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Global Metals Weekly

Copper markets tighten, despite China's battle with the 3Ds

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Commodities
Global

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Sell in March and go away

In contrast to some of the energy commodities, the base metals usually follow a longer-term business cycle trend, so they tend to be more stable intra-year. That said, copper prices have shown some "seasonality", often outperforming in 4Q, before then giving back those gains. Year-end rallies have been accompanied by an increase in speculative length, especially in the past two years after the end of COVID and China's re-opening. Meanwhile, the underperformance of copper into spring/summer has often been preceded by rising inventories: Northern Hemisphere winter and China New Year holidays tend to subdue markets. 'Sell in March and go away' can work, but a bottoming out of the global economy, an end to de-stocking through supply chains and rate cuts (see Metals Strategist - Year Ahead 2024) may make that trade more difficult in 2024. We remain constructive on copper into 2H24 and expect prices to average $10,500/t ($4.76/lb) in 2025.

China has an issue with overcapacity, not just in housing

China's grid investment carried the global copper market in 2023. Our analysis suggests that green spending should also support demand this year. Notwithstanding, the three Ds – deflation, debt and demographics – are formidable challenges for the Communist Party. Managing those, while moving the economy up the value chain, will be tricky. Near term, we believe wider demand weakness on subdued sentiment is the key issue in China, and that is unlikely to be remedied with measures targeting the supply side of the economy, including credit easing. Indeed, the government ultimately needs to put together a policy mix that lifts sentiment; hence the resolve to push equities higher. Against these headwinds, we are focused on how committed authorities are to investing in the 10 strategic industries to keep metals demand going.

Supply issues coming to a head

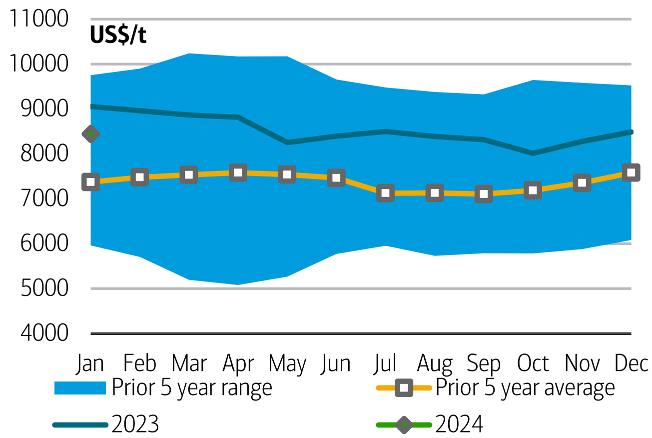
China's copper demand growth was extremely strong last year, but refined copper imports stayed within longer-term ranges. This was possible because domestic refined production hit a series of record highs in 2023, on ample mine supply and destocking, with concentrates inventories on site and in ports now standing at 3 weeks, down from a high of 4.5 weeks. Concentrates availability has tightened – also because mine supply growth is slowing. Treatment and refining charges are at levels that usually prompt production cuts at smelters/refiners. Scrap, an alternative supply source, is worth following. If secondary material becomes more expensive too, that would confirm headwinds for smelters/refiners are intensifying. Ultimately, China's consumers may be forced to increase refined imports.

Green spending offsets 3D headwinds

Sell in March and go away

Many energy commodities, like natural gas, show a pronounced seasonality, driven by demand. Meanwhile, the base metals often follow a longer-term business cycle trend, so they tend to be more stable intra-year. For instance, forward curves don't show the periodic spikes that e.g. natural gas does. That said, copper prices have recently shown some "seasonality", often rallying in 4Q, before giving back those gains in the following year, as Exhibit 1 and Exhibit 2 show.

