# Energy Tidbits

April 9, 2023

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## Stalling China Recovery, Scheduled Domestic Flights in April Only +3% to 98,517 Flights, Not Prior Scheduled 119,180 Flights

**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. More indicators China recovery is stalling, scheduled domestic flights in April now +3% to 98,517 flights vs last week's scheduled flights of 119,180 for April (Click Here).

2. RBC's Helima Croft highlighted how the US lack of response to the Sept 2019 bombing of Abqaiq was the tipping point to the negative of Saudi's view of the US (Click Here).

3. Still no indication when Turkey will allow resumption of 450,000 b/d of Iraq/Kurdistan oil exports via Ceyhan (Click Here).

4. WSJ says Exxon had preliminary talks with Pioneer Natural Resources about a potential deal (Click Here).

5. Saudi/Oman meeting with Houthis for talks to end 8-year war (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 – 23 bcf draw in US gas storage; now 443 bcf YoY surplus

**YoY storage at 443 bcf YoY surplus**

It's early-April so even though it was colder than normal end of March, the storage draw wasn't huge. So, for the week of Mar 31, the EIA reported a -23 bcf draw (in-line with expectations of -23 bcf), compared to the -33 bcf draw reported for the week of Apr 1 last year. This compares to last week's draw of -47 bcf, and the 5-year average build/draw which equates to 0 bcf. Total storage is now 1.830 tcf, representing a surplus of +443 bcf YoY compared to a surplus of +442 bcf last week and is +298 bcf above the 5-year average vs +321 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 (03/31/22) | | 5-year average (2018-22) | |
|---|---|---|---|---|---|---|---|---|
| Region | 03/31/23 | 03/24/23 | net change | implied flow | Bcf | % change | Bcf | % change |
| East | 335 | 343 | -8 | -8 | 245 | 36.7 | 274 | 22.3 |
| Midwest | 421 | 437 | -16 | -16 | 299 | 40.8 | 335 | 25.7 |
| Mountain | 80 | 82 | -2 | -2 | 91 | -12.1 | 89 | -10.1 |
| Pacific | 73 | 73 | 0 | 0 | 164 | -55.5 | 169 | -56.8 |
| South Central | 921 | 917 | 4 | 4 | 588 | 56.6 | 665 | 38.5 |
| Salt | 263 | 262 | 1 | 1 | 172 | 52.9 | 203 | 29.6 |
| Nonsalt | 658 | 655 | 3 | 3 | 415 | 58.6 | 462 | 42.4 |
| Total | 1,830 | 1,853 | -23 | -23 | 1,387 | 31.9 | 1,532 | 19.5 |

Source: EIA

## Natural Gas – Warmer than normal DJF and winter gas NDJFM season

**A warmer than normal winter**

It was a brutal natural gas winter withdraw season for US Henry Hub natural gas prices. HH prices ended Oct over $5, increased in Nov/Dec as it was a cold Dec reaching $7.15 before Xmas, and then it turned much warmer and HH prices crashed to $3.50 to end 2022. And then kept going lower as it was a warm Jan/Feb taking HH below $3 in late Jan, and even dipping below $2 in late March before holding just above $2 in April. It's a reminder that natural gas in the winter is driven by weather, which is why we highlight weather in the Nov thru mid-March period in our Energy Tidbits memos. We tend not to highlight weather during the brief should season periods in April. On Monday, the AGA posted its Heating Degree Day Summary that included its March HDD data and therefore the HDD data for the just finished winter natural gas season Nov 1 thru March 31. For official Nov 1-Mar 31 winter gas season, HDDs this year show it was 2.0% warmer YoY and 7.3% warmer vs normal. For the peak DJF, it was 3.1% warmer YoY and 9.6% warmer vs normal. Our Supplemental Documents package includes the AGA winter HDD data thru April 1. [LINK]

Figure 2: AGA Heating Degree Day Summary

MONTHLY COMPARISON

| Month Ending | 2022/ 2023 | 2021/ 2022 | Normal | % Change: 22/23 from 21/22 | | % Change: 22/23 from Normal | |
|---|---|---|---|---|---|---|---|
| September | 66 | 42 | 87 | 57.1 | Colder | 24.1 | Warmer |
| October | 299 | 205 | 310 | 45.9 | Colder | 3.5 | Warmer |
| November | 588 | 677 | 676 | 13.1 | Warmer | 13.0 | Warmer |
| December | 883 | 688 | 884 | 28.3 | Colder | 0.1 | Warmer |
| January | 811 | 1003 | 990 | 19.1 | Warmer | 18.1 | Warmer |
| February | 717 | 796 | 793 | 9.9 | Warmer | 9.6 | Warmer |
| March | 685 | 595 | 649 | 15.1 | Colder | 5.5 | Colder |

Source: AGA

## Natural Gas – March residential/commercial gas demand is much less than Jan/Feb

**March residential commercial gas demand**

The problem with the March weather was that it was a little warmer than normal for the first half of March, but then colder than normal in the last half of March. If it had been switched with a colder than normal first half, then it would have been better for HH prices. So it ended up colder than normal on an overall March basis. Over the prior 10 winters, residential/commercial natural gas consumption averaged 31.8 bcf/d and is normally 16% of winter demand, with a low of 24.4 bcf/d vs a high of 36.2 bcf/d. The averages were 46.7 bcf/d for Jan and 43.4 bcf/d for Feb. Below is our table of HDDs vs residential/commercial demand vs total US natural gas demand for the last 10 winters.

Figure 3: US Winter Natural Gas Consumption vs Heating Degree Days

| US Winter Natural Gas Consumption vs Heating Degree Days | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Heating Degree Days By Month** | | | | | | | | | | | | | |
| | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 10 Year Average | |
| | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | HDDs | % |
| Oct | 308 | 303 | 265 | 257 | 200 | 218 | 306 | 307 | 308 | 205 | 332 | 280 | 7% |
| Nov | 572 | 623 | 658 | 484 | 459 | 542 | 650 | 636 | 469 | 539 | 597 | 569 | 14% |
| Dec | 763 | 920 | 763 | 649 | 856 | 873 | 789 | 778 | 804 | 696 | 876 | 807 | 20% |
| Jan | 918 | 1,019 | 967 | 935 | 843 | 963 | 941 | 808 | 899 | 1005 | | 921 | 23% |
| Feb | 795 | 903 | 955 | 718 | 597 | 699 | 810 | 760 | 896 | 790 | | 793 | 20% |
| Mar | 827 | 831 | 738 | 511 | 618 | 660 | 804 | 555 | 572 | 638 | | 680 | 17% |
| Oct 1 - Mar 31 | 4,183 | 4,599 | 4,346 | 3,554 | 3,573 | 3,955 | 4,300 | 3,844 | 3,948 | 3,873 | 1,805 | 4,050 | 100% |
| Note: Oct includes Sept if applicable. March includes Apr if applicable. | | | | | | | | | | | | | |
| Source: AGA, SAF | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Total US Consumption** | | | | | | | | | | | | | |
| | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 10 Year Average | |
| | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | % |
| Oct | 61.3 | 60.2 | 61.7 | 64.3 | 62.1 | 65.5 | 73.7 | 75.1 | 74.9 | 73.0 | 76.4 | 67.2 | 13% |
| Nov | 72.3 | 77.2 | 78.6 | 75.2 | 72.1 | 78.6 | 90.5 | 92.6 | 81.3 | 89.8 | | 80.8 | 15% |
| Dec | 80.8 | 94.0 | 86.4 | 83.6 | 92.5 | 99.5 | 96.8 | 101.6 | 101.9 | 97.0 | | 93.4 | 18% |
| Jan | 92.8 | 103.4 | 100.5 | 100.0 | 93.3 | 107.8 | 110.0 | 106.3 | 106.0 | 115.9 | | 103.6 | 20% |
| Feb | 91.6 | 97.9 | 104.5 | 91.8 | 82.9 | 96.8 | 107.5 | 108.3 | 108.5 | 109.3 | | 99.9 | 19% |
| Mar | 81.3 | 82.5 | 83.6 | 76.3 | 81.1 | 90.2 | 93.8 | 87.4 | 84.1 | 89.8 | | 85.0 | 16% |
| **Average** | **80.0** | **85.9** | **85.9** | **81.9** | **80.7** | **89.7** | **95.4** | **95.2** | **92.8** | **95.8** | **76.4** | **88.3** | 100% |
| Source: EIA, SAF | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **US Residential & Commercial Demand** | | | | | | | | | | | | | |
| | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 10 Year Average | |
| | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | bcf/d | % |
| Oct | 14.6 | 13.9 | 13.4 | 12.8 | 12.2 | 13.1 | 15.9 | 14.4 | 14.4 | 12.6 | 15.1 | 13.7 | 7% |
| Nov | 26.3 | 28.8 | 30.2 | 23.0 | 22.0 | 26.3 | 32.8 | 32.6 | 24.4 | 27.3 | | 27.4 | 14% |
| Dec | 34.2 | 43.0 | 36.9 | 30.4 | 40.5 | 42.2 | 39.5 | 39.0 | 40.1 | 34.5 | | 38.0 | 19% |
| Jan | 47.0 | 51.9 | 47.4 | 45.0 | 42.4 | 49.5 | 48.6 | 42.2 | 44.1 | 48.8 | | 46.7 | 23% |
| Feb | 42.3 | 48.0 | 50.9 | 38.4 | 33.7 | 39.8 | 45.7 | 42.0 | 48.2 | 45.1 | | 43.4 | 22% |
| Mar | 34.3 | 36.2 | 33.1 | 24.4 | 30.8 | 34.8 | 35.9 | 27.8 | 29.7 | 31.5 | | 31.8 | 16% |
| **Average** | **33.1** | **37.0** | **35.3** | **29.0** | **30.3** | **34.3** | **36.4** | **33.0** | **33.5** | **33.3** | **15.1** | **33.5** | 100% |
| Source: EIA, SAF | | | | | | | | | | | | | |
| Data source EIA Natural Gas Monthly | | | | | | | | | | | | | |

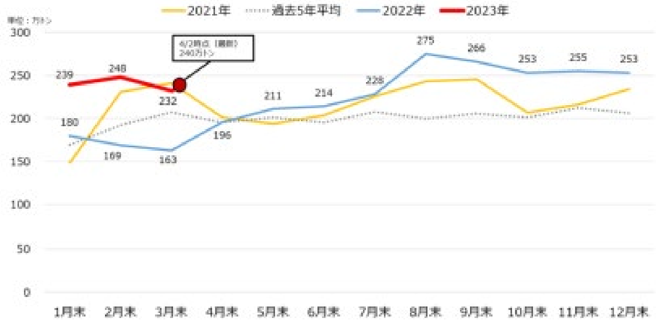
Source: EIA, AGA, SAF

## Natural Gas – Japan's LNG stocks up +4.4% WoW to 115 bcf

**Japan LNG stocks +4.4% WoW**

Japan had a mild 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 Apr 2 were ~115 bcf +4.4% WoW from Mar 26 of ~110 bcf and well above the 5-year average of 94 bcf. Below is the LNG stocks graph from the METI weekly report.

Figure 4: Japan's LNG Stocks




Source: METI

**Natural Gas – TotalEnergies & CNOOC complete first yuan-settled LNG trade**

**TotalEnergies 1st yuan-settled LNG deal**

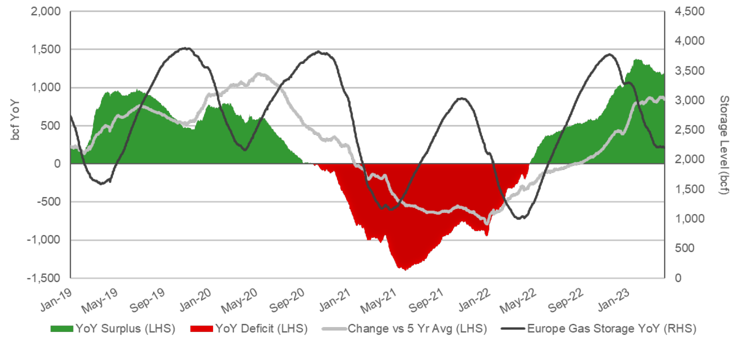
The US has made no secret of their major fear going forward is China. So there shouldn't be any surprise that China, where possible, is trying to get more commodity deals settle in the Yuan and not USD. Last week, we saw the first Yuan-settled LNG deal. Last week, China Daily reported [LINK] "*China National Offshore Oil Corporation and France's TotalEnergies have completed China's first yuan-settled liquefied natural gas trade through the Shanghai Petroleum and Natural Gas Exchange, the exchange announced on Tuesday. Approximately 65,000 tons of LNG imported from the United Arab Emirates changed hands in the trade, showcasing a new channel for international resource traders to participate in the Chinese market. According to Guo Xu, chairman of the exchange, the first international LNG transaction settled in yuan promotes multi-currency pricing, settlement, and cross-border payment. As one of the major buyers in the global LNG market, China's infrastructure scale has been expanding and the number of participants in international trade is also increasing, which has put higher demands on international trade services, he said.*" We checked again yesterday afternoon and there was nothing posted on the TotalEnergies website. Our Supplemental Documents package includes the China Daily report.

**Natural Gas – Europe storage is now +20.34% vs 5-yr average, but within 5-yr range**

**Europe gas storage**

The big global natural gas story for Q1/23 was how mild winters in Europe and Asia were the key reason why Europe made it through winter without a natural gas shortage. There was negligible weather driven demand for natural gas, which along with the continued industrial demand destruction, meant 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 29.06%. However, temperatures remained a bit cooler this past week resulting in storage falling slightly by -0.24% WoW to 55.40% on Apr 6. Storage is now +29.14% greater than last year levels of 26.26% and is +20.34% above the 5-year average of 35.06%. In addition, current storage is currently within the 5-year range, albeit at the top end of the range. Below is our graph of Europe Gas Storage Level.

Figure 5: Europe Gas Storage Level



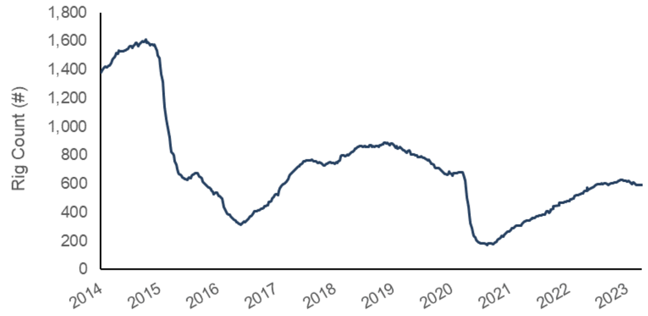

Source: Bloomberg

**Oil – US oil rigs down -2 rigs WoW to 590 oil rigs on April 6**

**US oil rigs down -2 WoW**

Baker Hughes released its weekly North American drilling activity data on Friday. This week total US oil rigs were down -2 to 590 rigs as of April 6. The total US oil rig count is now at 590 rigs, up +44 YoY, +109 from the 2022 low of 481 rigs in January and +418 since the 2020 low of 172 rigs on Aug 14. Notably, on a per basin basis the Permian added +1 rig to 353 rigs while the Cana Woodford, DJ-Niobrara and Williston each saw a -1 rig decline to 30, 17 and 41 rigs, respectively. US gas rigs were down -2 rigs WoW to a total of 158 rigs, an increase of +17 rigs YoY, which came to some surprise, and we continue to expect that US gas rigs will decline to a greater extent over the coming weeks. Below is our graph of total US rigs.

Figure 6: Baker Hughes Total US Oil Rigs



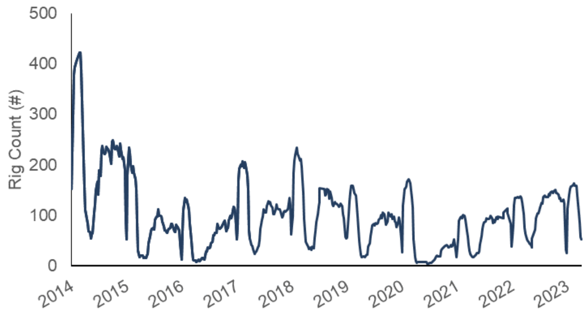

Source: Baker Hughes

**Oil – Total Cdn rigs down -12 WoW to 127 total rigs, +16 rigs YoY**

**Cdn total rigs -12 WoW**

The traditional winter drilling season in Canada has come to an end and as expected, Cdn rigs saw another material WoW decline. Moving forward, we expect to see additional rig declines in the next 2-3 weeks as we enter spring breakup. Total Cdn rigs were down -12 WoW to 127 rigs as of Apr 6. Notably, the week of Apr 6 saw declines of -10 rigs in AB, -1 rig in BC, and -1 rig in SK. There is now a total of 127 active rigs, +33 rigs vs the comparable Covid period of 19 rigs on Apr 9, 2021. Cdn oil and gas drilling rigs both fell by -6 rigs WoW to 52 and 75 rigs, respectively. Cdn oil rigs are now -1 YoY compared to 53 rigs last year while gas rigs are +17 YoY from 58 rigs. Below is our graph of total Cdn oil rigs.

