Energy Tidbits

November 24, 2024

Produced by: Dan Tsubouchi

Vitol: Mid-Term China Oil Demand Growth Slope is Similar to Pre-Covid Even as Peak Transport Fuel Reached

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 1998 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. My 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 the review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector. My target is to write on 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. Vitol's mid-term China oil demand outlook sees demand growth slope similar to pre-Covid even as peak transport fuel reached because of strong petchem growth. [click here]

2. Russia hits Ukraine with hypersonic Mach10 speed ballistic missile "Oreshkin" and reminds Oreshkin's range can reach anywhere in Europe. [click here]

3. COP29 acknowledges increasing costs for energy transition but doesn't specifically call out the high cost and lack of expected advancement of key items like Green Hydrogen, SAF, offshore wind, EVs, etc. [click here]

4. Huge demand for Cdn & US natural gas supply as TC Energy sees North American natural gas demand +40 bcf/d to ~160 bcf/d by 2035. [click here]

5. We expect IEA will take a more balanced oil messaging and likely to tweak up its oil demand forecast in its Dec and Jan Oil Market Reports now that they know Liberty Energy CEO will be their US boss. [click here]

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

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

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Natural Gas: -3 bcf draw in US gas storage; now +141 bcf YoY

-3 bcf draw in US gas storage

Two weeks' ago in our Nov 10, 2024, Energy Tidbits memo, we highlighted US gas storage started the traditional winter gas withdraw season at 3,932 bcf, which was +157 bcf YoY and +215 bcf above the 5-yr average. And this would have been way higher if producers hadn't shut in production in Q2 and Q3 due to low prices. This is the second week of the traditional winter withdraw season, and the first week we have seen a draw, following last week's +42 bcf WoW build. For the week ending Nov 15, 2024, the EIA reported a -3 bcf draw [LINK]. Total storage is now 3.969 tcf, representing a surplus of +141 bcf YoY compared to a surplus of +158 bcf last week. Since Feb, total storage had remained above the top end of the 5-yr range, until 1 month ago when storage dipped into the 5-yr range but last week saw the storage once again rise above the max, and this week continued this trend. The week of Nov 15, 2024, saw storage come in +92 bcf above the previous 5-yr maximum of 3.877 tcf. Total storage is now +239 bcf above the 5-year average, above last week's +228 bcf surplus. Below is the EIA's storage table from its Weekly Natural Gas Storage report and a table showing the US gas storage over the last 8 weeks.

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (11/15/23)		5-year average (2019-23)	
Region	11/15/24	11/08/24	net change	implied flow	Bcf	% change	Bcf	% change
East	931	943	-12	-12	922	1.0	909	2.4
Midwest	1,140	1,141	-1	-1	1,117	2.1	1,094	4.2
Mountain	293	291	2	2	255	14.9	224	30.8
Pacific	313	312	1	1	295	6.1	281	11.4
South Central	1,291	1,285	6	6	1,239	4.2	1,223	5.6
Salt	347	346	1	1	331	4.8	328	5.8
Nonsalt	944	939	5	5	908	4.0	896	5.4
Total	3,969	3,972	-3	-3	3,828	3.7	3,730	6.4

Totals may not equal sum of components because of independent rounding.

Source: EIA

Figure 2: Previous US Natural Gas Storage

Previous 8 weeks (Bcf)				
Week Ended	Gas in Storage	Weekly Change	Y/Y Diff	Diff to 5 yr Avg
Sep/27	3,547	55	127	190
Oct/04	3,629	82	124	176
Oct/11	3,705	76	107	163
Oct/18	3,785	80	106	167
Oct/25	3,863	78	107	178
Nov/01	3,932	69	157	215
Nov/08	3,972	42	158	228
Nov/15	3,969	-3	141	239

Source: EIA

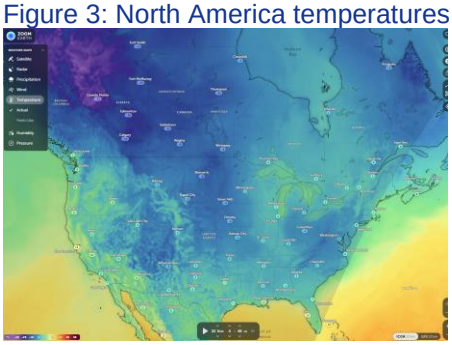
Natural Gas: Colder weather in Nov in US, Europe and Asia

Colder weather last week

Absent a major supply interruption, the major factor driving natural gas and LNG prices. Global natural gas storage started the winter at high levels in China, Europe and the US. Despite this, it was a good last 10 days or so for global LNG and natural gas prices as there was some colder weather for Nov. This is because weather is unpredictable and, because it's the early innings of winter in Nov, a little colder weather in Nov was a good boost to LNG and natural gas prices even in the face of forecasts for warmer weather. And the colder temperatures in more of the US surprised most forecasts. On Friday, we tweeted [LINK]

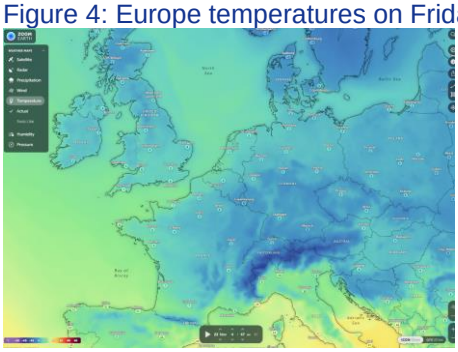
"*#NatGas #LNG prices up with generally cold temperatures for this time of Nov in most key #NatGas consuming regions. Great interactive temperature (also wind, precip, etc) from Zoom Earth. [LINK] #OOTT."* The Zoom Earth link is a good one to bookmark. Below are the Zoom Earth temperature maps for North America, Europe and Asia that were attached to our tweet.

Figure 3: North America temperatures on Friday morning.



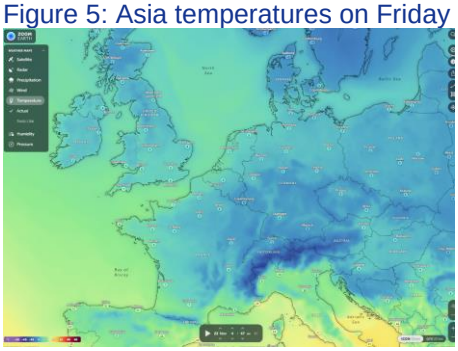
Source: Zoom Earth

Figure 4: Europe temperatures on Friday morning (North America time)



Source: Zoom Earth

Figure 5: Asia temperatures on Friday morning (North America time)



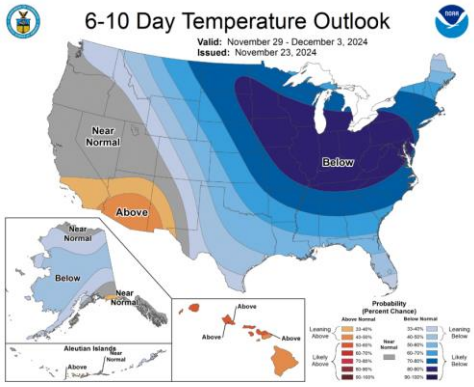
Source: Zoom Earth

Natural Gas: NOAA forecasts cold to end Nov/start Dec

NOAA updated weekly temperature outlooks

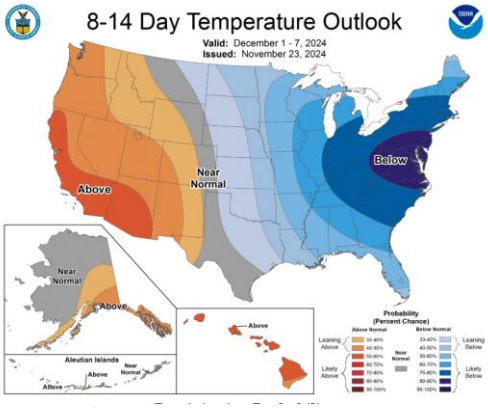
It's the last week of Nov so that means temperatures become even more important in the natural gas call for 2025 as history shows that a warm start to winter will hold back natural gas for most of 2025. When we saw NOAA's updated bullish 6-10 & 8-14 day temperature outlooks yesterday, we wanted to take a closer look at NOAA's temperature outlook for each of the next four weeks to see if this was a clear bullish temperature outlook from now until Dec. Yesterday, we tweeted [LINK] "*Updated by week @NOAA forecasts as of Nov 22. Nov 23-29. Looking normal to warmer than normal for most of US. Nov 30-Dec 6. Cold in north, warm in south. Dec 7-14. Cold in east, hot in west. Dec 14-20. warmer than normal for most of US. #NatGas #OOTT. W*hen we drill down to the weekly looks, it seems that we may have to wait a week to see the cold temperatures in the eastern half of the US for early Dec. So as we look out, like NOAA 6-10 day temperature outlook, it looks bullish but we have to wait a week to get there. We remind that temperature forecasts are from 100%. Below are NOAA's updated, as of yesterday, 6-10 day and 8-14 day temperature outlook maps covering Nov 22-30. And NOAA's weekly temperature outlook as of Friday that we attached to our tweet.

Figure 4: NOAA 6-10 day temperature outlook for Nov 29-Dec 3



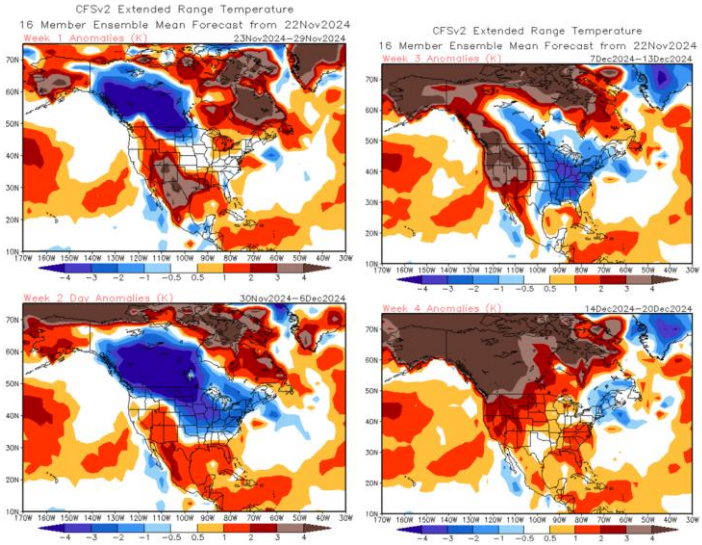
Source: NOAA

Figure 5: NOAA 8-14 day temperature outlook for Dec 1-7



Source: NOAA

Figure 6: NOAA weekly temperature outlook as of Nov 22



Source: NOAA

Natural Gas: Tough for HH prices to catch up if a warm start to winter

Risk to HH prices going into winter

For years, we have warned on the risk to HH gas prices unless it's cold to start winter ie. in Nov/Dec. Unfortunately, that is what we have seen for the last years other than when Russia invaded Ukraine in 2022. Here is the Bloomberg weekly graph as of the Friday close that shows the seasonal HH price moves. Russian invaded Ukraine on Feb 24, 2022 and that drove up global natural gas and LNG prices with Europe cutting off cheap Russia natural gas pipeline gas. Putting 2022 aside, all the other years have seen HH gas prices weaken in Nov/Dec even when temperatures were normal. And our weekly memos have been highlighting US gas storage is up YoY and would have been full if producers hadn't shut in natural gas production due to low prices. And, as noted above, there is bullish temperature support to end Nov/start Dec but that isn't, at this time, forecast to continue for an extended period. Our concern is that the graphs remind it is tough for HH gas prices to catch up with a weak start to winter. So, there is risk going into the winter unless it starts off cold and stays at least normal of colder on a sustained basis.

Figure 7: HH gas prices seasonal comparison to Nov 22, 2024 close

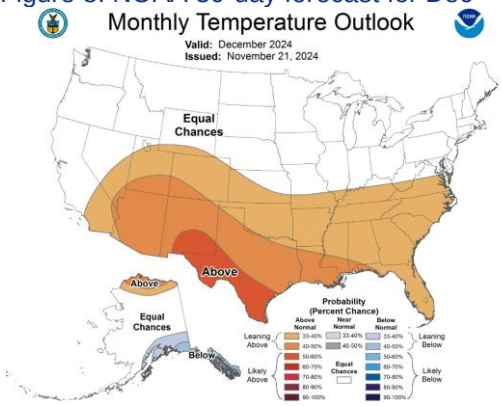
Source: Bloomberg

Natural Gas: NOAA expects above normal temp for most of U.S. in December

Forecast for a warm Dec

No one probably expected yesterday's NOAA's 6-10 day and 8-14 day temperature outlook based on their Dec forecast from Thursday. Just focusing on the new 30-day temperature outlook, we continue to expect a key holdback to near term natural gas and LNG prices will be weather forecasts still call for a warm winter. Absent major supply interruptions, a warm winter is a more important LNG and natural gas price factor. A warm start to winter is never a plus to HH gas prices and makes it essential for Jan/Feb/March to have below average temperatures; or else it points to another year where prices soften in Dec. Last winter was warm everywhere and tht warm start to winter and a warm winter overall has kept natural gas and LNG prices held back all year in 2024. On Wednesday, the NOAA posted its 30-day forecast for December, and the temperature probability outlook calls to expect warmer than average temperatures this December; the populous south of the U.S. is forecasted to have above average temperatures. The rest of the U.S. is forecasted to have equal chances of above or below temperature occurrences. We recognize that weather forecasts are far from 100% accurate, but near-term forecasts tend to have greater accuracy. Below is the NOAA temperature probability outlook forecast for November released on Nov 21.

Figure 8: NOAA 30-day forecast for Dec



Source: NOAA

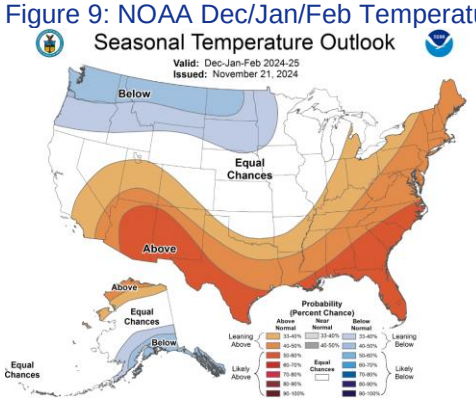
Natural Gas: NOAA sees a warmer than normal winter Dec/Jan/Feb

Warmer than normal winter

The NOAA sees a warmer than normal Dec/Jan/Feb in the lower 48. We recognize that temperature forecasts are never 100% accurate but, until they change to looking to normal temperatures, the weather forecasts will be a holdback to HH prices. As noted above, absent a supply interruption, winter weather temperatures are the most significant factor on LNG and natural gas prices. On Wednesday, the NOAA posted the updated monthly winter 2024-25 outlook [LINK]. On Wednesday, we Tweeted [LINK] "*HH #NatGas up on RUS/UKR escalation pulling global prices higher and colder weather in Lower 48. Thx @weatherchannel. But still reason to be cautious with @NOAA's updated Dec and Dec/Jan/Feb temperature forecast calling for warmer than normal temp. #OOTT*". NOAA continues to forecast an emerging La Nina in the Northern Hemisphere Winter 2024-25. The takeaway from the update is to expect warmer than average temperatures in the populous NE and south of the US, slightly below average temperatures favoured in the Pacific Northwest to the northern High Plains; with the

remaining areas being normal temperature. Below are NOAA's temperature forecast maps for Dec/Jan/Feb.

Figure 9: NOAA Dec/Jan/Feb Temperature Probability Forecast

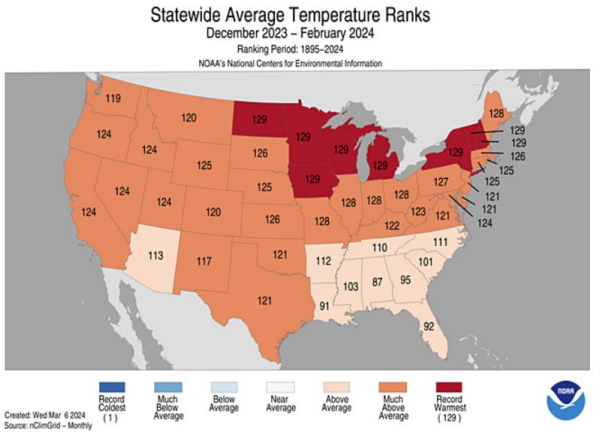


Source: NOAA

NOAA, winter 2023/24 was the hottest on record

Here is what we wrote in our February 18, 2024, Energy Tidbits about last winter, which was the warmest on record: "*On Friday, we tweeted [LINK] "No surprise HH #NatGas prices are $1.80 given @NOAA reminds it was the warmest winter on record. Would be <$1.50 if EQT, CHK & others weren't shutting in supply. Challenge for #NatGas is that shoulder season is starting ie. leave the windows open temperatures. #OOTT." On Friday, NOAA also posted its recap of US weather for Dec/Jan/Feb ie. Winter 2023/24. NOAA wrote "The 2023–24 winter season ranked warmest on record for the contiguous U.S. with eight states across the Upper Midwest, Great Lakes and Northeast each observing their warmest winter on record."*

Figure 10: NOAA Historical US Temperature Ranks by State – Dec/Jan/Feb 2023/24



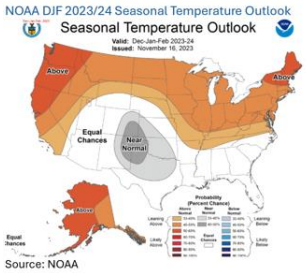
Source: NOAA

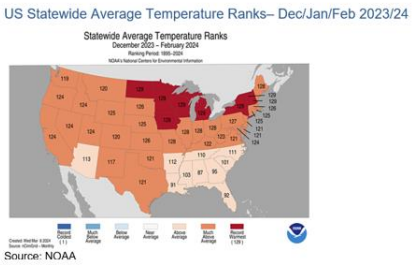
Natural Gas: Last 3 winters have turned out warmer than NOAA's Nov forecasts

Actuals DJF vs NOAA's Nov Forecast

After we tweeted the updated NOAA temperature forecast for winter DJF, we were asked if we knew how accurate NOAA's prior winter forecasts were relative to the actual temperatures. On Thursday, we tweeted [LINK] "*Thx @Josh_Young_1 for question. See 👇 Don't have the #s but looks like last 3 winters' actual temps turned out warmer vs @NOAA's seasonal temp forecast made in Nov. Winter 23/24: warmest on record. Winter 22/23: then ranked 17th warmest on record. Winter 21/22: then ranked 18th warmest on record. #NatGas #OOTT.*" We went back to NOAA's Nov forecasts for the last three winters and compared the actual winter temperatures. And it looks like the last three winters turned out warmer than NOAA's Nov forecasts. Below are the forecast vs actual temperature maps we attached to our tweet.

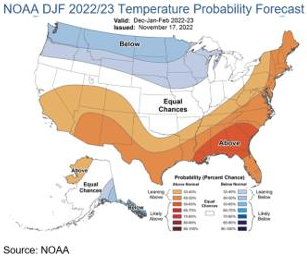
Figure 11: Nov DJF 2023/24 Temperature Forecast vs Actual DJF 2023/24 Temperature

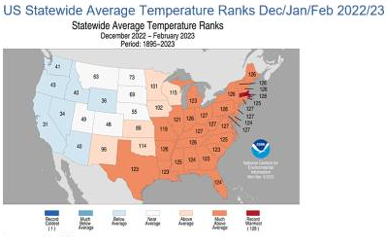




Source: NOAA

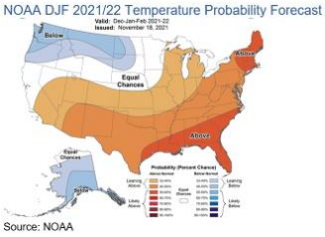
Figure 12: Nov DJF 2023/23 Temperature Forecast vs Actual DJF 2022/23 Temperature

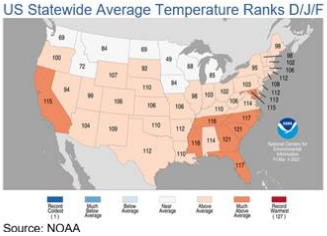




Source: NOAA

Figure 13: Nov DJF 2021/22 Temperature Forecast vs Actual DJF 2021/22 Temperature





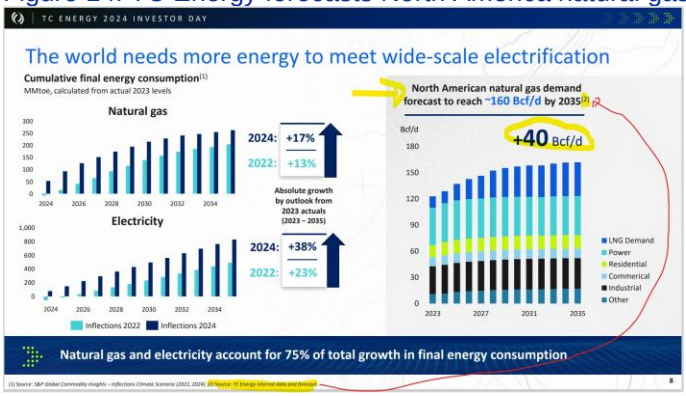
Source: NOAA

Natural Gas: TC Energy, demand for North American natural gas +40 bcf/d by 2035

US August LNG exports

TC Energy held its Investor Day on Tuesday and the included their bullis h outlook for growth in North America natural gas demand of +40 bcf/d by 2035 to ~160 bcf/d. TC Energy posted its slide deck early Tuesday morning ahead of the webcast and, when we saw the slides, we tweeted [LINK] "*Bullish for an increasing value for CAUS #NatGas reserves in 2020s. "TC Energy internal data and forecast" sees North America #NatGas demand +40 bcf/d to ~160 bcf/d by 2035. A huge supply challenge to get to 160 bcf/d & sustain as shale/tight gas have big initial decline rates. #OOTT."* Our tweet included the below TC Energy slide. We highlighted the footnote that this was "*TC Energy internal data and forecast*". TC Energy forecasts North America natural gas demand forecast to be +40 bcf/d to reach ~160 bcf/d by 2035. Our tweet noted our view that that is a huge challenge for US and Canada natural gas supply to add 40 bcf/d in 10 years and then an even bigger challenge to sustain that, or any future level of US/Canada natural gas supply with the high initial decline rates in shale and tight gas.

