Energy Tidbits

April 17, 2022

Produced by: Dan Tsubouchi

Libya NOC Declares Force Majeure at ~160,000 b/d Melitah Export Port, Have To Expect More Force Majeures to Come

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo, energy blogs and tweets. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not just focusing on daily trading. Our priority was and still is to not just report on events, but also try to interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector and not just a specific company results. Our target is to write on 48 to 50 weekends per year and to post by noon mountain time on Sunday.

This week's memo highlights:

1. Earlier this morning, the Libya NOC declared force majeure at the ~160,000 b/d Melitah oil export terminal, we have to expect more force majeures are coming (Click Here)

2. IEA reminds that only significant sustainable oil capacity is with Saudi Arabia, Iran, UAE and, to a lesser extent, Kuwait. (Click Here)

3. Seems like Putin isn't planning any immediate cut off of natural gas to Europe for not paying in rubles. (Click Here)

4. Globe and Mail reports Shell is now evaluating LNG Canada Phase 2 before making any FID decision (Click Here)

5. Delta Air Lines CEO says Delta had all time record bookings in March and continuing into April. (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 – Natural gas injection of +15 bcf, storage now -439 bcf YoY deficit

The natural gas winter withdraw season is over and it was a good winter for gas storge despite it was a warmer than normal winter with a widening of the YoY storage deficit from -282 bcf YoY at Oct 31 to current -439 bcf YoY. The EIA reported a 33 bcf draw (vs 16 bcf build expectations) for the Apr 8 week, which was less than the 5-yr average build of 33 bcf, and below last year's injection of 61 bcf. Storage is 1.397 tcf as of Apr 8, increasing the YoY deficit to -439 bcf, from 399 bcf last week and storage is 303 bcf below the 5-year average vs 285 bcf below last week. Below is the EIA's storage table from its Weekly Natural Gas Storage Report [LINK].

YoY storage at -439 bcf YoY deficit

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons: Year ago (04/08/21)		Historical Comparisons: 5-year average (2017-21)	
Region	04/08/22	04/01/22	net change	implied flow	Bcf	% change	Bcf	% change
East	229	241	-12	-12	310	-26.1	281	-18.5
Midwest	293	296	-3	-3	412	-28.9	372	-21.2
Mountain	90	91	-1	-1	118	-23.7	100	-10.0
Pacific	169	165	4	4	204	-17.2	185	-8.6
South Central	617	589	28	28	794	-22.3	763	-19.1
Salt	186	173	13	13	249	-25.3	240	-22.5
Nonsalt	431	416	15	15	545	-20.9	523	-17.6
Total	**1,397**	**1,382**	**15**	**15**	**1,836**	**-23.9**	**1,700**	**-17.8**

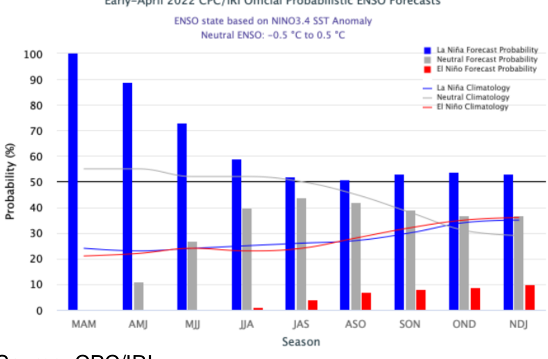
Source: EIA

Natural Gas – 93% probability for La Nina/Normal conditions ie. a normal hurricane season

The CPC/IRI released its updated monthly El Nino/La Nina outlook is issued on the 2nd Thurs of every month [LINK]. The new April forecast for JAS is 52% (was 47%) La Nina, 44% (was 47%) Neutral and only 4% (was 6%) for El Nino conditions. The new ASO forecast is 51% (was 45%) La Nina, 42% (was 45%) Neutral and 7% (was 10%) El Nino conditions. ASO is the peak period for Atlantic hurricane season. Again, weather is never 100% the same, but El Nino summers are normally associated with low Atlantic hurricane seasons, whereas neutral/La Nina conditions are more likely normal hurricane seasons. Below is the CPC/IRI official ENSO forecast.

La Nina/El Nino conditions this summer

Figure 2: Early-March NOAA El Nino/La Nina Outlook



Source: CPC/IRI

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Natural Gas – EIA forecasts US gas production growth in 2022 and 2023

U.S. gas production +3.84 bcf/d in 2022

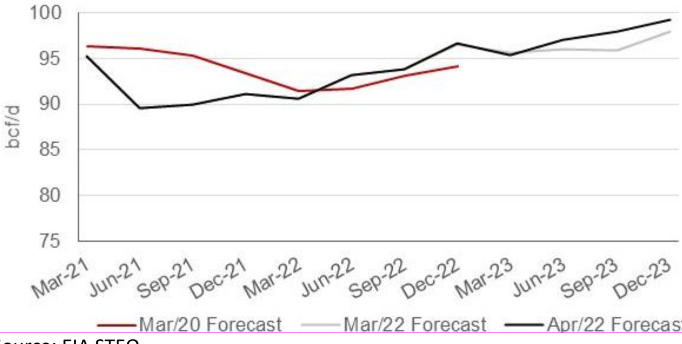
No surprise that, with continued stronger than expected oil and natural gas prices, the EIA increased its US natural gas production forecasts for 2022. However, what is different from prior years is that the increase isn't from associated natural gas from oil plays but from dry gas plays. The EIA released its monthly Short Term Energy Outlook April 2022 [LINK]. The EIA revised up both its 2022 and 2023 forecast for US natural gas production. (i) The EIA forecast shows US natural gas above the Q4/19 peak of 96.58 bcf/d, with Q4/22 US natural gas of 99.23 bcf/d (up 2.65 bcf/d from peak). (ii) For 2021, the EIA made downward revisions to Q4 keeping all other periods flat. 2021 US natural gas production is forecast to average 93.54 bcf/d (down from 93.57 bcf/d previously). (iv) US natural gas production is expected to average 97.40 bcf/d in 2022 (96.67 bcf/d previously) and 2022 is up 3.84 bcf/d YoY. 2023 production estimates were released and see Q1/23 production entering at 99.72 bcf/d (96.11 bcf/d previously) and exiting in Q4/23 at 101.9 bcf/d (98.64 bcf/d previously) for a 2023 average of 100.85 bcf/d. (v) The EIA wrote "*We forecast dry natural gas production to average 96.9 Bcf/d in April. For all of 2022, we expect that dry natural gas production will average 97.4 Bcf/d, which would be 3.8 Bcf/d more than in 2021. We expect dry natural gas production to average of 100.9 Bcf/d in 2023.*" Our Supplemental Documents package includes excerpts from the EIA STEO.

Figure 3: EIA STEO US Natural Gas Supply Forecasts by Forecast Month

bcf/d	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Apr-2022	95.29	89.59	89.99	91.15	91.49	90.59	93.15	93.86	96.63	93.57	95.41	97.01	97.94	99.23	97.41	99.72	100.6	101.4	101.7	100.9
Mar-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.57	93.54	95.69	96.09	96.97	98.00	96.69	96.11	98.75	99.60	100.10	98.64
Feb-2022	95.29	89.59	89.99	91.15	91.51	90.59	93.15	93.86	96.69	93.57	95.43	95.54	96.26	97.12	96.09	97.11	97.57	98.34	98.84	97.97
Jan-2022	95.29	89.59	89.99	91.14	91.50	90.59	93.15	93.89	96.33	93.49	95.94	95.55	95.96	96.69	96.04	96.71	97.13	97.89	98.45	97.55
Dec 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.01	95.59	93.32	95.22	95.35	96.1	97.21	95.97					
Nov 2021	95.29	89.59	89.99	91.14	91.50	90.48	93.20	94.52	94.94	93.29	95.41	96.00	97.12	98.18	96.68					
Oct 2021	95.29	89.57	89.99	91.14	91.50	90.30	92.89	93.32	93.65	92.54	94.38	95.41	97.12	98.69	96.40					
Sept 2021	94.80	89.68	89.83	91.15	91.36	90.30	93.05	92.64	92.70	92.18	93.17	94.54	96.25	97.59	95.40					
Aug 2021	94.79	89.68	89.83	91.15	91.35	90.29	92.49	92.67	93.11	92.15	93.34	94.15	95.51	96.47	94.88					
July 2021	94.79	89.68	89.83	91.15	91.35	90.31	92.88	93.17	93.80	92.55	93.65	94.10	95.16	95.82	94.69					
June 2021	94.79	89.68	89.83	91.15	91.35	90.53	92.26	92.63	93.26	92.18	93.13	93.48	94.31	94.81	93.93					
May 2021	94.79	89.68	89.83	91.15	91.35	90.09	90.75	91.34	92.03	91.06	91.97	92.54	93.60	94.36	93.12					
Apr 2021	94.79	89.68	89.83	91.18	91.36	90.82	90.90	91.59	92.31	91.41	92.23	92.75	93.76	94.39	93.29					
Mar 2021	94.79	89.68	89.82	91.08	91.34	90.50	91.04	91.71	92.13	91.35	91.87	92.25	93.28	93.90	92.83					

Source: EIA STEO

Figure 4: EIA STEO US Natural Gas Supply Forecasts By Forecast Month



Source: EIA STEO

Natural Gas – EIA STEO forecasts Nov 1/22 storage to be down YoY

EIA STEO storage forecast

The EIA STEO also forecasts US gas storage. Its forecast is a bit of mixed bag. (i) Winter 2021/22. US gas storage started winter 2021/22 at 3.66 tcf, which was down 283 bcf YoY.

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But the EIA now forecasts end of winter (March 31, 2022) at 1.5 tcf, which is -24 bcf YoY and ~1.8% below the 5-yr average. (ii) Summer 2022. The EIA forecasts start of winter 2022/23 storage at 3.52 tcf, which is -115 bcf YoY ie. the YoY surplus is expected unchanged from March 31, 2022. The start of 2022/23 winter forecast is -2.8% below the 5-yr average. (iii) The EIA wrote *"We estimate that natural gas inventories ended March at 1.4 trillion cubic feet (Tcf),which is 17% below the five-year (2017–2021) average. Inventory withdrawals in March were 203 billion cubic feet (Bcf), resulting from relatively flat production and rising natural gas exports. We expect natural gas inventories to increase by 245 Bcf in April, as the injection season begins, ending the month at about almost 1.7 Tcf, which would be 14% below the five-year average for this time of year. We forecast that natural gas inventories will end the 2022 injection season (end of October) at 3.5 Tcf, which is 4% below the five-year average.*

Figure 5: EIA STEO forecast US gas storage

	US Working Natural Gas in Storage (billion cubic feet)					
	Storage	2016-2023				
	Level	Low	High	Range	Average	Deviation
Mar 2016	2,486.3	1,184.9	2,486.3	1,301.4	1,835.6	35.4%
Oct 2016	4,012.7	3,236.3	4,012.7	776.4	3,624.5	10.7%
Mar 2017	2,062.5	1,184.9	2,486.3	1,301.4	1,835.6	12.4%
Oct 2017	3,816.5	3,236.3	4,012.7	776.4	3,624.5	5.3%
Mar 2018	1,390.3	1,184.9	2,486.3	1,301.4	1,835.6	-24.3%
Oct 2018	3,236.3	3,236.3	4,012.7	776.4	3,624.5	-10.7%
Mar 2019	1,184.9	1,184.9	2,486.3	1,301.4	1,835.6	-35.4%
Oct 2019	3,762.0	3,236.3	4,012.7	776.4	3,624.5	3.8%
Mar 2020	2,029.4	1,184.9	2,486.3	1,301.4	1,835.6	10.6%
Oct 2020	3,928.5	3,236.3	4,012.7	776.4	3,624.5	8.4%
Mar 2021	1,800.6	1,184.9	2,486.3	1,301.4	1,835.6	-1.9%
Oct 2021	3,664.6	3,664.6	4,012.7	348.1	3,838.6	-4.5%
Mar 2022	1,406.3	1,184.9	2,486.3	1,301.4	1,835.6	-23.4%
Oct 2022	3,524.0	3,236.3	4,012.7	776.4	3,624.5	-2.8%
Mar 2023	1,689.9	1,184.9	2,486.3	1,301.4	1,835.6	-7.9%
Oct 2023	3,784.1	3,236.3	4,012.7	776.4	3,624.5	4.4%

Source: EIA

Natural Gas – Big surprise, Shell says evaluating LNG Canada Phase 2 FID

Shell evaluating LNG Canada Phase 2

It's been interesting to see how it seems like, at least a few more, are finally believing that Shell is likely to go FID on LNG Canada Phase 2. We know there are no guarantees, but we have been following the trail of bread crumbs that Shell has been layng for the past several months, which is why we have been vocal about our view that Shell is likely to go FID soon in 2022. It's not just the bread crumbs, we go back to our prior comments that once Phase 1 gets to a certain level of construction completion, we believe LNG Canada would have to make a commitment to Phase 2 or else they will lose their place in the queue for Asian fabricators, Cdn services etc. And Phase 1 went past 50% months ago and, with other LNG projects going FID, we believe Shell will want to ensure they maintain their spot in the queue, in particular for Asian fabricators. Last week, the Globe and Mail posted a report *"Shell eyes major expansion of B.C. natural gas project"* [LINK]. Shell highlighted the need for more LNG and also made the first public comments we can recall that Shell is looking at now the decision on whether to go on LNG Canada Phase 2. The Globe and Mail reported on comments from Wael Sawan, the head of Shell's integrated gas and renewables division, and Susannah Pierce, Shell Canada President. On the need for LNG, The Globe and Mail wrote ""*It raises the urgency for more LNG supply because Europe and the world desperately needs it," Wael Sawan, the head of Shell's integrated gas and renewables division, said in an interview. "There is a lot of capacity that has to be built up to be able to meet the growing LNG demand."* Then on LNG Canada Phase 2, The Globe and Mail wrote "*In our mind, we*

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always wanted to be able to have that option to go into phase two," said Mr. Sawan, who visited Vancouver last week to attend the Globe Forum 2022 conference on sustainable business. "Now we need to be able to make sure that it makes sense on paper before we make that investment commitment." And "*Susannah Pierce, Shell Canada president and country chair, said LNG Canada will produce fuel at a lower carbon intensity than other large-scale terminals operating in the world. "The energy transition is not simple. It's complex, and we have a dependence right now on natural gas and oil that can't be eliminated overnight," she said. "So it has to be a very thoughtful approach."* And "*Shell PLC has set a target to have net-zero emissions at its energy businesses worldwide by 2050. The LNG Canada terminal was designed as a two-phase project. "We broke it out because you want to make a first investment and then consider a second," Ms. Pierce said."* Certainly far from any guarantee, but at least an acknowledgement that they are looking right now at the potential for LNG Canada Phase 2.

Seems like Shell has been showcasing LNG Canada as prelude to Phase 2 FID
Here is what we wrote in our Feb 27, 2022 Energy Tidbits. "*We recognize that almost no one else has been believing Shell will FID LNG Canada Phase 2 this year, but we can't help still believe this following Shell's LNG Outlook 2022 and its Integrated Business Deep Dive webcast that followed the outlook webcast. We tweeted [LINK] "Was #Shell showcasing #LNGCanada or just highlighting its positives today? @Shell expects average IRR of 14-18% for its pre-FID projects, which includes #LNGCanada Phase 2. #LNGCanada "is set to deliver the lowest carbon intensity in the entire industry". #OOTT #NatGas #LNG". (i) Just like we have been highlighted over the past months, this week, Shell seemed to showcase LNG Canada on multiple fronts (i) Shell now plans assuming there is an LNG supply gap in mid 2020s and that this "focuses attention" on the need for more LNG supply FIDs. So they are saying there is a clear market need for someone to step forward. (ii) In the Integrated Gas comments, mgmt said they are making good progress on LNG Canada Phase 1 construction and first LNG cargos are on track for by the middle of this decade. (iii) LNG Canada is the lowest emissions LNG project in industry. This is making the case that if there is any LNG to be done in a world of reducing emissions, it is the lowest emissions and Shell says LNG Canada is the best. Mgmt said "But the long term role of gas depends on efforts to abate emissions and develop cleaner pathways for gas. This is why we continually try to reduce the carbon intensity of our new projects. Take LNG Canada currently under construction. It will run on hydropower and is set to deliver the lowest carbon intensity in the entire industry." (iv) Shell's pre-LNG FID supply projects that includes LNG Canada have high RORs. Mgmt said "For the pre-FID projects, we have an expected average internal rate of return of between 14% and 18%, and a unit technical cost below $5/mmbtu. With most of these projects clearly having lower costs than the average in the industry. These are good numbers, but you will understand that we strive to push the IRR to the higher end and to push the unit costs down even further." There were other items showcasing LNG Canada including pictures. It just feels like Shell continues to showcase LNG Canada, which we believe keeps pointing to them wanting to FID LNG Canada Phase 2 in 2022 and sooner rather than later. Our Supplemental Documents package includes excepts from the Shell Integrated Gas slide deck and transcripts we made of some of the Shell mgmt comments.*

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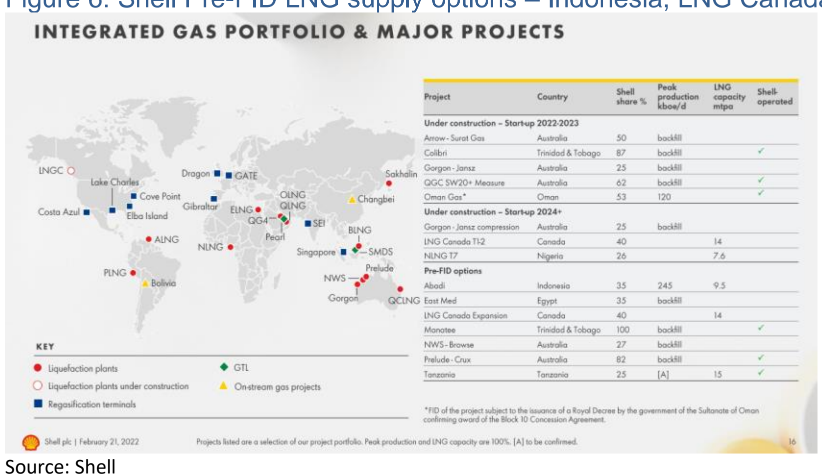
Figure 6: Shell Pre-FID LNG supply options – Indonesia, LNG Canada, Tanzania



Project	Country	Shell share %	Peak production kboe/d	LNG capacity mtpa	Shell-operated
Under construction – Start-up 2022-2023					
Arrow - Surat Gas	Australia	50	backfill		
Colibri	Trinidad & Tobago	87	backfill		✓
Gorgon - Jansz	Australia	25	backfill		
QGC SW20+ Measure	Australia	62	backfill		✓
Oman Gas*	Oman	53	120		✓
Under construction – Start-up 2024+					
Gorgon - Jansz compression	Australia	25	backfill		
LNG Canada T1-2	Canada	40		14	
NLNG T7	Nigeria	26		7.6	
Pre-FID options					
Abadi	Indonesia	35	245	9.5	
East Med	Egypt	35	backfill		
LNG Canada Expansion	Canada	40		14	
Manatee	Trinidad & Tobago	100	backfill		✓
NWS - Browse	Australia	27	backfill		
Prelude - Crux	Australia	82	backfill		✓
Tanzania	Tanzania	25	[A]	15	✓

*FID of the project subject to the issuance of a Royal Decree by the government of the Sultanate of Oman confirming award of the Block 10 Concession Agreement.

