Global Metals Weekly

LME Week in Pictures: gloomy, with China demand the one bright spark

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Commodities
Global

Global Commodity Research
BofA Europe (Madrid)

Michael Widmer
Commodity Strategist
MLI (UK)
+44 20 7996 0694
michael.widmer@bofa.com

Francisco Blanch
Commodity & Deriv Strategist
BofA Europe (Madrid)
+34 91 514 3070
francisco.blanch@bofa.com

Danica Averion
Commodity Strategist
MLI (UK)
danica_ana.averion@bofa.com

Warren Russell, CFA
Commodity Strategist
BofAS
warren.russell@bofa.com

Rachel Wiser
Commodity Strategist
BofAS
rachel.wiser@bofa.com

Equity Research
Jason Fairclough >>
Research Analyst
MLI (UK)
jason.fairclough@bofa.com

Matty Zhao >>
Research Analyst
Merrill Lynch (Hong Kong)
matty.zhao@bofa.com

Matthew DeYoe, CFA
Research Analyst
BofAS
matthew.deyoe@bofa.com

Caio Ribeiro
Research Analyst
BofAS
caio.ribeiro@bofa.com

Lawson Winder, CFA >>
Research Analyst
Merrill Lynch (Canada)
lawson.winder@bofa.com

James Redfern >>
Research Analyst
Merrill Lynch (Australia)
james.redfern@bofa.com

Lowering price forecasts for most metals

Moving into 4Q23, we are updating price forecasts. We factor in the weak macroeconomic backdrop ex-China, which is offset by energy transition investment in China. Near-term the base metals may face further headwinds, but we believe the downside is ultimately limited for most commodities. Lithium is, to some extent, the exception, and we now expect the raw material to fall towards marginal costs. We are cautiously optimistic that further price declines may remove excess supply from the market through production curtailments and industry consolidation. Once the market has rebalanced, we see a quite favourable opportunity to increase exposure again.

LME Week: gloomy, despite steady Chinese demand

With LME Week over, we summarise our discussions in a series of charts. On the macro side, traders noted that Chinese demand has been strong, but there was concern about a gloomy backdrop ex-China. To that point, the recent sharp increases in US rates, which our rates strategists put down to a re-pricing of the Fed hiking path, have been a headwind for metals. That said, we have also had discussions about rising/elevated fiscal deficits in the US. Linked to that, the make-up of spending is a concern: defense is a significant discretionary item, at a time when armed conflicts are at a record high, while entitlements are critical in non-discretionary spending. Fiscal deficits may persist for awhile, so they may not have a sustained impact on metals beyond bouts of volatility. Ultimately though, the US government may have to take some tough decisions.

Pushing ahead with the energy transition

Why do these deficits matter for metals? Beyond the volatility in recent months, green spending has carried copper demand in China this year, a focus during LME Week. Fiscal balances are an issue not just in the US, but also globally, with the IMF confirming that "Many countries are facing high debt, rising interest rates, and weaker growth prospects. These headwinds complicate efforts to tackle climate change". Making polluters pay for emissions is one measure the IMF proposes to keep decarbonisation on track.

Copper: record premia Europe; aluminium: China tight

Destocking has been a significant headwind to metals demand in recent months. However, there is increased confidence that we are approaching the end to the inventories reduction, which should increasingly support consumption in the coming months. Pockets of strength also persist in Europe, with Aurubis and Codelco proposing contract premia at almost twice spot levels for next year. Meanwhile, China's smelters are operating at 95% capacity utilisation and Russia is sending around 1Mt of aluminium to its Asian neighbour. Hence, there has been acknowledgement (and some surprise) that aluminium fundamentals in China have been so resilient.

LME Week in Pictures

Lowering price forecasts for most metals

Moving into 4Q23, we are updating price forecasts. The changes are predominantly a marking-to-market, so we are factoring in the persistently weak macroeconomic backdrop, offset by energy transition investment especially in China. That said, we reduce lithium expectations materially, and now expect the raw material to fall towards marginal costs. We are cautiously optimistic that further price declines may remove excess supply from the market through production curtailments and industry consolidation. Once the market has rebalanced, we see a quite favourable opportunity to increase exposure again (see also Global Metals Weekly: Lithium desperately seeking production discipline, 31 July 2023).

Table 1: BofA price forecasts

We cut lithium price expectations and expect the raw material to trade at marginal cost

		2023E			2024E		
		New	Old	Change	New	Old	Change
Base metals							
Aluminium	$/t	2,268	2,353	-3.6%	2,688	2,875	-6.5%
	c/lb	103	107	-3.6%	122	130	-6.5%
Copper	$/t	8,442	8,788	-3.9%	9,250	9,750	-5.1%
	c/lb	383	399	-3.9%	420	442	-5.1%
Lead	$/t	2,156	2,087	3.3%	2,000	2,000	0.0%
	c/lb	98	95	3.3%	91	91	0.0%
Nickel	$/t	21,786	22,063	-1.3%	20,250	21,250	-4.7%
	c/lb	988	1,001	-1.3%	919	964	-4.7%
Zinc	$/t	2,648	2,603	1.8%	2,375	2,375	0.0%
	c/lb	120	118	1.8%	108	108	0.0%
Precious metals							
Gold	nominal, $/oz	1,924	1,923	0.0%	1,975	1,963	0.6%
	real, $/oz	1,924	1,923	0.0%	1,927	1,915	0.6%
Silver	nominal, $/oz	23.20	22.98	1.0%	23.26	23.26	0.0%
	real, $/oz	23.20	22.98	1.0%	22.7	22.69	0.0%
Platinum	$/oz	976	1,068	-8.6%	1,050	1,465	-28.3%
Palladium	$/oz	1,379	1,391	-0.8%	1,100	1,100	0.0%
Bulk Commodities							
Iron ore fines	$/t cif	115	114	0.9%	98	98	0.0%
Hard coking coal	$/t fob	290	278	4.4%	249	249	0.0%
Semi-soft	$/t fob	211	185	14.2%	168	168	0.0%
Thermal Coal	$/t fob	181	184	-1.6%	160	160	0.0%
MIFTs and other commodities							
Lithium spodumene	$/t	3,802	4,132	-8.0%	1,763	3,125	-43.6%
Lithium carbonate	$/t	37,386	45,980	-18.7%	16,500	32,500	-49.2%
Lithium hydroxide	$/t	39,184	48,363	-19.0%	18,000	34,000	-47.1%
Alumina	$/t	343	342	0.4%	340	340	0.0%
Cobalt	$/lb	17.6	16.4	7.3%	18.0	15.6	15.4%
Uranium	$/lb	58.9	55.8	5.6%	78.1	66.3	17.8%
Molybdenum	$/lb	25.4	24.4	4.0%	23.8	21.8	9.0%
Manganese ore	$/lb	4.8	4.9	-2.6%	4.3	4.6	-5.5%
Steel							
Northern Europe	$/t	773	773	0.0%	749	749	0.0%
North America	$/t	951	971	-2.0%	865	849	1.9%
China	$/t	565	565	0.0%	595	595	0.0%

Source: BofA Global Research

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Macro has been a key concern

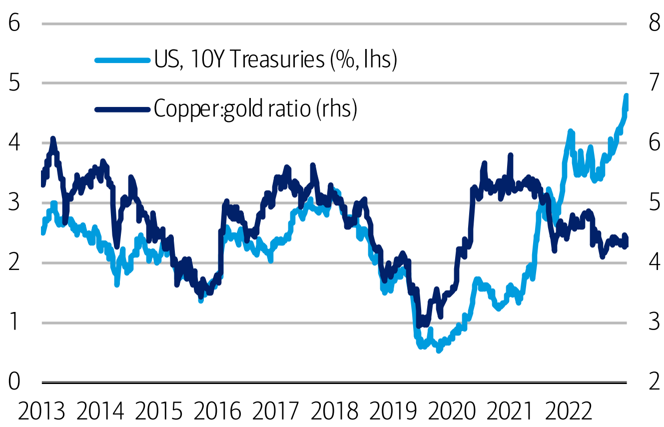
LME Week, the annual convention of metal industry participants, has just drawn to a close. As usual, a few themes have emerged, and the macroeconomic backdrop has been a concern. Indeed, market participants noted a gloomy backdrop, especially in World ex-China. Yet, traders also acknowledged that demand from China has been strong. In our view, the combination of bullish and bearish factors has been one reason, prices have overall been somewhat lacklustre.

