Global Metals Weekly

Aluminium prices have been falling, and so has production

Aluminium production is contracting

Smelters globally have had little appetite to boost production YTD, with supply dropping by 0.5% YoY in July. Even in China, where margins have been positive, output fell by 0.6% MoM. That said, some of the capacity idled in China's Yunnan province due to hydro power shortages has restarted and tonnages should hit the market after the summer. This has various implications: for example, unless demand strengthens, some of the material Rusal sends to China may not find a home, suggesting the operating environment for the producer could remain challenging.

Demand is solid in China, but weak elsewhere

Granted, China's apparent consumption has been holding up, expanding by 8% YoY YTD, with purchased tonnages consistently above last year's levels, except in April, when concerns over the health of the economy escalated. The breakdown of demand growth highlights that sectoral contributions have diverged: construction has been a drag, but that has been offset by increased activity in other industries; this has also been confirmed by Chalco's management. As a result, the physical market has been supported. Demand growing in almost double digits against profound macro concerns is phenomenal; it also highlights that traditional growth drivers like housing are becoming less relevant. Demand ex-China, however, has been somewhat subdued, which is one reason that physical premia are trading below recent peaks.

LME inventories dominated by Russian material

Total exchange and non-exchange stocks have stabilised at the lower end of the longer-term ranges. This confirms that supply discipline has helped stabilise fundamentals against the backdrop of muted demand. Taking a closer look at exchange stocks, Russian tonnages now dominate LME warehouses. Cash to three-month spreads have risen sharply, which could be interpreted as market participants having shown less interest in Russian material, putting them into the market, which in turn pushes up the contango.

Rising contango should support physical premia

Rising interest rates have also had an influence on time spreads. Yet the gap between current time spreads and the maximum arbitrage-free contango has continued to narrow, suggesting that convenience yields have also declined. One implication is that the P&L of warehouse financing deals has become positive again. In turn, this has implications for the physical market: if traders can lock up metal in financing deals, this may ultimately reduce the incentive to ship metal into the market, which should support physical premia.

30 August 2023

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Lower prices, lower production

Global aluminium production is restrained

China's production down 0.6% MoM in July

The latest run of global aluminium production shows that smelters globally have had little appetite to boost production, with global supply dropping by 0.5% YoY in July. Granted, operators in China raised output by 3% MoM in the past month, but adjusted for the number of working days, production was actually down 0.6% MoM. This matters because of persistent concerns that a restart of smelters in Yunnan province (idled over tight hydro power supply) could lead to weaker aluminium fundamentals.

Exhibit 1: Global aluminium production
Aluminium production declined by 0.5% MoM

	YTD 2023	YTD 2022	YoY change	Annualised Jul-23	Annualised Jul-22	YoY change	Annualised Jun-23	MoM change	YTD 2023 Annualised	2023 S/D model	Model v YTD Delta
Africa	922	940	-1.9%	1,578	1,625	-2.9%	1,594	-1.0%	1,581	1,646	65
North America	2,238	2,195	2.0%	3,885	3,603	7.8%	3,906	-0.5%	3,837	4,058	221
Latin America	841	697	20.7%	1,460	1,307	11.7%	1,472	-0.8%	1,442	1,689	247
Asia	2,710	2,655	2.1%	4,674	4,498	3.9%	4,672	0.1%	4,646	5,930	1,285
West Europe	1,575	1,734	-9.2%	2,708	2,967	-8.7%	2,713	-0.2%	2,700	3,130	430
E.Europe	2,330	2,379	-2.1%	3,968	4,121	-3.7%	3,979	-0.3%	3,994	4,049	55
Oceania	1,089	1,063	2.4%	1,884	1,801	4.6%	1,862	1.2%	1,867	1,958	91
Middle East	3,556	3,527	0.8%	6,111	6,099	0.2%	6,120	-0.1%	6,096	6,710	614
Other non-IAI nations	1,090	1,090	0.0%	1,884	1,884	0.0%	1,874	0.5%	1,869	0	-1,869
IAI ex-China	16,351	16,280	0.4%	28,152	27,905	0.9%	28,190	-0.1%	28,030	29,170	1,139
China	23,720	23,214	2.2%	40,856	41,433	-1.4%	41,087	-0.6%	40,663	40,601	-62
IAI Total	**40,071**	**39,494**	**1.5%**	**69,009**	**69,338**	**-0.5%**	**69,277**	**-0.4%**	**68,693**	**69,770**	**1,077**

Source: IAI, BofA Global Research

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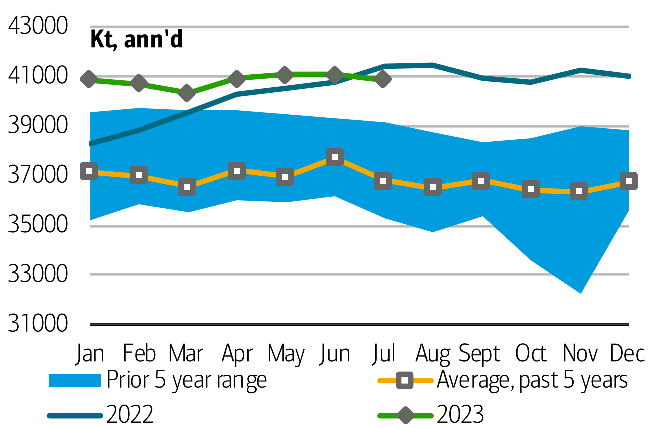
Exhibit 2 confirms that China's aluminium production has been stable so far this year. Similarly, output in World ex-China has been trending sideways.