Source: Shell

Shell wants enough gas supply to align with LNG Canada offtake obligations
Last week's (April 10, 2022) Energy Tidbits Shell's reporting that it had done a transfer of its Montney shale gas assets from Upstream to its Integrated Gas group. At that time, we tweeted [LINK] "*Hmm! Clean up or set up? #Shell transfers ~50 kboed of Cdn shale assets from Upstream to Integrated Gas. Clean up for reporting? Or set up ahead of #LNGCanada Phase 2 FID? Should know by Q1 on 05/05. Would be big value to all Cdn #NatGas if FID another 1.8 bcf/d #LNG. #OOTT*". Our tweet asks if this is simply a clean up transfer or it is represents a set up transfer for a future event for LNG Canada such as its Phase 2 FID. The other reason why we wonder if the transfer is a set up trade is that we have always wondered about Shell looking at potential acquisitions so they have enough natural gas supply to align with their offtake capacity. Here is what we wrote in our Feb 27, 2022 Energy Tidbits memo. "*We couldn't help tweet [LINK] "Buckle up, could be huge for Cdn #NatGas M&A. @Shell just said like to align equity #NatGas supply and offtake obligations, used #LNGCanada, Shell has 40% interest so would be 1.44 bcf/d if it FIDs #LNGCanada phase 2. It's why #LNGCanada Phase 2 is the must watch event #OOTT #LNG". Shell specifically said they want to have enough natural gas supply to align with their offtake obligations at LNG Canada. There was another excellent example of mgmt showcasing LNG Canada when they really didn't have to do so. In the Q&A, the analyst asks a general question if they will align their natural gas supply with their offtake obligations for any LNG project and then the analyst asked about the Coastal GasLink attack. The percentage question was not specifically directed at LNG Canada. However, mgmt took the opportunity to answer the supply question using LNG Canada. Mgmt replied "typically, what I would say, as much as possible, having access across the entire value chain in as close of a percentage as you can, helps ensure that wherever value might rate at any point in time, you are capturing that value. So in general. Take our LNG Canada investment that you just referenced in the second question, we would look to be able to at least assure ourselves that we are not caught up by vagaries of one part of the market. let's say the gas supply, but*

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we would want to have enough on the gas supply equity side to be able to make sure if gas prices go up there, we benefit from them while maybe disadvantaging the midstream or vice versa depending on where prices go. So we are not in the game of necessarily taking undue risk. we are in the game of creating integrated value chains that we can leverage as part of the broader portfolio." Shell has 40% in LNG Canada. Phase 1 is 1.8 bcf/d so Shell equity gas supply is 0.72 bcf/d. Our tweet included the Shell disclosure on North America natural gas supply, they don't provide Canada/US split, but that is roughly equal to North America in Q4/2021. They have some GoM natural gas but don't know the split. Maybe half or a little more in Canada? Phase 2 is 1.8 bcf/d so another 0.72 bcf/d".

Natural Gas – Sasol will buy LNG instead of joining pipeline to move its MZ gas to SA

Sasol not joining Mozambique gas pipeline

There was a good example this week of the challenge for major new international natural gas pipelines – will a 30 or 40 year natural gas pipeline still be needed in the 2040s and 2050s? Sasol has interests in Mozambique natural gas reserves/production and had previously planned to participate in an international natural gas pipeline that would bring its Mozambique natural gas reserves down to South Africa. On Wed, Club of Mozambique (Mozambique news) reported [LINK] "*Sasol Ltd. will no longer consider gas supply from a planned pipeline stretching from fields in northern Mozambique to its South African operations because it doesn't want to get stuck with the infrastructure as the world shifts away from fossil fuels, Chief Executive Officer Fleetwood Grobler said*." And "*The company's focus on options that involve less investment reflects a rapidly changing energy landscape that ultimately will see gas demand follow an exit from coal. Sasol is considering liquefied natural gas imports from the Matola terminal planned by TotalEnergies and Gigajoule Group in Mozambique, along with further development of its own fields in the country. "It's a no-regret move because you know that will deplete and then when you don't need the gas, you don't develop more gas," Grobler said. "You need to bridge 10 or 15 years and then you need to go out."* Our Supplemental Documents package includes the Club of Mozambique report.

Figure 7: African Renaissance Gas Pipeline

Source: First Energy

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Natural Gas – Pakistan is one of Putin's targeted south & east new energy markets

Pakistan looking at Russian LNG

One of the headlines from Putin's Thursday meeting on oil and gas with Novak, other key ministers and representatives from the oil and gas sector was on how Putin wants to find new markets for Russia energy exports. The Kremlin transcript [LINK] quoted Putin "*Second. We must diversify exports. Let us assume that energy supplies to the West will continue going down in the foreseeable future. Therefore, it is important to consolidate the trend of the past few years: to redirect our exports gradually to the rapidly growing markets of the South and the East. To achieve this, we must determine the key infrastructure facilities and start their construction in the near future.*" It appears that one of these new target markets is Pakistan. We found a recent March 24, 2022 The Express Tribune (Pakistan news) report *"Pakistan in talks with Russia for LNG imports. Moscow developing $27 billion Yamal Project facility."* [LINK]. The Express Tribune wrote "*As Russia develops the Yamal LNG project facility -- Islamabad and Moscow are in talks to a multi-billion dollar government-to-government import deal. The Yamal LNG Project includes the development of the giant South Tambey (Tambeyskoye) gas field that is located near Sabetta in the Yamal peninsula in Russia. The Russian government has declared the project to be of national interest at a cost of around $27 billion. This is a new addition to the energy cooperation between Pakistan and Russia as two countries are already working on different projects including the Pakistan Gas Stream, a gas pipeline from Kazakhstan and an offshore gas pipeline. Sources said the Pakistani government was interested to sign a government-to-government deal with Russia to import LNG to meet its growing gas demand.*" The Express Tribune also points out a cost issue as it will cost a lot more to transport LNG from Russia to Pakistan than LNG from Qatar to Pakistan. Our Supplemental Documents package includes The Express Tribune report.

Pakistan has seen LNG cargoes not being delivered on long term contracts

We are a little surprised The Express Tribune didn't mention one other key reason why Pakistan is talking to Russia – Pakistan wants to get into LNG contracts that deliver on LNG contracted supply volumes from long term contracts. Our March 27, 2022 Energy Tidbits highlighted the latest example of a LNG supplier (Gunvor) defaulting on LNG deliveries opting instead to pay the 30% penalty thereby freeing up the LNG cargoes for selling on the multiples higher LNG spot market. At that time, we wrote "*Unfortunately, it's the same narrative for Pakistan and trying to get LNG. They just can't catch a break on LNG cargos this winter. They didn't buy enough spot LNG in the fall because spot prices were too high and, they have had multiple situations of some LNG providers saying they will pay the 30% penalty by not delivering a contracted LNG cargo because the provider can make substantially more by paying the penalty to Pakistan and selling the LNG cargo on the spot market. Yesterday, The News (Karachi) reported "Singapore-based Guvnor has decided not to honour its contract to deliver four LNG term cargoes to Pakistan, which would force the dollar-starved country to purchase costly LNG from the spot market to fulfill its energy needs." "This is a gigantic blow that will force authorities concerned with no option but to purchase costly LNG cargoes at higher prices currently oscillating in global spot market in the range of $32-38 per MMBTU instead of over $10 per MMBTU under term agreement," a senior official in the Energy Ministry privy to the development told The News." "Guvnor has defaulted three times. The company backed out from delivering a cargo on November 19, 2021, then it backed out from the delivery of cargo on January 10, 2022, and then again a delivery for March 11,*

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2022 never arrived. Guvnor was to provide Pakistan four LNG cargoes each in April, May and two in June, but the trading company has informed Islamabad that that it would not be able to provide LNG cargoes in its remaining tenure of the term agreement." The News also reported "In 2017, PLL also inked a 15-year term agreement with Italy-based ENI, which has defaulted four times. The first default happened in January 2021, when ENI delivered half the cargo. Next it defaulted in November 2021, with the latest cargo cancellation happening in March 2022. The official record available with The News shows that with the latest defaults, Guvnor has defaulted on seven cargoes whereas ENI defaulted on four cargoes." Our Supplemental Documents package includes The News report."

Natural Gas – India continues to point to big growth in LNG imports for 2020s

India see big growth in LNG imports

We believe that it's inevitable that the rate of growth in LNG consumption in most Asian countries will be less than expected a year ago. $30 LNG prices has to have an impact. However, at least for now, we see India still pointing to big growth in LNG imports for the 2020s. (i) On Monday, India's Petroleum and Natural Gas Minister Puri's speech look to be more or less in line with Petronet's view that India LNG import growth over the 2020s will be >12 bcf/d. (ii) The thesis on India has been that they have just really started "moving" on the on the build out of the natural gas infrastructure over the past couple years. We posted an Oct 23, 2019 blog "*Finally, Some Visibility That India Is Moving Towards Its Target For Natural Gas To Be 15% Of Its Energy Mix By 2030*". And we would assume Covid had some delaying factors by a year or so. But the point is that the build out would be accelerating over the 2020s with more growth at the back end than the front end. (iii) Then the big reinforcement of this thesis came from Petronet in October, who forecast India LNG imports would increase +12.4 bcf/d in the 2020s to reach 15.8 bcf/d in 2030. See Oct 24, 2021 Energy Tidbits. (iv) Puri's speech only speak to the next few years but seem to be more or less in line with the Petronet views. We couldn't find a transcript for his speech, but Bloomberg reported "*India's liquified natural gas regasification capacity has gone up from 21 million metric tonnes per annum (MMTPA) in 2014 to 42 MMTPA now, while the aim was to increase the country's overall LNG regasification capacity to 62.5 MMTPA in the next few years, he said."* This is regas capacity and not imports But it says regas capacity was 2.75 bcf/d in 2014, is now 5.5 bcf/d and should reach 8.2 bcf/d in the next few years. If the pace is picking up a bit, that would point to something like a double, say 16 bcf/d by 2030. So that is more or less in line with Petronet forecast for LNG import growth of +12.4 bcf/d to 2030, although Puri point to something that might a little lower. Our Supplemental Documents package includes the Bloomberg reporting of the Puri speech

On Feb 10, India confirmed target is natural gas to 15% of energy mix by 2030

Here is what we put in our Feb 13, 2022 Energy Tidbits. "*On Thursday, India Ministry of Petroleum & Natural gas press released [LINK] "The Minister of State for Petroleum and Natural Gas, Shri Rameswar Teli in a written reply to a question in the Lok Sabha today informed that the Government has set a target to raise the share of natural gas in energy mix to 15% by 2030. At present, share of natural gas in primary energy mix has increased from 6.3% to 6.7% from 2020 to 2021." Lok Sabha is their parliament. We couldn't find out why they felt the need to make this release as this 15% target has been long stated.*"

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Petronet sees India LNG imports +12.4 bcf/d to reach 15.8 bcf/d in 2030
Here is what we put in our Feb 13, 2022 Energy Tidbits. "*To put in perspective, India's push to get natural gas to 15% of its energy mix would mean added LNG imports of approx. 3 times the capacity of Qatar's big LNG expansion project. The best illustration of the added LNG import impact was from Petronet. Our October 24, 2021 Energy Tidbits memo wrote "We continue to believe India's moves to increase natural gas to 15% of its energy mix by 2030 is a game changer for LNG markets in the 2020s. Especially as we have seen clear signs of action toward that target. On Friday, there was very bullish for India's LNG import growth from Petronet CEO Singh at the India Energy Forum on Friday. As soon as we saw the reports, we tweeted [LINK] "Bullish for #LNG #NatGas in 2020s. #Petronet CEO fcasts India LNG imports +12.4 bcfd to reach 15.8 bcfd (120 MTPA) in 2030. In line with his June est, see below SAF Group June 20 Energy Tidbits #Petronet sees LNG imports +13 bcfd to 2030. Thx @JournoDebjit @rajeshsing13 #OOTT". Bloomberg's India energy team reported "India's import of natural gas is expected to hit 120 million tons/year by 2030 as the nation targets an energy mix goal, Akshay Kumar Singh, CEO of Petronet LNG, said at the India Energy Forum by CERAWeek. NOTE: India aims to boost use to natural gas to 15% of primary energy mix from about 6% now. * India's current annual LNG import is about 26 million tons". Singh is forecasting India's LNG imports to grow from current 26 MTPA (3.4 bcf/d) to 120 MTPA (15.8 bcf/d) in 2030. That is an increase of 12.4 bcf/d to 2030. This is very bullish for LNG and natural gas in the 2020s."*

Natural Gas – Sounds like Japan wants to buy in brownfield Gulf Coast LNG projects

Japan to invest in upstream LNG

It sounds like Japan has its sights on investing in US Gulf Coast LNG projects. On Friday, Japan's industry minister announced its plans to step up its role in the investment of upstream LNG projects to spur new development and increase offtake by local companies. We tweeted [LINK] *"Japan to provide "risk money" thru state-run JOGMEC "for existing #LNG projects that can boost output quickly via expansion" reports @YukaObayashi Can't find any #LNG export that can execute brownfield expansions faster than US Gulf Coast. #OOTT #NatGas"* Reuters reported on Friday [LINK], that Japan sees an opportunity for LNG investment given the Russian war in Ukraine has raised concerns over the competition for the fuel and access to a stable supply of the fuel. Japan's energy minister stated in the report *"The government needs to come to the forefront to secure LNG through cooperation with private the sector."* The government aims to provide 'risk money' through the state-run Japan Oil, Gas and Metals National Corp (JOGMEC) for existing LNG projects that can boost output quickly via expansion. Hagiuda also confirmed that Japan plans to keep its interests in the Sakhalin-1 and Sakhalin-2 LNG energy projects in Russia as they are stable sources of long-term and inexpensive energy. But Japan would also work to cut dependence on Russian energy by diversifying sources of supply. Russia accounted for 8.8% of Japan's LNG imports in 2021. Our Supplemental Documents package includes the Reuters report.

Natural Gas – Japan's LNG stocks -18% YoY

Japan LNG stocks -18% YoY

The beginning of April has seen elevated temperatures in the Japanese shoulder season that has allowed for a modest build in inventories despite the earthquake that knocked off coal fired plants. Japan's METI weekly LNG stocks data was released on Wednesday morning

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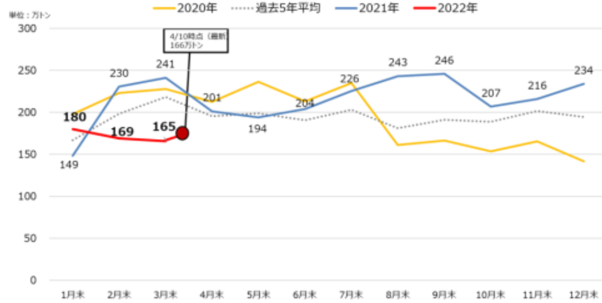
local time [LINK]. LNG stocks at April 10 were ~80 bcf, which is -20% YoY and -13% vs the 4-yr average. Below is the LNG stocks graph from the METI weekly report.

Figure 8: Japan’s LNG Stocks



Source: METI

BloombergNEF LNG Trade Weekly

Natural Gas – BloombergNEF, LNG cargoes continue to be diverted to Europe

LNG prices continue to be exceptionally strong considering it’s April as Europe tries to do all it can to start to prepare for next winter for natural gas. One of our favorite BloombergNEF weekly reports to flip thru (it’s quick) is it’s “*LNG Trade Weekly*”, which is a good quick recap of global LNG trade flows. There wasn’t anything necessarily new, however, BNEF confirms the urgency Europe is placing on building natural gas inventories in the refill season ie. we continue to see LNG cargoes be diverted to NW Europe. This week’s report was subtitled “*Two U.S. LNG Cargoes Diverted to Europe.*” BNEF wrote “*Diversions to Europe: British Listener loaded at Freeport LNG and was initially heading to Asia. The ship got diverted and crossed the Panama Canal back and is now signaling Gibraltar for April 24 arrival. Another Freeport cargo, onboard Prism Brilliance, was approaching Panama but is now signaling Milford, U.K. for delivery on April 13. • Europe LNG deliveries: Imports to Northwest Europe and Italy have accelerated from March as winter ended in Asia. The region received 1.75 million tons of LNG from April 4-10, almost 21 % higher than the same period in March. Supply from the U.S. increased to 42% of the total weekly imports, compared to 30% in the same week in March, as U.K., Italy and Belgium imported more U.S. cargoes. Qatari deliveries are up 72% from the same week in March as production in Qatar appears to be recovering from the lows seen in February. Supply from Russia stayed flat from the same week in the previous month.*” Our Supplemental Documents package includes excerpts from the BNEF LNG Trade weekly.