Figure 7: Baker Hughes Total Canadian Oil Rigs




Source: Baker Hughes

## Oil – US weekly oil production flat WoW at 12.2 mmb/d

**US oil production flat WoW**

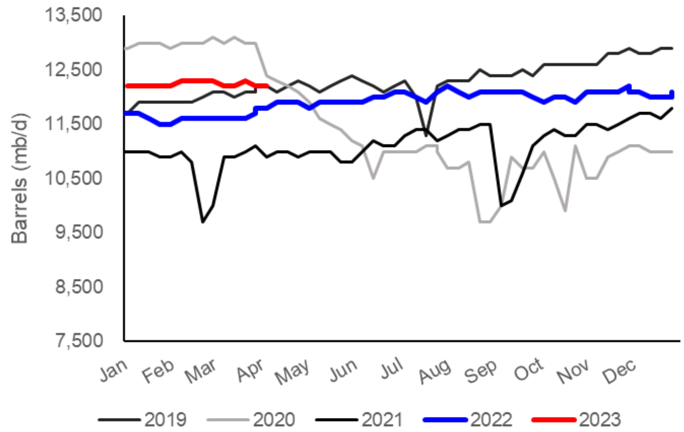
The EIA estimates US oil production was flat WoW at 12.2 mmb/d for the week ended Mar 31 with the Lower 48 and Alaska both flat at 11.8 mmb/d and 0.432 mmb/d, respectively. US oil production, based on the weekly estimates, was mostly range bound in 2022 between 11.9 to 12.1 mmb/d since the 2nd week of May. But this year production broke above 12.1 mmb/d to 12.2 mmb/d for the week ended Jan 6 and has remained at or above 12.2 mmb/d ever since. The first time since it touched 12.2 mmb/d since the pandemic was the 1st week of August in 2022. Total US production reached its highest level since March 13, 2020, this year on Feb 3 at 12.3 mmb/d. US oil production is up +0.400 mmb/d YoY at 12.2 mmb/d but is still down significantly at -0.900 mmb/d since the 2020 peak of 13.1 mmb/d on March 13.

Figure 8: EIA's Estimated Weekly US Oil Production

| Year-Month | Week 1 | | Week 2 | | Week 3 | | Week 4 | | Week 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | End Date | Value | End Date | Value | End Date | Value | End Date | Value | End Date | Value |
| 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 | 03/24 | 12,200 | 03/31 | 12,200 |

Source: EIA

Figure 9: US Weekly Oil Production




Source: EIA, SAF

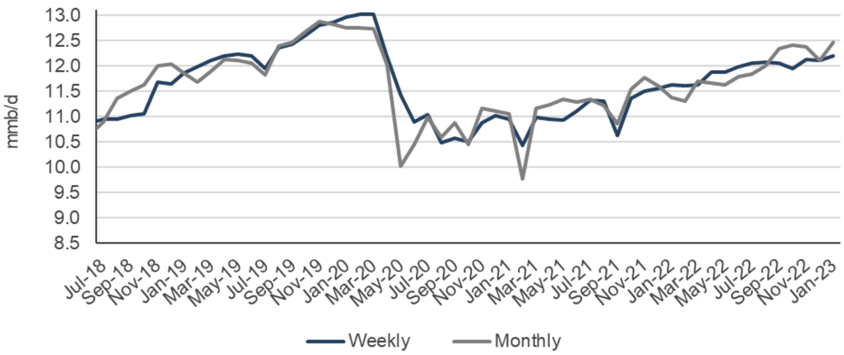
**EIA Jan actuals were +262,000 b/d vs EIA weekly estimates**
As a reminder there is a sizeable difference between what the EIA looks as "actuals" for US oil production vs the EIA's weekly estimates noted above. Here is what we wrote in last week's (Apr 2, 2023) Energy Tidbits memo. *"On Friday, we tweeted [LINK] "US oil production stronger than most expect. Jan 23 was 12.462 mmbd, +1.093 mmbd YoY vs 11.369 in Jan 22. @EIAgov actuals from Form 914 today. Biggest YoY increases: New Mexico +0.449 YoY to 1.792 mmbd. Texas +0.384 YoY to 5.237 mmbd. Offshore GoM +0.206 YoY to 1.914 mmbd. #OOTT." On Friday, The EIA released its Form 914 data [LINK], which is the EIA's "actuals" for January US oil and natural gas production. There were two key takeaways from the EIA's weekly US oil production data for Jan – the actuals were 262,000 b/d more than the weekly estimates, and Jan was the highest US oil production since Covid at +1.093 mmb/d YoY to 12.462 mmb/d. There was a moderate MoM increase in US oil production in Jan. (i) Form 914 estimates total US oil production was up +347,000 b/d MoM to 12.462 mmb/d in January. The actuals for January were 262,000 b/d higher than the EIA's weekly estimates that worked out to 12,200 mmb/d. December actuals were adjusted higher to 12.115 mmb/d from 12.101 mmb/d in last months Form 914. (ii) This is the highest since Covid. There was a big MoM jump of +0.347 mmb/d vs Dec of 12.115 mmbd but remember Dec was hit by weather. Our Supplemental Documents package includes the New Mexico, Texas and offshore Gulf of Mexico tables attached to our tweet."*

Figure 10: EIA Form 914 US Oil Production (thousand b/d)

| State | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2023 | 12,462 | | | | | | | | | | | |
| 2022 | 11,369 | 11,316 | 11,701 | 11,668 | 11,629 | 11,797 | 11,844 | 12,002 | 12,337 | 12,417 | 12,379 | 12,115 |
| 2021 | 11,124 | 9,925 | 11,326 | 11,305 | 11,356 | 11,356 | 11,347 | 11,277 | 10,918 | 11,569 | 11,790 | 11,634 |
| 2020 | 12,852 | 12,842 | 12,797 | 11,914 | 9,713 | 10,442 | 11,006 | 10,577 | 10,921 | 10,457 | 11,196 | 11,168 |
| 2019 | 11,869 | 11,673 | 11,913 | 12,149 | 12,154 | 12,218 | 11,902 | 12,486 | 12,590 | 12,809 | 13,000 | 12,978 |
| 2018 | 10,001 | 10,281 | 10,467 | 10,500 | 10,435 | 10,641 | 10,897 | 11,392 | 11,443 | 11,509 | 11,886 | 11,945 |
| 2017 | 8,875 | 9,110 | 9,166 | 9,101 | 9,185 | 9,111 | 9,247 | 9,250 | 9,517 | 9,669 | 10,085 | 9,983 |

Source: EIA

Figure 11: EIA Form 914 US Oil Production vs Weekly Estimate




Source: EIA

**Oil – If Exxon believes oil is here to stay, it makes sense it would look at Pioneer**

**Exxon reportedly takes a look at Pioneer**

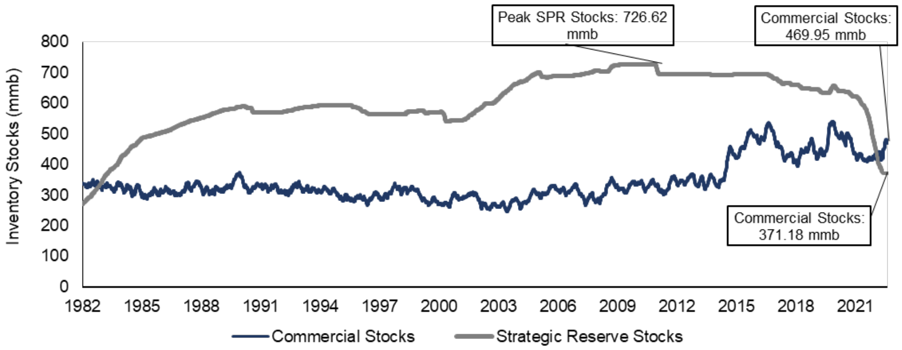
We don't know how serious a look Exxon has reportedly taken at US Permian shale player, Pioneer Natural Resources as reported by WSJ, but we have a little different take on the report than the Twitter chatter this weekend. As opposed to being worried that Exxon is just running out of organic oil growth opportunities, we start with the premise that Exxon believes oil is here to stay for a long time and, if so, it is looking to take advantage of its cost of capital and access to capital to figure out where is the best advantaged oil to add for the next 10 to 20 years. We have heard Exxon CEO Woods use the term "advantaged" with respect to assets. Advantaged is not just the lowest cost, but also low emissions, also access to markets, also access to integrated infrastructure, etc. Exxon has looked at the US Gulf Coast as a key oil and petrochemicals hub for the long term. So it makes sense that it would look at a Permian player for these reasons. As we said, we have no idea how serious a look, but we believe Exxon is only going to look at assets that it can call advantaged including from a low emissions perspective. Our Supplemental Documents package includes the WSJ report. [LINK]

**Oil – US SPR reserves now -98.777 mmb lower than commercial crude oil reserves**

**US SPR reserves**

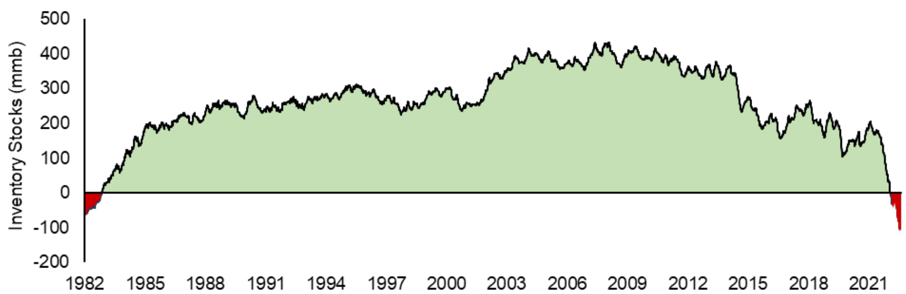
Oil in US Strategic Petroleum Reserves (SPR) moved below total US commercial crude oil reserves in the Sept 16 week for the first time since 1983, with the deficit narrowing again this week due to the draw on commercial oil stocks. However, this week's data showed an SPR draw of -0.404 mmb after 10 consecutive weeks of no change following the small draw for the week ended Jan 13. The EIA's new weekly oil data for Mar 31 has SPR reserves at 371.18 mmb vs commercial crude oil reserves at 469.95 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 12: US Oil Inventories: Commercial & SPR




Source: EIA

Figure 13: 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.*

SAF GROUP

**WCS less WTI differentials**

## Oil – Cdn oil differentials widened $1.45 to close at $15.60 on Apr 6

We wouldn't have expected this week to be a week to see the first real widening of the WCS-WTI differential over the past couple months given the announced OPEC cuts last weekend. Normally, the first barrels cut by OPEC members like Saudi Arabia are medium/heavy barrels, which would tend to compete vs WCS. So less barrels OPEC medium/heavy barrels is normally a boost to WCS prices. That wasn't the case this week. WCS-WTI differentials closed last Friday Mar 31 at $14.15 but widened this week by $1.45 to close at $15.60 on A\pr 6. This is back to month ago levels. Prior to this week, we have seen the normal seasonal narrowing of WCS-WTI differentials. Three months ago, the WCS-WTI differential was $26.60, closed on Jan 6, bounced up and down for a weeks to close at $23.00 on Jan 31, $16.50 on Feb 28, and then down to $14.15 on March 31. For perspective, a year ago, the WCS-WTI differential was $13.60 on April 6, 2022. Below is Bloomberg's current WCS–WTI differential as of April 6, 2023 close. Note markets were closed on April 7 for Good Friday.

Figure 14: WCS less WTI oil differentials including April 6 close

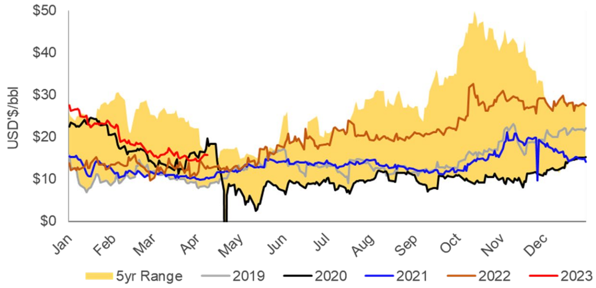

Source: Bloomberg

**WCS differentials normally narrow in spring**

## Oil – In the season that normally sees 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, the release 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 just moving into 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.

Figure 15: WCS less WTI oil differentials



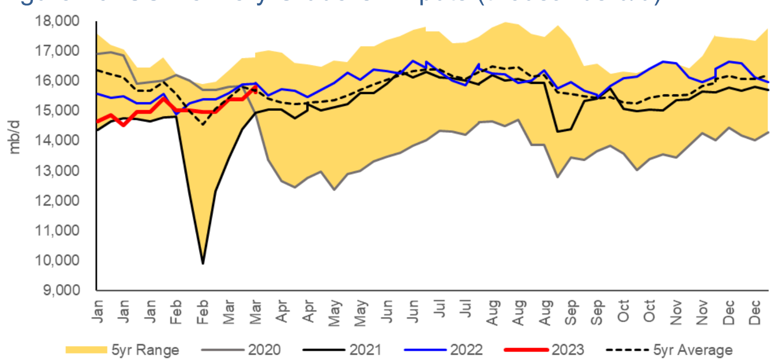

Source: Bloomberg

**Oil – Refinery inputs down -0.198 mmb/d WoW to 15.615 mmb/d**

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 31. The EIA reported crude oil inputs to refineries were down -0.198 mmb/d this week to 15.615 mmb/d and are down -0.333 mmb/d YoY from 15.948 mmb/d for the week ended Apr 1, 2022. This week's refinery utilization was down -0.7% WoW to 89.6% and is down -2.9% YoY. Total products supplied (i.e., demand) increased WoW, up +0.123 mmb/d to 20.599 mmb/d, and Motor gasoline was up +0.150 mmb/d to 9.295 mmb/d from 9.145 mmb/d last week. The 4-week average for Motor Gasoline was up +0.183 mmb/d YoY to 8.998 mmb/d. The 4-week average of Total demand was up +0.388 mmb/d YoY to 20.054 mmb/d.

**Refiners switching to summer fuel blends**

Figure 16: US Refinery Crude Oil Inputs (thousands b/d)




Source: EIA

**Oil – Strikes ending at France's oil refineries will bring back demand**

We don't' know how long this will last, but good news for oil markets this week with the reports that strikes are being lifted at TotalEnergies and Exxon's refineries in France. This

**France refinery strikes are ending**

has been a negative to oil as there has been up to 900,000 b/d of refinery capacity offline because of the strikes. (i) TotalEnergies. On Friday, Bloomberg reported "*TotalEnergies' Donges refinery will restart and deliveries will resume, according to emailed statement. * Strikes at Marseille-Fos oil terminal were lifted Thursday evening and partial work will resume within 48 hours, Agence France-Presse reports, citing union sources * Strikes at Donges* [219,000 b/d) *refinery are suspended from Friday until April 13, AFP also reported."* (ii) Exxon. On Thursday, Argus reported [LINK] "*Workers at ExxonMobil's downstream sites in France are ending a month-long strike over changes to pension rights at 14:00 local time (13:00 GMT) today. Striking staff will return to work this afternoon at the company's 236,000 b/d Port Jerome unit near Le Havre and its 133,000 b/d Fos refinery on the Mediterranean. Pickets will also be lifted, according to refinery workers. Port Jerome already began to restart units yesterday. Fos has managed to keep operating at very low levels through the strike, but few oil products deliveries have been carried out during the month of industrial action."* (iii) UK-Chinese refinery Petroineos. The Argus report also noted "*UK-Chinese refiner Petroineos' 207,100 b/d Lavera unit is halted, and dockers at the Fos-Lavera terminals remain on strike. They have not given any notice of when they intend to return to work. As a result of the dockers strike a backlog of around 12.5mn bl of crude has built up at the port."*

**France released 9.44 mmb of gasoline/diesel/jet fuel stocks**

The refinery strikes meant that France was forced to release some fuel from its strategic stocks. On Tuesday, Bloomberg reported "*More than 3m bbl of crude oil has been released from France's strategic stockpiles amid strikes by refinery and port workers, according to a person familiar with the matter. * As of this morning, a total of 3.145m bbl of crude oil had been released since the week of March 6, according to a Bloomberg calculation from the figure that was given in cubic meters ** That's up from up from about 940k bbl previously * Meanwhile, releases of gasoline/diesel and jet fuel remained unchanged from last week: ** Gasoline/diesel: ~6.92m bbl ** Jet fuel: ~2.52m bbl * Means total releases of crude oil and refined product morethan 12.5m bbl"*

**Oil – US "net" oil imports up +1.164 mmb/d WoW to 1.905 mmb/d**

**US net oil imports**

US "net" imports were up +1.164 mmb/d to 1.905 mmb/d for the Mar 31 week. US imports were up +1.819 mmb/d to 7.144 mmb/d. US exports were up +0.655 mmb/d to 5.239 mmb/d. The WoW increase in US oil imports was driven in part by "Others" while the Top 10 had an increase of +1.857 mmb/d. Some items to note on the by country data. (i) Canada was up this week +1.023 mmb/d to 3.980 mmb/d. (ii) Saudi Arabia was up +0.286 mmb/d to 0.514 mmb/d. (iii) Colombia was down -0.198 mmb/d to 0.071 mmb/d. (iv) Ecuador was down -0.038 mmb/d to 0.080 mmb/d. (v) Iraq was up +0.207 mmb/d to 0.345 mmb/d. (vi) Mexico was up +0.379 mmb/d to 0.920 mmb/d.