Exhibit 2: China, aluminium production
China's aluminium production has been stable around 41Mt YTD



Source: IAI, BofA Global Research

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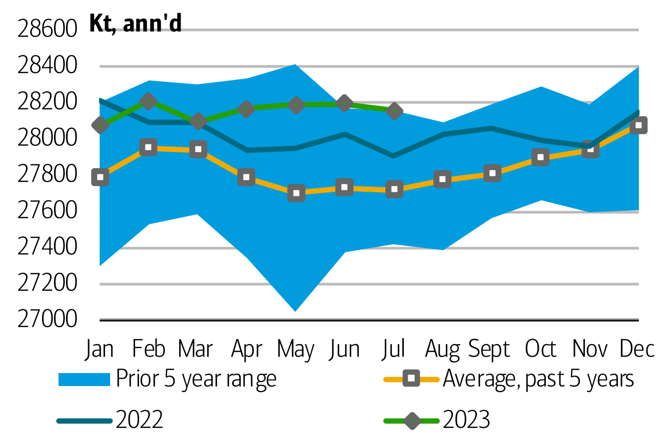
Exhibit 3: World ex-China, aluminium production
Smelters in World ex-China have not boosted supply



Source: IAI, BofA Global Research

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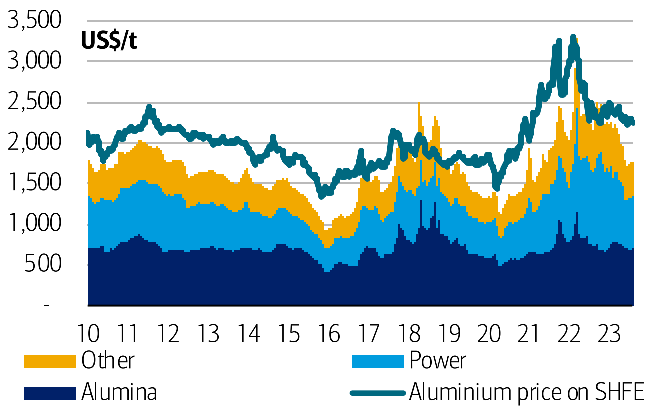
Production costs are falling, but smelters remain disciplined

Smelters don't take advantage of margins

The lack of production increases YTD is worth noting when we keep in mind that profit margins at an "average" Chinese smelter purchasing spot coal and alumina are positive, as our real-time cost estimator highlights (Exhibit 3). This is somewhat unusual because operators would not have left money on the table in the past; i.e. profits usually lead to output increases.

Exhibit 4: China, cash cost estimator on spot coal and alumina
Profit margins of an "average" smelter in China are positive



Source: Bloomberg, BofA Global Research

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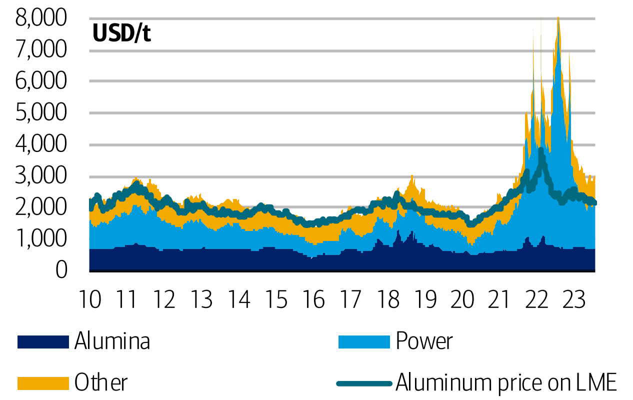
Exhibit 5: Europe, cash cost estimator on spot electricity and alumina
Headwinds for European smelters have subsided somewhat



Source: Bloomberg, BofA Global Research

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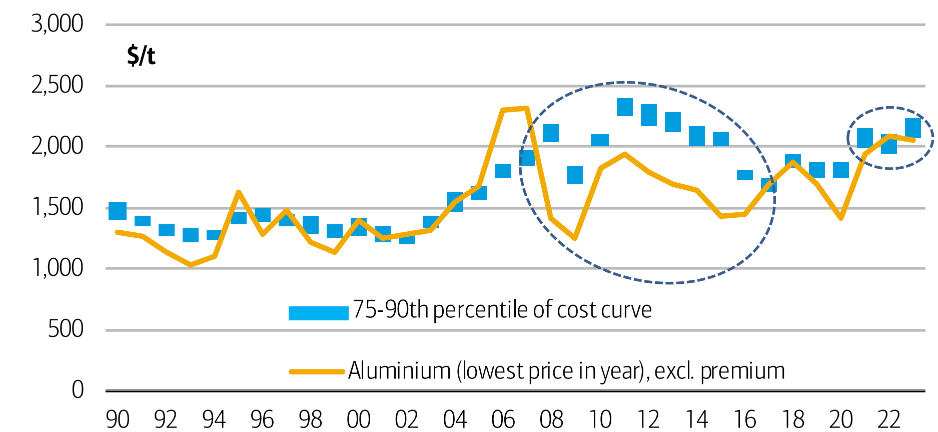
Exhibit 6 looks at the relationship between prices and costs from a different angle, highlighting that the production discipline has served the smelters well, with the 75th-90th percentile of the cost curve profitable even at the lowest intra-year price seen in recent months. This discipline is one reason we are optimistic that aluminium prices should stabilise, even if the demand backdrop remains somewhat patchy.

Exhibit 6: Aluminium production costs and prices
Production discipline has compressed the gap between the tail end of the cost curve and prices



Source: Bloomberg, Woodmac, BofA Global Research

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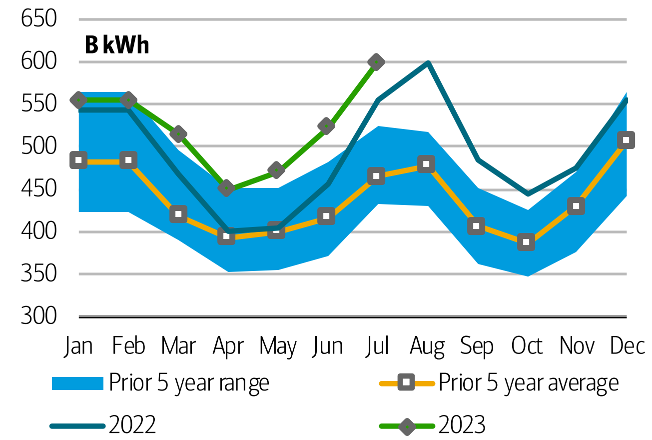
Incidentally, the 45Mt capacity cap imposed by the Chinese government has also helped keep fundamentals supported. While we acknowledge concerns on whether production restrictions will be firmly implemented, it is worth noting that Yunnan Aluminium is set to transfer 100Kt worth of its production quota to Chalco. To put this into context, smelters can only increase production if the corresponding amount of new capacity is closed at existing smelters. Yunnan Aluminium left its quota unused, because it was not included in wider primary aluminium production capacity in Yunnan Province. As such, we don't see any change to government policy on the capacity cap.