Headwinds from US rates

Bond vigilantes versus re-pricing of Fed hiking path

What is the issue with macro? Most importantly, the US economy is slowing and Europe is barely managing to stay out of recession. Accordingly, possible causes behind the recent rally in US rates, which was accompanied by falling metals prices, have been much discussed. High/rising US fiscal deficits, apprehension that inflation may remain elevated, along the decorrelation of bonds/equities have all been seen as potential candidates. Exhibit 1 picks up on this, showing the correlation between Treasuries and the copper:gold ratio. Somewhat simplified, taking gold's current spot price of $1,880/oz as a starting point, the implication is that copper should be trading at $14,400/oz ($6.53/lb). Yet, we would caution that much lower spot prices are an indicator that the bond vigilantes have come out in force. In fact, we believe both copper and gold are fairly priced at present, while rates have pushed higher after the market has been re-pricing the Fed rate paths.

Exhibit 1: US Treasuries and copper:gold ratio
Treasures have risen faster than the copper:gold ratio



Source: Bloomberg, BofA Global Research

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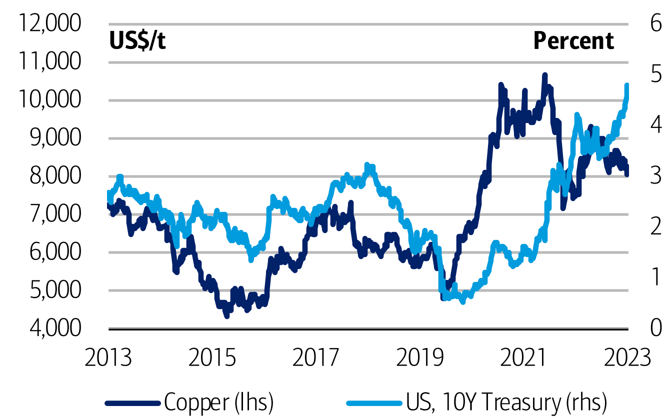
Exhibit 2: US Treasuries and copper
Treasuries have outpaced copper prices



Source: Bloomberg, BofA Global Research

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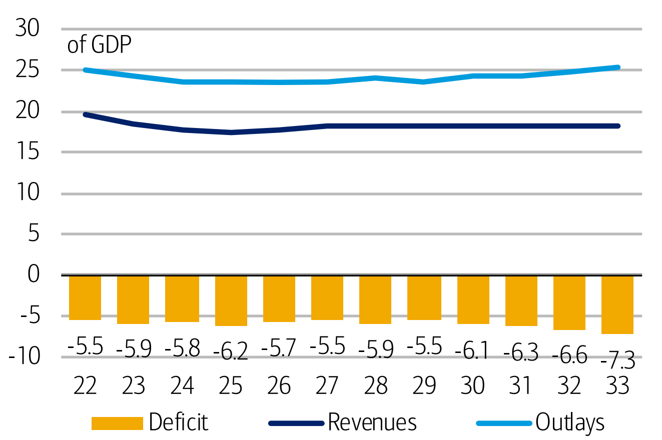
That said, fiscal policy remains a concern. To that point, the IMF highlighted that "Faced with myriad spending pressures, political red lines limiting taxation, at an insufficient level, translate directly into larger deficits that push debt to ever-rising heights. Something must give to balance the fiscal equation. Policy ambitions may be scaled down or political red lines on taxation moved if financial stability is to prevail".

Exhibit 3: US public finances
CBO expects the deficit to increase



Source: Congressional Budget Office. BofA Global Research

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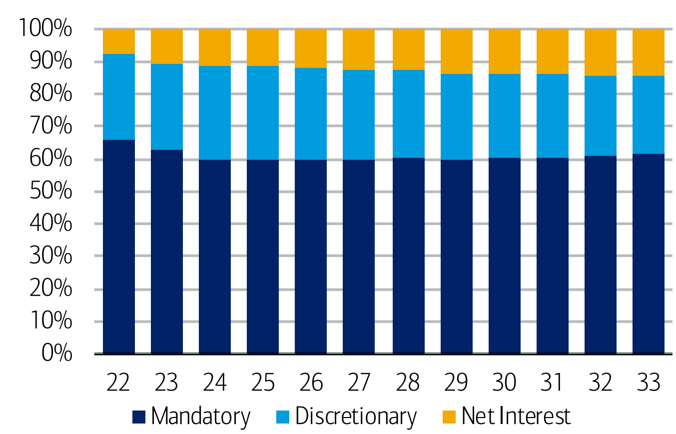
Exhibit 4: US, public spending
The bulk of US public spending is non-discretionary



Source: Congressional Budget Office. BofA Global Research

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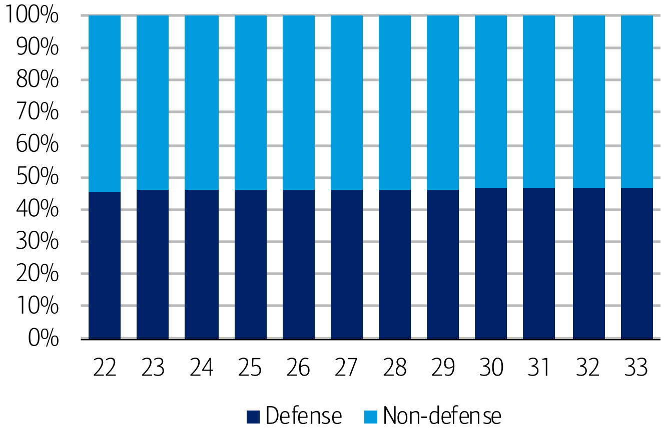
Exhibit 3 shows the US Congressional Budget Office's expectation that fiscal deficits could rise above 7% by 2033. Exhibit 4 digs a bit deeper, outlining that this will be accompanied by a squeeze of **discretionary spending** from interest payments and mandatory expenditure. Meanwhile, Exhibit 5 shows that defense accounts for almost half of discretionary spending.