Figure 17: US Weekly Preliminary Oil Imports by Major Countries

| (thousand b/d) | 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 | Mar 24/23 | Mar 31/23 | WoW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada | 3,707 | 3,419 | 3,587 | 3,856 | 3,556 | 3,197 | 3,605 | 3,780 | 3,371 | 3,240 | 2,957 | 3,980 | 1,023 |
| Saudi Arabia | 453 | 433 | 640 | 384 | 262 | 545 | 310 | 476 | 385 | 483 | 228 | 514 | 286 |
| Venezuela | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mexico | 909 | 511 | 758 | 913 | 690 | 683 | 725 | 556 | 633 | 1,118 | 541 | 920 | 379 |
| Colombia | 245 | 244 | 216 | 70 | 143 | 284 | 143 | 222 | 294 | 244 | 269 | 71 | -198 |
| Iraq | 201 | 195 | 469 | 230 | 322 | 251 | 290 | 265 | 346 | 144 | 138 | 345 | 207 |
| Ecuador | 0 | 69 | 243 | 207 | 156 | 145 | 97 | 55 | 46 | 0 | 118 | 80 | -38 |
| Nigeria | 211 | 114 | 317 | 248 | 75 | 256 | 98 | 243 | 170 | 129 | 104 | 302 | 198 |
| 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 | 5,726 | 4,985 | 6,230 | 5,908 | 5,204 | 5,361 | 5,268 | 5,597 | 5,245 | 5,358 | 4,355 | 6,212 | 1,857 |
| Others | 1,135 | 920 | 1,053 | 1,150 | 1,028 | 965 | 940 | 674 | 971 | 814 | 970 | 932 | -38 |
| Total US | 6,861 | 5,905 | 7,283 | 7,058 | 6,232 | 6,326 | 6,208 | 6,271 | 6,216 | 6,172 | 5,325 | 7,144 | 1,819 |

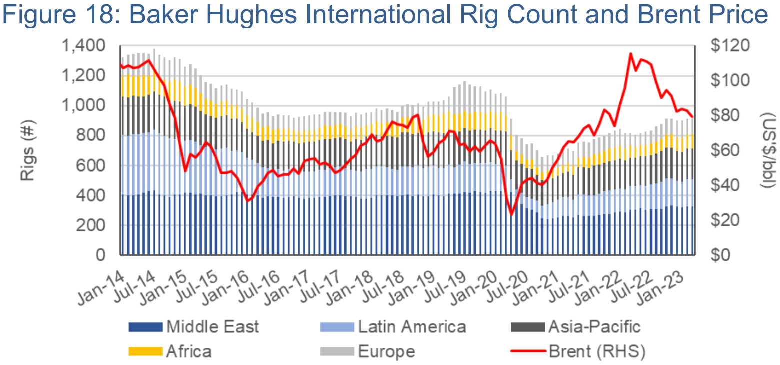
Source: EIA

## Oil – Baker Hughes International rigs +15 MoM to 930 rigs in February

**International rigs +15 MoM**

Baker Hughes posted its monthly update to international rigs on Thursday, which showed a large MoM increase in rig counts. March's increase is back in-line with the six-month trend of rig net additions seen from May to October of 2022. (i) Total international rigs increased by +15 rigs MoM to 930 rigs in March, and total rigs are now up +124 rigs from the recent low of 806 in April 2022. Mar 2023 is now +115 rigs YoY from 815 in Mar 2022. (ii) Turkey, Mexico and the UK had the largest MoM increases of +6 to 24 rigs, +4 to 50 rigs, and +3 to 13 rigs, respectively. In contrast, Oman, Libya and Norway had the largest MoM declines of -5 to 45 rigs, -4 to 8 rigs, and -2 to 15 rigs, respectively. Notably, Ukraine's rig count was flat for the third straight month at 37 rigs and is up +29 rigs YoY. (iii) March's count of 930 rigs was +14% YoY from 815 in March 2022, but still down -12% vs pre-Covid March 2020 of 1,059 rigs. The YoY rig count is as follows: Africa +10, Asia-Pacific +22, Europe +40, Latin America +23, and the Middle East +20. The North Sea's total count was unchanged MoM with the UK up +3 offshore rigs to 14 rigs but was down -1 onshore to 0 rigs, and Norway was down -2 to 15 rigs. (iv) Rig counts continue to be solid in the major Persian Gulf countries but remain below pre-Covid levels. Since February 2022, the UAE has added +18 rigs YoY to 52 active rigs in March 2023, while Saudi Arabia added +13 rigs and Iraq added +16 rigs each over the same period. Africa moderately increased its rig count YoY with Nigeria adding +7 rigs and Angola adding +3 rigs. Below is our graph of international rigs by region and avg monthly Brent price.

Figure 18: Baker Hughes International Rig Count and Brent Price




Source: Baker Hughes, Bloomberg

## Oil – Colombia oil production still below pre-Covid, Feb was 0.757 mmb/d

**Colombia February oil production**

It's hard to see how Colombia oil production eer sustainably rallies anywhere back to the 1 mmb/d or even 900,000 b/d given Colombia's target to reduce oil and natural gas. Despite stronger oil prices, the past two years saw Colombia oil production stuck at levels below 0.750 mmb/d up until September 2022, when it reached 0.754 mmb/d. Following the MoM decrease of -1.4% in January, February's oil production fell by another -2.1% MoM to 0.757 mmb/d, which continues to reverse the MoM increases seen in the final months of 2022. On Apr 6, Bloomberg reported Colombia oil production in February was up +2.4% YoY to 0.757 mmb/d vs 0.774 mmb/d in January. February's data brings average YTD production to 0.765 mmb/d, up +1.6% YoY from 2022's 0.754 mmb/d but production remains -13.59% below pre-Covid levels of 0.886 mmb/d in 2019.

Figure 19: Colombia Oil Production

| mmb/d | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 21/20 | 2022 | 22/21 | 2023 | 23/22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 0.986 | 0.860 | 0.860 | 0.899 | 0.884 | 0.745 | -15.7% | 0.740 | -0.7% | 0.774 | 4.6% |
| Feb | 0.955 | 0.864 | 0.823 | 0.893 | 0.878 | 0.746 | -15.1% | 0.740 | -0.8% | 0.757 | 2.4% |
| Mar | 0.917 | 0.804 | 0.856 | 0.885 | 0.857 | 0.745 | -13.0% | 0.751 | 0.8% | | |
| Apr | 0.915 | 0.857 | 0.865 | 0.891 | 0.796 | 0.745 | -6.4% | 0.751 | 0.8% | | |
| May | 0.904 | 0.851 | 0.866 | 0.895 | 0.732 | 0.703 | -3.9% | 0.746 | 6.1% | | |
| June | 0.888 | 0.857 | 0.864 | 0.892 | 0.730 | 0.694 | -4.9% | 0.752 | 8.4% | | |
| July | 0.843 | 0.856 | 0.860 | 0.869 | 0.735 | 0.731 | -0.5% | 0.748 | 2.3% | | |
| Aug | 0.827 | 0.858 | 0.866 | 0.883 | 0.742 | 0.748 | 0.8% | 0.749 | 0.1% | | |
| Sept | 0.859 | 0.851 | 0.869 | 0.879 | 0.749 | 0.744 | -0.7% | 0.754 | 1.3% | | |
| Oct | 0.846 | 0.864 | 0.879 | 0.883 | 0.751 | 0.740 | -1.5% | 0.757 | 2.3% | | |
| Nov | 0.855 | 0.851 | 0.883 | 0.880 | 0.761 | 0.747 | -1.9% | 0.771 | 3.2% | | |
| Dec | 0.837 | 0.870 | 0.889 | 0.882 | 0.759 | 0.745 | -1.8% | 0.784 | 5.2% | | |

Source: Bloomberg, Colombia Ministry of Mines and Energy

## Oil – Bloomberg estimates Russia cut ~700,000 b/d by end of March

**Russia may have cut 700,000 b/d**

As of our 7am MT new cut off, we have not seen any reports, including from TASS, on where Russian oil production ended up to close March or any Russian confirmation of the Bloomberg Friday report that Russia reportedly says it cut production by 700,000 b/d to close March. Recall Novak said Novak said Russia would get its voluntary 500,000 b/d cut done in March and that the cuts would continue thru June. On Friday, Bloomberg reported "*Russia's Energy Ministry said the nation reduced its oil output by about 700,000 barrels a day last month, according to a person familiar with the figures. Yet that figure is inconsistent with data on the nation's March seaborne exports and supplies to domestic refineries — adding to the uncertainty over how much oil Russia actually pumps." "Russia will cut its crude-only output using February's production as the baseline, according to Deputy Prime Minister Alexander Novak. Bloomberg calculations based on industry data put that month's production at 10.1 million barrels a day. The Energy Ministry data say producers pumped a daily average of 1.285 million tons of crude, the person said, asking not to be identified because the figures aren't public. That's equivalent to just over 9.4 million barrels, meaning crude-only cuts totaled nearly 700,000 barrels a day last month. The nation's total March production of crude oil and condensate averaged 1.413 million tons, the person said. That's equivalent to 10.36 million barrels per day, compared with 11.1 million barrels in February, according to Bloomberg calculations. The resulting total cuts averaged 740,000 barrels a day, the data indicate."*

**Oil – OPEC+ to voluntarily cut 1.16 mmb/d effective May 1 thru Dec 31**

**OPEC surprise cuts**

Last week's (Apr 2, 2023) squeezed in the breaking reports of the OPEC+ cuts of 1.16 mmb/d (excluding Russia's voluntary 500,000 b/d cut). We noted the cuts that were being tweeted by Amena Barkr (Energy Intelligence) and that there was no OPEC press release as of 9:30am MT. On Monday, OPEC issued its press release, which listed the cuts that were in line with tweets referenced last week. OPEC noted "*The Meeting noted the following voluntarily production adjustment announced on 2 April 2023 by Saudi Arabia (500 thousand b/d); Iraq (211 thousand b/d); United Arab Emirates (144 thousand b/d); Kuwait (128 thousand b/d); Kazakhstan (78 thousand b/d); Algeria (48 thousand b/d); Oman (40 thousand b/d); and Gabon (8 thousand b/d) starting May until the end of 2023. These will be in addition to the production adjustments decided at the 33rd OPEC and non-OPEC Ministerial Meeting, The above will be in addition to the announced voluntary adjustment by the Russian Federation of 500 thousand barrels per day until the end of 2023, which will be from the average production levels as assessed by the secondary sources for the month of February 2023. Accordingly, this will bring the total additional voluntary production adjustments by the above-mentioned countries to 1.66 million b/d."* Our Supplemental Documents package includes the OPEC release.

**Sounds like Granholm's not buying for SPR irritated the Saudis**

We don't think Granholm's comments about not buying oil for SPR in 2023 were the deciding factor in why OPEC went ahead with the surprise cuts, but we have to believe it was a reminder to OPEC that Biden's promise to buy back for the SPR was not something OPEC could count on as they looked at 2023 demand/supply. The FT reported [LINK] "*People familiar with Saudi Arabia's thinking say Riyadh was irritated last week that the Biden administration publicly ruled out new crude purchases to replenish a strategic stockpile that had been drained last year as the White House battled to tame inflation. Energy secretary Jennifer Granholm's statement that it could take "years" to refill the reserve sent oil prices briefly lower. The White House had previously offered reassurance to Saudi Arabia that it would step in to make purchases for its strategic reserve if prices fell."* Our Supplemental Documents package includes the FT report.

**Oil – So far, so good on Saudi/Iran moving to normalize its relations**

**Saudi/Iran relations**

It's early but, so far, so good for the Saudi Arabia/Iran move to normalize relations in order to support stability and security in the Middle East. The #1 takeaway for oil markets has been their reported intent for stability and security in the region. The big tests are still to come such as what happens if the Houthis decide to launch a missile into Saudi Arabia, or if/when Iran does something big against Iran. Now note that, at least for now, the Houthis look to be going along with Iran's move to improve Saudi relations. On Thursday, there was an official meeting of Saudi and Iran foreign ministers in Beijing, which followed with a joint statement of items of agreement and intent. Kind of what you would expect following a bilateral meeting between US and Canada. This week, the key items from the Saudi Press Agency of the joint statement were "*The two countries agreed to reopen their diplomatic missions within the agreed period, proceed with the necessary measures to open the embassies of the two countries in Riyadh and Tehran, and their consulates general in Jeddah and Mashhad, and continue coordination between the two sides' technical teams to explore ways of boosting cooperation, including resuming flights, carrying out reciprocal visits of official delegations* *and the private sector, and facilitating the issuance of visas for nationals of the two countries, including for performing Umrah."* And *"The two sides also expressed hope that they will hold more consultative meetings and explore means of cooperation, with positive outcomes, considering the natural resources, economic potential, and many opportunities their countries have, which can help both gain mutual benefit. They also said they were ready to make every possible effort to overcome any obstacles that may hinder their cooperation. Both sides agreed to boost cooperation in order to support stability and security in the region, to mutual benefit."* Our Supplemental Documents package includes the Saudi Press Agency reporting [LINK] and PressTV (Iran) reporting [LINK].

**Houthis look prepared to try to go along with the move to peace**

How the Houthis responded to the Saudi/Iran move to normalize relations and work to restore security & stability in the region was one of the big questions. At least so far, it looks like the Houthis are moving to go along with the move to peace. On Friday, we tweeted [LINK] "*Breaking! Saudi/Oman envoys to visit Sanaa next week to "negotiate a permanent ceasefire deal with Iran-aligned Houthi officials and end an eight-year-old conflict there, two people involved in the talks said" report @Elyaakoubi @MohammedGhobari. #OOTT."* We tweeted on the breaking news report by Reuters [LINK] "E*xclusive: Saudi delegation to hold ceasefire talks with Yemen's Houthis in Sanaa -sources. Saudi and Omani envoys are planning to visit Yemen's capital Sanaa next week to negotiate a permanent ceasefire deal with Iran-aligned Houthi officials and end an eight-year-old conflict there, two people involved in the talks said. The move signals that regional rifts are easing after rivals Saudi Arabia and Iran agreed to restore relations last month following years of hostility and backing opposite sides in Middle Eastern conflicts, including Yemen."* The significant part of the report was "*If an agreement is reached, the parties could announce it before Islam's Eid holiday starting April 20, the sources said."* That is only 11 days away. Our Supplemental Documents package includes the Reuters report.

**Wonder how any Saudi compensation to Houthis will be structured?**

We recognize that this isn't the view or is even talked about but, we still believe a part of any Saudi/Houthi peace process will somehow see compensation paid by the Saudis to the Houthis. How that will be structured or how it will be described is one thing, but any deal has to see something in it for the Houthis other than peace. They have carried on this fight for eight years when MBS thought it would be over in weeks. The war against the Houthis has cost the Saudis billions especially when you think about the damage from drones at Abqaiq. So we suspect money isn't the issue for a deal.