Figure 14: TC Energy forecasts North America natural gas demand +40 bcf/d to 2035



Source: TC Energy

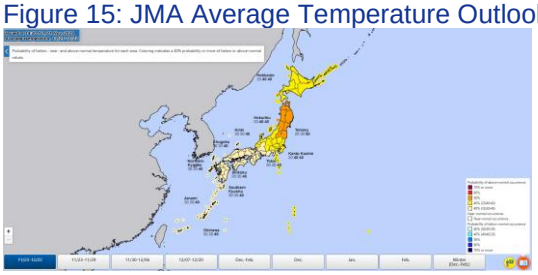
Natural Gas: Japan expects warmer than normal temps to move to normal in mid-Dec

JMA temperature forecast for the next 30 days

It was a hot summer in Japan and warmer than normal temperatures continued into Nov and forecast to continue until temperatures turn to more normal temperatures in mid-Dec. On Thursday, the Japan Meteorological Agency updated it's temperature forecast for the next 30 days, Nov 23 thru Dec 22, in Japan [LINK]. There is no JMA commentary on the forecast. JMA is calling for above normal temperatures for the rest of November and the first week of December. During the period of Nov 23-Dec 22 there is a +40% probability of above normal temperature occurrence in the majority of Japan during the period, with a +50% probability of above normal temperature occurrence in Hokuriku, and Tohoku. It is important to note that this is the first 30-day temperature forecast that has not called for only warmer than normal temperatures; there is a near normal occurrence predicted for temperatures expected during the second week of December in most of Japan, with a normal temperature occurrence in the majority of Japan during the period, with a +40% probability of above normal temperature occurrence in Hokuriku, Tohoku, Tokai, Kanto Koshin, and Hokkaido. We checked AccuWeather for Tokyo and, for November, there are forecasted daily highs in the 10-15C range and overnight lows from 3-6C. This may potentially a little bit of electricity heating

demand during the day, and more during the nights. Below is the JMA temperature forecast for the first two weeks of December.

Figure 15: JMA Average Temperature Outlook for Nov 23 – Dec 22



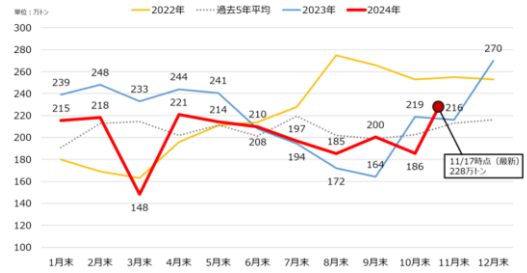
Source: Japan Meteorological Agency

Natural Gas: Japan LNG stocks up WoW, and up YoY; also, up against to 5-yr average

Japan LNG stocks up WoW

It's been a warm fall in Japan, which means no significant weather driven electricity demand. Japan's LNG stocks are up WoW, up YoY, and are up when compared to the 5-year average. On Wednesdays, Japan's METI releases its weekly LNG stocks data [LINK]. LNG stocks on November 17 were 109.5 bcf, up +3.2% WoW from November 10 of 106.1 bcf, and up +5.6% from 103.7 bcf from a year ago. Stocks are up compared to the 5-year average of 102.3 bcf. Below is the Japanese LNG stocks graph from the METI weekly report.

Figure 16: Japan LNG Stocks



Source: METI

Natural Gas: Russia continues to ship NatGas despite Ukraine control of Sudzha

Ukraine captures key Russian gas infrastructure

It's been over a few months since Ukraine invaded the Russian region of Kursk and took over control of the Sudzha natural gas intake station in Russia for transport on the last remaining open natural gas intake station in Russia for transport on the last remaining open natural gas pipeline allowed to export Russian natural gas to central European countries. Europe TTF gas prices were up 5% when Ukraine took over Sudzha on fears of supply interruption. However, since then Gazprom has confirmed almost daily, if not daily, that there has been no interruption in natural gas supplies. Bloomberg reports on the Gazprom volumes most days and the latest confirmation we saw on Friday Nov 22 that Gazprom continues to ship the same volume of natural gas of 1.50 bcf/d via Sudzha. Also earlier this morning, TASS reported [LINK] the same number 1.50 bcf/d for today. TASS wrote "*Gazprom supplies gas for Europe through Ukraine in the volume of 42 mln cubic meters (mcm) per day via the Sudzha gas pumping station in Russia's Kursk Region, a Gazprom representative told reporters, adding that the request for pumping through Sokhranovka had been rejected by*

the Ukrainian side. "Gazprom supplies Russian gas for transit through Ukrainian territory in the volume confirmed by the Ukrainian side via the Sudzha gas pumping station - 42 mln cubic meters as of November 24. The nomination for the Sokhranovka gas pumping station has been rejected," he said. The day before, the pumping volume was 42.4 mln cubic meters. The volume of supplies remains the same, despite the failure of Austrian company OMV to pay for Russian gas supplies.". Below is a 2018 map from Oxford Institute for Energy Studies showing Sudzha.

Figure 17: The Ukrainian pipeline system

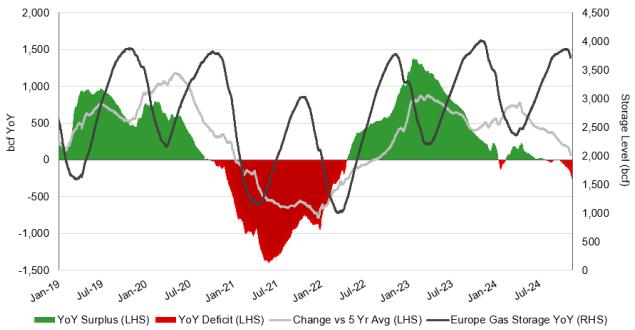
Source: Oxford Institute for Energy Studies

Natural Gas: Europe storage down -2.8% WoW to 88.8% full, down -9.8% YoY

Europe gas storage

As noted earlier, some colder temperatures for Nov were in Europe this week and wind generation was lower. As a result, there were storage draws this week. As noted above, Europe gas storage would have been effectively full if they hadn't cut back on LNG imports in Q2 and Q3. We have been highlighting that a big LNG theme in Q2 and Q3 was how NW Europe reduced LNG imports because storage was very high YoY leaving winter 2023/24. It got to +95% full, which we have been saying was what we considered to be effectively full. This week, Europe storage was down -2.8% WoW to 88.8% vs 91.7% on November 14. Recall that winter 2023/24 was one of the hottest winters in Europe. Storage is now down -9.8% from last year's levels of 98.7% on November 21, 2023, and down against the 5-year average of 90.6%. Below is our graph of European Gas Storage Level.

Figure 18: European Gas Storage Level

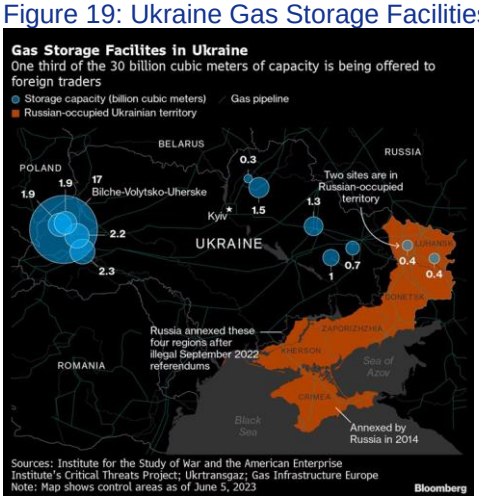


Source: Bloomberg, SAF

Ukraine storage is currently ~8% of total Europe gas storage volume

We have been breaking out Ukraine gas storage levels since the Mar/Apr Russian bombing of the Ukraine natural gas storage, which only impacted some above ground natural gas infrastructure. But it also reminded of the risk to Europe gas storage from Russia attacks. We broke out the Ukraine storage data from the above Europe data we monitor weekly from the GIE AGSI website [LINK], and, on November 20, 2024, natural gas in Ukraine storage was at 24.6% of its total capacity, down compared to 26.8% of its total capacity on November 13. Last year, Ukraine storage started the winter on Nov 1, 2023, at 39.38%. Right now, Ukraine makes up ~8% of Europe's natural gas in storage and, at the beginning of winter 2023/24, it was ~10% of Europe's natural gas in storage. Below is a map of Ukraine's major gas storage facilities.

Figure 19: Ukraine Gas Storage Facilities as of June 2023



Source: Bloomberg

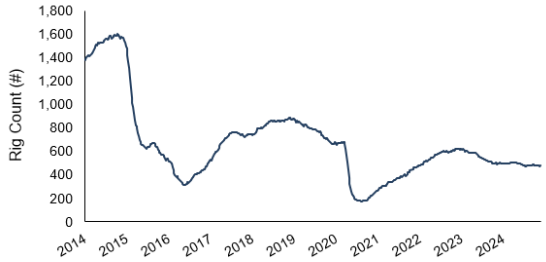
Oil: U.S. oil rigs up +1 rig WoW and down -26 rigs YoY to 479 oil rigs

US oil rigs up WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. (i) Note Baker Hughes no longer breaks out the basin changes by oil vs gas rig type. (ii) Total U.S. oil rigs were up +1 rig WoW to 479 oil rigs as of Nov 24, 2024. We expect, like seen every year, US rigs will decline in the coming week into U.S. Thanksgiving and continue this decline until just past X-Mas. U.S. oil rigs are now down -26 oil rigs YoY. The smaller YoY difference is because, in 2023, US oil rigs went below 520 rigs on Aug 25, 2023 and then were lower in the 490-510 rigs for several months. But then dropped down to 477 on July 19, 2024, which was the lowest oil rig count since Dec 2021. U.S. Oil rigs are currently down -26 YoY, and nearing the recent lows in July 2024 (iii) Note we can see the basin changes but not by type of rig; the WoW basin changes were, Ardmore Woodford down -1 rig WoW to 0 rigs, Cana Woodford up +1 rig WoW to 21 rigs, Granite Wash +2 rigs to 5 rigs, and Haynesville -2 rig to 30 rigs. (iv) The overlooked U.S. rig theme is the YoY declines, which have begun to taper as Q4 2023 saw activity leveling off, however, it is still important to note the YoY change. Total U.S. gas and oil rigs are down -43 rigs YoY to 578 rigs including US oil rigs -26 oil rigs YoY to 479 oil rigs. And for the key basins, the Permian is -11 rigs YoY, Haynesville is -9 rigs YoY, DJ Niobrara is -7 rigs YoY, Marcellus -4 rigs YoY, Williston up +2 rigs YoY, Arkoma

Woodford up +1 YoY, Granite Wash is down -1 rig YoY, Eagle Ford is down -2 rigs YoY, Barnett up +1 rig YoY, Ardmore Woodford was flat YoY, and Cana Woodford +3 rigs YoY. (v) US gas rigs were down -2 rigs this week to 99 gas rigs. It is important to note that U.S. gas rigs will need to increase over the next several months as more U.S. LNG capacity comes onstream in 2025. Lastly, U.S. miscellaneous rigs are flat WoW, and up +1 rig YoY.

Figure 20: Baker Hughes Total US Oil Rigs



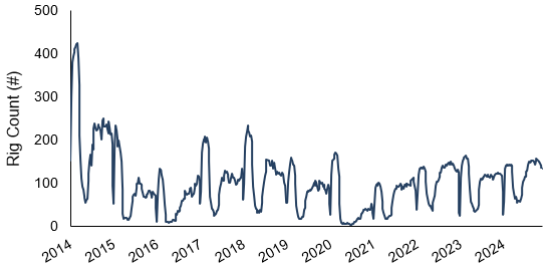
Source: Baker Hughes

Oil: Total Cdn oil rigs down -4 WoW on Friday, with gas rigs up +4 WoW

Cdn rigs +1 WoW

On Friday, Baker Hughes released its weekly North American drilling rig data. This week's total oil and gas rig count was flat WoW at 200 rigs on Nov 22. Every year, Canadian rigs typically increase until mid-Oct, where remain relatively flat until late Nov when they begin ramping up until the end of Dec; note that we should expect a bounce and we should start to see the normal Dec pickup for winter drilling seasons in the coming weeks before the normal decline into Christmas. Cdn oil rigs were down -4 rigs WoW this week to 133 rigs and are up +11 rigs YoY. Gas rigs are up +4 rig WoW to 67 rigs and are down -3 rigs YoY, and miscellaneous rigs are up +1 rig WoW and up +1 rig YoY at 1 rig total. As a reminder Baker Hughes changed their reporting format which does not allow us to see the provincial breakouts.

Figure 21: Baker Hughes Total Cdn Oil Rigs



Source: Baker Hughes

Oil: US weekly oil production down -0.199 mmb/d WoW to 13.201 mmb/d, flat YoY

US weekly oil production

We don't place as much emphasis on the EIA weekly oil supply estimates as others do because we recognize the near impossibility for anyone to post an accurate estimate on a Wednesday for the totality of US oil production for the week ended the prior Friday [LINK]. We have to give the EIA credit for putting out weekly oil supply estimates for the prior week- that can't be easy so no one should be surprised that the EIA weekly oil supply estimates,

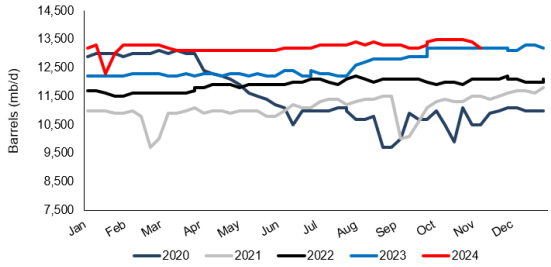
based on the Form 914 actuals, will regularly require re-benchmarking; sometimes the re-benchmarking can be significant and other times, it is relatively small. The EIA's weekly oil supply estimates had been essentially unchanged for the last nine months ranging from 13.100 to 13.300 mmb/d with the weekly estimates in July all at 13.300 mmb/d. This week's estimate came in within the previous range, down -0.199 mmb/d WoW to 13.201 mmb/d for the week ending Nov 15. This is flat YoY to 13.200 mmb/d for the week ended Nov 17, 2023. On Nov 13, the EIA released its Nov STEO and the EIA provides the backup monthly estimates for US oil production, and they are more or less in line with July at 13.210 mmb/d, Aug at 13.400 mmb/d, Sept at 13.210 mmb/d, and Oct coming in at 13.450 mmb/d. This week, the EIA's production estimates were down -0.199 mmb/d WoW to 13.201 mmb/d for the week ended Nov 15. Alaska were up +0.009 WoW to 0.441 mmb/d, compared to 0.432 mmb/d last week. Below is a table of the EIA's weekly oil production estimates.

Figure 22: EIA's Estimated Weekly US Field Oil Production (mb/d)

	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
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	11/24	13,200		
2023-Dec	12/01	13,100	12/08	13,100	12/15	13,300	12/22	13,300	12/29	13,200
2024-Jan	01/05	13,200	01/12	13,300	01/19	12,300	01/26	13,000		
2024-Feb	02/02	13,300	02/09	13,300	02/16	13,300	02/23	13,300		
2024-Mar	03/01	13,200	03/08	13,100	03/15	13,100	03/22	13,100	03/29	13,100
2024-Apr	04/05	13,100	04/12	13,100	04/19	13,100	04/26	13,100		
2024-May	05/03	13,100	05/10	13,100	05/17	13,100	05/24	13,100	05/31	13,100
2024-Jun	06/07	13,200	06/14	13,200	06/21	13,200	06/28	13,200		
2024-Jul	07/05	13,300	07/12	13,300	07/19	13,300	07/26	13,300		
2024-Aug	08/02	13,400	08/09	13,300	08/16	13,400	08/23	13,300	08/30	13,300
2024-Sep	09/06	13,300	09/13	13,200	09/20	13,200	09/27	13,300		
2024-Oct	10/04	13,400	10/11	13,500	10/18	13,500	10/25	13,500		
2024-Nov	11/01	13,500	11/08	13,400	11/15	13,201				

Source: EIA

Figure 23: EIA's Estimated Weekly US Oil Production



Source: EIA

Oil: North Dakota September oil production up MoM to 1.200 mmb/d

On Tuesday, the North Dakota Industrial Commission posted its monthly Director's Cut, which includes September's oil and natural gas production data as well as other data such as

North Dakota September oil production

well completions, DUCs, number of producing wells, etc. [LINK]. North Dakota's oil production in September was up MoM +0.020 mmb/d to 1.200 mmb/d from 1.180 mmb/d in August and is down -6.3% YoY against 1.280 mmb/d in September 2023. September well completions were down to 58 compared to August's 97 wells completed. Our Supplemental Documents package includes excerpts from the NDIC Director's Cut.

Figure 24: North Dakota Oil Production by Month

(b/d)	2018	2019	2020	2021	2022	2023	2024	*24/23*
Jan	1,179,564	1,403,808	1,430,511	1,147,377	1,088,613	1,060,708	1,102,976	*4.0%*
Feb	1,175,316	1,335,591	1,451,681	1,083,554	1,089,091	1,158,837	1,252,102	*8.0%*
Mar	1,162,134	1,391,760	1,430,107	1,108,906	1,122,640	1,122,693	1,229,536	*9.5%*
Apr	1,225,391	1,392,485	1,221,019	1,123,166	900,597	1,133,435	1,243,678	*9.7%*
May	1,246,355	1,394,648	859,362	1,128,042	1,059,060	1,135,009	1,198,086	*5.6%*
June	1,227,320	1,425,230	893,591	1,133,498	1,096,783	1,166,604	1,186,394	*1.7%*
July	1,269,290	1,445,934	1,042,081	1,076,594	1,072,632	1,180,611	1,169,499	*-0.9%*
Aug	1,292,505	1,480,475	1,165,371	1,107,359	1,075,307	1,223,617	1,179,728	*-3.6%*
Sept	1,359,282	1,443,980	1,223,107	1,114,020	1,121,063	1,280,052	1,199,764	-6.3%
Oct	1,392,369	1,517,936	1,231,048	1,111,910	1,121,754	1,254,475		
Nov	1,375,803	1,519,037	1,227,138	1,158,622	1,098,389	1,278,909		
Dec	1,402,741	1,476,777	1,191,429	1,144,999	957,864	1,274,869		

Source: NDIC, NDPA

October is likely flat North Dakota oil production despite higher completions

The NDIC didn't say it would be flat but based on the comments this month and last month, we think they are pointing to flat North Dakota oil production in Oct. (i) On Tuesday, NDIC held its monthly press conference on the Sept data and also gave an update on the Oct activity numbers. (i) In the prepared remarks, NDIC said: "*In September we were producing almost 1.2 million barrels of oil… that was an increase we have been expecting, anticipating, coming up later in the year here based on the completion we have been seeing… We permitted 111 wells in October, we think that around that 100 mark is the number we need to be at to be able to grow production 1-2%... we had 95 completions in October, those are good numbers that we need to maintain production*". So based on completions, they are pointing to a flat month. (ii) However the 2nd question was if they have a final figure for oil production was held back during the grassfires. NDIC replied "*I have not. Those numbers will come in next month…. But those will be reflected in next month's report."* (iii) Wildfires in Oct hit North Dakota oil production. The reason we listen to the monthly press conference is that there is always insight into the oil numbers and outlook. In Our Oct 20, 2024 Energy Tidbits memo, we highlighted the comments NDIC made in their Oct 17, 2024 press conference on the NDIC Director's Cut Oct for the wildfire impact in the Q&A. Here is what we wrote in the Oct 20, 2024 Energy Tidbits memo. "*October had higher completions but also had wildfires impacting production. On Thursday, NDIC held its monthly webcast conference call on the NDIC Director's Cut, which covers the August production data. But the reason why we listen to the webcasts is that we always get some insight into oil production for the next one or two Director's Cut. In this case, there was added colour on the October oil production that will be in the December Director's Cut. On the call, North Dakota was asked if they had any estimate of the impact on production from the October wildfires. North Dakota's update was that there was a 100,000 b/d impact at the peak, but it was down to 50,000 to 80,000 b/d in about a week for an estimated total impact of approx. 500,000 b/d, which would work out to 16,000 b/d over the month of October ie. a very small impact."*

Oil: North Dakota crude by rail up MoM to 145,077 b/d in September

North Dakota CBR up MoM in September

On Tuesday, the North Dakota Pipeline Authority posted its Monthly Update "*September 2024 Production & Transportation"* [LINK] containing September's data. Please note that we always go to the backup excel sheets from the North Dakota Pipeline Authority that provide low and high estimates for Williston crude by rail exports. While the NDPA's chart shows a high and low estimate by month, we always take the midpoint when summarizing the update. In the backup excel, the NDPA estimates crude by rail in September from a low of 130,077 b/d and a high of 160,077 b/d for an average of 145,077 b/d. There was an upward revision to August figures which previously had an average of 136,263 b/d, but is now 142,955 b/d. The NDPA did not comment on the MoM changes. Below is a chart showing the crude by rail volumes since 2014. Our Supplemental Documents package includes excerpts from the NDPA Monthly Update.

Figure 25: Estimated North Dakota Rail Export Volumes

Source: NDPA

Oil: Harold Hamm US oil production higher, but not hugely higher, over next 5-6 yrs

Harold Hamm's US oil production outlook

On Tuesday, we tweeted [LINK] "*US #oil production higher, but not hugely higher, for longer under Trump. Bakken leader, Harold Hamm: US OIl growth of 1-2 mmb/d over next 5-6 yrs almost entirely from Permian. Bakken "maybe flat to down" Anadarko "it not going tremendously" Powder River is similar. See 👇@hartenergy Chris Matthews. #OOTT."* Our tweet was based on Hart Energy's reporting of their interview with Harold Hamm. Hamm is one of the best known US oil leaders for building the Bakken thru his company Continental Resources. And as Hart Energy notes, he is a noted significant Trump backer. Hamm sees increasing US oil production but not the big growth others see and growth driven almost all from the Permian. This is the same view as we highlighted in last week's Nov 17, 2024 Energy Tidbits memo – higher, but not hugely higher, for longer US oil production. Hart Energy wrote "*People think that we're going to raise [production] 3 [MMbbl/d] to 4 [MMbbl/d]," Hamm said in an interview with Hart Energy. "But in my opinion, from a geologist's perspective, you're not going to see that." A more realistic trajectory would be raising U.S. output between 1 MMbbl/d to 2 MMbbl/d over the next five to six years, driven almost entirely by gains from the Permian Basin, Hamm said."* And "*But even a fully unleashed U.S. energy sector would struggle to overcome output declines from maturing shale fields, he said. Continental is active across the Lower 48 today, with holdings in the Permian, Bakken, Anadarko and Powder River basins. "You look at the Bakken, it looks pretty flat," Hamm said. "Maybe flat to down." "If you look at the Anadarko Basin, it's not going tremendously," he continued. Wyoming's Powder River Basin also isn't seeing a tremendous amount of production growth, Hamm said."* Our Supplemental Documents package includes the Hart

Energy report. [LINK]

Trump appoints Burgum & Wright, sets up higher for longer US oil production

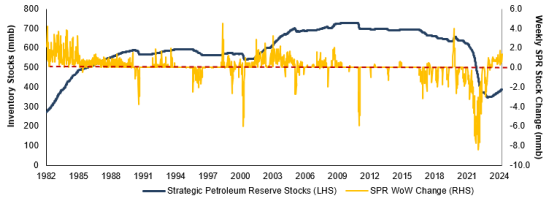
We are in the camp that doesn't see Trump driving up any significant near-term boost to US oil production but we do think his proposed team is setting up the US for higher levels for longer oil production. Last week's (Nov 17, 2024) Energy Tidbits memo was titled "*Trump Sets Up US for Higher for Longer Oil & Natural Gas Production as he Appoints Chris Wright and Doug Burgum."* And we wrote "*The US oil companies may not crank up oil drilling and production in 2025 but Trump is certainly setting up the US for higher for longer oil and natural gas production with his appointments of Doug Burgum (North Dakota governor) as Interior Secretary, Chris Wright (Liberty Energy CEO, one of the leading frack companies) as Energy Secretary and both to the new Council of National Energy. Wright has worked with probably every CEO in all the key shale/tight basins. Burgum has worked with many top CEOs in development of the Bakken. Industry has already come out with across the board accolades for both appointees. Yesterday, we tweeted [LINK] "US oil production higher for longer! Even Dems have to admit putting Chris Wright (Liberty Energy CEO) as Energy Secretary, Doug Burgum (North Dakota Gov) as Interior Secretary & both on Council of National Energy gives best odds for US #Oil #NatGas production to be higher for longer. #OOTT." These appointees are 180 degrees different from Biden's Energy and Interior Secretaries. CEO Wright knows how the oil an gas business works and probably has as much inside knowledge of the US major shale/tight plays as any person so knows the risks and upsides of the US plays. Our tweet included the Trump Truth Social post."*

Oil: US SPR less commercial reserve deficit narrows, now -41.102 mmb

US SPR reserves

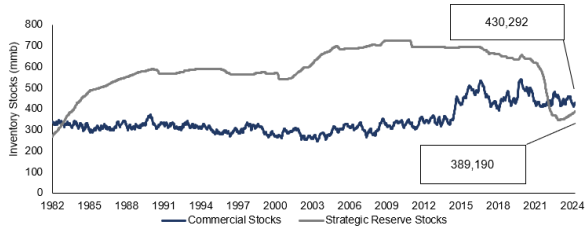
The US Strategic Petroleum Reserves (SPR) continues to be much lower than total US commercial crude oil reserves. The SPR went back below commercial for the first time since 1983 in the Sep 16, 2022, week. This week, we saw a build on the SPR side and a build on the commercial side. The EIA's weekly oil data for November 15, [LINK] saw the SPR reserves increase +1.400 mmb WoW to 389.190 mmb, while commercial crude oil reserves increased +0.545 mmb to 430.292 mmb. There is now a -41.102 mmb difference between SPR reserves and commercial crude oil reserves. The below graphs highlight the difference between commercial and SPR stockpiles, along with the weekly changes to SPR stockpiles.

