Energy Tidbits

November 26, 2023

Produced by: Dan Tsubouchi

OPEC+, We Expect Saudi Energy Minister Abdulaziz to Deliver Something More than a Minimum OPEC+ Deal

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. OPEC+ surprise postponement of its meeting to Nov 30 was negative to oil, but we expect Saudi's Abdulaziz to deliver something more than a minimum deal. [click here]

2. Western leaders pre-COP28 messaging suggest they have moved to UAE COP28 President's priorities. [click here]

3. Iran continues to ram up oil production and now says they will add 300,000 b/d this winter. [click here]

4. Houthis seized an Israeli linked cargo ship in Red Sea. [click here]

5. NOAA forecasts a warmer than normal 1st half of Dec and a warmer than normal Dec is never good for prices. [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: -7 bcf draw in US gas storage; now +251 bcf YoY surplus

US gas storage +251 bcf YoY surplus

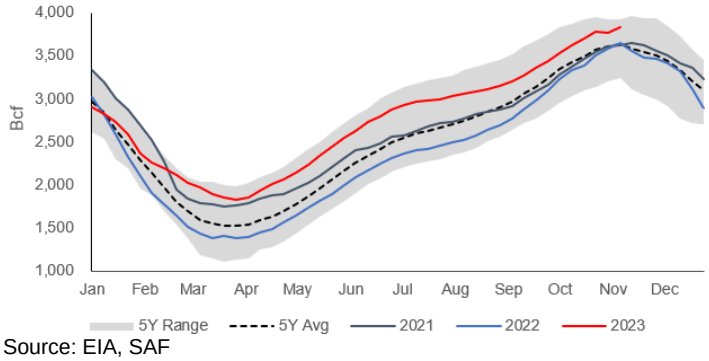
For the week of Nov 17, the EIA reported a -7 bcf draw (below expectations of a +2 bcf build), and a YoY increase compared to the -80 bcf draw reported for the week of Nov 18, 2022. Total storage is now 3.826 tcf, representing a surplus of +251 bcf YoY compared to a surplus of +198 bcf last week. Total storage is +249 bcf above the 5-year average, up from the +203 bcf surplus last week. Below is the EIA's storage table from its Weekly Natural Gas Storage report [LINK].

Figure 1 US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (11/17/22)		5-year average (2018-22)	
Region	11/17/23	11/10/23	net change	implied flow	Bcf	% change	Bcf	% change
East	918	931	-13	-13	868	5.8	881	4.2
Midwest	1,118	1,116	2	2	1,066	4.9	1,058	5.7
Mountain	255	256	-1	-1	204	25.0	207	23.2
Pacific	296	292	4	4	233	27.0	273	8.4
South Central	1,240	1,238	2	2	1,204	3.0	1,158	7.1
Salt	331	332	-1	-1	319	3.8	312	6.1
Nonsalt	909	906	3	3	885	2.7	846	7.4
Total	3,826	3,833	-7	-7	3,575	7.0	3,577	7.0

Source: EIA

Figure 2: US Natural Gas Storage – Historical vs Current



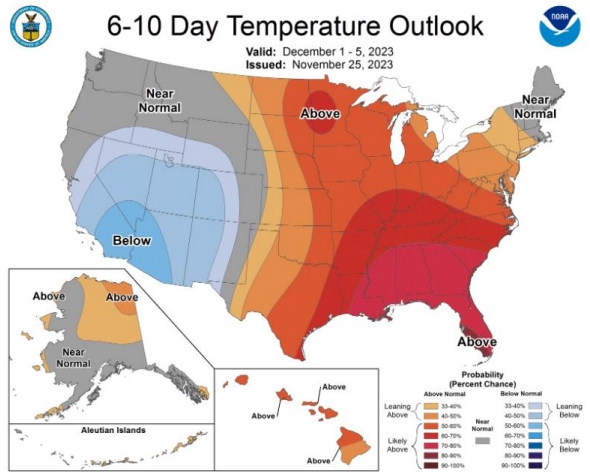
Source: EIA, SAF

Natural Gas: NOAA's calls for warmer than normal temp to start Dec

NOAA 8-14 day temperature outlook

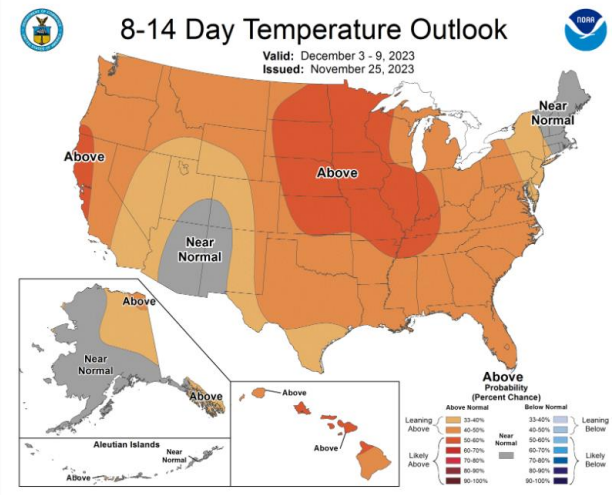
It's now the end of Nov and this is the start of the crucial period for weather driven demand for natural gas. Weather forecasts, even for the next 2-weeks period, are never 100%. NOAA updates its 6-10 day and 8-14 day outlooks every day, normally at 1pm MT. Yesterday's 6-10 and 8-14 day outlook cover Dec 1-9. Yesterday, we tweeted [LINK] "*No surprise, HH #NatGas prices were -7% WoW. Never a positive for #NatGas prices when forecasts are to start Dec warmer than normal. Today's @NOAA 6-10 & 8-14 day temp outlook call for warmer than normal temps. #OOTT."* NOAA's updated maps are below amd call for warmer than normal temps.

Figure 3: NOAA 6-10 day temperature outlook as of Nov 25



Source: NOAA

Figure 4: NOAA 8-14 day temperature outlook as of Nov 25



Source: NOAA

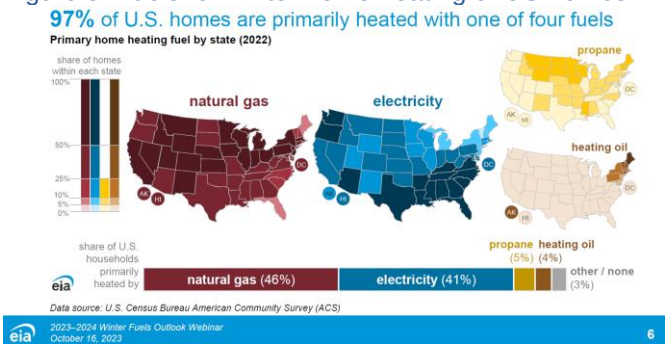
Natural Gas: 62% of US homes have winter home heating fueled by natural gas

Last week's (Nov 19, 2023) Energy Tidbits reminded of US home heating by fuel. Last week, we wrote "*Our primary focus for winter weather tends to be in the US NE and around the Great Lakes for the combination of population density, areas that have colder winters, and a higher percentage of the US homes in these regions that primarily use natural gas for heating. Below is the EIA's map from Oct showing the primary fuel source for heating homes. (i) On Thursday, we tweeted [LINK] "62% of US homes winter heated directly (46%) and indirectly (16%) by #natgas. All direct fuel % splits unchanged YoY ie. #natgas 46%, electricity 41%, etc. @EIAgov #natgas fuels 40% of electricity for home heating ie. indirect*

Natural gas home heating

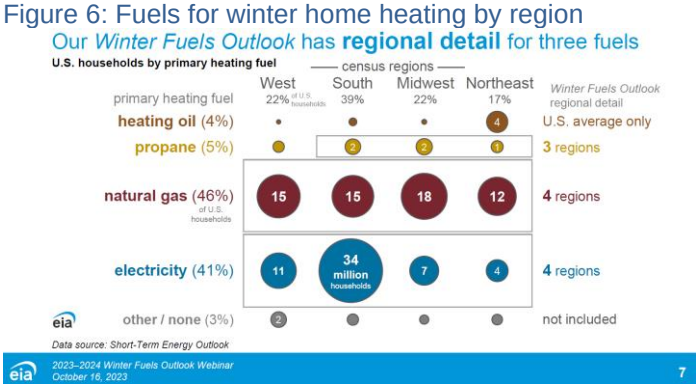
16% #OOTT." (ii) Natural gas continues to be the major fuel for "direct" fuel for home heating with 46% of US homes followed by electricity 41%, propane 5%, heating oil 4% and other/none at 3%. Note these % shares are unchanged vs last year. (ii) much of the electricity is provided by natural gas. (iii) Natural also is the major fuel to generate electricity. On a direct basis, electricity is the primary source for heating 41% of US homes. The EIA notes that natural gas provides the fuel for 40% of electricity. The EIA wrote "Last winter, electricity generation fueled by natural gas reached a new record of 619 billion kilowatthours (kWh), accounting for nearly 40% of all generation in the U.S. electric power sector. We forecast a similar level and share of natural gas generation for winter 2023–24. The addition of new natural gas-fired generating capacity has been one factor keeping natural gas the largest source of power generation. By October 31, we expect U.S. natural gas generating capacity to have grown by 4.7 gigawatts (GW) from the previous October." ivi) Adding the indirect and direct, natural gas provides the fuel for 62% of US homes."

Figure 5: Fuels for winter home heating of US homes



Source: EIA

Figure 6: Fuels for winter home heating by region



Source: EIA

Natural Gas: Mexico's natural gas production just below 5 bcf/d

Mexico natural gas just below 5 bcf/d

On Friday, Pemex posted its natural gas production data for October. [LINK]. Pemex does not provide any commentary on the data but reported October 2023 natural gas production of 4.950 bcf/d, which was +3.2% YoY and -0.4% MoM. The big picture story for Mexico natural gas is, at least for now, still unchanged – for the past six years, Mexico natural gas

production has been stuck right around 5 bcf/d, and that means any increased domestic natural gas consumption has been met by US natural gas imports. Below is our ongoing table of Pemex reported monthly natural gas production.

Figure 7: Mexico Natural Gas Production

Natural Gas Production bcf/d	2017	2018	2019	2020	2021	2022	22/21	2023	23/22
Jan	5.326	4.910	4.648	5.005	4.848	4.713	-2.8%	4.955	5.1%
Feb	5.299	4.853	4.869	4.942	4.854	4.646	-4.3%	4.979	7.2%
Mar	5.383	4.646	4.857	4.946	4.839	4.766	-1.5%	5.035	5.6%
Apr	5.334	4.869	4.816	4.827	4.671	4.740	1.5%	5.095	7.5%
May	5.299	4.827	4.841	4.460	4.730	4.702	-0.6%	5.034	7.1%
June	5.253	4.840	4.843	4.754	4.727	4.744	0.4%	5.035	6.1%
July	5.216	4.856	4.892	4.902	4.725	4.815	1.9%	4.936	2.5%
Aug	5.035	4.898	4.939	4.920	4.656	4.796	3.0%	4.947	3.1%
Sept	4.302	4.913	5.017	4.926	4.746	4.798	1.1%	4.969	3.6%
Oct	4.759	4.895	4.971	4.928	4.718	4.795	1.6%	4.950	3.2%
Nov	4.803	4.776	5.015	4.769	4.751	4.845	2.0%		
Dec	4.811	4.881	5.024	4.846	4.697	4.845	3.2%		

Source: Pemex, SAF

US pipeline exports are now up to Mexico at 6.9 bcf/d in August

The issue for increasing US natural gas exports to Mexico has been driven by when Mexican natural gas infrastructure can be built out. We report on the EIA's monthly data on US natural gas pipeline exports to Mexico. Here is what we wrote in our Nov 5, 2023 Energy Tidbits memo. "*The EIA Natural Gas Monthly also provides its "actuals" for gas pipeline exports to Mexico [LINK], which were 6.9 bcf/d in August, up +0.2 bcf/d MoM from 6.7 bcf/d in July and is up +1.1 bcf/d YoY from 5.8 bcf/d in August 2022. The EIA doesn't provide explanations for the numbers but the increase should be linked to some recent infrastructure increases. Mexico's relatively unchanged domestic production over the past seven years has created the need for increased US pipeline exports as Mexico builds out its domestic natural gas infrastructure. Below is our table of the EIA's monthly gas exports to Mexico*."

Figure 8: US Pipeline Exports to Mexico

bcf/d	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan	1.7	2.2	3.2	3.9	4.4	4.9	5.2	5.6	5.7	5.3
Feb	1.8	2.3	3.5	4.0	4.5	4.8	5.4	4.9	5.5	5.4
March	1.9	2.4	3.3	4.2	4.3	4.8	5.4	5.9	5.5	5.7
Apr	1.9	2.6	3.5	3.7	4.4	4.7	4.6	6.1	5.9	5.6
May	2.0	2.8	3.7	4.0	4.4	5.0	4.7	6.2	6.0	6.2
June	2.2	3.0	3.9	4.5	4.6	5.2	5.4	6.6	6.1	6.8
July	2.2	3.3	4.0	4.4	4.9	5.4	5.8	6.4	6.1	6.7
Aug	2.1	3.3	4.3	4.4	5.0	5.4	6.0	6.2	5.8	6.9
Sept	2.2	3.3	4.1	4.2	5.0	5.4	6.1	6.0	5.6	
Oct	1.9	3.2	4.2	4.2	4.9	5.5	6.0	6.0	5.5	
Nov	1.9	3.0	4.0	4.5	4.7	5.3	5.5	5.5	5.4	
Dec	2.1	3.2	3.6	4.4	4.5	4.9	5.3	5.4	5.1	
Average	2.0	2.9	3.8	4.2	4.6	5.1	5.5	5.9	5.7	6.1

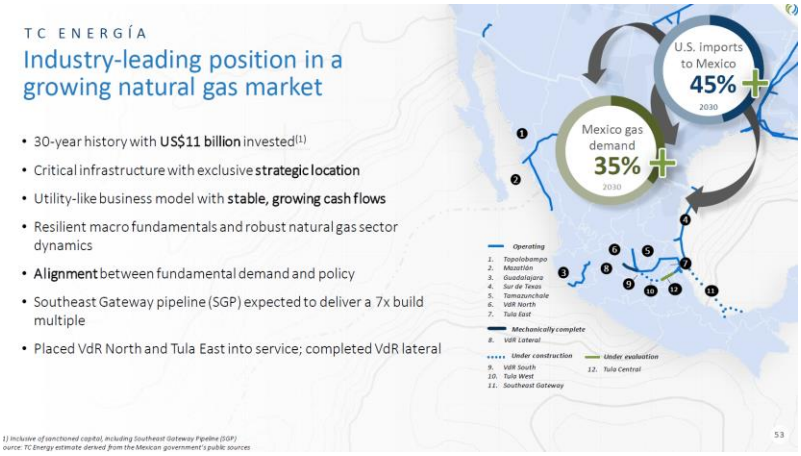
Source: EIA, SAF

TC Energy sees Permian natural gas +3 bcf/d to Mexico by 2030

TC Energy holds its investor day on Tues Nov 28 and we will expect to see an update from them on their outlook for Mexican natural gas capacity build out. ILast year's investor day highlighted TC Energy's bullish view for added natural gas pipeline exports over the balance of the 2020s. Here is what we wrote in our Dec 4, 2022 Energy Tidbits memo.. *"One overlooked upside to US natural gas in the 2020s*

is that the growth Mexico infrastructure projects are starting to kick in. Yesterday, we tweeted [LINK] "Positive for US #NatGas for 2020s. It's not just increasing #LNG exports, it's also Mexico. Mexico #NatGas demand from 9 bcfd to 12 bcfd in 2030. @TCEnergy expects MEX #NatGas pipeline imports from Permian +45% from 6 bcfd in 2022 to 9 bcfd by 2030. #OOTT." The growth in Mexico natural gas demand is a big plus to the Permian. For the last few years, every time we write on Mexico's natural gas production, we say it is still stuck below 5 bcf/d and that any increase in Mexico natural gas demand has to be met by increasing natural gas or LNG imports. For the past 5+ years, other than a few months, Mexico gas production was below 5 bcf/d. Mexico's natural gas demand growth and growing infrastructure was one of the key growth themes at TC Energy's investor day on Tuesday. Mgmt's slide deck included the below slide and mgmt said "We expect Mexican natural gas demand to increase by 3% per year across the country from 9 Bcf to 12 Bcf in 2030, with strategic government projects creating over 1 Bcf a day of incremental gas demand in the southeast alone by 2025. Now given Mexico's limited natural gas production, this increase in demand will likely be served by supplies in the U.S. and more specifically the Permian as we believe Mexican imports from the Permian are likely to increase by 45% from 6 Bcf a day in 2022 to 9 Bcf by 2030."

Figure 9: TC Energy Sees US Natural Gas Imports TO Mexico +45% to 2030



Source: TC Energy

Natural Gas: India October natural gas production up +2.6% MoM to 3.60 bcf/d

India domestic natural gas production peaked in 2010 at 4.6 bcf/d, and then ultimately declined to average 2.8 bcf/d in 2020-2021. India returned to modest growth in 2021/2022. There was a several months of basically flat production but production growth has returned in 2023. On Monday, India's Petroleum Planning and Analysis Cell released their monthly report for October's natural gas and oil statistics [LINK]. India's domestic natural gas production for October was 3.60 bcf/d, which was down +3.38% MoM from 3.73 bcf/d in September. On a YoY basis, natural gas production was up +9.26% from 3.30 bcf/d in October 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas: India LNG imports down MoM at 2.66 bcf/d in October

India LNG imports up YoY

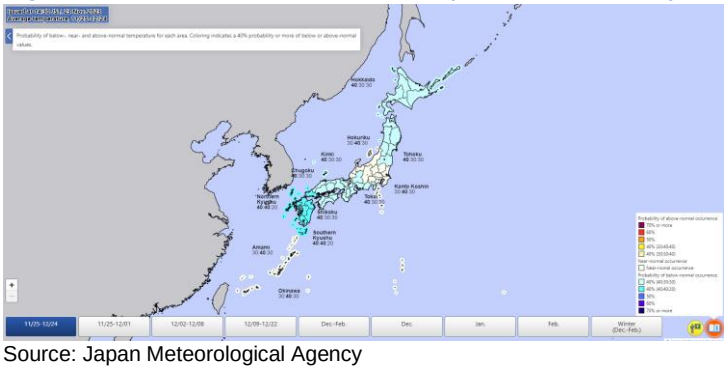
For the past several years, India has increased LNG imports whenever domestic natural gas production was flat or decreased. But the overriding factor in 2022 was the high LNG prices. India is always viewed as an extremely price sensitive buyer in terms of its LNG imports. We saw this in periods of low LNG prices such as June to Oct 2020 when India had a big ramp up in LNG imports. But with the sky-high LNG prices in 2022, India did their best to minimize LNG imports. However, now with the pull back in LNG prices, we have been seeing some India LNG imports move up or down in line with domestic production moving down or up. On Monday, India's Petroleum Planning and Analysis Cell released their monthly report for October's natural gas and oil statistics [LINK]. Over the past 3 years, India's LNG imports declined from a 2020-2021 peak of 3.84 bcf/d in Oct 2020 to just 2.85 bcf/d in Jan 2021 and lower in 2022. Additionally, October's LNG imports were 2.66 bcf/d, which is down MoM from 2.68 bcf/d in August. LNG imports are now up 18.21% YoY from 2.25 bcf/d 2022. Our Supplemental Documents package includes excerpts from the PPAC monthly.

Natural Gas: Japan forecast cooler temperatures for December

Japan's 30-day temperature forecast

We continue to stress that it's hard to catch up from a warm start to winter in natural gas regions. And if there is a warm start to winter, it means it has to be cold in Jan/Feb to catch up. Every Thursday, the Japan Meteorological Agency updates its 30-day outlook [LINK]. The November 23 update calls for cooler than normal temperatures to start December, especially in the southern prefectures. This is a change from prior forecasts which predicted warmer than normal temperatures to start December, although the middle of the month looks like it will be warmer. We checked AccuWeather who forecasts the month of December for Tokyo daily highs around 13-14C and nighttime lows of around 2-3C. This should generate more natural gas demand as people will be heating their homes at night. Below is the JMA's 30-day temperature probability forecast for Nov 25 – Dec 24.