**Oil –Tipping point in Saudi/US relations was Sept 2019 Houthi drone attack on Abqaiq**

**Tipping point in Saudi/ US relationship**

We hadn't appreciated the significance to Saudi Arabia of the lack of US response when Saudi's huge Abqaiq oil facility was bombed by the Houthi drone attack in Sept 2019. That is, until we listened to RBC's Helima Croft's Tues webcast "*OPEC+ and Geopolitical Update with Helima Croft*". On Tuesday, we tweeted [LINK] "*Tipping point US/Saudi relations. US response to 09/2019 drone attack on Abqaiq Oil facility. @CroftHelima "from the standpoint of the Saudis, they're also saying look we learned in Sept 2019 if something happens to*

*Saudi, a major attack, that we're kind of on our own" #OOTT."* Our tweet included the transcript we made of Croft's comments. SAF Group created transcript of comments by Helima Croft (RBC) on her webcast OPEC+ and Geopolitical UPdagte with Helima Croft on Apr 4, 2023. Transcript made from IPhone recording of the call. At 8:24am MT, Croft "… *when we think of the broader Saud relationship, the US is not going to be Partner #1. Now the question is if you had a different occupant in the White House, would that change? Is this basically a reflection of the US or just this administration. But even with the Trump administration which was the height I would say of the US/Saudi relations since the Bush administration. Even then, for example when you have that attack on the Abqaiq facility in Sept 2019, the Saudi perspective was they learned the US no longer had a Carter doctrine. We're no longer saying that the protection of energy infrastructure was a core national security interest of the US. So even with Trump, we signaled to the Saudis, hey you know what, Abqaiq is terrible, sorry the Iranians did it but no Americans were killed and this is oil going for Asia. So there has been a decline in that relationship. Even with someone they thought of as a very good partner. The deal they cut with Iran, it caught a lot of people off-guard, but I think the deal with Iran and that China negotiated it was very important. So from the standpoint of the Saudis, they're also saying look we learned in September 2019 if something happens to Saudi, a major attack, that we're kind of on our own."*

**05/02/22: Saudi said US relationship has been in the "downs" since Biden election**

As a reminder, Saudi Arabia was clear that its relationship went down with Biden's election. Here is what we wrote in our May 8, 2022 Energy Tidbits memo. "*As noted above, we think this interview may be even more significant given the King's going to the hospital today for medical checkups. On Monday, we tweeted [LINK] "Must read. No political speak here. Saudi says US relationship is in the downs since #Biden election. Also US #Oil problems are is "because of its energy policy" Biden made it a policy "to cut all links to what is called the oil and gas industry .." #OOTT". Arab News posted a great interview "Frankly Speaking: Saudis feel let down by America, says Prince Turki Al-Faisal" [LINK] because there were direct comments from Al-Faisal on the current negative relationship with the US. We believe these comments would not have been made in Saudi Arabia media unless MBS was onside and wanted this clear messaging to the Biden administration. We call this a must read as it is a good reminder that the US shouldn't expect any favors from Saudi Arabia. One of Al-Faisal's key comments was "We've had our ups and downs over the years and perhaps, at this time, it's one of the downs, particularly since the president of the US, in his election campaign, said that he will make Saudi Arabia a pariah. And, of course, he went on to practice what he preached: First of all, by stopping the joint operations that America had with the Kingdom in meeting the challenge of the Houthi-led rebellion in Yemen against the Yemeni people. And, second, among other similar actions, by not meeting with (Saudi Arabia's crown prince) and publicly declaring that he would not meet with the crown prince, and, at one stage, withdrawing anti-aircraft missile batteries from the Kingdom when we were facing an increase in attacks by the Houthis using Iranian equipment like missiles and drones." Our Supplemental Documents package includes the Arab News report."*

**Oil – Will a Saudi/Houthis deal be the prelude for MBS to become Saudi King**

Our initial thought post the Saudi/Iran move to normalize relations was that it looked like a set up trade for MBS to become King, and we feel that even moreso with the Friday report of the negotiations with the Houthis. We think Iran and the Houthis are the two big negatives of the MBS regime and ones that he would like to have put to bed. The last thing he wants is to have the legacy of the Houthis still hanging over his head. It was his intervention eight years ago in a conflict that MBS expected to be done in a matter of weeks. Last year, he moved to renew the Qatar relationship, got Biden to come to Saudi Arabia to give MBS his global validation, and Saudi Arabia also hosted the G30 events. The other big theme for Saudi Arabia in the last few months has a perceived elevation of importance of Vision 2030 to Saudi Arabia. Vision 2030 is MBS's major focus. With Iran and the Houthis, it just seems like the remaining items for the check list before he ascends to be King.

**Is stage being set for MBS to become King**

**Remember MBS's Atlantic March 3, 2022 interview**

Last week's OPEC+ production cuts were another reminder to the US that Saudi Arabia has its own priorities and isn't going to do what the US wants. We can't help but remember what we wrote in our March 6, 2022 Energy Tidbits. "*Oil – Saudi MBS "simply, I do not care" if Biden misunderstands something about him. The Atlantic's March 3 report "Absolute Power" [LINK] based on its interviews Saudi crown prince Mohammed bin Salman got some good headlines. MBS says their "aim is to keep it and strengthen it" talking about their long historical relationship with the US. The headlines were on his Biden comments and warning to not interfere in Saudi domestic issues. The Atlantic wrote "We asked whether Biden misunderstands something about him. "Simply, I do not care," he replied. Alienating the Saudi monarchy, he suggested, would harm Biden's position. "It's up to him to think about the interests of America." He gave a shrug. "Go for it." For now, MBS's main request to the outside world, and especially the United States, is the usual request of misbehaving autocrats—namely, to stay out of his internal affairs. "We don't have the right to lecture you in America," he said. "The same goes the other way." Saudi affairs are for Saudis. "You don't have the right to interfere in our interior issues." It reminds that no one should expect the Saudi's to bend over in anyway to the US on oil. The problem for Biden and the Democrats is that it's difficult to reverse their view on MBS. We look at it as another of the situations where Biden and the Democrats like to have a villain to make sure they can get people onside their views. But by doing so, it makes it difficult for Biden to back track in a public way. It's like now with the oil companies, they really can't say anything positive about them or ask them to help without looking very weak. They made the oil companies the villains to sell energy transition for so long. How can they go back and say something good. They made MBS out to be a huge villain, Biden's team making it clear that Biden wouldn't meet or talk with MBS, only the King, they pulled out a Patriot missile defense system from Saudi Arabia, and have supposedly not given in to Saudi's request for more Patriot missiles to replace the shot missiles. So no surprise by the MBS comments on US. And unfortunately for the US, it means that Saudi isn't likely to help the US unless it helps them. We will be watching to see if there are reports on restocking Patriot missiles and any potential MBS/Biden meeting. Our Supplemental Documents package includes The Atlantic report."*

**Oil – US, "*would only take [Iran] several months to produce an actual nuclear weapon*"**

**Iran keeps advancing its nuclear**

One of the key highlights from RBC's Helima Croft's webcast was on Iran. The topic that got her most comments was Iran nuclear and how Iran has progressed farther and faster than most appreciate also on the track for a bomb deliverability system, and General Milley said they are months away from having the potential for nuclear bombs. Milley is Chairman of the Joint Chiefs of Staff and made his comments at the House Armed Services Committee hearing on March 29. The transcript of Milley's comments were [LINK] "I*ran is taking actions to improve its capabilities to produce a nuclear weapon, should it make the decision to do so, while continuing to build its missile forces. From the time of a national decision, Iran could produce enough fissile material for a nuclear weapon in approximately 10-15 days and it would only take several months to produce an actual nuclear weapon. The United States remains committed, as a matter of policy, that Iran will not have a nuclear weapon. The United States military has developed multiple options for our national leadership to consider, if or when Iran decides to develop a nuclear weapon."* This is different than what most expect on the bomb deliverability system. And it leaves Biden with less options such as can he do a sweetened deal, from Iran perspective, to get this to stop. But that would have problems getting support even from some Dems. So that leaves the Netanyahu wildcard. This isn't a big surprise as to the progress, when we saw the first US adm,ission of Iran's progress. But also remember that was also when we saw the first US admissions that military options were on the table as opposed to the general all options.

**US believes Iran has enough nuclear material for several nuclear weapons**

General Milley's comments should not have surprised. Rather, two months ago, we saw similar comments from US envoy on Iran, Rob Malley. Here is what we wrote in our Feb 5, 2023 Energy Tidbits memo. "*We still believe there is heightened risk to Iran in 2023 given there is no JCPOA, Iran continues to make strong progress towards having nuclear capability and Netanyahu has returned as Israel PM. We were reminded of this risk when US envoy on Iran, Rob Malley, was on BBC Hardtalk. (i). Iran's nuclear progress. On Monday, we tweeted [LINK] "Big 2023 #Oil wildcard - Israel/Iran nuclear risk. @BBCHARDtalk asks re @rafaelmgrossi that Iran has amassed enough nuclear material for several nuclear weapons, not just one. @Rob_Malley "yeah, i think what he says is accurate. More in this great @stephensackur interview. #OOTT." Malley said he agreed with the IAEA view that Iran has amassed enough material for several nuclear weapons. This is a big risk factor especially if Israel also believes this status. (ii) Biden has spelled out an option is military option. We also tweeted [LINK] "Specifics for once, not the normal all options are on the table "as #Biden said if that fails, other options, all options will be on the table. and he spelled out what one of those options would be, which was a military option" @Rob_Malley. Great interview @stephensackur #OOTT." This was not the normal quote from Biden officials. For example, Blinken this week used the standard all options are on the table and not specifically mention military options."*

**Oil – Turkey still hasn't resumed exports of ~450,000 b/d Iraq/Kurdistan oil via Ceyhan**

**Turkey holds up Kurdistan oil exports**

As of our 7am MT news cut off, we have not seen any reports indicating Turkey has allowed the resumption of Iraq/Kurdistan oil exports via Ceyhan, which Kurdistan expected to resume on Tues Apr 4. That hasn't happened. (i) Last week's (Apr 2, 2023) Energy Tidbits memo highlighted the announced Kurdistand/Iraq deal but we did so with the caveat *"Can/will*

*Turkey stall the resumption of Iraq/Kurdistan tanker loaders? We made an exemption to our 7am MT news cut off for the reminder that Turkey is still a factor to deal with on the resumption of Iran/Kurdistan oil exports out of Ceyhan terminal in Turkey. Can or will they stall the resumption of actual tanker loadings out of Ceyhan. We tweeted [LINK] "Not clearhow long Turkey can/will stall actual Iraq/Kurdistan #Oil exports. 👇 @RowenaCaine noted Turkey still some unfinished business before they sign off. @CnkGt warned on this Turkey complication. #OOTT." Rowena Edwards (Reuters) tweet noted "Turkey had wanted an unfinished court case settled before reopening – sources"."* (ii) So far, Turkey has stalled. On Friday, we tweeted [LINK] "*Delay in restart Iraq/Kurdistan #Oil exports. Why would Turkey give up leverage & restart when @FiratKozok reports Turkey wants to negotiate a settlement & refused to elaborate if seeking a reduction in the comp. How much longer to keep ~450,000 bd off export mkt? #OOTT."* Turkey is trying to negotiate down the settlement so why would it give up any leverage it has with Iraq/Kurdistan? Every day of no Iraq/Kurdistan oil exports via Turkey is about $36 million a day assuming a $80/b price. Bloomberg wrote "*Turkey wants to negotiate with Iraq a settlement that it's been ordered to pay before an oil pipeline that exports 400,000 barrels a day is reopened, according to two Turkish officials familiar with the situation. A legal spat between the two countries halted a pipeline that carried crude from semi-autonomous Kurdistan on March 25. Baghdad, which has for years claimed control of Kurdish exports, agreed with the regional government this week to resume shipments. But it could be delayed by payments owed by Turkey to Iraq, adding to concerns over tight global oil supplies following big OPEC+ output cuts. The Turkish officials, who spoke on condition of anonymity, refused to elaborate on whether the country is seeking to reduce the compensation or determine a mechanism for how to make the payments. The Kurdistan Regional Government has said it would be able to restart supplies this week, but any negotiations could hold up the process. Iraq had been awarded a net $1.5 billion in compensation by an international business tribunal, after a ruling last month that Turkey breached an agreement by allowing crude from Kurdistan to be exported without Baghdad's consent, according to a March 30 statement from lawyers that represented the country. Turkey hasn't commented on the amount."* (iii) The question gets back to why would Turkey give up any leverage to resume the Iraq/Kurdistan oil exports until Turkey gets something in the negotiations.

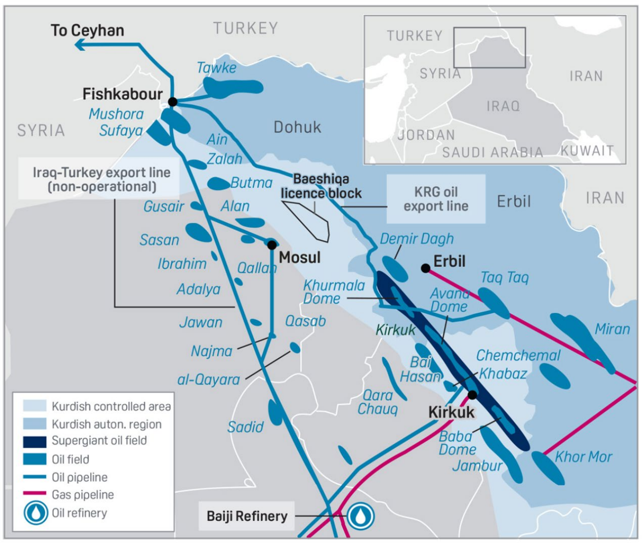
**Iraq's court case win halted 370,000 of Kurdistan oil exports**

Here is what we wrote in our March 26, 2023 Energy Tidbits memo. "*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].*

Figure 20: Northern Iraq's oi infrastructure map from 2020

NORTHERN IRAQ'S OIL INFRASTRUCTURE




Source: S&P Global Platts, PolGeoNow

Source: Platts

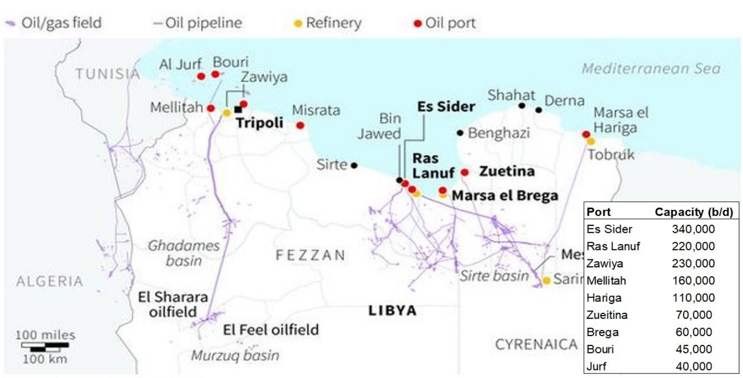
### Oil –Libya NOC says oil production continues to be stable at ~1.2 mmb/d

**Libya oil production 1.2 mmb/d**

We have to give the Libya National Oil Corporation credit that it's been able to keep oil production pretty stable right around 1.2 mmb/d for the past six months or so. The Libya National Corporation tends to post a short oil production update on its Facebook [LINK]. The latest update was Thursday and the Google Translate was "*Crude oil production reached 1.223 million barrels per day, and condensate production reached 53 thousand barrels per day during the past 24 hours.*"

Figure 21: Libya Ports, Major oilfields and Terminals map

**SAF Group Compiled Libya Ports & Terminals Status**




Source: Bloomberg, HFI Research, SAF

Source: SAF Group

**Libya sees low-risk development to go from 1.2 to 1.5 mmb/d in 2023**

Here is what we wrote in our Feb 19, 2023 Energy Tidbits memo. "*We have been reporting on how Libya has surprisingly been able to keep oil production steady ~1.2 mmb/d. At the same time, we have always highlighted the big near term upside potential to its oil production if east vs west armed fighting can stay on the sidelines as that will see the return of foreign capital for both natural gas and oil. But even before foreign capital, the Libya National Oil Corporation has many low risk development opportunities to increase oil production. On Tuesday, the Libya Herald reported [LINK] on comments from one of Libya NOC's operating companies, Arabian Gulf Oil Company (AGOCO) Chairman Salah Gatrani. The Libya Herald wrote "The continuation of the Arabian Gulf Oil Company's (AGOCO) development operations at this pace will inevitably lead to Libya reaching a production rate of more than 1.5 million barrels of oil per day in 2023, AGOCO chairman Salah Gatrani said in an exclusive statement to Libya Herald. He said this was because of the stability witnessed by the country in general, and by the oil sector in particular. Therefore, he continued, the Gulf Company has developed its own plan within the efforts of the National Oil Corporation (NOC). Libya has been unable to maintain production beyond 1.2 million bpd. Gatrani was commenting to Libya Herald following Sunday's AGOCO's meeting on developing reserves and increasing oil production in the sector companies, attended by relevant AGOCO and NOC management. The AGOCO chairman said that his company has already begun to implement the plan prepared by the NOC to raise production and increase reserves." Our Supplemental Documents package includes the Libya Herald report."*

**Oil – Big reduction in China scheduled domestic air flights for April**

**China domestic flights**

On Monday, we tweeted [LINK] "*Negative: China scheduled domestic flights. Yes +6.8% WoW to 95,624 for Mar 28-Apr 3. BUT big drop in growth in April. Today, next 4-weeks to be +3.0% to 98,517 a week. See 👇03/28 tweet, next weeks were to hit 119,180 a week. Thx @BloombergNEF Claudio Lubis #OOTT.*" We should note that we said negative, not because of the higher WoW number of flights, but because there was a big 20% drop in the scheduled domestic flights in April, which means, assuming no changes to schedules, only a 3% increase in domestic flights. We will have to watch over the coming weeks to see if the schedule gets ramped up but, if not, it would fit the narrative that the China recovery is happening but the rate of recovery is less than expected. BNEF wrote "*The number of scheduled domestic flights in China for the week of March 28 to April 3 stood at 95,624, a 6.8% uptick from the previous week. • The number of scheduled domestic flights is set to climb by 3.0%, to 98,517 Scheduled a week over the next four weeks, reflecting the end of Covid-19 travel curbs and the anticipated increase in journeys.""* Below is the NEF China scheduled domestic flights.