Exhibit 5: US, public discretionary spending
Defense is a significant line item in discretionary spending



Source: Congressional Budget Office. BofA Global Research

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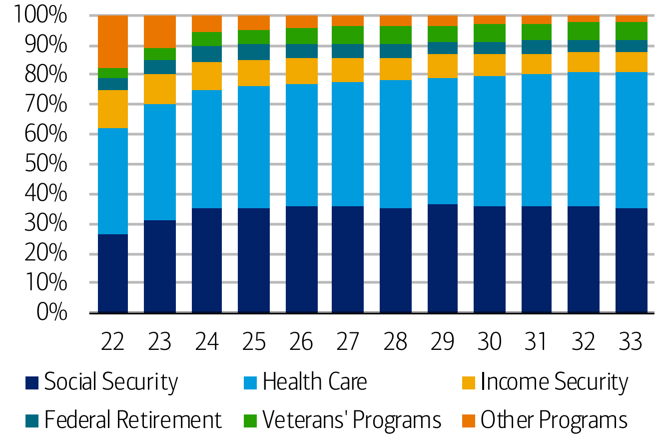
Exhibit 6: US, public non-discretionary spending
Entitlements make up the bulk of public spending



Source: Congressional Budget Office. BofA Global Research

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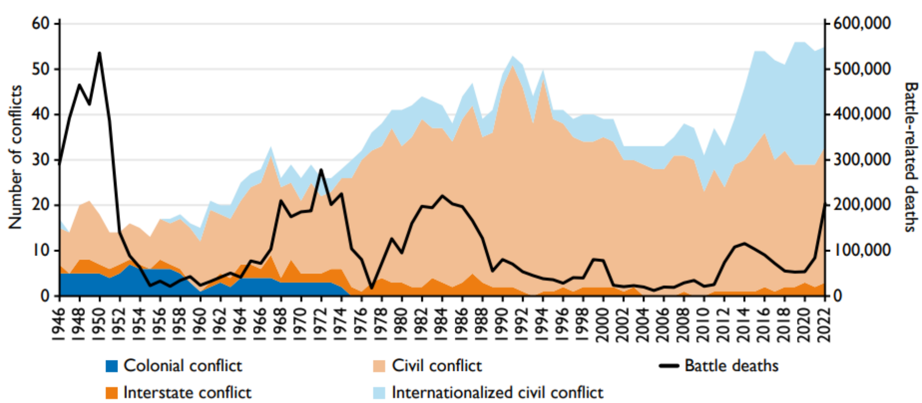
The number of countries engaged in armed conflicts has risen to a record high (Exhibit 7), one reason, Tudor's Paul Tudor Jones suggested that we are going through "the most threatening and challenging geopolitical environment that I've ever seen," which is occurring "at the same time the United States is at its weakest fiscal position since World War 2." He added that gold (and Bitcoin) should "probably take on a larger percentage of your portfolio than historically. As to **mandatory spending**, Exhibit 6 shows that most of it is deployed on social security and health care.

Exhibit 7: Number of countries with state-based armed conflicts by conflict type, 1946–2022
The world has always been an insecure place, but it has become even more so lately



Source : Lacina & Gleditsch Battle Death Datasest (2005); UCDP/PRIO Armed Conflict Dataset; UCDP Battle-Related Deaths Dataset (Davies et al., forthcoming)

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The bottom line: US deficits can persist for quite a while, so we are doubtful they will have a sustained impact on metals prices beyond the occasional bouts of volatility; China still looks more important, especially if US economic growth bottoms out next year. At the same time, the current fiscal trajectory looks somewhat unsustainable, so the US government may at some stage have to take some difficult decisions, potentially through bipartisan deals.

There are other implications beyond the macro uncertainty

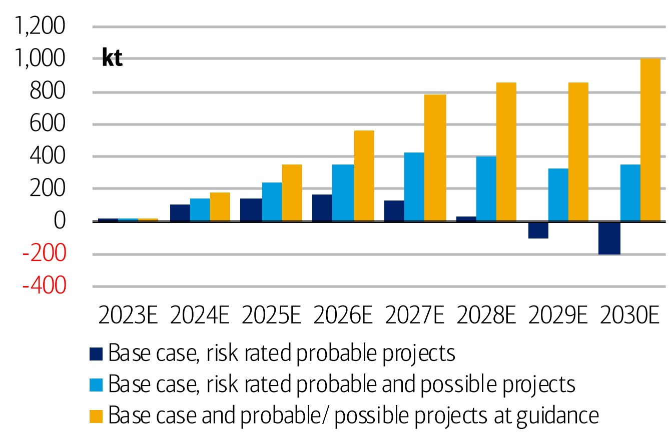
Beyond the discussion of the impact rates have had on metals, why do fiscal deficits matter for mined commodities? Green spending has single-handedly carried copper demand in China this year, so fiscal constraints globally are important. The solution? According to the IMF "Many countries are facing high debt, rising interest rates, and weaker growth prospects. Debt-to-GDP ratios are projected to rise by 1 percentage point a year globally during 2023–28, faster than foreseen before the pandemic. These headwinds complicate efforts to tackle climate change. On the one hand, relying mostly on spending-based measures to reach net zero goals by mid-century will become increasingly costly, possibly raising public debt by 45–50 percent of GDP for a representative large-emitting country, putting debt on an unsustainable path. On the other hand, limited climate action would leave the world exposed to adverse consequences from global warming. The trade-off can be relaxed by the use of carbon pricing, which is cost-effective in reducing emissions while also generating revenues to relieve the debt burden". In other words, rising carbon prices will incentivise polluters to clean up. In addition, "the transition to low-carbon energy sources will require strong complementarities between public and private actors".

Lithium remains challenged

Shifting focus away from macro, there has also been talk about the impact a consolidation of the supply chain has on the fundamentals of battery raw materials (i.e. lithium, cobalt and nickel). In fact, China's operators dominate both the production and consumption side, and a degree of supply chain integration usually gives an incentive to deliver required volumes, but keep prices low. Near-term, we are concerned that the market remains oversupplied, with producers for now unwilling to curtail production, although this is not wholly driven by China, a point we made in a recent note (see Global Metals Weekly: Lithium desperately seeking production discipline, 31 July 2023). The glut is mirrored in Exhibit 8, which factors in the guidance from the various producers, highlighting the risk of persistent oversupplies going forward.

Exhibit 9 shows the implications, outlining that prices of spodumene, the mined material, have been falling sharply. In our view, this highlights one of the key issues in lithium at present: the decision by miners to raise supply slowly prompted the bull market in 2021/22. Now, operators, especially in Australia, which tend to have relatively low costs, seem unwilling to cut production, potentially with an eye on industry consolidation/M&A.

Exhibit 8: Lithium, chemicals market balance
Lithium supply is set to outpace demand



Source: company reports, Woodmac, CRU,. BofA Global Research

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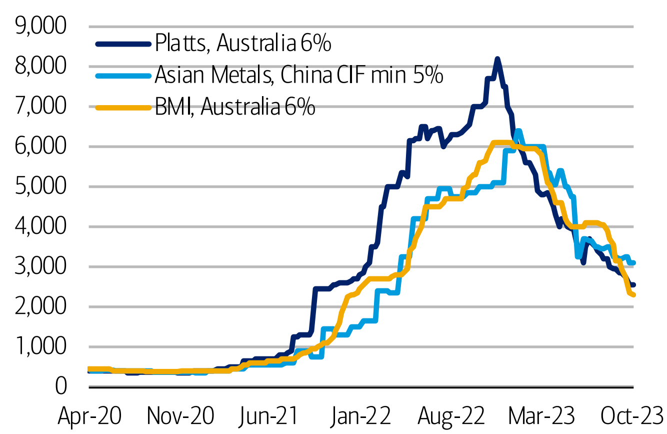
Exhibit 9: Lithium spodumene prices
Spodumene prices keep falling



Source: Bloomberg, BofA Global Research

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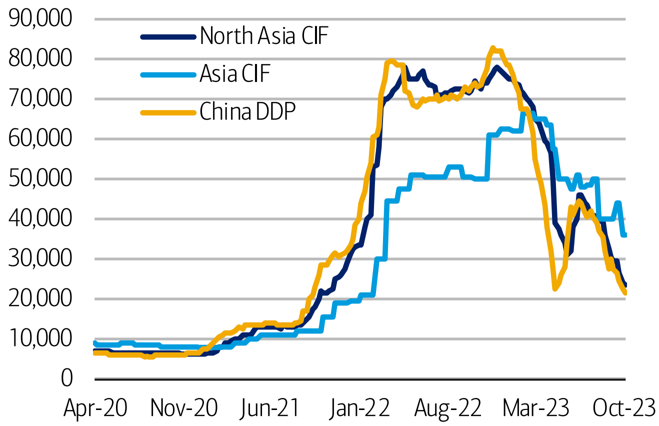
Not surprisingly, the decline in upstream prices has also fed through into downstream chemicals quotations, as Exhibit 10 shows. With little respite in supply growth and market re-balancing in sight, we are concerned that lithium needs to price at marginal costs to remove excess supply. As Table 2 shows, this implies that lithium carbonate should fall to around $14,500/t.