Figure 10: JMA Nov 25 – Dec 24 Temperature Probability Forecast



Source: Japan Meteorological Agency

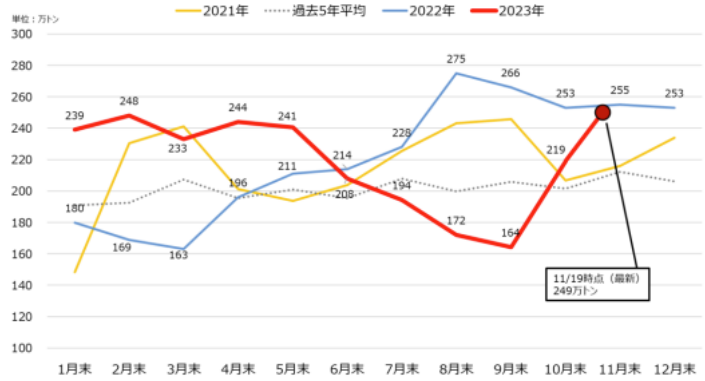
Natural Gas: Japan LNG stocks up WoW, down YoY, and above 5-yr average

Japan LNG stocks up +2.93% WoW

It was hot in Japan through September, and we saw Japan was drawing on its LNG stock in Sept for power generation, which took LNG stocks below year ago and the 5-yr average. Through October, Japan was building up their stocks and it looks like that build is continuing through November. Stocks are still below 2022 levels but now above the 5-year average. On

Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on Nov 19 were 119.6 bcf, up +2.93% WoW from Nov 12 of 116.2 bcf, and down -2.37% YoY from 122.5 bcf a year earlier, but above the 5-year average of 96.5 bcf. Storage is now the highest it's been since May. METI did not comment on the WoW increase. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 11: Japan LNG Stocks



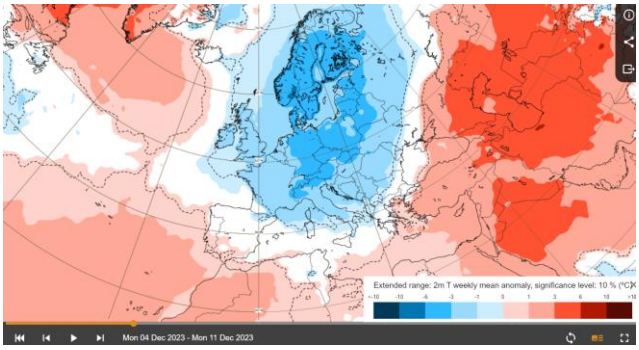
Source: METI

Natural Gas: Cooler weather to start Dec but turning warmer to end Dec

Europe Dec forecast

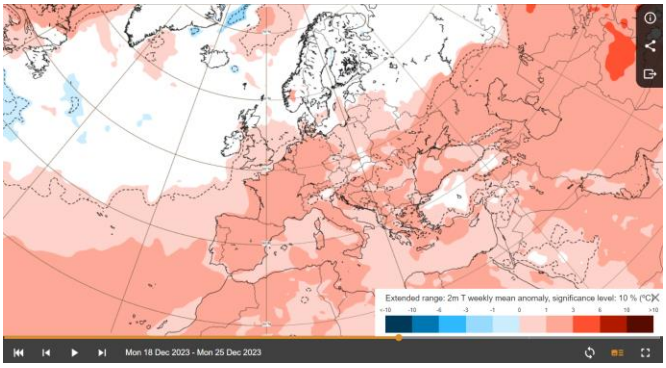
Our concern is always a warm start to winter needs to get offset sometime and a warmer than normal winter can be a hold back on natural gas/LNG prices for several months. Last winter 2022/23 was a hot winter and it held back prices all of 2023. It's been a warm start to winter in Europe but has turned cooler than normal to end Nov/start Dec. But then it is turning back to warmer than normal

Figure 12: ECMWF Dec 4-11 Temperature Probability Forecast



Source: ECMWF

Figure 13: ECMWF Dec 18-25Temperature Probability Forecast



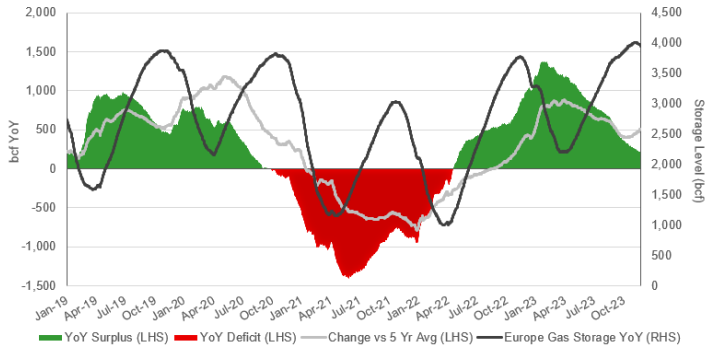
Source: ECMWF

Natural Gas: Europe storage still essentially full at 98.18%

Europe gas storage

Please note that Europe generally refers to the start of winter natural gas withdraw season as starting Oct 1, whereas North America refers to the start of winter natural gas season as starting Nov 1. After entering winter essentially full at over 99%, it looks like Europe has begun to draw on its gas storage. This week, Europe storage decreased by -1.02% WoW to 98.18% on Nov 23. Storage is now +3.80% greater than last year's levels of 94.38% and is +11.05% above the 5-year average of 87.13%. Two weeks ago, storage levels hit a 5-year high at 99.63% full. Below is our graph of Europe Gas Storage Level.

Figure 14: European Gas Storage Level



Source: Bloomberg, SAF

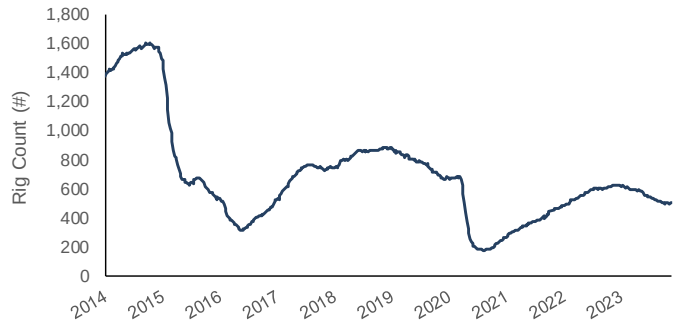
Oil: US oil rigs flat WoW at 500 rigs, US gas rigs up +3 rigs WoW at 117 rigs

US oil rigs flat WoW

On Wednesday, Baker Hughes released its weekly North American drilling rig data. This is earlier than the usual Friday release because of US Thanksgiving. (i) Total US oil rigs were flat WoW to 500 rigs. We expect this is likely the peak week until after Xmas as rigs normally seasonally peak just before Thanksgiving, which was Thursday Nov 23. (ii) Total US oil rigs were flat WoW at 500 total rigs and are down -127 rigs YoY for the week of November 22. This is up +19 rigs from the 2022 low of 481 rigs in January. (ii) Oil rigs were flat WoW at a total of 500 rigs. There were a couple of changes on a per basin basis in the major US basins

for oil rigs in the week of November 22. Cana Woodford was up +1 rig WoW at 15 oil rigs and DJ Niobara was down -1 rig WoW at 14 oil rigs. (iii) The Permian is near its lowest level since March 18, 2022, and is down -50 rigs from its recent high of 357 rigs on April 28, 2023. (iv) Gas rigs were up +3 rigs WoW to a total of 117 rigs and have now decreased -38 rigs YoY. On a per basin basis, Haynesville was up +1 rig WoW at 39 rigs, Marcellus was up +1 rig WoW at 27 rigs, and Others were up +1 rig WoW to 31 rigs and +1 misc rig WoW to 5 rigs. Below is our graph of total US oil rigs.

Figure 15: Baker Hughes Total US Oil Rigs



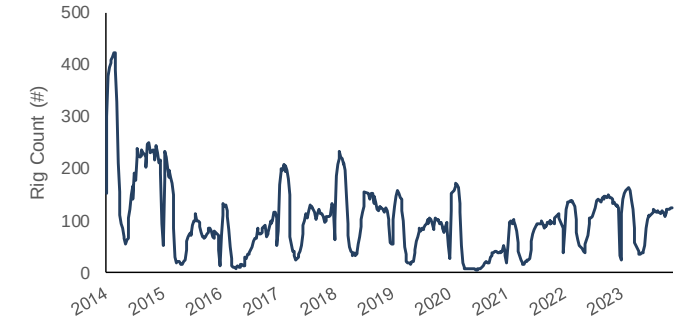
Source: Baker Hughes, SAF

Oil: Total Cdn rigs up +1 rig WoW to 197 total rigs

Cdn total rigs up WoW

For the week of November 22, total Cdn rigs were up +1 rigs WoW to 197 rigs. On a per province basis, BC was up +2 rigs WoW to 22 rigs, Alberta was down -2 rigs WoW to 144 rigs, Manitoba was up +1 rig WoW to 4 rigs, while Saskatchewan was flat WoW at 26 rigs and Newfoundland also flat WoW at 1 offshore rig. We still expect to see some modest increases over the next few weeks before the normal Xmas decline. Cdn oil rigs were up +1 WoW at 124 rigs, along with Cdn gas rigs at 73 rigs. Cdn oil rigs are down -5 rigs YoY, while gas rigs are up +8 rigs YoY. Below is our graph of total Cdn oil rigs.

Figure 16: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes, SAF

Oil: US weekly oil production estimates flat WoW at 13.200 mmb/d

US oil production flat WoW

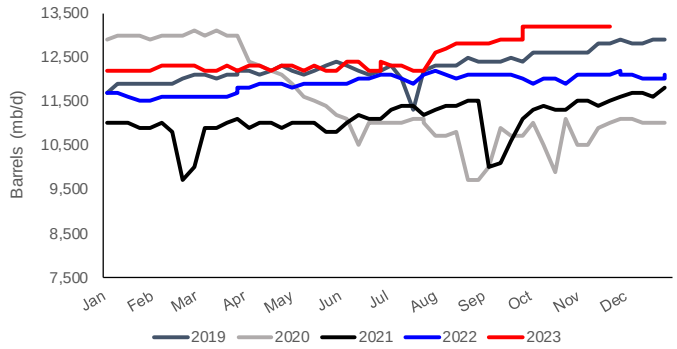
A month ago there was a second big adjustment to the EIA's weekly oil production estimates. The first was in August, when our Aug 13, 2023 Energy Tidbits memo highlighted the EIA increased their weekly US oil production estimates by +0.4 mmb/d. Our Oct 15th Energy Tidbits memo highlighted the EIA's second big, another +0.4 mmb/d, adjustment to the weekly production estimates. Last month, the EIA wrote *"Crude Oil Production Re-benchmarking Notice: When we release the Short Term Energy Outlook (STEO) each month, the weekly estimates of domestic crude production reported in the Petroleum Supply Monthly (PSM) and other current data. If we find a large difference between the two series, we may re-benchmark the weekly production estimate on weeks when we release STEO. This week's domestic crude oil production estimate incorporates a re-benchmarking that increased estimated volumes by 370,000 barrels per day, which is about 2.8% of this week's estimated production total*." This 2nd EIA adjustment was needed to bring the weekly production estimates in line with the EIA's actuals. And as noted in the Form 914 item below, the EIA's Oct adjustment basically makes up for the weekly estimates being below the EIA's actuals for Aug. This week, the EIA's production estimates were flat WoW at 13.200 mmb/d for the week ended November 17 [LINK]. Alaska was down -0.018 mmb/d WoW to 0.414 mmb/d. Below is a table of the EIA's weekly oil production estimates.

Figure 17: EIA's Estimated Weekly US Field Oil Production

	Week 1		Week 2		Week 3		Week 4		Week 5	
Year-Month	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
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
2023-Apr	04/07	12,300	04/14	12,300	04/21	12,200	04/28	12,300		
2023-May	05/05	12,300	05/12	12,200	05/19	12,300	05/26	12,200		
2023-Jun	06/02	12,400	06/09	12,400	06/16	12,200	06/23	12,200	06/30	12,400
2023-Jul	07/07	12,300	07/14	12,300	07/21	12,200	07/28	12,200		
2023-Aug	08/04	12,600	08/11	12,700	08/18	12,800	08/25	12,800		
2023-Sep	09/01	12,800	09/08	12,900	09/15	12,900	09/22	12,900	09/29	12,900
2023-Oct	10/06	13,200	10/13	13,200	10/20	13,200	10/27	13,200		
2023-Nov	11/03	13,200	11/10	13,200	11/17	13,200				

Source: EIA

Figure 18: EIA's Estimated Weekly US Oil Production



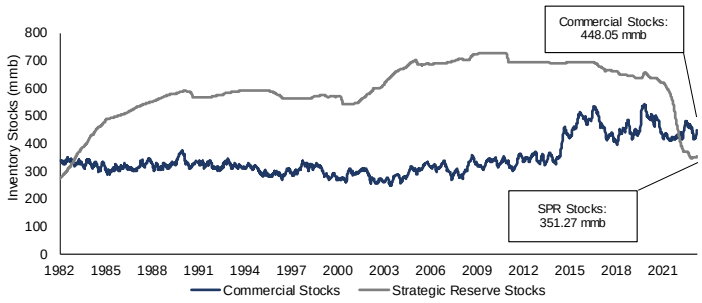
Source: EIA, SAF

US SPR reserves

Oil: US SPR reserves now -96.780 mmb lower than commercial crude oil reserves

Oil in the US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sept 16, 2022 week. This deficit widened this week after a build in commercial oil stocks of +8.700 mmb. The EIA's weekly oil data for November 17 [LINK] saw the SPR reserves stay flat WoW at 351.274 mmb, while commercial crude oil reserves increased +8.900 mmb to 448.054 mmb. There is now a -96.780 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles.

Figure 19: US Oil Inventories: Commercial & SPR



Source: EIA, SAF

Figure 20: US Oil Inventories: SPR Less Commercial

Source: EIA, SAF

Oil: US gasoline prices -$0.06 this week to $3.26

US gasoline prices

US gasoline prices continue to drift lower, in great part driven by lower California gasoline prices. Yesterday, AAA reported that US national average prices were down $0.06 this week to $3.26 on Nov 25, which is also down $0.28 MoM and down $0.32 YoY vs year ago of $3.58. Remember US gasoline prices started to ease below $4 in August 2022 and were helped in Q4 by the SPR releases.

California gasoline prices down big after Newsom allowed move to winter gas

The big reason for the drop in US gasoline prices over the past two months was the expected big drop in California gasoline prices following the surprise late Sept Gov Newsom move to then immediately switch to cheaper winter blend gasoline. That plus lower oil prices has meant a big cut in California gas prices. Yesterday, AAA reported California average gasoline prices were down $0.09 WoW to $4.19 and are now down $0.48 MoM and $0.19 YoY. And California gas prices are now down $1.89 since they were $6.08 on Sept 30, 2023. Here is what we wrote in our Oct 1, 2023 Energy Tidbits memo. "*California gasoline prices to drop as Newsom allows move to winter gas. We expect California gasoline prices to be down this week given Gov Newsom, on Thursday night, has moved an immediate switch to cheaper winter blend fuels. The San Diego Tribune reported [LINK] "In an attempt to curb a recent spike in gasoline prices, Gov. Gavin Newsom late Thursday instructed California regulators to speed the delivery of less expensive winter-blended gas to stations across the state. Winter-blended gas is about 20 to 25 cents per gallon cheaper than summer-blended gas and fuel analysts expect the waiver put in place by the California Air Resources Board at Newsom's behest will lead to a dip in prices within a few days. "This waiver will affect wholesale gas prices probably on Friday," said Patrick De Haan, head of petroleum analysis at GasBuddy, a tech company that helps drivers across the country find the cheapest places to buy gas. "But there's only one day left in the trading week. That may segue into another drop on Monday and theoretically retailers could be passing that along in lower prices this weekend, but it's not going to be much at first."*

Oil: Crack spreads decreased $0.59 WoW to $23.36

Crack spreads up this week

We remind that oil demand is driven by refiners and their ability to make money by processing oil and selling petroleum products. So crack spreads are a good indicator if

refiners will be looking to buy more or less oil. This week, crack spreads were -$0.59WoW to close at $23.36 on Nov 24, which followed $23.95 on Nov 17, $22.39 on Nov 10, $21.65 on Nov 3, and $20.47 on Oct 27. Crack spreads at $23.36 are a little above the high end of the more normal pre-Covid that was more like $15-$20, but not high enough to drive any real change in refiner plans.

Explaining 321 crack spread

People often just say "cracks", which refers to the 321 crack spread. This is the spread or margin that refiners make from buying crude at a certain price and then selling the finished petroleum products at their respective prices. The 321 crack spread is meant to represent what a typical US refinery produces. It assumes that for every three barrels of crude oil, the refinery will produce two barrels of gasoline and one barrel of distillates. So the crack spread is based on that formula and worked back to a crack spread per barrel. Below is the current 321 crack spread, which was $23.36 as of the Friday Nov 24, 2023 close.

Figure 21: Cushing Crude Oil 321 Crack Spread Nov 24, 2013 to Nov 24, 2023

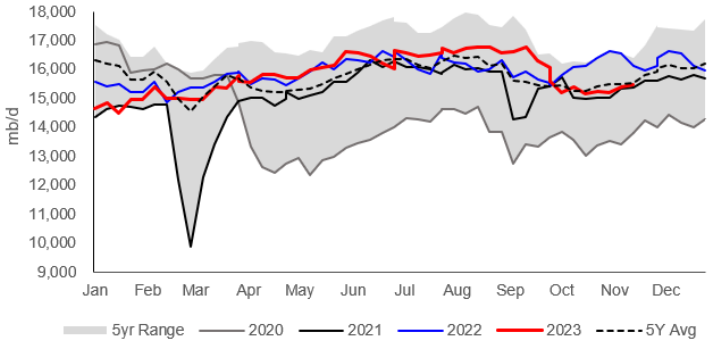
Source: Bloomberg

Oil: Refinery inputs up +0.105 mmb/d WoW to 15.504 mmb/d

Refinery inputs +0.105 mmb/d WoW

There are always unplanned issues that impact crude oil inputs into refineries, but refineries around the world follow seasonal patterns for their maintenance. There was the normal summer ramp up that lasted a little longer than normal given the big crack spreads. We saw the decline in crude oil inputs for the fall turnarounds, but it looks like US refineries are mostly coming out of turnarounds so we should start to see a steady increase in crude inputs. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended November 17 [LINK]. The EIA reported crude inputs to refineries were up +0.105 mmb/d this week to 15.504 mmb/d and are down -0.906 mmb/d YoY. Refinery utilization was up +0.9% WoW to 87.0%, which is -6.9% YoY. We likely hit the seasonal peak in refining last month.

Figure 22: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports +0.259 mmb/d WoW as oil exports down -0.103 mmb/d WoW

US net oil imports

The EIA reported US "NET" imports were up -0.259 mmb/d to 1.743 mmb/d for the November 17 week. US imports were up +0.156 mmb/d to 6.529 mmb/d. (i) Venezuela weekly imports. We know why the EIA doesn't have any data in the row for Venezuela weekly oil imports but we still don't know if the weekly oil imports are off or if Venezuela is included in the weekly oil imports in the Others number. But we do know that Chevron continues to import >100,000 b/d from Venezuela into the Gulf Coast. Give the EIA credit for putting out weekly oil import estimates, but it's a reminder that we have to be careful about using the weekly oil import estimates. Rather we need to make sure we go to the monthly data for oil imports. ii) The WoW decrease in US imports was driven mostly by "Top 10". The Top 10 was up +0.473 mmb/d. Some items to note on the country data: (i) Canada was up +0.011 mmb/d to 3.846 mmb/d. (ii) Saudi Arabia was down -0.018 mmb/d to 0.224 mmb/d. (iii) Mexico was up +0.605 mmb/d to 0.971 mmb/d. (iv) Colombia was down -0.099 mmb/d to 0.217 mmb/d. (v) Iraq was down -0.247 mmb/d to 0.036 mmb/d. (vi) Ecuador was up +0.090 mmb/d to 0.126 mmb/d. (vii) Nigeria was up +0.009 mmb/d to 0.079 mmb/d.

