of vessels that we have noticed patterns where they turn off their transponders. And we do have special sets of technology on the back end where we analyze. We have a great team that specializes in analyzing signals and gaps in the signals and where vessels reappear*.”

Oil – BNEF: global oil and product stocks surplus widened WoW to 44.6 mmb

BNEF’s global oil inventories

For those with a Bloomberg terminal we recommend flipping through BloombergNEF’s “Oil Price Indicators” weekly that came out on Monday as it provides good charts depicting near-term global oil demand and supply indicators. The global stockpile for crude oil and products surplus widened from 43.8 mmb to 44.6 mmb for the week of Mar 10. Crude oil inventories increased slightly WoW to 600.7 mmb, further widening the surplus against the five-year average (2016-2019, 2022) by +2.0 mmb to 5.3 mmb. Total crude inventories (incl. floating) decreased by -0.5% WoW to 681.3 mmb, narrowing the surplus from 37.6 mmb to 37.0 mmb. Product stocks were down slightly by -0.4% WoW and the stockpile surplus against the 4-year average (2017-2019,2022) widened from 6.2 mmb to 7.6 mmb. The gas, oil, and middle distillate stocks deficit narrowed against the four-year average deficit from 17.3 mmb to 16.2 mmb. Jet fuel consumption by international departures for the week of Mar 27 is set to increase by 22,640 b/d WoW to 5.66 mmb/d, while consumption by domestic and passenger departures will increase by 5,100 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 29: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

Oil – Bloomberg Oil Demand Monitor: Oil demand projected to end 2023 with a “bang”

Bloomberg Oil Demand Monitor

We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. Jet fuel, the most impacted indicator of oil demand by the Covid-19 pandemic is set to play a pivotal role in oil consumption growth this year. Demand for crude is forecasted to jump by 1.9 mmb/d in 2023 to an all-time global high of

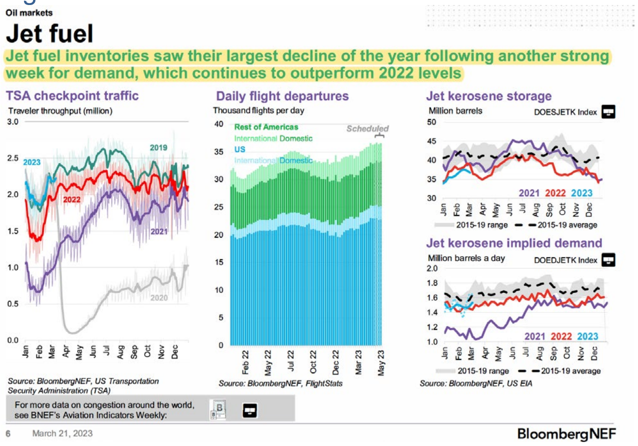
102 mmb/d, and jet fuel is expected to increase by the largest margin at 0.840 mmb/d. To this end, the IEA and Bloomberg commented, "*Demand growth may have started 2023 with a whimper, but it is projected to end the year with a bang. Global consumption will increase by 2 million barrels a day this year to average a record 102 million a day.*" Now that China has lifted its zero-Covid policy, oil demand has increased as expected while the country's economy continues to ramp up. The article noted, "*China's demand should rise by a "solid" 1 million barrels a day year-on-year in the second quarter, OPEC said, citing recovering air travel, continued expansion in petrochemical industries, increased mobility and rising construction activity.*" However, headwinds such as sticky inflation, rising interest rates, looming recessionary fears, and the recent banking crises continue weigh on oil demand recovery moving forward. Commercial airline flights at the start of this week were ~2% higher than 2019 levels (before Covid), according to a 7-day average tracked by Flightradar24. As of Monday morning, road congestion was exceeding pre-pandemic levels in just below half of the 13 major global cities tracked by TomTom mobility data, with China's traffic marginally lower in major cities following the huge recovery seen after the country's zero-Covid policy was lifted. Refinery utilization as of Mar 18 was at 88.6%, up +0.4% WoW but down -2.5% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Oil – US air travel indicators continue up strongly YoY, tracking closely to 2019

US oil indicators weekly

Notwithstanding the increasing concerns for global economies to be hurt with the fallout of the bank hits, at least so far, there hasn't been any impact on US air travel. On Tuesday, we tweeted [LINK] "*May not make a difference to #Oil price right now, but TSA checkpoint shows Americans are flying, and #JetFuel storage levels continue below 2015-19 range. Thx @BloombergNEF US Oil Indicators Weekly Danny Adkins. #OOTT.*" BloombergNEF posted its US Oil Indicators Weekly on Tuesday and our tweet included their Jet Fuel page (see below). BloombergNEF wrote "*Jet fuel inventories saw their largest decline of the year following another strong week for demand, which continues to outperform 2022 levels.*" Their TSA checkpoint traffic growth shows 2023 tracking well with 2019, and their Jet kerosene storage graph showing jet fuel below the 2015-2019 range.