Putin says a gradual depart from US$ Euros

Natural Gas – Seems Putin isn’t cutting gas to Europe for not paying rubles for now

On Friday, we tweeted [LINK] “*Doesn't sound RUS will immediately cut off #NatGas #Oil for no rubles payment. "I will remind you that our aim is to convert payments for energy resources into national currencies and to gradually depart from dollars and euros" says #Putin. #OOTT.*” We probably should have said, it doesn’t sound like Putin will broadly cut off natural gas as it wouldn’t surprise to see Putin selectively cut off some supply. No one knows what Putin will do, but, based on his Thursday comments, it sounds like he doesn’t plan to cut off natural gas just because the buyers aren’t prepared to pay in Rubles. On

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Thursday, Putin had a meeting on the current situation in oil and gas sector with Novak, other key ministers and representatives from the oil and gas sector. Recall Putin had threatened to cut off natural gas for any customers that didn't start paying from April 1 in Rubles. The Kremlin transcript [LINK] wrote "*Furthermore, there are setbacks in payments for Russian energy exports. Banks from these unfriendly countries are delaying the transfer of funds. I will remind you that our aim is to convert payments for energy resources into national currencies and to gradually depart from dollars and euros*." We thought Putin highlight this gradual depart from dollars and euros is a sign he doesn't play to immediately cut off customers.

Natural Gas – Germany says time to start saving natural gas consumption is now

Germany says start saving natural gas now

Germany's natural gas demand peaks in the winter. Winter has just ended, but Germany is already asking its citizens to start conserving use of natural gas as well as other energy. We hope we are wrong, but we worry about next winter and that there will be shortages of natural gas in Germany. This is not like a long term plan to replace natural gas. So if Germany is behind by next winter, it could get ugly. So we shouldn't be surprised to see reports that Germany is already asking people to conserve natural gas use even though it's shoulder season. On Thursday, we tweeted [LINK] on an Euractiv report [LINK] "*Germans asked to conserve energy to reduce reliance on Russia*". Euractiv wrote "*Habeck's calls to save gas come after similar statements were made by the head of the federal network agency, who recently became a trustee of Gazprom Germania following its nationalisation and is in charge of ensuring the security of gas supply. "From the point of view of the storage levels, I must say clearly: Everyone is called upon to contribute to saving gas even today," said Klaus Müller, head of the network agency, in an interview with ntv. Germany's gas storage levels are at around 29%, a comparatively low level for this time of year. Normally, stores fill up on cheap Russian gas over the summer while demand is lower. Experts have warned the German government to ensure high gas storage levels to be less susceptible to Russian threats in the coming winter. In March, the government enacted a law that ordains gas stores to be 90% full ahead of winter. Without sufficient stores and a sudden cut of supplies from Russia, Habeck would be faced with tough decisions. As per the German security of gas supply plan, households and special institutions like schools and hospitals are protected from gas cuts. Instead, industry would be on the chopping block, but no one can yet predict which industrial sectors would lose access to gas. "However, a situation with supply bottlenecks and the shutdown of industrial plants is an economic policy nightmare. You can't really do anything right – only less wrong," Habeck told Funke."* Habeck is vice chancellor and economy minister.

Natural Gas – Europe storage YoY deficit is now only 3.62% ie. 26.84% full vs 30.46%

Europe storage now 26.84% full

Europe avoided natural gas shortages this winter with the combination of warmer weather, strong wind generation and a massive increase in US LNG imports. As a result, the YoY Europe storage gap continues to narrow since the start of the winter natural gas season. Europe gas storage started down 18.52% YoY and is now down to a YoY deficit of 3.75%. Draws to European gas storage units ended this week with the second observed build. It was a small injection but signals the beginning of the injection season as Europe exits the heating season. The YoY deficit is narrowing but, even still, Europe inventories are at their lowest level at this time of the year in more than a decade. Europe gas storage started last winter (Nov 1/20) at basically full levels at 94.66% and had dropped by 65.77% to be 28.89% at Apr

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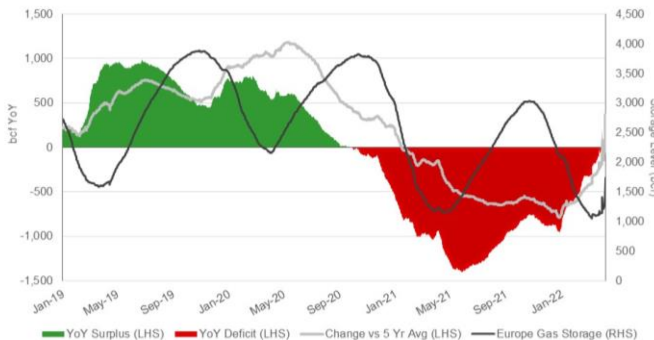
1/21. Europe storage levels bottomed in late Apr at 29%, which was the lowest level since Apr 2018. This winter began (Nov 1/21) with gas storage at 77.14% capacity, down 18.52% YoY. The YoY deficit has tightened since Nov 1. Despite the warm weather and US LNG, storage as of Apr 10 is still only at 26.84%, which is -3.62% less than last year levels of 30.46% and are -8.76% below the 5-year average of 35.60%. As winter draws come to an end we expect to see a decline in demand for LNG as less is used to heat homes as we enter the injection season. Below is our graph of Europe Gas Storage Level.

Figure 9: Europe Gas Storage Level



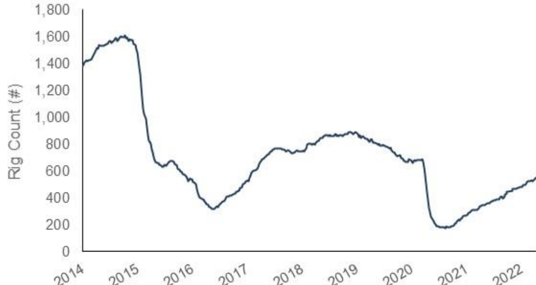
Source: Bloomberg
Prepared by SAF Group https://safgroup.ca/news-insights/

Oil – US oil rigs +2 WoW at 548 oil rigs at Apr 14

US oil rigs +2 WoW

Baker Hughes released its weekly North American drilling activity data on Friday. We expected another increase given the ~$100/bbl WTI and producers have ramped up production with the elevated prices. There is still strong oil, NGLs and natural gas prices and industry has fresh 2022 capex budgets and is still just catching up in 2021 from an extremely low 2020 activity level. This week US oil rigs were +2 WoW at 548 oil rigs, with all major oil and gas basins up slightly. Oil rigs are +376 off the bottom of 172 in Aug14/2020 week. There were modest basin changes this week; Permian was up 2 at 333 rigs this week while Bakken was flat at 33 rigs after increasing last week. US oil rigs hit their 2020 peak at 683 on March 13 and have since fallen by 130 to 548 oil rigs (-12%). US gas rigs were +2 WoW though still higher than normal with increases in the Haynesville basin reflecting the heightened $4 HH. Below is our graph of US oil rigs since January 1, 2014.

Figure 10: Baker Hughes Total US Oil Rigs



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Source: Baker Hughes

Oil – US frac spreads -6 to 269 for the shortened week ended April 14

Mark Rossano (C6 Capital Holdings) held his weekly US frac spread recap for shortened week ended April 14 on the Primary Vision network. YouTube video is at [LINK]. For the shortened week ended April 14, US frac spreads at the high point in the week were -6 to 269. Rossano expected this drop with Easter and emphasized that it was nothing to worry about. And then there will be spring back, pretty well until Aug. Most of the drop was in the smaller basins like Fort Worth, San Juan, Uinta. Anadarko had a drop. Whereas the big basins like the Permian still running hot, and he doesn't see that slowing down. Western Gulf, Williston, Texas, Louisiana, Mississippi Salt, all of those key areas are still running. Rossano still sees 290 as very likely to get to at the end of April/first week of May. The last 10 to get to 300 will take some time.

Frac spreads -6 to 269

Oil – Total Cdn rigs -8 to 103 total rigs, +47 rigs YoY

Total Cdn rigs were down -8 this week to 103 total rigs. Cdn oil rigs were -4 at 49 rigs. Cdn gas rigs were -4 at 54 gas rigs; attributed to the drilling season coming to an end; we expect the end of the declines in the coming weeks. But, as noted in last weeks Energy Tidbits memo, Cdn rigs are expected to be higher than normal during spring breakup. Total rigs are now +98 since the June 26, 2020 all-time low. Cdn drilling has recovered YoY, a year ago Cdn oil rigs were 17 and Cdn gas rigs were 39 for a total Cdn rigs of 56, meaning total Cdn rigs are +47 YoY and total rigs are +37 vs 2019.

Cdn rigs -8 WoW

Figure 11: Baker Hughes Total Canadian Oil Rigs

Source: Baker Hughes

Oil – US weekly oil production flat at 11.8 mmb/d

US oil production was held flat this week at 11.8 mmb/d for the week ended Apr 8 after increasing for consecutive weeks. Lower 48 production drove total production and was flat from last weeks level at 11.4 mmb/d this week, Alaska was also basically flat this week. US oil production is up YoY at +0.9 mmb/d from last year's production and is still down significantly at -1.3 mmb/d since the 2020 peak of 13.1 mmb/d on March 13. Absent weather impacts, we would expect US oil production to remain relatively flat if not inch up a little higher in Q2/22 as the US exits the turnaround season.

US oil production flat WoW

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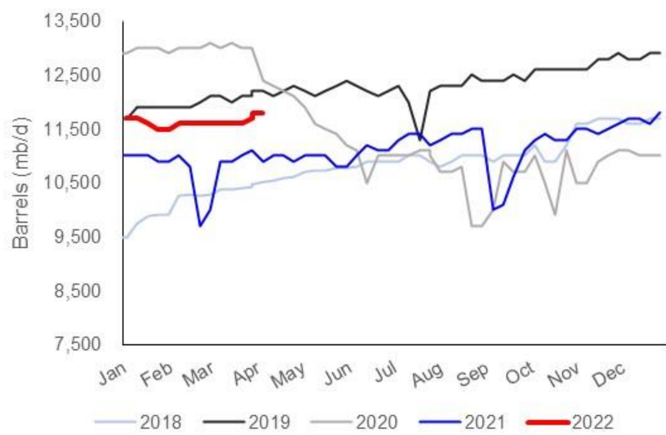
Figure 12: EIA's Estimated Weekly US Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2020-Jan	01/03	12,900	01/10	13,000	01/17	13,000	01/24	13,000	01/31	12,900
2020-Feb	02/07	13,000	02/14	13,000	02/21	13,000	02/28	13,100		
2020-Mar	03/06	13,000	03/13	13,100	03/20	13,000	03/27	13,000		
2020-Apr	04/03	12,400	04/10	12,300	04/17	12,200	04/24	12,100		
2020-May	05/01	11,900	05/08	11,600	05/15	11,500	05/22	11,400	05/29	11,200
2020-Jun	06/05	11,100	06/12	10,500	06/19	11,000	06/26	11,000		
2020-Jul	07/03	11,000	07/10	11,000	07/17	11,100	07/24	11,100	07/31	11,000
2020-Aug	08/07	10,700	08/14	10,700	08/21	10,800	08/28	9,700		
2020-Sep	09/04	10,000	09/11	10,900	09/18	10,700	09/25	10,700		
2020-Oct	10/02	11,000	10/09	10,500	10/16	9,900	10/23	11,100	10/30	10,500
2020-Nov	11/06	10,500	11/13	10,900	11/20	11,000	11/27	11,100		
2020-Dec	12/04	11,100	12/11	11,000	12/18	11,000	12/25	11,000		
2021-Jan	01/01	11,000	01/08	11,000	01/15	11,000	01/22	10,900	01/29	10,900
2021-Feb	02/05	11,000	02/12	10,800	02/19	9,700	02/26	10,000		
2021-Mar	03/05	10,900	03/12	10,900	03/19	11,000	03/26	11,100		
2021-Apr	04/02	10,900	04/09	11,000	04/16	11,000	04/23	10,900	04/30	10,900
2021-May	05/07	11,000	05/14	11,000	05/21	11,000	05/28	10,800		
2021-Jun	06/04	11,000	06/11	11,200	06/18	11,100	06/25	11,100		
2021-Jul	07/02	11,300	07/09	11,400	07/16	11,400	07/23	11,200	07/30	11,200
2021-Aug	08/06	11,300	08/13	11,400	08/20	11,400	08/27	11,500		
2021-Sep	09/03	10,000	09/10	10,100	09/17	10,600	09/24	11,100		
2021-Oct	10/01	11,300	10/08	11,400	10/15	11,300	10/22	11,300	10/29	11,500
2021-Nov	11/05	11,500	11/12	11,400	11/19	11,500	11/26	11,600		
2021-Dec	12/03	11,700	12/10	11,700	12/17	11,600	12/24	11,800	12/31	11,800
2022-Jan	01/07	11,700	01/14	11,700	01/21	11,600	01/28	11,500		
2022-Feb	02/04	11,600	02/11	11,600	02/18	11,600	02/25	11,600		
2022-Mar	03/04	11,600	03/11	11,600	03/18	11,600	03/25	11,700		
2022-Apr	04/01	11,800								

Source: EIA

Figure 13: US Weekly Oil Production



Source: EIA, SAF

Oil – EIA STEO revises its forecast for US oil production growth to Q4/23

EIA forecasts US 2022 oil exit at 12.46 mmb/d

There was no surprise to see the EIA STEO decrease its forecast for US oil production given the significant reduction in the demand forecast for 2022 and 2023. The EIA notes that their forecasts are subject to greater uncertainty amid the rapidly evolving conflict in Europe. (i) The EIA slightly raised the 2020 forecasted production numbers, up 0.01 mmb/d from last month. (ii) The EIA forecast slightly lowered its US crude expectations thru the back half of 2021, still not returning anywhere to the Q4/19 peak of 12.88 mmb/d, with Q4/21 US crude of 11.63 mmb/d (down 1.23 mmb/d from peak). Q4/21 of 11.62 mmb/d is +0.74 mmb/d YoY vs

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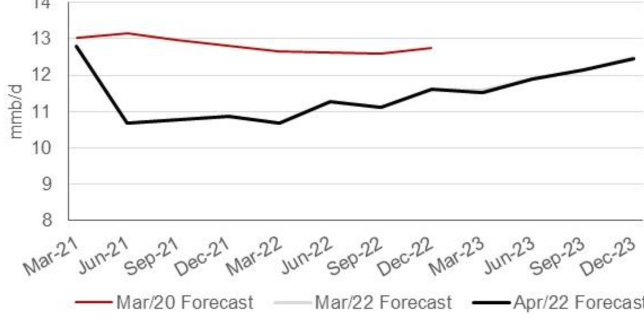
Q4/20. Full year 2020 US oil production is flat at 11.28 mmb/d and is down 1.10 mmb/d YoY from 12.29 mmb/d in 2019. (iii) Full year 2021 is increased by 0.01 mmb/d vs March STEO to 11.19 mmb/d, which is down -0.09 mmb/d YoY from 2020. (iv) The EIA forecasts a shift back to YoY growth in 2022 with production averaging 12.01 mmb/d, +0.82 mmb/d YoY (was 12.03 mmb/d previously), with Q4/22 production of 12.46 mmb/d, is still down -0.4 mmb/d from Q4/19. (v) The 2023 outlook was released and projects crude production to begin Q1/23 at 12.73 mmb/d and close the year in Q4/23 at 13.17 mmb/d for and average of 12.95 mmb/d in 2023. (vi) In the US oil production commentary, the EIA wrote U.S. crude oil production in the forecast averages 12.0 million b/d in 2022, up 0.8 million b/d from 2021. We forecast production to increase another 0.9 million b/d in 2023 to average almost 13.0 million b/d, surpassing the previous annual average record of 12.3 million b/d set in 2019."