Exhibit 1: Copper price movements
Seasonalities tend to be low



Source: Bloomberg, BofA Global Research

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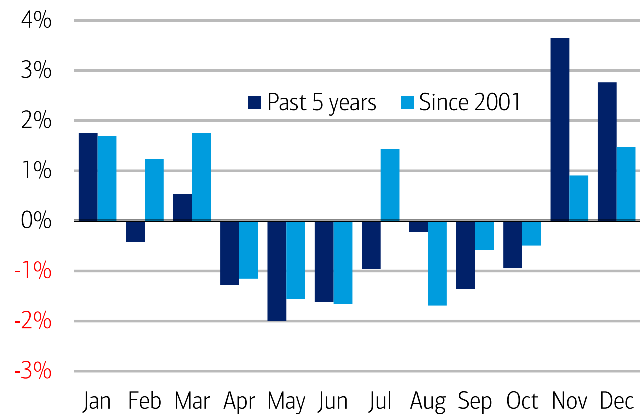
Exhibit 2: Copper, seasonal price component
Copper tends to outperform in November and December



Source: Bloomberg, BofA Global Research

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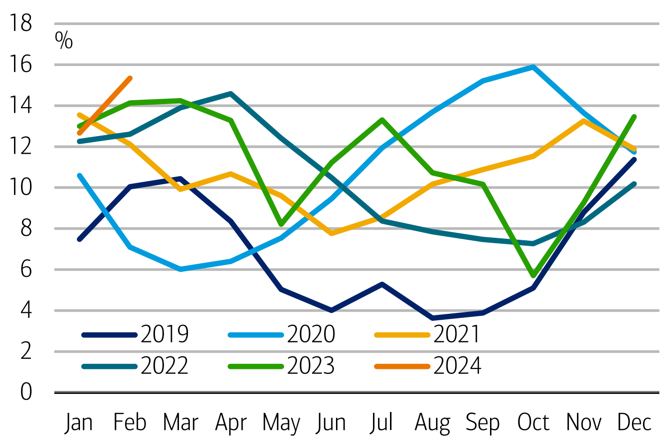
Looking into the year-end rallies, Exhibit 3 highlights that net non-commercial length rose sharply in 2022 and 2023, when market participants were taking bullish positions as the COVID pandemic came to an end and China re-opened.

Exhibit 3: LME, net non-commercial positions of open interest
Non-commercial length usually rises in 4Q



Source: Bloomberg, BofA Global Research

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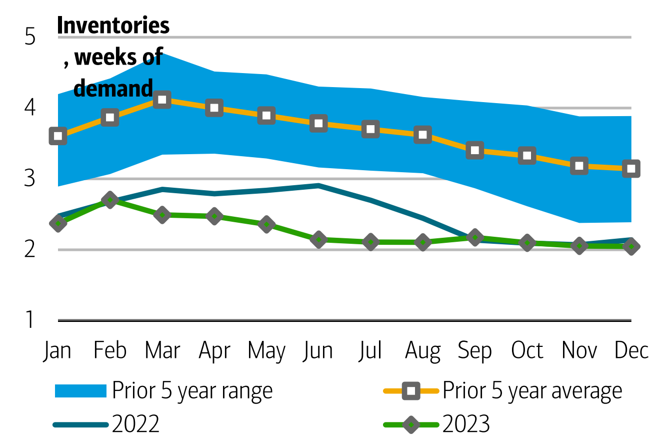
Exhibit 4: Total copper inventories
Inventories tend to rise at the beginning of the year



Source: CRU, Bloomberg, BofA Global Research

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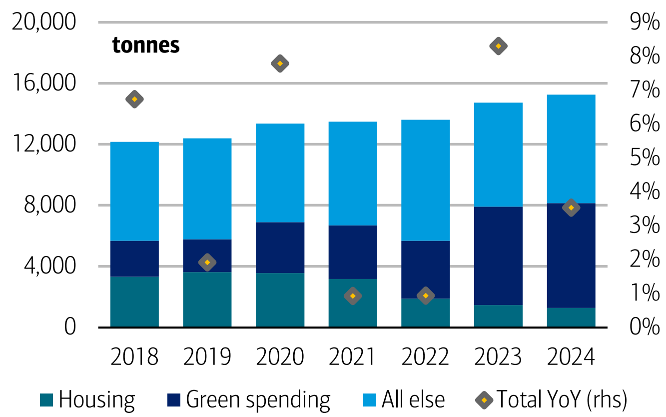
Exhibit 4 shows the trajectory of inventories, confirming that stocks usually fall into year-end, before moving up in 1Q. This is driven by a confluence of factors. Winter in the Northern Hemisphere can, for instance, subdue metals-relevant economic activity like construction. There may also be some restocking ahead of China New Year, before activity slows during the actual holiday period and takes a while to normalise. The bottom line: while some seasonality can be explained fundamentally, positioning, which exacerbated price trends towards year-end, have often been driven by one-off factors.