Figure 26: Strategic Petroleum Reserve Stocks and SPR WoW Change



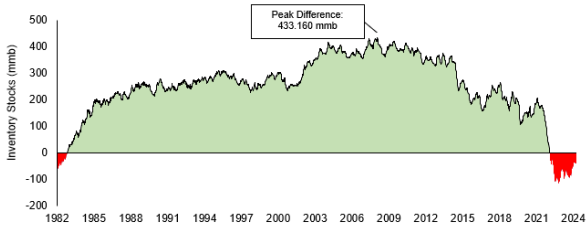
Source: EIA

Figure 27: US Oil Inventories: Commercial & SPR



Source: EIA

Figure 28: US Oil Inventories: SPR Less Commercial



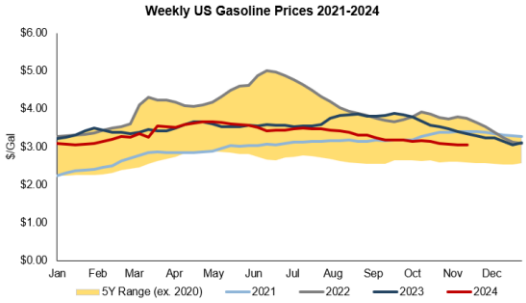
Source: EIA

Oil: AAA reports US national average gasoline price -$0.02 WoW to $3.06 on Nov 23

US gasoline prices

Yesterday, we tweeted [LINK] "*AAA National average prices -$0.02 WoW to $3.06 on Nov 23, -$0.10 MoM & -$0.21 YoY. California average prices -$0.02 WoW to $4.45, -$0.17 MoM & -$0.47 YoY. Grocery prices, not gasoline prices, was the cost of living factor in US Nov 5 election. Thx @AAAnews #OOTT*." Yesterday, AAA reported that US national average prices were $3.06 on Nov 23, which was -$0.02 WoW, -$0.10 MoM, and -$0.21 YoY. Yesterday, AAA also reported California average gasoline prices were $4.45 on Nov 23, which was -$0.02 WoW, -$0.17 MoM and -$0.47 YoY. Below is our graph of Bloomberg's National Average weekly gasoline prices.

Figure 29: National Average Gasoline prices



Source: Bloomberg

Oil: Crack spreads -$0.90 WoW to $17.09 WTI -$4.22 WoW to $71.24

Crack spreads closed at $17.09

On Friday, we tweeted [LINK] "*321 crack spreads -$0.90 WoW to $17.09 on Nov 22. WTI +$4.22 WoW to $71.24. Reinforces WTI is impacted more by global markets than by cracks*

ie. Putin signs new nuclear doctrine, 1st hypersonic ballistic missile attack on Ukraine. Thx @business #OOTT." Crack spreads were -$0.90 WoW to $17.09 on Nov 22 and WTI was +$4.22 to $71.24 . Crack spreads were relatively flat every day this week. WTI jumped up this week with the reports of Putin signing off on the a new Russia nuclear doctrine and on its first use of a hypersonic ballistic missile (with conventional payload) on Ukraine. As a general rule, over the past few months, WTI has been driven more by global factors and not crack spreads. Crack spreads at $17.09 are in line with the middle of the pre-Covid $15-$20 range, and generally not high enough to incentivize refineries to take any more crude than necessary. Crack spreads of $17.09 on Nov 22 followed $17.99 on Nov 15, $17.30 on Nov 8, $16.82 on Nov 1, $16.91 on Oct 25, $16.92 on Oct 18, $17.42 on Oct 11, $16.65 on Oct 4, $15.82 on Sept 27, $15.57 on Sept 20, $14.30 on Sept 13, $14.79 on Sept 6, $17.06 on Aug 30, and $17.10 on Aug 23,

Crack spreads normally point to near term oil moves, explaining 321 cracks

It hasn't been normal times for oil markets for the past few months with Iran/Israel, Chinese stimulus, Trump win, stronger US$, Putin's new nuclear doctrine and its 1st hypersonic ballistic missile hit on Ukraine. So for the most part, the last few months are good examples that global oil and market items impact WTI more than crack spreads. As noted above, that was the case this week with crack spreads -$0.90 WoW whereas WTI was +$4.22 WoW as markets focus on the new Russian nuclear doctrine and Russia's first hypersonic ballistic missile attack on Ukraine. But in normal times, broad market factors aside, we have focused on crack spreads for since the 90s as they are an unchanged fundamental of refineries – wide/high crack spreads provide incentives for refineries to buy more crude because there are big profit margins to be made. We track US crack spreads but there is also an influence on global refining capacity on US crack spreads as the increasing global refining capacity has also tended to have downward pressure on US crack spreads especially with demand being less than most expect. So if crack spreads are wide/high, it is normally a positive for the very near term look ahead to WTI. Conversely, if crack spreads are narrow/low, it doesn't give refineries any real incentive to take more crude, which is normally softness for the very near term look ahead to WTI. 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 vs WTI that we put in our tweet where we marked the gaps where the crack spread normally drags up oil prices. 321 Crack spread closed at $17.09 on Friday Nov 22.

Figure 30: Cushing Oil 321 Crack Spread & WTI Nov 22, 2014 to Nov 22, 2024

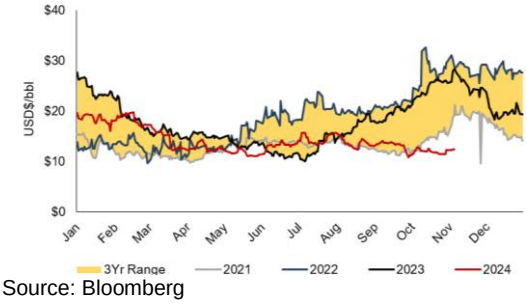
Source: Bloomberg

Oil: Cdn heavy oil differential widen +$0.65 WoW to close at $12.15 on Nov 22

WCS differential widens

WCS less WTI differentials widened this week +$0.65 WoW to close at $12.15 on Nov 22. As noted in the following item, we have been saying that the real test for WCS less WTI differentials will be in Sept/Oct/Nov as to how much the startup of the 590,000 b/d TMX expansion will impact WCS less WTI differentials. And it looks like TMX is working as hoped, if not better, in keeping WCS less WTI differentials way lower than would be expected at this time of year. Sept/Oct/Nov is when we normally see a significant seasonal widening of the WCS less WTI differentials. And WCS less WTI differentials has remained much lower and has not widened meaningfully this fall. But even with the TMX startup, there will always be the unexpected impact on WCS less WTI differentials from other items like refineries up and downs, wildfires, etc. Below is graph showing WCS-WTI differentials that shows this normal seasonal trend of narrowing WCS-WTI differentials that normally widens into or through October, which it did not. The WCS less WTI differential closed on Nov 22 at $12.15 which was a widening of +$0.65 WoW vs $11.60 on Nov 15.

Figure 31: WCS less WTI oil differentials to November 22 close



Source: Bloomberg

TMX impact: WCS less WTI diffs not seasonally widening as in 2022 & 2023

The start of TMX pipeline in Q2 continues to have the big expected positive for Cdn oil by keeping WCS less WTI differentials a lot narrower than what is normally seen in the normal seasonal widening in Sept/Oct/Nov. WCS less WTI differentials are approx. $12 narrower vs a year ago and approx. $16 narrower than two years ago. That is a big win for cash flows for all Cdn oil producers. For the past few several months, we have been saying that the big test for the impact of the start of the

590,000 b/d TMX expansion on WCS less WTI differentials wasn't what happened in the summer months but what would happen in late Aug, Sept and Oct when differentials normally start to widen with seasonal refinery turnarounds. On Friday, we tweeted [LINK] "*Big continuing win for Cdn #Oil Q4/24 cash flows.Ramp up of volumes on 590,000 b/d TMX has kept WCS less WTI differentials from normal Sept/Oct/Nov widening. WCS less WTI diffs: 11/22/24: $12.15. 11/22/23: $24.40. 11/22/22: $28.40. Thx @garquake @business #OOTT .* Our tweet included the below chart that shows how WCS less WTI differential have been stronger this summer, been fairly flat in Aug/Sept/Oct/Now and how differentials were widening in Sept/Oct/Nov in 2022 and 2023.

Figure 32: WCS less WTI differentials to Nov 22, 2024 close

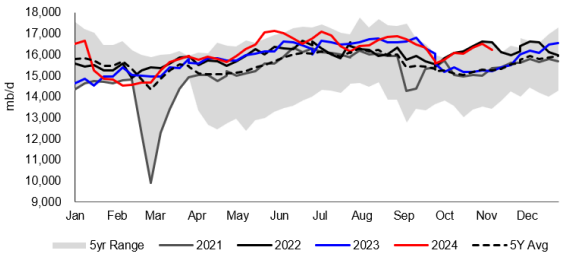
Source: Bloomberg

Oil: Refinery Inputs down -0.281 mmb/d WoW to 16.228 mmb/d

Refinery inputs -0.281 mmb/d WoW

There are always unplanned refinery items that impact crude oil inputs into refineries. And there is always different timing for refinery turnarounds; generally late October marks the point when refineries have come out of fall turnarounds and are ramping up crude oil inputs as they change from summer to winter fuel blends. And in Nov/Dec, it is normally some ups and down, before we start to see refineries move into turnarounds starting the end of Jan. On Wednesday, the EIA released its estimated crude oil input to refinery data for the week ended November 15 [LINK]. The EIA reported crude inputs to refineries were down -0.281 mmb/d this week to 16.228 mmb/d and are up +0.723 mmb/d YoY. Refinery utilization was down -1.2% WoW to 90.2% and was up +3.2% YoY.

Figure 33: US Refinery Crude Oil Inputs



Source: EIA, SAF

Oil: US net oil imports up +0.237 mmb/d WoW as oil exports up +0.938 mmb/d

US net imports +0.237 mmb/d WoW

The EIA reported US "NET" imports were up +0.237 mmb/d to 3.306 mmb/d for the week of November 15. US imports were up +1.175 mmb/d to 7.684 mmb/d, while exports were up +0.938 mmb/d to 4.378 mmb/d. Top 10 were up +1.034 mmb/d. (i) Previously we have noted that the EIA did not report weekly Venezuela imports, however, last month the EIA resumed reporting imports from Venezuela. Give the EIA credit for putting out weekly oil import estimates, but it's a reminder that we must 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) Canada was down -0.091 mmb/d to 3.862 mmb/d. Weekly imports have been higher for the past five months with the increased Cdn crude coming off TMX and hitting west coast US refineries. (iii) Saudi Arabia was up +0.080 mmb/d to 0.220 mmb/d. (iv) Mexico was up +0.384 mmb/d to 0.768 mmb/d. This is because of the new Olmeca/Dos Bocas refinery being down and some of the other refineries taking reduced crude. But, as a general rule, oil imports from Mexico in Q2 and Q3 have been significantly lower than prior year's levels with the new Olmeca (Dos Bocas) refinery slowing ramping up in 2024 and Pemex's other refineries increasing crude oil processing. (v) Colombia was up +0.272 mmb/d to 0.414 mmb/d. (v) Iraq was up +0.116 mmb/d to 0.237 mmb/d. (vi) Ecuador was up +0.108 mmb/d to 0.355 mmb/d. (vii) Nigeria was up +0.009 mmb/d to 0.086 mmb/d. (iix) Venezuela was down -0.148 mmb/d to 0.211 mmb/d.

Figure 34: US Weekly Preliminary Imports by Major Country

	Sep 20/24	Sep 27/24	Oct 4/24	Oct 11/24	Oct 18/24	Oct 25/24	Nov 1/24	Nov 8/24	Nov 15/24	WoW
Canada	3,912	3,799	3,499	3,537	3,719	3,660	3,879	3,953	3,862	-91
Saudi Arabia	291	145	285	314	150	13	443	140	220	80
Venezuela	0	297	315	134	289	250	212	359	211	-148
Mexico	499	448	382	406	258	621	247	384	768	384
Colombia	295	347	149	223	365	150	72	142	414	272
Iraq	265	152	241	70	237	216	183	121	237	116
Ecuador	4	253	228	35	138	67	37	247	355	108
Nigeria	135	84	44	134	125	145	86	77	86	9
Brazil	0	186	134	154	285	88	202	280	498	218
Libya	0	77	28	0	81	89	238	0	86	86
Top 10	5,401	5,788	5,305	5,007	5,647	5,299	5,599	5,703	6,737	1,034
Others	1,055	840	934	522	784	676	641	806	947	141
Total US	**6,456**	**6,628**	**6,239**	**5,529**	**6,431**	**5,975**	**6,240**	**6,509**	**7,684**	1,175

Source: EIA

Source: EIA, SAF

Oil: Norway Oct oil production of 1.774 mmb/d is up +10.9% MoM up +0.1% YoY

Norway October oil production

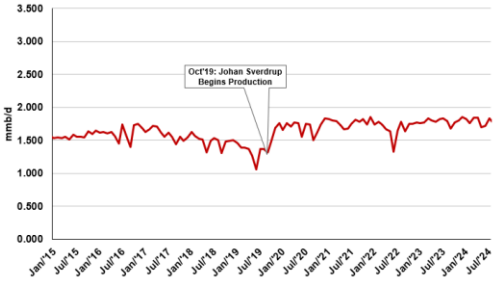
On Wednesday, the Norwegian Offshore Directorate released it's October production figures [LINK]. It reported oil production of 1.774 mmb/d, up +10.9% from revised September figures of 1.600 mmb/d and up +0.1% YoY from 1.772 mmb/d in October 2023. October's production actuals came in +8.2% (+0.135 mmb/d) over the forecast volumes of 1.639 mmb/d. The NOD does not provide any explanation for any MoM changes so we don't know if the MoM increases are temporary. But, as we have been highlighting since early 2024, Norway oil production is expected to peak in early 2025 with the start of decline at Norway's biggest oilfield, Johan Sverdrup, and then move into decline. Note that, prior to 2024, the Norwegian Offshore Directorate was called the Norwegian Petroleum Directorate.

Figure 35: Norway October 2024 Production

		Oil	Sum liquid	Gas	Total
		mill bbl/day	mill bbl/day	MSm³/day	MSm³ o.e/day
Production	**October 2024**	**1.774**	**1.988**	**341.2**	**0.657**
Forecast for	October 2024	1.639	1.875	328	0.626
Deviation from forecast		0.135	0.113	13.2	0.031
Deviation from forecaset in %		8.2 %	6 %	4 %	5 %
Production	September 2024	1.600	1.734	241.4	0.517
Deviation from	September 2024	0.174	0.254	99.8	0.140
Deviation in % from	September 2024	10.9 %	14.6 %	41.3 %	27.1 %
Production	October 2023	1.772	1.986	328.8	0.645
Deviation from	October 2023	0.002	0.002	12.4	0.012
Deviation in % from	October 2023	0.1 %	0.1 %	3.8 %	1.9 %

Source: Norwegian Offshore Directorate

Figure 36: Norway Monthly Oil Production 2015-2024



Source: Norwegian Offshore Directorate

Oil: Equinor, Norway's 755,000 b/d Johan Sverdrup was down for a couple days

The oil market had a brief burst on Monday morning when the reports emerged that Norway's giant 755,000 b/d Johan Sverdrup oilfield was shut down by Equinor early Monday morning and it wasn't clear how long it would be down for. But since it was due to losing power to part of the facilities. Equinor had shut down production early Monday morning. Johan Sverdrup has 755,000 b/d capacity. Early Tuesday morning, we tweeted [LINK] "*Norway's Johan Sverdrup back to ~500,000 b/d vs capacity of 755,000 b/d says @Equinor. Power loss "triggered by overheating in an electric converter station". Reminder 👇10/24/24 tweet below @Equinor CEO Johan Sverdrup 755,000 b/d "will be on plateau until early 2025" ie. after plateau is decline. #OOTT."* Our tweet included the E24 report that included "*Tonight we have resumed production on Johan Sverdrup. We expect to produce at 2/3 of normal capacity during the morning hours," writes Equinor press spokesperson Gisle Ledel Johannesen in a message to E24. "Work is still being done to achieve full production capacity. Production was shut down yesterday because we lost power to parts of the plant. This was triggered by overheating in an electric converter station at Kårstø," he writes."* On Wednesday, Reuters and others reported that Equinor said Johan Sverdrup returned to full production.

Norway's 755,000 b/d Johan Sverdrup

10/24/24: Equinor, 755,000 b/d Johan Sverdrup to begin to decline in early 2025

Our tweet on the Johan Sverdrup outage included our Oct 24, 2024 tweet on Equinor's Q3/24 call that the 755,000 b/d Johan Sverdrup field would come off

plateau in early 2025 and then begin to decline. Here is what we wrote in our Oct 27, 2024 Energy Tidbits memo. "*Johan Sverdrup is Norway's biggest oilfield and it is currently at ~755,000 b/d, which is approx. half of Norway's total oil production. On Feb 8, 2024, we first tweeted how Aker BP, a partner in Johan Sverdrup, was the first to note that Johan Sverdrup was moving from plateau to decline in late 24/early 25 as water was starting to hit some wells. That view hasn't changed all year. Our view is simple – when a country's giant oilfield that accounts for half of a country's production, it normally means the country's total oil production will start to decline. It is why, since Feb, we have warned that Norway oil production is about to start to decline. On Thursday, Equinor held its Q3 call and it also reminded how the best insights come from the Q&A portion of conference calls. Equinor confirmed that they see the 755,000 b/d Johan Sverdrup oilfield will come off plateau in early 2025, which is the way to say Johan Sverdrup oil production will begin to decline in early 2025. On Thursday, we tweeted [LINK] "Norway on track for peak #Oil production in 2025 & then decline. @Equinor CEO confirms Norway's 755,000 b/d field "will be on plateau until early 2025" ie. after plateau is decline. Fits 👇08/21, 03/11 & 02/08 tweets, Norway sees its oil production peaking in 2025. #OOTT." In the Q&A, mgmt replied "Your second question, Henri, on Johan Sverdrup. Yes. So far, so good. We see that we are now in a position where we can say that the plateau, we will be on plateau until early 2025. I think it's very important for me to say that we are not surprised at all that we will come off plateau in 2025. It is a function of that we have invested in higher capaciy, the 755,000 barrels per day pushing cash flow and net present value higher. And that leads to that we will get off plateau earlier."*

08/21/24: Norway forecast reaching peak oil production in 2025, then declining

Our tweet on the Johan Sverdrup outage also included a link to our Aug 21, 2024 tweet that noted Norway's forecast for Norway's oil production will peak in 2025 and then begin to decline. Here is what we wrote in our Aug 25, 2024 Energy Tidbits memo. "*Equinor's confirming the 755,000 b/d Johan Sverdrup oilfield will begin to decline in early 2025 is in line with Norway's forecasts that its total country oil production will reach peak oil production in 2025 and then decline. Here is what we wrote in our Aug 25, 2024 Energy Tidbits memo. "Norway still forecasts reaching peak oil production in 2025, then declining. On Wednesday, Norway posted its "Resource report 2024", which is a report encouraging an increase in exploration. And it starts with their unchanged long-term oil production forecast from March that forecasts Norway' s peak oil production is in 2025 and then decline under current levels of exploration ie. include ongoing new field discoveries. Early Wednesday morning, we tweeted [LINK]: "Norway still forecasts peak #Oil production in 2025 & then decline. EVEN WITH "multiple discoveries are made and brought on stream, accompanied by investments aimed at increasing recovery from existing fields. Despite this, resource growth will not be sufficient to offset the overall gradual decline, due to diminishing production from the major, mature fields." See 👇 03/11/24 & 02/08/24 tweet, can't make up for giant Johan Sverdrup hitting peak oil in six mths. #OOTT" Norway is warning that, even with new discoveries and production enhancement, peak oil supply is in 2025. Norway wrote that even with ""multiple discoveries are made and brought on stream, accompanied by investments aimed at increasing recovery from existing fields. Despite this, resource growth will not be*

sufficient to offset the overall gradual decline, due to diminishing production from the major, mature fields." Despite this, resource growth will not be sufficient to offset the overall gradual decline, due to diminishing production from the major, mature fields." Norway is highlighting the reality that has been seen in other global basins that have a giant oil field – when the giant oilfield starts to decline, it normally points to decline in a country production. And that is the case in Norway with the giant Joahn Sverdrup expected to start to decline in late 2024 or early 2025. Norway does says that a big increase in exploration and oil and gas spending could lead to some modest growth and push back in oil decline. Our Supplemental Documents package includes excerpts from the Norway resource report."

Figure 37: Norway forecast long term Norway oil production

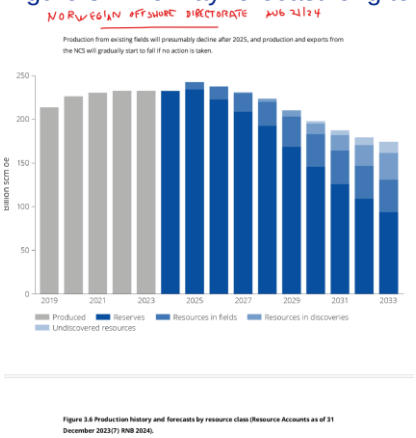


Figure 3.6 Production history and forecasts by resource class (Resource Accounts as of 31 December 2023(7) ©NB 2024).