Figure 14: Estimated US Crude Oil Production By Forecast Month

(million b/d)	Q1/20	Q2/20	Q3/20	Q4/20	2020	Q1/21	Q2/21	Q3/21	Q4/21	2021	Q1/22	Q2/22	Q3/22	Q4/22	2022	Q1/23	Q2/23	Q3/23	Q4/23	2023
Apr-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.63	11.19	11.52	11.90	12.15	12.46	12.01	12.73	12.88	13.02	13.17	12.95
Mar-2022	12.81	10.68	10.79	10.87	11.28	10.69	11.28	11.13	11.62	11.18	11.59	11.89	12.15	12.48	12.03	12.75	12.91	13.06	13.24	12.99
Feb-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.13	11.69	11.20	11.67	11.86	12.06	12.27	11.97	12.46	12.54	12.63	12.75	12.60
Jan-2022	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.12	11.54	11.16	11.58	11.7	11.88	12.05	11.8	12.26	12.33	12.46	12.58	12.41
Dec-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.11	11.63	11.18	11.67	11.72	11.91	12.09	11.85					
Nov-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.07	11.47	11.13	11.69	11.77	11.97	12.16	11.90					
Oct-2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	10.98	11.13	11.02	11.54	11.64	11.78	11.96	11.73					
Sept 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.28	11.06	11.28	11.08	11.42	11.58	11.81	12.06	11.72					
Aug 2021	12.81	10.67	10.79	10.87	11.28	10.69	11.22	11.26	11.30	11.12	11.46	11.62	11.86	12.11	11.77					
July 2021	12.75	10.81	10.81	10.90	11.31	10.70	11.20	11.17	11.34	11.10	11.54	11.72	11.95	12.20	11.85					
June 2021	12.75	10.81	10.81	10.90	11.31	10.70	11.04	11.17	11.38	11.08	11.55	11.67	11.88	12.05	11.79					
May 2021	12.75	10.81	10.81	10.90	11.31	10.65	10.97	11.12	11.34	11.02	11.51	11.68	11.96	12.21	11.84					
Apr 2021	12.75	10.81	10.81	10.90	11.31	10.75	10.93	11.13	11.35	11.04	11.54	11.74	11.99	12.18	11.86					
Mar 2021	12.75	10.81	10.81	10.87	11.31	10.79	11.06	11.27	11.46	11.15	11.67	11.84	12.16	12.41	12.02					
Feb 2021	12.75	10.81	10.81	10.89	11.31	10.98	10.91	11.00	11.18	11.02	11.30	11.38	11.61	11.83	11.53					
Jan 2021	12.75	10.81	10.81	10.81	11.29	11.06	11.03	11.07	11.25	11.10	11.32	11.37	11.52	11.74	11.49					

Source: EIA STEO

Figure 15: Estimated US Crude Oil Production By Forecast Month



Source: EIA STEO

Oil – Trans Mountain expansion now >50% complete, on track for yr end 2023 start

Trans Mountain expansion 50% complete

The Trans Mountain pipeline expansion (TMX) continues to be on track for startup before year end 2023 as construction has now passed the 50% completion mark. Trans Mountain issued a press release [LINK] The halfway mark of construction for the Expansion Project includes more than 412 kilometres of pipe in the ground, 574 kilometres of the pipeline right-of-way stripped and graded, 471 kilometres of pipe welded and the completion of 32 major trenchless crossings. Executive VP Corey Goulet note in the release *"This celebration of the halfway mark of construction was made possible by the hard work and dedication of each and every person on our workforce. As we continue construction in 2022 and 2023, we will*

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continue to work as one team and create long-term benefits for Canadians through this world-class project," said Corey Goulet, Executive Vice President, Execution, Trans Mountain Expansion Project." Our Supplemental Documents package includes the Trans Mountain release.

Oil – Trans Mountain expansion costs +70% to $21.4b, and delayed 1 yr to late 2023

Big TMX cost revision and a year late

Our Feb 6, 2022 Energy Tidbits noted the Feb 3 Bloomberg report [LINK] that the Trans Mountain Pipeline Expansion project is expected to run over budget by at least ~$4b and cost over $17b, and would likely be a year late with a revised startup in 2023. On Friday, we tweeted [LINK] "*#TransMountain revises #TMX expansion to now cost $21.4b (was $12.6) and start up pushed back a year into late 2023. Good early catch @ChrisVarcoe. #Oil #OOTT."* Trans Mountain had just posted [LINK] "*Trans Mountain Corporation Updates Expansion Project Cost and Schedule"* that had two key updates. (i) 70% higher cost. "*Trans Mountain has completed a full review of its Project schedule and cost estimates. With all work fronts now active, mechanical completion of the Project is anticipated to occur in the third quarter of 2023. The total Project cost has increased from $12.6 to $21.4 billion."* (ii) One year delay in startup. Prior planned start up was by year-end 2022, but Trans Mountain wrote "*Schedule pressures total approximately $2.6 billion of the increase and include permitting processes required for the several thousand permits that are required for the Project, and significant construction challenges in both marine and difficult terrain which have extended the schedule into late 2023.*" Our Supplemental Documents package includes the Trans Mountain update.

Liberals say no more public funding for TMX

After the Trans Mountain release, the Liberals released a statement from Deputy Prime Minister Freeland on TMX [LINK]. She was clear in her statement "*TMC today announced their increased cost estimates, and the extended completion date for the Trans Mountain Expansion Project to the third quarter of 2023. Reasons cited include the pandemic, the BC floods, and significant but necessary changes to deal with the terrain and to protect the environment. However, I want to assure Canadians that there will be no additional public money invested in TMC. TMC will secure necessary funding to complete the project through third-party financing, either in the public debt markets or with financial institutions. Both BMO Capital Markets and TD Securities have been engaged by the government to provide advice on financial aspects of the project. Their analyses confirm that public financing for the project is a feasible option that can be implemented swiftly. They have also confirmed that the project remains commercially viable."* Our Supplemental Documents package includes the Freeland statement.

Oil – Refinery inputs -0.424 mmb/d WoW at 15.523 mmb/d

Refinery inputs down WoW

The EIA crude oil input to refinery data is for the week ended Apr 8. This week, the EIA reported crude oil inputs to refineries down 0.424 mmb/d this week to 15.523 mmb/d for the week ended Apr 8 and are +0.473 mmb/d YoY from last years February Freeze in the Permian. Refinery utilization was down at 90%, which is +5% YoY though is still below 5-year average utilization levels as US refineries begin planned maintenance in sync with the Canadian oil sands. Total products supplied (i.e., demand) decreased WoW, down 1.044 mmb/d to 18.771 mmb/d. Motor gasoline was up 0.174 mmb/d at 8.736 mmb/d from 8.562

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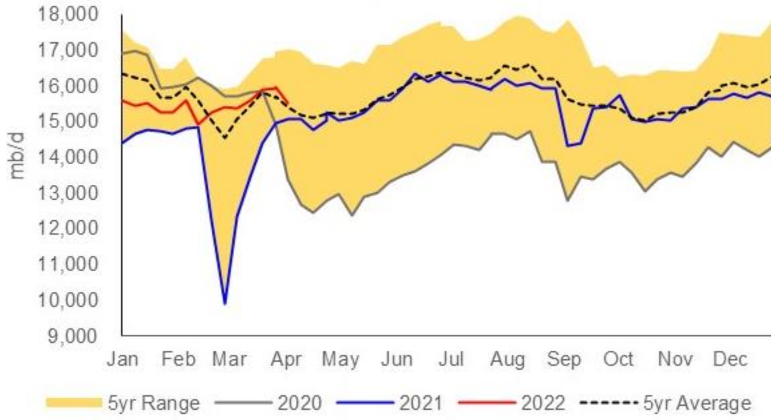
mmb/d last week. Gasoline supplied, a proxy for demand, was up last week. Gasoline stockpiles are at their lowest levels with demand for gasoline at a 4-week high. The four-week average of production supplied decreased to 19.896 mmb/d, up from last year.

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



Source: EIA

Oil – US "net" oil imports up +1.208 mmb/d WoW at 3.815 mmb/d

US "net" oil imports up WoW

US "NET" imports were up +1.208 mmb/d to 3.815 mmb/d for the Apr 8 week. US imports were up down -0.305 mmb/d to 5.995 mmb/d. US exports were down -1.513 mmb/d to 2.180 mmb/d. The WoW increase in US oil imports was driven by US's Top 10 imports by country were down by 0.944 mmb/d from Top 10. Some items to note on the by country data. (i) Canada was down this week by -0.770 mmb/d to 3.153 mmb/d, which is now ~0.1 mmb/d above the average levels in Jan/Feb of 2020. (ii) Saudi Arabia was down 245,000 b/d to 0.328 mmb/d this week. (iii) Colombia was down 0.167 mmb/d to 0.049 mmb/d. (iv) Ecuador was up +0.065 at 0.145 mmb/d. (v) Iraq was up 84,000 b/d to 155,000 b/d. (v) Venezuela remained at 0 due to US sanctions. (vi) Mexico was up by 144,000 b/d to 0.619 mmb/d.

Figure 17: US Weekly Preliminary Oil Imports by Major Countries

(thousand b/d)	Jan 28/22	Feb 4/22	Feb 11/22	Feb 18/22	Feb 25/22	Mar 4/22	Mar 11/22	Mar 18/22	Mar 25/22	Apr 1/22	Apr 8/22	WoW
Canada	3,953	3,631	3,342	3,869	3,630	3,731	3,398	3,806	3,612	3,923	3,153	-770
Saudi Arabia	613	383	250	358	520	701	562	534	333	573	328	-245
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0
Mexico	383	958	510	768	497	412	645	641	731	619	763	144
Colombia	286	258	234	332	144	71	279	72	284	216	49	-167
Iraq	412	226	225	285	295	188	161	489	82	71	155	84
Ecuador	236	101	98	98	0	160	205	103	96	76	145	69
Nigeria	9	144	182	25	43	96	0	2	148	148	89	-59
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0
Angola	0	0	0	0	0	0	0	0	0	0	0	0
Top 10	5,892	5,701	4,841	5,735	5,129	5,359	5,250	5,647	5,286	5,626	4,682	-944
Others	1,193	688	949	1,093	638	960	1,145	839	973	674	1,313	639
Total US	7,085	6,389	5,790	6,828	5,767	6,319	6,395	6,486	6,259	6,300	5,995	-305

Source: EIA, SAF

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Oil – Pemex HSFO crude not suited to replace Russian imports

Mexico not suited to replace Russian crude

One of the items that politicians seem to overlook is that oil refineries are the consumers of oil and are set up to run on specific crude oil qualities and that means that not any oil barrel can be substituted for any other oil barrel at every refinery. We saw a reminder of this with the Tuesday Argus media report [LINK] that Pemex HSFO is an unlikely replacement for the lost Russian barrels after the US issued sanctions prohibiting imports of Russian crude. Russian Urals-derived M100 fuel oil regularly makes its way to US refiners as a coker feedstock. In February as much as 53% of US Gulf coast fuel oil imports came from Russia, according to Vortexa, versus about 24% from Mexico. In March Russian fuel oil imports rose to 71% while Mexican imports shrank to only 5%. Pemex HSFO generally also has lower yields of gasoline and gasoil, as Pemex's fuel oil output has more than 0.5% of sulphur, limiting its ability to place it in other markets or for shipping after the International Maritime Organization's 2020 restrictions on marine fuel oil sulphur levels. The report noted "*Besides the quality, Mexico's geographic proximity appears to be offset by lower freight costs for Middle East shipments. Dirty tanker rates from the Mideast Gulf to the US Gulf coast for 280kt vessels have been 30pc lower on average since 14 March through 11 April, according to Argus assessments, with the Mideast-USGC rate as much as 53pc below the Mexico-USGC rate at $7.08/t versus $10.84/t on 25 March. As of 11 April, the Mideast-USGC rate was 18pc lower than the Mexico-USGC rate, as both increased up to $12.03/t and $14.19/t, respectively.*" Our Supplemental Documents package includes the Argus media report.

Oil – AMLO's confirms Pemex's 340,000 b/d Dos Bocas refinery to start up in July

Dos Bocas 340,000 b/d refinery start in July

On Tuesday, Mexico President Obrador made a speech on his first quarterly report of 2022. In the speech, AMLO confirmed with Mexico Secretary of Energy Rocio Nahle that the under construction 340,000 b/d Dos Bocas refinery was still on track for start up in July. El Universal reported [LINK] "*AMLO affirms that Dos Bocas will be ready in July: "Isn't that right, Rocío?", asks the head of Sener. During his report, AMLO emphasized that in less than 3 months the refinery will be finished and in operation; in full speech he questioned Rocío Nahle. President Andrés Manuel López Obrador assured that in July of this year, the Dos Bocas refinery will start operations. This during his first quarterly report of 2022, 100 days into his fourth year in the Presidency of Mexico. During his message, AMLO emphasized that in less than three months the Dos Bocas refinery will be finished and in operation; and upon assuring the opening date, the president took a moment to look for the Secretary of Energy, Rocío Nahle , among the crowd and confirm the information by saying "right, Rocío?" and flash a brief smile. "In July, the new Dos Bocas refinery, the Olmeca refinery in Paraíso, Tabasco, will start operations, right, Rocío?" said the president.*" Our Supplemental Documents package includes the El Universal report.

If Dos Bocas is on time, why is AMLO not going to refine more in Mexico?

Something doesn't seem to make sense as to why, if the 340,000 b/d Dos Bocas is on time, AMLO plans to keep importing more petroleum products in 2022. Our April 3, 2022 Energy Tidbits highlighted AMLO's new "plan emergente" and how AMLO said that would mean Mexico's oil exports were not going down in 2022. Recall that AMLO's big promise for his presidency was that Mexico would stop all oil exports in 2023 as it would be able to refine all Mexico crude oil and therefore stop having to import petroleum products. The "plan emergente" is a big change in Mexico's 2022

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oil plans that will impact Cdn heavy/medium crude oil. Here is what we wrote in our April 3, 2022 Energy Tidbits. "*One of the big 2022 oil themes for Cdn medium/heavy oil was supposed to be the ramp up in Pemex refinery capacity and Mexico's move to drastically cut oil exports in 2022 and then eliminate oil exports in 2023. This would have been a win for Cdn medium/heavy oil as it would create more demand in PADD 3 Gulf Coast refineries This would be a big win for Cdn medium/heavy oil as it would create more demand in PADD 3 Gulf Coast refineries We have been highlighting how Pemex was behind on its refinery construction at the new Dos Bocas refinery and that they weren't seeing the big ramp up in existing oil refineries so there were behind and not likely to hit their reduced oil export targets. However, there has been no indication that Mexico would not be trying to dramatically reduce exports in 2022. But AMLO indicated a big shift in strategy on Thursday. Cutting out oil exports was one of AMLO's key election themes and he has been insistent that this was going to happen. That is, until Thursday, when he announced his "plan emergente" that would see Mexico oil exports would be relatively flat YoY in 2022, and not down huge as has been the plan. Bloomberg reported ""We launched a new plan because the price of crude oil is high and we are in the process of modernizing the refineries, so we are taking advantage now that the price is high to dedicate more resources and time to the rehabilitation of the plants," President Andres Manuel Lopez Obrador said during his daily press conference on Thursday. Mexico will reduce its crude processing to 850,000 barrels a day from a goal of about one million barrels a day, he said. The country processed 846,329 barrels a day of crude in February, and it averaged 711,612 barrels a day last year, according to data from Pemex." For the moment, if you believe the rationale here, he is saying that it is better economically for them to export more crude/import more fuels versus exporting less crude/importing less fuels. At $100+ oil, it could make sense that the margin for the production is likely better than the margin to produce fuels given Pemex refineries have consistently produced at much lower than expected rates. So if refineries have poor margins, there could well be a net margin pickup. However, the real question is that is this the strategy or the result of slower than expected construction at the new Dos Bocas refinery that was supposed to be ready on July 1 and also not making progress on improving efficiency at existing refineries. We suspect its more a question that they are behind on their refineries. Regardless, continued oil exports means that Mexico should continue to get more oil to PADD 3 Gulf Coast. Our Supplemental Documents package includes the Bloomberg report.*

In Jan, Pemex CEO said Mexico oil exports down big in 2022, to zero in 2023
Here is what we wrote in our Jan 2, 2022 Energy Tidbits. "*For the last year, one of the mostly ignored oil stories has been that Pemex (Mexico) expects to have its domestic refineries process all Mexican oil production such that that will no longer be oil exports and also imports of petroleum products ie. they will be self sufficient on petroleum products. On Tuesday, we tweeted [LINK] "Pemex/MEX will stop exporting crude in 2023 after reducing exports to 435k b/d in 2022 says @Pemex CEO. vs ~1 mmb/d in 2021. PADD 3 Gulf Coast gets >50% of MEX #Oil exports. Cdn heavy/med wins when MEX oil exports go down. Thx @amystillman #OOTT." Pemex CEO Oropeza spoke at the National Palace before Mexican President Obrador. Pemex posted [LINK] "He specified that it is proposed to maintain the value of proven*

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*reserves, the requirement of the National Refining System will be covered to serve the domestic market, so oil exports will stop starting in 2023." Bloomberg reported on the presentation adding more details "Pemex will stop exporting crude in 2023 after reducing exports to 435k b/d in 2022, Pemex Chief Executive Officer Octavio Romero Oropeza said during a press conference in Mexico City on Tuesday. * Crude processing to reach 1.509m b/d in 2022 and 2m b/d in 2023 with the addition of the Deer Park, Texas refinery and the Dos Bocas refinery in Tabasco. * NOTE: Mexico's six refineries have capacity to process 1.627m b/d: Pemex."*

Oil – Russian oil & condensate reportedly down 0.8 mmb/d MoM

Russia's oil production down this week

Is the worst still to come for hitting Russia's oil production? We still think so, and are still in the camp that expects to see an increasing hit on Russia's near term oil production as Russia strives to find ways to move its oil production in the face of the international shunning of Russian oil, storage for its crude getting full, and near term declines in Russian refinery runs. One of the challenges will be is to get good data given Russia's Ministry of Energy hasn't been providing an official data. But, on Friday, Reuters reported [LINK] "*Russian oil production has continued to slide in April, declining by 7.5% in the first half of the month from March, the Interfax news agency reported on Friday, citing a source familiar with the data. Oil output has been under pressure amid sanctions from the West over Moscow's activities in Ukraine. Interfax said Russian oil and gas condensate output stood at 1.392 million tonnes per day on average in the first two weeks of April, down 7.45% from March. In barrels, output declined to 10.2 million per day (bpd) from 11.01 million in March*."

Oil – What did Biden actually ask Modi on not using Russia oil?

Biden/Modi call

We recognize politicians and their spokespeople don't want to speak about items that aren't 100% what they want, but we still find it annoying when they use what looks to be sneaky disclosure on items that they know are of great interest to people and, in this case, markets. The issue is that India has been buying cheap Russian crude and people want to know what Biden and Modi discussed on this at their video meeting this week. (i) Our March 20, 2022 Energy Tidbits noted that India had been accelerating their purchases of Russia oil following the White House March 15 press briefing when Psaki said that India wasn't' violating any sanctions by buying Russian oil. (ii) On Monday, the White House readout of the Biden/Modi call did not mention or even hint that Biden brought up India's buying Russian oil with Modi. We interpreted that as the White House not wanting to acknowledge that Biden brought it up with Modi and Modi said sorry. We tweeted [LINK] "*#Biden says will India pls stop buying RUS crude oil? #Modi replies no, unless you get #Oil to us at the same big discount. How else can you interpret the #WhiteHouse readout of their call?*" Our tweet included the White House readout [LINK] . (iii) Then on Monday at the White House briefing [LINK],Psaki said that Biden did bring it up with Modi. Psaki said "*In terms of — and we also made clear, I should say, that — the President also made clear that he does not believe it's in India's interest to accelerate or increase imports of Russian energy and other commodities as well, which is something we certainly convey to other countries."* If so, why didn't the readout say Biden brought it up and asked Modi to not increase how much Russia oil India is buying? Or whatever Biden supposedly asked. (iv) Our end takeaway is that the US is trying to get India to not buy more India oil, but we don't think Modi made any promise to try to do so ie. look for India to continue to buy cheap Russia oil and we suspect, likely more.