'Sell in March and go away' can work, but a bottoming out of the global economy, an end to de-stocking through supply chains and rate cuts (see Metals Strategist - Year Ahead 2024) may make that trade more difficult in 2024. We remain constructive on copper into 2H24 and expect prices to average $10,500/t ($4.76/lb) in 2025.

Demand supported by green spending

Exhibit 5 highlights that green spending made a big contribution to China's copper offtake in 2023, more than offsetting weakness in the housing market. While China's State Grid is targeting CNY500bn of grid investment this year, slightly below 2023's level, it should nonetheless support consumption. Other countries also remain focused on facilitating the energy transition, so demand for copper-containing renewables will likely be healthy ex-China too. Indeed, Exhibit 6 shows the dynamic in Europe, highlighting that demand is pulling higher in that region, notwithstanding the weak macro backdrop. What other sectors beyond renewables are also supporting demand? We answer this question in the sections below.

Exhibit 5: China copper demand
Green spending has offset the weakness housing market



Source: Bloomberg, BofA Global Research

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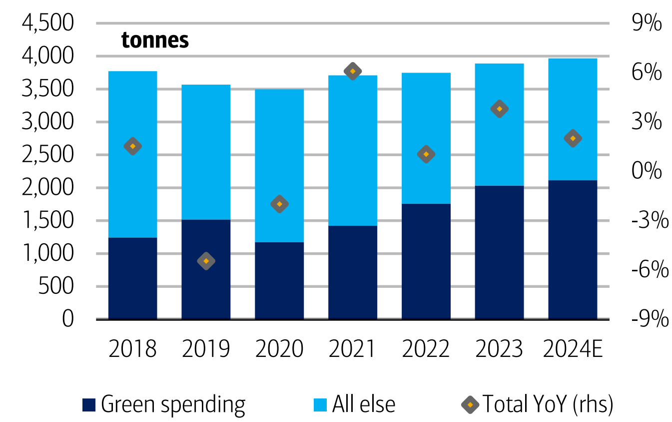
Exhibit 6: Europe, copper demand
Green spending has been adding to copper demand in Europe



Source: Bloomberg, BofA Global Research

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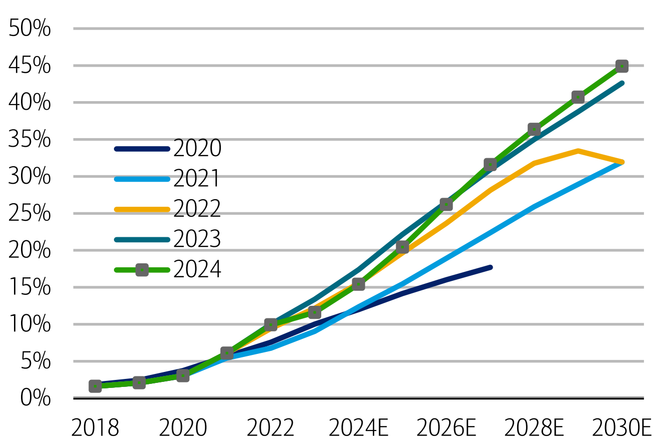
Autos – an important growth driver, EV penetration rates lower

We have lowered EV penetration rates

Looking at transportation, usually 10% of copper demand, Exhibit 7 shows that we have cut electric vehicle penetration rates.

Exhibit 7: EV penetration rates
We have reduced EV penetration rates in 2024 and 2025



Source: Platts, BofA Global Research

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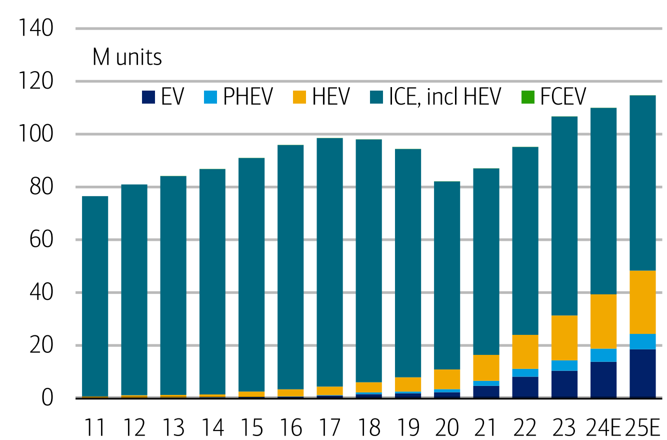
Exhibit 8: Global car production
Car production is expanding



Source: Platts, BofA Global Research

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This matters insofar as EVs have a higher copper content than cars with a combustion engine. Notwithstanding, Exhibit 8 shows that total car production should still be expanding. Pulling this together, global copper demand from transportation is set to increase by around 5% this year. Yet, factoring in lower EV penetration rates, we have reduced copper demand by around 200kt pa in 2024 and 2025, or around 0.7% of global consumption, compared to our previous forecasts.