Source: Norwegian Offshore Directorate

Oil: Russia/Ukraine escalation was the oil story this week

As of our 7am MT news cut off, there haven't been any major overnight developments or escalations in the Russia/Ukraine war. But, after this week's events, more are at least worried that an escalation is possible. We looked at five key events that are leading to this risk.

Russia uses hypersonic ballistic missile

11/17/24: Biden authorizes Ukraine to use long range US missiles vs Russia

Last Sunday, Biden authorized Ukraine to use the US long range missiles, Army Tactical Missile System ATACMS. Zelensky has been asking Biden for months to use the ATACMS and Biden finally gave in post the election. It is also important to remind that Ukraine needs US support to actually use the missiles. And for months, Putin has warned that this would be viewed as an escalation.

11/19/24: Putin approves Russia's revised nuclear doctrine

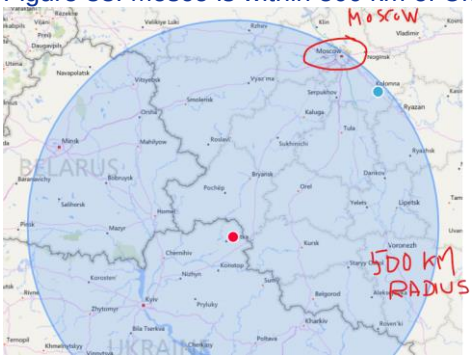
Early Tuesday morning, we tweeted [LINK] "*Breaking! Putin approved Russia's revised nuclear doctrine. "Russia will now view any attack by a non-nuclear country supported by a nuclear power as a joint attack. Moscow also reserves the right to consider a nuclear response to a conventional weapons attack threatening its sovereignty, a large-scale launch of enemy aircraft, missiles, and drones targeting*

Russian territory, their crossing of the Russian border, and an attack on its ally Belarus." #OOTT."

11/20/24: Ukraine uses long range UK/France Storm Shadow missile

On Wednesday, we tweeted [LINK] "*Heightened Putin retaliation risk? Ukraine use Storm Shadow cruise missile at RUS. A deep strike missile... against high value targets such as hardened bunkers...Overlooked is MBDA says range "in excess of 250 km". Is Wikipedia right that range is 550 km, if so , Moscow is in range. #OOTT #Oil."* We were surprised others didn't worry more about escalation from Ukraine using the Storm Shadow missiles. Ukraine had reported it fired its first UK/France Storm Shadow. The media reports all talked about a limited range and using 250 km as a limit. And not seemingly making a big deal about the Storm Shadow. We went to the MBDA (Storm Shadow maker) to pull their characteristics on the Storm Shadow. This is a deep strike missile ie. can go at underground high value targets. And MBDA says the range is "*in excess of 250 km*"., without being precise or bragging about the range. We did some digging and almost all the reports were using the 250 km range but saw a couple with range over 500 km. One was a military site we hadn't heard of that had range exceeds 560 km at low altitude. And then Wikipedia that had operational range of 500 kma range of 500 km would put Moscow within range. and we have to believe Putin knows if the range is 250 km or +500 km. Our Supplemental Documents package includes the MBDA Storm Shadow specks and the Wikipedia specs.

Figure 38: Mosco is within 500 km of Ukraine



Source: CalcMaps

11/21/24: Russia uses hypersonic ballistic missile

Early Thursday morning, we tweeted [LINK] "*Likely not a coincidence reported 1st ever use by Putin of an ICBM in conflict. See 👇11/20/24 tweet. MBDA only discloses Storm Shadow range at "in excess of 250km". Wikipedia noted it was ~550km. ie. Moscow in range. RUS/UKR escalation impacting #NatGas #Oil prices. #OOTT."* The US then came out and said it wasn't an ICBM (intercontinental), it was an intermediate range ballistic missile. We then tweeted [LINK] "*Whether its an Intercontinental Ballistic Missile or Intermediate range Ballistic Missile, wasn't Putin's reminder RUS ballistic missiles can have conventional or nuclear warheads. US corrects, it wasn't an ICBM. #OOTT Thx @HollyMAWilliams [LINK] via*

@CBSNews." We thought the most important factor was this was an ballistic missile that can be equipped with either a conventional or nuclear warhead. Then later, we tweeted [LINK] "*Game Changer? Putin on hitting UKR with new Oreshnik hypersonic speed medium-range ballistic missile that had a non-nuclear payload. At 6:30 min mark "because there are currently no means to counteract such weapons. [the new Oreshnik missile] . Theses missiles strike at speeds of Mach 10, 2.5 to 3 km per second. Modern air defense systems worldwide, including those developed by the US for deployment in Europe, cannot intercept such missiles. It is simply impossible". Thx TD for forwarding [LINK]."* Putin said it was new hypersonic ballistic missile that strikes at speeds of Mach 10 or 2.5 to 3 km per second. And we remind this is a ballistic missile that cold be equipped with either a conventional or nuclear warhead.

11/22/24: Russia reminds Oreshnik can hit targets across entire Europe

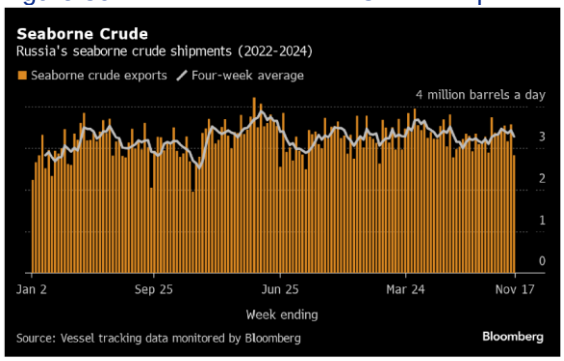
On Friday, TASS reported [LINK] "*The Oreshnik missile system is capable of reaching targets across entire Europe, Sergey Karakayev, commander of Russia's strategic missile forces, told President Vladimir Putin. "This missile system with hypersonic blocks can hit any targets - from isolated to area-type, as well as highly-protected - with a high efficiency. Based on the tasks and the range of this weapon, it can hit targets across entire Europe, which sets it apart from other high-precision long-range weapons," he said at a meeting with top Russian defense officials, executives of defense sector companies and arms developers."*

Oil: Russia's seaborne crude oil exports fall to lowest since September

Russia's seaborne crude exports

Last week's (Nov 17, 2024) Energy Tidbits memo highlighted "*We should see a pull back in Russia oil shipments in a week or two give the Bloomberg Friday report "Russia Raises Weekly Refinery Runs to Highest Since Late August. More Russian oil refined within Russia means there is less oil for export."* This week, the four-week average for Russia's seaborne crude exports fell, following last week's rise. The decline comes from a decline in flows from the Arctic, Black Sea, and Baltic Ports with loading schedules for the main Baltic port of Primorsk MoM. The four-week average fell by -150,000 b/d for the week to November 17. Bloomberg reported "*Four-week average flows slipped by about 150,000 barrels a day in the period to Nov. 17, driven lower by the biggest drop in weekly exports since early July. This month's loading schedules for the main Baltic port of Primorsk are thinner than in October, with sixteen cargoes scheduled to load in the first 17 days of November, compared with 22 a month earlier. Russia's primary refining rate rose again in the second week of November, potentially reducing the volume of crude available for export.*" Russia made significant output cuts in May, June, and July; however, they were still slightly above their promised targets. Notably, in last OPEC JMMC, the committee confirmed the cooperation of Russia in complying with these cuts going forward. Our Supplemental Documents package includes the Bloomberg report.

Figure 39: Russia's Seaborne Crude Shipment



Source: Bloomberg

Russia oil exports to China just below April levels

For the last several months, we have been highlighting how China is a price sensitive buyer of oil and has been hitting oil imports from Russia when Russia increased its prices in Q2/24. But China also has the ability to shift some Russian barrels to Iranian barrels and vice versa. What isn't clear is if China oil imports from Russia are tweaking up because Iran has been tweaking up its oil prices to China or if China has been just increasing imports. (i) Russia oil shipments to China averaged 1.360 mmb/d for the first half of April. But they were down thereafter with the reports that Russia had cut its discounts to China, meaning China was taking less Russian oil. Bloomberg's crude oil shipments from Russia to China have been up +0.060 mmb/d the last three weeks vs late Oct. Bloomberg highlighted the four-week average of Russia oil shipments to China were down -0.060 mmb/d to 1.300 mmb/d for the week ending November 17, 2024, up from last week's 1.360 mmb/d for the week of November 10, 2024. This compares to 1.240 mmb/d for the last week of Oct. (ii) On Nov 6, Shana (news agency for Iran's energy ministry) reported Iran's oil price to China was the most expensive, relative to Brent, in five years [LINK]. Shana wrote "*Iran's crude oil going to China these days is priced at its narrowest discount to Brent in five years.Oil Price news website, quoting Reuters, announced this on November 5, adding the discount of Iran Light crude to ICE Brent has now narrowed to below $4 per barrel, from $5-$6 a barrel earlier this year."* (iii) Russia increasing oil prices in April led to lower Russia shipments to China. We have been highlighting that the warning that China oil imports from Russia were being hit on April 22 by one of our favorite commentators on the Gulf Intelligence Daily Energy Podcasts is Victor Yang, Senior Analyst JLC Network Technology. He is based in China, so we like to hear his on-the-ground views on oil, natural gas and markets in China. Here is what we wrote in our April 28, 2024, Energy Tidbits memo referencing Yang's comments from our April 22, 2024, tweet that included a transcript we made of Yang's comments. "*And for the second quarter, we see a lot of refinery maintenance, is imports will actually come down. And for now, the premium for Russian cargoes have strengthened this year, from -0.5 barrels to -0.3 barrels. And now it's flat to Brent, meaning 0 now. So, this has dampened refiners, particularly independents, interest in Russian crude. Their margins for imported crude, including Russian crude, actually turned negative*

late last month and the beginning of this month. So, it's now kind of [inaudible] slightly above the breakeven point. So, the interest in this has been dampened too. So, we are not expecting imports to grow much in the second quarter, yes." Below is the table from Bloomberg's Russia oil exports report this week.

Figure 40: Russian Crude Exports to Asia

Crude Shipments to Asia
Shipments of Russian crude to Asian buyers in million barrels a day

4 weeks ending	China	India	Other	Unknown Asia	Other Unknown	Total
October 13, 2024	1.24	1.85	0.00	0.00	0.00	3.09
October 20, 2024	1.36	1.73	0.00	0.05	0.00	3.15
October 27, 2024	1.24	1.66	0.00	0.17	0.06	3.12
November 3, 2024	1.34	1.40	0.00	0.24	0.06	3.05
November 10, 2024	1.36	1.32	0.00	0.32	0.06	3.06
November 17, 2024	1.30	1.15	0.00	0.32	0.17	2.94

Source: Vessel tracking data compiled by Bloomberg — Bloomberg

Source: Bloomberg

Oil: Absent Trump surprise, hard to see OPEC return voluntary barrels in Q1/25

OPEC+ countries voluntary cuts

As of our 7am MT news cut off, we haven't seen any confirmation if the expected OPEC+ Dec 1 meeting will be in-person or via video conference. We were seeing reports on Friday afternoon that it was going to be via video conference. Our view hasn't changed in that unless there is a Trump surprise, we still believe it will be difficult for or Saudi et al to add back the voluntary cut barrels in Q1/25. For the past few months, we have been reminding of the big challenge for the OPEC+ voluntary cut countries in their planned start to adding back oil was that, if they didn't start adding back the voluntary cut oil on Oct 1, they might be forced to wait until at least Q2/25. Our view for that is unchanged in that if they added back barrels it would be in a period where global oil demand is always seasonally lower in Q1 vs the prior Q4. So they would be adding back barrels when oil demand is declining in Q1/25. Simply if oil supply is up and oil demand is down, it will move oil prices lower. Prior to this week's OPEC Nov MOMR and IEA Nov OMR, on Monday, we tweeted [LINK] "*Reminder #Oil demand seasonally weakens every year such that Q1 is always less demand than preceding Q4. OPEC Oct MOMR forecasts Q1/25 at 104.41 mmb/d, which is -1.20 mmb/d lower than Q4/24 of 105.61 mmb/d. #OOTT."* On Tuesday, OPEC Nov MOMR' forecasts Q4/24 demand of 105.56 mmb/d decreases -1.27 mmb/d QoQ to 104.29 mmb/d in Q1/25. On Thursday, IEA Nov OMR forecasts oil demand in Q4/25 of 103.5 mmb/d, then down 0.9 mmb/d QoQ to 103.5 mmb/d in Q1/25.

Will OPEC's decision on Dec 1 reveal if Trump plans to hit Iran oil exports

As we have been highlighting, there is a Trump wildcard to oil markets that would impact when Saudi et al can bring back voluntary cut barrels. Will Trump move immediately to cut Iran and Venezuela oil exports. Absent an early Trump move to do so, we stick to our view that the normal seasonal decline in oil demand from Q4/24 to Q1/25 will prevent Saudi et al from adding back barrels. We also wonder if Trump has given or will be giving a hint on what he plans to do on Iran to Saudi Arabia, Russia and UAE, who will be the big winners if Trump cuts Iran and Venezuela oil exports. Our Nov 10, 2024 Energy Tidbits memo wrote "*It will be*

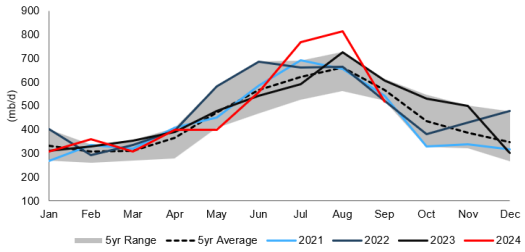
interesting to watch OPEC announces in a month on what Saudi, Russia et al decide about bringing back the voluntary cut barrels on Jan 1, 2025. Will they start the add back of voluntary oil barrels in Q1/25 which is forecast to have lower QoQ oil demand vs Q4/24. Will they add back the barrels in Q1/25? If so, we have to believe Saud Arabia and UAE and Russia have some indication from Trump that he is going to move immediately to cut Iran oil exports. In his CNN Interview on Thursday, Brian Hook (former envoy on Iran in Trump's 1st administration and rumored lead on the transition team on US State Dept) made a point of highlighting that Trump's Day 1 calls were with Saudi Arabia, UAE, Egypt and Israel."

Saudi oil use for electricity down in Sept

Oil: Saudi use of oil for electricity down big in Sept i.e. more oil available for export

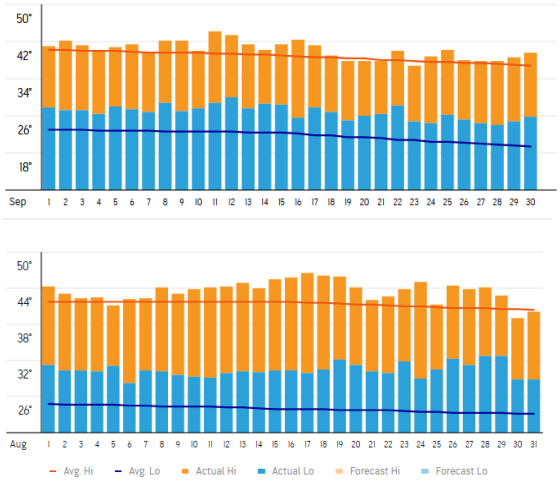
The key seasonal theme for Saudi oil exports is that, all things being equal, Saudi can export more oil in winter months as it uses less oil for electricity and, conversely, it would have less oil for export in summer months as it uses more oil for electricity i.e. air conditioning. Note that a normal peak to trough decline is ~400,000 b/d. If there is less oil used for electricity, then there is more oil for export and vice versa. But that is comparing winter to summer. And September is still the end of summer. The JODI data for Saudi Arabia oil supply and demand for September [LINK] was updated on Monday. Saudi used significantly less oil for electricity in September vs August. August was really hot, in particular also at night time with night time lows generally 30C or more. September was less hot during the daytime and much moreso at night time with over 1/3 of night time lows below 26. Lows. Even still, we were surprised at the MoM drop. Oil used electricity generation in September was 518,000 b/d, (vs September 2023 of 606,000 b/d) and August was 814,000 b/d (vs August 2023 of 726,000 b/d). Also note that this year has exceeded the historical trough-to-peak swing of 400,000 b/d. The low was 308,000 b/d in January, and we just saw 814,000 b/d in August. Another factor impacting the use of oil for electricity is that Saudi Arabia is increasing its use of natural gas for electricity. Below are the AccuWeather temperature maps for Riyadh for September and August.

Figure 41: Saudi Arabia Direct Use of Crude Oil for Electricity Generation



Source: JODI, SAF

Figure 42: Riyadh Temperature Recaps for September (top) and August (bottom)



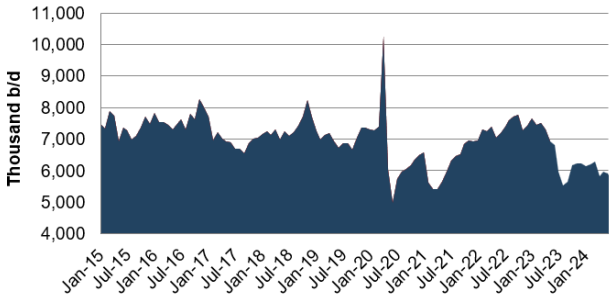
Source: Accuweather

Oil: Saudi net oil exports up only +0.076 mmb/d to 5.632 mmb/d in September

Saudi net oil exports up MoM

As noted above, Saudi Arabia used 296,000 b/d MoM less oil for electricity so we would have expected to see a MoM increase in exports or MoM increase in oil inventories. Until recently, JODI did not have access to Saudi import data. But the oil import data is available, so we calculate net oil exports. In the fall, as electricity demand falls from the August peaks, we expect to see net oil exports increase slightly. In September, the JODI data showed Saudi net oil exports were up +0.076 mmb/d MoM to 5.632 mmb/d. This comes as imports were up +0.004 mmb/d and exports were up +0.080 mmb/d. Below is our graph of Saudi Arabia monthly net oil exports.

Figure 43: Saudi Arabia Net Oil Exports (mb/d)



Source: JODI, SAF

2023/10/11: Saudi reminded oil exports are seasonal, less in summer

There are always unusual events but, as a rule, there is a seasonality to Saudi oil exports. Here is what we wrote in the Nov 12, 2023 Energy Tidbits memo. "*We probably should have called it Saudi Oil 101, but we were a little surprised that Saudi Energy Minister felt the need to explain how there is seasonality to Saudi's oil exports*

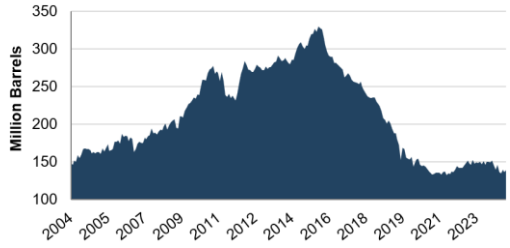
because Saudi domestic consumption of oil has a seasonal pattern. So seasonally, there is more Saudi oil available for export in the fall than in the summer. On Friday, we tweeted [LINK] "Agreed, he is explaining Saudi Oil 101. Summer heat = more #Oil used to generate electricity for A/C ie. less for export. Aug 2023 was 726,000 b/d, +414,000 b/d vs Jan 2023. See 👇SAF 10/22/23 Energy Tidbits graph. Thx @SVakhshouri for flagging. #OOTT." Well known oil strategist Dr. Sara Vakhshouri tweeted "Saudi Energy Minister on #oil price drop: demand is healthy & speculators are to blame for the recent drop. OPEC exports don't indicate increased production. Shipments are seasonal, dipping in summer & rebounding in Sep & Oct; not a sign of output changes." This is the theme we highlight every month when we report on the monthly Saudi oil data for oil to refineries, production, exports, oil for electricity and oil into inventories. Our tweet showed our Oct 22, 2023 Energy Tidbits graph on how Saudi used 414,000 b/d more oil for electricity in Aug than it did in Jan because of the weather. The hot summers always drive up Saudi use of oil for electricity."

Oil: Saudi oil inventories build +2.094 mmb MoM in September

Saudi oil inventory data

As expected given the big MoM decrease in oil used for electricity and small MoM increase in Saudi oil exports, Saudi crude oil inventories were up MoM. The JODI data for Saudi oil stocks is 138.612 mmb on September 30, which is up +2.094 mmb MoM from 136.518 mmb on August 31. When we look at the components of the MoM changes for production, oil used for electricity, oil intakes into refineries and net oil exports, we would have expected to see a build in oil stocks of +2.070 mmb in September which is a difference of -0.024 mmb. For the math components. Saudi production in September was 8.975 mmb/d, down -0.017 mmb/d MoM vs 8.992 mmb/d in August i.e. this would have led to a +8.975 mmb/d build in inventories MoM. Saudi direct use of oil for electricity was 0.518 mmb/d in September, down -0.296 mmb/d MoM vs 0.814 mmb/d in August, this would lead to a -0.518 mmb/d MoM draw in oil inventories. Refinery intake of oil was 2.756 mmb/d in September and was up +0.35 mmb/d MoM vs 2.721 mmb/d in August, this would have led to a -2.756 mmb/d MoM draw in oil inventories. Net oil exports were 5.632 mmb/d in September, up +0.076 mmb/d MoM vs 5.556 mmb/d in August i.e. would lead to a +5.632 mmb/d MoM build in oil inventories. The net impact of the key components would have been a MoM build of +2.070 mmb in oil inventories in September vs the reported MoM build of +2.094 mmb.

Figure 44: Saudi Arabia Oil Inventories (million barrels)



Source: JODI, SAF

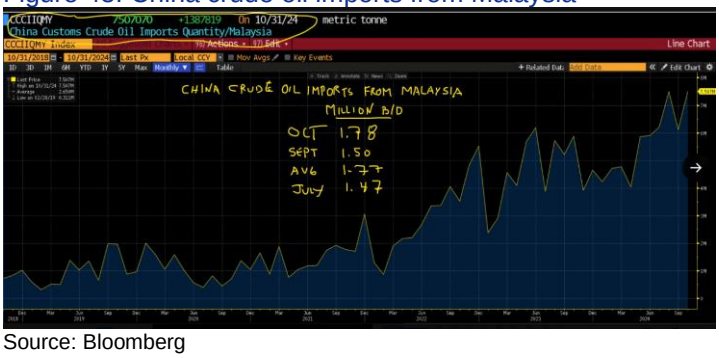
Oil: Iran oil keeps getting rebranded as Malaysia oil into China

China imports of "Malaysian" oil

On Wednesday, we tweeted [LINK] "*Iran #Oil keeps getting rebranded as Malaysia oil. China*

customs official data is zero oil imports from Iran since June 2022. BUT China oil imports from Malaysia in Oct 1.78 mmb/d (new record) vs OPEC Secondary Sources Malaysia Q3/24 production of 0.326 mmb/d. #OOTT." Bloomberg had just posted the China customs data of crude oil imports by country for Oct. We checked Iran and there was no changes to China customs not showing any oil imports from Iran since June 2022. But then we looked as usual at Malaysia and the China customs data shows China crude oil imports from 1.178 mmb/d in Oct, which was a new record. This followed 1.50 mmb/d in Sept, which followed 1.77 mmb/d in Aug, 1.47 mmb/d in July and 1.44 mmb/d in June. Our tweet also included the OPEC Monthly Oil Market Report Nov 2024, which included Secondary Sources estimate that Malaysia only produced 0.326 mmb/d in Q3/24ie. China is importing oil from Malaysia that is equal to over five times Malaysia total country production. Below is the Bloomberg graph of China oil imports from Malaysia that was attached to our tweet.