Figure 23: US Weekly Preliminary Imports by Major Country

(thousand b/d)	Aug 18/23	Aug 25/23	Sep 1/23	Sep 8/23	Sep 15/23	Sep 22/23	Sep 29/23	Oct 6/23	Oct 13/23	Oct 20/23	Oct 27/23	Nov 3/23	Nov 10/23	Nov 17/23	WoW
Canada	3,832	3,405	3,679	3,645	3,287	3,880	3,291	3,544	3,723	3,387	3,485	3,873	3,835	3,846	11
Saudi Arabia	221	462	567	383	383	383	291	67	208	436	294	192	242	224	-18
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	780	437	699	1,095	603	844	524	656	609	614	1,004	465	366	971	605
Colombia	290	295	300	211	287	286	143	289	150	146	74	364	316	217	-99
Iraq	283	232	100	248	233	280	306	247	127	182	351	187	283	36	-247
Ecuador	192	328	99	0	134	167	125	0	0	92	133	61	36	126	90
Nigeria	89	144	220	219	0	3	0	46	48	89	30	39	70	79	9
Brazil	198	245	68	545	209	240	209	362	63	221	168	234	135	257	0
Libya	85	0	90	0	0	0	89	88	47	86	106	0	86	86	0
Top 10	5,970	5,548	5,822	6,346	5,136	6,083	4,978	5,299	4,975	5,253	5,645	5,415	5,369	5,842	473
Others	963	1,069	948	1,236	1,381	1,146	1,237	1,030	967	760	780	979	1,004	687	-317
Total US	6,933	6,617	6,770	7,582	6,517	7,229	6,215	6,329	5,942	6,013	6,425	6,394	6,373	6,529	156

Source: EIA, SAF

Oil: Mexico oil production including partner volumes just below 1.6 mmb/d

Pemex October oil production

On Friday, Pemex posted its October 2023 oil production data. [LINK] Pemex does not provide any commentary on the data, but reported October oil production, including partners, was 1.574 mmb/d, which was -7.3% YoY and -1.19% MoM. The big picture story remains the same - Mexico (Pemex) oil production is stuck around 1.6 mmb/d for the last three years. Pemex has been unable to grow Mexico oil production, which means that any increase in

Pemex Mexico refineries crude oil input will result in less Mexico oil for export including to the US Gulf Coast. And it also means that if Mexico has refinery issues in a month, there will be more Mexico oil for export in a month. Below is our table tracking Pemex oil production.

Figure 24: Pemex (Incl Partners) Mexico Oil Production

Oil Production (thousand b/d	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	2,259	2,020	1,909	1,623	1,724	1,651	1,705	1,584	-7.1%
Feb	2,214	2,016	1,876	1,701	1,729	1,669	1,684	1,582	-6.1%
Mar	2,217	2,018	1,846	1,691	1,745	1,697	1,696	1,597	-5.8%
Apr	2,177	2,012	1,868	1,675	1,703	1,693	1,686	1,608	-4.6%
May	2,174	2,020	1,850	1,663	1,633	1,688	1,690	1,611	-4.7%
June	2,178	2,008	1,828	1,671	1,605	1,698	1,702	1,609	-5.5%
July	2,157	1,986	1,823	1,671	1,595	1,701	1,707	1,573	-7.9%
Aug	2,144	1,930	1,798	1,683	1,632	1,657	1,691	1,602	-5.3%
Sept	2,113	1,730	1,808	1,705	1,643	1,709	1,685	1,593	-5.5%
Oct	2,103	1,902	1,747	1,655	1,627	1,692	1,698	1,574	-7.3%
Nov	2,072	1,867	1,697	1,696	1,633	1,691	1,706		
Dec	2,035	1,873	1,710	1,706	1,650	1,694	1,576		

Source: Pemex, SAF

Oil: Dos Bocas refinery gasoline production reportedly delayed again for two months

Delays to Dos Bocas refinergy

As noted above, Mexico hasn't been reducing oil exports in 2023 as expected and this is due to the delayed startup in the new 340,000 b/d Dos Bocas refinery. As soon as Dos Bocas cranks up oi processing, it will be reducing Mexico oil exports. It was supposed to ramp up in November, but that looks to be pushed back to Jan. On Tuesday, Bloomberg reported [LINK] "*The Dos Bocas refinery will produce commercial gasoline in January 2024, an executive at Petróleos Mexicanos, a state-owned company known as Pemex, told Bloomberg Línea, a date that exceeds the deadline promised by Mexican President Andrés Manuel López Obrador. Héctor Ruíz, director of projects for gas, petrochemical and refining processes at Pemex, said that the final price of the Dos Bocas refinery will not be Pemex's project director for gas, petrochemical and refining processes, Héctor Gustavo Ruíz Monjaraz, explained in an interview that the real risk conditions of the project have required more time than planned, but the start-up process of Pemex's seventh refinery is going "well." "We're going to do diesel in a jiffy, and gasoline in the first few weeks of next year, there's going to be white smoke and everybody's going to be very happy," he said. AMLO, as the president is known, assured that commercial production of gasoline and diesel in Dos Bocas would begin "at the latest" in November 2023, after multiple breaches in the start date, originally scheduled for July 1, 2022, when the refinery was inaugurated."* Our Supplemental Documents package includes the Bloomberg report.

Oil: Mexico exports 1.053 mmb/d of oil in October, -5.90% MoM

Pemex October oil exports

On Friday, Pemex posted its oil exports for October. [LINK] Pemex does not provide any commentary on the data but reported October oil exports were 1. 053 mmb/d, which was +8.4% YoY and -5.90% MoM vs 1.119 mmb/d in September. Pemex oil exports were down -0.066 mmb/d MoM overall but its exports to the US was only down slightly in October at 0.757 mmb/d vs 0.771 mmb/d in August. The US tends to be a higher margin market so Pemex typically prioritizes oil exports to the US. Please note that Mexico oil exports were expected to decline in Q4/23 with the start up of their new 340,000 b/d Olmeca (formerly known as Dos Bocas) refinery, but it sounds like there are still delays in the ramp up ie. why oil exports haven't really gone down. Below is our table of the Pemex oil export data.

Figure 25: Pemex Mexico Oil Exports

Oil Exports (thousand b/d)	2016	2017	2018	2019	2020	2021	2022	2023	23/22
Jan	1,119	1,085	1,107	1,071	1,260	979	832	980	17.8%
Feb	1,241	1,217	1,451	1,475	1,093	1,006	925	949	2.6%
Mar	1,062	1,001	1,176	1,150	1,144	925	905	971	7.3%
Apr	1,081	1,017	1,266	1,023	1,179	923	1,024	989	-3.4%
May	1,204	958	1,222	1,205	1,062	1,031	965	1,087	12.6%
June	1,098	1,157	1,110	995	1,114	1,106	1,029	1,203	16.9%
July	1,146	1,255	1,156	1,079	1,051	1,173	1,062	1,052	-0.9%
Aug	1,261	1,114	1,181	1,082	1,190	1,099	915	1,076	17.6%
Sept	1,425	1,159	1,206	995	1,023	983	1,022	1,119	9.5%
Oct	1,312	1,342	1,027	963	908	935	971	1,053	8.4%
Nov	1,273	1,388	1,135	1,114	1,171	1,025	893		
Dec	1,115	1,401	1,198	1,115	1,243	1,037	900		

Source: Pemex, SAF

Norway October oil production

Oil: Norway October oil production of 1.777 mmb/d, up +6% MoM

On Monday, the Norwegian Petroleum Directorate released its October production figures [LINK]. It reported oil production of 1.777 mmb/d, up +6% MoM from 1.677 mmb/d in September and +1.5% YoY from 1.750 mmb/d in October 2022. October's production actuals came in -3.2% (-0.059 mmb/d) under the forecast volumes of 1.836 mmb/d. The NPD does not provide any explanations for the MoM changes but we expect it was likely due to the completion of some platform maintenance that took place in September.

Figure 26: Norway October 2023 Production

		Oil mill bbl/day	Sum liquid mill bbl/day	Gas MSm³/day	Total MSm³ o.e/day
Production	**October 2023**	**1.777**	**1.981**	**328.1**	**0.643**
Forecast for	October 2023	1.836	2.066	354.7	0.683
Deviation from forecast		-0.059	-0.085	-26.7	-0.040
Deviation from forecaset in %		-3.2 %	-4.1 %	-7.5 %	-5.9 %
Production	September 2023	1.677	1.853	199.1	0.494
Deviation from	September 2023	0.100	0.128	128.9	0.149
Deviation in % from	September 2023	6 %	6.9 %	64.7 %	30.2 %
Production	October 2022	1.750	1.971	349.4	0.663
Deviation from	October 2022	0.027	0.010	-21.3	-0.020
Deviation in % from	October 2022	1.5 %	0.5 %	-6.1 %	-3 %

Source: Norwegian Petroleum Directorate

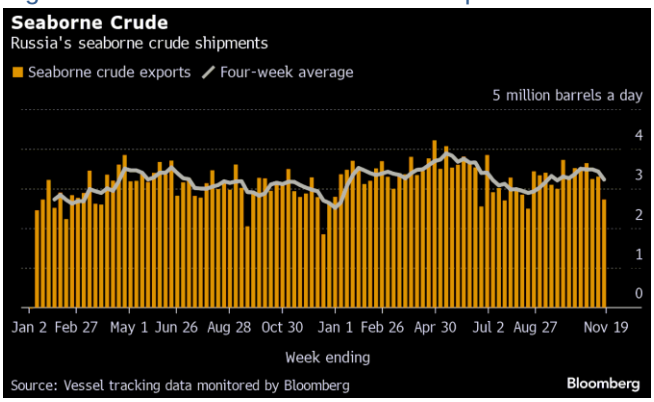
Russia oil shipments over commitment

Oil: Russia crude oil shipments down with increased Russia refinery runs

No one should be surprised to see that Russia oil shipments were down give Russia oil refineries have been coming out of fall maintenance and increasing crude oil runs. On Tuesday morning, we tweeted [LINK] "*It's just math. Russia refinery runs up = Less #Oil for export. 11/19 wk: RUS oil shipments -580,000 b/d WoW to ~2.7 mmb/d. And 4-wk average down to 3.23 mmb/d ie. less than commitment to cut exports to 3.23 mmb/d. Thx @JLeeEnergy #OOTT*." Our tweet included the below graph from Bloomberg's weekly review of Russia crude oil shipments. Bloomberg wrote "*Russia cut back its seaborne crude exports to the lowest since August before a meeting of OPEC+ oil minsters this weekend when compliance with production cuts will be in sharp focus. The move came after shipments*

surged in October. About 2.7 million barrels a day of crude was shipped from Russian ports in the week to Nov. 19, tanker-tracking data monitored by Bloomberg show. That was down by 580,000 barrels a day from the revised figure for the period to Nov. 12, the biggest week-on-week drop in more than four months." And "*The less volatile four-week average flow fell to 3.23 million barrels a day, down by about 200,000 barrels a day from the revised figure for the period to Nov. 12. That was the lowest in eight weeks, but still about 340,000 barrels a day above shipments in the period to Aug. 20, when Moscow's crude export cuts were at their deepest.""* Our Supplemental Documents package includes the Bloomberg report.

Figure 27: Russia's seaborne crude shipments thru Nov 19 week



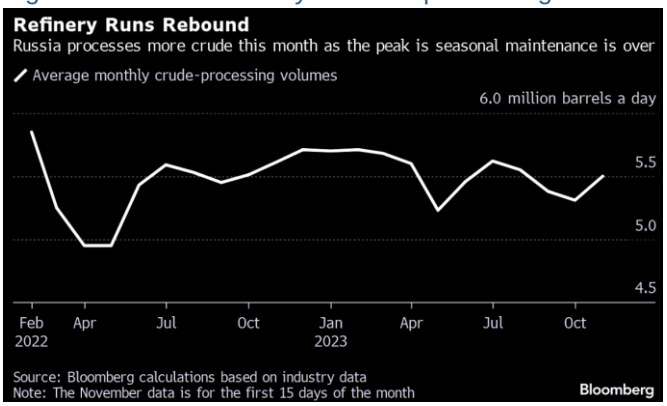
Source: Bloomberg

11/17/23: Russia refineries processing more oil so less "oil" for export

Our Monday tweet included our Nov 17 tweet that we wereorte about in last week's (Nov 19, 2023) Energy Tidbits memo. Here is what we wrote last week. "*Please note that this comment is with respect to Russia's export of "oil" and, as noted above, Russia should be able to increase its gasoline exports with the gasoline export ban being lifted and Russia refineries producing more gasoline. All refineries go thru seasonal maintenance. As expected, Russian oil refineries are coming out of maintenance and that means their refineries are processing more oil and therefore there is less oil for export. The seasonal maintenance isn't finished so oil processing should be increasing for the next month. On Friday, we tweeted [LINK] "Russian oil refineries processing more oil = less #Oil for export. Russia refinery processed 5.55 mmb/d for Nov 9-15, +84,000 b/d vs early Nov. Still not finished seasonal maintenance so oil processing volumes should go higher in Dec. Thx @ja_herron. #OOTT." On Friday, Bloomberg reported "Russia's oil-processing rates in the week to Nov. 15 have jumped to the highest in 12 weeks as the nation's refiners have returned most of their capacity online after seasonal maintenance. The country processed nearly 5.55 million barrels a day between Nov. 9-15, according to a person with knowledge of the matter. These are the highest daily processing rates since late August, and the volumes are almost 84,000 barrels a day more than the average for the first days of November, Bloomberg calculations based on historic data show." Bloomberg also wrote "Completion of seasonal maintenance this month may bring Russia's oil-processing rates in December back to 5.8 million barrels per*

day, the level last seen in early April, according to estimates of market intelligence firm Kpler."

Figure 28: Russia refinery crude oil processing volumes



Source: Bloomberg

Oil: What type of deal will OPEC announce on Nov 30? Will it move markets?

OPEC+ meeting is now Nov 30

OPEC+ meeting was supposed to be held today but, earlier this week, was delayed to Nov 30 and it will reportedly be an online meeting. There had been the expectation for some sort of deal but then the OPEC watchers reported that OPEC hasn't been able to get Angola. Congo and Nigeria to agree with lower baseline production levels as these countries have not been able to produce to their existing quota. We do expect to see a deal announced on Nov 30. And we have to believe that any deal Saudi Energy Mininster Abdulaziz was or is orchestrating is much more than getting these countries to accept lower baselines. Rather, we think the extension of voluntary Saudi production cuts and Russia oil exports is the main component of some sort of deal that at a minimum includes something on the African country baselines and some sort of compliance mechanism for members producing more than quota such as Iraq. Recall Iraq's Oct production was 109,000 b/d over quota. The real question is can Abdulaziz orchestrate something bigger that could include UAE agreeing to hold back on producing to its higher previously approved baseline/quota and small cuts across the board for all members that would be reviewed after the seasonally low Q1 demand period. We think any additional cut wouldn't be for a year but focus on being attentive to the seasonally lower demand in Q1 of every year. It would also be the way Abdulaziz sells it to OPEC+ members. We remind that the reason why we have thought all along that Saudi would extend its voluntary cuts thru Q1/24 is that oil demand is always seasonally lower QoQ in Q1 of every year versus the prior Q4. If Abdulaziz can pull off a bigger deal like the above, we think it moves oil higher as markets can look through the seasonally lower oil demand. The next bigger picture question is can he bring Libya into the quotas? We don't think he brings Iran and Venezuela into the quotas as both are still subject to US sanctions, although Biden has waved Venezuela for another five months. So we are expecting something and something more than a minimum deal. And after all, Saudi Arabia Energy Minister Abdulaziz is The Man and seems to always to get to a deal. We are hopeful to post a short blog tomorrow on why we believe Saudi Arabia needs to have an OPEC+ deal now instead of using a hammer on other OPEC+ members by bringing back its 1 mmb/d voluntary cut.

Oil: Houthis seize partially Israeli owned ship in Red Sea

Houthis seize Israeli owned cargo ship

The Houthis warned on Israel linked ships in the Red Sea and took action last Sunday. We had an early Sat 10pm MT news cut off for last week's memo so we couldn't include the big Sunday morning breaking news on the Houthis seizing a ship in the Red Sea. This finally brought attention to the risk of transit thru the Red Sea and Bab el Mandeb, although the working assumption from markets is that the risk is only to ships with Israel links and not other ships/tankers. Mid Sunday morning, we tweeted [LINK] *"Breaking. Houthis say seized an Israeli ship. [LINK]. IDF says no Israeli's on board, "It is not an Israeli ship" [LINK] Suez Canal 101. See 👇11/09 reminder, all Suez Canal cargo and tankers go thru Red Sea/Bab el Mandeb. #OOTT."* Notwithstanding the IDF statement the Jerusalem Post reported "*A cargo ship partially owned by an Israeli businessman was hijacked by Yemen's Houthi rebels in the Red Sea on Sunday, Israel confirmed on Sunday, accusing Iran of directing the maritime piracy. The cargo ship, Bahamas-flagged Galaxy Leader, was leased from a British company partly owned by Israeli Rami Unger to a Japanese company."*

Houthis have only warned on Israel ships and not goods carrying to/from Israel

Here is what we rote in last week's (Nov 19, 2023) Energy Tidbits memo. "*If we were looking for a reason why people aren't worried about sea transit thru the Red Sea and Bab el Mandeb despite missiles and drones being shot down is that they must believe the shooting can be limited to US navy ships and Israel flagged/owned ships. So far, the Houthis have only warned on Israel flagged and owned ships and not ships that are carrying goods to and from Israel. People must be comfortable that this targeting limits can be done without impacting any other shipping thru the Red Sea and Bab el Mandeb."*

Oil: US destroyer shoots down another Houthi drone heading toward it in Red Sea

US shot down Houthi drone

Up until the Houthi ship seizure, we have been surprised that markets haven't been worried about tanker and cargo ship travel thru the Red Sea and Bab el-Mandeb and the reality that every tanker/cargo ship that goes thru the Suez Canal has to go thru the Red Sea and Bab el-Mandeb. We continue to be surprised that there doesn't appear to be risk concerns on shipping in the Red Sea and Bab el Mandeb. This week, we saw more Houthis drone shot down by Israel over the Red Sea. And we also saw more Houthi drones shot at US navy ships. On Wednesday, U.S. Central Command tweeted [LINK] "*On the morning (Yemen time) of November 23, the USS Thomas Hudner (DDG 116) shot down multiple one-way attack drones launched from Houthi controlled areas in Yemen. The drones were shot down while the U.S. warship was on patrol in the Red Sea. The ship and crew sustained no damage or injury."* We still don't see people too worried that drones and missiles are being shot down over the Red Sea, which is the major sea transit for all ships/tankers that go thru the Suez Canal. And that Houthi drones are being shot at US navy ships. We always say imagine what if what was happening in the Red Sea had been happening in the Persian Gulf, oil prices would be way higher. We recognize that others don't share this concern. But we just have to think there is added risk to ships in the Red Sea when there are more missiles being launched and shot down. We certainly don't dispute that the Strait of Hormuz is the most important potential shipping chokepoint for oil and LNG transit and that continues to be the primary worry/focus for most wondering if the Israel/Hamas war expands to a regional war involving Iran. But the reality so far is that there is increasing military action in the Red

Sea thanks to the Houthis. We say Suez Canal 101 because people overlook that every tanker or cargo ship that goes thru the Suez Canal has to also go thru the Red Sea and Bab el Mandeb.