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Oil – Ukraine would be landlocked if Russia takes over Odessa

Russia's southern strategy?

We are not gotten into the day to day Russia/Ukraine war updates, rather trying to focus on the implications to energy and food markets. But one map caught our attention yesterday on the overall future of Ukraine risk. Yesterday, the Institute for the Study of War's "*Assessed Control of Terrain in Ukraine and Main Russian Maneuver Axes as of April 16, 2022, 3:00 PM ET*" [LINK] had the below map. And our first thought in seeing the map was how important Odessa is for Ukraine. Their map shows how Russia has control over almost all of Ukraine's coastal areas so if Russia were to take over Odessa, Ukraine would be land locked. Surely that would be a big consolation prize for Putin.

Figure 18: Control of Terrain in Ukraine as of April 16, 2022, 3:00 PM ET

Source: Institute for the Study of War

Oil – OPEC MOMR assumes demand impacts of China lockdowns only affect 1H 2022

OPEC MOMR for April

OPEC released its Monthly Oil Market Report at 6am MT on Tues morning. (i) The headlines on the MOMR still indicate that the geo political impact on demand is still a wildcard as to how it plays out. It's why we tweeted [LINK] *"Expect #OilDemand to be lowered in #OPEC MOMR Apr being released in morning. Note below tweet, what OPEC didn't account for in MOMR Mar was any impact of then accelerating China Covid lockdowns. #OOTT"*. China lowered demand was expected but OPEC only assumes that Q1 and Q2 demand will be impacted by the recent Covid outbreaks in Shanghai. (ii) There was an immaterial; change to 2020 demand from 91.02 mmb/d in Mar to 91.13 this month. For 2021, full year average demand was revised up to 96.82 mmb/d from 96.74 mmb/d last month. 2021 is now +5.70 mmb/d YoY. YoY demand growth is unchanged, on a rounded basis, at +5.70 mmb/d YoY from +5.73 mmb/d last month. 2021 remains down 3.39 mmb/d vs pre-covid 2019 of 100.10 mmb/d (iii) As expected oil demand growth in 2022 declined to +3.67 mmb/d YoY from 4.13 mmb/d last month. 2022 demand average was revised down at 100.50 mmb/d form 100.90 mmb/d, up 0.29 mmb/d from pre-covid 2019 of 100.21 mmb/d. OPEC wrote *"In 2022, oil*

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demand growth was revised to the downside by 0.5 mb/d to average 3.7 mb/d y-o-y, accounting for declines in global GDP on account of the geopolitical developments and the resurgence of the Omicron variant on global oil demand in China."" (iii) OPEC Mar production per "secondary sources" was up +0.57 mmb/d to 28.56 mmb/d. Note that Feb was revised from the Mar report by +27,000 to 28.50 mmb/d from 28.47 mmb/d in Mar. Reminder that OPEC+ agreed to a +0.4 mmb/d MoM in Feb. OPEC's increase of +0.253 mmb/d rather than it's scheduled 0.254 mmb/d is below the Mar quota. There were only small revisions to Mar. The biggest underperformers were Nigeria who produced 1.354 mmb/d vs a quota of 1.718 mmb/d, and Angola producing 1.156 mmb/d vs a quota of 1.435 mmb/d. We were surprised to see Saudi Arabia producing 10.262 mmb/d against their quota of 10.331 mmb/d, a consecutive month of production below the quota. Venezuela was up at 0.697 mmb/d over 0.5 mmb/d as was the case in all 2021; There were no revisions to the March report. (v) There was a minor decrease to non-OPEC supply growth for 2021, +0.59 mmb/d to 63.56 mmb/d from 63.57 mmb/d last month, and a minor change to 2022 from last month at 66.26 mmb/d due to natural declines in offshore fields. Canada was revised up +0.16 mmb/d MoM flat from last month. Key non-OPEC supply growth areas for 2021 are Canada +0.30 mmb/d YoY, Russia +0.21 mmb/d YoY, UK -0.16 mmb/d, and the US at +0.15 mmb/d YoY. Key YoY growth areas for 2022 are Russia at +0.21 mmb/d, US +1.29 mmb/d, Brazil +0.16 mmb/d, Canada +0.16 mmb/d and Kazakhstan at +0.13 mmb/d. (vi) The other big positive in the OPEC outlook is OECD commercial oil stocks for Feb estimates -351 mmb, -194 mmb below 2015-2019 average, a decline MoM. Our Supplemental Documents package includes the OPEC MOMR.

Oil – IEA OMR: heavy demand revisions to Q2/22 amid China lockdowns

IEA Oil Market Report

The IEA released its monthly Oil Market Report for April at 2am MT Wednesday. They only release very limited public info, but Bloomberg provided tables and added color from the report. So big thanks, as usual, to the Bloomberg team. (i) The headlines of this forecast are all on lowering oil demand with most of the revisions occurring in Q2/22 at 99.5 mmb/d. Global oil stocks are still tight and they see stocks being brought back into balance over time with strategic reserve releases. There is a key caveat that the outlook is mired in uncertainty with the report noting *"Benchmark crude prices are now back to near pre-invasion levels but remain troublingly high and are a serious threat for the global economic outlook."* We are at a disadvantage given the limited public disclosure but we feel that the underlying message is that relief is on the horizon with strategic reserve releases. China Covid and Russia are giving some relief to Q2 oil prices, but the IEA still believes that prices are "troubling high" and serves as a reminder that measures to fix oil prices will come. (ii) 2022 demand forecast revised downwards at 99.4 mmb/d from 99.6 mmb/d last month. Global oil demand is now set to increase by 6.4 mmb/d in 2021 and by 1.9 mmb/d in 2022 when it returns to 99.4 mmb/d. (iii) Non-OPEC supply growth saw no changes to 2021 and 2022 at +2.1 mmb/d. Non-OPEC supply remained forecasted at 63.7 mmb/d in 2021 and 64.5 mmb/d in 2022 with no revision. (iv) See the following item for more detail. The IEA reminds that the on sustainable surplus capacity is in the Persian Gulf with only 1.16 mmb/d of sustainable global surplus capacity existing outside of Saudi Arabia, Iran, UAE and Kuwait. (v) The IEA delays the impact of Russian oil being hit amid uncertainty. The IEA now expects Russia production to be down 1.5 mmb/d in April, vs Mar OMR that estimated 3.0 mmb/d hit in April. But the IEA expects the 3.0 mmb/d hit to be in May ie. a month later (vi) OPEC March production up +0.60 mmb/d MoM to 28.54 mmb/d. The biggest MoM changes were Libya -0.06 mmb/d to 1.10 mmb/d in

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March, Saudi Arabia +0.05 mmb/d to 10.28 mmb/d in Mar, and UAE +0.03 mmb/d to 2.99 mmb/d in Mar. Iran was unchanged at 2.58 mmb/d in Mar. The IEA revised March production to 28.54. There were no major difference between countries in OMR at 28.54 vs OPEC MOMR at 28.50. (vii) On refined products draw the IEA wrote *"Global refinery throughputs are forecast to increase by 4.4 mb/d from April to August due to new capacity and normal seasonal gains. This would allow product inventories to see the first build in two years, offering some respite to the tight market. Overall, 2022 runs are forecast to gain 3 mb/d y-o-y but will remain below 2017 levels."* (viii) The IEA was positive on OECD stocks, which they believe will bring the market back into balance with SPR releases. The IEA wrote, *"Global oil inventories have decreased for 14 consecutive months, with February stocks 714 mb below the end-2020 level and OECD countries accounting for 70% of the decline. OECD total industry stocks fell by 42.2 mb to 2 611 mb in February, nearly double the seasonal trend. Preliminary data show a build in OECD industry stocks of 8.8 mb for March."* Our Supplemental documents package includes the IEA release and the Bloomberg report.

Figure 19: IEA Global Demand Forecast By OMR Report Month

mmb/d	2019	2020	20-19	Q1/21	Q2/21	Q3/21	Q4/21	2021	21-20	Q1/22	Q2/22	Q3/22	Q4/22	2022	22-21
Apr-22	99.7	91.0	-8.7	94.3	96.3	98.8	100.5	97.5	6.5	98.5	98.3	100.1	100.5	99.4	1.9
Mar-22	99.7	91.0	-8.7	94.3	96.3	98.8	100.5	97.5	6.5	99	98.8	100.2	100.6	99.6	2.1
Feb-22	99.7	91.0	-8.7	94.1	96.2	98.7	100.2	97.4	6.4	98.9	100.1	101.7	101.6	100.6	3.2
Jan-22	99.7	91.0	-8.7	93.3	95.4	97.8	99.0	96.4	5.4	97.8	99.3	100.9	100.8	99.7	3.3
Dec-21	99.7	91.0	-8.7	93.3	95.2	97.6	98.6	96.2	5.2	97.9	99.1	100.8	100.3	99.5	3.3
Nov-21	99.7	91.0	-8.7	93.3	95.2	97.7	98.9	96.3	5.3	98.5	99.2	100.6	100.3	99.7	3.4
Oct 21	99.7	91.0	-8.7	93.4	95.2	97.8	98.9	96.3	5.3	98.6	99.1	100.5	100.2	99.6	3.3
Sep 21	99.7	91.0	-8.7	93.4	95.1	97.2	98.8	96.2	5.2	98.2	98.9	100.3	100.7	99.5	3.3
Aug 21	99.7	91.0	-8.7	93.4	94.9	97.4	98.9	96.2	5.2	98.0	98.8	100.1	100.2	99.3	3.1
July 21	99.7	91.0	-8.7	93.6	94.7	98.1	99.4	96.4	5.4	98.2	98.7	100.3	100.6	99.5	3.1
June 21	99.7	91.0	-8.7	93.3	94.9	98.0	99.3	96.4	5.4	98.3	98.6	100.3	100.6	99.5	3.1
May 21	99.7	91.0	-8.7	93.1	94.6	98.3	99.6	96.4	5.4	-	-	-	-	-	-
Apr 21	99.7	91.0	-8.7	93.7	95.1	98.3	99.5	96.7	5.7	-	-	-	-	-	-

Source: IEA, SAF

Oil – IEA's new table of sustainable spare capacity by country

IEA's sustainable spare capacity table

The IEA included some new data in their publicly disclosed information on their Oil Market Report – their estimate of sustainable spare oil capacity of all OPEC+ countries. On Wednesday, we tweeted [LINK] "*Here's why @MoEnergy_Saudi Abdulaziz ("The Man") & #OPEC+ are in control of #Oil prices for next few years - New @IEA OMR table est only 1.16 mmb/d of global spare sustainable capacity outside of Saudi 1.95, Iran 1.22, UAE 1.10 & Kuwait 0.53. #OOTT."* The IEA table is excellent as it shows that the only significant sustainable spare capacity is with Saudi Arabia, Iran, UAE and, then to a lesser degree, Kuwait. Below is the IEA's new table.

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Figure 20: IEA Estimate of Sustainable Spare Capacity

OPEC+ crude oil production[1]
million barrels per day

	Feb 2022 supply	Mar 2022 supply	March compliance	Mar 2022 target	Sustainable capacity[2]	Spare cap vs. Mar
Algeria	0.98	1.00	0.88	0.99	0.99	0.00
Angola	1.16	1.14	4.17	1.44	1.19	0.05
Congo	0.26	0.26	3.42	0.31	0.29	0.03
Equatorial Guinea	0.09	0.09	5.29	0.12	0.11	0.02
Gabon	0.19	0.20	-1.08	0.18	0.21	0.00
Iraq	4.27	4.29	1.28	4.37	4.82	0.53
Kuwait	2.61	2.64	0.99	2.64	2.79	0.15
Nigeria	1.27	1.25	5.22	1.72	1.54	0.29
Saudi Arabia	10.23	10.28	1.08	10.33	12.23	1.95
UAE	2.96	2.99	0.93	2.98	4.09	1.10
Total OPEC-10	**24.02**	**24.14**	**1.57**	**25.06**	**28.26**	**4.13**
Iran[3]	2.58	2.58	0.00	0.00	3.80	1.22
Libya[3]	1.16	1.10	0.00	0.00	1.20	0.10
Venezuela[3]	0.72	0.72	0.00	0.00	0.75	0.03
Total OPEC	**28.48**	**28.54**	**0.00**	**0.00**	**34.02**	**5.48**
Azerbaijan	0.57	0.58	3.21	0.68	0.60	0.02
Kazakhstan	1.65	1.60	1.06	1.61	1.69	0.09
Mexico[4]	1.63	1.64	0.00	1.75	1.69	0.05
Oman	0.82	0.83	1.02	0.83	0.87	0.04
Russia	10.05	10.00	1.49	10.33	10.23	0.23
Others[5]	0.90	0.90	3.18	1.04	0.93	0.04
Total Non-OPEC	**15.62**	**15.55**	**1.62**	**16.23**	**16.01**	**0.47**
OPEC+-19 in cut deal[4]	**38.00**	**38.05**	**1.59**	**39.54**	**42.58**	**4.55**
Total OPEC+	**44.10**	**44.09**	**0.00**	**0.00**	**50.03**	**5.96**

1. Excludes condensates. 2. Capacity levels can be reached with 90 days and sustained for extended period. 3. Iran, Libya, Venezuela exempt from cuts. 4. Mexico excluded from OPEC+ compliance. Only cut in May, June 2020. 5. Bahrain, Brunei, Malaysia, Sudan and South Sudan.

Source: IEA,

Oil – Israel laser defense system is a "game changer" vs drones, rockets, mortars, etc

Israel "game changer" laser defense system

One of the big issues for Saudi Arabia and UAE was that their defense systems were based on Patriot missiles or the THAAD missile defense system, both of which were designed to defend against the flight path of ballistic missiles. But what happened over the past several years is that the Houthis moved to mostly launch relatively inexpensive drones that are more effective in getting thru the Patriots and THAAD. It sounds like Israel may have developed the right defense system. On Friday, the Times of Israel report "*In 'game changer,' Israeli laser-based air defense shoots down drones. Officials hail Iron Beam system after successful interceptions of guided and unguided projectiles; Gantz says all efforts being made for early deployment.*" This is the "Iron Beam" laser-based air defense system. The key here is that the laser defense system shoots down basically everything other than a ballistic missile. The laser system reportedly shoots down drones, rockets, mortars and anti-tank missiles. There was no mention of cruise missiles. Israel has been developing laser defense for years, but the key is that "t*he ministry has been testing the laser-based defense system for several years, shooting down a drone with it last year. The recent tests were the first to be successful against the other threats, including unguided projectiles and anti-tank guided missiles. (The latter was not shown in footage released by the ministry.*" Our Supplemental Documents package includes the Times of Israel report. [LINK]

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Figure 21: Israel's "Iron Beam" laser-based defense system

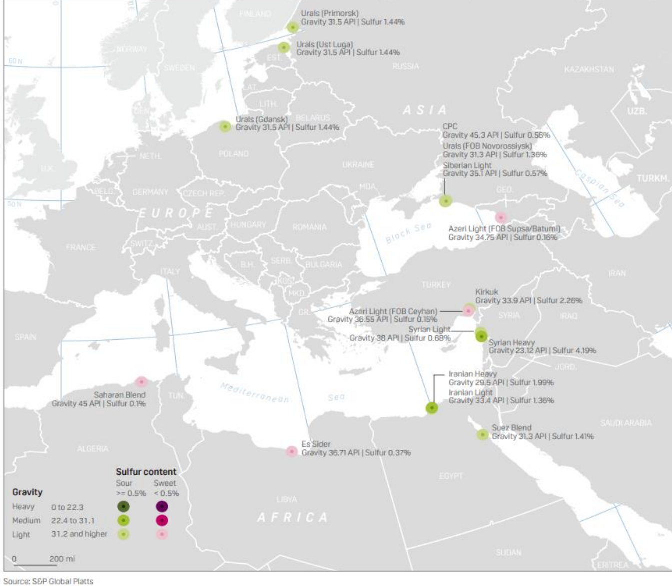
Source: Times of Israel

Oil – Iran's oil would be a good crude quality replacement for Urals crude to Europe

Iran oil similar to Russia Urals

We still expect to see a JCPOA deal, but it keeps dragging on. But one key item to remember is that Iran oil is needed to replace Russian crude oil in Europe markets. On March 9, we tweeted [LINK] on a good reminder from the Gulf Intelligence daily Podcast [LINK] that Iran's crude oil quality would be a good replacement for Russian Urals crude oil to Europe. We tweeted *"#JCPOA. Good reminder from @gulf_intel podcast. Matt Stanley @starfuels reminds Iran light matches API and H2S very well and is a good substitute RUS Urals. See below @SPGlobalPlatts crude specs map. #OOTT".* Our tweet included the below Platts map that noted crude qualities for Russia were Urals (Primorsk) 31.5 API 1.44% H2S, Urals (Ust Luga) 31.5 API 1.44% H2S, and Urals Gdansk 31.5 API 1.44% H2S, which compares to Iranian Light 33.4 API 1.36% H2S.