Figure 30: Jet fuel



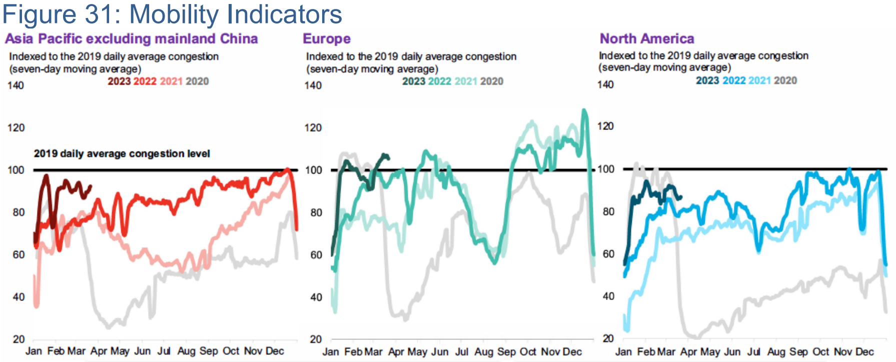
Source: BloombergNEF

Oil – TomTom mobility indicators traffic down WoW but elevated in all key regions

Global road traffic indicators

In the BloombergNEF Global Road Traffic Indicators Weekly report we continue to see the same signals as the US gasoline consumption data from BloombergNEF US Oil Indicators Weekly. On Thursday, we tweeted [LINK] "*#EU traffic down, still >2019. NA, Asia excl China, up YoY but <2019 levels. China "traffic in Feb & Mar has been exceptionally high". BUT 5th consecutive WoW down in traffic -4.0% for Mar 22 to 135% of Jan 2021. Thx @BloombergNEF. Global Road Traffic Indicators Weekly. #OOTT.*" Mobility indicators like TomTom data point to stable levels in North American driving YoY, although cumulative road congestion has yet to recover to 2019 levels. For week ending Mar 22, European and North American traffic levels were both down WoW by -1.8% and -1.4%, respectively. In contrast, Asia Pacific (ex-China) traffic was up +4.7% WoW following last weeks -4.0% decline. Traffic levels in Europe are now +5.5% above the 2019 average but still down -2.8% YoY. North American traffic is -13.0% below the 2019 average and is -3.9% YoY. Finally, traffic levels in the Asia Pacific (ex-China) region are -7.7% below the 2019 average but up +2.8% YoY. Traffic in the Asia-Pacific region has been exceptionally high since Feb. The TomTom mobility data seems logical as MoM North American road traffic down slightly resulting in a widened differential to 2022's levels, but overall congestion remains strong despite being below the 2019 average. It its worth noting that TomTom data on congestion levels now reflects daily average congestion compared to peak congestion previously. The change in methodology took effect from January 19.

Figure 31: Mobility Indicators



	Week-on-week (2019 average = 100)				Year-on-year (same week last year = 100)			
	Latest week: Mar 21	Δ vs. Mar 14	4-week MA	Δ vs. Mar 14	Latest week: Mar 21	Δ vs. Mar 14	4-week MA	Δ vs. Mar 14
Asia Pacific ex-China	92.3	+4.1 (4.7%)	90.7	+0.5 (0.6%)	118.7	+3.2 (2.8%)	119.1	-0.2 (-0.2%)
Europe	105.5	-2.0 (-1.8%)	102.6	+3.4 (3.5%)	112.2	-3.3 (-2.8%)	106.7	+3.4 (+3.3%)
North America	87.0	-1.3 (-1.4%)	89.2	+0.8 (0.9%)	108.3	-4.4 (-3.9%)	109.2	+0.8 (+0.7%)

Source: BloombergNEF's calculation based on TomTom data. Note: ***Data up to March 22, 2023****. Fixed data issue for London and Manila. Birmingham was replaced with Warsaw. Δ = change. MA = moving average.*