China's hydro power backdrop remains challenging

Operators in Yunnan province had idled around 2Mt of capacity over electricity shortages, and hydro power generation is still running at multi-year lows (Chart 2). We acknowledge that smelters in the region have reactivated facilities (see Chalco (H): Mgmt call: Optimistic about aluminum price and margin to expand in 2H23 29 August 2023) and some of those tonnages should feed into the market from August onwards. At the same time, uncertainty over production increases persists, also because dryer weather could put hydro power generation at risk again further down the line.

Exhibit 7: China, thermal power generation

Thermal power generation has been elevated



Source: Bloomberg, BofA Global Research

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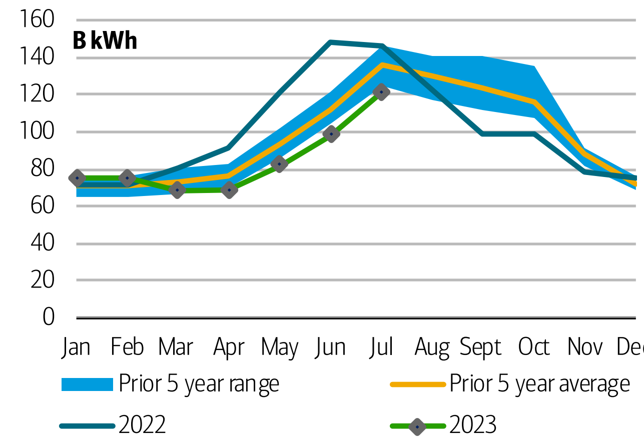
Exhibit 8: China, hydro power generation

Hydro power generation has been running at multi-year lows



Source: Bloomberg, BofA Global Research

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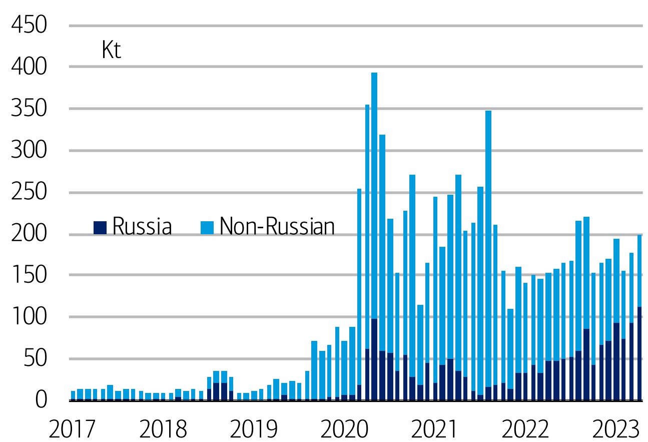
Of course, these production increases matter when we consider that China has boosted imports of Russian aluminium, as Exhibit 9 highlights. Exhibit 10 shows that Rusal's material has not displaced tonnages produced domestically in China, with exports stable. Yet as China's smelters churn out more aluminium, there is apprehension over cannibalisation of shipments from Russia, potentially increasing the risk that some of these units may struggle to find a home (more on this in the next section).

Exhibit 9: China, imports of unwrought aluminium & alloys

China now imports 50% of its aluminium from Russia



Source: Bloomberg, BofA Global Research

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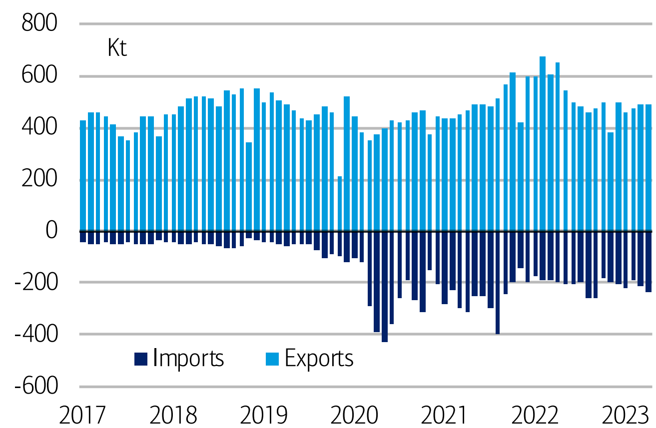
Exhibit 10: China, imports and exports of unwrought aluminium & products

Higher imports from Russia have not displaced China's aluminium units; as a result, exports have not risen



Source: Bloomberg, BofA Global Research

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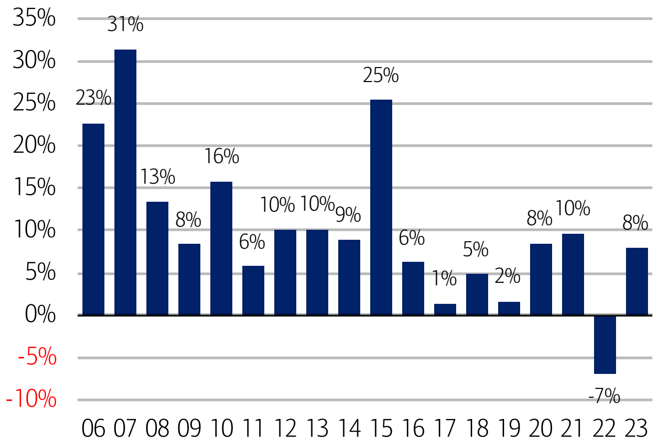
China's demand holds up, exports contained

Stable fundamentals on China's physical markets

Exhibit 11 shows that China's apparent consumption of aluminium has been holding up, expanding by 8% YoY YTD, with purchased tonnages consistently above last year's levels, except in April, when concerns over the health of China's economy escalated.