Figure 22: China scheduled domestic air flights

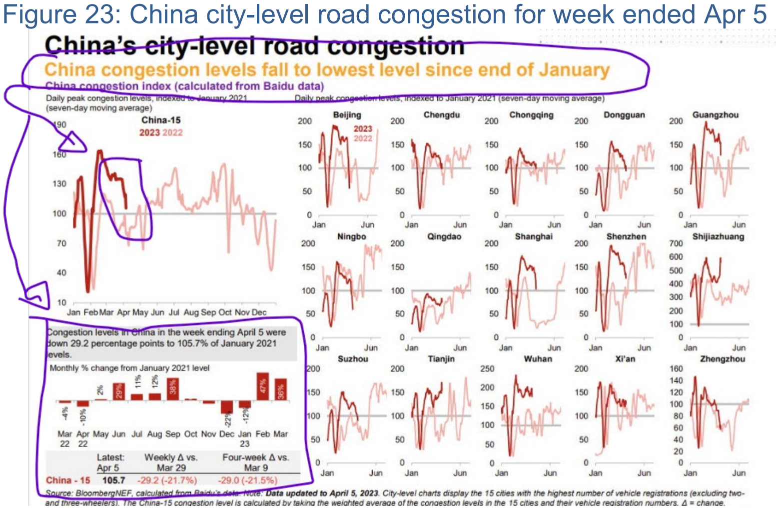

Source: BloombergNEF

**Oil – "China congestion levels nosedive after season-long high"**

**China road traffic congestion**

It looks like the China recovery has stalled out, at least for now. It's not just traffic congestion, it's the domestic air flights and, as noted later in the memo, the Caixin PMI. No one can deny that China's traffic surged in early 2023 following the removal of Covid restrictions and "*traffic in Feb and March has been exceptionally high*", BUT it has been down over the past month and then nosedived last week. China traffic congestion surged with the reopening in Jan, but we now have seen seven consecutive WoW declines in traffic congestion and April traffic levels "fall to lowest level since end of January". On Thursday, we tweeted [LINK], "*Stalling out China recovery! China traffic congestion levels "nosedive", -21.7% WoW, down to 105.7% of Jan 2021. Asia ex China -1.6% WoW, still <2019. EU +0.6% WoW, still >2019. NA +0.8% WoW, still <2019. Thx @BloombergNEF. #OOTT.*" BloombergNEF's Global Road Traffic Indicators Apr 6, 2023 described China's city-level road congestion in April as "*exceptionally low so far*" based on the Baidu data. Our tweet also included the below BloombergNEF graphic on China road congestion.

Figure 23: China city-level road congestion for week ended Apr 5




Source: BloombergNEF

**Oil – Expect IEA to lower its oil demand forecast in next week's OMR April**

**IEA Oil Market Report next week**

The IEA is scheduled to release its monthly Oil Market Report April 2023 on Apr 14 and we expect they will reduce their forecast for 2023 oil demand. On Wednesday, we tweeted [LINK] *"#OilDemand. Will @IEA reduce fcast for record demand 102 mb/d in 2023 in its OMR April? Re #OPEC cuts, 👇"pushing up oil prices at a time when strong inflationary pressures are hurting vulnerable consumers around the world, especially in emerging & developing economies". #OOTT".* In their Oil Market Report March 2023, the IEA forecast global oil demand to be +2 mmb/d YoY in 2023 "*to reach a record of 102 mb/d*." On Monday, post the OPEC surprise cut on Sunday, the IEA released a short statement that we believe points to a likely reduction in their oil demand forecast. In a one paragraph statement they noted concerns on the outlook for the world economy and the strains on consumers around the world, especially emerging and developing countries. The IEA wrote [LINK] '*The significant new cuts in oil production announced by OPEC+ countries come during a period of heightened uncertainty for global oil markets and concerns about the outlook for the world economy. Forecasts by the IEA and other relevant institutions, representing consumers and producers alike, all indicate that global oil markets were already set to tighten in the second half of 2023, with the potential for a substantial supply deficit to emerge. The new OPEC+ cuts risk exacerbating those strains and pushing up oil prices at a time when strong inflationary pressures are hurting vulnerable consumers around the world, especially in emerging and developing economies."*

**IEA OMR March forecast record oil production in 2023**

Here is what we wrote in our March 19, 2023 Energy Tidbits memo. "*On Wednesday, the IEA released its monthly Oil Market Report for Feb at 3am MT. They only release very limited public info, but Bloomberg provided detailed tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) The OMR is short term bearish with surplus oil stocks in H1/23, but then bullish in H2/23 as oil strongly grows to record levels. The IEA forecasts another new record oil demand in 2023 and with huge YoY oil demand momentum to exit 2023. (ii) The IEA is known as an oil demand bear who seems to reluctantly increase its oil demand forecasts. It did so again this month. We tweeted [LINK] "Buckle up! @IEA OMR. Yes Oil surplus in Q1 BUT #Oil swings into deficit in H2... demand hits record levels… set to surge by 3.2 mb/d from 1Q23 to 4Q23... matching that increase would be a challenge even if Russia were able to maintain production at pre-war levels. #OOTT." Oil demand YoY growth for 2023 revised up and is now +2.0 mmb/d YoY to another new record 102.0 mmb/d (101.9 previously but there were rounding items last month). (iii) The IEA sees oil markets moving from a surplus in H1 to a deficit in H2. The IEA wrote, "Following an 80 kb/d contraction in 4Q22, world oil demand growth is set to accelerate sharply over the course of 2023, from 710 kb/d in 1Q23 to 2.6 mb/d in 4Q23. Average annual growth is forecast to ease from 2.3 mb/d in 2022 to 2 mb/d, and global oil demand to reach a record 102 mb/d. Rebounding air traffic and the release of pent-up Chinese demand dominate the recovery." This makes sense as the normal seasonal pattern for oil demand is Q1 of every year (peak of winter) is normally down QoQ vs Q4 of the prior year. Then oil demand normally increases a little bit QoQ in Q2, before the bigger increases in Q3 (peak of summer consumption)* *and another increase in Q4. The IEA forecasts Q4/22 oil demand at 100.8 mmb/d, but then forecasts quarterly 2023 oil demand of: 100.1 mmb/d in Q1/23, 101.1 mmb/d in Q2/23, 102.9 mmb/d in Q3/23 and 103.5 in Q4/23. (iv) No signs of oil demand growth slowing down to leave 2023. IEA's Q4/23 demand forecast of 103.5 mmb/d is +0.6 mmb/d QoQ and +2.7 mmb/d YoY. (v) On Russia, IEA highlights that while oil production is holding up well, exports are not. The IEA writes "While Russian oil production remained near pre-war levels in February, Russia's exports to world markets fell by more than 500 kb/d to 7.5 mb/d. Over the past year, 4.5 mb/d of Russian oil previously going to the EU, North America and OECD Asia Oceania has had to find alternative outlets. Willing buyers in Asia, namely India and, to a lesser extent, China, have snapped up discounted crude oil cargoes, but increasing volumes on the water suggest the share of Russian oil in their import mix may be getting too big for comfort. Russia accounted for around 40% and 20% of Indian and Chinese crude imports, respectively, in February. The two countries took in more than 70% of Russia's crude exports last month." (vi) This month, the IEA did not provide any commentary on how OECD oil and products stocks compared to the 5-yr average. But the message is clear – oil stock shave been building and will continue to build in the first part of 2023 before flipping to a deficit in H2/23. However, last month the IEA estimated the deficit of OECD industry stocks narrowed at Dec 31 vs Nov 30. The Feb OMR estimates Dec 31 OECD stocks at 95.7 mmb below the 5-yr average, vs Jan OMR that had Nov 30 OECD stocks at 125.9 mmb below the 5-yr average. (vii) Mar OMR 2023 non-OPEC YoY growth is increased by +1.2 mmb/d YoY to 66.9 mmb/d (was +0.9 mmb/d to 66.6) but note the big increase MoM was driven by FSU (Russia and other countries that were former Soviet Union) that was increased to 13.3 mmb/d (was 13.0 mmb/d) in 2023."*

Figure 24: IEA Global Demand Forecast by OMR Report Month

| mmb/d | 2020 | 2021 | 21-20 | Q1/22 | Q2/22 | Q3/22 | Q4/22 | 2022 | 22-21 | Q1/23 | Q2/23 | Q3/23 | Q4/23 | 2023 | 23-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar 23 | 91.0 | 97.7 | 6.7 | 99.6 | 98.8 | 100.8 | 100.8 | 100.0 | 2.3 | 100.3 | 101.3 | 103.0 | 103.5 | 102.0 | 2.0 |
| Feb 23 | 91.0 | 97.7 | 6.7 | 99.5 | 98.7 | 100.7 | 100.8 | 100.0 | 2.3 | 100.1 | 101.1 | 102.9 | 103.5 | 101.9 | 1.9 |
| Jan 23 | 91.0 | 97.7 | 6.7 | 99.5 | 98.7 | 100.7 | 100.5 | 99.9 | 2.2 | 99.6 | 100.8 | 102.9 | 103.5 | 101.7 | 1.8 |
| Dec 22 | 91.0 | 97.7 | 6.7 | 99.5 | 98.7 | 100.7 | 100.8 | 99.9 | 2.2 | 99.7 | 100.6 | 102.7 | 103.4 | 101.6 | 1.7 |
| Nov 22 | 91.0 | 97.7 | 6.7 | 99.4 | 98.7 | 100.3 | 100.7 | 99.8 | 2.1 | 99.6 | 100.5 | 102.3 | 103.0 | 101.4 | 1.6 |
| Oct 22 | 91.0 | 97.7 | 6.7 | 99.4 | 98.5 | 100.0 | 100.6 | 99.6 | 1.9 | 99.5 | 100.4 | 102.1 | 102.9 | 101.3 | 1.7 |
| Sep 22 | 91.0 | 97.7 | 6.7 | 99.5 | 98.4 | 99.9 | 100.9 | 99.7 | 2.0 | 100.2 | 101.0 | 102.6 | 103.3 | 101.8 | 2.1 |
| Aug-22 | 91.0 | 97.6 | 6.6 | 99.4 | 98.5 | 100.0 | 100.8 | 99.7 | 2.1 | 100.3 | 101.1 | 102.5 | 103.3 | 101.8 | 2.1 |
| July 22 | 91.0 | 97.5 | 6.5 | 99.3 | 97.8 | 99.4 | 100.2 | 99.2 | 1.7 | 99.8 | 100.8 | 102.0 | 102.7 | 101.3 | 2.1 |
| June 22 | 91.0 | 97.5 | 6.5 | 99.3 | 98.2 | 99.8 | 100.4 | 99.4 | 1.9 | 100.5 | 101.1 | 101.9 | 102.7 | 101.6 | 2.2 |
| May 22 | 91.0 | 97.5 | 6.5 | 98.8 | 98.2 | 100.0 | 100.4 | 99.4 | 1.9 | | | | | | |
| Apr 22 | 91.0 | 97.5 | 6.5 | 98.5 | 98.3 | 100.1 | 100.5 | 99.4 | 1.9 | | | | | | |
| Mar 22 | 91.0 | 97.5 | 6.5 | 99.0 | 98.8 | 100.2 | 100.6 | 99.6 | 2.1 | | | | | | |
| Feb 22 | 91.0 | 97.4 | 6.4 | 98.9 | 100.1 | 101.7 | 101.6 | 100.6 | 3.2 | | | | | | |
| Jan 22 | 91.0 | 96.4 | 5.4 | 97.8 | 99.3 | 100.9 | 100.8 | 99.7 | 3.3 | | | | | | |
| Dec 21 | 91.0 | 96.2 | 5.2 | 97.9 | 99.1 | 100.8 | 100.3 | 99.5 | 3.3 | | | | | | |

Source: IEA, SAF

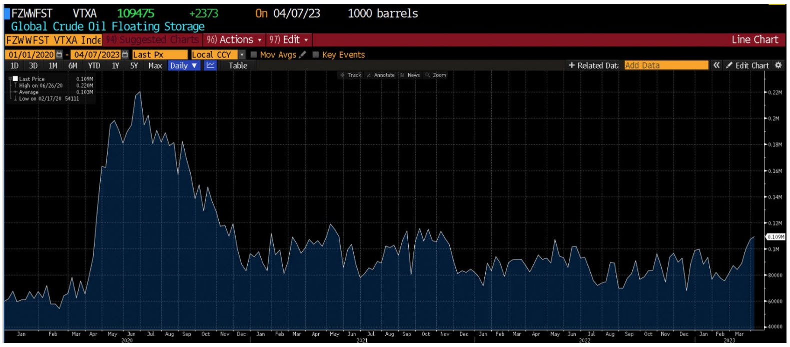
## Oil – Vortexa crude oil floating storage at Apr 7 was 109.48 mmb, +2.38 mmb WoW

**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 Apr 3 at 6am MT. (i) Recall that we did not have a

Vortexa item in last week's (Apr 2, 2023) Energy Tidbits memo as we had IT software issues impacting our remote access. But we did download the Vortexa data on Monday morning. (ii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Apr 7 at 109.48 mmb, which was +2.38 mmb vs upwardly revised Mar 31 of 107.10 mmb. Note Mar 31 was revised +2.50 mmb vs 104.60 mmb posted on Bloomberg as of 6am MT on Apr 3. (iii) There was a mix of revisions +/- to the past seven weeks, but they weren't huge in either direction. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 6am on Apr 3 are as follows: Mar 31 revised +2.50 mmb. Mar 24 revised +0.53 mmb. Mar 17 revised -1.16 mmb. Mar 10 revised -0.48 mmb. Mar 3 revised -0.27 mmb. Feb 24 revised -2.34 mmb. (iv) There is still a wide range of floating storage for the past several weeks, but a simple average for the past seven weeks is 93.93, which is up big vs last week's 89.21. The increase is due to dropping a low week and replacing with a 109.48 mmb week. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis and we do not track the revisions through the week. (vi) Apr 7 estimate of 109.48 mmb is -110.90 mmb vs the post-Covid peak on June 26, 2020 of 220.38 mmb. (vii) Note the below graph now goes back to Jan 1, 2020 and not just three years as floating storage in Apr 2020 had started to reflect the Covid impact. (viii) Apr 7 estimate of 109.48 mmb is +433.87 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (ix) Apr 7 of 109.48 mmb is +21.40 mmb YoY vs Apr 8, 2022 of 88.08 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Apr 8, 6am MT Apr 3, and 9am MT Mar 25..

Figure 25: Vortexa Floating Storage posted on Bloomberg Apr 8 at 9am MT




Source: Bloomberg, Vortexa

Figure 26: Vortexa Estimates Posted Apr 8 9am MT, Apr 3 6am MT, Mar 25 9am MT

Source: Bloomberg, Vortexa

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

**Vortexa tracking the "dark fleet"**

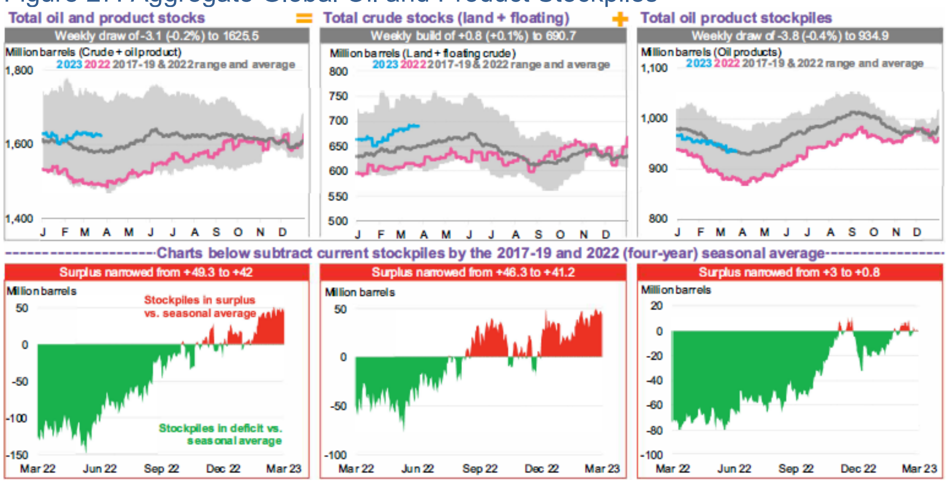
One of the questions we get on the Vortexa floating oil storage estimates is if they track Russia's increasing dark fleet. The answer is Yes, and it is a priority tor Vortexa to do so. Here is what we wrote in our March 19, 2023 Energy Tidbits memo. "*There was a great commentary on Friday from Vortexa's 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 narrowed WoW to 42.0 mmb**

**BNEF's global oil inventories**

One of the negatives for oil going into 2023 was that there was expected to be surplus oil in Q1 and a building of global oil inventories. That's happened. So, a key data point to watch will be does the building in Q1 and early Q2/23 start to turn into a draw as markets move thru Q2/23. And we remind that one week doesn't make a trend, but there was a narrowing of the surplus this week. . 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 narrowed from 49.3 mmb to 42.0 mmb for the week ending Mar 24. Crude oil inventories decreased by -8.8 mmb WoW to 590.8 mmb, turning last week's surplus of +1.4 mmb into a -7.4 mmb deficit against the five-year average (2016-2019, 2022). Total crude inventories (incl. floating) increased by +0.1% WoW to 690.7 mmb, narrowing the surplus from 46.3 mmb to 41.2 mmb. Total product stocks were down slightly by -0.4% WoW and the stockpile surplus against the 4-year average (2017-2019,2022) narrowed from 3.0 mmb to 0.8 mmb. The gas, oil, and middle distillate stocks were up 0.1% to 154.0 mmb/d, narrowing the deficit against the four-year average from 19.0 mmb to 17.7 mmb. Jet fuel consumption by international departures for the week of April 10 is set to increase by +112,300 b/d WoW, while consumption by domestic and passenger departures will decrease by -23,700 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 27: Aggregate Global Oil and Product Stockpiles