Figure 45: China crude oil imports from Malaysia



Source: Bloomberg

05/09/24: Malaysia recognizes UN, not individual country sanctions

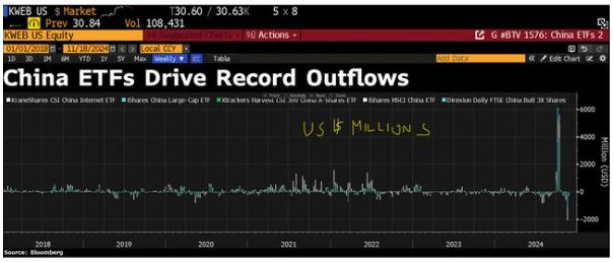
Here is what we wrote in our May 12, 2024 Energy Tidbits memo. "*One of the oil trade themes in the past year is how we see Iran oil rebranded as Malaysia oil and then shipped to China and likely other markets. That will be continuing as Malaysia has said they don't follow individual country sanctions like US on Iran but follow all UN sanctions. The Straits Times reported [LINK] "Malaysia rebuffs US on Iran oil sales, says it recognises only UN sanctions. Malaysia will recognise sanctions imposed by the United Nations only and not by individual countries, said Home Minister Saifuddin Nasution Ismail on May 9, following claims by a top US official that Iran has relied on Malaysian service providers to sell US-sanctioned oil in the region. "I emphasised that we will only recognise sanctions if they are imposed by the United Nations Security Council. "The delegation from the US respected our stance," Datuk Seri Saifuddin told reporters following a meeting with the US Treasury Department's top sanctions official Brian Nelson, who was visiting Kuala Lumpur." We hadn't realized the trade level between Malaysia and the US. The Straits Times closed their report "Still, the "US would also not want to lose the support of Malaysia, which is one of its key Asean partners, as the country will assume the role of Asean chair next year", he said. Malaysia is among the US' top 20 trading partners, with bilateral trade between the two nations amounting to US$78.3 billion (S$106 billion) in 2022." Our Supplemental Documents package includes the Straits Times report*.'

Oil: Foreign investors pulled out of China ETFs post Trump election

China ETFs

Last week's (Nov 17, 2024) Energy Tidbits memo highlighted a number of China economic and financial indicators for October with the caveat that the Oct data was before Trump won the election so we will have to wait to see how that impacts Nov/Dec/Jan economic and financial data. On Tuesday, we saw some of the first indicators for the Trump impact on China and it has been an immediate negative. Early Tuesday morning, we tweeted [LINK] "*Accelerated funds pulled out of ETFs for China stocks post Trump's Nov 5 win. Reminds markets will want to see how Trump factor impacts positive China Oct economic data changes in Nov/Dec/Jan. #OOTT."* Bloomberg had posed the data on funds flows from China ETFs. To be fair, foreign investors had pulled money from China ETFs as the polls and betting odds moved away from a Harris win but accelerated after Trump won. Our tweet included the weekly funds flows up to the partial week to Nov 18. The funds flows into/out of China ETFs by week were: Sept 27 week, +$1.65b. Oct 4 week, +$6.14b. Oct 11 week, +$5.62b. Oct 18 week, +$0.12b. Oct 25 week, -$0.25b. Nov 1 week, -$0.34b. Nov 8 week, -$0.54b. Nov 15 week, -$2.07b. Partial week to Nov 18, -$0.23b.

Figure 46: China ETFsdrive record outflows



Source: Bloomberg

Figure 47: China ETFsdrive record outflows

Source: Bloomberg

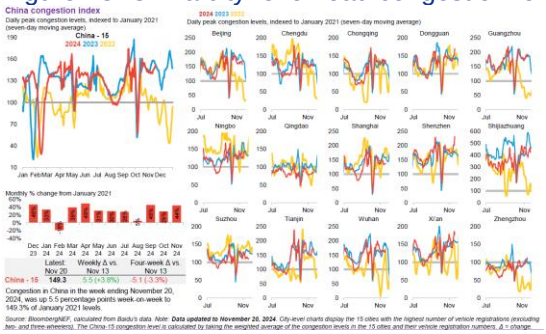
Oil: Baidu China city-level road congestion down 1.9% YoY

China city-level road congestion down YoY

We are now 2/3 the way thru Nov for the China city-level road congestion data. And Nov is a good period to check vs last year as there aren't holidays to distort the data. It may not be a huge change but city-level road congestions is down 1.9% YoY, which infers there is lesser China activity in Nov 2024 vs Nov 2023. On Wednesday, BloombergNEF posted its China Road Traffic Indicators Weekly Nov 21 report, which includes the Baidu city-level road

congestion for the week ended Nov 20. BloombergNEF reported Baidu city-level road congestion saw an increase +3.8% WoW to 149.3% of Jan 2021 levels. November MTD has seen average daily peak congestion down -1.9% YoY when compared to November 2023. Note that this report was formerly titled Road Traffic indicators, and is now China Road Traffic Indicators, but the content of the report is unchanged. BloombergNEF's report was titled "*Congestion level edges higher"*. Below are the BloombergNEF key figures.

Figure 48: China city-level road congestion for the week ended November 20, 2024



Source: Bloomberg

Figure 49: China city-level road congestion for the week ended November 20, 2024

Indexed to January 2021 = 100

	Nov 23	Dec	Jan 24	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
China-15	146	146	133	81	138	148	130	129	127	104	144	128	143
Beijing	167	161	145	73	151	169	143	141	146	123	171	147	161
Chengdu	123	116	120	68	134	140	125	119	126	98	135	113	124
Chongqing	122	116	111	80	112	138	122	129	119	75	119	119	133
Dongguan	141	144	121	52	129	138	138	138	126	103	141	123	149
Guangzhou	178	181	161	76	171	195	174	170	162	158	179	159	181
Ningbo	146	142	127	79	144	146	120	128	121	94	140	119	130
Qingdao	99	103	78	51	71	78	72	75	91	80	87	79	79
Shanghai	155	150	115	79	146	152	130	132	119	93	151	121	136
Shenzhen	169	170	149	68	160	164	172	163	162	155	184	159	194
Shijiazhuang	491	461	494	350	400	390	311	329	334	308	364	356	407
Suzhou	127	136	118	79	134	137	113	112	105	96	115	106	112
Tianjin	169	190	133	85	160	165	145	132	106	98	186	150	157
Wuhan	159	159	167	105	174	171	146	144	141	117	168	154	164
Xi'an	156	155	152	98	141	147	129	123	135	107	145	136	158
Zhengzhou	97	108	110	85	95	96	80	78	86	66	91	83	101

Indexed to the same month in previous year = 100

	Nov 23	Dec	Jan 24	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
China-15	155	187	151	55	100	114	110	96	104	87	94	99	98
Beijing	214	275	135	42	92	113	103	93	106	90	95	92	96
Chengdu	131	124	144	51	106	107	115	91	116	85	104	93	101
Chongqing	395	224	136	64	101	125	125	112	113	85	94	107	110
Dongguan	104	156	258	41	99	127	120	108	108	101	96	94	106
Guangzhou	317	307	199	45	99	127	127	107	107	106	98	99	102
Ningbo	101	127	203	59	115	140	121	112	106	81	110	101	90
Qingdao	124	195	175	62	94	97	98	87	95	76	82	85	80
Shanghai	93	172	156	54	98	117	105	101	98	76	93	95	88
Shenzhen	97	156	189	41	96	120	132	99	113	106	102	105	115
Shijiazhuang	459	258	156	69	93	85	81	77	89	70	75	104	83
Suzhou	88	157	171	60	111	130	117	97	99	88	86	98	88
Tianjin	137	244	136	60	114	121	119	100	96	86	107	100	93
Wuhan	192	187	151	55	94	100	97	85	95	86	88	107	103
Xi'an	139	152	132	66	110	112	105	91	110	97	96	101	101
Zhengzhou	294	164	119	76	98	102	90	82	98	72	86	103	104

Source: BloombergNEF calculations based on Baidu data. Note: Data updated to ***November 20, 2024. Values for the latest month are month-to-date.*** *The China-15 congestion level is calculated by taking the weighted average of the congestion levels in the 15 cities and their vehicle registration numbers.*

Source: Bloomberg

Oil: China visitors to Hong Kong up YoY in Sept, but still short of pre-covid levels

Chinese visitors to Hong Kong

On Wednesday, the Hong Kong Tourism Board released their September statistics for total arrivals and visitors from mainland China. We split out the visitors from mainland China as a measure to the recovery of the Chinese consumer and to a lesser extent mainland businessman. We do not focus on the changes from July to Aug to Sept unless there is a change in the seasonal trend. Aug is still summer travel month so it is always higher than Sept. For Aug 2024, there were 4.454 mm total visitors and 3.660 mm visitors from mainland China. Sept always sees a MoM decline from end of summer travel in Aug. In Sept, there were total visitors of 3.062 mm, which was +10.5% YoY vs 2.772 mm in Sept 2023. For mainland China visitors, there were 2.295 mm visitors, which ws +6.15 YoY vs 2.163 mm in Sept 2024. Relative to pre-Covid, total visitors of 3.062 mm in Sept 2024 is only 1.4% below pre-Covid of 3.104 mm in Sept 2019.. For visitors from mainland China of 2.295 in Sept 2024 is down 4.9% below pre-Covid of 2.412 mm in Sept 2019. Our Supplemental Documents package contains the press release from the Hong Kong Tourism Board.

Oil: Bloomberg, China apparent oil demand -5.4% YoY to 14.073 mmb/d in Oct

China apparent oil demand

One of the continuing oil market stories is how China oil demand has been weak and down YoY. Here is what we wrote in last week's (Nov 17, 2024) Energy Tidbits on the weaker China apparent oil demand. "*As noted earlier in the memo, the IEA highlighted the weak China oil demand and how it sees "Chinese demand contracted for a sixth straight month in September – taking the 3Q24 average to 270 kb/d below a year ago." On Friday, Bloomberg reported on its calculations for China "apparent oil demand" based data from China's National Bureau of Statistics. Apparent oil demand is a good indicator, Bloomberg defines it as "* Total apparent demand is oil processing volume and net import of refined petroleum oil." They would have picked up the data in Chinese and we won't see the data in English for a few days. Bloomberg reported "China's apparent oil demand fell 5.4% to 14.07m b/d in Oct., according to data compiled by Bloomberg. * Jan.-Oct. apparent oil demand -4.03% y/y to 14.00m b/d." Below is Bloomberg's table.*

Figure 50: Bloomberg's estimate for China Total Apparent Oil Demand

	Oct. 2024	Sept. 2024	Aug. 2024	July 2024	June 2024	May 2024	April 2024	Year-to Date
Total Apparent Oil Demand								
Million Barrels per Day	14.073	14.176	13.860	13.554	13.664	14.097	14.639	13.996
YoY%	-5.37%	-6.98%	-5.94%	-8.02%	-8.08%	-3.32%	-3.01%	-4.03%

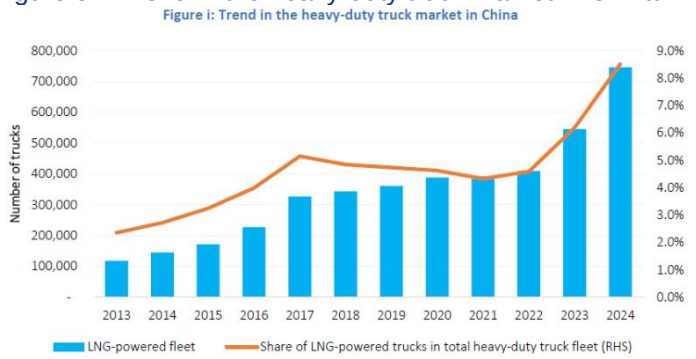
Source: Bloomberg

Oil: China to reach peak diesel & oil demand sooner than expected due to LNG trucks

China peak diesel demand

Last Sunday night, we tweeted [LINK] "*Here's why China peak diesel & ultimately oil demand is sooner than expected. Huge growth in LNG-fueled heavy duty trucks. YTD Sept 30, ~150k LNG HDT sold or ~35% of all HDT. ~750k LNG HDT is now 8.5% share (was 4.6% in 2022). Great data from today's 👇@GECF_News MGMR #OOTT #NatGas."* We started highlighting in June how the rapid rise of LNG-fueled heavy duty trucks in China would move forward China reaching peak diesel demand. That comment was based Wood Mackenzie comments on the rise of LNG-fueled trucks. On Sunday, the Gas Exporting Countries Forum released their Monthly Gas Market Report (MGMR), which included a "*Feature article: LNG-powered trucks emerging as a potentially major driver of natural gas demand growth*." The GECF provides history on LNG-fueled heavy duty trucks and why they have jumped up in the last two years. And they included the best data on LNG-fueled heavy duty truck sales is the best we have seen. GECF estimates that the penetration is even higher with LNG-fueled heavy duty trucks being 35% of all new heavy duty trucks for YTD Sept 30, 2024. And that means LNG-fueled heavy duty trucks have almost doubled from 4.6% penetration in 2022 to 8.55 in 2024. The 35% penetration of LNG-fuel trucks as a percentage of all new heavy duty truck sales is way higher than Wood Mackenzie estimated in June. We don't have a China oil by products demand model but we have to believe this growth rate in LNG-fueled heavy duty new truck sale have to be at least offsetting any normal increase in trucking diesel demand. Diesel is used for more than trucking but trucking is the key component. And with diesel roughly 25% of oil production, it would also help bring peak oil demand sooner. Below is the GECF chart that we attached to our tweet. Our Supplemental Documents package includes the GECF feature article on LNG-fueled trucks.

Figure 51: Trend in the heavy-duty truck market in China



ource: GECF Secretariat estimates based on data from China Association of Automobile Manufacturers, CIECData, McKinsey,

Source: GECF

06/25/24: China to reach peak diesel demand sooner than expected

Here is what we wrote in our June 30, 2024 Energy Tidbits memo when we first raised how the rapid increase in LNG-fueled heavy duty trucks would lead to China reading diesel demand sooner than expected. "*On Tuesday, we saw the rationale for why China should hit peak diesel demand sooner than expected. Mackenzie said something we, and it seems many others, hadn't realized in that 25% of new heavy-duty trucks in China are now LNG fueled and not diesel fueled. We say others must be realizing because we saw comments later this week on this very subject of 25% of heavy-duty trucks being LNG fueled so we suspect they also saw the Wood Mackenzie comments. We assume that this didn't go from zero to 25% overnight so there has been some buildup of this LNG truck sales. Diesel is driven by trucks so this will have a direct impact on diesel demand. And if China reaches peak diesel demand, it also points to peak oil demand as diesel demand is roughly 25% of China's 16 mmb/d oil consumption. And on early Tuesday morning, we tweeted [LINK] "Good China insights from @WoodMackenzie Alan Gelder. Chinese distillate demand is not particularly great. so negative indicator for economy today. But decoupling of China diesel demand vs economy indicator is starting for mid-term as 25% of new heavy duty trucks are LNG fuel so "that decouples the manufacturing & movement of goods from diesel demand"' Would also be a factor to China oil demand peaking sooner than prior forecasts. #OOTT @gulf_intel." Our tweet included the transcript we made of comments by Alan Gelder (Downstream Global SME, VP Refining, Chemicals & Oil Markets, Commodities Research, Wood Mackenzie) on Gulf Intelligence's Daily Energy Markets June 25 podcast. [LINK] Items in "italics" are SAF Group created transcript. At 10:40 min mark, Gelder "The Chinese economy hasn't materially returned to growth. So there is a degree to which how you measure that. We look at Chinese distillate demand – it's not particularly great, not particularly strong. There is a challenge in that actually there is a akin to what China has done around electrification of the passenger car fleet. They are shifting trucks onto LNG. So something like 25% of new heavy duty truck purchases are LNG. So in a sense, we are having that move decouples the manufacturing and*

movement of goods from diesel demand. Just that activity of changing their fuel type.“

Diesel consumption will become less of an economy indicator in China

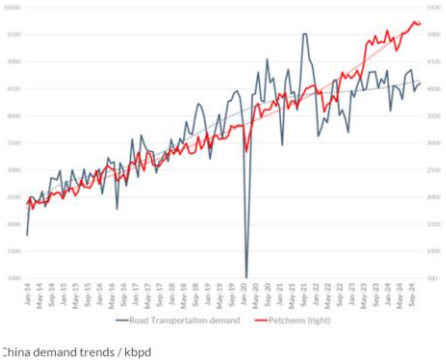
Our June 25, 2024 tweet noted above on diesel demand included the note that this mean diesel consumption will be less of an indicator for the economy. Many look at diesel consumption as an indicator for the China economy and increasing LNG heavy duty trucks will delink this relationship. Wood Mackenzie's Alan Gelder said "*They are shifting trucks onto LNG. So something like 25% of new heavy duty truck purchases are LNG. So in a sense, we are having that move decouples the manufacturing and movement of goods from diesel demand. Just that activity of changing their fuel type."*

Oil: Vitol, China total oil demand growth on trend even as peak transport fuel reached

Vitol's China oil demand view

Yesterday, we tweeted [LINK] "*Great China #Oil demand perspective from @vitolnews @Giovanni Serio. China oil demand "trend is the same. What has changed is the composition of that demand. It is very clear when you break it down that peak transport fuel has been reached in China, but that petchem continues to expand and drive demand growth".Excerpt from his must read [LINK] #OOTT."* We have been focusing on the piece of the China oil demand picture that we can follow – the growth of LNG-fueled trucks leading to peak China diesel demand. But that is a key piece but only piece of the China oil demand picture and we were reminded of this point by a great perspective comments by Giovanni Serio, Vitol's Global Head of Research at this week's FT Commodities Asia conference. The headlines from Serio's comments were his clear view that *"peak transport fuel has been reached in China*". That makes sense with LNG-fueled trucks and BEVs and PHEVs growth. Although he does also remind a wildcard is how much PHEVs keep taking share from BEVs. But what was missed in the headlines is that he sees China oil demand on trend with pre-Covid because strong petchem growth makes up for peak transport fuels. Our tweet included his key quote and the graphs that show the flattened gasoline/gasoil (diesel) curve an the strong growth in petchems to give the overall trend. Below is his road transport fuels and petchem demand growth graph. Our Supplemental Documents package includes the excerpt from his comments. .

Figure 52: China road transportation fuels & petchems demand



Source: Vitol

Oil: Will IEA tweak up its oil demand forecast in it's Dec and Jan OMRs?

Will IEA increase oil demand in Dec OMR

Yesterday, we tweeted [LINK] "*Over/Under? Will IEA tweak up its oil demand forecast in its Dec & Jan OMRs ahead of new US boss @LibertyFrac Chris Wright who will be able to drill down on their fcast assumptions. Can anchor Dec tweak on 👇11/14/24 tweet actual oil stocks continue to go lower. #OOTT."* Later in the memo, we note that the IEA is likely, at a minimum, to shift their messaging on their oil views with a new boss, Trump's announced Energy Secretary Chris Wright. We suspect it won't be enough but we won't be surprised to see some messaging tone change in the Dec OMR and we won't be surprised to see the IEA tweak up its oil demand forecasts in its Dec and Jan OMRs because they have to know incoming Energy Secretary will be able to easily drill down on their key forecast assumptions. And we would expect the IEA will want to start off on as best a foot as possible with Wright. Our tweet noted they can easily anchor a Dec tweak up in demand based on low global oil stocks that was in their Nov OMR, even if it wasn't the highlight.

> **IEA Nov OMR, global oil inventories plunged in Sept, lowest level since Jan**
> Here is what we wrote in last week's (Nov 17, 2024 Energy Tidbits memo. "*IEA Nov OMR, global oil inventories plunged in Sept, lowest level since Jan. It may not get much attention but the IEA Nov OMR reminded that, despite their negative forward commentary on oil markets, the actual global oil stocks continue to be low. On Thursday, we tweeted [LINK] "Actuals vs forecast. Won't move #Oil prices today but physical playes have been highlighting that actual global oil stocks continue to go lower. IEA Nov OMR "Global oil inventories plunged by 47.5 mb in September, to their lowest level since January, led by a sharp draw in OECD oil products and non-OECD crude oil stocks ....." #OOTT." We do not have the paid subscription to the IEA's OMR so only have their limited press release disclosure. But that disclosure was that global oil inventories are low. The IEA wrote 'Global oil inventories plunged by 47.5 mb in September, to their lowest level since January, led by a sharp draw in OECD oil products and non-OECD crude oil stocks. OECD industry stocks fell by 36.4 mb to 2 799 mb, 95.3 mb below the five-year average. Provisional data suggest total global stocks decreased for a fifth consecutive month in October."*

Oil: Vortexa crude oil floating storage est 69.11 mmb at Nov 22, +12.35 mmb WoW

Vortexa floating storage

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 16 at 9am MT. (i) Yesterday, we tweeted [LINK] "*Vortexa crude #Oil floating storage. 69.11 mmb on Nov 22 is +12.35 mmb WoW vs revised up by +8.60 mmb Nov 15 of 56.76 mmb. Only 1 week data but 69.11 mmb is 1st time since mid-Aug that ~70 mmb instead of around 60 mmb or lower. Want to watch as coming up to Q1/25, when oil demand is seasonally lower vs Q4/24. Thx @vortexa @business #OOTT."* (ii) As of 9am MT Nov 23, Bloomberg posted Vortexa crude oil floating storage estimate for Nov 22 was 69.11 mmb, which was +12.35 mmb WoW vs revised up Nov 15 of 56.76 mmb. Note Nov 15 was revised up +8.60 mmb vs 48.16 mmb originally posted at 9am on Nov 16. (iii) We recognize it's only one data point but Nov 22 at 69.11 mmb but this is the first time floating storage has been near 70 mmb since mid-Aug. The reason we want to keep it on our radar

is that we are soon to move into Q1/25, when oil demand is seasonally lower than Q4/24. Storage to the most part has been closer to 60 mmb or lower over the past 3 months. The 7-wk moving average of 62.58 mmb is breaks a 2+ month period that included the only five weeks with a 7-week moving average below 60 mmb. (iv) Revisions. Nov 15 was revised +8.60 mmb to 56.76 mmb from 48.16 mm and one of the then only two weeks below 50 mmb since Covid. The revisions were up for the prior three weeks but were small <1 mmb for the prior four weeks. Here are the revisions for the past seven weeks compared to the estimates originally posted on Bloomberg at 9am MT on Nov 16. Nov 15 revised +8.60 mmb. Nov 8 revised +3.46 mmb. Nov 1 revised +2.28 mmb. Oct 25 revised +0.25 mmb. Oct 18 revised +0.65 mmb. Oct 11 revised -+0.55 mmb. Oct 4 revised -0.82 mmb. (v) There is a wide range of floating storage estimates for the past seven weeks, but a simple rolling average for the last seven weeks is 62.58 mmb vs last week's then seven-week rolling average of 56.88 mmb. The big factor was dropping the only <50 mmb week since Covid (Oct 4 of 44.19 mmb,) from the seven-week moving average and replacing it with Nov 22 of 69.11 mmb. And also the impact of the prior three weeks' upward revisions. (vi) Also remember Vortexa revises these weekly storage estimates on a regular basis. 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. (vii) Note the below graph goes back to Jan 1, 2020 to show the run up to Covid and then how Covid started to impact Covid in March/April 2020. (viii) Nov 22 estimate of 69.11 mmb is -60.02 mmb vs the 2023 peak on June 25, 2023 of 129.13 mmb. Recall Saudi Arabia stepped in on July 1, 2023 with its voluntary cuts. (ix) Nov 22 estimate of 69.11 mmb is -14,66 mmb YoY vs Nov 24, 2023 at 83.76 mmb. Below are the last several weeks of estimates posted on Bloomberg as of 9am on Nov 23, Nov 16, and Nov 9.