Over 6 mmb/d of oil & products is tankered thru the Bab el-Mandeb

Here is what we wrote in our Aug 1, 2021 Energy Tidbits memo. "*The Bab el-Mandeb is one of the world's most significant chokepoints for moving oil and petroleum products. The EIA Aug 27, 2019 brief "The Bab el-Mandeb Strait is a strategic route for oil and natural gas shipments" reminds "The Bab el-Mandeb Strait is a sea route chokepoint between the Horn of Africa and the Middle East, connecting the Red Sea to the Gulf of Aden and Arabian Sea. Most exports of petroleum and natural gas from the Persian Gulf that transit the Suez Canal or the SUMED Pipeline pass through both the Bab el-Mandeb and the Strait of Hormuz." And the EIA estimates "In 2018, an estimated 6.2 million barrels per day (b/d) of crude oil, condensate, and refined petroleum products flowed through the Bab el-Mandeb Strait toward Europe, the United States, and Asia, an increase from 5.1 million b/d in 2014. Total petroleum flows through the Bab el-Mandeb Strait accounted for about 9% of total seaborne-traded petroleum (crude oil and refined petroleum products) in 2017. About 3.6 million b/d moved north toward Europe; another 2.6 million b/d flowed in the opposite direction mainly to Asian markets such as Singapore, China, and India". Our Supplemental Documents package includes the EIA brief [LINK].*

Figure 29: Bab el-Mandeb Strait, a world oil chokepoint

Source: EIA

Oil: Did Houthis or who hit Israeli-managed vessel with a drone in the India Ocean

Drone attack in India Ocean

We have been of the view that Iran is another who really doesn't want to be drawn directly into an regional war. Rather they seem happy to leave it to their surrogates. So we think it is best to be careful on who we write on yesterday's report of an Israeli managed ship getting it by a drone in the northeast portion of the Red Sea as to who launched the drone, which is reported to be an Iranian model drone If, as we believe, Iran really doesn't want to be drawn into a direct war, then we interpret the Reuters reporting as being an Iranian model drone but one that is more likely launched the Houthis. Yesterday, Reuters reported [LINK] "*Israeli-managed vessel hit by suspected Iranian drone, US official says. A container ship managed*

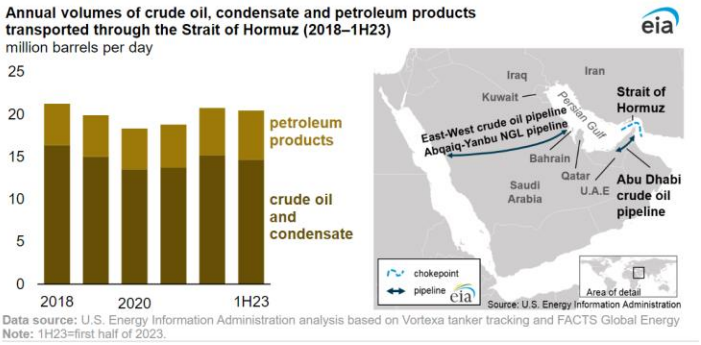
by an Israeli-controlled company was hit by a suspected Iranian drone in the Indian Ocean, causing minor damage to the vessel but no injuries, a U.S. defence official said on Saturday. The Malta-flagged CMA CGM SYMI, recently renamed Mayet, was struck on Friday by an unmanned aerial vehicle, which appeared to be an Iranian Shahed-136 drone, in the northeast portion of the Indian Ocean, the official said, asking not to be named."

Strait of Hormuz

Oil: EIA updates its Strait of Hormuz is the world's most important transit chokepoint

To dated, the market has been focused on the Strati of Hormuz risk as it is the most important world oil chokepoint. We have been more worried to date on interruptions via the Red Sea and Bab el Mandeb but have also been noting how the Strait of Hormuz is more significant to supply if any interruption. And we have been included the EIA's latest Strait of Hormuz blog, which is four years old. But on Tuesday, the EIA updated its Strait of Hormuz blog "*The Strait of Hormuz is the world's most important oil transit chokepoint*" [LINK]. "*The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because large volumes of oil flow through the strait. In 2022, its oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. In the first half of 2023, total oil flows through the Strait of Hormuz remained relatively flat compared with 2022 because increased flows of oil products partially offset declines in crude oil and condensate." "Between 2020 and 2022, volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz rose by 2.4 million b/d as oil demand recovered after the economic downturn from the COVID-19 pandemic. In the first half of 2023, shipments of crude oil and condensates dropped because OPEC+ members implemented crude oil production cuts starting in November 2022. Flows through the Strait of Hormuz in 2022 and the first half of 2023 made up more than one-quarter of total global seaborne traded oil. In addition, around one-fifth of global liquefied natural gas trade also transited the Strait of Hormuz in 2022."* Our Supplemental Documents package includes the EIA blog.

Figure 30: Crude oil, Condensate & Petroleum Products Flows Thru Strait of Hormuz



Source: EIA

Figure 31: Volumes thru the Strait of Hormuz 2018-1H23

Volume of crude oil, condensate, and petroleum products transported through the Strait of Hormuz (2018–1H23)
million barrels per day

	2018	2019	2020	2021	2022	1H23
Total oil flows through Strait of Hormuz	**21.3**	**19.9**	**18.3**	**18.8**	**20.8**	**20.5**
Crude oil and condensate	16.4	15.0	13.5	13.7	15.2	14.7
Petroleum products	4.9	4.9	4.8	5.1	5.6	5.8
World maritime oil trade	**77.4**	**77.1**	**71.9**	**73.2**	**75.2**	**76.3**
World total petroleum and other liquids consumption	**100.1**	**100.9**	**91.6**	**97.1**	**99.6**	**100.3**
LNG flows through Strait of Hormuz (billion cubic feet per day)	**10.3**	**10.6**	**10.4**	**10.6**	**10.9**	**10.8**

Source: EIA

Iran barrels being rebranded

Oil: Looks like Iran oil to China being rebranded as Malaysia oil

On Monday night, we tweeted [LINK] "*Looks like Iran oil being rebranded. @business reports China #Oil imports from Malaysia: 1.4 mmbd in Oct, up vs 1.3 mmbd in Sept. And no reported imports from Iran. Yet OPEC est Malaysia only produces 0.6 mmbd. Thx @business. #OOTT."* Bloomberg had just posted "*China Imports of Russian Oil Drop as Flows From Malaysia Expand*. *China imported 8.54m tons of crude from Russia in Oct., down from 8.74m tons in Sept., according to customs data. * Shipments from Malaysia rose to 5.88m tons vs 5.21m tons, expanding to the highest since June."* And **No Iranian or Venezuelan imports were reported last month*." As our tweet noted, China reported oil imports from Malaysia were 1.4 mmb/d in Oct and 1.3 mmb/d in Sept. Our tweet included the table from OPEC's Monthly Oil Market Report Nov that notes Malaysia only produces 0.6 mmb/d. We expect most believe any extra Malaysia barrels to China are Iran barrels. Our Supplemental Documents package includes OPEC's table of oil production by country.

Iran adding 300,000 b/d

Oil: Iran expects to add 300,000 b/d to production in Q1/24

One of the negatives to oil in H2/23 will continue to be a negative in Q1/24 – Iran continues to grow its oil production and add 300,000 b/d to production this winter. On Tuesday morning, we tweeted [LINK] "*Negative to #Oil. Friday, Iran said at 3.3 mmb/d, adding 300,000 b/d to hit 3.6 mmb/d by end of winter. Iran delivering on Aug warning it was adding 0.6 mmb/d. See 👇08/13 tweet. Will US clamp down on sanctions like said last week or keep turning blind eye? #OOTT."* Just like he warned in August, Iran's oil minister is saying Iran's oil production is going higher over the next few months. Shana (news agency for Iran's oil ministry) reported [LINK] "*Iran oil output up 50% despite sanctions, to hit 3.6m bpd by next March: Owji. Iran's oil production has increased 50 percent since the 13th administration took office two years ago, said Oil Minister Javad Owji on Friday. The minister, who made the announcement in a meeting with some religious sources of imitation, including Ayatollah Seyyed Hashem Hosseini Bushehri and Ayatollah Abdollah Javadi Amoli, in the holy city of Qom, north-central Iran, added the country's oil production stood at 2.2 million barrels per day (bpd) when the incumbent government took over in August 2021 while the output has*

now soared to 3.3m bpd and will hit 3.6m bpd by the end of the upcoming winter." Our Supplemental Documents package includes the Shana report.

08/13/23: Will or can anyone stop Iran from adding ~0.6 mmb/d in H2/23?

No one should be surprised that Iran has added so much oil production in H2/23, that is unless they don't believe anything said by Iran's Oil minister. Here is what we wrote in our Aug 13, 2023 Energy Tidbits memo. "*We still believe one of the major oil risks over the coming months is Iran increasing supply and exports. Here is what we wrote in last week's (Aug 13, 2023) Energy Tidbits memo. "Iran looks to be an overlooked risk to oil prices in H2/23 and not because of sanctions removal. Rather because they are adding oil production capacity and we don't know who will or can stop them from adding the new oil capacity to oil markets. (i) Earlier this morning, we tweeted [LINK] "Near term Oil hold back. Another Iran reminder today that at 3.2 mmb/d & to exceed 3.3 mmb/d by late Aug. Vs #OPEC MOMR Secondary Sources had Iran at 2.828 mmb/d in July. Who can or will stop Iran from adding up 0.6 mmb/d to #Oil markets in next few mths? #OOTT." It follows our tweet yesterday [LINK] "Who can or will stop Iran from adding up to 0.6 mmbd to #OIl markets over coming mths? Iran not subject to #OPEC quota. US negotiating with Iran on prisoners & releases of Iranian funds. See 👇08/09/23 thread - Iran is #oil supply risk in H2. #OOTT @DanialRahmat12." Our Aug 8, 2023 tweet was [LINK] "Iran near term #Oil supply adds! Given #Biden doesn't have any stroke over #MBS & tapped SPR, wonder if he effectively turns a blind eye as he sees this as a replacement for an SPR release to try to help keep a lid on oil/#Gasoline prices for 2024. Thx @DanialRahmat12! #OOTT. " (ii) On Wednesday, Tehran-based analyst, Danial Rahmat, tweeted [LINK] "CEO of #NIOC: Iran's crude prod. to increase by 150 k b/d in a week. By the end of Sep. 100k b/d will be added and output will reach 3.5 mil. b/d. In H2, about $8 b deals will be signed to develop 2 joint fields. #OOTT @Energy_Tidbits @sean_evers @FrankKaneDubai @imannasseri." Rahmat was reporting on comments by National Iranian Oil Company managing director, Khojasteh mehr, at a press conference in Tehran on Aug 9. (iii) Later PressTV (Iran state media) reported on Khojasteh mehr's comments on the press conference. [LINK] "Iran will reach a milestone oil production figure of 3.5 million barrels per day (bpd) in late September, according to the CEO of state oil company NIOC, despite sanctions imposed on the country by the US. Mohsen Khojasteh Mehr said on Wednesday that Iran's oil output will increase by 150,000 bpd within the next week and by another 100,000 bpd by the end of the month to September 22 to reach a total of 3.5 million bpd. The figure would be a major increase from 2.2 million bpd of oil production reported in August 2021 when the current administrative government led by President Raeisi took office, said Khojasteh Mehr. He said the growth in oil output will entirely serve Iran's plans to increase its oil exports." Earlier this morning, our tweet attached the Irna (state media) reporting [LINK] on Iran oil minister saying today that oil production was 3.2 mmb/d and to surpass 3.3 mmb/d by the end of August. (iv) Iran is saying they can hit 3.5 mmb/d in late Sept. Based on this week's OPEC Aug MOMR Secondary Sources production for Iran of 2.828 mmb/d in July, this is an add of >600,000 b/d. We think this is a significant item as we don't see who will or can block Iran from adding these barrels to global markets. Iran is one of three countries not subject to OPEC+ quotas so isn't held back by OPEC+ in*

increasing production and exports. (v) In theory, Iran is under sanctions but US has turned a blind eye to stopping Iran oil exports. And given the late week breaking news of a potential US/Iran prisoner swap and release of Iran's blocked funds in South Korea, it's hard to see the US stepping up to enforce sanctions. Plus there is the political reality that it's only 15 months to the US 2024 Presidential election. Our Aug 9 tweet said "Given #Biden doesn't have any stroke over #MBS & tapped SPR, wonder if he effectively turns a blind eye as he sees this as a replacement for an SPR release to try to help keep a lid on oil/#Gasoline prices for 2024." US gasoline prices keep inching up. Biden used the SPR to keep a lid on prices in the run up to the 2022 mid-term elections. He doesn't have that cushion now so he can look at Iran's new capacity as a bit of SPR replacement to keep a lid on oil prices. Our Supplemental Documents package include the PressTV report."

Oil: Kurdistan PM says restart of oil exports all about Iraq keeping IOCs whole

Kurdistan oil still shut in

Kurdistan PM Barzani didn't use these use these words but his comments really define the hold up of an agreement with Iraq as a significant issue that Iraq has to keep the IOCs operating in Kurdistan whole as to their economics. On Tuesday, we tweeted [LINK] "*When will Kurdistan resume #Oil exports? Doesn't sound soon! @masrourbarzani "I cannot tell you when" "ball is in Baghdad's court. Are they willing to give he actual cost of production to the IOCs that are operating in Kurdistan". See 👇SAF transcript. Thx @BBCMaryam. #OOTT."* The BBC interviewed Kurdistan PM Barazani at a conference. There is the basic economic issue to be resolved will Baghdad give the same economic terms to the IOCs that they already have with Kurdistan. If so, then it sounds like oil exports can get going. And this sounds like a big gulf to bridge. And Barzani noted that Iraq's saying the IOCs need to live under a cost recovery of $6 I snow where near the cost recovery the IOCs are getting under their deal with Kurdistan. And he also reminded there is a big picture constitutional issue that Kurdistan won't give up its rights on oil. Not clear if that would hold up exports if Baghdad agrees to the deal. He says "*I cannot tell you when*" a deal will happen. It's hard to see a deal in the near term. We created a transcript of Barzani's comments. Here are a couple of his key comments. "*To be more specific, we have contracts with international oil companies. These contracts are valid and legal. And of course, the KRG respects these contracts. But there is a cost for the production of oil by these IOCs because they are the ones that have invested in Kurdistan. So it's not like Baghdad, we haven't invested in producing oil, the companies have invested so they need to have the investment cost, and also the production cost and also the profit based on the contract they have. There is a price, there is a cost for the production of oil. Unfortunately, Baghdad is talking about a number that Is not real. They're introducing $6 for the cost of production for each barrel in Kurdistan. There are similar wells in Kurdistan, for instance in [Qayara?], that the cost of production of oil in that well is $34. So how come another well in Kurdistan, the cost should be $6. Soi there is a huge difference."* And ""*We are ready. As I said, we are in the KRG, the ministry of natural resources is ready as of today. Now the ball is in the Baghdad's court. Are they willing to give the actual cost of production to the IOCs that are operating in Kurdistan? If they are, we can definitely produce and they can produce*." Our Supplemental Documents package includes the transcript we made o the Barzani comments.

11/17/23: IOCs want to keep Kurdistan PSCs, big hurdle to Kurdistan/Iraq deal

Barzani seemed to suggest that the key for a deal is not necessarily keep production sharing agreement but making sure the IOCs were economically kept whole. We ar'n't sure that will be enough fo the IOCs as production sharing agreements typically have better financing potential than profit sharing agreements. We haven't seen any change in the position of the IOCs on moving awayh from production sharing agreements. Here is what we wrote in last week's (Nov 19, 2023) Energy Tidbits memo. "*On Friday, we tweeted [LINK] "Big roadblock for Iraq/Kurdistan deal. APIKUR (Kurd #Oil industry association) condition precedent is Production Sharing Contracts remain in force & governed by English law. Iraq says IOCs must switch to Profit Sharing Contract. #OOTT." It looks like there is at least one big roadblock for an Iraq/Kurdistan deal to resume Kurdistan oil exports via Turkey. Iraq has been saying they need to get Kurdistan oil companies to give up their Production Sharing Contracts and move to a Profit Sharing Contracts. On Friday, APIKUR, the industry association for the Kurdistan oil and gas companies, released its statement on what it needs from any Iraq/Kurdistan deal and said a condition precedent to resume full exports includes keeping Production Sharing Contracts. And APIKUR says "APIKUR members have communicated conditions precedent to resume full oil exports and remain committed to resolve outstanding issues. Production Sharing Contracts (PSCs) remain in-force and are governed by English law with dispute resolution via international arbitration at the London Court of International Arbitration." This is in direct conflict with Iraq saying that IOCs operating in Kurdistan must switch from Production Sharing Contracts to Profit Sharing Contracts to be in line with Iraq's constitution. This is a big roadblock. Our Supplemental Documents package includes the AKIPUR release. [LINK]"*

11/13/23: Iraq said Kurdistan IOCs must switch to Profit Sharing Contracts

Here is another item from last week's (Nov 19, 2023) Energy Tidbits memo. "*On Monday, we tweeted [LINK] "Easier said than done. Iraq says Kurdistan Production Sharing Contracts with IOCs must be changed to Profit Sharing Contracts to fit within constitution. That doesn't seem to point to a quick return of Kurd #Oil via Turkey. Thx @RudawEnglish #OOTT." Before the APIKUR statement, Iraq has been clear that the IOCs operating in Kurdistan would have to switch to Profit Sharing Contracts so that their contracts are in line with the national constitution. Our tweet included the Rudaw (Kurdistan) news report of the Iraq/Kurdistan Sundary/Monday meetings. Rudaw wrote "Iraq's Oil Minister Hayyan Abdul-Ghani on Monday told Rudaw that both Erbil and Baghdad are working on adjusting the Region's contracts with the International Oil Companies (IOCs) to the Iraqi constitution and expressed optimism about a prompt resumption of Kurdish oil exports. Ghani arrived in Erbil on Sunday accompanied by an Iraqi oil ministry delegation and met with KRG Prime Minister Masrour Barzani and Natural Resources Minister Kamal Muhammad Salih, to discuss the outstanding issues between the Region and Baghdad over the resumption of the Kurdish oil exports. The oil minister told Rudaw's Sangar Abdulrahman that during his meetings with Kurdish officials, the nature of the Region's contracts with the IOCs was discussed, noting that the KRG's natural resources ministry presented a "complete explanation" of the economic model and the details of the contracts. The IOCs and the KRG are bound by Production Sharing*

Contracts (PSCs), which Ghani noted are against the Iraqi constitution, adding that the Iraqi government licenses companies under Profit Sharing Contracts. "We have a project to adjust those contracts with the laws that are allowed by the Iraqi constitution," Ghani said." Our Supplemental Documents package includes the Rudaw report. [LINK]."

Oil: Libya oil production stable at ~1.2 mmb/d

Libya oil stable at ~1.2 mmb/d

As of our 7am MT news cut off, the latest NOC production update was posted on Monday. The Google Translate of the Libya National Oil Corporation tweet [LINK] *"Crude oil production reached 1,240,000 barrels per day, and condensate production reached 50,000 barrels per day during the past 24 hours."* This looks to be inching up. It has been closer to 1.2 mmb/d for the last several months, but may be inching up given they have been expecting production to hit 1.3 mmb/d by year end.

05/19/23: Libya NOC Chair sees production about 1.3 mmb/d by yr-end

Here is what we wrote in our May 21, 2023 Energy Tidbits memo. *"For the past few months, we have been expecting to see some indication from the Libya National Oil Corporation of where they see oil production growth in 2023, especially since we are almost at the end of May. Libya oil production has been steady right around 1.2 mmb/d. On Friday, Bloomberg reported that Libya NOC Chair Farhat Bengdara expects production to reach ~1.3 mmb/d by yr-end 2023 and, with $17b, could reach 2 mmb/d within five years. We have been expecting a higher 2023 exit production rate given the Feb comments from one of the Libya NOC operating companies (see following item) that production to reach 1.5 mmb/d by yr-end 2023. Bloomberg wrote "Libya is aiming to boost oil production by about 8% by December, a level that would catapult it to the highest in a over a decade. North Africa's biggest producer should be able to pump about 1.3 million barrels a day by the end of the year, Farhat Bengdara, chairman of the National Oil Company, said in an interview. Avoiding field closures and steps like improving oil workers' pay already helped boost output by nearly a quarter since January 2022 to 1.2 million barrels a day now, he said. Libya has been dogged by political turmoil ever since the overthrow and killing of leader Moammar Al Qaddafi in 2011, with a political stalemate pitting rival governments and factions against each other." And "Bengdara said that $17 billion of investment across 45 projects would allow the National Oil Corp. to raise production to 2 million barrels a day within five years. If sustained, that would far exceed anything achieved during Qaddafi's rule."*

02/14/23, Libya's AGOCO Chair forecast production to hit 1.5 mmb/d in 2023

As noted above, we have been expecting the Libya NOC to come out with a higher production estimate to end 2023. The Libya National Oil Corporation is really the top level company with various regional operating companies from both the east and west. One of the operating companies is Arabian Gulf Oil Company (AGOCO) that looks like it is producing ~250,000 b/d or about 20% of Libya's oil production. In Feb, the AGOCO Chair forecast Libya oil production would reach 1.5 mmb/d by year-end 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."