Exhibit 10: Lithium carbonate prices

Prices have fallen sharply



Source: Bloomberg, BofA Global Research

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Table 2: Lithium production flowsheet

Spodumene prices of $1,500/t would justify carbonate trading at $14,641/t

	Trough	Spot	Peak
Spodumene Concentrate Price *($/mt)*	1500	3120	8200
6% Spodumene to Lithium Oxide	6.0%	6.0%	6.0%
Lithium Oxide to Pure Lithium	46.5%	46.5%	46.5%
Lithium Carbonate	18.8%	18.8%	18.8%
Conversion Recovery	85%	85%	85%
Tonnes of 6% LiO2 Concentrate at 85% Recovery	7.93	7.93	7.93
Input Cost of Concentrate	11,891	24,734	65,005
Freight/Insurance	250	250	250
Conversion Cost	2,500	3,000	4,000
Cost per tonne of LiCO3 Equivalent at plant gate China	**14,641**	**27,984**	**69,255**

Source: Bloomberg, BofA Global Research

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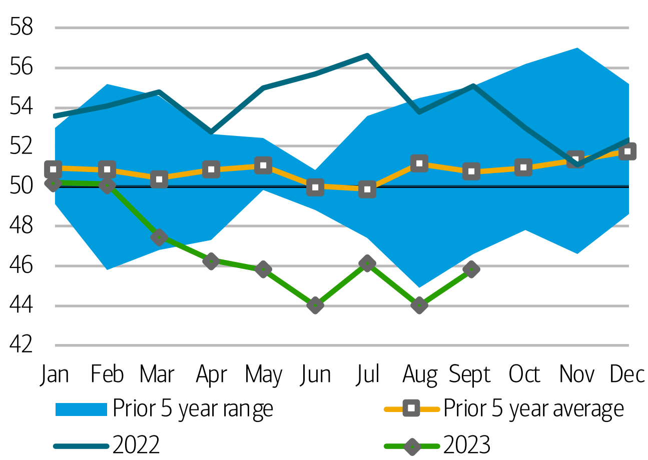
Copper: falling inventories in the US and China

De-stocking has been an issue

Shifting to copper, destocking has been a much-discussed topic. Exhibit 11 and Exhibit 12 pick up on this, highlighting that inventories have been falling in both the US and China of late. The drop of metal product inventories in China has affected activity, particularly in the second quarter; it is also one reason the economy has recovered only slowly after the re-opening.

Exhibit 11: US PMI, inventories subindex

Manufacturers are still de-stocking



Source: Bloomberg, BofA Global Research

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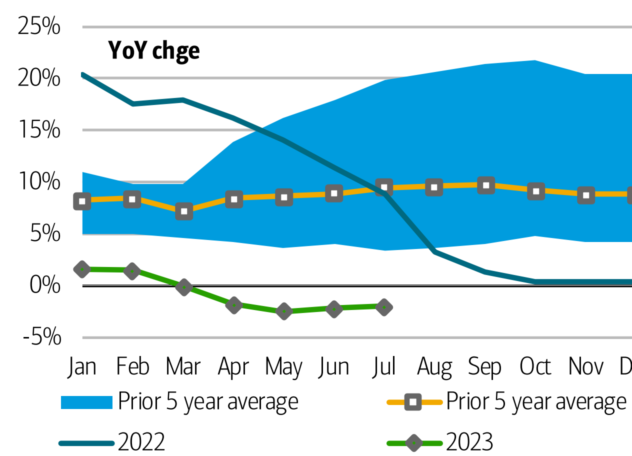
Exhibit 12: China, metals inventories

Inventories of metals products have been drawing since 2Q23



Source: Bloomberg, BofA Global Research

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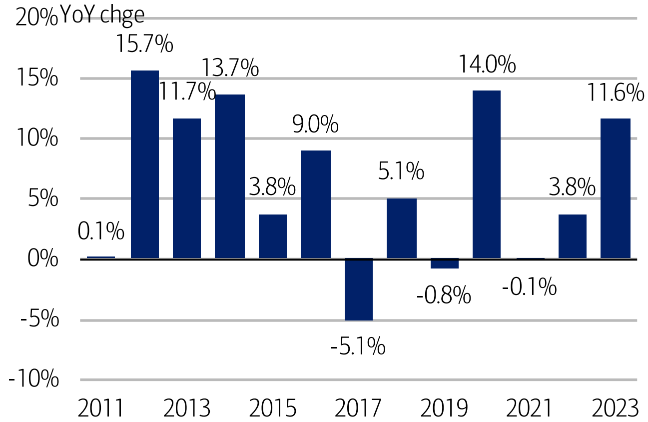
Steady demand growth in China

That said, it has been acknowledged that consumption in China has been strong. Exhibit 13 picks up on this, showing that apparent demand (refined production plus imports minus exports, adjusted for stock changes) has expanded by 11.6% YoY YTD. Similarly, looking at the sectoral activity, Exhibit 14 confirms that demand has been expanding at a steady pace in recent months.

Exhibit 13: China, apparent copper demand
China demand has expanded by 11.6% YoY YTD



Source: Bloomberg, BofA Global Research

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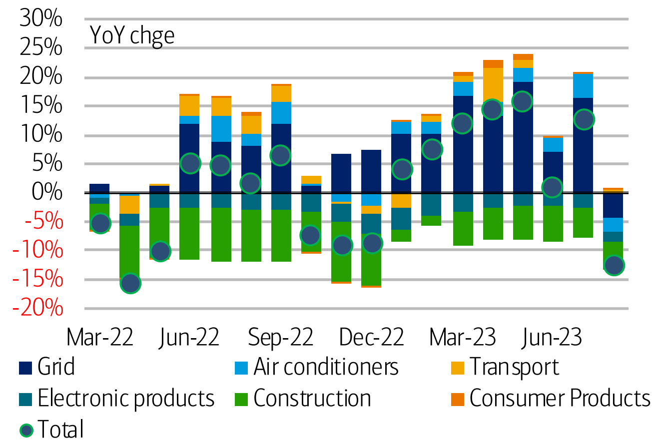
Exhibit 14: China, real-time demand indicator
Sectoral activity data confirms that copper usage has been resilient



Source: Bloomberg, BofA Global Research

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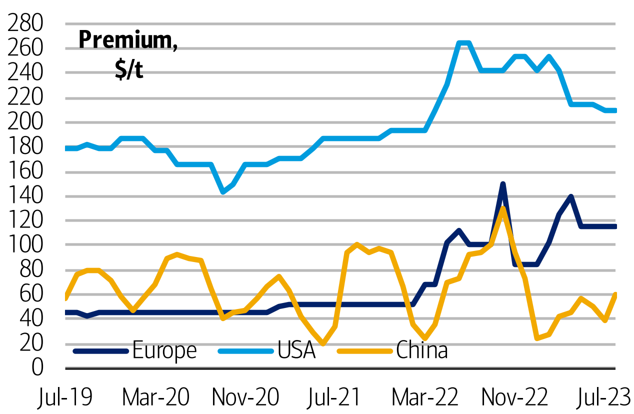
While demand has been softer ex-China, pockets of strength are worth noting. Indeed, Codelco has offered copper to consumers in Europe at a record premium[1] of \$235/t, up 85% from 2022. Similarly, German copper producer Aurubis has offered to sell copper at \$228/t – to put this number into context, spot premia are currently quoted at \$115/t. How to read this? The two copper miners seem to be confident in their ability to strike contracts with consumers who might be concerned over supply disruptions (Boliden's 229kt Ronnskar smelter declared force majeure in summer over a fire), a rebound of activity and more spending on green technologies.