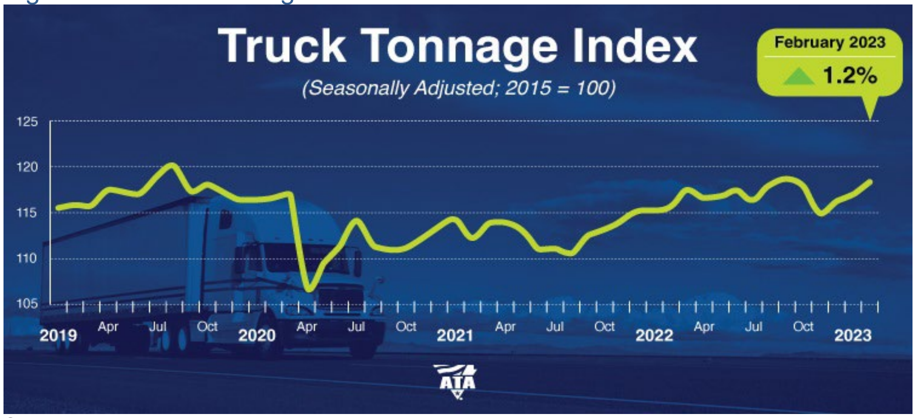
Source: BloombergNEF

Oil – Truck tonnage rose 1.2% in February to 118.4

Truck tonnage index +2.3% YoY in February

Truck tonnage grew by 1.2% MoM in February, resulting in a total three-month gain of 2.9% since the start of 2023. This follows 2022's cumulative growth of 3.4% which was the largest single year increase observed since 2018. In addition, February's 2.3% YoY growth marked the eighteenth consecutive YoY gain, highlighting the slow but apparent recovery from 2020 lows. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for February on Thursday [LINK]. Chief Economist Bob Costello noted, "*As a result, the index is just 0.3 percent below the recent high in September. The fact that our index is* *growing sequentially and on a year-over-year basis demonstrates that contract freight continues to hold up at high levels.*" And, "*Looking ahead, we continue to see evidence the inventory cycle is improving, which means bloated stocks will stop being a headwind and eventually help truck freight volumes," Costello said. "Increased infrastructure spending will also boost volumes heading into the summer months. However, we expect to see continued freight softness related to lower home construction and slowing factory output.*" 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, equating to roughly 3.6% of total U.S. GDP in 2021. Our Supplemental Documents package includes the ATA release.

Figure 32: Truck Tonnage Index



Source: ATA

Oil & Natural Gas – TIPRO Texas oil natural and gas jobs up MoM in Jan

TIPRO January jobs update

Employment continues to increase in the Texas oil and gas sector. The Texas Independent Producers and Royalty Owners Association (TIPRO) updated their employment figures for the Texas upstream sector for January [LINK]. TIPRO wrote "*direct Texas upstream employment for January 2023 totaled 198,100, an increase of 1,700 jobs from revised December employment numbers. Texas upstream employment in January 2023 represented the addition of 24,000 positions compared to January 2022, including an increase of 1,600 jobs in oil and natural gas extraction and 22,400 jobs in the services sector."* And "*The Houston metropolitan area, the largest region in the state for industry employment, showed an increase of 700 upstream jobs in January compared to December, for a total of 66,400 direct positions, according to TIPRO. Houston metro upstream employment in January 2023 represented an increase of 6,200 jobs compared to January 2022, including an increase of 400 in oil and natural gas extraction and 5,800 jobs in the services sector.*" In addition, TIPRO president, Ed Longanecker commented, "*There continues to be a strong demand for talent in the Texas oil and natural gas industry in line with growing exploration and production activity in the state and rising demand for our product… Our industry is one of the only remaining sectors in the country that provides a pathway for the middle-class to support their families, something we must preserve. Policy decisions being made at the state and federal level should not hinder an industry that is critical to our state, country* *and allies abroad from an economic and energy security perspective.*" Our Supplemental Documents package includes the TIPRO release.

Energy Transition – Equinor energy transition self inflicted train crash in slow motion

Equinor blunt talk on energy transition

We can't help but chuckle as we see more and more European energy companies come out with stark warnings that Europe is nowhere near on track for their energy transition goals. Where were they in 2019, 2020 and 2021? This week, it was a very blunt warning from Equinor Chief Economist Eirik Waerness in his interview with the FT. He highlights the same themes that clean energy investment is nowhere near enough, the clean energy infrastructure is far behind and oil and gas spending is at levels consistent to being on track with a Net Zero emissions spending where oil and gas demand is in decline. But what was a little different about Wareness's comments were how he described it. FT wrote "*But slashing oil supply only works if an increase in clean energy infrastructure drives down oil demand at the same time — and that is not happening, says Wærness: transition investment is nowhere near the level needed to wean global economies off oil. "This is a self-inflicted train crash in slow motion, because we don't have the investment. It is a recipe for an energy crunch," he said."* Waerness also reminds of one of our key themes – it's more than windmills and EVs, the energy transition only works with infrastructure. FT wrote "*But slashing oil supply only works if an increase in clean energy infrastructure drives down oil demand at the same time — and that is not happening, says Wærness: transition investment is nowhere near the level needed to wean global economies off oil."* One other good reminder from Waerness was "*Meanwhile, relying on subsidies to deliver new clean energy capacity or spur electrification in the US without measures to curb consumption of energy, such as a carbon tax, could lead to other distortions, Wærness argued. "If we hide the true costs [of carbon] or energy from consumers, we don't get an extra incentive to make things smaller, more energy efficient," he said."* Our Supplemental Documents package includes the FT report.