Source: BloombergNEF

**Vortexa noted March oil stock draws in "*time to get bullish again on crude?*"** Here is what we wrote in last week's (Apr 2, 2023) Energy Tidbits memo. *"Early yesterday morning, we tweeted [LINK] ""Time to get bullish again on crude?" @Vortexa chief economist @david_wech "Vortexa real-time global onshore inventory data is showing substantial, widespread and persistent draws over the last two months. Seven of the last nine weeks saw draws, averaging a strong 1.6mbd" #OOTT." Wech posted his blog on March 30 and we were surprised that it didn't get much attention as it is one of the only major views we have seen suggesting oil markets may be tipping to the positive earlier than the summer. It's a short blog and worth a read. Our tweet included his below graph and his key description "With ample supply and limited demand, crude balances shouldn't be supportive to prices at this point of the year, with the picture widely expected to tighten substantially, but only in H2 2023. However, Vortexa real-time global onshore inventory data is showing substantial, widespread and persistent draws over the last two months. Seven of the last nine weeks saw draws, averaging a strong 1.6mbd. China has kicked off the trend of draws early in the year, but has turned around to builds in more recent weeks. This may be reflective of two things: currently lacklustre refining economics and strong crude procurement from all around the world, including Russia, Iran and parts of the Atlantic Basin. Barrels arriving currently and over the* *coming months have been bought at low outright prices, and more is expected to come as seasonal demand and rising prices may stimulate more purchases amid concerns of even high prices in the future. Dirty tanker rates are already lofty, especially for the bigger vessel classes, giving support to the notion of strong Chinese buying and even more upside is expected for the remainder of the year. That is if the supply is actually there to meet crude oil demand! But either way, crude prices are set to rise." Our Supplemental Documents package includes the Vortexa blog."*

Figure 28: World onshore crude inventory change by region (4-wk average, mbd)


Source: Vortexa

**Oil – Big miss in China Caixin PMI -1.6 MoM to 50.0 in Mar, vs expectations 51.4**

**China Caixin PMI Index**

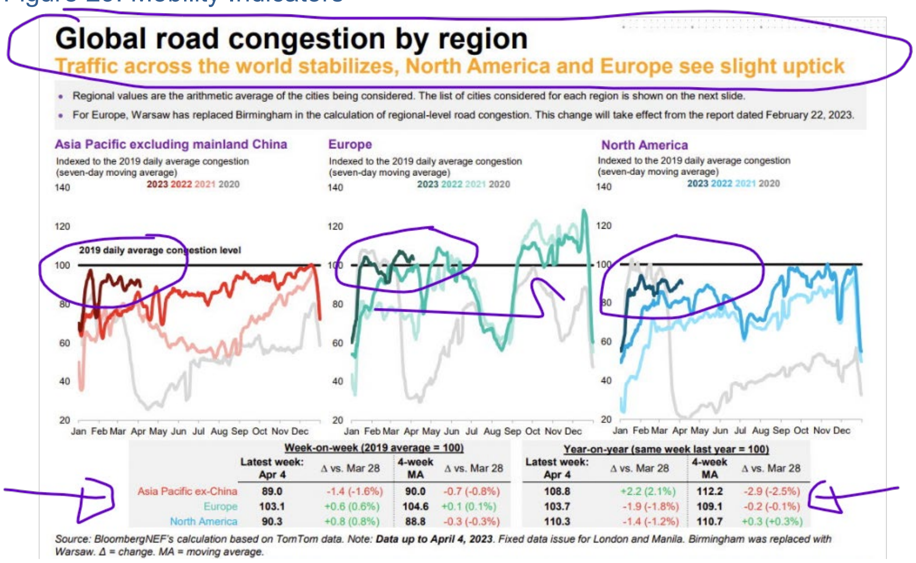
Last Sunday night, we tweeted [LINK] *"Surprise big miss in China Caixin PMI for Mar 50.0 vs Est 51.4, Feb 51.6, Jan 49.2, Dec 49.0. "External demand weakened amid a global economic downturn, with the gauge for new export orders falling back into contraction". Thx @IHSMarkitPMI #OOTT #Oil."* Last Sunday night, IHS Markit released the Caixin China Manufacturing PMI data for March [LINK].It was a big miss. The PMI was 50.0, which was well below expectations of 51.6 and Feb of 51.6. Production increased MoM in March, marking the second consecutive uptick seen since August 2021 but at a much slower pace compared to Feb. However, manufacturers cited declines in new export orders and employment as the main drivers behind March's PMI being lower than last month. The Caixin Insight Group commented, "*Growth in both manufacturing supply and demand softened last month. Although market conditions continued to improve after a Covid-19 policy shift, the marginal slowdown in recovery was evident. The subindexes for output and total new orders remained in expansionary territory, but both readings dipped by more than 2 points from February. External demand weakened amid a global economic downturn, with the gauge for new export orders falling back into contraction, the seventh time it was below 50 in the past eight months."* And, *"In a nutshell, the economy saw a marginal slowdown of recovery in March as the expansion in both manufacturing supply and demand significantly weakened* *from the previous month. Overseas demand dragged, employment worsened, inventories dropped slightly, prices remained largely stable, logistics was gradually restored to normal, and businesses were still highly confident in the economic outlook."* Our Supplemental Documents package includes the Caixin China PMI for March.

### Oil – TomTom mobility indicators: traffic mostly static; down slightly in Asia Pacific

**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], "*Stalling out China recovery! China traffic congestion levels "nosedive", -21.7% WoW, down to 105.7% of Jan 2021. Asia ex China -1.6% WoW, still <2019. EU +0.6% WoW, still >2019. NA +0.8% WoW, still <2019. Thx @BloombergNEF. #OOTT.*" Mobility indicators like TomTom data point to stable levels in global driving YoY, although road congestion has yet to recover to 2019 levels in Asia Pacific (ex-China) and North America. For week ending Apr 5, European and North America traffic levels were both up WoW by +0.6% and +0.8%, respectively. In contrast, Asia Pacific (ex-China) traffic was down -1.6% WoW. Traffic levels in Europe are now +3.1% above the 2019 average but down -1.8% YoY. North American traffic is -9.7% below the 2019 average and is -1.2% YoY. Finally, traffic levels in the Asia Pacific (ex-China) region are -11.0% below the 2019 average but up +2.1% YoY. Traffic in the Asia-Pacific region has been exceptionally high since Feb but this weeks slight decline narrowed the YoY differential. The TomTom mobility data seems logical as MoM North American road traffic is down slightly resulting in a narrowed 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 29: Mobility Indicators



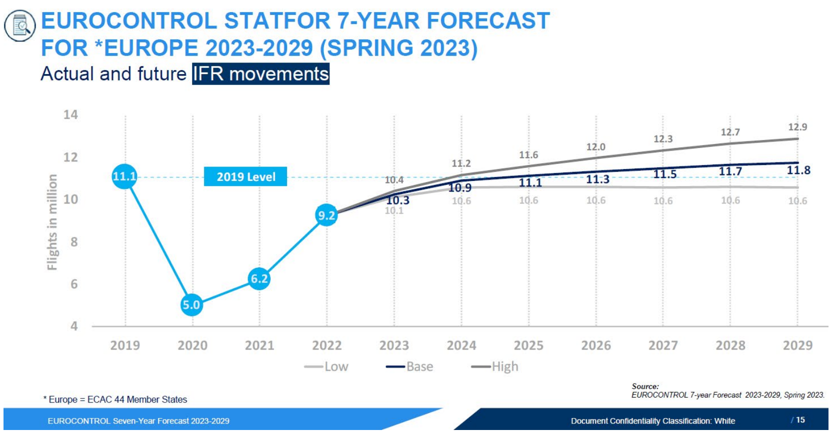

Source: BloombergNEF

**Oil – EU air travel revised up in 2023/24, not back to 2019 levels until 2025**

**EU air travel increasing**

Good reminder that Europe air travel and its oil consumption keeps increasing but still has a way to go to get back to 2019 levels. Last Friday, Eurocontrol's posted its new 7-yr forecast "*Eurocontrol Forecast Update 2023-2029*". [LINK]. We tweeted [LINK] *"#OilDemand may be up in 2023 but still more room to grow from there. Aviation is stronger in 2023 but return to 2019 not until 2025, at least in EU. @eurocontrol "slightly revised upwards" 2023 & 2024, not back to 2019 until 2025. #OOTT."* The takeaway is positive vs their Autumn 2022 forecast with "*slightly revised upwards"* 2023 and 2024, but still way to go to get back to 2019 levels. Eurocontrol wrote "*The number of European flights in 2023 and 2024 has been slightly revised upwards due to the continuatoin of vivid pent-up demand (solild bookings, strong tourist flows in Southern Europe). The 2019 number of flights (11.1 million) is expected to be reached in 2025."* Our Supplementall Documents package includes excerpts from the Eurocontrol 7-year forecast.

Figure 30: Eurocontrol 7-yr forecast




Source: Eurocontrol

**Oil & Natural Gas– Tough Q1 reporting ahead for E&P with prices down QoQ & YoY**

**Tough Q1 reporting for Cdn E&P**

We are about 3 weeks away Q1 report for the Cdn oil and gas companies and one thing is clear, it will be a tough Q1 reporting with oil and gas prices down QoQ and YoY. Yesterday, we tweeted [LINK] "*Tough Q1 reporting for E&P in a few weeks. See 👇#Oil #NatGas price table. Q1/23 prices down QoQ for all prices except WCS. Q1/23 prices down even more YoY for all prices. Looking further ahead, Q2/23 YoY price comparison will be even worse as Q2/22 was peak prices. #OOTT.*" Our tweet included our quarterly oil and gas price table. Q1/23 Ed Par prices of US$73.80 were -7.5% QoQ and -21.0% YoY. Q1/23 WCS prices of US$56.52 were +3.4% QoQ and -31.3% YoY. Q1/23 AECO prices of $3.10 were -38.2% QoQ and -31.2% YoY. Our tweet reminded that the YoY comparisons for Q2/23 reporting this summer will be even worse as Q2/22 was the period of peak oil and natural gas prices. Below is our updated table of quarterly oil and natural gas prices.

Figure 31: Oil and Natural Gas Prices

| Quarter | Brent US$ | WTI US$ | EdPar US$ | WCS US$ | HH US$ | AECO C$ |
|---|---|---|---|---|---|---|
| Q1/18 | $67.00 | $62.86 | $57.19 | $37.07 | $3.11 | $1.97 |
| Q2/18 | $74.41 | $67.83 | $60.78 | $49.88 | $2.83 | $1.17 |
| Q3/18 | $75.27 | $69.69 | $59.81 | $42.32 | $2.92 | $1.18 |
| Q4/18 | $68.18 | $59.41 | $36.53 | $25.63 | $3.79 | $1.53 |
| Q1/19 | $62.91 | $54.49 | $50.28 | $43.79 | $2.93 | $2.42 |
| Q2/19 | $68.58 | $59.96 | $54.41 | $47.46 | $2.57 | $1.07 |
| Q3/19 | $61.95 | $56.48 | $52.43 | $43.91 | $2.38 | $0.94 |
| Q4/19 | $62.51 | $56.83 | $50.61 | $37.98 | $2.40 | $2.33 |
| Q1/20 | $51.28 | $46.73 | $39.75 | $28.55 | $1.92 | $1.94 |
| Q2/20 | $31.14 | $27.67 | $21.84 | $18.02 | $1.70 | $1.90 |
| Q3/20 | $42.70 | $40.87 | $36.83 | $31.13 | $1.96 | $2.14 |
| Q4/20 | $44.47 | $42.67 | $37.92 | $31.34 | $2.46 | $2.51 |
| Q1/21 | $60.51 | $57.75 | $54.17 | $45.83 | $3.39 | $2.97 |
| Q2/21 | $68.44 | $65.90 | $61.94 | $53.11 | $2.89 | $2.80 |
| Q3/21 | $72.95 | $70.57 | $66.90 | $57.65 | $4.28 | $3.40 |
| Q4/21 | $79.45 | $77.26 | $73.78 | $60.87 | $4.74 | $4.47 |
| Q1/22 | $99.08 | $94.57 | $93.40 | $82.27 | $4.60 | $4.51 |
| Q2/22 | $112.72 | $108.76 | $107.10 | $93.41 | $7.46 | $6.89 |
| Q3/22 | $99.67 | $92.38 | $90.52 | $71.50 | $7.98 | $4.17 |
| Q4/22 | $88.35 | $82.63 | $79.74 | $54.66 | $5.59 | $5.02 |
| Q1/23 | $81.44 | $76.17 | $73.80 | $56.52 | $2.69 | $3.10 |
| | | | | | | |
| Q1/23 YoY | -17.8% | -19.5% | -21.0% | -31.3% | -41.6% | -31.2% |
| Q1/23 QoQ | -7.8% | -7.8% | -7.5% | 3.4% | -52.0% | -38.2% |

Source: Bloomberg

## Energy Transition – Liberals confirm carbon tax costs more than rebates

**Rebates don't cover the carbon tax**

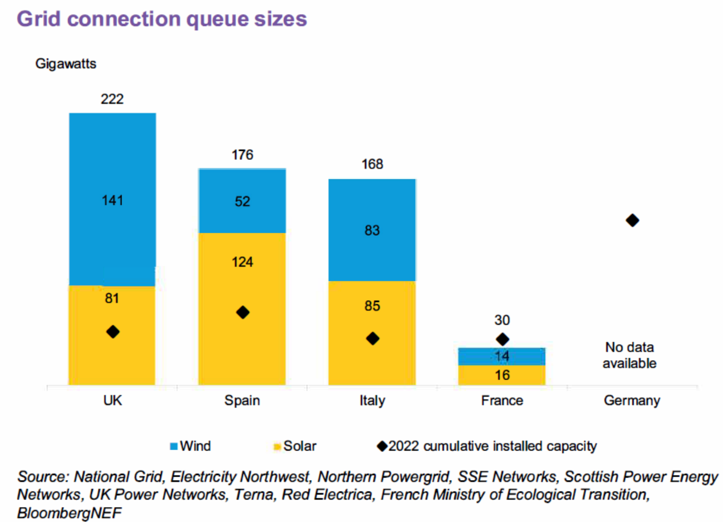
Confirm may not be the precise word but it is the political meaning when a politician doesn't answer the direct question. In this case, it was Liberal Environment Minister Guilbeault on CTV Question Period. [LINK]. Guilbeault was asked about the Parliamentary Budget Officers report on the net cost of the carbon tax [LINK]. He would not deny the PBO analysis that most Canadians do not have rebates cover the cost of the carbon tax. He just can't say that it does. Rather he deflects to some other point. The PBO report clearly states "*Under the Government's 2030 Emissions Reduction Plan, the federal fuel charge is set to rise from $65 per tonne of carbon dioxide equivalent in 2023-24 to $170 per tonne in 2030-31. In 2023-24, the federal fuel charge will be expanded to include Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. The federal fuel charge will continue to apply to Alberta, Saskatchewan, Manitoba and Ontario. When both fiscal and economic impacts of the federal fuel charge are considered, we estimate that most households will see a net loss, paying more in fuel charges and GST, as well as receiving lower incomes, compared to the Climate Action Incentive payments they receive and lower personal income taxes they pay. However, relative to disposable income, our estimates of household net cost of the federal fuel charge show a progressive impact that is, larger net costs for higher income households."* Guilbeault was asked about the report and deflected to talk about the things they were doing to help in the transition. CTV's Vassy Kapelos came back and tried to get a direct answer. She said … *but that isn't what you told Canadians carbon pricing would be. You didn't say it's going to cost you but we'll do all this other stuff to help you. You said our rebates will cover you*". Guilbeault didn't answer the question but said "*we have said that the rebates would help the people most in need in Canada and that's exactly what the system is doing*." Global National TV showed a clip of Parliamentary Budget Officer Yves Giroux on the report [LINK] saying "*most households are expected to be worse off under a carbon tax regime than without a carbon tax regime except for those at the bottom end of the income scale."*

## Energy Transition – Staggering 600GW of EU solar/wind stuck waiting grid connection

**600GW wind solar waiting EU grid connection**

We continue to see clear indicators that the energy transition will take way longer than expected, which means natural gas and its existing power infrastructure will be needed for way longer than aspired in Europe. One critical area that is being overlooked by leaders and others is the need to upgrade the grid to accommodate more intermittent power. Windmills and solar panels are great but they have to be hooked into the grid and the grid capacity must be enhanced so it can reliably accommodate more intermittent power. Otherwise adding more wind and solar will sit and wait, which means natural gas and its existing power infrastructure will be needed for way longer than aspired in Europe. (i) On Thursday, we tweeted [LINK] "*Here's why #NatGas & its existing power infra is needed for way longer! @BloombergNEF staggering 600GW #Solar #Wind projects stuck in lines in UK, ES, IT, FR, DE. 2x existing capacity. See 👇 03/15 tweet, #E.ON CEO warned every windmill needs grid connection/reinforcement #OOTT.*" (ii) BloombergNEF posted its "*European Energy Crisis Indicators: April 2023*" and had a clear warning. "*Europe's grid connection backlog threatens net-zero goals. The transmission and distribution grid for electricity is fast becoming the main bottleneck that could delay the scale-up of renewables in Europe, just as targets to decarbonize loom ever closer. • There is a staggering 600GW of solar and wind projects stuck in lines in the UK, Spain, Italy, France and Germany. This is equivalent to twice their existing solar and wind capacity. • Grid operators are struggling to keep up with connection requests and upgrade their networks to allow for timely connections. Waiting times and connection costs are on the rise. In some markets like the UK, the earliest a developer can secure a connection is 2028 and beyond in most cases. In addition to long timeframes, costs are more often becoming prohibitively expensive, due to extensive works needed to allow the adoption of further capacity. • Securing a grid connection is only one stage of developing a renewable energy project. Other lengthy processes such as planning permissions could mean that project timelines easily reach 10 years, significantly slowing down additional renewable energy coming online in the future years.* Below is the BloombergNEF chart attached to our tweet.