Exhibit 15: Copper, physical premia
Premia in Europe and the US have remained supported



Source: Bloomberg, BofA Global Research

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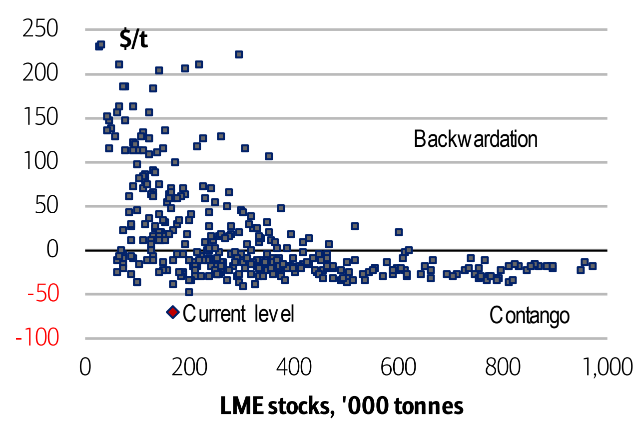
Exhibit 16: Copper LME inventories and time spreads and
Copper time spreads are extremely wide



Source: Bloomberg, BofA Global Research

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While macro concerns ex-China could push copper prices lower near-term, we believe steady demand in China and relatively sound fundamentals overall should ultimately support the red metal. Hence, we only mark-to-market our forecasts.

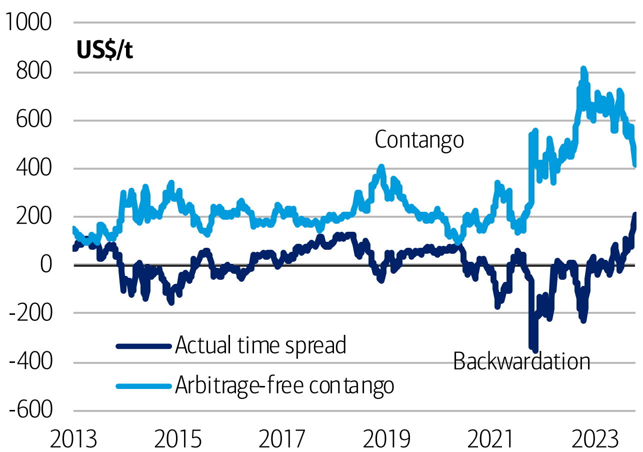
[1] Physical premia have to be paid on top of the quoted LME price; they can include items such as transportation cost and insurance. However, they are also an indicator of the tightness of regional markets.

Wide contangos

Contangos have also been a focus, with Exhibit 16 highlighting that cash to 3-month spreads[2] are extremely wide relative to inventories held in LME warehouses. Exhibit 17 looks at this from a different angle, comparing the actual with the arbitrage-free contango. The chart highlights that rising interest have pushed term structures higher (warehouse costs are usually stable). Yet, actual contangos have been closing the gap with the arbitrage-free contango, suggesting that additional factors have been at play. Exhibit 18 looks at inventories, confirming the recent sharp increase of stocks in LME warehouses, which has caused some concern about spare metal units finding their way back into the LME system over weak demand. Yet, these deliveries come with a caveat: there have been several spikes of LME inventories in recent years, often accompanied by a shift in time spreads. Linked to that, one of the most asked questions during LME Week has been, which trading house is behind the shift of off-exchange copper into the exchange's warehouse?

Exhibit 17: Copper cash to 3-month time spreads

Actual time spreads have been closing the gap with arbitrage free forwards



Source: Bloomberg, BofA Global Research

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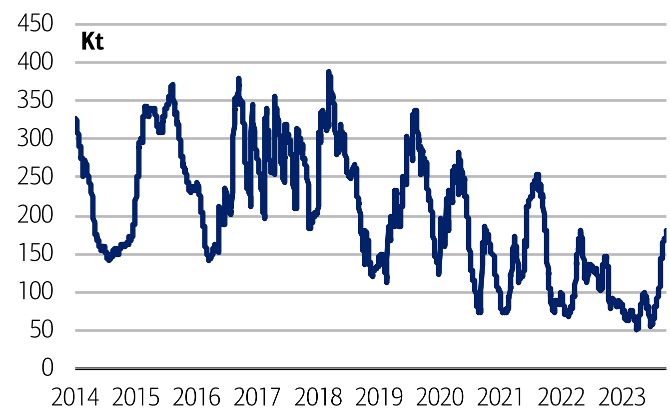
Exhibit 18: LME copper inventories

There have been several spikes in LME copper inventories



Source: Bloomberg, BofA Global Research

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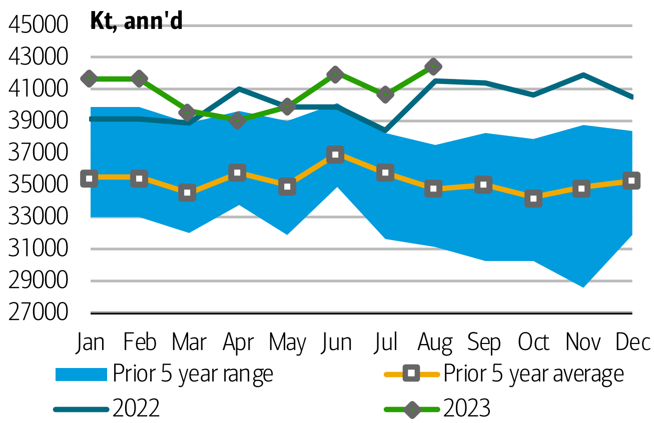
Beyond the shift of metal into warehouses, we agree that contangos are to some extent a confirmation of the current patchy fundamental backdrop. At the same time, we note an additional element that is actually not bearish: consumer forward buying has been relentless.

China's aluminium smelters operating at +95% utilisation rate

Shifting focus to aluminium, there was significant concern earlier this year about whether the domestic market could absorb the additional tonnages from a restart of China's aluminium smelters. Exhibit 19 picks up on this, confirming that the country's aluminium output is now running at an annualised rate of 42.5Mt, implying a +95% utilisation rate, relative to a capacity cap of 45Mt. Beyond that, around 1Mt of Russian material is also being sent to the Asian country. Yet, Exhibit 20 shows that the domestic market has remained stable, with exports continuing to hover around longer-term averages. Incidentally, this is very different from 2022, when smelter restarts met falling demand over rolling lockdowns, so aluminium exports doubled over the summer.