Oil: China outstanding property loans contract have first YoY drop on record

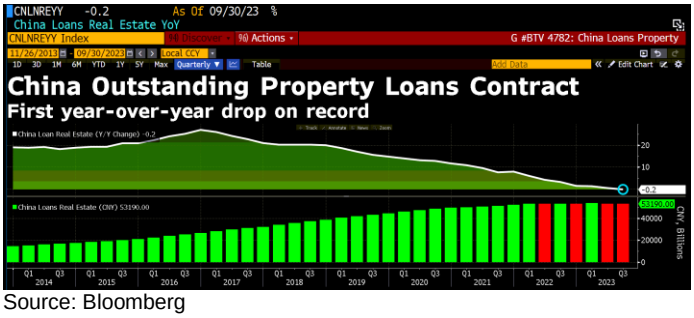
China weak home market

Last week's (Nov 19, 2023) Energy Tidbits noted how, in Oct, China new and existing home sale prices down big MoM. On Nov 16, we tweeted [LINK] "*No move yet off the bottom for China home prices. China new and existing home prices keep going lower and not yet found a bottom. Thx @business Ailing Tan #OOTT."* Bloomberg reported on the National Bureau of Statistics data that showed new home prices declined 0.4% MoM in Oct, which is the largest MoM drop since Feb 2015. And existing home prices declined 0.6% MoM in Oct, which was the largest MoM drop in nine years. Market Insider wrote "*Private ownership of property makes up a quarter of China's total Gross Domestic Product and nearly 70% of all household wealth, according to data from the Cato Institute*." On Thursday night, Bloomberg TVChina Open followed up on last week's declining new and existing home sale prices story with the below graph that showed China's first year-over-year drop on record for China's outstanding property loans contracts.

Figure 32: China new home price changes

Source: Bloomberg

Figure 33: China Outstanding Property Loans Contract



Source: Bloomberg

Oil: China scheduled domestic flights still back to March 21-27 levels

China scheduled domestic flights

On Monday, we tweeted [LINK] "*Stalled China recovery. China scheduled domestic flights -0.2% WoW to 89,562 flights. 2nd consecutive week <90,000, back to Mar 21-27 levels. Domestic flights to increase for more feeder flights for increasing international flights. Thx @BloombergNEF Claudio Lubis #OOTT."* (i) BloombergNEF posted its Aviation Indicators Weekly Nov 20 early Monday morning. (ii) Negative. Similar to the last few weeks, we think the takeaway is negative for China's scheduled domestic flights. The message from the "actuals" for China domestic scheduled flights is that the # of flights is back to Mar 21-27 levels. This is even less than the pre-summer early June levels when China was then calling for a peak in Covid wave at the end of June, before the wave of China stimulus and before international flights began to ramp up. China scheduled domestic flights for the Nov 13-20 week were -0.2%T WoW to 89.562 flights, which is the 2nd consecutive week below 90,000 flights. The next 4-week lookahead is -0.8% to 96,104 flights vs the Nov 14 report that had 4-week lookahead at 96,920 flights. (iii) China scheduled domestic flights were -0.2% WoW to 89,562 flights for the Nov 14-20 week, which followed 89,776 flights for the Nov 6-13 week, 92,146 flights for the Oct 31-Nov 6 week, which followed 92,361 flights for the Oct 24-30 week, 92,638 flights for the Oct 17-23 week, 99,490 flights for the Oct 10-16 week, 101,120 flights for the Oct 3-9 week, 97,009 flights for Sept 26-Oct 2 week and start of Golden Week travel, 95,742 flights for the Sept 19-25 week. Domestic flights went back below 90,000 flights last week and, at 89,562 flights for Nov 14-20 week, it's back to Mar 21-27 levels of 89,513 flights. This is even below the Oct 30 report that said ""*The number of scheduled domestic flights is set to grow by 3.6% over the next four weeks to 95,676*." And that report was hugely down from the Oct 23 report that said "*the number of scheduled domestic flights is set to grow by 39.3% over the next four weeks to 129,038*". Instead, they are back to March 21-27 levels. (iv) The look ahead to the next four weeks is down vs last week. Today's update says "*the number of scheduled domestic flights is set to grow by 7.3% over the next four weeks to 96,104 flights*." This is down from last week's Nov 14 report that said "*the number of scheduled domestic flights is set to grow by 8% over the next four weeks to 96,920 flights*". But these are both hugely below the Oct 23 report that said "*the number of scheduled domestic flights is set to grow by 39.3% over the next four weeks to 129,038*". The increasing domestic flights in the look ahead is likely mostly due to the increasing international flights as more international flights means more need for domestic feeder flights. Today's report says the combined number of international flights out of China for seven major airlines "*will rise by more than 370 a week to around 3,315 by the second week of December*." This is basically unchanged from last week's report that had 3,310 international

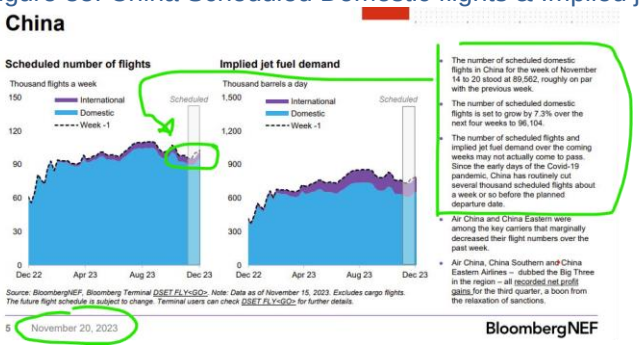
flights by the second week of Dec. Both are higher than the Nov 6 report that had 3,160 international flights by the 1st week of Dec.. The increasing international flights is the key factor for increasing domestic flights. Below is our running WoW changes from the prior BloombergNEF reports and the BloombergNEF charts from the Nov 20 report.

Figure 34: China scheduled domestic flights from BNEF Aviation Indicators Weekly reports

Nov 14-20: -0-.2% WoW to 89,562 flights
Nov 7-13: -2.6% WoW to 89,776 flights
Oct 31-Nov 6: -0.2% WoW to 92,146 flights
Oct 24-30: -0.3% WoW to 92,361
Oct 17-23: -6.9% WoW to 92,638
Oct 10-16: -1.6% WoW to 99,490
Oct 3-9: +4.2% WoW to 101,120
Sept 26-Oct 2: +1.3% WoW to 97,009
Sept 19-25: essentially flat WoW to 95,742
Sept 12-18: -2.7% WoW to 95,853
Sept 5-11: -5.0% WoW to 98,469
Aug 29-Sep 4: -1.2% WoW to 103,637
Aug 22-28: +0.2% WoW to 104,932
Aug 15-21: -0.1% WoW to 104,716
Aug 8-14: +0.8% WoW to 104,823
Aug 1-7: -0.4% WoW to 104,000
July 25-31: +0.4% WoW to 104,436
July 18-24: +1.3% WoW to 104,011
July 11-17: +2.8% WoW to 102,709
Jul 4-10: +2.4% WoW to 99,904
Jun 27-Jul 3: +1.9% WoW to 97,572
Jun 20-26: +3.4% WoW to 95,724
Jun 13-19: -0.9% WoW to 92,568
June 6-12: -1.2% WoW to 93,328
May 30-Jun 5: +0.2% WoW to 94,486
May 23-29: -0.1% WoW to 94,321
May 16-22: -2.8% WoW to 94,417
May 9-15: basically flat at 97,049
May 2-8: +2.8% WoW to 97,087
Apr 25-May 1: +0.04% to 94,471
Apr 18-24: +2.1% WoW to 94,138
Apr 11-17: +0.7% WoW to 92,231
Apr 3-10: -4.2% WoW to 91,567
Mar 28-apr 3: +6.8% WoW to 95,624
Mar 21-27: +1.5% WoW to 89,513
Mar 14-20: -0.6% WoW to 88,166
Mar 7-13 week: -0.8% WoW to 88,675
Feb 27-Mar 3 week: -2.6% WoW to 89,430
Feb 21-27 week: +0.0% WoW to 91,828
Feb 14-20 week -0.5% WoW to 91,561
Feb 7-13 week -0.7% WoW to 92,007
Jan 31- Feb 6 week +10.9% WoW
Jan 24-30 week -9.2% WoW to 83,500
Jan 17-23 week +7% WoW to 91,959
Jan 10-16 week +20% WoW to 85,910
Jan 3-9 week: -5.3% WoW to 71,642
Dec 27-Jan 2 week: -5.6% WoW to 75,652

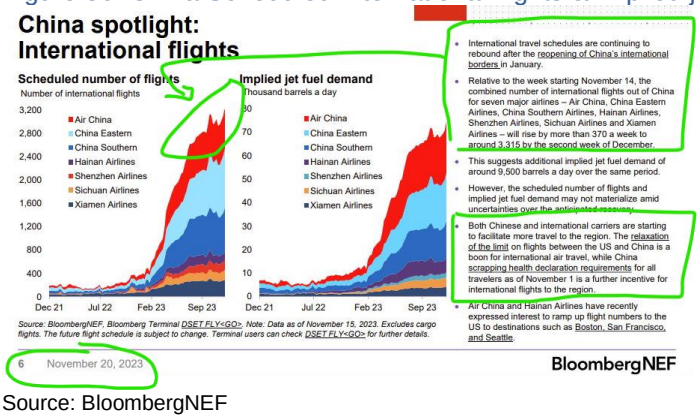
Source: BloombergNEF

Figure 35: China Scheduled Domestic flights & Implied jet fuel demand Nov 14-20



Source: BloombergNEF

Figure 36: China Scheduled International flights & Implied jet fuel demand Nov 14-20



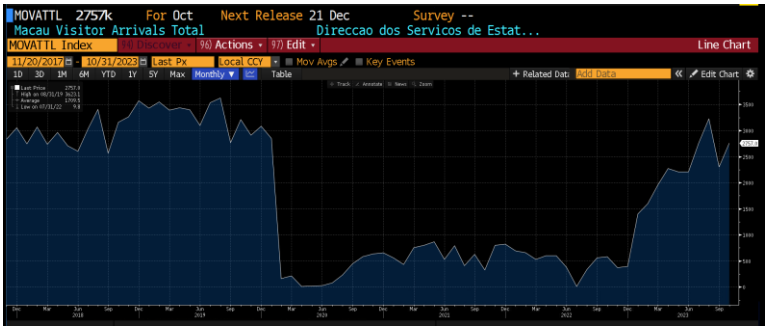
Source: BloombergNEF

Oil: Visitors to Macau pickng up, now at 85.9% of pre-Covid

Visitors to Macau picking up

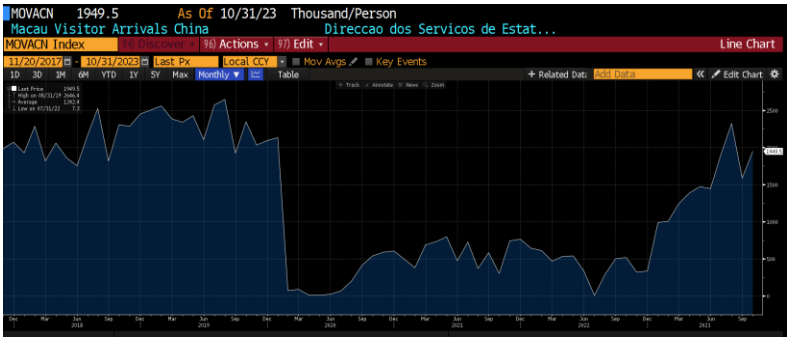
China is still fighting a pause in its domestic economy recovery but one area that is expected to ramp up is international travel to and from China. On Monday night, we tweeted [LINK\] *"Recovering China travel. Macau visitors back to 85.9% of pre-Covid. Oct 23: 2.757 mm incl 1.950 f/ mainland. Oct 22: 0.580 mm incl 0.519 f/mainland. Oct 19: 3.210 mm incl 2.342 f/mainland. Sep 23 was 83.2% of pre-Covid, 2.301 mm incl 1.589 f/mainland. Thx @business. #OOTT."* Bloomberg posted the updated Macau tourist visitors for Oct. For the updated tourist visitors to Macau data for Oct. Visitors to Macau in Oct back to 85.9% of pre-Covid Oct 2019. Sept 2023 was 83.2% or pre-Covid. Visitors to Macau. Oct 2023: 2.757 mm total, incl 1.95 mm from China mainland. Sept 2023: 2.301 mm total, incl 1.589 mm from China mainland. Oct 2022: 0.580 mm total, incl 0.519 mm from China mainland
Oct 2019: 3.210 mm total, incl 2.342 mm from China mainland."

Figure 37: Visitors to Macau - total



Source: Bloomberg

Figure 38: Visitors to Macau – Mainland China



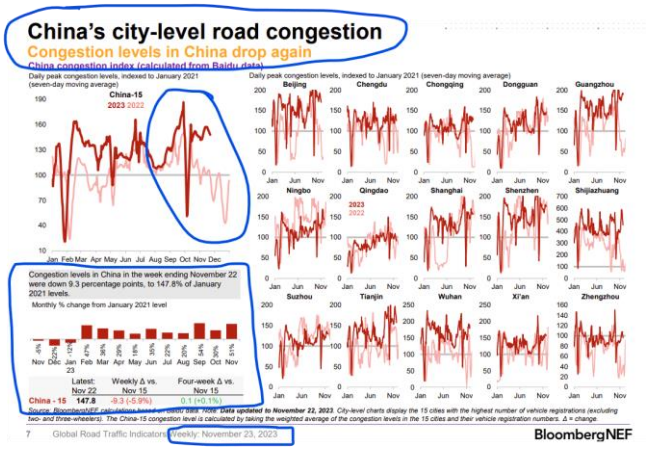
Source: Bloomberg

Oil: Baidu China city-level road congestion Nov MTD at 130% of Nov 2021 levels

China city-level traffic congestion

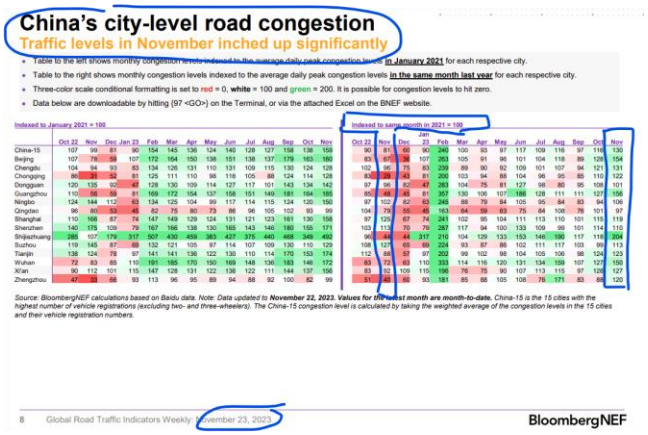
On Thursday, we tweeted [LINK] "*China Baidu city-level road congestion for Nov/23 MTD. Top 15 cities are 130% of Nov/21 levels. Nov/22 was 81% of Nov/21 levels. Still a way to go. Covid restrictions pre 23. 1st China New Year post Covid restrictions Feb/20 was 240% of Feb 2021. Thx @BloombergNEF. #OOTT."* (i) BloombergNEF posted its Global Road Traffic Indicators Nov 23, which includes the China Baidu city-level road congestion data for week ended Nov 22. (ii) BNEF's headlines were "*Congestion levels in China drop again*" and "*Traffic levels in November inched up significantly*". Looks like a typo in the second headline as down WoW but up significantly YoY. (ii) For the week ended Nov 22, Baidu data for China city-level road congestion was -5.9% WoW to 147.8 of Jan 2021 levels. For Nov MTD, China city-level road congestion continues to be up strongly YoY and vs Nov 2021. But China was under Covid restrictions prior to 2023. For Nov 2023 MTD, the Top 15 cities in aggregate were 130% of Nov 2021 levels vs Nov 2022 that was 81% of Nov 2021 levels. So a big increase in city-level congestion YoY but China was still in Covid recovery in Q4/22. Nov 2023 is the best month relative to the same month in 2021 other than Feb 2023 that was the first Chinese New Year without Covid restrictions in China city-level congestion was 240% of Feb 2021 levels. (ii) The Baidu data is for the first half (22 days) of Nov. Remember China was still under Covid restrictions a year ago. For the Top 15 cities in aggregate, MTD to Nov 2023 is 130% of Nov 2021 levels vs Nov 2022 that was 81% of Nov 2021 levels. Twelve of the top 15 cities are higher YoY and three are lower. The 3 lower YoY cities are Shanghai (China's most populous city), Shenzhen (18 mm population, adjacent to Hong Kong), and Suzhou ((13 mm population, right to the west of Shanghai). All but one of the top 15 cities in Nov 2023 are higher than Nov 2021. The exception being Qingdao (11 mm population, port city across Yellow Sea from South Korea). Our tweet included the below two charts from the BloombergNEF Road Traffic Indicators Nov 23 weekly report.

Figure 39: China city-level road congestion for the week ended Nov 22



Source: BloombergNEF

Figure 40: China city-level road congestion for the week ended Nov 22.



Source: BloombergNEF

Oil: China increasing respiratory infections especially in children

China increasing respiratory infections

The reason why we are highlighting this item is because of the Global Times (China state media) report this morning [LINK] "*Beijing calls on schools to prioritize student health as respiratory infections rise. Schools should not issue any mandatory requirements for student homework during illness, and should treat student health as priority, the Beijing Municipal Education Commission (BMEC) stated on Saturday, as the city entered a period of high incidence of respiratory infections and an increase in the number of children calling in sick. According to the BMEC, to ensure the maximum protection for students' health and safety, thorough health monitoring for both teachers and students should be conducted to make sure that no one attends work or class while ill."* Let's all hope its from an abundance of caution and not something to cause a bigger worry. But this follows the reports of a rise in these cases and a rush on hospitals. Yesterday, Global Times reported [LINK] "*Current respiratory cases caused by known infectious agents: China's top health authority. The respiratory cases*

that are currently being reported by the country's monitoring and hospital systems were caused by already known infectious agents, China's National Health Commission (NHC) said on Friday, after the World Health Organization (WHO) expressed concern over the country's increasing respiratory illnesses and reported clusters of pneumonia in children.: And "*The country has seen a spike in respiratory infectious diseases including influenza, mycoplasma infection and pneumonia. In a notice issued by China's State Council on effectively preventing respiratory infectious diseases on Friday, it warned that during the winter and the coming spring, China may face a situation in which several respiratory diseases, including COVID-19, flu, and mycoplasma could overlap and prevail*."

PetroChina on China gasoline demand

Oil: PetroChina expects China gasoline demand to peak at ~3.89 mmb/d in 2025

On Thursday, Bloomberg reported on comments from Qiu Xuan, a researcher with PetroChina Planning & Engineering Institute, at an industry conference in China, who apparently forecast China gasoline demand to peak at ~3.89 mmb/d in 2025, diesel demand has already peaked, and jet fuel to increase from 0.88 mmb/d to 1.94mmb/d in 2040. Bloomberg wrote "*China's gasoline demand will peak around 2025 at 170m tons, Qiu Xuan, a researcher with PetroChina Planning & Engineering Institute, said at an industry conference hosted by JLC in Hangzhou on Thursday. * Consumption will quickly contract after peaking due to aggressive penetration by EVs, rising fuel efficiency and falling per car mileage ** Gasoline demand will drop sharply to 50m tons by 2040 * Diesel consumption in the road freight sector has already peaked, and is estimated to drop by 30m tons by 2030, from 120m tons currently ** LNG trucks will displace over 20% of road freight consumption by 2030 * Jet fuel demand will peak at 90m tons by 2040 ** Compares with 37m tons expected for 2023 * Demand for transport oil products will peak at 390m tons by 2025-2030."*

OPEC's estimate of China's oil demand split by product

OPEC's Monthly Oil Market Report November 2023 includes their estimate of China's oil demand in Sept of 16.40 mmb/d and split by the various oil products. The largest demand product is diesel at 3.98 mmb/d, and then gasoline at 3.86 mmb/d. OPEC estimates China jet fuel was 0.83 mmb/d in Sept. Below is the OPEC table.