Exhibit 11: China, apparent aluminium demand
Aluminium consumption has risen by 8% YoY



Source: Bloomberg, CRU, BofA Global Research

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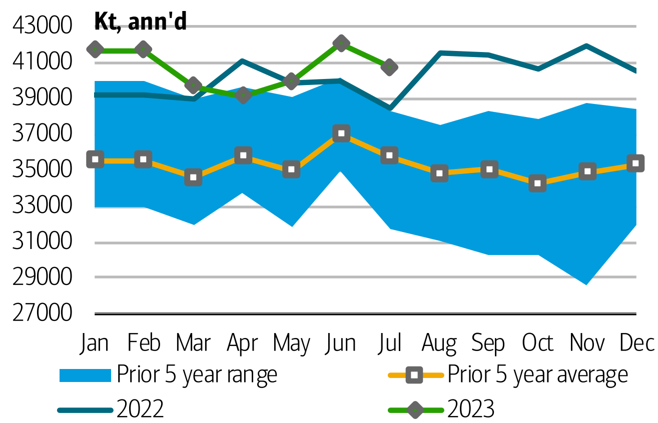
Exhibit 12: China, apparent aluminium demand
Aluminium consumption has persistently exceeded last year levels, except in April



Source: Bloomberg, CRU, BofA Global Research

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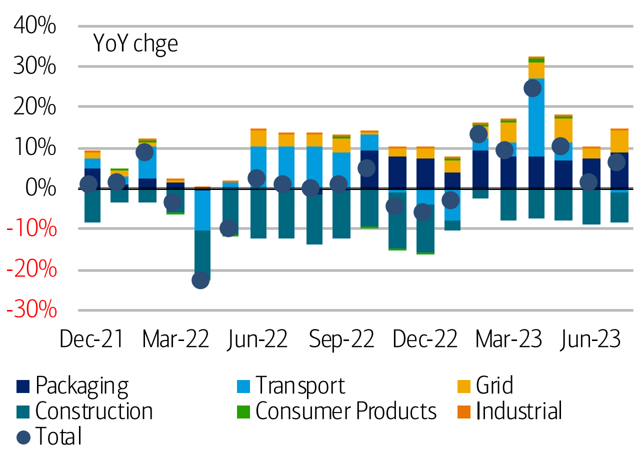
Exhibit 13 looks at the breakdown of demand growth, highlighting how the contribution by sector have diverged, mirroring copper market dynamics. Construction has been a drag, but that has been offset by increased activity in other industries. Exhibit 14 shows the implications: steady demand growth, along production discipline has contributed to keeping physical premia[1] supported. This was also reflected in comments from Chalco management, which outlined that despite the shrinking property market, a lifting of housing restriction, along rising investment in other sectors like solar/new energy vehicles/infrastructure projects, would be supportive to aluminium consumption.

Exhibit 13: China, breakdown of aluminium demand growth
Demand growth has been patchy



Source: Bloomberg, BofA Global Research

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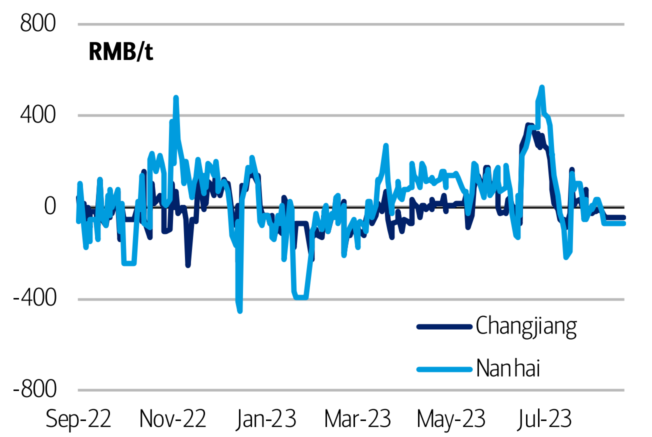
Exhibit 14: China, physical premia
The physical market has been well supported



Source: Bloomberg, BofA Global Research

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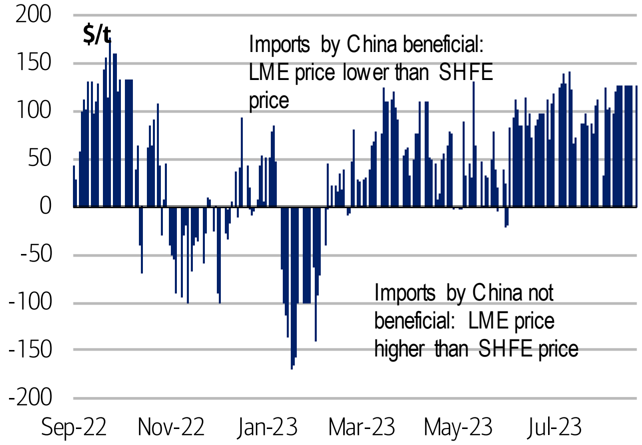
Exhibit 15 shows that SHFE aluminium prices have been trading above those on the London Metals Exchange in recent months. The implications? If China's government manages to reboot the economy, the domestic market may be able to absorb some of the additional aluminium units from Yunnan province, and potentially also some of the Rusal tonnages.

[1] Physical premia have to be paid on top of the quoted LME price; they can include items such as transportation costs and insurance. However, they are also an indicator for the tightness of regional markets.

Exhibit 15: Price differentials, Shanghai Futures Exchange and London Metal Exchange

Aluminium trades at a premium in Shanghai



Source: Bloomberg, BofA Global Research

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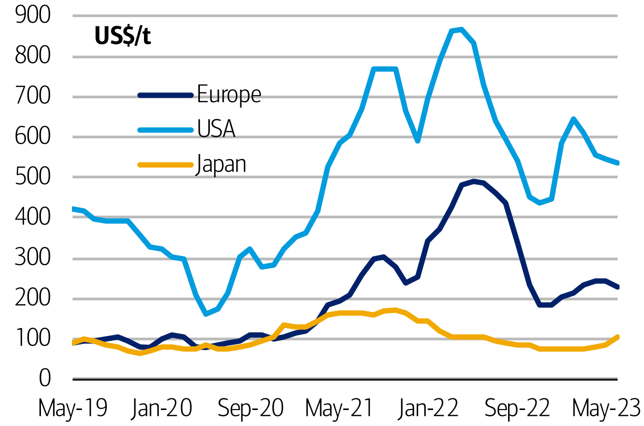
Exhibit 16: Regional premia