Figure 53: Vortexa Floating Storage Jan 1, 2000 – Nov 22, 2024, posted Nov 23 at 9am MT

Source: Bloomberg, Vortexa

Figure 54: Vortexa Estimates Posted 9am MT on Nov 23, Nov 16 and Nov 9

Source: Bloomberg, Vortexa

Oil: Vortexa crude oil floating storage WoW changes by regions

Vortexa floating storage by region

Bloomberg posts Vortexa crude oil floating storage in key regions, but not all regions of the world. The regions covered are Asia, North Sea, Europe, Middle East, West Africa and US Gulf Coast. We then back into the "Other" for rest of world. (i) As noted above, last week's Nov 15 was revised +8.60- mmb. The major revision was Asia revised +5.09 mmb, next highest was West Africa revised +1.38 mmb. (ii) Total floating storage at Nov 22 of 69.11 mmb was +12.35 mmb WoW vs the revised up Nov 15 of 56.76 mmb. The major WoW changes were Other +3.47 mmb WoW, Europe +3.15 mmb WoW, North Sea +2.54 mmb WoW and US Gulf Coast +1.86 mmb WoW. (iii) Nov 22 estimate of 69.11 mmb is -60.02 mmb vs the 2023 high on June 23, 2023 of 129.13 mmb. Recall Saudi Arabia started its voluntary 1 mmb/d production cuts on July 1, 2023. The major changes by region vs the last year June 23, 2023 peak are Asia -44.62 mmb and Other -22,87 mmb. (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 15 that was posted on Bloomberg at 9am MT on Nov 16.

Figure 55: Vortexa crude oil floating by region

				Original Posted	Recent Peak	
Region	Nov 22/24	Nov 15/24	WoW	Nov 15/24	Jun 23/23	Nov 22 vs Jun 23/23
Asia	28.66	29.35	-0.69	24.26	73.28	-44.62
North Sea	3.14	0.60	2.54	0.12	4.71	-1.57
Europe	5.68	2.53	3.15	1.96	5.63	0.05
Middle East	12.43	12.05	0.38	10.68	6.76	5.67
West Africa	9.45	7.81	1.64	6.43	7.62	1.83
US Gulf Coast	2.51	0.65	1.86	0.47	1.02	1.49
Other	7.24	3.77	3.47	4.24	30.11	-22.87
Global Total	69.11	56.76	12.35	48.16	129.13	-60.02
Vortexa crude oil floating storage posted on Bloomberg 9am MT on Nov 23						
Source: Vortexa, Bloomberg						

Source: Bloomberg, Vortexa

Oil: Global oil & product stocks deficit narrows: -18.300 mmb from -21.100 mmb

Bloomberg Weekly Oil Indicators

On Tuesday, 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 + 2022-2023, and other times using a five-year average 2017-2019 + 2022-2023. In both cases they do not include 2020 and 2021 in the averages. (ii) The global stockpile for crude oil and products deficit narrowed to -18.300 mmb for the week ending

November 8, from a deficit of -21.100 mmb for the week ended November 1. (iii) Total crude inventories (incl. floating) saw a build of +0.5% WoW to 607.100 mmb, while the stockpiles deficit narrowed, from a deficit of -21.100 mmb to a deficit of -18.300 mmb. (iv) Land crude oil inventories increased +0.7% WoW to 548.100 mmb, widening their deficit from -28.200 mmb to -28.400 mmb against the five-year average (2017-2019 + 2022-23). (v) The gas oil, and middle distillate stocks increased +0.1% WoW to 225.300 mmb, with the widening against the four-year average widening to +6.500 mmb from +4.300 mmb. Jet fuel consumption by international departures in the week starting November 19, is set to decrease by -0.022 mmb/d WoW, while consumption by domestic passenger departures is forecast to increase by +0.008 mmb/d WoW. Below is a snapshot of aggregate global stockpiles.

Figure 56: Aggregate Global Oil and Product Stockpiles

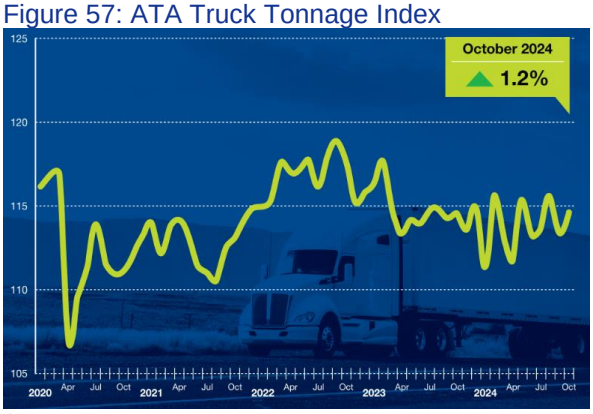
Source: BloombergNEF

Oil: ATA Truck tonnage index in October up +1.2% MoM, +3.0% YTD

October Truck Tonnage up MoM

We look to items like truck tonnage for indicators on the US economy, and the October truck tonnage is indicative of a slowly growing US economy. The American Trucking Association released its seasonally adjusted Truck Tonnage Index for October on Tuesday [LINK]. Truck tonnage rose by +1.2% MoM and is up +3.0% YTD, after hitting a low in January 2024. Chief Economist Bob Costello noted *"The slow, and choppy, climb off of the bottom continued in October, since hitting a low in January of this year, tonnage is up a total of 3%, plus the index is up sequentially in three of the last four months. No doubt the freight market has improved – albeit slowly – over the course of the year."* Trucking serves as an indicator 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 truck tonnage index report.

Figure 57: ATA Truck Tonnage Index



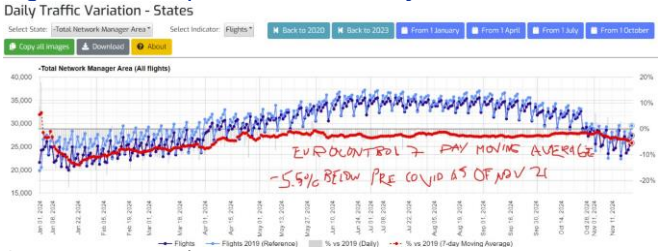
Source: ATA

Oil: Europe airports daily traffic 7-day moving average is -5.5% below pre-Covid

Europe airports daily traffic

Yesterday, we tweeted [LINK] "*Tough times in EU? Daily Europe air traffic lowest since Apr. 7-day moving average as of: Nov 21: -5.5% below pre-Covid. Nov 14: -3.8%. Nov 7: -2.9%. Oct 31: -2.0%. Oct 24: -1.6%. Oct 17: -1.9%. Oct 10: -1.7%. Oct 3: -2.9%. Sept 26: -2.9%. Sept 19: -2.8%. Thx @eurocontrol #Oil #OOTT."* Daily Europe air traffic is now back down to early April levels. Other than over Christmas, European daily traffic at airports has been stuck a little bit below pre-Covid. The 7-day moving average has got close to pre-Covid including -0.8% below pre-Covid as of May 30, but the 7-day moving average is now -5.5% below pre-Covid as of Nov 21, which is the lowest since early April weeks were -3.8% as of Nov 15, -2.9% as of Nov 7, -2.0% as of Oct 31, -1.6% as of Oct 24, -1.9% as of Oct 17, -1.7% as of Oct 10, -2.9% as of Oct 3, -2.9% as of Sept 26, and -2.8% as of Sept 19. Please note that we try to pull the data early Saturday mornings for a consistent weekly comparison. Eurocontrol updates this data daily and it is found at [LINK].

Figure 58: Europe Air Traffic: Daily Traffic Variation to end of Nov 21



Source: Eurocontrol

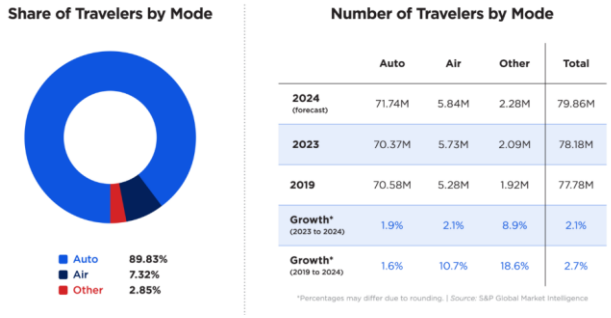
Oil: U.S. Domestic travel over U.S. Thanksgiving weekend forecast up +2.1% YoY

Thanksgiving weekend travel up YoY

On Monday, the American Automobile Association (AAA) released its forecast for US travel over the Thanksgiving Weekend [LINK]. AAA projects the number of travelers will be +2.1% YoY to a forecasted 79.86 million travellers. The AAA wrote "*This year's projection of nearly 80 million travelers is an increase of 1.7 million people compared to last year and 2 million more than in 2019… AAA projects a record 71.7 million people will travel by car over Thanksgiving – that's an additional 1.3 million travelers on the road compared to last year…*

AAA projects 5.84 million people will fly domestically this holiday. That's an increase of 2% compared to last year and a nearly 11% increase over 2019… Nearly 2.3 million people are expected to travel by other modes of transportation, including buses, cruises, and trains. This category is seeing an increase of almost 9% compared to last year and an 18% jump over 2019". Air travel is also expected to set a new record +2% YoY to 5.84 mm people flying domestically. As usual, the worst days to drive are Tuesday and Wednesday afternoon. AAA also noted the top 10 domestic and international destinations for Americans over U.S. Thanksgiving weekend, and domestically, Orlando FL, was #1. Our Supplemental Documents package includes the official AAA report.

Figure 59: 2024 Thanksgiving Travel Forecast



Source: AAA

Figure 60: Top 10 Domestic and International Destinations over Thanksgiving weekend

DOMESTIC	INTERNATIONAL/CARIBBEAN
Orlando, FL	Budapest, Hungary
Miami, FL	Mexicali, Mexico
Fort Lauderdale, FL	San Juan, Puerto Rico
New York, NY	Cancun, Mexico
Anaheim/Los Angeles, CA	Punta Cana, Dominican Republic
Tampa, FL	Rome, Italy
Honolulu, HI	Amsterdam, Netherlands
San Francisco, CA	Paris, France
Las Vegas, NV	Barcelona, Spain
Atlanta, GA	Munich, Germany

Source: AAA

Strong US$ means international flights +23% YoY over Thanksgiving

For anyone looking to travel to favored US international vacation destinations like Europe and Asia, you might want to look to book sooner than later. The AAA forecast for US Thanksgiving travel wrote "*According to AAA booking data, air travelers are paying 3% more for domestic Thanksgiving flights this year, while the number of flight bookings is similar to last year. International flight bookings are up 23% compared to last Thanksgiving, in part because the cost to fly internationally is down 5%*." We were reminded of this a couple time hearing the CNBC show hosts talking about the strong US $ and how they were going to look to book a summer

vacation to Europe.

Energy Transition: Won't the IEA have to shift views with new Energy Secretary Wright

IEA and new Energy Secretary Wright

One of the headline stories this week was Platts reporting "*Trump, congressional Republicans set to take aim at IEA funding, forecasts: sources"* and reportedly US funds 14% of the IEA budget. If Trump wanted, he could cut funding overnight to the IEA. Platts wrote ""*The IEA is definitely on their radar screen," said one industry source with close ties to the Trump team, while a second said the incoming administration feels the agency "needs to be reined in." "They will want to see a change," the second source said. "There's a feeling in the [Trump] administration and people who will be playing senior roles in energy in the administration that the IEA has gone beyond its mandate*." No one will dispute the IEA will likely be on the target list. However, we aren't convinced the Republicans have to go after the IEA. Rather, just proposed Energy Secretary Chris Wright go to the meetings. He has the real oil and gas and electricity knowledge and experience to cut thru any fluff in particular the assumptions the IEA uses for its forecasts. For years, we have highlighted that it's all about the assumptions the IEA uses in its forecasts. And we have to believe Secretary Granholm doesn't have the ability to probe on the assumptions otherwise she would have raised concerns with the IEA forecasts. Wright will probe on assumptions. And as every analyst and agency know, forecasts are all about the assumptions. And that most people never look at the assumptions. We have trouble believing that just having Wright probe on assumptions won't force the IEA to shift their views. Our Supplemental Documents package includes the Platts report.

IEA Executive Director Birol's congratulations to Trump signals a change

We think the IEA is trying to signal to Trump and Wright they will try to be more balanced in their views. IEA Executive Director Birol's Nov 6 congratulations tweet to Trump [LINK] was "*Congratulations President @realDonaldTrump on your election for a 2nd term, As during your 1st term, @IEA looks forward to working closely with your new administration to support US energy policy goals and to advance global efforts towards affordable, secure & sustainable energy."* Birol didn't mention climate, climate change, clean energy or renewable energy.

02/1924: Macron, IEA is "our armed wing of implementing" Paris agreement

Maybe if Trump's team saw our Feb 25, 2024 Energy Tidbits memo, they would just go ahead and cut off IEA funding on the theory that a leopard can't change its spots. Our Feb 25, 2024 Energy Tidbits memo was titled "Macron Hurts IEA Analysis Credibility "*The IEA has become, so to speak, our armed wing of implementing the Paris agreement"*. And we then wrote "*Energy Transition: Macron, IEA is "our armed wing of implementing" Paris agreement. We were shocked by France President Macron's comment on the IEA. On Monday, we tweeted [LINK] "The IEA has become, so to speak, our armed wing of implementing the Paris agreement" Macron. The IEA has no guns, is Macron saying analysis/fcasts are their weapons to implement Paris as opposed to analyzing energy! Saudi Energy Minister Abdulaziz will say I told you so! #OOTT." Macron made the keynote speech at the IEA Ministerial Meeting in Paris that also celebrated the IEA's 50th anniversary. We were surprised that Macron made such a direct comment that made it clear the IEA's focus*

is on implementing the Paris Agreement on behalf of the western governments that fund the IEA. This was not an accident, rather it looked like a prepared speech Macron read from a teleprompter. So, for some reason, Macron wanted the world to know the IEA is there to the "armed wing" for their western country funders to implement the Paris agreement. And not an agency that provides analysis for their western governments to make the right policy decisions. But, if we take Macron at his words, the IEA's analysis is there to support policy or provide the impetus for their western government funders to make policy to support the conclusions of the analysis. And to provide the western governments with the rationale for why they make policies for Paris Agreement. It was a major ht to the IEA credibility and we just don't understand why Macron did it unless he wanted to hurt the IEA's credibility. Here is the transcript we made of Macron's comments that was attached to our tweet. Note that we made the transcript from the IEA's posting of Macron's speech. The IEA just didn't includes the full Macron quote. At 0;52 min mark, Macron "We are also very proud that since its creation, the Agency has been able to profoundly shift its mandate. From an agency dedicated to managing strategic oil reserves, it has now become a global hub for debate, collective action to meet the challenge of the energy transition. The IEA has become, so to speak, our armed wing of implementing the Paris agreement, given that energy accounts for more than 75% of global greenhouse gas emissions."

Energy Transition: Kuwait Petroleum CEO on prematurely getting rid of fossil fuels

Kuwait on getting rid of fossil fuels

It seems like most people, on both sides of the climate change fight, have a sense of humor. Or at least some of our pro-climate change friends who had couldn't help chuckling on our tweet of comments by Kuwait Petroleum CEO on prematurely getting rid of fossil fuels. On Thursday, we tweeted [LINK] "*Energy Transition? "Ending fossil-fuel production without an abundant, reliable alternative is like "calling for humanity to jump out of a plane and then try to invent a parachute on the way down," Sheikh Nawaf said." @FionamMacDonald on comments by Kuwait Petroleum CEO. #OOTT."* It is a funny line. But his point is that the energy transition aspirations were focused first on getting rid of fossil fuels because the theory was that clean energy was available to replace it. But as we are seeing with even the most advanced energy transition areas like wind and solar, they are not available to replace fossil fuels power generation to provide the world with 24/7 reliable, available, affordable power. Below is the cartoon we attached to our tweet.

Figure 61: Roadrunner and Wiley E Coyote:

Source: Pinclipart

Energy Transition: Equinor cuts 20% of renewables jobs to match planned activity

Equinor cuts 20% of renewables jobs

No one should have been surprised to see the comments from Equinor EVP Renewable Energy that they were cutting 20% of their renewable jobs to match their new planned activity levels. Early Thursday morning, we tweeted [LINK] "*Here's why Equinor to cut 20% of renewable jobs. "we need to adapt the organisation and staffing to the level of activity we are planning" "I would call it an adaptation and adjustment to the reality we see out there" "We have to acknowledge that the offshore wind industry is in its first real downturn" Equinor EVP for renewable energy Pål Eitrheim to E24. #NatGas will be needed for power for longer. #OOTT. [LINK].*" Our tweet linked to the E24 interview with Eitrheim and his comments were clear – renewable are not growing as expected, Equinor needs to downsize to fit materially lower renewable energy activity levels and his offshore wind statement "*We have to acknowledge that the offshore wind industry is in its first real downturn. The entire industry has faced challenges over the past 12-18 months. Cost inflation and cost levels have put pressure on margins, and there have been challenges with interest rates, bottlenecks and quality challenges in the supply chain," says Eitrheim,*" Our Supplemental Documents package includes the E24 report.

10/24/24: Equinor said blue hydrogen is not ready, green is even further away

On Oct 24, 2024, Equinor highlighted its concern that blue hydrogen is not ready and green hydrogen is ever further away in the Q&A portion of its Q3 call. Equinor includes its hydrogen to power business in its group called "Low Carbons Solutions" ie. hydrogen is not part of Equinor's Renewables group. Here is what we wrote in our Oct 27, 2024 Energy Tidbits memo. "*The Equinor Q3 call on Thursday is another good example of how the best insights come from the Q&A portion of conference calls when mgmt is more or less forced to answer questions apart from their prepared remarks. On Thursday, we tweeted [LINK] "Hydrogen isn't ready for prime time. Blue hydrogen "needs to be significant before any green hydrogen can actually be viable" And Blue Hydrogen doesn't work: it's uneconomic, "no significant customer base to life an investment like this", not "a well functioning market to do that". @Equinor CEO. #Oil #NatGas will be needed for longer. #OOTT." In the Q&A, mgmt had some direct comments on green and blue hydrogen and was clear that hydrogen is far from ready. Equinor was negative on Green Hydrogen as that will only come after Blue Hydrogen. And Equinor also is far from bullish on Blue Hydrogen in the near term as Blue Hydrogen has the same basic problems that we have noted before: it isn't economic, there are no significant customers and it is not a well functioning market. Here is what mgmt said in the Q&A. Mgmt was asked "Yeah, hi. Thanks for taking my question. I'll keep it to one, then. I just wanted to ask about the recent cancellation of a blue hydrogen project and hydrogen pipeline to Germany with RWE. Could you maybe talk about why the project wasn't viable, and what is next for your hydrogen plant? Thank you." CEO replied "Okay, thanks, Kim. Yeah. We do believe that blue hydrogen is going to be very important for Europe, and we also do believe that that needs to be significant before any green hydrogen can actually be viable, as such. For a blue hydrogen value chain to work, there are three things that really need to be in place. One is there needs to be an economic framework for investing into it; the second is there needs to be a customer base, and I would say actually a significant customer base to lift an investment like this; and the third one is actually a well-functioning market to do that. And I'm sorry to say, none of*

these are in place sufficiently to justify an investment like this. So that is the reason that things are going slower than we had hoped, and we think we are all better in actually maybe thinking of the different ways of creating a blue hydrogen value chain in Europe."

EU Oct BEV sales

Energy Transition: ACEA, EU Oct BEV sales up YoY in Oct but share still down in 2024

As a reminder, EU Oct new car registrations are EU so do not include UK. EU BEV sales were +2.4% YoY in Oct, which followed +9.8% YoY in Sept and the brutal -43.9% YoY in Aug. On Thursday, we tweeted [LINK] "*EU Oct new car registrations. BEV share down in 2024 despite car manufacturers holding back some ICE/HEV in Oct, Nov, Dec to meet BEV sales minimum. BEV: Oct +2.4% YoY, Sept +9.8% YoY, brutal Aug -43.9% YoY. YTD Oct 31 -4.9% YoY, share 13.2% vs 14.0%. PHEV: Oct -7.2% YoY & -7.9% YoY. HEV: continued big winner, Oct +17.5% YoY, YTD +19.8% YoY, share 34.0% vs 25.5%. Petrol -6.8% YoY, YTD -4.7% YoY, 34.0% share. Diesel -7.6% YoY, YTD -10.8% YoY., 12.3% share. Thx @ACEA_auto #OOTT."* BEV sales up YoY in Oct and Sept broke a string of four consecutive months with BEV sales down YoY including the brutal -43.9% YoY in Aug. Our tweet reminds of the big picture theme making the BEV sales look better as there has been some holding back of ICE and HEV as car manufacturers try to get BEV sales to as high a percentage as possible of 2024 sales. We expect this to also BEV sales in Nov and Dec. The other big theme is that HEV continues to be the big winner in 2024 with Oct HEV sales +17.5% YoY and YTD Oct 31 sales +19.8% YoY to 30.4% share vs 25.5% share in 2023. Gasoline sales continue to be down YoY as -6.8% YoY in Oct and -4.7% YoY in YTD Oct 31 but their market share is still 34.0% vs 35.9%. The other big picture theme is that EU car sales are only +0.7% YoY to 8,856,195 YTD Oct 31. Below is our table of EU Oct and YTD Oct 31 new car registrations by power source. Our Supplemental Documents package includes the ACEA Oct new car registrations.