Figure 41: China's oil demand by product

Table 4 - 4: China's oil demand*, mb/d

By product	Sep 22	Sep 23	Change Sep 23/Sep 22 Growth	%
LPG	2.44	2.75	0.31	12.6
Naphtha	1.43	1.62	0.19	13.1
Gasoline	3.55	3.86	0.32	8.9
Jet/kerosene	0.31	0.83	0.52	169.1
Diesel	3.50	3.98	0.48	13.7
Fuel oil	0.63	1.04	0.41	64.7
Other products	2.25	2.34	0.09	3.9
Total	**14.10**	**16.40**	**2.30**	**16.3**

Source: OPEC MOMR Nov 2023

Oil products conversion factors

In the b/d above, we used the Energy Institute oil products conversion factors. Gasoline tonnes to barrels of 8.35x and Kerosene (Jet Fuel) tonnes to barrels of 7.88x. Energy Institute took over from BP for the Statistical Review of World Energy this year.

Figure 42: Oil products conversion factors

Oil products From	To convert					
	barrels to tonnes	tonnes to barrels	kilolitres to tonnes	tonnes to kilolitres	tonnes to gigajoules	tonnes to barrels oil equivalent
	Multiply by					
Ethane	0.059	16.850	0.373	2.679	49.400	8.073
Liquefied petroleum gas (LPG)	0.086	11.600	0.541	1.849	46.150	7.542
Gasoline	0.120	8.350	0.753	1.328	44.750	7.313
Kerosene	0.127	7.880	0.798	1.253	43.920	7.177
Gas oil/diesel	0.134	7.460	0.843	1.186	43.380	7.089
Residual fuel oil	0.157	6.350	0.991	1.010	41.570	6.793
Product basket	0.124	8.058	0.781	1.281	43.076	7.039

*Based on worldwide average gravity.

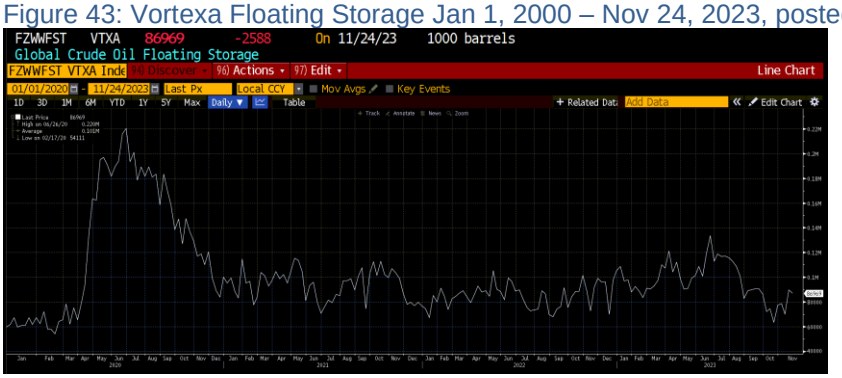
Source: Energy Institute Statistical Review of World Energy 2023

Vortexa floating storage

Oil: Vortexa crude oil floating storage est 86.97 mmb at Nov 24, -2.59 mmb WoW

We are referencing the Vortexa 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 Nov 18 at 9am MT. (i) Yesterday, we tweeted [LINK] "*Floating oil storage creeping higher? 2nd wk floating #Oil storage in high 80's after 6 wks in 70s/60s. 11/24 was -2.59 mmb WoW to 86.97 mmb but that was after 11/17 revised +5.46 mmb. All other prior revisions were very small. Thx @Vortexa @business #OOTT."* (ii) Two weeks may not yet be a trend, but crude oil floating storage has moved to the high 80's after six weeks that averaged in the low 70s including two weeks in the 60s. (iii) As of 9am MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate for Nov 24 at 86.98 mmb, which is -2.59 mmb WoW vs revised up Nov 17 of 89.56 mmb. Note Nov 17 was revised up +5.46 mmb vs 84.10 mmb originally posted at 9am on Nov 18. (iii) Revisions. There was a +5.4 mmb revision to Nov 17, but all other revisions were almost nothing. The revisions from the estimates posted yesterday at 9am MT vs the estimates posted on Bloomberg at 9am MT on Nov 18 are as follows: Nov 17 revised +5.46 mmb. Nov 10 revised -0.26 mmb. Nov 3 revised -0.40 mmb. Oct 27 revised -0.64 mmb. Oct 20 revised -0.26 mmb. Oct 13 revised +0.34 mmb. (iv) There is a wide range of floating storage estimates for the past seven weeks, but a simple average for the past seven weeks is 77.21 mmb vs last week's then seven-week average of 74.32. The increase is due to the upward revision to Nov 17 and replacing Oct 6 of 71.91 with Nov 24 of 86.97 in the average. (v) Also remember Vortexa revises these weekly storage estimates on a regular basis. For example, when most report on the Vortexa data on Monday morning, they will be reporting on different estimates. We do not track the revisions through the week. Rather we try to compare the first posted storage estimates on a consistent week over week timing comparison. Normally we download the Vortexa data as of Saturday mornings around 9am MT. (vi) 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. (vii) Nov 24 estimate of 86.97 mmb is -12.19 mmb YoY vs Nov 25, 2022 of 99.16 mmb. (viii) Nov 24 estimate of 86.97 mmb is -133.34 mmb vs the Covid peak of 220.31 mmb on June 26, 2020. (ix) Nov 24 estimate of 86.97 mmb is +21.36 mmb vs pre-Covid Feb 28, 2020 of 65.61 mmb. (x) Below are the last several weeks of estimates posted on Bloomberg as of 9am MT Nov 25, 9am MT Nov 18, and 9am MT Nov 11.

Figure 43: Vortexa Floating Storage Jan 1, 2000 – Nov 24, 2023, posted Nov 25 at 9am MT



Source: Bloomberg, Vortexa

Figure 44: Vortexa Estimates Posted 9am MT on Nov 25, Nov 18, and Nov 11

Posted Nov 25, 9am MT

Date	Last Px
Fr 11/24/2023	86969
Fr 11/17/2023	89557
Fr 11/10/2023	69970
Fr 11/03/2023	78780
Fr 10/27/2023	77387
Fr 10/20/2023	63318
Fr 10/13/2023	74512
Fr 10/06/2023	71912
Fr 09/29/2023	86287
Fr 09/22/2023	90733
Fr 09/15/2023	90608

Nov 18, 9am MT

Date	Last Px
Fr 11/17/2023	84101
Fr 11/10/2023	70228
Fr 11/03/2023	79175
Fr 10/27/2023	78027
Fr 10/20/2023	63582
Fr 10/13/2023	74171
Fr 10/06/2023	70940
Fr 09/29/2023	84410
Fr 09/22/2023	89165
Fr 09/15/2023	89655
Fr 09/08/2023	89374

Nov 11, 9am MT

Date	Last Px
Fr 11/10/2023	53767
Fr 11/03/2023	76043
Fr 10/27/2023	76680
Fr 10/20/2023	64379
Fr 10/13/2023	71140
Fr 10/06/2023	70262
Fr 09/29/2023	87254
Fr 09/22/2023	91102
Fr 09/15/2023	91086
Fr 09/08/2023	93361
Fr 09/01/2023	91137

Source: Bloomberg, Vortexa

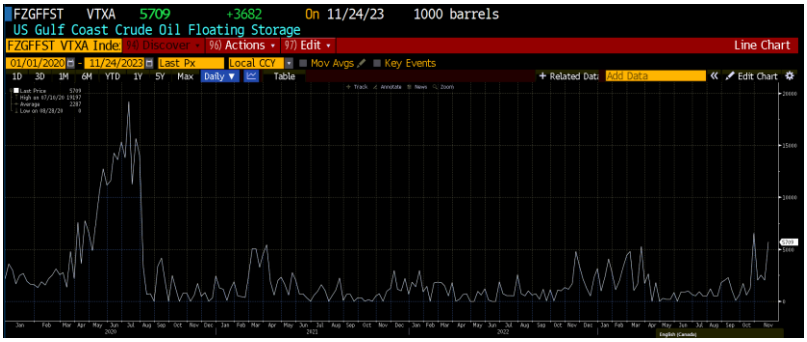
Oil: Is Panama Canal why Vortexa Gulf Coast floating oil storage was up WoW?

Vortexa Gulf Coast floating storage

It's only been two different weeks, but we have to believe we are now seeing the Panama Canal backup leading to weeks of much higher than normal floating oil storage in the Gulf Coast Oil tankers. Yesterday we tweeted [LINK] "*Panama Canal backup impact? Crude tankers can't pre-book canal slots. 2nd recent spike up in floating #Oil storage in Gulf Coast. 11/24 was +3.68 mmb to 5.71 mmb & 10/28 was 6.64 mmb. Norm is 1-2 mmb. Thx @Vortexa @business #OOTT.*" This was the 2nd spike up in recent weeks and we have t believe the likely reason is the backup in the Panama Canal. On Nov 4, we tweeted [LINK] *"No surprise, floating oil storage in Gulf Coast was back down to 1.82 mmb at Nov 3. See 👇10/28 tweet last week's 6.64 mmb as originally posted on Oct 28 looked to be set for either a downward revision or it was an unusual one-time spike. Thx @vortexa @business #OOTT."* But since then, the Panama Canal has further reduced transit volumes and we have to believe that is why we saw another spike up this week in the Vortexa crude oil floating storage that was +3.68 mmb WoW to 5.71 mmb at Nov 24. Normally Gulf Coast floating storage has been much smaller, normally closer to 1 than 2 mmb. But crude oil

tankers do not have the luxury of being able to pre-book slots, like cargo ships, for Panama Canal slots so we have to believe this week's spike up and the Oct 28 spike of 6.64 mmb are linked to the Panama Canal. And we would expect that we could see more weekly spikes.

Figure 45: Vortexa crude oil floating for Gulf Coast



Source: Bloomberg, Vortexa

Vortexa floating storage by region

Oil: Vortexa crude oil floating storage WoW changes by regions

Bloomberg also posts the Vortexa crude oil floating storage in the key regions, but not all regions of the world. The regions covered are Asia, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" or rest of world. (i) As noted above, Nov 17, in total, was revised up +5.46 mmb. The main revisions in a region vs the originally posted (as of 9am Nov 18) floating oil storage for Nov 17were Other revised +2.22 mmb and Middle East revised +1.83 mmb. (iii) The major WoW changes by region were US Coast +3.68 mmb WoW and Other -2.82 mmb WoW. (iv) Nov 24 of 86.97 mmbis still down a huge 46.51 mmb vs the recent June 23, 2023 peak of 133.48 mmb. The major changes by region vs the recent June 23 peak are Asia -31.11 mmb and Oher -21.39mmb. (iv) Below is the table we created of the WoW changes by region posted on Bloomberg at of 9am MT yesterday. Our table also includes the "Original Posted" regional data for Nov 10 that was posted on Bloomberg at 9am MT on Nov 11.

Figure 46: Vortexa crude oil floating by region

Vortexa Crude Oil Floating Storage by Region (mmb)				Original Posted	Recent Peak	
Region	Nov 24/23	Nov 17/23	WoW	Nov 17/23	Jun 23/23	Nov 24 vs Jun 23
Asia	42.50	42.47	0.03	42.33	73.61	-31.11
Europe	6.81	8.00	-1.19	7.58	6.47	0.34
Middle East	9.02	9.79	-0.77	7.96	7.17	1.85
West Africa	6.77	8.29	-1.52	7.97	7.71	-0.94
US Gulf Coast	5.71	2.03	3.68	1.50	0.97	4.74
Other	16.16	18.98	-2.82	16.76	37.55	-21.39
Global Total	86.97	89.56	-2.59	84.10	133.48	-46.51
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Nov 25						

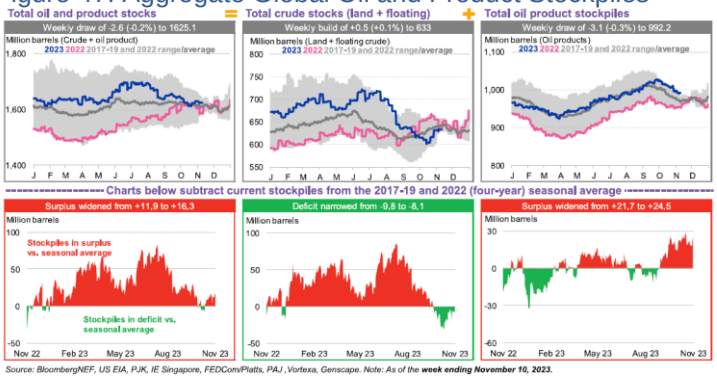
Source: Bloomberg, Vortexa

Oil: BNEF – global oil and product stocks surplus widens WoW to 16.3 mmb

Please note that the BloombergNEF global oil and products stocks estimate are for the week ending Nov 10, which is a week earlier than the normal EIA US oil inventory data that is for the week ending Nov 17 which was a build/draw of x.xx b/d. On Monday, BloombergNEF

posted its “Oil Price Indicators” weekly, which provides good charts depicting near-term global oil demand and supply indicators. (i) Note BloombergNEF uses different periods to determine the surplus/deficit, sometimes using a four-year average for 2017-2019 + 2022, and other times using a five-year average 2016-2019 + 2022. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products surplus widened from 11.9 mmb to 16.3 mmb for the week ending Nov 10. (iii) Total crude inventories (incl. floating) increased by +0.1% WoW to 633.0 mmb, while the stockpile deficit narrowed from 9.8 mmb to 8.1 mmb. (iv) Land crude oil inventories increased by +0.2% WoW to 538.4 mmb, narrowing the deficit to -29.0 mmb against the five-year average (2016-2019 + 2022). (v) The gas, oil, and middle distillate stocks decreased by -0.4% WoW to 140.0 mmb, with the deficit against the four-year average narrowing to -13.7 mmb. Jet fuel consumption by international departures for the week of November 27 is set to increase by +5,100 b/d WoW, while consumption by domestic passenger departures is forecast to increase by +22,800 b/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 47: Aggregate Global Oil and Product Stockpiles



Source: BloombergNEF

Oil: Bloomberg Oil Demand Monitor “Economic Woes to Weigh on Growth in 2024”

Bloomberg oil demand monitor

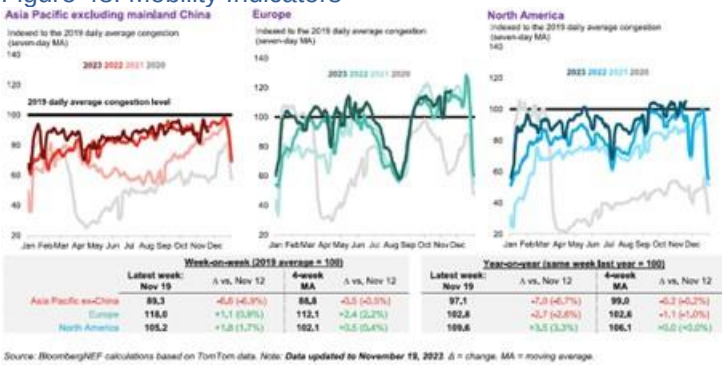
We recommend reading the Bloomberg Terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. The major message in this week’s report is that oil prices are holding up surprisingly well considering lackluster economic outlooks for major consuming countries and growing global oil supplies. The IEA and OPEC still maintain optimistic demand growth projections for 2024 based on their latest reports. There are some bright spots in this week’s monitor, but also some mixed signals. the EIA reported the 4-week average for diesel and distillate demand was near the highest it’s been all year. European countries like France, Italy and Portugal saw increases in demand for oil products and gasoline. In terms of air travel, global flights continued to track comfortably above both 2022 and 2019 levels during the week of Nov 20 but dipped on a MoM basis. China’s domestic flights for the week of Nov 14 dropped -0.2% WoW, but international flights are showing signs of a rebound. As of Nov 13, road congestion was above pre-pandemic levels in 6 of the 13 major global cities tracked by TomTom mobility data. This compares to only two cities (London and Berlin) that were above 2019 levels last week. Refinery utilization in the US as of Nov 17 was up +1.4% MoM to 87% but down -6.9% YoY. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Oil: TomTom mobility indicators: EU, NA increase while Asia-Pacific decreases WoW

Global road traffic indicators

On Thursday, BloombergNEF posted its Global Road Traffic Indicators Weekly report, which recaps traffic indicators in all the major economic regions of the world i.e. mobility indicators like TomTom. For the week ending Nov 19, Asia Pacific (ex-China), traffic levels decreased by -6.9%, while Europe and North American traffic levels increased +0.9% and +1.7% WoW, respectively. Traffic levels in Asia Pacific (ex-China), Europe and North America are -10.7%, +18.0% and +5.2% compared to the 2019 average and are -2.9%, +2.8% and +9.6% YoY, respectively. Traffic in Europe has recovered to pre-summer levels while Asia Pacific (excluding mainland China) is still below pre-Covid levels. It is 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 48: Mobility Indicators



Week-on-week (2019 average = 100)

	Latest week: Nov 19	Δ vs. Nov 12	4-week MA	Δ vs. Nov 12
Asia Pacific ex-China	89.3	-6.6 (-6.9%)	88.8	-3.5 (-3.5%)
Europe	118.0	+1.1 (0.9%)	112.1	+2.4 (2.2%)
North America	105.2	+1.8 (1.7%)	102.1	+3.5 (3.4%)

Year-on-year (same week last year = 100)

	Latest week: Nov 19	Δ vs. Nov 12	4-week MA	Δ vs. Nov 12
Asia Pacific ex-China	97.1	-7.0 (-6.7%)	99.0	-0.3 (-0.2%)
Europe	102.8	+2.7 (+2.6%)	102.6	+1.1 (+1.0%)
North America	109.6	+3.5 (3.3%)	106.1	+0.0 (+0.0%)

Source: BloombergNEF calculations based on TomTom data. Note: **Data updated to November 19, 2023**. Δ = change. MA = moving average.

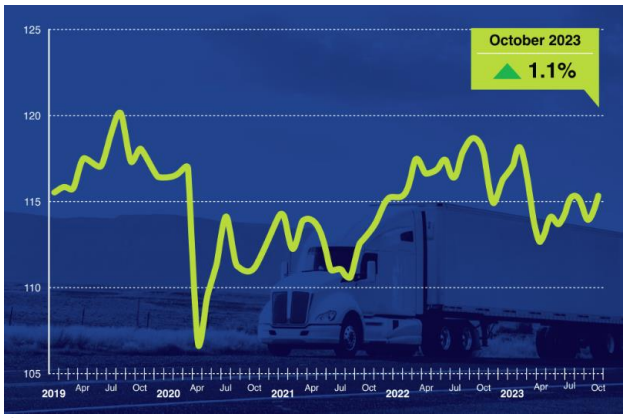
Source: BloombergNEF

Oil: Truck tonnage index in October +1.1% MoM, recovers Sept loss but still down YoY

October Truck Tonnage +1.1% MoM

We look to items like truck tonnage for indicators on the US economy, and the October truck tonnage is in line with the expectations for a somewhat stalling US economy. Truck tonnage increased +1.1% MoM and is down -2.1% YoY from October 2022. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for October last Tuesday [LINK]. Chief Economist Bob Costello noted "*After hitting a floor in April, tonnage has slowly and inconsistently improved, but remains 3% below its recent peak in September 2022…Despite the monthly gain, truck freight remains soft as it continues to contract on a year-over-year basis. It is important to remember that our for-hire truck freight index, which includes both truckload and LTL freight, is dominated by contract freight with minimal amounts of spot market loads. The traditional spot market remains much weaker than contract tonnage*." Trucking serves as a barometer of the U.S. economy, representing 72.6% of tonnage carried by all modes of domestic freight transportation, including manufactured and retail goods. Trucks hauled 11.46 billion tons of freight in 2022. Motor carriers collected $940.8 billion, or 80.7% of total revenue earned by all transport modes. Our Supplemental Documents package includes the ATA release.

Figure 49: Truck Tonnage Index



Source: ATA

Oil & Natural Gas: TIPRO Texas oil and natural gas jobs up MoM in October

TIPRO October jobs update

On Nov 17, the Texas Independent Producers and Royalty Owners Association (TIPRO) updated their employment figures for the Texas upstream sector for October [LINK]. September saw an increase of ~2,200 jobs MoM, and employment is up to 212,900 active jobs across direct oil and gas extraction and services, which is 19,200 more jobs than in October 2022. TIPRO wrote "*TIPRO's new employment data yet again indicated strong job postings for the Texas oil and natural gas industry during the month of October. According to the association, there were 10,843 active unique jobs postings for the Texas oil and natural gas industry in October, including 3,965 new job postings added during the month by companies. In comparison, the state of California had 3,066 unique job postings last month, followed by Oklahoma (1,512), Louisiana (1,409) and Pennsylvania (1,041). TIPRO reported a total of 47,517 unique job postings nationwide last month within the oil and natural gas sector*". Our Supplemental Documents package includes the TIPRO release.