Figure 22: Platts Specifications Guide Europe and Africa Crude Oil



Source: Platts

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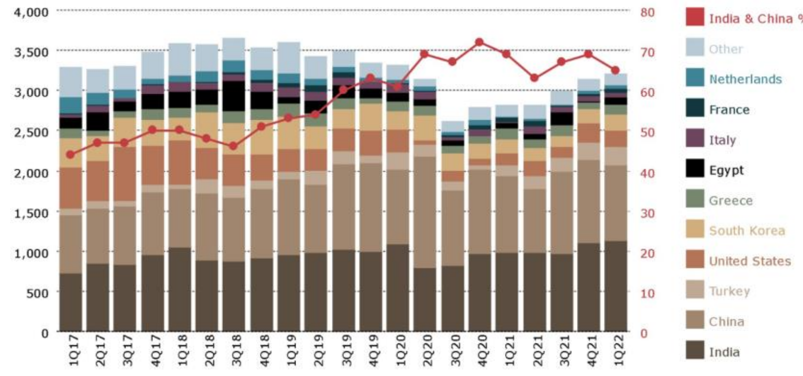
Oil – Iraq oil exports will be hurt by more Russian to China and India

2/3 of Iraq's southern exports go to China/India

Good reminder from MEES that Iraq crude oil exports will be hit by nations shunning Russian oil as that means more Russian oil to China and India. MEES reminded that 2/3 of Basra (southern Iraq oil exports) are shipped to China and India. We have already seen more Russian oil going to China and India as these countries go after the heavily discounted oil barrels. MEES wrote "*Iraq acknowledges that increased flows of cut-price Russian crude into its largest oil market are a challenge, albeit one it intends to overcome.*" Fortunately, >$100 oil means that Iraq is still on track for record export revenues even with some pressure on some of its export barrels. Below is the MEES chart. [LINK]

Figure 23: Basra (Iraq) oil exports by destination



Source: MEES

Oil – Libya NOC declares force majeure at 160,000 b/d Melitah oil export terminal

Force majeure at Libya's Melitah export terminal

We have to go back to last week's (April 10, 2022) Energy Tidbits and remind that there is increasing risk to oil supply/export interruptions from Libya. And we are concerned that the force majeure at the 160,000 b/d Melitah oil export terminal will be followed by other force majeures. As of our 7am MT news cut off, we have only seen one Libya National Oil Corporation force majeure at Melitah oil export terminal but not one as of yet for the Zueitina oil export terminal. (i) Earlier this morning, we tweeted [LINK] *"Libya National Oil Corporation just declared #ForceMajeure of #Oil exports from Melitah Port. Don't know what current exports were, but export capacity is ~160,000 b/d. #OOTT [LINK]".* This followed the NOC Facebook posting around 4am MT "*The National Oil Corporation announces force majeure on the El Feel oil field due to the interruption of production. Yesterday, Saturday, April 16, 2022 at 18:30, the El Feel oil field was subjected to arbitrary closure attempts, due to the entry of a group of individuals and the prevention of users from continuing production. Production has stopped completely today, Sunday, April 17, 2022, which made the implementation of the Corporation to its contractual obligations is impossible. Accordingly, the National Oil Corporation is obliged to declare a state of force majeure on Mellitah crude until further notice."* (ii) This followed yesterday's news at El Feel. Yesterday afternoon, we tweeted [LINK] *"Libya #Oil supply interruption. El Feel is normally ~70,000 b/d. Will nearby Sharara oil field be next? See SAF Group Libya oil fields & ports map.*" We had just seen a

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Libya Observer tweet on the El Feel oil field shut down. They tweeted "*Playing the oil card, militia groups loyal to warlord Khalifa Haftar close Al-Feel oil field demanding the Government of National Unity to hand over power to the government of Fathi Bashagha.*" (iii) Note that as of our 7am MT news cut off, we have not seen any NOC confirmation for any shut down of the Zueitina oil export terminal. We don't know the current throughput but Zueitina has capacity of ~70,000 b/d. Earlier this morning, Libya Observer reported [LINK] "*A group of citizens claiming to represent the Zueitina oil district community announced Saturday the suspension of oil production and exports from the Zueitina oil port and its fields, vowing to keep it closed until Prime Minister Abdul Hamid Dbeibah hands over power to Fathi Bashagha, the prime minister-designate by the eastern-based House of Representatives*." (iv) Up until yesterday, we were surprised at no negative news on Libya's oil production and exports. Last week's (April 10, 2022) Energy Tidbits memo was titled "*Libya's Eastern Military Commanders Urge Haftar to Shut Down Libya Oil Exports*" so we had expected something to happen. Around ~4pm MT, Tripoli based Libya Observer tweeted [LINK] "*Playing the oil card, militia groups loyal to warlord Khalifa Haftar close Al-Feel oil field demanding the Government of National Unity to hand over power to the government of Fathi Bashagha.*" As soon as we saw the reports, our first thought was that this is likely just the start of the oil supply interruptions, especially for the nearby Sharara oilfield. And also because the eastern military leaders urged Haftar to shut in all of Libya's oil exports. An hour later, we tweeted [LINK] "*Libya #Oil supply interruption. El Feel is normally ~70,000 b/d. Will nearby Sharara oil field be next? See SAF Group Libya oil fields & ports map. [LINK] #OOTT.*" And [LINK] "*Remember Eastern Libya military leaders left 5+5 JMC a week ago and urged Haftar to shut in Libya #Oil exports. It's why it feels like there are more oil supply interruptions than just El Feel still to come. #OOTT [LINK]*"." Our tweets included the below SAF Group Libya ports & terminal map.

Eastern Libya military leaders urged Haftar to shut down Libya oil exports

As noted above, there was the big warning on April 9. Last week's (April 10, 2022) Energy Tidbits memo said "*It looks like one of the oil news stories for Monday will be Libya. Last night, we tweeted [LINK] "Positive for #Oil prices with risk to Libya oil exports. Libya unity looking like a fantasy. @Lyobserver says eastern military leaders leaving 5+5 & urge Haftar to stop oil exports, close key road, etc. Libya loaded ~1 mmbd in March. #OOTT ". We have to wonder if we are about to go back to a split in Libya and oil supply interruptions. Yesterday, Tripoli based and pro Western Libya, Libya Observer, reported [LINK] "Haftar's representatives in JMC 5 + 5 call for closing oil, coastal road and cutting cooperation with GNU Representatives of warlord Khalifa Haftar in the Joint Military Commission 5+5 (JMC) have advised him to stop oil exports, close the coastal road linking the eastern region with the western region, suspend flights between both regions, and stop all aspects of cooperation with the Government of National Unity (GNU). The representatives have also suspended their participation in UN-brokered JMC talks. In a statement issued on Saturday, they claimed that "the Prime Minister of the GNU, Abdel Hamid Dbeibah, had practised behaviours that are contrary to the political agreement and a flagrant violation of human rights in accordance with international and national standards". Our tweet referenced Libya loadings at ~1 mmb/d in March, which was from Bloomberg's tanker tracking."*

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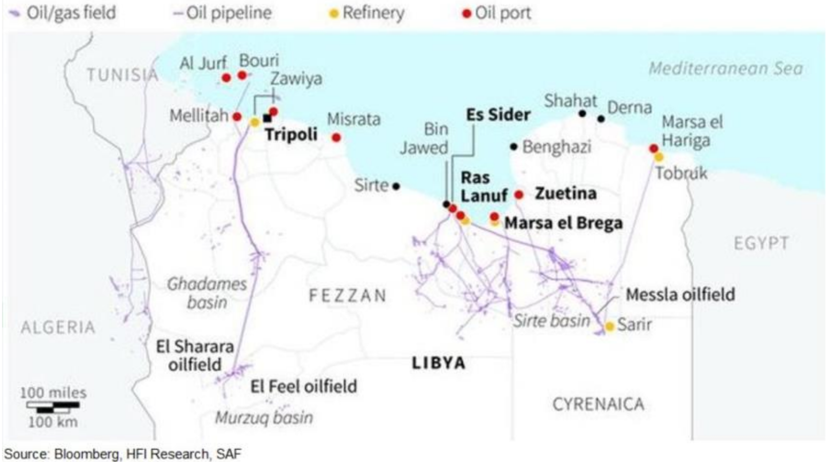
Figure 24: Libya Ports, Major oilfields and Terminals map



Source: SAF Group

China Covid restrictions

Oil – China Covid restrictions expanding to more cities

We don't now if anyone really understands how bad it is or isn't in China with Covid. Is it that the Chinese know more than they are telling the world? Or is it that their vaccines are just not very effective? Or is it a combination of both? Regardless, it is an economic, oil, natural gas and LNG story that we are seeing Covid restrictions being applied to a couple more major cities in China beyond Shanghai because it means less economic activity and less transportation. Yesterday, we tweeted [LINK] "#ChinaLockdown. Not a full lockdown like Shanghai, but Covid restrictions announced in Xi'an, capital of Shaanxi province with 13 million people, ~1,400 km west of Shanghai. #OOTT [LINK]." Our tweet was based on the Global Times (China state owned media) report "*Xi'an launches temporary closed-off management amid latest COVID-19 flare up*". It isn't a full lockdown in Xi'an, but clear Covid restrictions.

Europe diesel imports

Oil – Europe trying to make up for Russia diesel imports

One of the major impacts from Europe's moving to stop Russia energy imports is a shortage of diesel. On Tuesday, we tweeted [LINK] "*It's not just #LNG, Europe also needs to keep attracting #Diesel cargos. Good reminder graphs from @vmohith25 @BloombergNEF*". Europe is heavily dependent on Russia diesel imports for about half of its diesel imports or approx. 700,000 b/d of Russian diesel imports. Our tweet included the below graphs from BloombergNEF's Oil Products Arbitrage and Flows that showed how Europe is trying to make up for diesel imports from Russia. Europe is increasing diesel flows from everywhere – from the US, from the Middle East and from India in its push to replace Russian diesel. Our Supplemental Documents package includes excerpts from the BNEF Oil Products Arbitrage and Flows.

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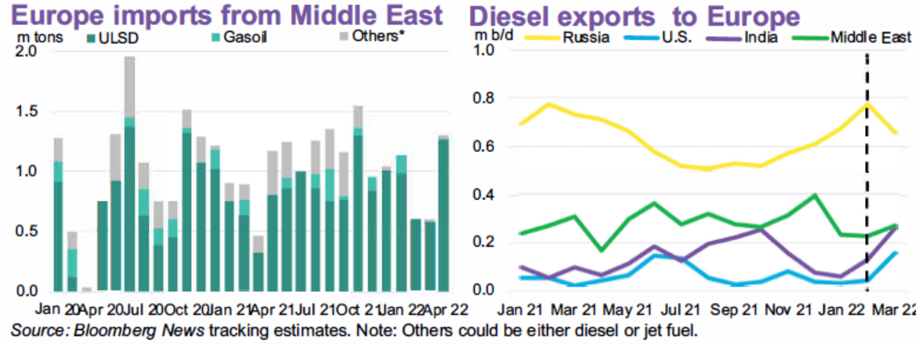
Figure 25: Europe diesel imports



Source: BloombergNEF

Oil – BloombergNEF: Global oil inventories continue to show big deficit

BNEF's global oil inventories

For those with a Bloomberg terminal we recommend flipping thru BloombergNEF's "Oil Price Indicators" weekly that comes out on Mondays as it provides good charts depicting near-term global oil demand and supply indicators. The key data this week is the outlook for global oil and products stocks which delivers a bullish outlook at the widening of the deficit relative to the 2017-2019 average. It is also important to note that most indicators outside of Asia are positive. The deficit for crude and product narrowing from 129.6 mmb to 125.2 mmb compared to the 2017-2019 average. For the week ended Apr 1, land crude oil storage in tracked regions grew WoW at 530.5 mmb. The stockpile deficit against the 5 yr average (2015-2019) narrowed from 85.1 mmb to 81.5 mmb. Total crude inventories increased by 0.4% to 616.7 mmb, including global floating inventories. Product stocks were down 0.4% WoW with the stockpile deficit against the 3-year average widening from 74.6 mmb to 75.3 mmb. Gas oil and middle distillate stocks have narrowed against their three-year average deficit (2017-2019) of 39.1 mmb to 38.4 mmb. Jet fuel consumption by international departures increased by 185,900 b/d WoW while consumption by domestic passenger departures declined by 63,700 b/d, a consecutive week of declines. Global mobility indices were weaker over the week after a decline last week with declines in Europe and Asia Pacific-specifically for China. The high frequency oil and product stockpile deficit against the three-year seasonal average (2017-2019) suggests the stockpile deficit has widened to near the post pandemic record set three weeks ago. Below is a snapshot of aggregate global stockpiles. Our Supplemental Documents package includes excerpts from the Bloomberg report.

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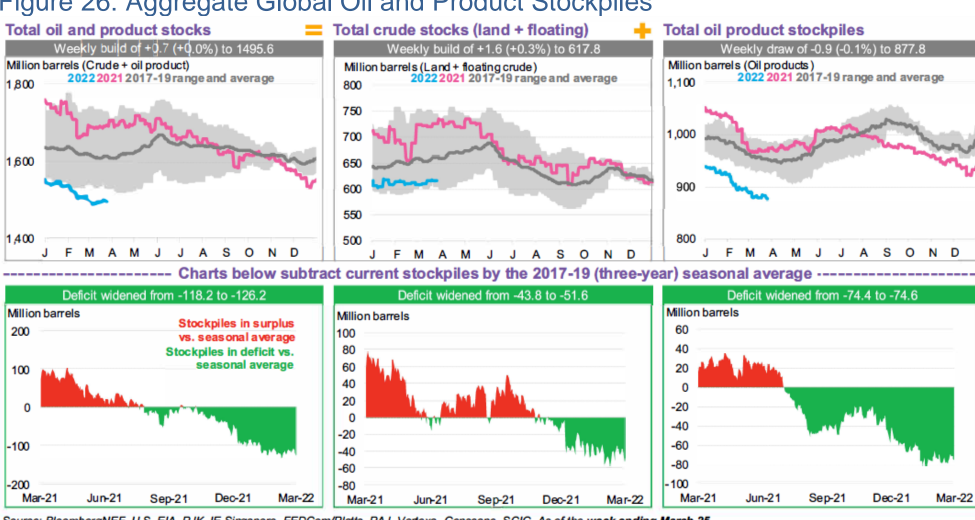
Figure 26: Aggregate Global Oil and Product Stockpiles



Source: Bloomberg

Vortexa crude oil floating storage

Oil – Vortexa crude oil floating storage 91.88 mmb as of April 15, -2.07 mmb WoW

We are referencing the Vortexa global crude oil floating storage data posted on the Bloomberg terminal as of Noon MT yesterday. And we note that these estimates get revised over the course of the week. Note we do not check daily for the revisions, so our comments are compared to the April 8 and April 1 posted on Bloomberg on April 9 at Noon MT. (i) As of Noon MT yesterday, Bloomberg posted Vortexa crude oil floating storage estimate as of April 15 was 91.88 mmb, which is -2.07 mmb WoW vs revised up April 8 of 93.95 mmb. Note April 8 was revised +6.65 mmb from the Bloomberg estimate of 87.30mmb posted as of noon MT on April 9. (ii) The weekly storage fits the general trend over the past few months with crude oil floating storage generally being around the 90 to 95 mmb range. (iii) There were revisions to the prior two week's estimates. Yesterday's April 8 estimate of 93.95 mmb was revised +6.65 mmb from the Bloomberg estimate of 87.30mmb posted as of noon MT on April 9. Yesterday's April 1 estimate of 84.45 mmb was revised -1.52 mmb from the Blooomberg estimate of 85.97 mmb posted as of noon MT on April 9. (iv) April 15 estimate of 91.88 mmb is -131.209 mmb vs June 26, 2020 peak of 223.08 mmb. (v) Note that the below graph goes back 3 years and not just 2 years as crude oil floating storage was in the big ramp up period in late March/early April 2020 as Covid started to have a huge impact. April 15 estimate of 91.88 mmb is +39.58 mmb vs pre-Covid of 52.30 mmb as of April 15, 2019. Note April 17, 2020 was 134.32 mmb and had basically doubled from 63.59 mmb on March 27, 2020. (vi) Below are the last several weeks' estimates made as of yesterday at Noon MT, Apr 9 at Noon MT, and Apr 2 at 1pm MT.