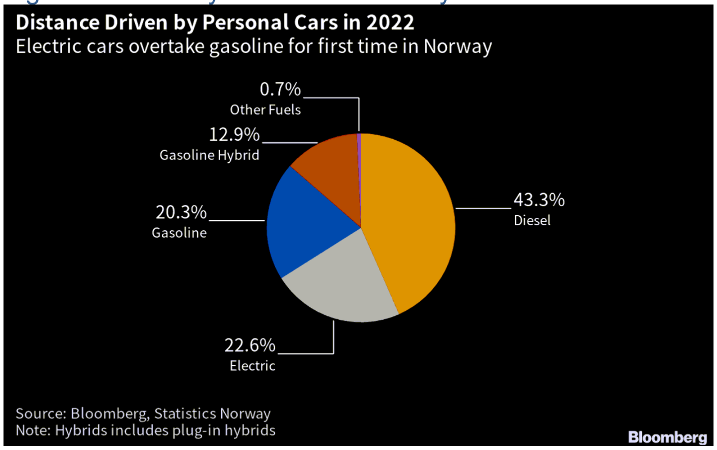
March 15, E.ON CEO reminded it's more than windmills & EVs

Last week's (March 19, 2023) Energy Tidbits memo highlighted E.ON CEO Leonard Birnbaum's reminder that it's more than windmills and EVs. Here is what we wrote last week. "*E.ON reported Q4 on Wednesday and its CEO Leonard Birnbaum made a number of comments on Bloomberg Markets Europe that had a a clear message – Europe is far behind on the energy transition and how Germany's energy policies have led to lost competitiveness and Germany facing the danger of deindustrialization. Here are a few of his key points. (i) Windmills & EVs aren't enough. We continue to believe that many just focus on wind/solar installations and EV penetration and not focus enough on being able to transmit wind/solar power and strengthening the grid to take more intermittent power. As Birnbaum reminded, every windmill added to the grid drives the need for more grid strengthening. On Wed, we tweeted [LINK] "#NatGas & its existing power infra will be needed for longer. #EnergyTransition is much more than windmills & EVs. #E.ON CEO every windmill needs a great a grid connection, every grid connection drives for more backbone reinforcement ...Thx @annaedwardsnews M. Cudmore. #OOTT." Our tweet included a 25-second clip of his comments on windmills. (ii) need to massively invest in energy infrastructure. This was his key warning. On Wednesday, we tweeted [LINK] "over/under? #E,ON CEO "do not have the infra in place for the #EnergyTransition" "need to massively invest into infra" if can "achieve at sufficient speed" can make it* *happen. "If not, we are going to run into trouble"#NatGas will be needed for longer. Thx @annaedwardsnews #OOTT." Our tweet included a 1:10 min clip of these comments. (iii) High energy prices have led to Germany loss of competitiveness. Birnbaum was blunt on how Germany has been hard hit by high energy prices. We tweeted [LINK] "E.ON CEO on #EnergyTransition ""we [Germany] have clearly lost competitiveness with the high energy costs" "unless we actually save energy & get prices down...... we will not see investments that we need and then, Yes, the danger of deindustrialization can not be neglected" #OOTT." Our tweet included the transcript we made of Birnbaum's comments to Bloomberg's Anna Edwards. "Edwards ".. do you see Germany as deindustrializing right now …… how different is the German economy going to look when we get to the other side of all this Energy Transition?" Birnbaum "I see investment, let me put it this way, I see investment decisions more and more taking place to the detriment of Europe and actually also Germany. Because we have clearly lost competitiveness with the high energy prices and we have not delivered any compensation for that. And so for me, unless we actually save more energy and get prices down. Unless we work much harder to compensate for the loss of competitiveness in energy somewhere else, we will not see investments that we need and then, Yes, the danger of deindustrialization can not be neglected. So that is challenge". (iv) our reminder is that any delays on having the energy infrastructure to support the energy transition should be a positive for natural gas.*