Premia are off the highs, but remain supported



Source: CRU, BofA Global Research

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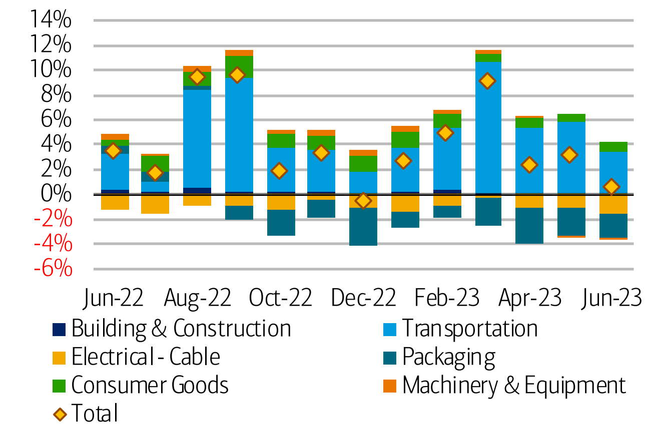
Weak demand ex-China, but premia supported

World ex-China demand has been somewhat subdued, which is one reason that physical premia are trading below recent peaks (Exhibit 16). These headwinds are demonstrated in the exhibits below.

Exhibit 17: Europe, aluminium demand growth by sector

European aluminium demand growth has been slowing



Source: Bloomberg, BofA Global Research

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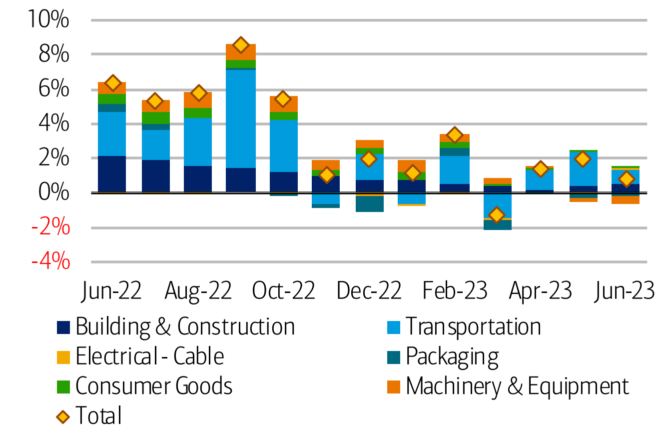
Exhibit 18: US, aluminium demand growth by sector

Aluminium demand is barely growing in the US



Source: Bloomberg, BofA Global Research

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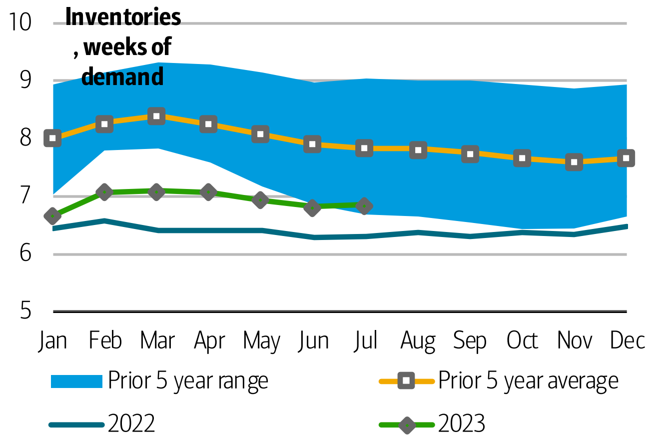
LME inventories remain a concern

Inventories remain low, despite weak demand

Exhibit 19 outlines that global stocks have stabilised towards the lower end of the longer-term ranges, after persistent draws in recent years (Exhibit 20). This confirms the supply and demand backdrop: against muted demand, supply discipline has prevented surpluses. Exchange inventories in particular are concerningly low (Exhibit 20).

Exhibit 19: Aluminium, reported inventories in weeks of demand
Aluminium inventories have stabilised at low levels



Source: Bloomberg, CRU, BofA Global Research

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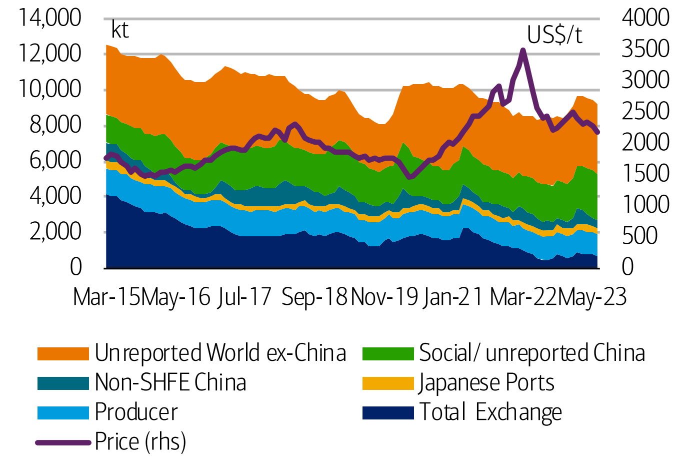
Exhibit 20: Aluminium, prices and breakdown of inventories in tonnes
Exchange inventories are at multi-year lows



Source: Bloomberg, CRU, BofA Global Research

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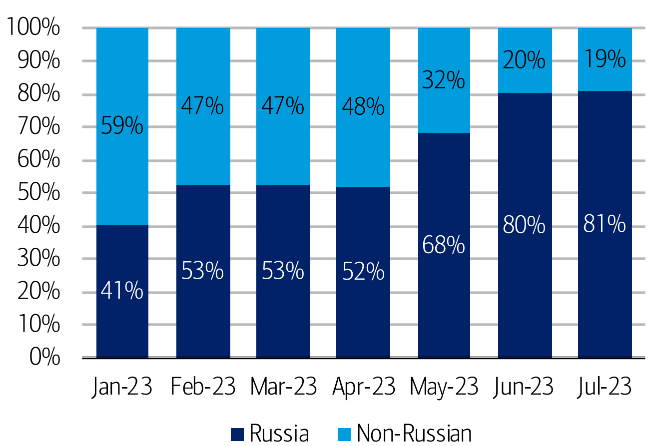
LME inventories are a concern

Picking up on low exchange inventories, Exhibit 21 and Exhibit 22 highlight that Russian tonnages now dominate LME warehouses.