Oil & Natural Gas: Small decline in BC wildfires Alberta wildfires up

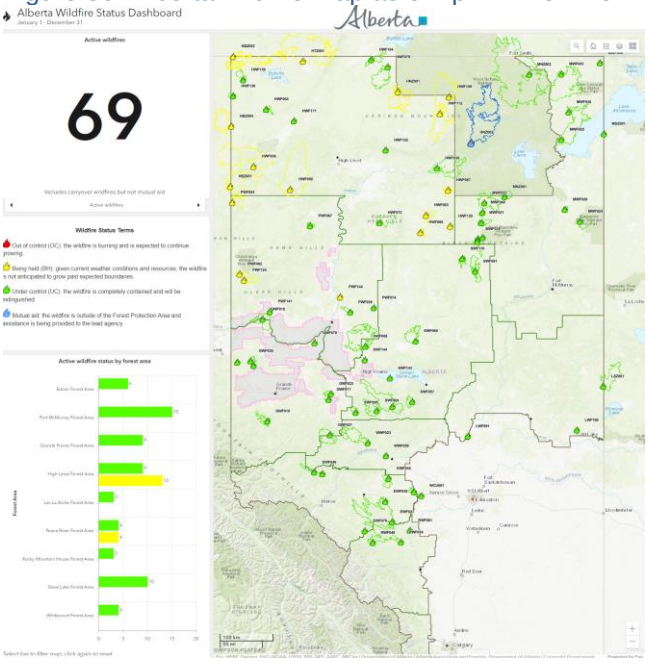
BC and Alberta Wildfires

This is crazy that there are still this many wildfires at the end of Nov and there are still 24 Out of Control wildfires in BC. There was actually a very small increase in Alberta wildfires this week and BC wildfires were down a bit. As of 7pm MT last night, there were 69 Albera wildfires and zero Out of Control, which compares to a week ago at 67 Alberta wildfires including zero Out of Control. As of 7pm MT last night, there were 160 BC wildfires including 24 Out of control, which compares to a week ago at 176 wildfires including 25 Out of Control.

Links to Alberta and BC wildfire status maps

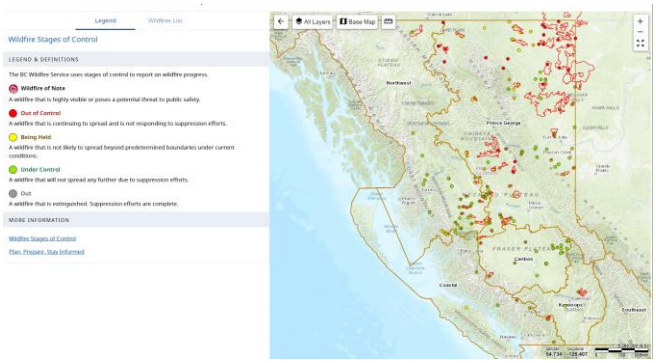
We recommend bookmarking the starting points for wildfire information are the Alberta Wildfire Status interactive map [LINK] and the BC Active Wildfires interactive map [LINK]. Please note these links have changed over the past few years. Both maps are interactive and open up for the information on any particular fire. Here are the wildfire maps as of 7pm MT last night.

Figure 50: Alberta wildfire map as of 7pm MT on Nov 25



Source: Alberta Wildfire Status Dashboard

Figure 51: BC wildfire map as of 7pm MT on Nov 25



Source: BC Wildfire Service

Energy Transition: Looks like UAE COP 28 President is winning

No one knows what will happen at COP28 but the last couple days of pre-COP28 chatter give some hints on what western leaders believe they can attain and message as wins. We saw methane emissions from oil and gas last week and we have seen more on focus on "unabated" emissions from fossil fuels and western countries reducing meat consumption. Western leaders may not admit it but the western leaders changing message is really an admission that UAE COP28 President Al Jaber looks to have won over the big picture win for COP28.

UAE COP28 President

EU's focus on methane emissions from oil & gas shows Al Jaber is winning

Perhaps the best example showing how UAE COP28 President Al Jaber has won is how the EU joined his focus on reducing methane emissions from oil and gas. Here is what we wrote in last week's (Nov 19, 2023) Energy Tidbits memo. *"On Tuesday, we tweeted [LINK] "Is UAE Al Jaber The Climate Man? Criticized for wanting impact/practical COP28 actions ie. 03/06 #Oil #NatGas methane emissions to net zero by 2030. Now EU to prioritize methane emissions "we want to do something that's really meaningful for the climate" Thx @johnainger #OOTT." The climate change side and western governments aren't going to come out and say UAE COP28 President Al Jaber was right after all, but the actions being portrayed as wins now are really what Al Jaber tried to get people to join in several months ago. Our tweet included the National UAE March 7, 2023 report on how Al Jaber was pushing the need to get the oil and gas industry to reach net zero methane emissions by 2030. At that time, the climate change side didn't want to jump on board as they wanted the to get rid of fossil fuels and not focus on reducing methane emissions. Al Jaber has been working on the basis that focus for Paris has been to reduce emissions. The report that led to our tweet was that the EU has reached an agreement to focus on energy companies reducing methane emissions – basically Al Jaber's March priority. Our tweet also noted how the EU climate leaders bragging that this was so they were going to do something really meaningful to the climate. Bloomberg wrote "A key comment here is "We're watching you," Jutta Paulus, the Green lawmaker who is parliament's lead negotiator, said in a message to fossil fuel companies outside of the bloc. "We want to do something that's really meaningful for the climate." We have always said methane is the worst for the enivronment but reducing methane emissions from oil and gas has been done for at least a decade in the Cdn oil patch going back to when the one of our friends was the group leader for the then big company (PanCanadian) in capturing methane emissions from pneumatic deviices and compressors, etc and he then explained to us how it was easy to do. It's why the E&P companies are quick to sign on to reducing methane emissions. .So when we see the european leader talk about how this is doing something really meaningful for the climate seems to be positioning for COP28 and this would fit one of the UAE COP28 president areas of focus. Our Supplemental Documents package includes the Bloomberg report".*

Do western leaders have to go along with UAE COP28 approach?

Here is another item from our Nov 19, 2023 Energy Tidbits memo. *"The EU highlighting methane emissions from the energy industry reinforces our view on COP28. Here is what we wrote in our Nov 5, 2023 Energy Tidbits memo. "This isn't what anyone on the climate change side including the western government leaders would ever say, but when we read the UAE COP28 President Al Jaber comments on Monday, at the pre-COP meeting, we can't help but wonder if Al Jaber knows western leaders have no choice but to go along with his approach. We recognize that the climate change side never wanted UAE's Al Jaber as COP28 President or they are probably still mad that UAE was even made the host of COP28. We divide the climate change side at COP28 into two parts: those on the climate change side that are the rank and file delegates. And then there are government leaders (ie the politicians and the senior bureaucrats) that have led theEnergy Transitiuon and Net*

Zero push. The delegates will never be happy because Al Jaber is an oil and gas guy from the #2 OPEC producer and they are trying to get rid of oil and gas. They may not say this as the primary directive as the that is to reduce emissions, but the focus for the COPs to date have been on replacing and getting rid of coal, oil and natural gas as the key to the solution. So they can't be happy if Al Jaber focuses on methane reduction because he knows that is doable and can be successful and done so quickly. But that isn't a get rid of oil and gas approach. However, we continue to think the government leaders know (even if they don't want to directly say so) that they are far behind so are going to be trying to salvage something at COP28. And that mean they need to come out of COP28 with some plan that they can sell to some degree as being keeping them on track or at least giving the world a chance at 1.5C. We think the timing may be right for Al Jaber. And we think Al Jaber knows this. It's why we think he says what he says. We think he knows that the western leaders have to give in to some degree. And he is making it clear to them that this is the best they are going to get from COP28 under his leadership and that they can message they are staying on track to 1.5c. So they will ultimately have to agree with his approach to include oil and gas as part of "all", COP28 has to take a "pragmatic" approach and come up with "solid" solutions. The climate change side hasn't said this but the part that will be one of Al Jaber's biggest accomplishments is that seems to have got the oil and gas industry as part of the "all" in COP28 negotiations. And the second part is that he is able to try to direct the negotiation to a "pragmatic" type conclusion and not the normal aspiration negotiation. Here is is one of his key quotes "We need solid solutions for a 43 percent cut in emissions by 2030 because that is exactly what the science tells us," Dr. Al Jaber said. On the issue of fossil fuels, he said, "I know there are strong views about the idea of including language on fossil fuels and renewables in the negotiated text. I need you to work together to come forward with solutions that can achieve alignment, common ground and consensus between all parties. We must be responsible. We must be pragmatic. And we must leave no-one behind." The Emirates News Agency report "COP28 President says world must unite on climate action" is at [LINK] "

Fits our 2022 Prediction, leaders forced to admit energy transition isn't working

Our above comment on western leaders fits out expectation that we don't expect to see many western leaders come out and directly say the energy transition isn't working but we do expect to see their actions reflect that conclusion. Our #1 prediction for 2022 was on this concept. We were probably 6 to 12 months early but it is unfolding. Here is what we wrote in our Dec 12, 2021 Energy Tidbits memo. "*Its December and so analysts will soon be coming out with 2022 predictions, so we thought we would beat them with one of our main 2022 predictions. On Thursday, we tweeted [LINK] "Time for #2022Predictions. My #1 is more #EnergyTransition #NetZero leaders come out of closet, have a #MacronMoment ie. have "transition" not self inflicted shortage so 2021 energy crisis isn't every year. A return to #EnergySecurity = #Oil #NatGas #LNG strong thru 2030. #OOTT." This should not surprise readers as we have been noting the start of energy transition leaders starting to admit, in a politician's manner, that the energy transition isn't working as per aspirations and energy costs will be a lot higher than aspired. We have said for years that the energy transition will happen, but it will take longer, be bumpy road*

and cost more than the aspirations. Last week's (Dec 5, 2021) Energy Tidbits wrote on the ADNOC CEO speech There was much more in the speech, which is why we tweeted [LINK] "If more leaders have a "Macron Moment" in 2022, maybe COP28 UAE in 2023 can be catalyst for getting down to work on practical, commercial, sustainable energy solutions: pro climate/pro growth? See SAF Group transcript of @SultanAhmedalj8 #ADIPEC keynote. #EnergyTransition #OOTT." We do wonder if we will see more world leaders accept that the energy transition isn't working according to their aspirations and that there is an increasing risk of a decade of energy crisis like seen in Europe in H2/21 unless the world puts in an achievable energy transition plan." We think COP26 will turn out to be turning point, but a turning point to force energy transition leaders into changing their plan. It why we think we will more of the energy transition leaders come out of the closet and admit this in 2022. But what got us to tweet this week was after seeing Saudi Aramco CEO Nasser speech at the WPC in Houston. Nasser said "There is one more thing that can no longer remain unsaid. A majority of key stakeholders agree with these realities as much as they believe in addressing climate change. We know this, because they say so in private. They should say it publicly too. I understand their dilemma. Publicly admitting that oil and gas will play an essential and significant role, during the transition and beyond, will be hard for some." So our #1 2022 Prediction is that we will see leaders come out of the close and admit, in a politician's way, that the energy transition plan needs to be changed. The key result will be that fossil fuels are needed for way longer and the outlook for oil, natural gas and LNG will be stronger thru 2030 and beyond.

What about energy conservation priority?

Energy Transition – Will conservation/efficiency finally get priority at COP28?

We have been surprised for the past few years how we haven't seen western leaders place a priority on energy conservation and efficiency as the easiest and most effective way to quickly cut emissions. And will it finally get its day at COP28 especially as we have seen problems in all the major energy transition items. Perhaps it's because it's old school approach from 50 years ago and it's not exciting, but it has proven to work. Anyone who was an adult in the 70s should know how the major push was on energy conservation and efficiency and it worked. And if the true goal of Paris is to cut emissions, why not do something that works and is hard for anyone to go against.

04/04/21: Surprised conservation/efficiency wasn't a bigger Biden priority

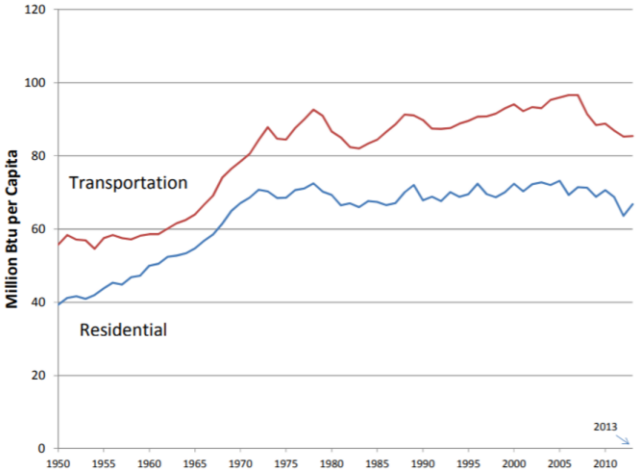
Here Is what we wrote in our April 4, 2021 Energy Tidbits memo after seeing Biden's then big infrastructure plan. "*One of the surprises to us in the Biden infrastructure plan was that there wasn't a huge priority placed on energy conservation and efficiency of energy use. Note in mentioning conservation here, we are also including improving efficiency of energy use. It was there for buildings and homes, but we have always wondered if there would be a separate category push on energy conservation as a priority in all energy uses. Its one thing we don't see in the push for a renewable energy world, how much emissions could be reduced by energy conservation. We have always believed it's a big number and one that isn't a politically touchy subject. But it probably doesn't get the attention as it isn't a great headline item. But we thought Biden might elevate it as a priority because Biden is*

lived thru the period where the US priority was on energy conservation and it worked. Biden became a US Senator in 1973, just in time for the Arab Oil Embargo in Oct 1973 that changed the world of energy and led to the election of Jimmy Carter in 1976. Interestingly, Biden's Wikipedia page features a picture of Biden and Carter in the section on Biden's senate career. The reality is that if Biden wants to make a huge dent in emissions, he should have a priority on conservation and efficiency as a key focus area. Again this is another thing that jumps out at us from not being in Biden's plan – this priority on conservation as an area, because we remember Jimmy's Carter's first major address after taking office in 1977. His famous sitting by the fireplace wearing a cardigan speech to the nation. [LINK] Carter says "our program will emphasize conservation. The amount of energy being wasted, which could be saved is greater than the total energy we are importing from foreign countries". For those who also saw the speech then, it's worth a second listen."

04/04/21: It worked, conservation led to big reductions in energy consumption

Here is another items form our April 4, 2021 Energy Tidbits memo. "*The push on energy conservation worked as it led to less energy consumption per capita. Carter won the Nov 1976 election and took office in Jan 1977. Carter's big push was on energy efficiency and conservation, and its also forgotten that he was the one who led to big expansion in coal and in the first substantial tax incentives for shale oil that set the stage for US shale/tight oil and gas growth in the last decade. To be fair, Nixon also started some energy conservation such as implementing a national high speed limit of 55 mph whereas prior to that there wasn't a national standard, but most states were 70 or 75 mph. But the point is that it worked. And we would expect lower consumption would have led to lower emissions. Biden lived thru this as a senator, which is why we are surprised that it wasn't a bigger priority in itself.* "

Figure 52: Per Capital Energy Consumption in Transportation & Residential Sectors



Source: Congressional Research Service

Energy Transition: Looks like cows will be back in the headlines at COP28

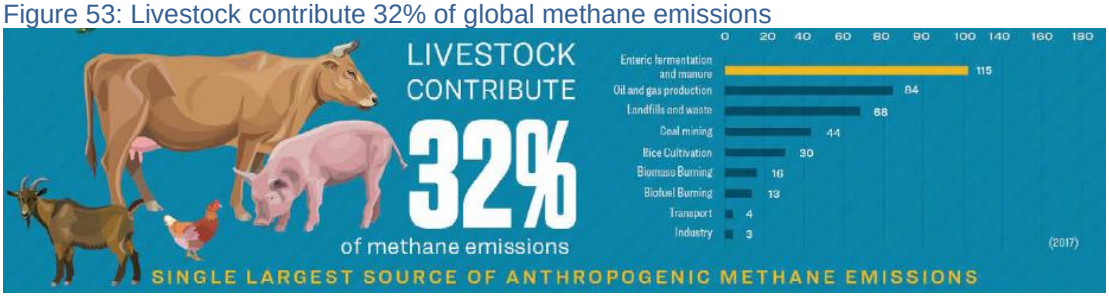
Livestock is the biggest methane emissions group

Earlier this morning, we tweeted [LINK] "*Did you know? Methane emissions from livestock is more than from #Oil #NatGas. See 👇11/14/22 tweet. #COP28 chatter in last couple days on west cutting back meat consumption will bring cow methane emissions back in headlines. #OOTT."* It's been interesting to see the reports emerge in the last few days of how the west will be looking at reducing meat consumption at COP28. The chatter tends to emerge on items that will be gaining western approval at COP28 and reducing meat consumption is one of these issues. And if reducing meat consumption is on the agenda, it means that methane emissions from cows will be in the headlines. We suspect many will be surprised to note that livestock, including cows, methane emissions are more than oil and gas

11/15/22: IATP reminds livestock is the biggest methane emissions source

Here is what we wrote in our Nov 20, 2022 Energy Tidbits. "*As of our 7am MT news cut off, we haven't seen the final COP27 communique, but one of the big themes that seems to be in agreement is the focus to cut methane emissions from the oil and gas industry. We have yet to see the COP27 delegates focus on the largest methane emissions group in the world - livestock. Livestock emissions are more than oil and gas. On Tuesday, the Institute for Agriculture & Trade Policy posted its report "Emissions Impossible: How emissions from big meat and dairy are heating up the planet". [LINK]. We tweeted [LINK] "#Methane emissions are much more than #Oil #NatGas. @IATP report "How emissions from big meat and dairy are heating up the planet", livestock contribute 32% of #Methane emissions, single largest source of anthropogenic methane emissions. #OOTT." The IATP first chapter is "the urgency of addressing livestock methane" and writes "Animal agriculture contributes 32% of the world's methane emissions, making it the single largest source of human-made methane emissions.Although animal agriculture has started to get more attention for its contribution to climate change, the emissions of big meat and dairy companies remain below the radar for urgent climate action. Animal agriculture is responsible for 57% of emissions linked to agricultural production, which accounts for an estimated 37% of all global emissions. Even if the world immediately stopped using all fossil fuels, scientists say that current emissions from the global food system would make it impossible to limit warming to 1.5°C and difficult even to realise the 2°C target."*

Figure 53: Livestock contribute 32% global methane emissions



Source: Institute for Agriculture & Trade Policy

UN warned Ruminants (cows, etc) almost 2x methane emissions vs oil & gas

Here is another item from our Nov 20, 2022 Energy Tidbits memo. "*No one should be surprised by the IATP report highlighting livestock as the single largest source of global human caused methane emissions. Just like no one should be surprised that the sector continues to fly under the radar for western governments. Rather it is easy for western leaders to keep oil and gas as the #1 methane enemy. Our May 9, 2021 Energy Tidbits wrote "This week, the UN Environment Programme published their major report – "Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissons" [LINK] . The US starts right at the start and reminds that methane is way worse the CO2 "Methane, a short-lived climate pollutant (SLCP) with an atmospheric lifetime of roughly a decade, is a potent greenhouse gas tens of times more powerful than carbon dioxide at warming the atmosphere". We have been highlighting for years how the Cdn oil and gas sector has been reducing methane emissions going back to when one of our friends was in the Encana group doing so. The reality is that fossil fuels are the easy target for governments even if they were already reducing methane emissions. And the first set of measures recommended by the UN are against fossil fuels "Oil, gas and coal: the fossil fuel sector has the greatest potential for targeted mitigation by 2030. Readily available targeted measures could reduce emissions from the oil and gas sector by 29–57 Mt/yr and from the coal sector by 12–25 Mt/yr. Up to 80 per cent of oil and gas measures and up to 98 per cent of coal measures could be implemented at negative or low cost. (Section 4.2)". We understand why fossil fuels are the easiest to go after, but the UN report also reminds of the leading cause of methane emissions. For example, ruminants (ie. cattle, etc) cause 73% more methane emissions than oil and gas. Its why we tweeted [LINK] "Interesting data from @UNEP global #Methane emissions report. worst are Freshwaters 159 mt/yr, Wetlands 145, Ruminants (cattle etc) 115, #Oil & #NatGas 84. Termites 9 are ~= to all offshore oil & gas. Fortunately, oil & gas will keep doing more. #OOTT". Below is the table we created to rank the US methane sources table.*