Norway EV distance driven

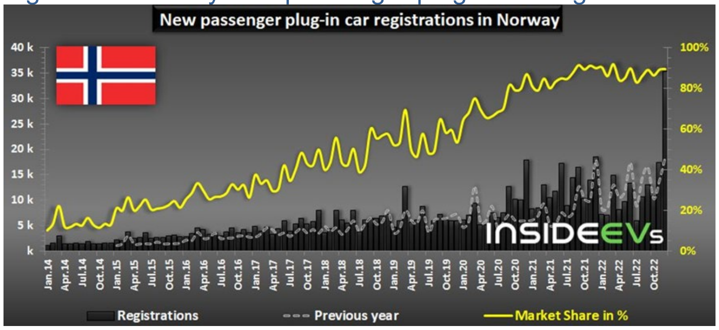
Energy Transition – Norway's EVs 22.6% of distance driven in 2022. Only??
The Bloomberg headline on Wednesday was "*EV Mileage Passes Gasoline Only Cars in Norway, Trailing Diesel*", which no question shows that EVs are having an impact on gasoline/diesel consumption in Norway. Norway has been held out as the country that has had the highest EV sales penetration for the last decade. (i) However, based on the huge penetration of EV sales for many years, we would have thought the EVs share of distance driven would have been much higher. It's why we tweeted [LINK] "*Why don't Norwegians drive their new EVs? Is it more than don't drive in winter? #EVs distance driven 22.6% in 2022. EVs were >80% of new car sales in 2022, been 60% for ~4 years. Thx @business @InsideEVs.* #OOTT". (ii) EVs were 22.6% of Norway distance driven in 2022. Bloomberg reported "*The distance covered by electric cars jumped 34% last year from the year before, Statistics Norway said Wednesday. Electric cars now account for 23% of miles driven, while automobiles fueled only by gasoline made up 20%. Diesel cars drove a whopping 43% of the total."* (iii) But EVs were >80% of sales in 2022 and been over 60% for ~4 years. Our tweet included the InsideEVs graph of Norway's plug-in car registrations since Jan 2014. BEVs were 79.3% and PHEVs were 6.5% of Norway new car registrations. (iv) We would have thought that with the consistent high level of EVs sales that more than 22.6% of the distance driven would be from EVs. Most people buy new cars to drive them and not use as a second vehicle. Part of the reason has to be winter with people leaving their EVs in their garage and driving a gasoline or diesel vehicle. But there are likely other times/reasons for not using EVs and relying on gasoline or diesel cars. (v) We think the takeaway is that EVs are penetrating Norway and impacting gasoline/diesel consumption. But there is a long lag impact for EV sales to have anything close to a proportional impact on distance driven. It reinforces that the Energy Transition will take longer than expected. Our Supplemental Documents package includes the Bloomberg report and InsideEVs report on Norway EV sales in 2022.

Figure 33: Norway Distance Driven by Personal Cars in 2022



Source: Bloomberg

Figure 34: Norway new passenger plug-in car registrations



Source: InsideEVs

Equinor chief economist says Norwegians bought EVs as 2nd or 3rd cars

The Equinor Chief Economist Wareness comment to the FT also supported the above item on how Norwegians aren't using their EVs as much as would be expected given the massive penetration of new car sales over the past several years. Yesterday, we tweeted [LINK] "*Here's why Norwegians #EV mileage is low relative to new car sales. "We've bought an EV instead of taking the bus, or it becomes the second or the third car" says @EWaerness. many other reality check energy transition views in his @FT interview [LINK] #OOTT.*" Waerness says that Norwegians really have bought EVs as their 2nd or 3rd cars and not the principal car. Whereas historically car buyers buy new cars as a principal car other than the wealthy who have more than a couple cars. The FT wrote *"Norway's experience with electric vehicles provides an example, Wærness suggested. Subsidies to buy battery-powered cars had rapidly increased their number, and Norway has been repeatedly cited as an example of how quickly customers could switch to EVs. But* *the overall car fleet had swollen too, Wærness said. "We've kept a lot of the diesel cars and gasoline cars, and we've added EVs, and it took 10 years before gasoline demand went down," he said. "We've bought an EV instead of taking the bus, or it becomes the second or the third car."*

Energy Transition – Ford CEO sys US needs to stop importing rare earths

Ford CEO on rare earths

The headlines on Ford this week were on how they separated out their electric vehicles group and how the EV losses went from $0.9b in 2021 up to $2.1b in 2022, and how Ford is guiding to $3b loss in 2023. But one of Ford's warnings was overlooked – the need for the US to do more than encourage EV manufacturing, they need mines to supply the critical metals. We reviewed the transcript and didn't see mgmt. warn like they did on Fox that US needs to do more than just focus on building EVs – it needs to focus on mining capabilities. Ford CEO Jim Farley was on Fox & Friends on Friday. We listened to the video and the Fox reports [LINK] had the exact quotes. Fox wrote ""*No one makes more full-size trucks than we do in America. We have to on-shore this stuff," Ford Motor Company president and CEO Jim Farley told "Fox & Friends" co-host Brian Kilmeade on Friday. "We have to have mines and processing to build a digital economy here in the U.S. We cannot continue to import batteries and rare earth from overseas. We have to move it to America." "We're willing to invest," Farley continued, "but we have to have people in partnership with government that's going to improve mines, improve processing. These sites are really important. We can build all the plants, but what's the good if we're importing batteries?"*