Figure 62: EU Oct new car registrations by power source

EU Oct 2024 New Car Registrations by Power Source										
				Share	Share				Share	Share
	Oct-24	Oct-23	% Change	Oct-24	Oct-23	YTD Oct 24	YTD Oct 23	% Change	YTD Oct 24	YTD Oct 23
BEV	124,907	121,989	2.4%	14.4%	14.2%	1,172,737	1,232,937	-4.9%	13.2%	14.0%
PHEV	66,964	72,154	-7.2%	7.7%	8.4%	617,409	670,530	-7.9%	7.0%	7.6%
HEV	288,160	245,308	17.5%	33.3%	28.6%	2,692,726	2,247,298	19.8%	30.4%	25.5%
Others	25,281	29,052	-13.0%	2.9%	3.4%	273,938	267,333	2.5%	3.1%	3.0%
Petrol	266,498	285,845	-6.8%	30.8%	33.4%	3,011,926	3,159,823	-4.7%	34.0%	35.9%
Diesel	94,587	102,414	-7.6%	10.9%	12.0%	1,087,459	1,219,014	-10.8%	12.3%	13.9%
Total	866,397	856,762	1.1%	100.0%	100.0%	8,856,195	8,796,935	0.7%	100.0%	100.0%
Others incl fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels										

Source: ACEA

11/13/24: ACEA, worsening EU EV outlook reinforces need for urgent action

As noted above, on Thursday, the ACEA reported EU BEV sales in Oct were up +2.4% YoY but its YTD share was down to 13.2%. That was on Nov 19 so the ACEA obviously was rolling up the Oct sales in the week or so prior to that. So they knew the numbers and no surprised, on Nov 13, the ACEA wrote "*New evidence of worsening outlook for electric vehicle market reinforces need for urgent action*". We didn't see the ACEA Nov 13 call for urgent action on BEVs in EU until Wed. On Wed, we tweeted [LINK] "*Can EU do something to fix stagnating #BEV sales? How long will it take to turnaround? "New evidence of worsening outlook for electric vehicle market reinforces need for urgent action" "All indicators point to a stagnating EU*

electric vehicle market, at a time when acceleration is needed." ACEA_auto #OOTT." The warnings are new ones from the ACEA. They are clear, the BEV market is stagnating in the EU. It's worth a read as the ACEA highlights stability is not enough, the BEV market needs more. And the costs of compliance in hitting the BEV sales targets is steep for car manufacturers. There are number of items that need to get the BEV market accelerating instead of stagnating including more EV market stimulus. Our Supplemental Documents package includes the ACEA urgent action release.

09/19/24: ACEA, urgent action needed as EU BEV Aug sales -43.9% YoY

As noted above, the ACEA has previously called on EU leaders for urgent action to help BEV market. Here is what we wrote in or Sept 22, 2024 Energy Tidbits memo. "*On Thursday, the ACEA posted Europe Aug car sales and it was a brutal month for car sales, especially in BEVs. And the brutal numbers led the AEWCA to post "European auto industry calls for urgent action as demand for EVs declines". [LINK]. The ACEA has a blunt warning that BEV sales are not growing at a slower rate, rather BEV sales are declining. And the EU needs urgent action to to try to stop the decline. (i) On Thursday, we tweeted [LINK] "1/2. EU BEVs decline looks unfixable in near term. @ACEA_auto says urgent action needed. "We are missing crucial conditions to reach the necessary boost in production and adoption of zero-emission vehicles: charging and hydrogen refilling infrastructure, as well as a competitive manufacturing environment, affordable green energy, purchase and tax incentives, and a secure supply of raw materials, hydrogen and batteries. Economic growth, consumer acceptance, and trust in infrastructure have not developed sufficiently either". #OOTT." (ii) The ACEA lists a broad range of items they see leading a decline in BEV sales in EU. These include a number of items that are unfixable in the near term such as needing "affordable green energy". The ACEA is looking beyond the marginal cost of solar electricity when the sun is shining or the marginal cost of wind electricity when the wind is blowing. Instead they are looking at how power costs are going up, not down, under the EU's leading push for green energy. And the ACEA lists the obvious one tha they need to get consumer acceptance for BEVs. (iii) Brutal month for BEV sales. On Thursday, we also tweeted [LINK] on the ACEA Aug new car registration. "2/2. EU EV car sales -43.9% YoY in Aug, 4th consecutive monthly decline. @ACEA_auto ACEA Aug car sales: BEV: 92,627, -43.9% YoY, 14.4% share vs 21%. PHEV: 45,590, -22.3% YoY, 7.1% share vs 7.4%. HEV: 201,552, +6.6% YoY, 31.3% share vs 23.9%.. Petrol: 213,057, -17.1% YoY, 33.1% share vs 32.6%. Diesel: 72,177, -26.4% YoY, 11.2% share vs 12.5%. Others: 18,634, -5.3% YoY, 2.9% share vs 2.5%. #OOTT." Below is the table we created of the ACEA data for Aug new car registrations. Our Supplemental Documents package includes the ACEA urgent action release and the ACEA Aug new car registrations."*

Figure 63: EU Aug new car registrations by power source

EU August New Car Registrations by Power Source						
	Aug-24	Aug-23	% Change	YTD Aug 24	YTD Aug 23	% Change
BEV	92,627	165,204	-43.9%	902,011	983,718	-8.3%
PHEV	45,590	58,660	-22.3%	501,266	527,697	-5.0%
HEV	201,552	189,114	6.6%	2,138,474	1,765,893	21.1%
Others	18,634	19,687	-5.3%	224,692	213,537	5.2%
Petrol	213,057	257,139	-17.1%	2,504,457	2,580,076	-2.9%
Diesel	72,177	98,008	-26.4%	909,592	1,007,279	-9.7%
Total	643,637	787,812	-18.3%	7,180,492	7,078,200	1.4%
Others incl fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels						
Sources ACEA						

Source: ACEA

Energy Transition: Lower than expected EU EV demand, Ford cuts 4,000 EU jobs

Ford sees lower than expected EU EVs demand

When we read the Ford call for action and the ACEA call for urgent action on a stagnating EU BEV market, we continue to be surprised that that everyone didn't realize the shift to BEVs was going to take way longer, cost way more than aspirations and be a rocky/bumpy road. Western leaders and the car companies extrapolated the rate of growth from the early adopters rapid growth from a very small base would just apply to lower and middle class. This is despite the numerous reports from years ago that price and cost were key considerations. As a result, we see another negative EU EVs story this week that didn't surprise anyone when Ford announced 4,000 EU job cuts driven by lower than expected EU electric vehicles demand. On Wed, we tweeted [LINK] "*Demise of ICE vehicles & gasoline will take longer than aspirations. Headline: Ford cutting 4,000 EU jobs.Ford's negative EU EVs market recap. "lower than expected demand for electric cars" "a misalignment between CO2 regulations and consumer demand for electrified vehicles". #OOTT."* As noted in our tweet, Ford's release was clear in why it was cutting jobs – EU demand for BEVs is lower than expected and nowhere near what was assumed in the EU's CO2 regulations that set minimum BEVs % of total cars for car manufacturers. Ford's call for action includes the expected "*meaningful incentives to help customers make the shift to electrified vehicles.*" Ford wrote ""*What we lack in Europe and Germany is an unmistakable, clear policy agenda to advance e-mobility, such as public investments in charging infrastructure, meaningful incentives to help consumers make the shift to electrified vehicles, improving cost competitiveness for manufacturers, and greater flexibility in meeting CO2 compliance targets," Lawler said."* Our Supplemental Documents package include the Ford release.

Energy Transition: UK Oct BEV sales +24.5% YoY since ICE/HEV sales are held back

UK Oct BEV sales +24.5% YoY

The big outlier in the ACEA Oct new registrations for BEV sales in the UK of 29,802, which was +24.5% YoY, and for YTD Oct 31 were +14.2% YoY to 299,733 BEVs for a 18.1% share vs 16.3% YTD Oct 31, 2023. PHEV Oct sales -3.2% YoY and YTD +22.5% YoY to 8.4% share vs 7.1%. HEV Oct sales +7.4% YoY and YTD +15.8% YoY for a 35.6% share vs 31.7%. Petrol Oct -27.7% YoY and YTD -11.6% YoY to 35.1% share vs 41.0%. Diesel Oct -17.7% YoY and YTD -23.2% YoY to 2.9% share vs 3.9%. On Thursday, we tweeted [LINK] "*UK BEV numbers are deceiving. UK BEV Oct sales: Another strong month, +24.5% YoY & YTD +14.2% YoY. @ACEA_auto. BUT not because of BEV demand but because BEVs at 18.1% is still well short of UK regulated BEVs to be 22% of 2024 total car sales. See 10/16/24 tweet: @vertumotorsCEO some car manufacturers rationing ICE & HEV to meet ZEV mandate. [LINK] #OOTT*." We called the BEV numbers deceiving because there has

been ICE and HEV demand in the UK but car manufacturers have been holding back ICE and HEV deliveries to ensure BEV sales try to get as close as possible to the UK targeted minimum 22% of total car sales in 2024. So if the BEV demand hasn't and still isn't high enough, then the car manufacturers have to restrict and hold back ICE and HEV sales. So weak demand for BEVs automatically translates into weaker ICE and HEV sales than demand. Below is our table of UK Oct new car registrations by power source for Oct and YTD Oct 31.

Figure 64: UK Oct new car registrations by power source

UK Oct New Car Registrations by Power Source										
	Volume	Volumes		Share	Share				Share	Share
	Oct-24	Oct-23	% Change	Oct-24	Oct-23	YTD Oct 24	YTD Oct 23	% Change	YTD Oct 24	YTD Oct 23
BEV	29,802	23,943	24.5%	20.7%	15.6%	299,733	262,487	14.2%	18.1%	16.3%
PHEV	13,832	14,285	-3.2%	9.6%	9.3%	138,775	113,278	22.5%	8.4%	7.1%
HEV	51,251	47,737	7.4%	35.5%	31.1%	590,186	509,476	15.8%	35.6%	31.7%
Others	0	0	n/a	0.0%	0.0%	0	0	n/a	0.0%	0.0%
Petrol	45,071	62,303	-27.7%	31.2%	40.6%	582,108	658,249	-11.6%	35.1%	41.0%
Diesel	4,332	5,261	-17.7%	3.0%	3.4%	47,580	61,947	-23.2%	2.9%	3.9%
Total	144,288	153,529	-6.0%	100.0%	100.0%	1,658,382	1,605,437	3.3%	100.0%	100.0%
Others incl fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels										

Source: ACEA

10/23/24: Vertu: UK BEVs sales down, some ICE/HEV being rationed

Our UK Oct new car registrations tweet linked to a prior Oct 16 tweet on this issue of car manufacturers holding back on ICE and HEV due to lesser BEV sales. One other item we noted was how UK BEV sales are being driven by fleet buying and not individual consumer buying. Here is what we wrote in our Oct 20, 2024 Energy Tidbits memo. "*No one should be surprised by the negative UK BEVs update from the Vertu H1 results. Vertu is one of the large car dealership groups in the UK. On Wednesday, we tweeted [LINK] "More UK BEVs reality check from Vertu @vertumotorsCEO UK BEV in retail customer market -7% YoY, concerns not just price and charging infra, but also costs. UK BEV growth due to fleet. Some car manufacturers rationing ICE & HEV to meet ZEV mandate. UK needs either more incentives or reduce % of new sales to be BEV. #OOTT." Vertu noted that retail customer BEV sales are -7% YoY despite big BEVs sale discounts but overall BEV sales are up a bit due to fleet sales. They warn retail customer demand continues to be weak due to price and charging infrastructure. But Vertu also added that retail customers are concerned about costs, which we believe relates to items like higher BEV insurance costs. Because weak retail BEV, as of Aug 2024, BEVs only accounted for 17.2% of new car registrations, which is below the government mandated target of 22% in 2024. BEVs at 17.2% would be lower if some car manufacturers hadn't already started to restrict ICE and HEV deliveries in 2024 to not make the 17.2% a lower percentage. Vertu says "as manufacturers cannot sustain price cuts indefinitely, government incentives like tax breaks or subsidies will likely be needed to boost BEV private sales or changes to the Mandate will be required to take the pressure off the sector and make the transition to BEV vehicles more achievable and sustainable." Ie. the government has to lower the target significantly to something realistic to customer demands. Our Supplemental Documents package includes an excerpt from the Vertu H1 release."*

09/08/24: Vertu warned restricting ICE/HEV to help UK EVs sales get to 22%

Vertu was the first significant auto group to warn that car manufacturers were already restricting ICE and HEV deliveries to try not to make the BEV % of total car sales get even lower. Here is what we wrote in our Sept 9, 2024 Energy Tidbits memo. "*The UK government will be able to say UK EVs sales should be near their regulated 22% of total car sales. But it won't be because EVs demand supports 22% of total car sales. Rather it will be because car manufacturers are holding back ICE and HEVs in 2024. It's math. If EVs sales are less, then the ICE/HEV sales have to be stopped or else the denominator will get too large. On Friday, we tweeted [LINK] "Blunt talk! UK EVs should hit UK regulated EVs to be 22% of total car sales BUT not because of EVs demand. RATHER @vertumotorsCEO explains: "some franchises there's a restriction on supply of petrol cars and hybrid cars, which is actually where the demand is." "It's almost as if we can't supply the cars that people want, but we've got plenty of the cars that maybe they don't want." "They [manufacturers] are trying to avoid the fines. So they're constraining the ability for us to supply petrol cars in order to try and keep to the government targets." "The new car market is no longer a market, unfortunately. It's a state-imposed supply chain." #OOTT." This is the concern that others have had but weren't as blunt as Vertu Motors CEO Forrester – disappointing demand for EVs means car manufacturers have to restrict deliveries of ICE and HEVs. Vertu Motors posted The Daily Telegraph story that included Forrester's comments. They also wrote "But the scheme has prompted stark warnings from bosses at major brands, such as Vauxhall owner Stellantis and Ford, which have said they cannot sacrifice profits by selling EVs at large discounts indefinitely. Instead, they have previously warned they may be forced to restrict petrol car supplies to artificially boost their ZEV mandate performance. The warning from Vertu is the first confirmation that carmakers have now begun doing so." Our Supplemental Documents package includes the Vertu posted story. [LINK]"*

Energy Transition: Germany BEV only power source share to be down YoY

Germany Oct BEV sales -4.9% YoY

No one should be surprised Germany BEV sales continue to suffer given all the negative comments from the German car manufacturers over the past few months. Germany BEV sales were better in Oct but still down YoY. On Thursday, we tweeted [LINK] "*Germany BEVs only power source Oct sales down YoY and losing share in 2024. BEV. Oct -4.9% YoY, YTD -26,.6% YoY to 13.3% share vs 18.0%. PHEV Oct +18.2% YoY, YTD +8.9% YoY to 6.5% share vs 5.9%. HEV Oct +14.1% YoY, YTD +11.4% YoY to 26.0% share vs 23.3%. Petrol Oct+3.7% YoY, YTD +2.8% YoY to 36.0% share vs 34.9%. Diesel Oct +3.7% YoY, YTD +1.5% YoY to 17..7% share vs 17.4%. Thx @ACEA_auto #OOTT."* It's hard to ignore that BEV sales and share are down big in 2024 and all other power sources have gained market share in 2024. Below is our table of Germany new car registrations by power sources for Oct and YTD Oct 31.

Figure 65: Germany Oct new car registrations by power source

Germany Oct New Car Registrations by Power Source										
	Volume	Volume		Share	Share				Share	Share
	Oct-24	Oct-23	% Change	Oct-24	Oct-23	YTD Oct 24	YTD Oct 23	% Change	YTD Oct 24	YTD Oct 23
BEV	35,491	37,334	-4.9%	15.3%	17.1%	311,881	424,623	-26.6%	13.3%	18.0%
PHEV	19,337	16,361	18.2%	8.3%	7.5%	152,198	139,706	8.9%	6.5%	5.9%
HEV	65,672	57,575	14.1%	28.3%	26.3%	610,973	548,430	11.4%	26.0%	23.3%
Others	1,056	1,162	-9.1%	0.5%	0.5%	12,031	12,526	-4.0%	0.5%	0.5%
Petrol	74,264	71,646	3.7%	32.0%	32.7%	845,263	822,032	2.8%	36.0%	34.9%
Diesel	36,172	34,881	3.7%	15.6%	15.9%	415,720	409,708	1.5%	17.7%	17.4%
Total	231,992	218,959	6.0%	100.0%	100.0%	2,348,066	2,357,025	-0.4%	100.0%	100.0%
Others incl fuel-cell electric vehicles, natural gas vehicles, LPG, E85/ethanol, and other fuels										

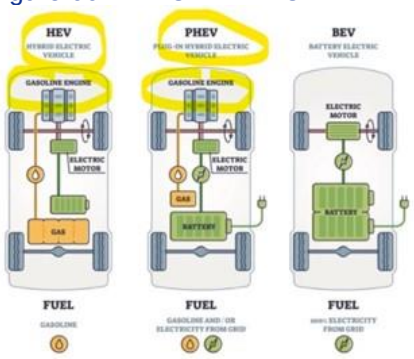
Source: ACEA

Energy Transition: HEVs & PHEVs are really just more fuel efficient ICE vehicles

HEVs/PHEVs are just fuel efficient ICE vehicles

The ACEA Oct new car registrations continue to show that the dominant trend in car sales has been the emergence of HEVs over the past year as the growth areas for cars in Europe. [Note that China is different as PHEVs dominate. See our 11/04/24 tweet [LINK] PHEVs are 60% of BYD's NEV New Energy Vehicles]. But what most forget is that is a win or at least a much lesser loss of gasoline/diesel consumption vs BEVs. No one can deny an HEV will burn less gasoline or diesel than its ICE counterpart. However, we still find many don't understand that HEVs and even PHEVs are really just more fuel-efficient ICE vehicles and, in particular, for PHEVs that are generally lumped in with BEVs for an electrified car group as BYD does in its NEV category. HEVs and PHEVs run on gasoline or diesel for likely at least half of the time for PHEVs and probably 90% for HEVs. On Sept 4, we tweeted [LINK] "*HEV/PHEV 101 - They are really just more fuel efficient ICE. Ford: HEV F150 does 23 mpg vs ICE150 at 19 mpg. Volvo: PHEVs km driven are split 1/2 using battery, 1/2 using petrol/diesel. #OOTT."* Our tweet referenced Ford and Volvo data on HEVs and PHEVs. On Ford F150 Hybrid vs ICE mpg. Our tweet included the EPA rated mileage for the Ford F150 ICE vs Hybrid. The EPA rates the Hybrid fuel efficiency as being only 4 mpg more than the ICE. That increased fuel efficiency would be reduced if it was a full apples-to-apples comparison. The ICE has a much larger towing capacity. The F150 ICE 3.5L cyl F-150 does 19 MPG with a tow capacity of 13,500 lbs. The F150 HEV 3.5L 6 cyl F-150 does 23 MPG with a tow capacity of 11,200 lbs. Note how much kms PHEVs drive on ICE mode vs battery mode is like a dirty little secret and we have only been able to find one PHEV player, Volvo, make a clear statement on this split. On Volvo PHEVs, most just lump PHEVs in with EVs because both are electrified. But the reality is that a lot of PHEV is driven in ICE mode. As noted earlier, Volvo backed off its fully electric plans and its press released noted "*Volvo Cars' most recent data shows that around half of the kilometres covered by the latest plug-in hybrid Volvo cars are driven on pure electric power."* So based on the "most recent data", Volvo PHEVs are driven around 50/50 between km driven in battery mode vs ICE mode. Given the press release was Volvo having to back away from its electrified goals, we have to be believe the "around half" driven by PHEV is likely below half. We also believe that Volvo has likely picked the best time period for PHEVs driving in battery mode. We would assume the most recent data is referring to some spring/early summer period and it does not include winter months where the PHEVs will be driven more in their ICE mode.

Figure 66: HV vs PHEV vs BEV



Source: Engineering Infrastructure

Energy Transition: Trump Admin to also move to advance autonomous driving

Trump Admin to advance autonomous driving

It looks like a big plus to Elon Musk with the new Trump Admin looking to advance autonomous driving to add to China already announcing it would do the same. Both the US and China are putting autonomous driving as a focus to advance and that is a big plus to Tesla. Early Monday morning, we tweeted [LINK] "*Autonomous driving race is on. Tesla +8% pre-mkt. "Trump's team transition team have told advisers they plan to make a federal framework for fully self-driving vehicles one of the @USDOT's priorities" reports @DavidWelch47 @allyversprille. China speeding up piloting for autonomous driving. See 👇11/13 tweet. #OOTT [LINK].*" Bloomberg wrote "*Members of President-elect Donald Trump's transition team have told advisers they plan to make a federal framework for fully self-driving vehicles one of the Transportation Department's priorities, according to people familiar with the matter. If new rules enable cars without human controls, it will directly benefit Elon Musk, the Tesla Inc. chief executive officer and Trump mega-donor who's become a powerful fixture in the president-elect's inner circle. He's bet the future of the EV maker on self-driving technology and artificial intelligence.*" And "*Current federal rules pose significant roadblocks for companies looking to deploy vehicles without steering wheels or foot pedals in large quantities, which Tesla plans to do. The Trump team is looking for policy leaders for the department to develop a framework to regulate self-driving vehicles, according to people familiar with the matter, who asked not to be named because they weren't authorized to speak publicly.*" Our Supplemental Documents package includes the Bloomberg report.

China speeding up testing of autonomous vehicles on roads

Here is what we wrote in last week's (Nov 17, 2024) Energy Tidbits memo on China's push on China's push on autonomous drilling. "*Last Sunday night, we tweeted [LINK] "China realizing Elon is the man behind the Trump throne. "China will speed up piloting market access for intelligent connected vehicles and letting them run on the roads, authorities have said." State media. Will help EVs advancement & stay on Elon's good side. #OOTT." Last Saturday night, Xinhua (stated media) reported [LINK] "China will speed up piloting market access for intelligent connected vehicles and letting them run on the roads, authorities have said. The country will promote the demonstration and application of autonomous driving and driverless vehicles in key areas including the Yangtze River Delta region and the Guangdong-Hong Kong-*

Macao Greater Bay Area, according to an action plan jointly released by the Ministry of Transport and the National Development and Reform Commission." Xinhua did not mention Tesla but we suspect that everyone sees this as a move to help Tesla accelerate its autonomous driving advancement. Our Supplemental Documents package includes the Xinhua report."

Cathie Wood says 90% of their 5-yr Tesla target upside is for autonomous

Here is another item from last week's (Nov 17, 2024) Energy Tidbits memo. "*Cathie Wood (CEO Ark Invest) may not have said it specifically, but she is probably happy to see China's announcing it is speeding up its pilots for autonomous vehicles. We were watching Squawk Box on Friday when she was talking about Tesla. We tweeted [LINK] "Tesla. Just now @CathieDWood with @andrewrsorkin @SquawkCNBC. reminds 90% of their 5-yr target upside in Tesla is for autonomous. ICYMI, see 👇11/13/24 tweet. China is doing its part to help Elon's autonomous ramp by speeding up pilot for autonomous on roads. #EVs."*

Energy Transition: COP29, no specific firm $b commitments from rich nations

COP29 ended early today

Please note that as of 4am MT, we haven't seen posted the final big COP29 document. But they have posted the key climate finance document. Hopefully this isn't viewed as another pile on COP29 because, as of our 7am MT news cut off, there has been a lot of piling over the past less than 12 hours since the signing off on the *"new collective quantified goal on climate finance*". Rather, it is an accomplishment to have this many countries agree on anything. When we read the draft decision that was posted as of 4am MT, it was as we expected – there were goals set but no specific firm sending commitments by rich nations. Rather it comes back to what we have said in prior years that rich nations will only agree to do what the choose to do. But, again, what more can be expected. And this year, there was a specific reality check by rich nations that they have fiscal constraints and the costs of energy transition items is more than aspired. Note they don't want to specifically name all the key areas that are seeing higher transition cost but say it in a general way. We believe that the climate change don't want to specifically say what company leaders in specific energy transition areas have shown and said in the last year: offshore wind costs are way higher, EVs costs are way higher. Green Hydrogen isn't making any real progress due to costs. Sustainable Aviation Fuel is too expensive and not competitive. Earlier this morning, we tweeted [LINK] "*Reality of way higher than aspired Energy Transition costs is a key why COP29 couldn't get specific firm commitments by rich countries. 👇"14. Acknowledges the fiscal constraints and increasing costs to adapt to the adverse effects of climate change ..." Big misses on cost to roll out Offshore wind, green hydrogen, EVs, sustainable aviation fuel, etc. Energy transition is happening but will take way longer, cost way more than aspired and will be a rocky/bumpy road .#Oil #NatGas #Coal will be needed for longer. #OOTT."* The commitment for rich nations to fund $300b/yr by 2035 to help poor nations for climate action is a "goal". One of the big criticisms so far is that this wasn't a government (public finance) goal but from all sources of capital. Ultimately, COP29 did what it could and get rich nations to a goal and to do what they choose to do. Our Supplemental Documents package includes the climate finance draft posted as of 4am MT today.