Figure 54: Sources of Methane 2017

Sources of Methane Ranked (2017)	
Source	Magnitude (MT/yr)
Freshwaters	159
Wetlands	145
Ruminants (Cattle, goats, etc.)	115
Oil and gas industry	84
Landfill and waste	68
Geological	45
Coal mining	44
Rice cultivation	30
Biomass burning	16
Biofuels	13
Termites	9
Oceans	6
Transport	4
Industry	3
Wild animals	2
Permafrost soils	1

NATURAL SOURCES	MAGNITUDE (MT/YR)	ANTHROPOGENIC SOURCES	MAGNITUDE (MT/YR)	SINKS	MAGNITUDE (MT/YR)
Wetlands	145 [100–183]	Coal mining	44 [31–63]	Soils	40 [37–47]
Termites	9 [3–15]	Oil and gas industry	84 [72–97]	Total chemical loss	531 [502–540]
Oceans	6 [4–10]	Landfill and waste	68 [64–71]	Total loss	571 [540–585]
Geological	45 [18–65]	Ruminants	115 [110–121]		
Wild animals	2 [1–3]	Rice cultivation	30 [24–40]		
Freshwaters	159 [117–212]	Biomass burning	16 [11–24]		
Permafrost soils	1 [0–1]	Industry	3 [0–8]		
		Biofuels	13 [10–14]		
		Transport	4 [1–13]		
Total natural	367 [243-489]	Total anthropogenic	380 [359–407]		
Total natural (top-down)	232 [194-267]	Total anthropogenic (top-down)	364 [340-381]		

Source: UN Environment Programme

Energy Transition – Cows are not just big methane emitters, also big water consumers

Cows water consumption

We expect cow methane emissions to be in the headlines but aren't sure if the COP28 headlines will also note that cows are big water consumers Here is what we wrote in our July 3, 2022 Energy Tidbits memo. "*We have to wonder when the far left will be more aggressively going after the meat industry, not for their profits but for their environmental impact. We normally only mention cows with respect to their methane emissions, but they are also huge water consumers and lead to deforestation. It was Canada Day holiday on Friday so BNN Bloomberg wasn't playing its normal Canadian based programs, but was picking up Bloomberg. On Friday morning, Bloomberg Markets interviewed Eric Jenkusky (Matrix Food Technologies CEO) who was highlighting the huge use of water and impact on deforestation by cows. Jenkusky said "a single cow, for instance, that is of calf bearing age, uses 8,760 gallons of water a year". We know that cows need huge amounts of water relatives to people ie. 8 cups a day is ½ gallon a day or 182.5 gallons a year. But it seemed like a huge number so wanted to see what data was out there. It turns out that number looks high, relative to Canadian cows. The Beef Cattle Research Council (Canada) [LINK] estimates bred Heifers & dry cows use 32.9 liters/day or 3,170 US gallons a year. But the BCRC estimates a lactating cow uses 64.0 liters/day or 6,167 US gallons a year. Regardless, it's a big use of water. One interesting tidbit from the BCRC estimates is the huge range of water intake per cow depending on the temperature. For the lactating cows, the daily intake in liters is 43.1 at 4.4C, 47.7 at 10C, 54.9 at 14.4C, 64.0 at 21.1C, 67.8 at 26.6C and, surprisingly, down to 61.3 at 32.2C."*

Figure 55: Approximate Total Daily Water Intake of Beef Cattle

	Intakes in litres for temperatures in Celsius (C)					
Animal Description	**4.4°C**	**10°C**	**14.4°C**	**21.1°C**	**26.6°C**	**32.2°C**
Feeders & Replacements 2 - 6 Months	20.1	22.0	25.0	29.5	33.7	48.1
Feeders & Replacements 7 - 11 Months	23.0	25.7	29.9	34.8	40.1	56.8
Feeders & Replacements 12 Months & Older	32.9	35.6	40.9	47.7	54.9	78.0
Bred Heifers & Dry Cows	22.7	24.6	28.0	32.9	-	-
Lactating Cows	43.1	47.7	54.9	64.0	67.8	61.3
Herd Bulls	32.9	35.6	40.9	47.7	54.9	78.0

Source: Beef Cattle Research Council

Energy Transition: Enel pulls back as it needs "*adequate returns on renewables*"

Enel needs "*adequate returns on renewables*"

We were a little surprised that Enel shares were only down small this week after they announced "*a temporary setback in some trends in the short-term*" and "*need RES at adequate returns*". Adequate returns can't be a big positive. Another high-profile EU power player, this time it's Enel, has had to make changes and pull back on its renewables push due to inadequate returns. It's all about capital allocation and Enel is pulling back on capital allocation to renewables. On Tuesday, we tweeted [LINK] *"Capital allocation is where the rubber meets the road. Enel pulls back on renewables. "reassessment of our key business drivers" "increases in LCOE calls for adequate returns on renewables." " focus on mature projects with higher investment return" Energy Transition will take way longer, cost way more and be a rocky road. #Oil #NatGas will be needed for longer. #OOTT."* Enel blamed items like inflation and interest rates but they haven't been getting adequate returns from renewables and have to focus on renewables with "*higher investment returns"* and not impacting "*direction*". Enel said "Need for RES at adequate returns" and "*focus on mature projects with higher investment returns and full eligibility in terms of hedging/risk assessment*." Enel used careful correct terms to call these *"adjustments*", "*temporary setback*". And . Enel said "*called for timely adjustments on the scenario embedded in Enel's plan", "caused a temporary setback in some trends in the short-term" "though not impacting the medium-term direction*". So the direction is clear but changing capital allocation means it will take longer to get there and, with the inadequate returns so far, cost more to get there. Our Supplemental Documents package includes the key Enel slides.

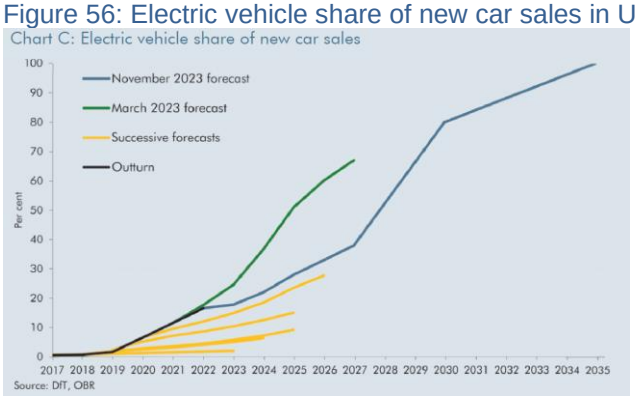
Energy Transition: UK makes massive 43% cut to its forecast for EV uptake in 2027%

Massive cut to UK EV uptake forecast

On Wednesday, the UK Office for Budget Responsibility issued its Economic and fiscal outlook November 2023 [LINK] and they made a massive 43% cut to their forecast for EV uptake looking ahead to 2027 compared to its March 2023 forecast. We tweeted [LINK] "*UK slashes EV uptake fcast to 38% in 27 vs 67% in Mar 23 fcast. 22/23 uptake was less than Mar 23 fcast. High upfront costs, costly if can't charge at home, etc. #Oil is needed for longer! #EnergyTransition will take way longer, cost way more, be a rocky road. #OOTT.* This is a massive change in forecast in eight months ie. compared to the March 2023 forecast. The key reasons are no surprise – high upfront cost of EVs that impact the steep adoption rate to date as EVs move to middle and lower income, and high cost to charge for those who can't

charge at home. Yesterday we tweeted [LINK] "*Will steep growth rate of EV sales "boosted by (usually high-income) early adopters" be maintained? UK says No. Price matters so higher EV upfront costs are an increasing factor moving from high to middle to lower income. #Oil #Gasoline will needed for longer #OOTT* " This has been one of our biggest criticisms of medium/long term EV forecasts – they assume adoption rates for lower and middle income households will be a steep as high income households. The UK writes "*The generally higher upfront costs of EVs relative to ICEVs will likely still be disincentivising many consumers, especially purchasers using car finance as interest rates are significantly higher than we had anticipated in 2022. In the absence of low cost EVs, the steep sales growth of the past years, boosted by (usually high-income) early adopters, is expected to slow."* And "*EVs have lower running costs for consumers who can charge vehicles at home. However, the cost advantage of EVs charged away from home is significantly less and can become negative, and the availability of public charging points seems to be a concern for many drivers."* As a result, the UK made a massive cut to their EV uptake forecast "*reduces our forecast of EV uptake (compared to March 2023) from 25 per cent to 18 per cent in 2023, and from 67 per cent to 38 per cent in 2027 (Chart C)."* Our Supplemental Documents package includes excerpts from the UK Economic and fiscal outlook.

Figure 56: Electric vehicle share of new car sales in UK



Source: UK Office for Budget Responsibility

Energy Transition: Big reduction in Ford's EV growth expectations

Ford slashes EV growth forecast

People can always discount the forecasts of agencies or analysts, but one thing that is predictive for the short/medium term is how much companies are investing in needed capital projects for any industry including the energy transition. If companies aren't investing needed capital for capacity additions in any sector, forecasts have to be reduced. Ford has cut back on its battery plant capacity to produce 40% less batteries and also says clearly the growth in EVs isn't what they "*and others*" had expected. They didn't elaborate who was in "*the others*". On Tuesday, we tweeted [LINK] "*Big reduction in forecast US EV demand growth. #Ford downsizes plant to produce ~40% less batteries. Says "We're very bullish on EVs" "Clearly the growth isn't at the rate that we and others had expected". #Oil is needed for longer! Thx @MikeColias #OOTT."* We referenced the WSJ report [LINK] "*Ford Motor is moving forward on construction of a battery plant in Michigan but at a reduced size from original plans, citing a pullback in the outlook for future electric-vehicle demand. Ford in September paused work on the factory, in Marshall, Mich. At the time, the company said it*

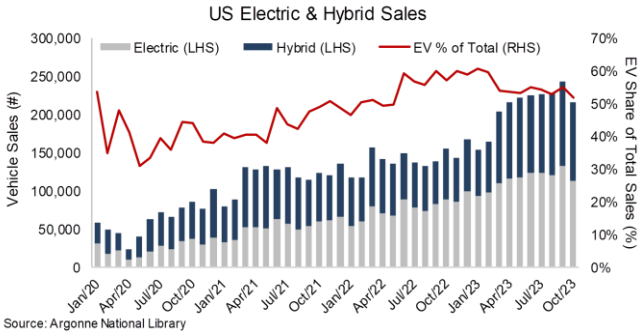
was reassessing its ability to competitively operate the plant, which will make batteries using technology from China's Contemporary Amperex Technology Co. Congressional Republicans have criticized the China connection and argued against the project qualifying for federal tax subsidies. On Tuesday, Ford said it has resumed work at the site, but downsized the scope of the project, with plans to produce roughly 40% fewer batteries than originally planned. It now expects to employ about 1,700 workers at the facility when the plant opens, scheduled for 2026, down from about 2,500. "We're still very bullish on EVs," a Ford spokesman told reporters Tuesday. "Clearly, the growth isn't at the rate that we and others had expected." Our Supplemental Documents package includes the WSJ report.

Energy Transition: Is hybrids taking market share from EVs a here-to-stay trend?

Hybrids gaining share from EVs

It's hard for even the climate change side to deny EVs are not being adopted anywhere near as fast as assumed in the Energy Transition plans and aspirations. But one other item that looks like a trend that isn't getting as much attention is that hybrids look to be taking market share from EVs at least in certain key markets like the US. On Monday, we tweeted [LINK] "*Hybrid vs EVs. Even EV skeptics likely see last few months sales as a pause and not a trend. But EV fans have to wonder if hybrid taking market share from EVs is a trend. Hybrid 48%/EVs 52% in Oct. #OOTT."* We look at the Argonne National Laboratory monthly light duty electric drive vehicles monthly data. [LINK]. The headlines on the monthly data have been on how EV sales have leveled off over the past few months. We agree, but we thought the more interesting trend is how hybrids looks to be taking market share from EVs. Our tweet included the below graph we made of the ANL data. EVs as a % of EVs + Hybrids sales reached its peak of 60.8% in Jan 2023 and now aback to 52.0% in Oct 2023.

Figure 57: US EV and Hybrid monthly sales



Source: Arbonne National Laboratory

Energy Transition: Germany wrongly tapped €60b Covid fund for energy transition

Germany used €60b Covid funds for climate

On Friday, we tweeted [LINK] "*Busted! Top court says Germany wrongly tapped debt relief to fight Covid to switch "untapped borrowing worth €60b into its Climate and Transformation Fund" Who else used Covid emergency funding to fund Energy Transition? Thx @kmatussek @KowalczeKamil #OOTT."* Germany is in a scramble to redo its budget with the big news last week that the Federal Constitutional Court ruled the government violated German constitutional law by shifting €60 billion ($65.2 billion) in debt relief for emergency Covid spending to its climate change funding. On Nov 15, Bloomberg wrote "*In a statement issued*

Wednesday in Karlsruhe, the court said that the scope of the fund, which in August was topped up to €212 billion for the period 2024 through 2027, must now be reduced by €60 billion. The ruling doesn't in any way limit the amount the government can spend on tackling climate change but rather the budgetary methods it can use. "If this means that obligations already entered into can no longer be met, the legislator must compensate for this in some other manner," Doris Koenig, vice president of the court, said in delivering the ruling, which was carried live on German television." There is no way they can reallocate that much money and German Vice Chancellor Habeck (also head of the Green Party) says "*"An unchanged debt rule prevents investments and climate protection, it weakens the German economy in times of need".* There has to be some sort of deal on increasing the debt limit. What isn't yet clear is if they will change Germany's plans to keep spending big on climate change. Ultimately, we would expect that there has to be some slower funding for climate change given this was caused by them tapping the available Covid funding by €60 billion to fund their climate change initiatives. Our Supplemental Documents package includes the Bloomberg reporting.

Who else used emergency Covid funding for climate change initiatives?

We don't know how easy it was withing Germany government spending to determine if was using €60 billion of Covid debt funding to shift over to climate change. But, we have to believe this use of emergency or temporary Covid funding for non-Covid reasons such as climate change wasn't limited to Germany among the western nations. It's why our Friday tweet included "*Who else used Covid emergency funding to fund Energy Transition?"* Billions were being allocated on an emergency basis without a lot of detail. It will be interesting to see if there can ever be an accounting of where Covid emergency funding was actually spent.

Capital Markets: IFIC Equity and balanced funds net redemptions in October

IFIC Cdn mutual fund data

One of the big Cdn equity stories in 2022 continues to play out in 2023 – the continued net redemptions from active managed Cdn equity and balanced mutual funds. This flipped in Q2/22 from massive net sales into balanced and equity mutual funds to massive net redemptions in equity and balanced mutual funds. On Friday, IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for October. IFIC reported net redemptions for balanced mutual funds were $8.565b in vs $6.187b in September and $4.750b in August. IFIC also reported net redemptions for equity mutual funds were $4.142b vs net redemptions of $2.197b in September and $2.152b in August. This brought YTD October 2023 net redemptions to $65.640b out of balanced and equity mutual funds, a large increase compared to YTD September 2022 net redemptions of $22.341b for a YoY difference of $43.299b. Note that Q2/22 was when it flipped from net sales into the massive net redemptions to end 2022. Last year net redemptions in balanced and equity funds totalled $38.47b, which was a massive YoY crashing of $138.92b vs 2021 that saw net sales in balanced funds and equity funds of $100.45b. Our Supplemental Documents package includes the IFIC release.

Figure 58: Cdn Mutual Fund Net Sales/Net Redemptions ($ Millions)

Mutual fund net sales/net redemptions ($ millions)*

Asset class	Oct 2023	Sep 2023	Oct 2022	YTD 2023	YTD 2022
Long-term funds					
Balanced	(8,565)	(6,187)	(5,660)	(45,754)	(19,964)
Equity	(4,142)	(2,197)	(1,968)	(19,886)	(2,377)
Bond	(1,028)	(890)	(1,662)	6,628	(10,512)
Specialty	199	133	(2)	2,971	1,213
Total long-term funds	(13,537)	(9,142)	(9,291)	(56,042)	(31,640)
Total money market funds	997	1,572	1,189	12,815	4,832
Total	(12,540)	(7,570)	(8,102)	(43,226)	(26,807)

Source: IFIC

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

It's been another bad year for net redemptions for Cdn balanced and equity funds, but 2022 was brutal. Here is what we wrote in our Jan 29, 2023 Energy Tidbits memo. "*One of the big Cdn equity stories in 2022 continued to play out in the final month of the year – the massive net redemptions from active Cdn equity fund manager's balanced and equity mutual funds in 2022, which is a huge change from the massive net sales into balanced and equity mutual funds in 2021. On Thursday, we tweeted [LINK] "WOW! @IFIC balanced & equity mutual funds net sales/redemptions data for 2022. YTD 12/31/22 net REDEMPTIONS of $38.5b. YTD 12/31/21 net SALES $100.4b. YoY diff is -$138.9b!! Makes #Oil #NatGas stocks big outperformance vs TSX and oil prices even more impressive. #OOTT." On Tuesday the IFIC (Investment Funds Institute of Canada) reported [LINK] mutual funds and ETF sales for Dec. IFIC reported net redemptions for mutual funds balanced funds were $4.97b (vs $5.07b in Nov and $5.66b in Oct) and YTD Dec 31 of $29.99b. IFIC reported net redemptions for mutual funds equity funds were $3.08b in Dec (vs $3.01b in Nov and $1.89b in Oct) and YTD Dec 31 of $8.48b. The change vs 2021 is huge and has widened since the Nov update. YTD Dec 31, net redemptions in balanced funds and equity funds was $38.47b, which is a YoY crashing of $138.92b vs YTD Dec 31, 2021 that saw net sales in balanced funds and equity funds of $100.45b.*"

Figure 59: Cdn Mutual Fund Net Sales/Net Redemptions ($ Millions)

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

Asset Class	Dec. 2022	Nov. 2022	Dec. 2021	2022	2021
Long-term Funds					
Balanced	(4,969)	(5,066)	1,628	(29,999)	63,346
Equity	(3,080)	(3,014)	462	(8,480)	37,102
Bond	(2,254)	(1,104)	(1,276)	(13,790)	14,530
Specialty	(37)	(10)	415	1,166	6,010
Total Long-term Funds	(10,340)	(9,194)	1,229	(51,103)	120,988
Total Money Market Funds	1,642	551	185	7,026	(7,414)
Total	(8,698)	(8,643)	1,415	(44,077)	113,574

Source: IFIC

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

@Energy_Tidbits on Twitter

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

LinkedIn: Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

John Madden's classic turducken featured on NFL games this week

It's US Thanksgiving this week so that means NFL football and that means reminders on John Madden's classic turkey clips especially his turducken. For those that know, turducken is a deboned chicken inside a deboned duck inside a mostly deboned Turkey that has its wings and legs left intact. And it seems like most variations include stuffing inside the chicken and a layer of stuffing separating the chcken and the duck and the duck and the turkey. We couldn't find the video showing Madden using his hand like a knife to cut the turducken in half.

Figure 60: Turducken

Source: For the Win

Illy Chairman "*one defective bean can spoil up to one kilo of coffee*".

We had Bloomberg playhiong on Sirius this week when they ran a replay of their Nov 15, 2023 interview with Andrea Illy (Chairman of illycaffe S.p.A). [LINK]. At 2:20 min mark, he said "… *producing high quality coffee is not an easy job ….. electronic sorting of every single bean. This has been one of our patents. Sorting every single bean because one defective bean can spoil up to one kilo of coffee*."

Every vote counts – Louisiana election won by one vote

Elections are a 50/50 bet as to getting the election results you want. We often hear people say their vote doesn't make a difference so that is why people may not vote. But we saw a great example that eve vote makes a difference. On Wednesdayt, AP reported [LINK] "*In the northwest corner of Louisiana, a candidate for parish sheriff demanded a recount Wednesday after losing by a single vote in an election where more than 43,000 people cast ballots."*