Exhibit 21: LME inventories, breakdown by origin
Russian material now dominates LME stocks



Source: LME, BofA Global Research

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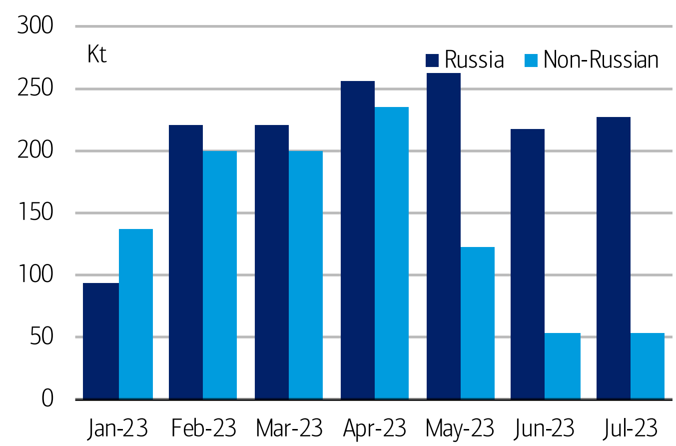
Exhibit 22:LME inventories by origin in tonnes
The dominance of Russian tonnages is partially driven by a removal of non-Russian material



Source: LME, BofA Global Research

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Exhibit 23 outlines that cash to three-month spreads has risen sharply. One interpretation of this dynamic is that market participants have shown less interest in Russian material, so they are rolling positions, which in turn pushes up the contango[2]. Granted, rising interest has also had an influence on time spreads. Yet, the gap between current time spreads and the maximum, arbitrage-free contango has continued to narrow (Exhibit 24), suggesting that convenience yields have also declined.

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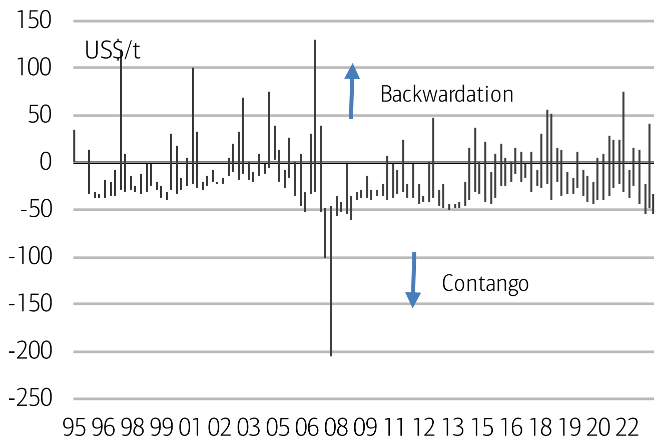
[2] Forward prices can be calculated through a cost-of-carry model, i.e. the cash price is the starting point, and holding costs (such as expenses for storage in warehouses or interest) are added. Holding benefits (e.g. from lending a metal) are deducted. Forward curves are normally in contango, i.e. future prices are higher than the cash price. However, future prices can fall below cash prices when markets are extremely tight. In such a situation, metal consumers are prepared to pay a convenience yield, i.e. spend more to have metal available immediately

Exhibit 23: LME< cash to 3-month time spread

The contango has risen



Source: Bloomberg, BofA Global Research

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Exhibit 24: Difference between arbitrage free contango and actual Cash to 3-month time spreads

Time spreads are keep moving towards full contango

Source: Bloomberg, BofA Global Research

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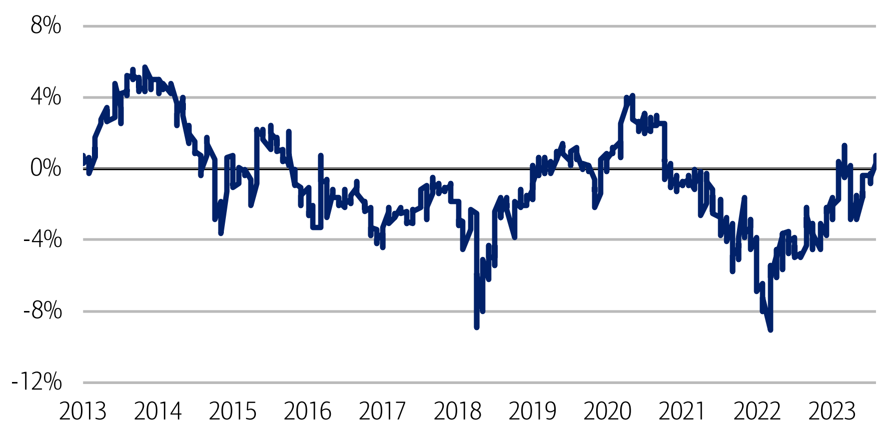
One implication of this is that the P&L of warehouse financing deals has become positive again. In turn, this has implications for the physical market: if traders can lock up metal in financing deals, this may ultimately reduce the incentive to ship metal into the market, which in turn should support physical premia further.

Exhibit 25: LME, PnL warehousing financing deals

Locking up metal in warehouse financing deals has become profitable again



Source: Bloomberg, BofA Global Research

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Appendix

Exhibit 26: Commodity prices, exchange rates, equity indices, yields and inventories
Metal prices have stabilized