Figure 32: Grid connection queue sizes



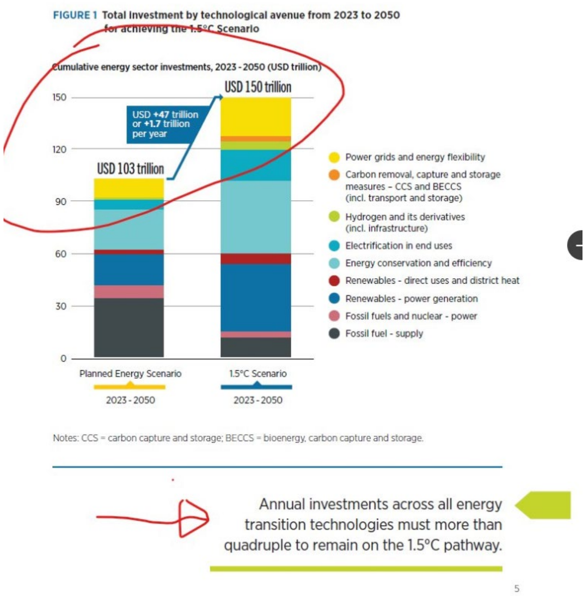

Source: BloombergNEF

**E.ON CEO, every windmill needs a grid connection & backbone reinforcement**
There was a g great reminder of the need for grid connections by E.ON CEO on March 15. Here is what we wrote in our March 19, 2023 Energy Tidbits memo. "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.*

**IRENA warned Energy Transition is far off track**
Here is what we wrote in last week's (April 9, 2023) Energy Tidbits memo. "*IRENA is the International Renewable Energy Agency, which is a pro international agency for renewable energy. On Tuesday, we tweeted [LINK] "No more denial from renewable side. It will take way longer & cost way way more. @IRENA #EnergyTransition is off-*

*track, investment in transition tech needs to average >$5t PER YEAR (vs $1.3t in 22) OOPS! #Oil ."#NatGas is needed for way longer, but ESG forces capital out. #OOTT." It is a good reminder that the Energy Transition is nowhere near on track, which means that the existing energy system will be needed for way longer. And with investment not being anywhere near enough on the existing system, it means higher prices. Given the agency, this is to get the momentum for governments to accelerate climate change actions in the run up to COP 28 in 7 months. So maybe there is a little hype so they can push for a ridiculous amount to get a lot. Our concern isn't that they use this report to say the world needs to accelerate to try to get on track for clean energy. But they don't But we think is mostly non-hype, which gets back to our thesis from years ago. The energy transition will take longer, be a rocky/bumpy road and energy will cost a lot more. And with obvious implications like natural gas will be needed for longer. One other key point – whether it's power generation or EVs, the original energy transition thesis made a fundamental assumption that has proven wrong. It's not that the renewable power generation system replaces the existing power generation on a one-for-one basis, or anywhere near that. Rather, to the most part, its just additive at least for the next decade or two. And the same thing for EVs in the northern hemisphere, where we use Norway, the EV sales leader for the last several years, EVs are to the most part 2nd or 3rd cars and not the primary car. This is a good report to review and there is a lot of good data. But the message is clear – the Energy Transtion needs $ trillions more every year. Our Supplemental Documents package includes excerpts from the IRENA report."*

Figure 33: Total investment by technological avenue 2023-2050 to hit 1.5C



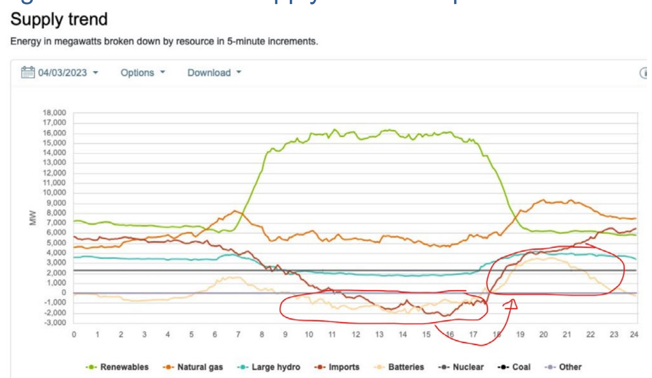

Source: IRENA

**Energy Transition – Batteries store energy, batteries are not an energy supply**

One of the energy transition analysts we follow is BloombergNEF's Nat Bullard, who is a great source of data/forecasts on the energy transition. On Wednesday, he tweeted [LINK] the below graphs that noted how, on Monday in California, batteries at their peak provided as much energy as imports or large hydro. There is no question that the massive push in California to add battery storage is resulting in more energy from storage coming back into the market during the normal peak early dinner period. We still believe the global game changer to the energy world will be when there is long duration send out capability of battery or other storage ie. ability to send out days and not four hours. But it's now 2023 and there is still not visibility to when that will happen. So for now, the reminder from the graphs is that batteries only have short term send out capacity. And it also reminds the overlooked fundamentals that batteries are storers of energy and not an energy source. The graphs show how batteries are receiving energy and then discharging that stored energy during the peak demand period. And that batteries have a relatively short send out period of perhaps 3 to 4 hours. The graphs also remind how natural gas is needed in California as a base and peaking generation.

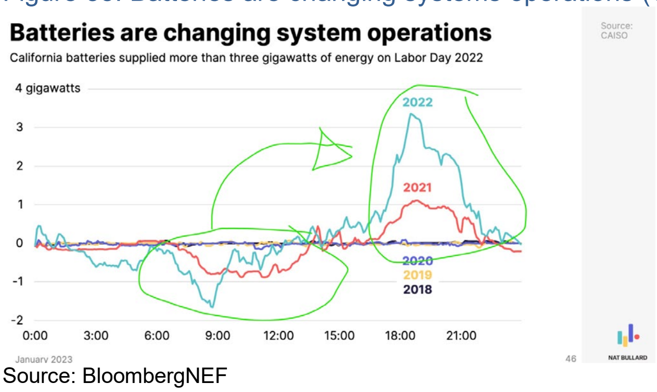
**Batteries store not produce energy**

Figure 34: California supply trend on Apr 3




Source: BloombergNEF

Figure 35: Batteries are changing systems operations (California)




Source: BloombergNEF

**Energy Transition – Reminder mangroves will be a key focus for carbon credits**

**Mangroves for carbon credits**

There was a good reminder on why companies are focusing on mangroves for carbon credits from Bloomberg's Wed report "*Companies Facing Carbon Offset Backlash Are Funding Own Projects*". Mangroves are likely the best at sequestering carbon vs other vegetation. Bloomberg started off "*A world away from its steel-and-glass headquarters in London, GSK Plc is wading into unfamiliar waters: A mangrove nursery in coastal Indonesia that's being nurtured to harbor crabs, fish — and carbon. It's the precious carbon GSK is really after, as it seeks to apply the mangroves' carbon-capture prowess to nullify climate-warming gases emitted by its global network of factories and vehicles, and the many asthma inhalers it sells. The drugmaker, wary about the poor quality and questionable climate benefits of carbon offsets for sale on the open market from brokers, is now devising its own credits. Carbon offsetting is "a fundamental mechanism to move capital where it is needed for nature, climate and health," said Adele Cheli, sustainability partnerships and strategy director at GSK.*" Then at the end, Bloomberg notes the value of mangroves "*One approach is to invest in mangroves, an attractive tool for sucking carbon dioxide from the air. Easily identified by their distinctive latticed roots, the plants thrive in shallow, brackish water, creating a defense against floods and a vibrant habitat for aquatic life. Crucially, they can sequester up to 50 times more carbon in their soils by area than tropical forests, according to the World Bank.*" Our Supplemental Documents package includes the Bloomberg report.

**UAE/Indonesia leads push to plant/preserve mangrove trees**

We remind that Indonesia wil be one of the major focus countries for mangroves projects to generate carbon credits. The Bloomberg report referenced the mangrove projects in Indonesia. Here is what we wrote in our Nov 13, 2022 Energy Tidbits memo. "*No one should be surprised by a focus this week on mangrove trees at COP27. Just like there are superfoods, mangroves are a super carbon storage tree. So if anyone wants to plant a tree, mangroves will do the most to store carbon. On Tuesday, UAE announced "Mariam bint Mohammed Almheiri, Minister of Climate Change and the Environment, today announced the launch of the Mangrove Alliance for Climate (MAC). Led by the UAE and Indonesia, the initiative seeks to scale up and accelerate the conservation and restoration of mangrove ecosystems for the benefit of communities worldwide. The announcement took place at the 27th UN Climate Change Conference (COP27), running in Egypt from 6th to 18th November. Five other countries – India, Sri Lanka, Australia, Japan, and Spain – have joined the Alliance." Almheiri highlighted UAE intends to plant 3 million mangroves within the next two months. At COP26, the UAE presented their target to plant 100 million mangroves by 2030. Our Supplemental Documents package includes the UAE announcement. [LINK]*"

**Saudi's also have been focusing on mangroves as part of its carbon reduction plans**

We have been following mangrove planting initiatives. Here is what we put in our Oct 24, 2021 Energy Tidbits. "*The SPA reporting of MBS speech yesterday also noted the Saudi focus on trees as part of their Net Zero 2060 plans "His Royal Highness confirmed the start of the first phase of afforestation initiatives by planting more than 450 million trees, in addition to rehabilitating eight million hectares of degraded lands, and allocating new protected areas, bringing the total protected areas in the Kingdom to more than 20% of its total area. MBS did not specifically mention mangrove trees,* *but that is part of this tree focus. We have been surprised to not see many announced mangrove forest projects as a way to meet net carbon reduction targets. We would have thought that the 4x higher carbon absorption by mangrove forests vs regular forests would have led to more announced projects. Especially in countries like Mexico that have global manufacturing and are familiar to oil and gas companies. But Friday night MT (Saturday morning local time), Arab News reported [LINK] that, as part of Saudi Green Initiative hat starts on Oct 23/24, "Plans to establish Saudi Arabia's first national mangrove park are underway to enhance the Kingdom's efforts in environmental protection and tourism development through vast green spaces." And "Mangrove forests are vital for climate change, as highly productive and biodiversity-rich inter-tidal forests sequester carbon faster than terrestrial forests. The more CO2 the mangroves capture, the faster the greenhouse gases are removed from the atmosphere. The distinctive ecosystems also protect shores and can help prevent direct damage in case of storms. More than a quarter of the world's mangroves have been lost over the past decade due to artificial intrusions."*

**Indonesia, Mangrove forests absorb 4x carbon vs tropical forests**

Our April 25 2021 Energy Tidbits included this item. "*One of the big emissions reductions themes will be tree planting. But we hadn't appreciated (and should have realized) that not all tree planting is created equal. Makes perfect sense. Indonesia President Jokowi's speech certainly fit into the category that they are open for investment. Earlier this morning, we tweeted [LINK] "Did you know carbon absorption of mangrove forests is multiples higher than tropical forests? Indonesia Pres @jokowi says 4 times higher. Makes sense not all plants absorb the same amount of carbon. Good for ID, MEX, others. #OOTT #NetZero." In his Biden climate speech, Jokowi said "We are currently rehabilitating 620 thousand hectares of mangrove forests until 2024, the largest in the world with carbon absorption reaching fourfold higher than that of tropical forests". Currently rehabilitating sounds like an invitation for capital. 620,000 hectares is ~2,400 square miles."*

**Capital Markets – Dimon, don't underestimate the extreme importance of interest rates**

**Interest rates and NPVs**

As usual there was a lot in JP Morgan CEO Jamie Dimon's annual letter [LINK], but we were a little surprised that his warning on interest rates didn't get more attention. It reminded us of our first finance classes calculating NPVs and IRRs. In his section "*Preparing for what may be a new and uncertain future*", he highlighted "*Don't underestimate the extreme importance of interest rates. Interest rates are extraordinarily important – they are the cosmological constant, or the mathematical certainty, that affect all things economic. Before I comment on that, I want to share some astounding numbers to illustrate this point: When you analyze a stock, you look at many factors: earnings, cash flow, competition, margins, scenarios, consumer preferences, new technologies and so on. But the math above is immovable and affects all. In a rapidly rising rate environment, any investment where the cash flows were expected in the out years would have been dramatically affected – think venture capital or real estate development, for example. Any form of carry trade (effectively borrowing short and investing long) would be sorely disappointed. Carry trade exists not just in banks but is embedded and is silently present in companies, investment vehicles and others, including situations that require recurring refinancing."* He then follows "*We are prepared for potentially higher interest rates, and we may have higher inflation for longer*."

Figure 36: Net present value (NPV) of $1.00 annuity

**Net present value (NPV) of $1.00 annuity**

| | Lifetime NPV | % NPV in first 10 years |
|---|---|---|
| 1% interest rate | $100 | 9% |
| 10% interest rate | $10 | 61% |

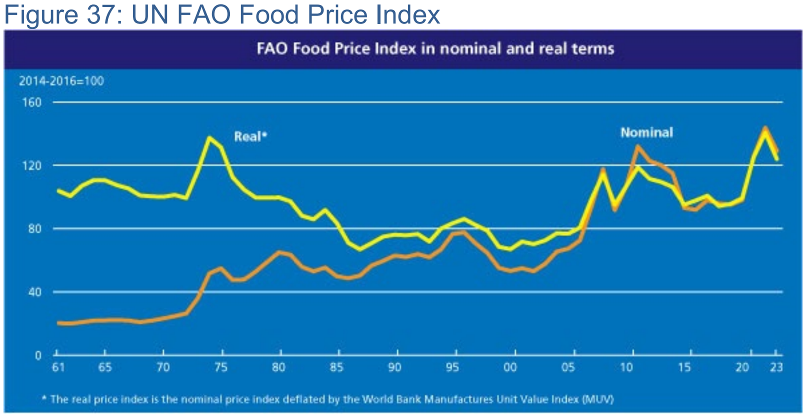
Source: JP Morgan

**Capital Markets – UN FAO Food Price Index dropped in March and is down YoY**

**UN Food Price Index down MoM**

We recognize the UN FAO Food Price Index isn't a measure of what people pay when they go to the grocery store. We know this because grocery prices aren't going down. The UN global food price index for March 2023 was down for the 12th consecutive month. The UN wrote, *"During the past twelve months since March 2022, the index has fallen by as much as 32.8 points (20.5 percent). The decline in the index in March was led by drops in the cereal, vegetable oil and dairy price indices, while those of sugar and meat increased."* The FFPI fell to -20.5% YoY in March, and that is down huge from the record high YoY increase of +33.6% seen in March 2022 when the Index averaged 159.8. On Apr 7, the UN posted its monthly update of its FAO Food Price Index [LINK] titled "*The FAO Food Price Index continues to drop".* Note that the index is calculated on a Real price basis. The FFPI averaged 126.9 points for March, which was a decline of -2.1% MoM from 129.8 in February and is down -20.5% YoY. The FFPI also reported MoM declines for most of its sub-indices in March. The Meat Price Index was up +0.8% MoM and is now -21% YoY while the Sugar Price Index was also up +1.4% MoM and is +7.7% YoY. In contrast, the Vegetable Oil, Dairy, and Cereal Price Indices were all down from last month by -3.0% (-47.7% YoY), -0.8% (-10.6% YoY), and -5.5% (-18.5% YoY), respectively. Below is the all time FFPI graph. Our Supplemental Documents package includes the UN FAO Food Price Index update.