[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 19: China, aluminium production
Smelters are running at 42.5Mt, implying a 95% capacity utilisation rate



Source: Bloomberg, BofA Global Research

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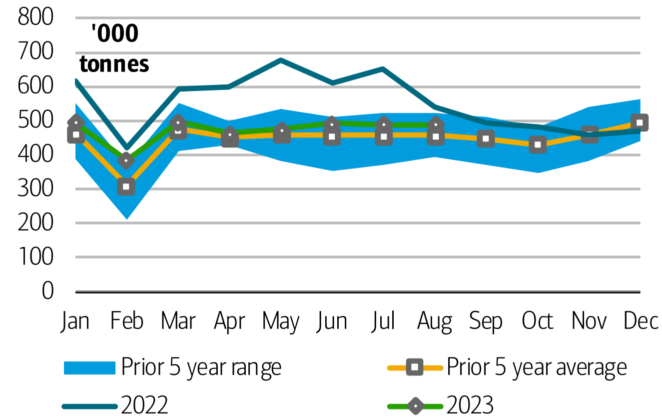
Exhibit 20: China, net exports of aluminium and products
In contrast to 2022, exports have remained in a range



Source: Bloomberg, BofA Global Research

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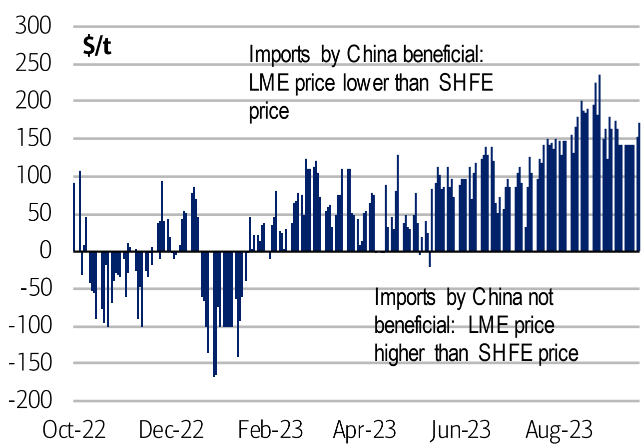
Exhibit 21 confirms that China's domestic aluminium market has remained resilient, with prices continuing to trade at a premium to LME. **This is why we have only marked-to-market aluminium prices and ultimately see support to the white metal.**

Exhibit 21: China, import arbitrage
Prices on Shanghai Futures Exchange keep trading above those on LME



Source: Bloomberg, BofA Global Research

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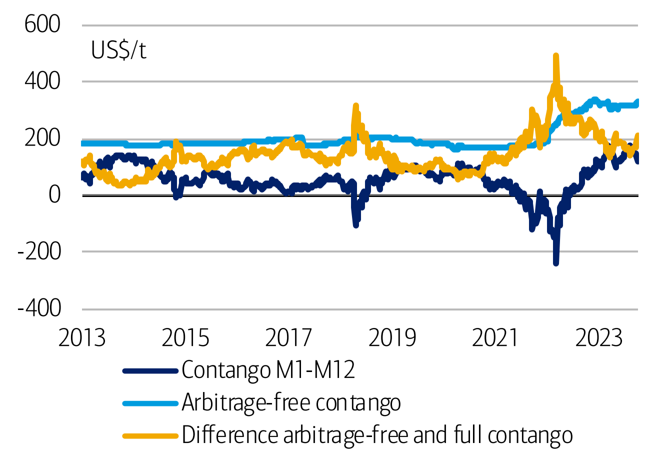
Exhibit 22: Aluminium cash to 3-month time spreads
Aluminium time spreads are also extremely high



Source: Bloomberg, BofA Global Research

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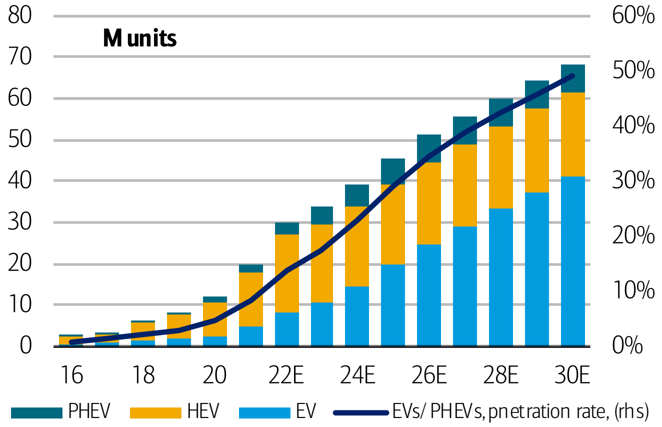
Meanwhile, similar to copper, times spreads have also widened for aluminium. To some extent, this has also been driven by consumer buying. In addition, with LME inventories now dominated by Russian material, some "unwanted" tonnages have also been rolled/re-delivered, which has led to a steeper curve.

Nickel demand from rising EV production

While nickel is benefitting from rising electric vehicle production (Exhibit 23) market participants have been cautious over a confluence of factors. Exhibit 24 shows the potential evolution of the market shares of different lithium-ion batteries, highlighting that lithium iron phosphate batteries are gaining share, driven by China's EV manufacturers.

Exhibit 23: Global electric vehicle production

Electric vehicle production keeps powering ahead



Source: Bloomberg, BofA Global Research

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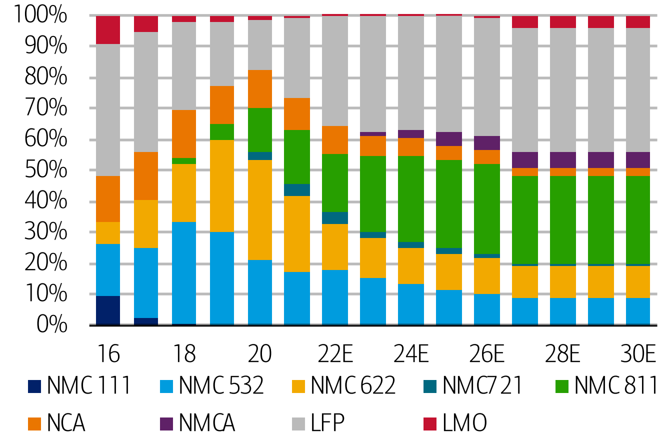
Exhibit 24: Market share of electric vehicle cathodes

Lithium iron phosphate batteries are gaining market share



Source: BofA Global Research

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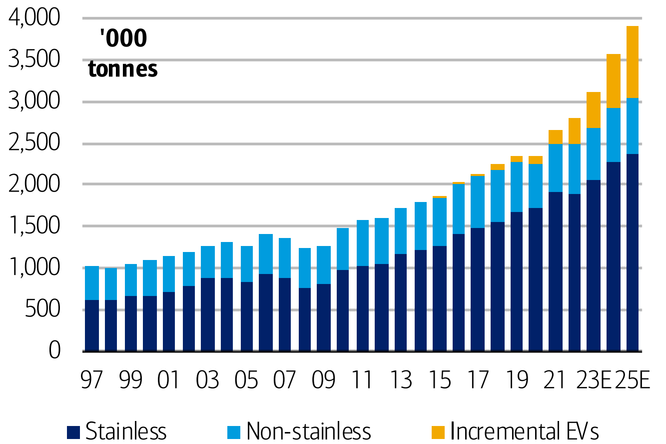
Of course, Exhibit 25 shows that an overall increase of EV production still implies growth in nickel demand. Yet, with supply from Indonesia rising, Exhibit 26 outlines that the market will be oversupplied in the foreseeable future. What could be one implication? Battery manufacturers may no longer be as concerned about nickel supply, so there may ultimately be less of a push to reduce the reliance on nickel-containing batteries, which usually have a larger energy density and driving range anyway.

Exhibit 25: Nickel demand

Marginal demand increases will come from EVs



Source: Bloomberg, BofA Global Research

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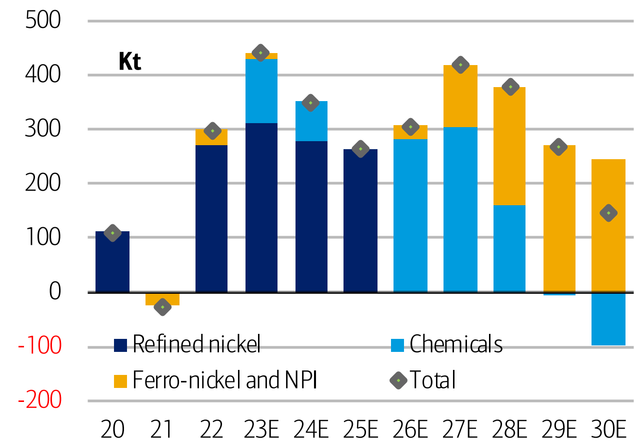
Exhibit 26: Nickel market balance by product

The nickel market looks to be oversupplied in the foreseeable future



Source: Bloomberg, BofA Global Research

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Overall, we reduce nickel forecasts slightly to factor in the relatively subdued fundamental backdrop. At the same time, we believe that prices are relatively close to marginal costs, so the downside may be limited from here.