Capital Markets – Liberals budget come on Tues March 28

Liberals March 28 budget

The Liberal government is releasing its budget on Tues March 28. We hadn't focused on the budget until hearing from some of our Ontario contacts predicting increasing govt take on high income earners. (i) And after seeing Finance Minister Freeland's Monday and Wednesday speeches, we would be in their camp that the likely, and certainly not surprising, scenario will see increasing govt take on high income earners and corporations and some sort of hit to oil and gas. And it's good politics considering the Liberals are behind in the polls. On Friday, we tweeted [LINK] "*Liberals need a boost in the polls. so hard not to see increased govt take from usual targets (high income, wealthy, corporations, #Oil #NatGas, etc.) in Mar 28 budget Vs current seats. Liberals -23, NDP +1 so combo is -22 or down to 159 vs 170 for majority Thx @338Canada #OOTT.*" Our tweet referenced the 338Canada latest polling that has the Liberals well behind the CPC and, more importantly, has the combined Liberals/NDP seat projections falling short of the majority needed to form government. (ii) What wasn't in Freeland's speeches. Freeland made two speeches that both included the comment "*That means government revenues are lower*". She talked about fiscal restraint but nowhere did she says that would mean holding the line or cutting government expenditures. And she also talked about key new investment areas. What struck us was what wasn't in her speech – no mention of where she might get more revenues. And this makes us feel like our Ontario contacts are more likely right. The last thing she would do is, in advance, warn where she plans to increase govt take. (iii) Our Supplemental Documents package includes the two Freeland speeches.

Capital Markets – IFIC: Equity (balanced) funds see net sales (redemptions) in Feb

IFIC Cdn mutual fund data

On Thursday, we tweeted [LINK] "*Continued net redemptions! @IFIC Cdn balanced & equity mutual funds net sales/redemptions data for Feb 2023. 2023 Jan/Feb net REDEMPTIONS of*

$5.6b. 2022 Jan/Feb net SALES $15.8b. YoY diff is -$21.4b! See 👇01/26 tweet, 2022 YoY diff was -$138.9b.#OOTT." One of the big Cdn equity stories in 2022 continued to play out to start 2023 - there was massive net redemptions from active Cdn balanced and equity mutual funds in 2022, which is a huge change from the massive net sales into balanced and equity mutual funds in 2021. On Thursday the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for Feb. IFIC reported net redemptions for mutual funds balanced funds were $0.945b in Feb (vs $4.38b in Jan and $4.97b in Dec). IFIC reported net sales for mutual funds equity funds were $0.42b in Feb (vs net redemptions of $0.67b in Jan and $3.08b in Dec). Last year net redemptions in balanced and equity funds totalled $38.47b, which was a massive YoY crashing of $138.92b vs 2021 that saw net sales in balanced funds and equity funds of $100.45b. Although balanced funds are still seeing net redemptions so far in 2023, the pace has slowed drastically. In contrast, equity funds recovered and had net sales in Feb, following total net redemptions of $8.5b in 2022. Our Supplemental Documents package includes the IFIC release.

Figure 33: Cdn mutual fund net sales/net redemptions ($ millions)

Asset Class	Feb. 2023	Jan. 2023	Feb. 2022	YTD 2023	YTD 2022
Long-term Funds					
Balanced	(945)	(4,384)	5,067	(5,329)	8,163
Equity	423	(668)	4,702	(245)	7,628
Bond	2,365	3,463	(162)	5,828	194
Specialty	114	649	243	763	874
Total Long-term Funds	1,957	(940)	9,851	1,017	16,860
Total Money Market Funds	1,301	1,098	112	2,398	290
Total	3,258	158	9,963	3,416	17,150

Source: IFIC

There were massive redemptions in Cdn active equity/balanced funds in 2022

2023 is not off to a good start for Cdn balanced and equity funds, but 2022 was brutal. Our Thursday tweet on the Jan/Feb IFIC data referenced the brutal 2022 data. Here is what we wrote in our Jan 29, 2023 Energy Tidbits memo. "*One of the big Cdn equity stories in 2022 continued to play out in the final month of the year – the massive net redemptions from active Cdn equity fund manager's balanced and equity mutual funds in 2022, which is a huge change from the massive net sales into balanced and equity mutual funds in 2021. On Thursday, we tweeted [LINK] "WOW! @IFIC balanced & equity mutual funds net sales/redemptions data for 2022. YTD 12/31/22 net REDEMPTIONS of $38.5b. YTD 12/31/21 net SALES $100.4b. YoY diff is -$138.9b!! Makes #Oil #NatGas stocks big outperformance vs TSX and oil prices even more impressive. #OOTT." On Tuesday the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for Dec. IFIC reported net redemptions for mutual funds balanced funds were $4.97b (vs $5.07b in Nov and $5.66b in Oct) and YTD Dec 31 of $29.99b. IFIC reported net redemptions for mutual funds equity funds were $3.08b in Dec (vs $3.01b in Nov and $1.89b in Oct) and YTD Dec 31 of $8.48b. The change vs 2021 is huge and has widened since the Nov update. YTD Dec 31, net redemptions in balanced funds and equity funds was $38.47b, which is a YoY crashing of $138.92b vs YTD Dec 31, 2021 that saw net sales in balanced funds and equity funds of $100.45b.*"