Figure 37: UN FAO Food Price Index




Source: UN

## Capital Markets – Forbes' 37th Annual Billionaires List

On Tuesday, Forbes released its 37th Annual Billionaires List [LINK], which, in contrast to last year, showed material declines in the fortunes of the world most wealthy individuals as global markets cool down from a record year in 2022. According to the most recent list, there are a total of 2,640 billionaires across the globe, which is down 28 from 2,668 last year, and cumulative wealth fell by $500 billion YoY to $12.2 trillion. Some of the most dramatic drops in wealth was experienced by those with strong ties to the U.S. tech industry, specifically companies that appear to be lagging in the newly established AI war. Bernard Arnault surpassed Elon Musk for the 1st place position after growing his fortune by $53b YoY to $211b as his empire of high-end fashion and cosmetic brands like Louis Vuitton and Sephora remained strong throughout the year. In contrast, Elon Musk, now in 2nd, saw his fortune decline by $39b YoY to $180b primarily attributable to his Twitter acquisition not living up to expectations. The top 20 richest are now worth $1.853 trillion, an 8.5% decrease from $2.025b in 2022. There are now 6 people whose wealth is greater than $100b, with Larry Page and Sergey Brin both falling short after making the cut last year. New to the top 10 are Michael Bloomberg at $94.5b and Carlos Slim Helu Family at $93.0b. The concentration of billionaires remains in the US at 735, unchanged from last year. However, China is remains in second place, though down 45 YoY to 562. For Canadians, David Thomson (Thomson Reuters) ranks 22 at $54.4b, Changpeng Zhao (Crypto) ranks 167 at $10.5b (was $65 billion), Jim Pattison (Diverse) ranks 202 at $9.5b, Anthony von Mandl ranks 215 at $9b, Joseph Tsai ranks 290 at $7.6b, and Alain Bouchard ranks 425 with a net worth of $6b. The table below shows the YoY change in Top 20 Billionaire net worth. Our Supplemental Documents package includes some of the Forbes posted reports.

Figure 38: Forbes Top 20 Billionaires – 2023 / 2022 / 2021

| Ranking | 2023 | Net Worth (US$b) | 23/22 | 2022 | Net Worth (US$b) | 22/21 | 2021 | Net Worth (US$b) |
|---|---|---|---|---|---|---|---|---|
| 1 | Bernard Arnault & family | $211.0 | -$8.0 | Elon Musk | $219.0 | $25.6 | Jeff Bezos | $193.4 |
| 2 | Elon Musk | $180.0 | $9.0 | Jeff Bezos | $171.0 | $2.0 | Elon Musk | $169.0 |
| 3 | Jeff Bezos | $114.0 | -$44.0 | Bernard Arnault & family | $158.0 | -$10.1 | Bernard Arnault & Family | $168.1 |
| 4 | Larry Ellison | $107.0 | -$22.0 | Bill Gates | $129.0 | -$0.5 | Bill Gates | $129.5 |
| 5 | Warren Buffett | $106.0 | -$12.8 | Warren Buffett | $118.8 | $5.5 | Mark Zuckerberg | $113.3 |
| 6 | Bill Gates | $104.0 | -$7.0 | Larry Page | $111.0 | $11.2 | Larry Ellison | $99.8 |
| 7 | Michael Bloomberg | $94.5 | -$12.8 | Sergey Brin | $107.3 | $7.7 | Warren Buffet | $99.6 |
| 8 | Carlos Slim Helu Family | $93.0 | -$13.2 | Larry Ellison | $106.2 | $8.5 | Larry Page | $97.7 |
| 9 | Mukesh Ambani | $83.4 | -$8.0 | Steve Ballmer | $91.4 | -$3.3 | Sergey Brin | $94.7 |
| 10 | Steve Ballmer | $80.7 | -$10.0 | Mukesh Ambani | $90.7 | $10.4 | Francoise Bettencourt Meyers & Family | $80.3 |
| 11 | Francoise Bettencourt Meyers & family | $80.5 | -$9.6 | Gautam Adani & family | $90.1 | $12.7 | Amancio Ortega | $77.4 |
| 12 | Larry Page | $79.2 | -$2.9 | Michael Bloomberg | $82.1 | $5.9 | Mukesh Ambani | $76.2 |
| 13 | Amancio Ortega | $77.3 | -$3.9 | Carlos Slim Helu Family | $81.2 | $6.7 | Steve Ballmer | $74.5 |
| 14 | Sergey Brin | $76.0 | $1.2 | Francoise Bettencourt Meyers & family | $74.8 | $7.1 | Carlos Slim Helu & Family | $67.7 |
| 15 | Zhong Shanshan | $68.0 | $0.7 | Mark Zuckerberg | $67.3 | $1.2 | Alice Walton | $66.1 |
| 16 | Mark Zuckerberg | $64.4 | -$1.8 | Jim Walton | $66.2 | $1.8 | Jom Walton | $64.4 |
| 17 | Charles Koch | $59.0 | -$6.7 | Zhong Shanshan | $65.7 | $2.1 | Rob Walton | $63.6 |
| 18 | Julia Koch & family | $59.0 | -$6.3 | Alice Walton | $65.3 | $2.7 | Zhong Shanshan | $62.6 |
| 19 | Jim Walton | $58.8 | -$6.3 | Rob Walton | $65.1 | $4.9 | Ma Huateng | $60.2 |
| 20 | Rob Walton | $57.6 | -$7.4 | Changpeng Zhao | $65.0 | $6.0 | Michael Bloomberg | $59.0 |
| **TOTAL** | | **$1,853.4** | **-$171.8** | | **$2,025.2** | **$108.1** | | **$1,917.1** |

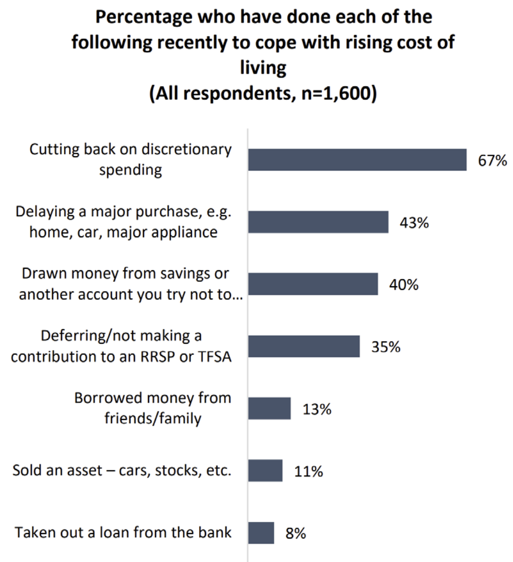
Source: Forbes

## Demographics – Canadians struggle to deal with current cost-of-living crisis

**Angus Reid Institute Cdn cost-of-living**

Our big concern is that politicians look at inflation numbers and naively assume that percentage is how people are impacted on their actual costs to live and eat. We don't think they want to realize how difficult it is for many Canadians to make ends meet. On Thursday, the Angus Reid Institute posted a report [LINK] titled "*Tightening up, drawing down: Vast majority of Canadians making tough decisions to handle cost-of-living crisis*" which leverages an analysis of consumer spending habits and survey results to paint a picture on how Canadians are impacted by rising living costs. Canada's cost-of-living crisis started last year as real estate prices and inflation soared to near record-highs and has since gotten marginally worse. Some key takeaways from the report were: (i) 67% of Canadians stated that they have been forced to cut back on discretionary spending, an increase of 14% YoY. (ii) 40% of Canadians say that they have had to draw money out of otherwise untouched savings accounts while 33% (was 22%) reported the need to defer contributions to RRSP and TFSA accounts. (iii) 34% stated that they are in either "bad" or "terrible" financial shape, which is a 6% increase YoY, with many citing sticky food cost inflation as a core driver behind their current state. To this end, 80% if those in "bad" shape and 94% in "terrible" shape struggle to feed their families, and those who report being in either state tend to be of a younger age overall. (iv) Finally, 11% of respondents reported being in such bad shape financially that they have been forced to sell an asset such as a car and 8% have relied on borrowing money from friends or family to make ends meet. The Angus Reid Institute is a non-profit, non-partisan public opinion research foundation established to advance education by commissioning, conducting and disseminating accessible and impartial statistical data, research and policy analysis for public use. The figure below summary figure is an excerpt from the Angus Reid report. Our Supplemental Documents package includes the Angus Reid report.

Figure 39: Canadian cost-of-living coping mechanisms




Source: Angus Reid Institute

**Demographics – How does layoffs by email make better managers of people?**

**McDonald's layoffs by email**

Last week, the WSJ reported [LINK] "*Some McDonald's workers began to hear about the fate of their jobs Monday. The company's corporate vice president of insurance said he was informed Monday that his position was being eliminated and he was leaving the company after 20 years, he said in an email to colleagues that was viewed by The Wall Street Journal.*

*McDonald's was laying off hundreds of corporate employees this week, according to people familiar with McDonald's plan. The Chicago-based fast-food chain said in an internal email last week to U.S. employees and some international staff that they should work from home from Monday through Wednesday so it can deliver staffing decisions virtually. The company, in the message, asked employees to cancel all in-person meetings with vendors and other outside parties at its headquarters. "During the week of April 3, we will communicate key decisions related to roles and staffing levels across the organization," the company said in the message viewed by The Wall Street Journal."* And the WSJ wrote "*We want to ensure the comfort and confidentiality of our people during the notification period," the company said."* When we saw the last sentence, couldn't help wonder if they were talking about the employees being fired or the manager who sent out the email. Regardless, every company, or at least almost every company, always talks about people as their most important asset or their competitive advantage. But we continue to believe firing people via email can't be a positive from the perspective of employees being fired and other employees who watch it happen. And we don't see how it makes the managers better managers of people. Firing people by email may make it easier to do, but the fear is that is that it doesn't make the manager think really hard about hiring someone. Anyone who has managed people knows that the hardest and most stressful thing to do as a manager is to sit face-to-face with someone and tell them they are being fired. But that is nowhere near as bad as the person getting fired. When a manager has to do that, it means they also think twice before hiring because you don't want to hire people if they aren't right or you don't need to position. So when McDonald's and tech firms fire people by an email, it doesn't have the impact on the manager's approach to staffing. They don't have some basic level of respect to someone who has been part of the team to tell them face-to-face. And as we see now, hiring and layoffs are now just part of a more regular part of business. Oil companies didn't do layoffs with a bad quarter or two, it had to look like a bad longer cycle. And oil companies still seem to have that approach whereas other sectors use layoffs to cut jobs, almost like they cut items like their overspending on the free food, etc. Our Supplemental Documents package includes the WSJ report.

**Demographics – Italy population continues steady decline since 2014**

We always follow the well-known population decline in Japan, but Japan isn't alone in having a steady production decline. Italy's population has been in steady decline since 2014. On Friday, Reuters reported [LINK] Italy's national statistics bureau, ISTAT, reported that Italy 's population fell by 179,000 to 58.85 million in 2022. Reuters wrote "*The population decline slowed somewhat compared with 2021 and 2020, two years heavily affected by the COVID-19 pandemic. Italy recorded 392,600 births in 2022, down from 400,249 the previous year, ISTAT said, the 14th consecutive fall and the lowest number since the country's unification in 1861."* And "*Italy's overall population has been falling steadily since 2014, with a cumulative loss since then of more than 1.36 million people, equivalent to the residents of Milan, the country's second biggest city*."

**Italy's population down 1.36 mm since 2014**

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

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

**@Energy_Tidbits on Twitter**

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.

#### 5th anniversary of tragic Humboldt Broncos hockey team bus crash

Wednesday April 6 was the 5th anniversary of the tragic Humboldt Broncos Junior hockey team bus crash that killed 16 people and injured 13 others. The hockey team's bus was hit by a semi that ran a stop sign at 4:50pm local time. It was six months ago that the Broncos were also in the news. Our Oct 10, 2021 Energy Tidbits highlighted the unveiling of a commemorative stamp from Canada Post. We then wrote "*On Friday, Canada Post "unveiled a stamp paying tribute to Bruce MacKinnon of The Chronicle Herald (Halifax) [LINK], one of the country's most thoughtful, talented and respected editorial cartoonists. MacKinnon had his first editorial cartoon published in his hometown weekly paper in Antigonish, Nova Scotia, when he was just 14. After he drew weekly cartoons for the Herald, the paper hired him full time in 1986. Since then, he has drawn roughly 8,000 cartoons – but it is their quality that has won him numerous accolades". MacKinnon is noted for his political cartoons but, like other cartoonists, also moves to more powerful serious themes, such as on the tragic Humboldt Broncos bus crash that will be a new Canada stamp."*

Figure 40: Bruce MacKinnon stamp


Source: Canada Post

### Cdn Mike Weir's Masters win was amidst a Who's Who in golf

Unfortunately, Cdn Mike Weir missed the cut at the Masters. But we thought that he should be part of a Jeopardy question. Between the two of them, Tiger Woods and Phil Mickelson had five Masters wins within a six-year period and their run was only interrupted in 2003. This was the 20th anniversary of Mike Weir's Masters win in 2003. What is even more impressive on that win is the list of winners before him and right after. It is a Who's Who in Golf. Here is the 25 yrs of winners:

Figure 41: Masters winners 1983-2009

| | | | | | |
|---|---|---|---|---|---|
| 1983 | Seve Ballesteros | 1992 | Fred Couples | 2001 | Tiger Woods |
| 1984 | Ben Crenshaw | 1993 | Bernard Langer | 2002 | Tiger Woods |
| 1985 | Bernhard Langer | 1994 | Jose Maria Olazabal | 2003 | Mike Weir |
| 1986 | Jack Nicklaus | 1995 | Ben Crenshaw | 2004 | Phil Mickelson |
| 1987 | Larry Mize | 1996 | Nick Faldo | 2005 | Tiger Woods |
| 1988 | Sandy Lyle | 1997 | Tiger Woods | 2006 | Phil Mickelson |
| 1989 | Nick Faldo | 1998 | Mark O'Meara | 2007 | Zach Johnson |
| 1990 | Nick Faldo | 1999 | Jose Maria Olazabal | 2008 | Treero Immelman |
| 1991 | Ian Woosnam | 2000 | Vijay Singh | 2009 | Angel Cabrera |

Source: Wikipedia

### Amazing no one hurt with massive trees falling at Augusta on Friday

If you didn't see it, there is a good video of [LINK] at ESPN of one of the massive pine trees falling between the 16th green and 17th tee on Friday. It was pretty amazing how no one was hurt, but as the announcer said, the noise was quite loud so patrons had time to react to jump out of the way of the massive pine tree crashing. The threesome of Larry Mize, Min Woo Lee and Harrison Crowe watched from the 16th green.

Figure 42: Massive pine tree crashing at the Masters on Friday6

Source: ESPN

### Food concession prices are amazingly cheap at the Masters

Was talking Masters golf with an investor on Thursday and he was telling me of how he missed being in the gallery for Mike Weir's 2003 win but did get there for Tiger's 2005 win. When I asked what is that we don't/can't appreciate from the TV coverage. He said three things: how hilly the course is, how loud the roars reverberate around the golf course and what a cheap price for the food concession.

It's the direct opposite of what fans pay when they attend any major sporting event. Golf Digest posted a picture of the concessions menu and wrote *"No sandwich on the menu will run you more than $3, and the two without meat—the pimento cheese (can confirm, might be the GOAT) and the egg salad (hard pass)—are both $1.50. Everything on the breakfast menu, which is served until 10 a.m., is also $3 or less. Non-alcoholic beverages are all $2, while beer and a specialty drink called the "Crow's Nest," a nod to where the amateurs stay this week, are $5 each. The most expensive item on the menu, white wine, is $6. All snacks, including the famous Georgia Peach Ice Cream Sandwich, are $2.50 or less."*

Figure 43: Masters food concessions prices 2023


Source: Golf Digest

### Didn't realize Google employees used to use Apple MacBooks

On Monday, CNBC had a report on Google's finance chief Ruth Porat's March 31 companywide email on the cost cutting at Google. The headlines were on Porat's comments like "we've baked too many muffins on a Monday", and how they are going to cut back on their days of operations for their cafes and yoga classes. And it followed some recent cost cuttings like the Jan layoffs that saw Google let go of more than two dozen on-site massage therapists. But one item that surprised us was, up until now, Google employees were given the option to use Apple MacBooks. We would have thought that the company wide standard would be Chromebooks. It certainly isn't the best endorsement for their products to see that wasn't the standard. CNBC wrote "*Google employees who are not in engineering roles but require a new laptop will receive a Chromebook by default. Chromebooks are laptops made by Google and use a Google-based operating system called Chrome OS.*
*It's a shift from the range of offerings, such as Apple MacBooks, that were previously available to employees. "It also provides the best opportunity across all of our managed devices to prevent external compromise," one document about the laptop changes said."* Our Supplemental Documents package includes the CNBC report that also includes the Porat email. [LINK]

**Quinnipiac Bobcats win NCAA hockey championship over Minnesota Gophers**
Haven't followed NCAA men's hockey for years, but was surprised to see the headline this morning that Quinnipiac Bobcats won the NCAA hockey championship with a 3-2 overtime win over the Minnesota Gophers. It was Quinnipiac's first NCAA championship and, unless you follow the NCAA hockey scene, didn't even know this university played hockey. Whereas the Gophers have been one of the big brand names in NCAA hockey since the 70s when Coach Herb Brooks built the Gophers into a powerhouse and one that was unique when he moved to only Minnesota athletes at a time when US schools were aggressively recruiting Cdns to play hockey.  Brooks went on big fame coaching the US to the Olympic Gold medal at Lake Placid in 1980 with their upset of the Soviet Union in the medal round. Quinnipiac is a private university with ~9,000 students located in Hamden, Connecticut.  The university says they way to pronounce is "Kwi-nuh-pee-ak."