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Figure 27: Vortexa Floating Storage as of April 15 Posted on Bloomberg Noon MT Sat

Source: Bloomberg, Vortexa

Figure 28: Vortexa Estimates Apr 16 noon MT, Apr 9 noon MT, and Apr 2 1pm MT

Est as of Apr 16, noon MT

	Date	FZWWFST VT... Mid Px
Fr	04/15/2022	91882
Fr	04/08/2022	93949
Fr	04/01/2022	84450
Fr	03/25/2022	89304
Fr	03/18/2022	90780
Fr	03/11/2022	93993
Fr	03/04/2022	93116
Fr	02/25/2022	92805
Fr	02/18/2022	86368
Fr	02/11/2022	97959
Fr	02/04/2022	99663

Est as of Apr 9, noon MT

	Date	FZWWFST V... Mid Px
Fr	04/08/2022	87295
Fr	04/01/2022	85965
Fr	03/25/2022	89581
Fr	03/18/2022	91542
Fr	03/11/2022	93402
Fr	03/04/2022	92397
Fr	02/25/2022	92181
Fr	02/18/2022	84472
Fr	02/11/2022	97403
Fr	02/04/2022	98271
Fr	01/28/2022	93433

Est as of Apr 2, 1pm MT

	Date	FZWWFST V... Mid Px
Fr	04/01/2022	89501
Fr	03/25/2022	90194
Fr	03/18/2022	96062
Fr	03/11/2022	90367
Fr	03/04/2022	96009
Fr	02/25/2022	94149
Fr	02/18/2022	85687
Fr	02/11/2022	99352
Fr	02/04/2022	100.9k
Fr	01/28/2022	95887
Fr	01/21/2022	98802

Source: Bloomberg, Vortexa

Oil – Bloomberg Oil Demand Monitor: Europe flights increase while China declines

Bloomberg's Oil Demand Monitor

We recommend reading the weekly Bloomberg terminal Oil Demand Monitor for a good recap of key oil demand indicators around the world. China continues to see declines in air traffic as lockdown measures continue in effort to abate the current Covid-19 outbreak. European airlines have continued to see higher volumes of flights as restrictions continue to ease across the continent. Roadway traffic has stalled as road fuel prices surge around the world. The US DOE has estimated that jet fuel demand has increased 7% in the last month as the demand for aviation fuel continues to narrow, though is still down from 2019 levels; demand for distillates has fallen. Flights in Europe were down 20% from 2019, an improvement from 37% at the end of January as reported by Eurocontrol. Current flight schedules indicate that global seats offered will surpass 100 million seats for the first time since the outset of the pandemic in about 7 weeks time; global capacity has jumped higher again for the week starting April 11, to 85.2 million, as Chinese airlines add more flights to their rosters again. The number of tracked flights at Shanghai's two main airports, Pudong and Hongqiao, declined markedly through March amid severe movement restrictions to combat a coronavirus outbreak, and haven't yet recovered. China's air traffic is not expected to recover

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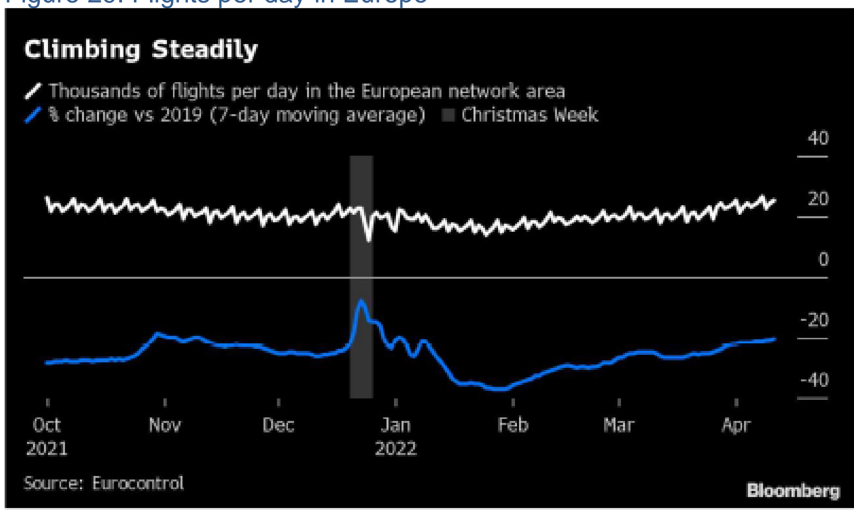
before the end of 2022 under the nations zero-Covid policy. Roadway congestion was down across all of the 13 tracked cities; New York, Taipei and London were down from 2019 levels by 12%, 25% and 52%, respectively. There were 15.3 million vehicles that travelled on US highways for the week ended April 3, down 1.9% from the week earlier, reflecting the elevated road fuel prices. While the pricing environment does not seem to be severely deterring motorists, governments around the world have begun reducing taxes to ease the burden bared by consumers.UK road sales have fallen after the panic buying observed at the end of February as Russia invaded Ukraine. Gasoline and diesel sales for the week ended Apr 3 are 9% below 2019 levels. Our Supplemental Documents package includes the Bloomberg Oil Demand Monitor.

Figure 29: Flights per day in Europe



Source: Bloomberg

Oil – Domestic air travel recovering in most countries

Global domestic RPKs 116% above Feb 2021 levels

On Apr 6, the International Air Transport Association (IATA) released its update for global air travel and cargo [LINK]. The data only goes till February, and accounts for the usual volatility surrounding the Chinese New Year. Global demand, measured in cargo tonne-kilometers (CTKs), rose by 2.7% in both Jan and Feb compared to the previous year, however passenger kilometers (RPKs) are up big, with International RPKs up 115.9% and Domestic RPKs -60.7% YoY. Air cargo markets saw improvements in February as disruptions from Omicron eased outside of Asia though we expect later data in March will represent the impacts of China's lockdowns and the Russia-Ukraine War. The conflict in Ukraine has had a limited impact on air travel demand in February as travel performed well around the world, even between Europe and Asia. The IATA spread of Omicron in China, as well as elevated inflation and falling consumer confidence, will add to the challenges threatening the recovery. Our Supplemental Documents package includes the IATA release

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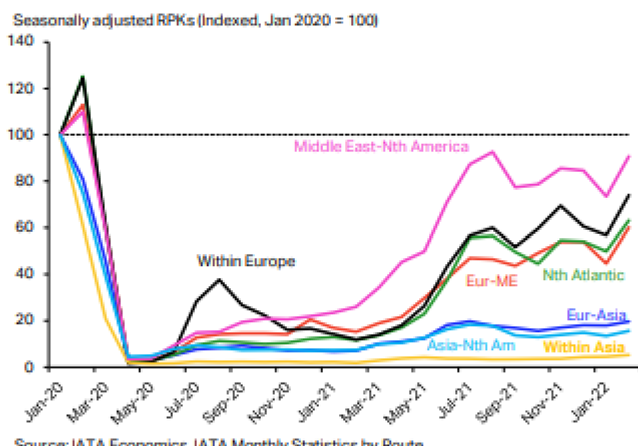
Figure 30: Domestic Travel RPKs Indexed to Jan 2020



Source: IATA

Oil – Delta Air Lines CEP says had record all time bookings in March

Highest all time booking for Delta in March

The big stories everyday are inflation and rising prices in everything. One area that has, at least so far, resisted high price is US air travel. This was reinforced by Delta Air Lines CEO Ed Bastian. We were watching CNBC Wednesday morning and saw Bastian's interview. We then tweeted [LINK] *"#JetFuel. "in the month of March, we've had the highest sales, in terms of bookings, of any month in our history, period" "and this is continuing into April" says @Delta CEO Bastian to @Lebeaucarnews. #OOTT."* Our tweet included the transcript we made of Bastian's comments to CNBC's Phil LeBeau [LINK]. Here is the SAF Group created transcript "Bastian "*the demand is phenomenal. We've never seen, in our company's history, demand for our product and services at the level we are. In the month of March, we've had the highest sales, in terms of bookings, of any month in our history, period*." LeBeau "*highest ever*?" Bastian *"Highest ever in March*." LeBeau *"that's just going back to the start of the pandemic*?" Bastian "*Highest ever and this is continuing into April*."

Tight US jet fuel inventories

Post our Delta Air Lines tweet, we then tweeted [LINK] "*Tight US #JetFuel inventories just as @Delta CEO Bastian tells @Lebeaucarnews record bookings for any month in their history. @EIAgov jet fuel stocks are down 10-20% vs norm for 1st week of April. #OOTT."* Our tweet included the EIA' s estimate of stocks of kerosene-type Jet-fuel compared to the prior 5 years and it shows how current jet-fuel inventories are down about 10-20% vs the 1st week of April for the past 5 years. It's a tight jet-fuel market in the face of record US airline bookings by companies like Delta Air Lines.

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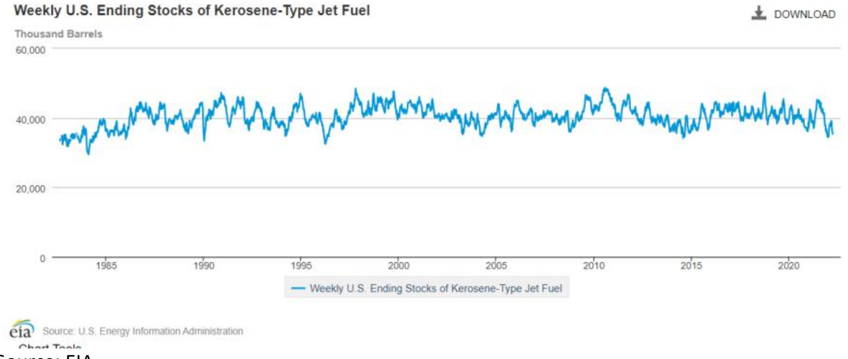
Figure 31: EIA US ending stocks of kerosene-type jet-fuel for 1st week of April

EIA U.S. Ending Stocks of Kerosene-Type Jet-Fuel For 1st Week of April

2022: 35.4 mmb
2021: 38.3
2020: 38.9
2019: 41.9
2018: 40.0
2017: 42.5

Source: EIA

Figure 32: Weekly US ending stocks of kerosene-type jet-fuel



Source: EIA

Oil – Lower income Americans feeling the pinch of gasoline prices

Lower income drivers hit harder by gas prices

The recent surge in gas prices have hit low-income drivers in the United States the hardest in recent weeks. FinanceBuzz released an article on Apr 6 [LINK] that sought to determine how much the average US driver's income is spent on gas. The study found that the average US driver spends 2.24% of their monthly income on gas, compared to the average US pickup truck and SUV driver who spend 3.12% of their monthly income. Six out of the ten states that spend the highest percentage of their monthly income on gas are in the south. Alabama residents pay the most at 7.71% of their monthly income while e Wyoming is the second highest at 6.82% and Mississippi comes in at 3rd with residents spend 6.71% of their monthly income on gasoline. Alabama also has one of the lowest monthly incomes in the country at $3,652/month and Mississippi coming in even lower at $3,354/month drivers in Washington, D.C., New York, and Alaska pay the lowest percent of their monthly income on gas. Car owners in Washington, D.C. spend 0.73% of their income on fuel. New York's median income is $4,709/month and Washington DC is $6,529/month with Alaska at $4,673/month. In an effort to reduce gas prices, some states have implemented "gas tax holidays," which typically involve suspending taxes on gas across the state for a certain period. Maryland, Georgia, and Connecticut were the first states to suspend fuel taxes, but other states are also considering taking action. Our Supplemental Documents package includes excerpts from the FinanceBuzz report.

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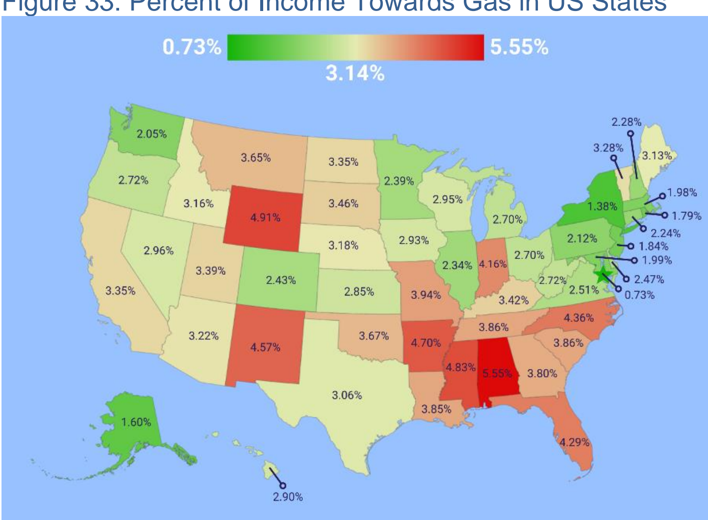
Figure 33: Percent of Income Towards Gas in US States



Source: FinanceBuzz

New taxes on pickup trucks

Oil – Liberals new taxes on pickup trucks

On Thurs, Alberta Premier Kenney tweeted [LINK] on what he calls the New Liberal NDP Truck Tax Grab, noting that an F350 would be charged an extra $4,000 and even an F150 would be charged an extra $1,000. Kenney is right, there is a new tax on pickup trucks that the Liberals introduced two weeks ago on pg 192 of their 2030 Emissions Reduction Plan. The Liberals hope the additional ZEV incentives will encourage smaller vehicles of all fuel types. We know a number of independent contractors who will be impacted and we dobt that any of them could switch to a smaller pickup truck. We tweeted [LINK] "*Here is pg 192 excerpt Liberals "2030 Emissions Reduction Plan" on adding sliding scale Green Levy on pickup trucks. one of the many battles for @jkenney with some big ones still to come from the ERP. #OOTT.*" Our tweet included the pg 192 excerpt from the Liberals "2030 Emissions Reduction Plan" that said "*Encourage ZEV adoption. Consider adopting an approach that combines financial incentives for the purchase of ZEVs with fees for the purchase of fuel-inefficient ICE vehicles. Broaden Canada's existing Green Levy (Excise Tax) for Fuel Inefficient Vehicles to include additional ICE vehicle types, such as pickup trucks. A sliding scale for the implementation of this Green Levy should be developed based on the emissions produced from different vehicles. Revenue from a broadened Green Levy could increase available funding for ZEV incentives for individuals and organizations without limiting the fleet size and while encouraging smaller vehicles of all fuel types. Carefully consider the impacts on and supports for low-income households and other vulnerable populations when exploring changes to the Green Levy and ZEV incentives.*"

Air conditioning vs driving with open windows

Oil – 30 mph is indifference gasoline consumption point for using AC vs open windows

Here is a little gasoline consumption tidbit from today's Express (UK) report "*Drivers urged to 'make changes' as air con and open windows slashes fuel efficiency*". [LINK] Apparently up to 30 mph, a driver will save on gasoline consumption driving with the windows open, but over 30 mph, a drive saves gasoline consumption using air conditioning. The Express writes

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"*When driving at 45mph, many variables can change how much fuel is used, including the weather, the weight of the car and the driving style. If a driver is travelling at this speed and using the air conditioning, it can increase fuel consumption by around 10 percent. In comparison, when driving at 45mph and having the windows open causes drag, meaning fuel consumption can be increased by as much as 20 percent. At low speeds, drivers should open the window as the fuel used to compensate for drag is less than the fuel used to power the air con. But when driving on the motorway, drivers should follow the opposite advice. The climate control should be turned on and the windows should be rolled up. Mr Kindred said the tipping point for this is around 30mph."*

Oil & Natural Gas – Texas drought conditions worst since 2011, expected to get worse

Texas drought conditions

The oil and gas sector only represents ~3% of total Texas water consumption, but, it's still worth watching the Texas drought conditions. So far, no expectations for any water cutbacks this summer. Yesterday, we tweeted [LINK] "*Texas drought conditions worst since 2011, expected to get worse in near term, hopefully not enough to cause cutbacks. #Oil #Gas (Mining) is only 3% of TX water use. But last thing needed is impact on irrigation for food. Good @twdb recap [LINK] #OOTT*." We referenced a good Texas Water Development Board short video recapping the Texas drought conditions as of the end of March, which included the below graphs/tables. The TWDB warned that drought conditions are the worse since 2011, expected to get worse in the near term, and water storage levels are 6.5% below normal. The TWDB did not say Texas is at a critical level, rather it was just a warning that drought conditions are widespread and going to get worse. Our tweet also referenced the TWDB data showing Texas water consumption by industry. The oil and gas sector is part of what TWDB calls mining, and only uses 3% of Texas waer consumption. The major consumer of water in Texas is irrigation. Our Supplemental Documents package includes the TWDB's updated drought report and their Texas water consumption by industry for 2019.

Figure 34: Texas Water Development Board recap at end of March

- March was drier and cooler than normal for much of the state.
- Drought conditions covered 88 percent of the state, the worst conditions this time of year since 2011.
- Storage in our water supply reservoirs is at 78 percent of capacity, 6.5 percentage points below normal.
- Drought is expected to expand and intensify in Texas over the next few months.

Source: Texas Water Development Board

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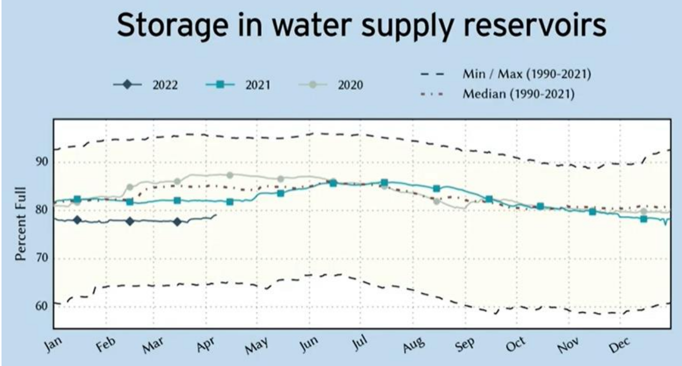
Figure 35: Texas Storage in water supply reservoirs at end of March



Source: Texas Water Development Board

Oil & Natural Gas – Biden has no choice but to keep sanctions pressure on Russia

Biden's low approval ratings

On Thursday, the Quinnipiac Poll showed Biden's approval ratings have once again dropped and are back the low approvals he received on Jan 12 before he got a bump with Russia/Ukraine. We tweeted [LINK] "*Americans want more US support to UA, but only 19% prepared to risk war w/ RUS. #Biden approval 33% & RUS/UA handling 39%. thru mid-terms, does #Biden have any choice but try to get more countries like Japan to ban RUS #Oil #NatGas #LNG imports? #OOTT*." Biden has low approval ratings overall for his job and for his handling on Russia/Ukraine and Americans also want to do more against Russia but only 19% of Americans are prepared to risk war with Russia. The reality is that mid terms are now less than 6 months away. Americans want the US to do more, but are still mostly wary about getting the US dragged into a war with Russia. We think there is a big energy implication here – Biden has no choice but to push hard on more countries to shut Russia especially on energy ie. pushing countries like Japan to move away faster from Russia energy. We are now starting to see Japan look like it is starting to waiver. And with Biden's low approval ratings, it means that it's almost impossible to see how Biden can reduce any Putin push before the mid terms. If so, it means that the push against the Japan's of the world will be more lasting on Russia thru the 2020s. It gets back to the point our view that the oil and natural gas supply picture is much tighter than the numbers may suggest. Our Supplemental Documents package includes the Quinnipiac poll.