Capital Markets – USDA consumer price index for food +7.7% YoY in February

USDA CPI for food +7.7% YoY

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 in summer 2021 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 February on Friday [LINK], which is -2.6% MoM and +7.7% YoY, compared to Janurary at +10.1%; while it is up over 7%, it still seems very low. Due to recent travel, we had the opportunity to ask a different circle of US friends what they think their grocery bills have increased by YoY and the common number tends to be over 20%. The +7.7% 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 -2.5% YoY, poultry -12.9% YoY, fresh fruits +3.7% YoY, fresh vegetables +26.2% YoY, and eggs +64.3% YoY. We wonder what their forecasts are used for as they did not provide an updated forecast this month but last month overall food price escalation was forecasted to be +5.5% to 10.3% for 2023.

Capital Markets – Shrinkflation means more grocery items taxed as snacks

Shrinkflation makes more items snacks & taxed

It looks like there is more to your increased grocery bills in Canada than inflation – it's also shrinkflation making more food items previously exempt from tax now being taxable as the smaller size makes them classified as snacks. On Dr. Sylvain Charlebois posted an article on Monday in the Toronto Sun that noted "*The Canada Revenue Agency (CRA) has provisions that make some smaller products taxable that weren't in their larger forms. This policy is not new, it actually dates back to 2007, when the GST/HST Memorandum was revised. Some articles of the memo even existed back in 1997. But what is new is the number of products now subject to this Tax Act due to reduced quantities. An increasing number of products, hundreds, are now taxed that weren't before. The Act's policy section Schedule VI, Part III clearly defines a snack and the meaning of single serving. For instance, the threshold for ice cream is 500 millilitres. Anything below that means the product is taxable as it is considered a snack, not as part of basic groceries. Cakes, muffins, pies, pastries, tarts, cookies, donuts, brownies, croissants with sweetened filling or coating, or similar products are all taxable if quantities are reduced below thresholds specified by the Act.*" Charlebois also tweeted an example of a Loblaws bill showing granola bars were now being taxed at the grocery store. Our Supplemental Documents package includes the Toronto Star report [LINK] and his tweet.

Demographics – Skytrax World top 100 airports has Singapore ranked 1st; Doha 2nd

Skytrax World airport awards

Based in London, UK, Skytrax is an international rating organization that is recognized as a global benchmark for quality standards in the air transport industry. The company has worked with 150+ airlines and 100+ airports worldwide and is the sole provider of certified ratings backed by professional analysis of product and service quality. In addition to its professional rating services, the company hosts an annual awards ceremony to acknowledge the worlds best airports based on a large-scale customer satisfaction survey. There are numerous awards such as overall best airport, best staff, cleanest facilities, etc. On Mar 15, Skytrax released its list of award winners for 2023 [LINK], which had Singapore Changi as the world's best airport, followed by Doha Hamad and Tokyo Haneda as second and third best airports, respectively. Notably, there were four Canadian airports to make the top 100, with Vancouver in 20th place, followed by Montreal (45th), Toronto Pearson (64th), and Calgary (92nd). In addition to making the top 10 best airports, Seoul Incheon was recognized for having the World's best staff, while Tokyo Haneda was named the World's cleanest airport, and Zurich recognized for having the World's best security. See below figure for a breakdown of World's top 10 airports for 2023 and how Canadian airports stack up against their global competition.

Figure 34: Skytrax World's top 10 airports 2023

World's Top Airports - 2023

Rank	Airport	Country
1	Singapore Changi	Singapore
2	Doha Hamad	Qatar
3	Tokyo Haneda	Japan
4	Seoul Incheon	South Korea
5	Paris CDG	France
6	Istanbul	Turkey
7	Munich	Germany
8	Zurich	Switzerland
9	Tokyo Narita	Japan
10	Madrid Barajas	Spain
20	Vancouver	Canada
45	Montreal	Canada
64	Toronto Pearson	Canada
92	Calgary	Canada