Appendix

Table 3: Commodity prices, exchange rates, equity indices, yields and inventories

Metal prices have stabilised

Base metals	Cash, $/t	3-month, $/t	Cash, WoW change	3-month, WoW change
Aluminium	2,172	2,200	-1.5%	-1.8%
Copper	7,876	7,949	-1.2%	-1.2%
Lead	2,065	2,042	-5.4%	-4.7%
Nickel	18,284	18,546	-0.1%	-0.2%
Tin	24,753	25,087	1.7%	1.8%
Zinc	2,423	2,446	-2.4%	-2.5%
LMEX	3,561		-1.1%	
	Cash, c/lb	**3-month, c/lb**		
Aluminium	99	100		
Copper	357	361		
Lead	94	93		
Nickel	829	841		
Tin	1,123	1,138		
Zinc	110	111		
Other commodities, freight, exchange rates, equities and yields	**Spot**	**WoW change**		
Gold, $/oz	1,933	5.4%		
Silver, $/oz	23	5.2%		
Platinum, $/oz	884	0.3%		
Palladium, $/oz	1,151	-1.1%		
Iron ore, China fines cfr $/dmt	117	-0.2%		
Brent, $/bbl	91	7.5%		
Baltic Dry Index	1,945	0.8%		
EUR/USD	1.051	-0.7%		
Dow Jones Industrial Average	33,670	0.8%		
10-year US Treasury yield	4.613	-4.0%		
ICE BofA Commodity index, ER	446	4.2%		
ICE BofA Commodity index Industrial Metals, ER	171	-1.5%		
ICE BofA Commodity index Precious Metals, ER	211	5.2%		
ICE BofA Commodity index Energy, ER	547	6.5%		
Exchange stocks and cancelled warrants	**Stocks, tonnes**	**WoW change**	**Canc. warrants, tonnes**	**Canc. warr., of stocks**
Aluminium				
LME	486,600	-2.2%	293,250	60.3%
Shanghai	110,308	39.3%		
Total aluminium	596,908	3.5%		
Copper				
LME	181,000	6.4%	14,800	8.2%
Comex	21,962	-2.3%		
Shanghai	56,894	45.9%		
Total copper	259,856	12.2%		
Lead				
LME	96,225	13.7%	3,050	3.2%
Shanghai	77,197	8.1%		
Total lead	173,422	11.1%		
Nickel				
LME	42,870	-0.6%	828	1.9%
Shanghai	9,312	24.7%		
Total nickel	52,182	3.1%		
Tin	7,390	-1.7%	455	6.2%
Zinc				
LME	83,450	-11.6%	31,450	37.7%
Shanghai	41,289	28.5%		
Total zinc	124,739	-1.4%		

Source: BofA Global Research

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Table 4: 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	$2,268/t 103c/lb	$2,688/t 122c/lb	• China is almost operating at its 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 has been strong, 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	$8,442/t 383c/lb	$9,250/t 420/lb	• Copper rallied as China re-opened, but most of these gains have reversed • 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	$2,156t 98/lb	$2,000/t 91c/lb	• There are no immediate scrap or 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	$21,786/t 988c/lb	$20,250/t 919c/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	$2,648/t 120c/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	$1,924/oz	$1,975/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 2024	• 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	$23.20/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	$976/oz $1,379/oz	$1,050/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 offset some of the catalyst demand losses	• 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	$115/t CIF	$98/t CIF	• Iron ore inventories at China's mills are extremely low. • Production cuts at mills, along with 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	$290/t $181/t	$249/t $160/t	• Thermal coal prices to come under pressure as supply is increasing and the energy emergency normalises • 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	$86/bbl $81/bbl	$90/bbl $86/bbl	• We project Brent and WTI to average $90/bbl and $86/bbl, respectively, in 2024 • The global oil balance should stay tight in 2024, as OPEC+ withholds supply from the market as demand growth slows • We forecast global demand growth to slow to 2mn b/d YoY in 2023 and 1.1mn b/d in 2024 • Non-OPEC supply should grow roughly 2mn b/d YoY in 2023 and 1.2mn b/d in 2024 • We project total US crude and NGL supply to rise 1.27mn b/d in 2023 and 540k b/d in 2024 • OPEC crude oil supplies are set to fall 490k b/d in 2023 and 80k 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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Table5: Commodity price forecasts

Copper should outperform

		Current	3Q23E	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2022E	2023E	2024E	2025E	2026E	2027E	LT price
Base metals															
Aluminium	US$/t	2,153	2,160	2,250	2,500	2,750	2,750	2,750	2,706	2,268	2,688	3,000	2,770	2,540	2,310
	USc/lb	98	98	102	113	125	125	125	123	103	122	136	126	115	105
Copper	US$/t	7,916	8,367	8,000	8,750	9,250	9,500	9,500	8,822	8,442	9,250	10,500	9,703	8,907	8,110
	USc/lb	359	380	363	397	420	431	431	400	383	420	476	440	404	368
Lead	US$/t	2,113	2,171	2,200	2,000	2,000	2,000	2,000	2,149	2,156	2,000	1,750	2,024	2,298	2,572
	USc/lb	96	98	100	91	91	91	91	97	98	91	79	92	104	117
Nickel	US$/t	18,330	20,392	18,500	18,500	22,500	20,000	20,000	25,707	21,786	20,250	22,500	20,289	18,077	15,866
	USc/lb	831	925	839	839	1,021	907	907	1,166	988	919	1,021	920	820	720
NPI, 8-12%	CNY/t		1,123	1,000	1,032	1,032	1,032	1,032	1,424	1,129	1,032	1,062	1,102	1,141	1,180
Zinc	US$/t	2,424	2,435	2,500	2,500	2,500	2,250	2,250	3,482	2,648	2,375	2,250	2,424	2,597	2,771
	USc/lb	110	110	113	113	113	102	102	158	120	108	102	110	118	126
Precious metals															
Gold, nominal	US$/oz	1,921	1,927	1,900	1,950	1,950	2,000	2,000	1,803	1,924	1,975	2,150	2,112	2,074	2,037
Gold, real	US$/oz		1,927	1,900	1,902	1,902	1,951	1,951	1,803	1,924	1,927	2,046	1,961	1,879	1,800
Silver, nominal	US$/oz	22.61	23.56	22.50	22.50	23.00	23.53	24.00	21.80	23.20	23.26	24.75	26.31	27.86	29.42
Silver, real	US$/oz		23.56	22.50	21.95	22.44	22.96	23.41	21.80	23.20	22.69	23.56	24.43	25.24	26.00
Platinum	US$/oz	895	932	950	1,000	1,000	1,100	1,100	964	976	1,050	1,250	1,322	1,394	1,466
Palladium	US$/oz	1,150	1,254	1,250	1,200	1,200	1,000	1,000	2,110	1,379	1,100	1,000	1,155	1,310	1,466
		Current	**3Q23E**	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**LT price**
Bulk Commodities															
Hard coking coal	US$/t fob	367	264	310	249	249	249	249	365	290	249	218	198	178	158
Semi-soft	US$/t fob	178	168	168	168	168	168	168	277	211	168	147	133	120	107
Thermal Coal	US$/t fob	144	147	164	181	166	153	140	357	181	160	125	112	99	85
Iron ore fines	US$/t CIF	120	114	110	110	100	90	90	120	115	98	90	90	89	89
Other materials															
Lithium spodumene	US$/t	3,120	3,298	2,000	1,950	1,850	1,750	1,500	4,498	3,802	1,763	2,188	1,858	1,529	
Lithium carbonate	US$/t	22,950	34,163	20,000	18,000	17,000	16,000	15,000	71,531	37,386	16,500	21,875	21,250	20,625	
Lithium hydroxide	US$/t	22,275	32,546	19,500	19,500	18,500	17,500	16,500	70,142	39,184	18,000	23,375	22,750	22,125	
Alumina	$/t	337	337	331	340	340	340	340	362	343	340	348	357	366	375
Uranium	$/lb		59.07	72.50	75.00	77.50	80.00	80.00	50.17	58.91	78.13	75.00	67.08	59.17	51.25
Molybdenum	$/lb	19.2	23.77	23.77	23.77	23.77	23.77	23.77	18.74	25.41	23.77	23.77	19.71	15.65	11.60
Cobalt	$/lb	17.3	18.00	18.00	18.00	18.00	18.00	18.00	31.04	17.57	18.00	18.00	18.44	18.88	19.32
Manganese ore	$/dmtu	4.25	4.35	4.35	4.35	4.35	4.35	4.35	6.06	4.79	4.35	4.35	4.93	5.51	6.09
Steel, HRC															
HRC, Europe	US$/t	633	711	703	771	751	741	732	950	773	749				
HRC, US	US$/t	827	871	816	926	898	843	794	1,122	951	865				
HRC, China	US$/t	522	575	571	568	585	602	623	663	565	595				
Energy		**Current**	**3Q23E**	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**LT price**
Brent	US$/bbl	90	86	96	94	92	88	86	100	86	90	60	60	60	60
WTI	US$/bbl	87	82	92	90	88	84	82	95	81	86	57	57	57	57
Henry Hub	US$/MMBtu	3.1	2.8	3.3	3.8	3.5	4.3	4.5	6.7	2.7	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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Supply and demand balances