COP29 signees will only agree to do what they choose to do

As of 4am MT, we have not seen the COP29 final big document posted. That isn't a surprise given the key climate finance was only agreed to within the last 12 hours But we expect the final COP29 agreement will fit the concepts we wrote last week. Here is what we wrote in last week's (Nov 17, 2024) Energy Tidbits memo. "*COP29 signees will only agree to do what they choose to do. It was a tough week at COP29 with the cloud overhanging from Trump's election and his expected pulling the US, once again, out of the Paris Agreement. It didn't start off well when Azerbaijan President Ilham Aliyev opening address that said Azerbaijan's oil and gas assets are a "gift from God'. COP29 is scheduled to end on Nov 22 and normally, like prior COPs, we would expect COP to be extended a few days to get all the countries to sign on the final statement. So unless it gets worse and COP29 explodes into chaos and people storm out, there should eventually be a signed off final statement with the vast majority of countries signing off. The question this year will be how many countries. But, every year, we remind that no matter how many countries sign off, the final text always includes enough caveats that countries are not obligated to do something they don't want to do. The final statements always don't obligate countries, rather they "call on" countries. And the key provisions always include that countries do what they can but it is written the they call on countries to act ".... in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches". On Friday, we tweeted [[LINK] "COP29. dDespite reports of divisions at COP29, should inevitably get broad sign off on text but will have more outs than normal for countries.COP28 "calls on Parties to contribute .... in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches". Everyone wants a cleaner environment but #Oil #NatGas #Coal will be needed for longer than aspirations. #OOTT." Our tweet included the key excerpt from the final COP28 text that we highlighted in our Dec 17, 2023 Energy Tidbits memo."*

Energy Transition: Denmark new green deal includes carbon tax on cattle and pigs

Denmark carbon tax on cows & pigs

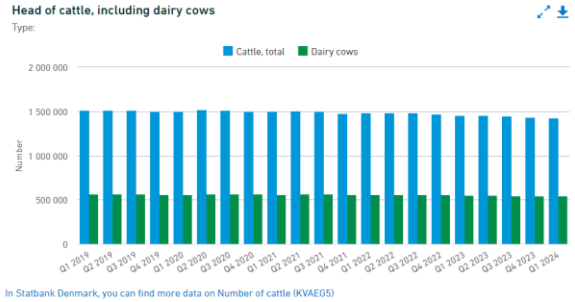
Whether you are a green fan or not, you have to give Denmark credit for driving faster and further on green initiatives than other western countries. (i) On Monday, Denmark announced [LINK] "*Cutting agriculture emissions and restoring nature: Discover Denmark's historic tripartite agreement. With broad political consensus, Denmark's government has today unveiled a historic tripartite agreement. Inlcuding nature restoration, the world's first carbon emission tax for agriculture, and more, this agreement will initiate the largest transformation of the Danish landscape in over 100 years."* (ii) Please note this is not a new initiative, rather it was the agreement to a plan announced in June that we highlighted in our June 30,2024 Energy Tidbits memo. (iii) On Monday, we tweeted [LINK] "*Food inflation ahead in Denmark. Denmark approves carbon tax on 1.430 million cows & 11.449 million sheep. See 👇06/26 tweet for data. Will also takes land out of agriculture use to convert to forest. Denmark signs off on The Green Tripartite deal. [LINK] #OOTT.".* (iv) We highlighted the carbon tax on livestock as methane emissions from livestock is an item we have included in our Energy Tidbits memo for over a decade. And, as far we understand, this will be the first carbon tax on livestock. Our tweet noted Denmark has 1.430 million cows and 11.449 million sheep. (v) One of the priorities is to reduce nitrogen from fertilizer leching into the water. So Denmark is

going to convert 140,000 ha of low lying farmland into natural areas ie. forest as part of its plan to establish 250,000 ha of new forest. (vi) There is much more but we have to believe food costs will go higher when they are reducing the amount of farmlands and adding to the cost livestock. (vii) Our Supplemental Documents package includes the State of Green report. [LINK]

06/24/24: Denmark introduces carbon tax on cattle and pigs

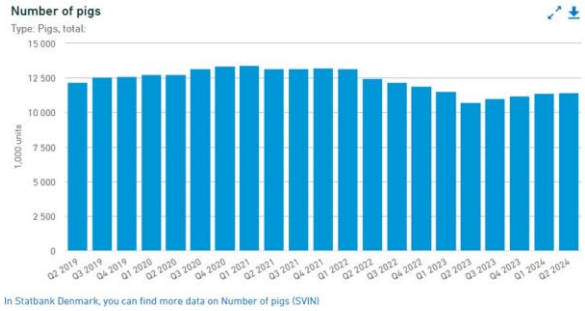
Here is what we wrote in our June 30, 2024 Energy Tidbits memo on when Denmark introduced the green deal that was signed off on Monday. "*On Wednesday, we tweeted [LINK] "Denmark introduces carbon tax on cattle and pigs starting 2030, increasing in 2035. See 👇Statistics Denmark Q2/24 data says there are 1.430 million cows and 11.449 million sheep in Denmark. #NetZero #Methane [LINK]" We recognize that TV is not reality but after first seeing Borgen a few years ago we started following Denmark more on their climate change push. Denmark is a leader in moving on climate change initiatives and that was reinforced this week when Denmark approved the first carbon tax on cattle and pigs. New Zealand would have been the first but, as highlighted in our June 16, 2024 Energy Tidbits memo, New Zealand backed off charging farmers on methane emissions. Our tweet linked to the Denmark release [LINK] that "With the agreement, the parties agree that a CO2e-tax on emissions from livestock. A tax of DKK 300 per tonne of CO is introduced2e in 2030 increasing to DKK 750 per tonne of CO2e in 2035 with a basic deduction of 60 per cent. The effective tax will thus amount to DKK 120 per tonne of CO2e in 2030 increasing to DKK 300 per tonne of CO2e in 2035." The Danish Kroner is about US$0.14 ie. DKK 300 is US$42 and DKK 750 is US$105. Our tweet included the below Statistics Denmark Q2/24 estimate of 1.430 million cows and 11.449 million sheep in Denmark. Our Supplemental Documents package includes the Denmark release.* "

Figure 67: Denmark, Head of cattle, including dairy cows



Source: Statistics Denmark

Figure 68: Denmark, Number of pigs



Source: Statistics Denmark

Capital Markets: Two telecom cables damaged in the Baltic Sea

Telecom cables severed in the Baltic Sea

We probably could have included this under the Russia section given the suspicion is falling on Russia. It didn't get too much attention because of the bigger stories out of Europe on Sunday and Monday on Ukraine and Russia – the severing of two separate telecom cables in the Baltic Sea. (i). But on Monday, we tweeted [LINK] "*Overlooked global risk. Severed underwater cable connecting Finland & Germany in the Baltic Sea. DEU & FI "We are deeply concerned .... fact that such an incident immediately raises suspicions of intentional damage". [LINK] See 👇@TeleGeography map. #OOTT".* There were two underwater telecom cables severed in the Baltic Sea. One from Finland to Germany and one Sweden to Lithuania. The immediate speculation on the Finland to Germany cable, much like Nord Stream pipeline sabotage, went on Russia. But we still haven't seen anything more than speculation at this time. (ii) Cinia C-Lion1 cable. Cinia is the operator of the Cinia C-Lion1 submarine cable between Finland and Germany. On Tuesday, we tweeted [LINK] "*Exact time to repair FI to DEU "Cinia C-Lion1" submarine cable is "not yet known, but typically the repair time for submarine cables is between 5 and 15 days." "location of the cable cut is in the Baltic Sea, in the Swedish Exclusive Economic Zone, east of the southern tip of Öland, about 700 km from Helsinki." Per Cinia #OOTT."* Cinia also reported "*The details of the fault are yet not known and are currently being investigated."* (iii) Telio cable between Lithuania and Sweden. On Monday, Lithuanian National Radio and Television (LRT) reported [LINK] "*A telecommunications cable running between Lithuania and Sweden in the Baltic Sea has been damaged, Telia Lietuva, a Swedish telecoms company in Vilnius, has said. "The cable was cut on Sunday morning, at around 10:00. The systems immediately reported that we had lost the connection. Further investigation and clarification took place, and it turned out that it was damaged," Andrius Šemeškevičius, the company's chief technology officer, told LRT TV on Monday evening. This followed earlier Finnish media reports about an unexplained failure of an undersea cable between Finland and Germany. According to Šemeškevičius, Telia transmits the internet connection to Lithuania through three cables, which means that the internet bandwidth was reduced by one-third due to the incident. However, the connection was restored to users after bypassing the fault."* Our Supplemental Documents package includes the Cinia update.

Typically takes 5-15 days to repair an underwater telecom cable

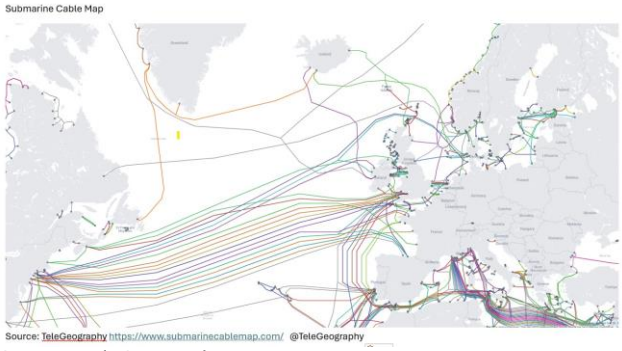
As noted above, in our Tuesday tweet, Cinia said they don't know the exact time it will take to fix repair the underwater telecom cable but "*typically the repair time for*

submarine cables is between 5 and 15 days." We have been following the Baltic Sea weather this week and it is cold but we also have been seeing relatively steady winds. So we would assume that the winds will tend to have an impact.

Good link to interactive global submarine cable map

Our tweet included the below submarine cable map from Telegraphy. This is a good link to add to reference libraries. It is an interactive map that can be moved around the world and can be clicked on to identify the cable. It is a submarine reference cable mapping that we have referenced many times before. The link is at [LINK].

Figure 69: Submarine cable map Europe & Atlantic



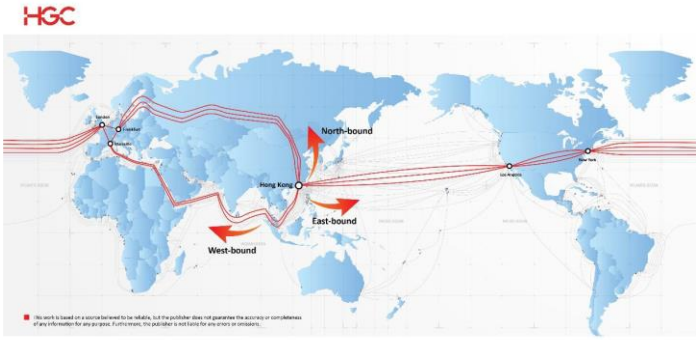
Source: TeleGeography

03/04/24: HGC confirms 4 of 15+ Red Sea submarine cables were cut

The last significant underwater telecoms cable being cut was in March when four cables were cut in the Red Sea. The post mortem cause from White House National Securities Communications Director John Kirby was the cables were likely severed by the anchor of a driving ship that had been attacked by the Houthis. Here is what we wrote in our March 10, 2024 Energy Tidbits memo. "*Even though the Houthis have said they aren't going to go after submarine cables, the now confirmed cut on 4 submarine cables in the Red Sea is a reminder that there is real risk towards a major interruption in Europe to Asia communications cables. On Tuesday, there was official confirmation of the submarine cables being cut in the Red Sea. We tweeted [LINK] "Who cut the Red Sea cables ? HGC confirms 4 of 15 Red Sea submarine cables were cut last week. impacted 25% of traffic. "Around 15% of Asia traffic goes west-bound, while 80% of those traffic" will pass thru these cables/ Rerouting via China, US & 11 remaining cables. #OOTT." Last week's (Mar 3, 2024) Energy Tidbits memo noted the WSJ Mar 2 report confirming that three submarine communication cables were cut in the Red Sea. Our tweet included the media statement from HGC Global Communications, the owner of 15 submarine cables in the Red Sea. HGC confirmed "• Among 15+ submarine cables in the Red Sea, 4 of them (Seacom, TGN, AAE-1, EIG) are cut which we estimated impact 25% of traffic • Around 15% of Asia traffic goes west-bound, while 80% of those traffic will pass through these submarine cables in the Red Sea". Fortunately, HGC has re-routing options. HGC also wrote "In light of this situation, HGC has already taken necessary measures to mitigate for our clients. We have successfully devised a comprehensive*

diversity plan to reroute affected traffic: • North-bound: departing from Hong Kong and routing through mainland China to Europe; • East-bound: departing from Hong Kong and routing through the United States to Europe; • West-bound: diversifying traffic within the rest of 11 submarine cables system in the Red Sea." Our Supplemental Documents package includes the HGC release."

Figure 70: HGC re-routing



Source: HGC Communications

02/13/24: Houthis Leader says have no intention of targeting submarine cables

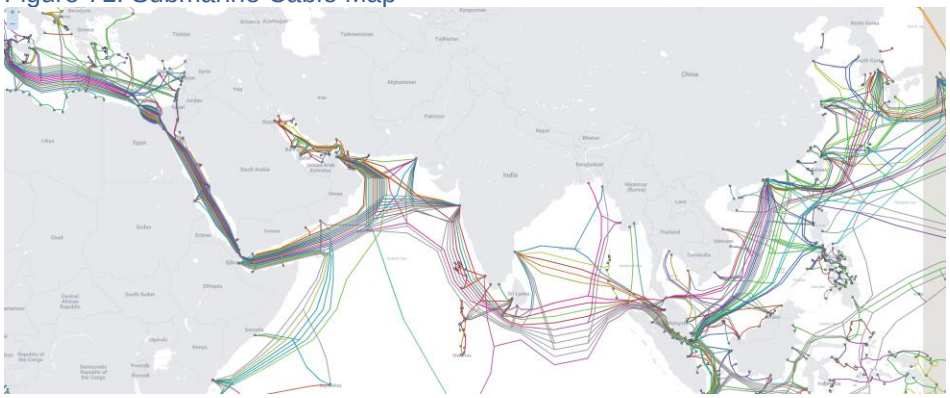
Here is what we wrote in our Feb 18, 2024 Energy Tidbits memo. "*On Tuesday, we tweeted [LINK] "Houthis leader "we have no intention of targeting submarine cables connecting to countries in region". Lets hope his intention is more indicative than when politicians say no intention. #OOTT." The Houthis leader was responding to the media reports last week about the risk to underwater communications cables from Europe to Asia that all run thru the Red Sea and Bab el Mandeb. Our tweet included the Al Masirah (Yemen news) web page that showed the headlines of the Houthis leader comments "Sayyed Abdulmalik. We have no intention of targeting submarine cables connecting to countries in region" "Sayyed Abdulmalik. Rumors circulating in some media about our intention to target submarine cables, internet cables are aimed at distorting, mispresenting Yemen's position."*

EU to Asia underwater communications cables run thru Houthis Bab el Mandeb

Here is what we wrote in our Feb 11, 2024 Energy Tidbits memo. "*There was a good reminder that the Bab el Mandeb is more than a critical shipping chokepoint, it is also a critical choke point for global communications. On Monday, we tweeted [LINK] "Overlooked Houthis global risk. "we also have to make sure they never build the capacity to touch the underground sea cables that handle most of the internet traffic between EU and Asia that go thru the Bab el Mandeb" warns @Norman_Roule to @FerroTV @lisaabramowicz1 @annmarie See 👇@TeleGeography map. #OOTT." This was a reminder from Norman Roule(Senior Advisor, Transnational Threats Project for CSIS Center for Strategic & International Studies on Blooomberg Surveillance. HE remidned that all of the major underwater cables for communications from Europe to Asia went thru thej Bab el Mandeb. And that the Houthis could cause major global economic hit if they damaged this underwater*

cables. Our prior writings on these underwater cables was on the risk in the South China Sea and not the Bab el Mandeb but the concept is the same. These underwater communications cables are at risk. Our tweet included the Submarine Cable Maps from TeleGeography that shows the major global underwater communications cables. Our Supplemental Documents package includes the Submarine Cable Maps.

Figure 71: Submarine Cable Map



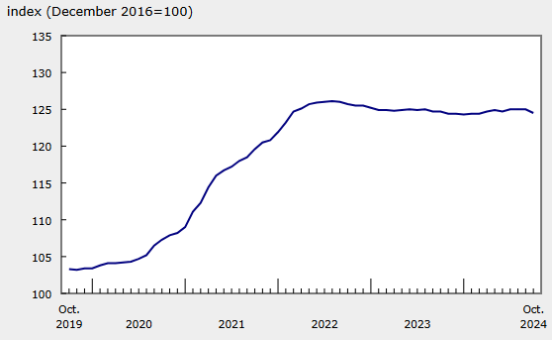
Source: GeoTrelegraphy

Canada New Housing prices down MoM

Capital Markets: Canada's New Housing Prices fall -0.4% MoM in October

On Friday, Statistics Canada released their New Housing Price Index (NHPI) for October 2024 [LINK]. Statistics Canada noted that in October the index fell by -0.4% MoM, marking the largest decline since April 2009; however, it is important to note that prices were down in only 9 out of 27 census metropolitan areas; unchanged in 11, and up in 7 census metropolitan areas. The index was primarily pulled down by Toronto, Vancouver, and Windsor; Toronto NHPI fell -1.2% MoM, and Vancouver fell by -0.6%, Windsor also fell -0.6%. The report notes that builders have been incentivizing potential buyers with design credits and cash offers; they attribute the MoM fall to weak market conditions. Some other key MoM changes are as follows: Calgary up +0.2%, Winnipeg up +0.4%, Kelowna -0.5%, Victoria -0.1%, and Saskatoon flat MoM. Statistics Canada reported: "*On a monthly basis, the New Housing Price Index (NHPI) fell 0.4% in October, the largest monthly decline since April 2009. However, the picture was mixed across the country, as prices were down in 9 out of 27 census metropolitan areas (CMAs) surveyed, but unchanged in 11 CMAs and up in the remaining 7… Builders attributed the price declines in these markets to weak market conditions. Toronto and Vancouver builders offered cash incentives and design credits to encourage new home sales*". Below we have included the NHPI chart provided by Statistics Canada.

Figure 72: New Housing Price Index



Source: StatsCan

Twitter: Thank you for getting me to 11,000 followers

@Energy_Tidbits on Twitter

Last month, I went over 11,000 followers on Twitter/X. I really appreciate the support and, more importantly, some excellent insights and items to look at from Twitter followers. It helps me do a better job. 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.

Misc Facts and Figures.

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

Wine of the week: Chapoutier Bila-Haut Occultum Lapidem 2014

In August, I started the wine of the week when I realized I had to get to opening up some wines bought 20 to 30 years ago that included some that, unfortunately, were getting past their prime. One of the negatives of the change in life from Covid was a huge absence of entertaining at home, which means there has been a big shortfall in wine drinking at our home. So am now making sure what, when I bought them 15-25 years ago, were some good wines and make sure bottles get opened especially as many are 20 to 40 years old. On Friday, I tweeted out the wine of the week, which was Chapoutier Bila Haut Occultum Lapidem 2014.Didn't realize at first it was 2014 as I have been focused on older bottles. It drank very well, could have waited five more years. And recall it wasn't very expensive when I bought it.

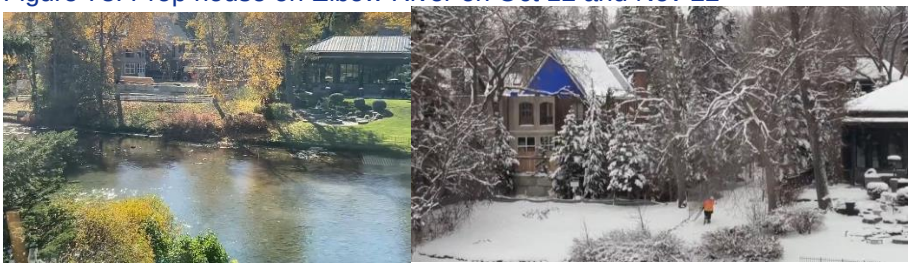
Figure 73: Chapoutier Bila Haut Occultum Lapidem 2014

Source: SAF Group

JonBenet Ramsey mini-series prop house is ready for filming in Calgary

It looks like the prop house for the JonBenet Ramsey mini-series being partially filmed on the Elbow River in Calgary was done start to finish in under three months including landscaping and big tree planting. The mini-series starring Melissa McCarthy and Clive Owen is to film in this prop house starting this week. There was green space empty lot three months ago and now a prop house ready for filming. Our Oct 13 Energy Tidbits had noted how a green space empty lot turned into a almost finished house in about a month. This week, we saw the workers taking away the chain metal fence away as the notice said filming was to start this week. The other amazing feature was how, in Nov, they planted many 15-20 ft evergreens to surround the house. Not the ideal tree planting time.

Figure 73: Prop house on Elbow River on Oct 12 and Nov 22



Source: SAF Group

Calgary fills record 35,864 potholes

We have to believe that one of the just can't win jobs is whoever is responsible for fixing potholes. It's a huge issue in Canada and other countries with increase traffic and roads that just don't get repaved as much as they should due to budget constraints. As a result, cities fight this losing battle of filling in potholes, as many as possible. So the good news in Calgary is that, on Nov 14, the city announced [LINK] *"While Calgarians continue to enjoy warm weather, City crews continue filling potholes at a swift pace. Crews have filled 35,864 potholes as of mid-November and are expected to continue filling as the weather remains favourable. "While our crews continue to be ready for winter maintenance operations, we can still take advantage of the weather and continue our good work on the pothole repair program," says*

Chris Hewitt, Manager of Mobility Maintenance. "We have exceeded 2023's record of 33,000 potholes filled. At this point the weather will likely determine how many more we're able to fill through the end of the year." Have to believe that, absent a repaving push that isn't going to come, the pothole situation will continue to keep worse and worse every year. Using a bandaid doesn't fix the need for surgery.