Source: SAF, Skytrax

Demographics – Marginal improvement for Canada in World Happiness Report

Can moves up in world happiness ranking

We can't help but still be a bit disappointed to see the results of the 11th anniversary report of the World Happiness Report 2023 [LINK]. Canada is a great country to live in but it is not great to see how the Canadians in these results have led to large drop in Canada's ranking of the world's happiest places to live over recent years. Although Canada moved up to 13th overall (15th last year) it is still far below its rank of 5th overall in 2015. This is the 11th report so there is the ability to see trends. It was interesting to note how trust in governments is a key factor in happiness. For Canada, they wrote "*Finland continues to occupy the top spot, for the sixth year in a row, with a score that is significantly ahead of all other countries. Denmark remains in the 2nd spot, with a confidence region bounded by 2nd and 4th. Iceland is 3rd, Israel is in 4th position, up five positions from last year. The 5th through 8th positions are filled by the Netherlands, Sweden, Norway, and Switzerland. The top ten are rounded out by Luxembourg and New Zealand. Austria and Australia follow in 11th and 12th positions, as last year, both within the likely range of 8th to 16th. They are followed by Canada, up two places from last year's lowest-ever ranking. The next four positions are filled by Ireland, the United States, Germany, and Belgium, all with ranks securely in the top twenty, as shown by the rank ranges*".

Figure 35: Ranking of happiness based on 3yr average score

World Happiness - Top 10			World Happiness - Bottom 10		
Rank	Country	Life Score	Rank	Country	Life Score
1	Finland	7.804	137	Afghanistan	1.859
2	Denmark	7.586	136	Lebanon	2.392
3	Iceland	7.530	135	Sierra Leone	3.138
4	Israel	7.473	134	Zimbabwe	3.204
5	Netherlands	7.403	133	Republic of Congo	3.207
6	Sweden	7.395	132	Botswana	3.435
7	Norway	7.315	131	Malawi	3.495
8	Switzerland	7.240	130	Comoros	3.545
9	Luxembourg	7.228	129	Tanzania	3.694
10	New Zealand	7.123	128	Zambia	3.982
13	Canada	6.961	101	Iran	4.876
15	United States	6.894	98	Iraq	4.941
19	United Kingdom	6.796	92	Ukraine	5.071

Source: SAF, World Happiness Report

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures

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

Jill Biden taking notes listening to youths in Ottawa

We recognize US politics is pretty black and white – the Democrats and Republicans are normally strongly against what the other is doing, or at least say so publicly. But one area that we have to believe there is at least some modest support is on First Lady Jill Biden on how she represents the US. Yesterday morning, we were watching Cdn news recap and they included a clip of Jill Biden with Sophie Gregoire Trudeau at an Ottawa curling club listening to youths talk about mental health and physical activity. We couldn't help note that the youth start talking and she pulls a otebook and starts making notes on what they are saying. Don't recall ever seeing a first lady on any scene doing this. We tweeted [LINK] '*Couldn't help note the Cdn news clips this morning on @DrBiden at in Ottawa. It's not just that she goes to hear youth speak* *about mental health & physical activity, she listens, pulls out a notebook, takes notes, and then reads back a quote she liked! Thx @CBCNews."*

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Figure 36: Jill Biden and Sophie Gregoire Trudeau

Source: CPAC

Yesterday's deadly tornado in Mississippi

Was watching CNN This Morning Weekend early today, when CNN meteorologist Allison Chinchar was talking about yesterday's deadly tornado in Mississippi. She said the average tornado is only on the ground for less than 10 minutes, this one was an hour and 10 minutes. The average tornado is on the ground for about 3 miles in length, this one was 59 miles. Combine that with EF-4 wind speeds and no wonder it was deadly. The tornado was given a rare EF-4 rating, which only make up less than 1% of all tornadoes and that the last time Mississippi saw an EF-4 was April 2020. EF-4 ranges from 166-200 miles per hour and yesterday's was estimated at 170 mph.

Figure 37: Tornado ratings

Category	Wind Speed	Damage
EF 0	65-85 mph	Minor
EF 1	86-110 mph	Moderate
EF 2	111-135 mph	Strong
EF 3	136-165 mph	Severe
EF 4	166-200 mph	Devastating
EF 5	>200 mph	Incredible

Source: CNN

WSJ what's in your pocket

The Los Cabos areas is the towns of Cabo San Lucas at the southern tip of the Baja Peninsula to the town of San Jose del Cabo 32 km to the north, and the corridor of development of condos and hotels between the two towns. Life has been back to normal for some time without masks for the most part although staff in many restaurants and shops have wear masks. But the one place that has been masks is the big grocery stores. The big grocery story in San Jose del Cabo is La Comer, which up until a few years ago was known as MEGA. It was the first big grocery store in the Los Cabos area , but sometime earlier in March, they stopped the requirement to wear masks for the first time since Covid three years ago.