Base metals	Cash, $/t	3-month, $/t	Cash, WoW change	3-month, WoW change
Aluminium	2,125	2,176	-2.7%	-2.6%
Copper	8,256	8,295	-3.1%	-3.2%
Lead	2,101	2,109	-0.9%	-0.9%
Nickel	19,953	20,241	-5.4%	-5.0%
Tin	26,221	26,457	-5.1%	-4.5%
Zinc	2,409	2,398	-3.9%	-4.3%
LMEX	3,675		-3.2%	
	Cash, c/lb	**3-month, c/lb**		
Aluminium	96	99		
Copper	374	376		
Lead	95	96		
Nickel	905	918		
Tin	1,189	1,200		
Zinc	109	109		
Other commodities, freight, exchange rates, equities and yields	**Spot**	**WoW change**		
Gold, $/oz	1,914	-1.5%		
Silver, $/oz	23	-4.0%		
Platinum, $/oz	916	-1.1%		
Palladium, $/oz	1,299	3.1%		
Iron ore, China fines cfr $/dmt	105	0.6%		
Brent, $/bbl	87	0.7%		
Baltic Dry Index	1,129	-0.6%		
EUR/USD	1.095	-0.5%		
Dow Jones Industrial Average	35,281	0.6%		
10-year US Treasury yield	4.155	2.9%		
ICE BofA Commodity index, ER	443	0.7%		
ICE BofA Commodity index Industrial Metals, ER	176	-3.4%		
ICE BofA Commodity index Precious Metals, ER	212	-1.7%		
ICE BofA Commodity index Energy, ER	533	2.1%		
Exchange stocks and cancelled warrants	**Stocks, tonnes**	**WoW change**	**Canc. warrants, tonnes**	**Canc. warr., of stocks**
Aluminium				
LME	491,750	-2.3%	211,075	42.9%
Shanghai	105,233	-6.7%		
Total aluminium	596,983	-3.1%		
Copper				
LME	85,375	7.6%	350	0.4%
Comex	39,359	-0.3%		
Shanghai	52,915	1.5%		
Total copper	177,649	3.9%		
Lead				
LME	56,125	-1.8%	7,225	12.9%
Shanghai	49,722	-1.2%		
Total lead	105,847	-1.5%		
Nickel				
LME	37,014	-0.3%	1,050	2.8%
Shanghai	3,593	15.4%		
Total nickel	40,607	1.0%		
Tin	5,900	7.7%	45	0.8%
Zinc				
LME	92,175	-2.9%	15,775	17.1%
Shanghai	63,069	1.7%		
Total zinc	155,244	-1.1%		

Source: BofA Global Research

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Exhibit 27: Price forecasts, fundamental drivers and risks
We are bullish on a range of cyclical commodities

Metal	2023E	2024E	Fundamental drivers	Risks (D = downside; U = upside)
Aluminium	$2,353/t 107c/lb	$2,875/t 130c/lb	• China is reaching for a 45mt capacity cap and smelters ex-China have closed capacity. • China's smelters remain under pressure on hydro power shortages, but are now restarting some capacity. At the same time, demand should pick up, so exports will likely remain capped. • We expect rising **deficits** going forward	• D: No production discipline in China/ World ex-China • D: China exports more • U: Smelter restraint and/or production disruptions reduce output • U: Stronger than anticipated demand growth
Copper	$8,788/t 399c/lb	$9,750/t 442c/lb	• Copper rallied as China re-opened, but has given back most of these gains • Demand in China has been patchy, but grid spending has completely offset weakness in housing. Demand may be more balanced in 2023, and should hold up. Copper to rally, if the government pushes through more stimulus • Inventories are low, which is supportive, but could also increase volatility • We expect a small **deficit** for 2023	• D: China re-exports metal • D: Global demand slows sharply into next year • U: Strong restocking through the supply chain on improved confidence • U: Continued production disruptions in coming quarters
Lead	$2,087t 95/lb	$2,000/t 91c/lb	• There are no immediate scrap and concentrates shortages, suggesting the market could flip back into surplus • China's demand has slowed structurally, as the ebike market has matured	• D: Destocking in China or higher lead exports from the country. • U: Strong seasonal demand for replacement batteries after cold/ hot winter/ summer months
Nickel	$22,063/t 1001c/lb	$21,250/t 964c/lb	• Nickel demand from electric vehicle producers should rise in the coming years, yet more NPI is being converted to nickel sulphate • China has built conversion capacity, which should take about 100Kt of Indonesian units into the refined market • Indonesian supply may prevent shortages near-term, but further out, more material is required • We expect a **surplus** for 2023, but **deficits** beyond	• D: NPI producers don't close shop; ore inventories last for longer and more ores are imported form the Philippines. • D: Faster ramp-up of Indonesian NPI production • D: Stainless steel demand remains subdued
Zinc	$2,603/t 118c/lb	$2,375/t 108c/lb	• The project pipeline is not well filled with high quality operations • Zinc may remain an underperformer, but immediate downside more limited, also because smelter closures in Europe have not been offset by supply additions elsewhere • Cost support is starting to kick in, as recent mine closures highlight	• D: Unreported inventories exist on the zinc market. More metal could become available • D: The zinc market is fragmented. There is evidence that miners, especially in China, could consider further output increases
Gold	$1,923/oz	$1,963/oz	• Gold has been a trade on US rates. The rally past $2,000/oz subsided as the Fed signalled a resumption of rate hikes. Until the end of the hiking cycle is reached, gold prices will remain capped • Central bank buying has been strong, but not sufficient; a Fed pivot may bring more investors into the market. • Gold to rally into year-end 2023.	• D: Deterioration of investor sentiment • D: Real rates become more positive; sustained USD rally • D: High gold prices deter buyers of physical gold; increased scrap supply
Silver	$22.98/oz	$23.26/oz	• The silver market has rebalanced on production discipline and demand from new applications including solar panels • As more spending on solar panels come through, silver should rally • Bottoming out of the global economy in 2024 should also help industrial demand	• U: Investors returning to the market • U: China's imports to rise • D: ETF liquidation • D: More supply
Platinum Palladium	$1,068/oz $1,391/oz	$1,465/oz $1,100/oz	• Palladium is slowly moving into surplus, likely keeping prices capped. • Supply problems in South Africa have reduced platinum supply. The hydrogen economy and substitution should push the metal up	• D: Jewellery demand suffers due to rising prices. • D: In palladium, the risk of deliveries from Russian stockpiles has not gone away • D: Demand from key buyers like Europe not increasing • U: Production disruptions reduce availability of PT and PD
Iron Ore	$114/t CIF	$98/t CIF	• Iron ore inventories at China's mills are extremely low. • Production cuts at mills, along higher steel demand should support steel prices, likely pulling iron ore higher as well near-term	• D: China's steel production slowing sharply • U: Mine closures/slowdown in production increases
HCC Thermal coal	$278/t $184/t	$249/t $160/t	• Thermal coal prices to come under pressure as supply is increasing and the energy emergency normalises • A normalisation of supply should also contribute to lower met coal prices	• D: Lack of supply discipline • U: Chinese steel production stronger (HCC) • U: mine closures
Brent and WTI crude oil	$80/bbl $75/bbl	$90/bbl $85/bbl	• We project Brent and WTI to average $80/bbl and $75/bbl, respectively, in 2023. • The global oil balance should stay tight in 2023, supported by additional OPEC+ cuts starting in May, slower non-OPEC growth, and rebounding Asia demand, • We forecast global demand growth to slow to 1.2mn b/d YoY in 2023 and 1mn b/d in 2024. • Non-OPEC supply should grow roughly 1.8mn b/d YoY in 2023 and 720k b/d in 2024. • We project total US crude and NGL supply to rise 1.1mn b/d in 2023 and 600k b/d in 2024. • OPEC crude oil supplies are set to fall 650k b/d in 2023 and 230k b/d in 2024 as OPEC+ actively manages balances..	