Oil & Natural Gas– Expect record cash flows in Q1 for Cdn E&P, higher again in Q2

Expect record Q1 cash flows

We are about 2 weeks away away from Q1 reporting for the Cdn oil and gas companies and one thing is clear, there should be record cash flows. And that means the conference calls will all the analysts starting off with the "great quarter guys". The conference calls will be peppered with analysts. On April 1, we tweeted [LINK] that Cdn E&P should report record Q1/22 cash flows. Cash flows will be up huge YoY and also big QoQ. Edmonton par oil prices in Q1/22 were If we use Ed Par oil prices, WCS oil prices and AECO natural gas prices, Q1/22 Ed Par prices of US$93.66/b were +72.9% YoY and +26.8% QoQ. Q1/22 WCS prices of US$82.51/b were +80.0% YoY and +35.3% QoQ. Q1/22 AECO prices of $4.51 were +43.9% YoY and +0.6% QoQ. And based on April 8 closing prices, it looks like Q2 will be even higher cash flows. On Thursday, WTI closed at $106.95, Ed Par at $113.76, WCS at $93.96 and AECO at $6.69. Below is our updated table of quarterly oil and natural gas prices.

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Figure 36: Oil and Natural Gas Prices

Quarter	Brent US$	WTI US$	EdPar US$	WCS US$	HH US$	AECO C$
Q1/18	$67.00	$62.86	$57.19	$37.11	$3.09	$2.06
Q2/18	$74.41	$67.83	$60.78	$49.88	$2.84	$1.23
Q3/18	$75.27	$69.69	$59.81	$42.32	$2.92	$1.25
Q4/18	$68.18	$59.41	$36.53	$25.63	$3.78	$1.62
Q1/19	$62.91	$54.49	$50.28	$43.79	$2.92	$2.55
Q2/19	$68.58	$59.96	$54.41	$47.46	$2.55	$1.13
Q3/19	$61.95	$56.48	$52.43	$43.91	$2.37	$1.00
Q4/19	$62.51	$56.83	$50.61	$37.98	$2.36	$2.46
Q1/20	$51.28	$46.73	$39.75	$28.55	$1.91	$2.04
Q2/20	$31.14	$27.67	$21.84	$18.02	$1.70	$2.00
Q3/20	$42.70	$40.87	$36.83	$31.13	$1.98	$2.26
Q4/20	$44.47	$42.67	$37.92	$31.34	$2.47	$2.65
Q1/21	$60.51	$57.75	$54.17	$45.83	$3.39	$3.13
Q2/21	$68.44	$65.90	$61.94	$53.11	$2.89	$2.95
Q3/21	$72.95	$70.57	$66.90	$57.65	$4.28	$3.41
Q4/21	$79.43	$77.31	$73.84	$60.96	$4.74	$4.49
Q1/22	$99.08	$94.79	$93.66	$82.51	$4.61	$4.51

Source: Bloomberg

Oil & Natural Gas – Quebec becomes first jurisdiction to ban O&G exploration

Quebec bans O&G exploration

In what campaigners are calling a "world first", Quebec's National assembly voted to ban new oil and gas exploration within the province. On Wednesday, the Energy Mixer noted [LINK] that the vote also included the shut down of existing drill site withing the next 3 years even as promoters tried to revive projects in the wake of the Russia-Ukraine conflict. Montreal-based Equiterre noted in the article *"By becoming the first state to ban oil and gas development on its territory, Quebec is paving the way for other states around the world and encouraging them to do the same. However, it is important that the political will that made this law possible be translated into greenhouse gas reductions in the province, since Quebec and Canada have done too little to reduce their GHGs over the past 30 years."* Quebec has indicated that the reclamation and cleanup of its existing 1,000 wells will be the responsibility of the existing energy companies operating within the province. Bill 21 will require fossil operators to shut down existing exploration wells within three years, or 12 months if the sites are at risk of leaking. The bill follows Quebec's announcement during last year's COP 26 climate summit that it would join the Beyond Oil and Gas Alliance (BOGA), part of a list of a dozen jurisdictions that did not include Canada, the United States, or the United Kingdom. The bill passed just days after it was reported that GNL Québec's $14-billion Énergie Saguenay megaproject, was trying to resurrect its plan to ship LNG to Europe, with the war in Ukraine as its justification. Quebec rejected the proposal in July amid massive public opposition and concerns about an incomplete environmental assessment, with opponents warning that it would produce 1.8 billion tonnes of GHG emissions over 25 years and risk damage to wetlands, water pollution, and other impacts on traditional Innu territory.

Energy Transition – Volvo C40 Recharge is 100% electric, 0% leather

Volvo C40 highlights 0% leather

On Wednesday, we saw the commercial for Volvo's new C40 Recharge [LINK]. The first two selling features mentioned were "*100% electric*" and then "*0% leather*". They noted 0% leather as a selling feature even ahead of "*go places with 200+ mile range on a single charge*". So we couldn't help tweet [LINK] "*just saw the new #Volvo C40 Recharge commercial with the selling features 100% electric and 0% leather. anyone else remember*

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when Chrysler had Ricardo Montalban introducing the 1975 Chrysler Cordoba with the big selling feature "fine Corinthian leather". It wasn't that long ago that leather was considered a selling feature for a car, but how could we not remind of who probably was the best car pitch person for leather – Ricardo Montalban with his classic accented "find Corinthian leather". In the pre-EV era, leather was a luxury feature that was symbolic of luxury cars and it cost more. So give Volvo credit, they can save money by using cheaper cloth seats and make it a selling feature. Wonder if future versions of the 0% leather feature will show a cow?

Figure 37: 1975 Chrysler Cordoba commercial with Ricardo Montalban

Source: Chrysler

Capital Markets – Increasing railway capacity constraints are adding to US inflation

US railway capacity constraints

The last thing the economy needs is more supply chain constraints, but the US is far from over supply chain constraints that will only add to inflationary pressures and also to less supply of key staples – food and fuel. And as a reminder, items like fertilizer shortage in the US will flow thru to impact Canada. (i) On Monday, Union Pacific rail released a letter to its customers [LINK] advising that their "*network has experienced some setbacks – including numerous service interruptions, crew shortages in select areas and delays to our network – as we have seen our operating inventory continue to climb over the past 60 days. This additional inventory has led to more congestion in yards, an imbalance of our resources, and further slowdown of our operational performance*." To deal with the backlog, Union Pacific is "*now asking for your help to further reduce the number of active rail cars on our network. We have already identified and notified those customers who can help us manage the current congestion by reducing their rail car inventories. If we do not see reductions to the operating inventory through their voluntary efforts, then we will begin metering traffic after April 18th."* (ii) Apparently energy and agriculture are among these customers being "asked" to cut back on shipments. We have not seen any specific disclosure from energy shippers as to the % being asked to cut back, but we would assume it would be similar to agriculture. For example, fertilizer company, CF Industries [LINK] wrote "o*n Friday, April 8, 2022, Union Pacific informed CF Industries without advance notice that it was mandating certain shippers to reduce the volume of private cars on its railroad effective immediately. The Company was told to reduce its shipments by nearly 20%. CF Industries believes it will still be able to fulfill delivery of product already contracted for rail shipment to Union Pacific destinations, albeit with likely delays. However, because Union Pacific has told the Company that noncompliance will result in the embargo of its facilities by the railroad, CF Industries may not have available shipping capacity to take new rail orders involving Union Pacific rail lines to meet late season*

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demand for fertilizer. The application of nitrogen fertilizer is critical to maximizing crop yields. If farmers are unable to secure all the nitrogen fertilizer that they require in the current season because of supply chain disruptions such as rail shipping restrictions, the Company expects yield will be lower. This will likely extend the timeline to replenish global grains stocks. Low global grains stocks continue to support high front month and forward prices for nitrogen-consuming crops, which has contributed to higher food prices." (iii) The Surface Transportation Board said they were holding hearings on Apr 26/27 to deal with this rail issue. We recognize that process is important for the Surface Transportation Board so it's good news that there is a hearing to deal with it. However, the problems with process is that it requires time, and, in particular for agriculture, time is of the essence at this time of the year and therefore action is needed. End results for any restriction on supply for energy products and agriculture products is that it will only add to inflation. Our Supplemental Documents package includes the Union Pacific release, the CF Industries, release, the Surface Transportation Board release and backgrounder.

Capital Markets – Inflation causing Americans to cut back on spending

84% of Americans cutting back on spending

We are seeing around the world reports of how people are having to cut back due to inflation driving prices up pretty well every item including the staples of food and fuel. The US and the rest of the world has endured the steepest inflation since the early 1980s and is rattling spending budgets and habits across the US. On Tuesday, Bloomberg reported 84% of Americans are planning on cutting back their spending due to the higher prices. Harris Poll conducted the Poll for Bloomberg News and indicated that the biggest cuts in spending involved eating out less, fewer impulse purchases and numerous reductions in activities like driving, sporting events and concerts. While the job market continues to make gains and remain stable, wages have not kept up with the inflation rate of everyday items which now sits at 8.5%; consumers are enduring obstacles on all sides as the Fed starts to increase interest rates. The Harris Poll found that more than 70% of respondents say they are feeling the effects of inflation which is mostly in gas and grocery prices. This was supported by the Consumer Price Index for March which saw gas prices increase by 48% from a year earlier and food rising 8.8%. The poll was conducted among a nationally representative sample of 2,100 Americans during two weekends in April, before the inflation report. About 40% of Americans say that inflation is causing them to spend less on items that may be good for their health but are more expensive. Millennials are most likely to do this, followed by Gen Z and Gen X. We were unable to obtain the Harris Poll for reference on the reported data. Our Supplemental Documents package includes the Bloomberg report.

Demographics – College grads from college grad parents have highest income

College grads have higher median earnings

I am a little surprised to see the Pew Research survey data that shows college graduates from wealthier families still have a big pay advantage over college graduates who had parents without a college degree. There is no question that in the 70's college graduates from families more likely to have business connections were more likely to get better starting opportunities. Part of that was due to being able to go to the higher regarded universities. But, I am surprised that gap is still there. On Tuesday, Pew Research released a study on that highlighted 10 facts about today's college graduates [LINK]. There is no surprise that college graduates continue to make way more than non-college graduates. In 2021, full-time workers ages 22 to 27 who held a bachelor's degree, but no further education, made a

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median annual wage of $52,000, compared with $30,000 for full-time workers of the same age with a high school diploma and no degree. But Pew also noted that that graduates who had parents without a college degree, ie first generation college graduates, lag significantly behind second generation college students with a median income of $99,600 in 2019 compared with $135,800. First generation college graduates are more likely to accumulate det while second generation graduates typically come from more affluent families and are less likely to incur any debt. Our Supplemental Documents package includes the Pew survey.

Demographics – Money talks with respect to attracting or retaining employees

Pay is #1 to employees

On Wednesday, Willis Towers Watson posted findings from their 2022 Global Benefits Attitude Survey that was titled "*Infographic: More than half of employees open to leaving employer."* [LINK] The big picture them on employees leaving has been the major employment theme since Covid on how many employees are switching jobs. WTW survey was 53% are either actively looking for new opportunities or at risk of leaving. And two-fifths would leave for a 5% pay increase, and 1 in 5 would leave for the same pay. The reality is that one theme is unchanged over the past decades – money talks and pay and bonus are the primary reason for job jumping. WTW also noted the increasing importance of health benefits, which, in reality, are really an increasing component of pay package. Below we past the WTW table that shows the top reason for moving to a new job is pay and bonus, as it is the top reason for staying. Our Supplemental Documents package includes the WTW infographic.

Figure 38: Employee considerations while weighting job options

Employee considerations when weighing job options

Top reasons for staying		Top reasons for moving to new job	
Pay and bonus	39%	Pay and bonus	56%
Job security	38%	Health benefits	39%
Health benefits	34%	Job security	33%
Flexible work	29%	Flexible work	31%

Source: Willis Towers Watson

Demographics – 23% of US adults are part of the "*sandwich generation*"

the "*sandwich generation*"

We had never heard the term "sandwich generation" before seeing the Pew Research Apr 8 blog "*More than half of Americans in their 40s are 'sandwiched' between an aging parent and their own children*". [LINK] Pew said that for all US adults, its 23% are now part of the so-called "*sandwich generation*". This generation are sandwiched between parents who are living longer and adult children who are struggling to achieve financial independence. Pew said "*These are adults who have a parent age 65 or older and are either raising at least one child younger than 18 or providing financial support to an adult child. Americans in their 40s are the most likely to be sandwiched between their children and an aging parent. More than*

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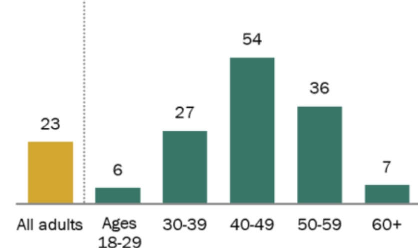
half in this age group (54%) have a living parent age 65 or older and are either raising a child younger than 18 or have an adult child they helped financially in the past year. By comparison, 36% of those in their 50s, 27% of those in their 30s, and fewer than one-in-ten of those younger than 30 (6%) or 60 and older (7%) are in this situation."

Figure 39: Americans in the sandwich generation by age group

Adults in their 40s are the most likely to be in the 'sandwich generation'

% who have a parent 65+ and have a child younger than 18 or have provided financial support to an adult child in the year prior to the survey



Source: Survey of U.S. adults conducted Oct. 18-24, 2021.

Source: Pew Research

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

@Energy_Tidbits on Twitter

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

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

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

Misc Facts and Figures.

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

75 years ago, Jackie Robinson broke the MLB color barrier

It was 75 years ago, on April 15, 1947, that Jackie Robinson broke the Major League Baseball color barrier and made his first appearance for the Brooklyn Dodgers (now Los Angeles Dodgers after moving to LA in 1958) at a home game at Ebbets Field. After signing with the Dodgers, Robinson spent his first season with the old Montreal

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Royals, the then top farm team for the Brooklyn Dodgers. Robinson was star baseball player winning Rookie of the Year, later an MVP, a several time all-star and is in the Hall of Fame. But perhaps even more significantly, he had to put up with what was probably an unbelievable racial attacks. I can't imagine what Robinson had to put up with in his historic quest. I say that because I had the opportunity to play hockey with, as a kid, with the second ever black NHL hockey player, Mike Marson, and still remember the racial slurs and shunning he put up with and this is when we kids. Mike made his NHL debut in 1974, 16 years after Willie O"Ree broke the NHL's color barrier. Our Supplemental Documents report includes a good profile of Mike Marson. [LINK]

A favorite food holiday on Tuesday for Japanese – National Rice Ball Day

I have to believe that anyone growing up in a Japanese family had to have rice balls as a staple as a snack or instead of a sandwich for lunch at school or for when we would drive from Toronto to Fort William to see our relatives. So how I could not note that April 19 is National Rice Ball Day. [LINK]. And we did call them rice balls or as Foodimentary notes, Onigiri. Onigiri is different from Nigiri sushi. Onigiri is a rice ball, basically sushi rice with a strip of nori. Nigiri sushi is what you get at restaurants

The "Oil Patch Warrior" statue in the UK is a great oil story

The API President Sommers speech to the Economic Club of Florida [LINK] on Thursday reminded me of a great oilpatch story that I haven't noted for more several years – how US oil drillers helped the UK during WWII. Sommers said "*I think back into history, at the height of World War Two. Britain had a severe energy shortage. Supplies from the Middle East were hindered by enemy movements, and oil tankers were under attack by U-boats, which were devastating allied shipping. England at the time had an oilfield near the famous Sherwood Forest. What it didn't have were men with the experience and the equipment to put that oilfield to maximum advantage. In the short of it, crews and drilling rigs from a small town in Oklahoma soon arrived. They drilled nearly a hundred wells and quickly increased production by tenfold. Everyone was amazed by the skill and speed of these American roughnecks, who did all of this without enemy intelligence ever even learning what they were up to. The job done, our men came home. It took time for recognition to come their way. But now in Ardmore, Oklahoma, there's a statue known as the Oil Patch Warrior. It's an exact replica of one that stands in Nottinghamshire, England. Both monuments honor America's critical contribution to victory in Europe.*"

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Figure 40: The Oil Patch Warrior in UK

Source: AF Branco

Chelsea FC's cauliflower and celery snack for £7.95.

It must be something that is regular feature for The Sun (UK) to look at the worst deals at UK football (soccer) snack bars in the Premier League. We look at UK press most days, in great part to look at their "football" coverage. Last Sunday, The Sun report "*FORKING HELL Chelsea mocked for selling a meal of cauliflower and celery for £7.95*" [LINK] featured Chelea's vegan snack. The Sun wrote "*Chelsea fans have mocked the club for selling a meal of cauliflower and celery for £7.95. One took a photo of the meal which contained just seven coated buffalo cauliflower wings and four tiny sticks of celery.*" Our Feb 20, 2022 Energy Tidbits noted The Sun Feb 13 report "*SNACK OF THE NET Worst football club fan food revealed as Man Utd serves up scrambled egg with mashed potato.*" [LINK].

Figure 41: Chelsea's cauliflower & celery snack

Source: The Sun

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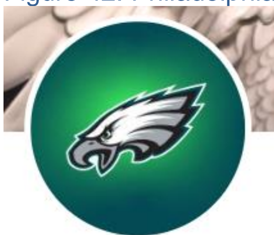
Almost every NFL, MLB, NHL, NBA team logos face to the right.

It's always a surprise when we are looking at Australian news sites for reports on Australian LNG projects to run across an interesting report on US sports, in this case the NFL. And especially an NFL trivia that most probably didn't know. Every NFL logo either faces straight on or to the right, other than the Philadelphia Eagles. news.com.au report "*Hidden optical illusion why Philadelphia Eagles are not like the rest of the NFL"* noted that "the Philadelphia Eagles logo is facing the opposite direct to the rest of the NFL logo, and the reason is just brilliant design. *The feathers at the back of the eagle actually double up to form the letter "E", for Eagles. The three main feathers facing to the right stick out in order to look like the letter. And while it's hard to find initially, it can't be unseen after being identified. It's a very clever tactic, and one that wouldn't have been possible were the eagle facing to the right."* Of course, we had to check other leagues. Almost all have the graphics or caricature slant to the right except NBA (Boston Celtics), MLB (Toronto Blue Jays), and NHL (Chicago Blackhawks and Pittsburgh Penguins)

Figure 42: Philadelphia Eagles logo



Source: Philadelphia Eagles

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