Table 6: Aluminium supply and demand balance

Deficits set to increase

'000 tonnes	2021	2022	2023E	2024E	2025E
Global production	67563	68412	69638	73363	73793
YoY change	3.2%	1.3%	1.8%	5.3%	0.6%
Global consumption	68618	69228	70134	73640	77322
YoY change	7.5%	0.9%	1.3%	5.0%	5.0%
Balance	-1054	-816	-496	-277	-3530
Market inventories	9142	8326	7830	7553	4023
Weeks of world demand	6.9	6.3	5.8	5.3	2.7
LME Cash ($/t)	2474	2706	2353	2875	3500
LME Cash (c/lb)	112	123	107	130	159

Source: SNL, Woodmac, CRU, Bloomberg, company reports, IAI, BofA Global Research

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Table 7: Copper supply and demand balance

Balanced market in 2023E

'000 tonnes	2021	2022	2023E	2024E	2025E
Global production	24127	24646	25874	27042	27575
YoY change	3.8%	2.2%	5.0%	4.5%	2.0%
Global consumption	24863	25166	25607	26631	27697
YoY change	3.8%	1.2%	1.8%	2.1%	1.9%
Balance	-736	-520	267	411	-122
Market inventories	1164	643	911	1322	1200
Weeks of world demand	2.4	1.3	1.8	2.6	2.3
LME Cash ($/t)	9321	8822	8788	9750	10500
LME Cash (c/lb)	423	400	399	442	476

Source: SNL, Woodmac, CRU, Bloomberg, company reports, ICSG, BofA Global Research

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Table 8: Nickel supply and demand balance

Nickel to be well supplied

'000 tonnes	2021	2022	2023E	2024E	2025E
Global production	2772	3220	3617	3980	4230
YoY change	7.9%	16.2%	12.3%	10.0%	10.5%
Global consumption	2798	2931	3217	3693	4049
YoY change	14.5%	4.8%	9.8%	14.8%	10.6%
Balance, incl. NPI oversupply	-26	288	400	287	181
Market inventories	392	680	1080	1367	1548
Weeks of world demand	7.3	12.1	17.5	19.3	19.9
LME price ($/t)	18455	25707	22063	21250	22500
LME price (c/lb)	837	1166	1001	964	1021

Source: SNL, Woodmac, CRU, Bloomberg, company reports, INSG, BofA Global Research

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Table 9: Zinc supply and demand balance

Project pipeline not a significant risk

'000 tonnes	2021	2022	2023E	2024E	2025E
Global production	13883	13494	14100	14600	15150
YoY change	1.6%	-2.8%	4.5%	3.5%	3.8%
Global consumption	14016	13553	13896	14242	14596
YoY change	6.3%	-3.3%	2.5%	2.5%	2.5%
Balance	-133	-59	204	358	554
Market inventories	736	580	784	1142	
Weeks of world demand	2.7	2.2	2.9	4.2	
LME Cash ($/t)	3003	3482	2603	2375	
LME Cash (c/lb)	136	158	118	108	

Source: SNL, Woodmac, CRU, Bloomberg, company reports, ILZSG, BofA Global Research

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Table 10: Iron ore supply and demand balance

Flipping back into surplus

Wet Mt	2021	2022	2023E	2024E	2025E
Global production	2,274	2,301	2,334	2,435	2,541
YoY change	0.7%	1.2%	1.4%	4.3%	4.3%
Global consumption	2,310	2,211	2,261	2,303	2,320
YoY change	-0.4%	-4.3%	2.3%	1.9%	0.7%
Balance	-36	90	73	132	221
Iron ore price (US$/t)	160	120	114	98	90

Source: Company reports, CRU, Bloomberg, BofA Global Research estimates

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Table 11: Platinum supply and demand balance

Substitution and hydrogen an offset for catalyst

'000 ounces	2021	2022	2023E	2024E	2025E
Global production	7750	6721	6633	7676	7990
YoY change	20.5%	-13.3%	-1.3%	15.7%	4.1%
Global consumption	7848	6057	7231	7557	7685
YoY change	12.5%	-22.8%	19.4%	4.5%	1.7%
Balance	-98	664	-598	119	306
Spot ($/oz)	1092	964	1068	1465	1453

Source: Matthey, company reports, BofA Global Research estimates

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Table 12: Lithium supply and demand balance

The lithium market is increasingly oversupplied

tonnes	2021	2022	2023E	2024E	2025E
Global production	511,931	637,116	897,189	1,259,189	1,640,703
YoY change	22%	24%	41%	40%	30%
Global consumption	528,983	720,407	920,934	1,198,060	1,541,595
YoY change	63%	36%	28%	30%	29%
Balance	-17,052	-83,292	-23,745	61,129	99,108
Spot ($/lb)	19169	71531	45980	32500	32500

Source: Company reports, Woodmac, Bloomberg, BofA Global Research estimates

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Table 13: Cobalt supply and demand balance

The cobalt market needs some supply cuts

tonnes	2021	2022	2023E	2024E	2025
Global production	158,076	198,235	231,241	274,225	301,692
YoY change	14.4%	25.4%	16.6%	18.6%	10.0%
Global consumption	159,887	188,640	220,119	265,120	309,644
YoY change	18.5%	18.0%	16.7%	20.4%	16.8%
Balance	-1,811	9,595	11,121	9,106	-7,952
Spot ($/lb)	51,514	69,557	60,624	70,544	60,881

Source: Company reports, CRU, Bloomberg, BofA Global Research estimates

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Disclosures

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