Colours indicate our stance on each commodity: Green = bullish, Yellow = neutral, Red = cautious. 2020E/2024E = period averages. bbl = barrel. b/d = barrels/day. c/lb = cents/pound. oz = ounce.
Source: BofA Global Research estimates

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Exhibit 28: Commodity price forecasts
Copper should outperform

		Current	2Q23E	3Q23E	4Q23E	1Q24E	2Q24E	3Q24E	2022E	2023E	2024E	2025E	2026E	2027E	LT price
Base metals															
Aluminium	US$/t	2,091	2,260	2,250	2,500	2,750	2,750	3,000	2,706	2,353	2,875	3,500	3,103	2,707	2,310
	USc/lb	95	103	102	113	125	125	136	123	107	130	159	141	123	105
Copper	US$/t	8,243	8,461	8,250	9,500	10,000	10,000	9,500	8,822	8,788	9,750	10,500	9,703	8,907	8,110
	USc/lb	374	384	374	431	454	454	431	400	399	442	476	440	404	368
Lead	US$/t	2,087	2,118	2,050	2,050	2,000	2,000	2,000	2,149	2,087	2,000	1,750	2,024	2,298	2,572
	USc/lb	95	96	93	93	91	91	91	97	95	91	79	92	104	117
Nickel	US$/t	19,789	22,277	20,000	20,000	22,500	22,500	20,000	25,707	22,063	21,250	22,500	20,289	18,077	15,866
	USc/lb	898	1,011	907	907	1,021	1,021	907	1,166	1,001	964	1,021	920	820	720
NPI, 8-12%	CNY/t		1,000	1,000	1,000	1,032	1,032	1,032	1,424	1,000	1,032	1,062	1,102	1,141	1,180
Zinc	US$/t	2,356	2,539	2,250	2,500	2,500	2,500	2,250	3,482	2,603	2,375	2,250	2,424	2,597	2,771
	USc/lb	107	115	102	113	113	113	102	158	118	108	102	110	118	126
Precious metals															
Gold, nominal	US$/oz	1,912	1,977	1,925	1,900	1,900	1,950	2,000	1,803	1,923	1,963	2,150	2,112	2,074	2,037
Gold, real	US$/oz		1,977	1,925	1,900	1,854	1,902	1,951	1,803	1,923	1,915	2,046	1,961	1,879	1,800
Silver, nominal	US$/oz	22.66	24.20	22.65	22.50	22.50	23.00	23.53	21.80	22.98	23.26	24.75	26.31	27.86	29.42
Silver, real	US$/oz		24.20	22.65	22.50	21.95	22.44	22.96	21.80	22.98	22.69	23.56	24.43	25.24	26.00
Platinum	US$/oz	906	1,027	1,000	1,250	1,465	1,465	1,465	964	1,068	1,465	1,453	1,457	1,462	1,466
Palladium	US$/oz	1,268	1,445	1,300	1,250	1,200	1,200	1,000	2,110	1,391	1,100	1,000	1,155	1,310	1,466
		Current	**2Q23E**	**3Q23E**	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**LT price**
Bulk Commodities															
Hard coking coal	US$/t fob	256	243	250	275	249	249	249	370	278	249	218	198	178	158
Semi-soft	US$/t fob	161	202	168	168	168	168	168	277	185	168	147	133	120	107
Thermal Coal	US$/t fob	144	160	159	164	181	166	153	357	184	160	125	112	99	85
Iron ore fines	US$/t CIF	103	111	120	100	110	100	90	120	114	98	90	90	89	89
Other materials															
Lithium spodumene	US$/t	3,250	4,178	3,500	3,250	3,500	3,000	3,000	4,498	4,132	3,125	3,250	2,567	1,883	
Lithium carbonate	US$/t	36,975	36,189	45,000	43,762	35,000	35,000	30,000	71,531	45,980	32,500	32,500	28,333	24,167	
Lithium hydroxide	US$/t	35,800	39,889	43,500	45,262	36,500	36,500	31,500	70,142	48,363	34,000	34,000	29,833	25,667	
Alumina	$/t	345	344	331	331	340	340	340	362	342	340	348	357	366	375
Uranium	$/lb		53.80	60.00	59.00	66.30	66.30	66.30	50.17	55.77	66.30	75.00	67.08	59.17	51.25
Molybdenum	$/lb	26.0	21.30	21.80	21.80	21.80	21.80	21.80	18.74	24.42	21.80	21.80	18.40	15.00	11.60
Cobalt	$/lb	19.3	16.05	15.60	15.60	15.60	15.60	15.60	31.04	16.37	15.60	15.60	16.84	18.08	19.32
Manganese ore	$/dmtu	4.35	4.80	4.60	4.60	4.60	4.60	4.60	6.06	4.92	4.60	4.60	5.10	5.59	6.09
Steel, HRC															
HRC, Europe	US$/t	668	845	711	703	771	751	741	950	773	749				
HRC, US	US$/t	871	1,171	965	799	854	909	843	1,122	971	849				
HRC, China	US$/t	556	556	575	571	568	585	602	663	565	595				
Energy		**Current**	**2Q23E**	**3Q23E**	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**LT price**
Brent	US$/bbl	86.1	77.7	80.0	82.0	90.0	90.0	90.0	100.2	80.5	90.0	60.0	60.0	60.0	60.0
WTI	US$/bbl	82.4	73.7	75.0	77.0	84.0	84.0	84.0	95.3	75.4	84.0	57.0	57.0	57.0	57.0
Henry Hub	US$/MMBtu	2.8	2.3	2.8	3.3	4.0	4.0	4.0	6.7	2.8	4.0	2.6	2.6	2.6	2.6

Note: quarterly energy forecasts are period-end, rest are period averages; **Source:** BofA Global Research

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