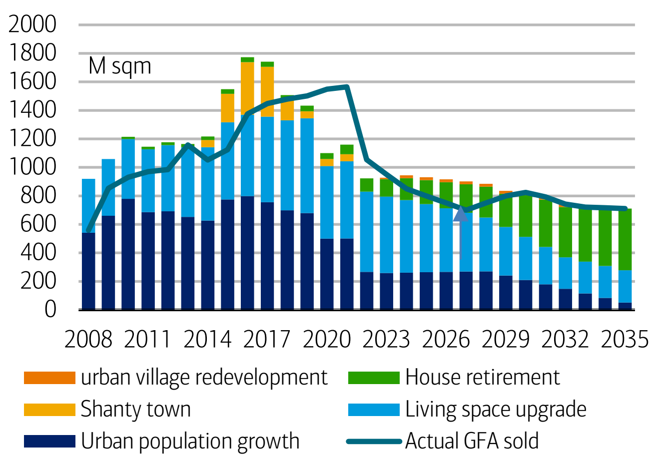
EV changes in composition

Car technology is transforming rapidly and we follow changes to the power system closely. There are two electricity circuits in an EV: one for the drivetrain and an ancillary system. Tesla recently announced a shift towards a 48V architecture in the ancillary system, which currently runs on 12V in all cars, even in EVs. Working through the numbers, Tesla said that a 48V system may require 75% less copper. The drivetrain battery contains around 40kg of copper, which is just under 50% of the total EV copper content. Assuming the drivetrain remains unchanged, Tesla's comments imply that the total copper content would fall by around 38% or by 30kg to 50kg, compared to a copper content of 30kg in a car with a combustion engine. As such, updating the ancillary infrastructure does reduce the copper intensities of EVs, but these vehicles still need more copper than a car with a combustion engine.

Housing – inventory overhang an issue

China's housing market historically accounted for around one-third of domestic copper demand. However, we argue that the sector is in structural decline (Exhibit 9), with housing demand set to fall gradually in the coming years. Exhibit 10 shows that housing starts are running well below housing demand.

Exhibit 9: China, housing demand
The demand in China for housing will likely keep trending lower



Source: BofA Global Research

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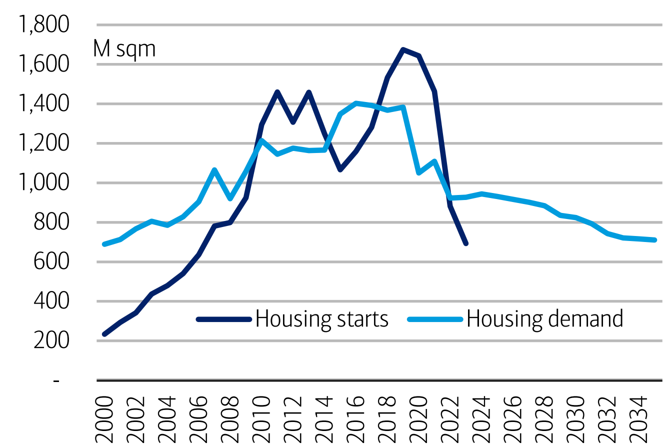
Exhibit 10: China, housing demand and housing starts
Housing starts are running well below demand



Source: BofA Global Research

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Our China property team estimates that vacant secondary stocks represent 5-6 years of new home demand, so mathematically, new home demand can be satisfied entirely by vacant secondary stocks.

Exhibit 11: China, housing markets
Activity is set to be contracting

	2023	2024E (new)
National sales volume	-8.20%	5% to 10% drop
National sales value (commodity housing only)	-6.00%	9% to 16% drop
Residential new starts	-21.00%	9% to 15% drop
Residential Completion	17.20%	5%-10% drop

Source: BofA Global Research

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For housing starts to stabilise, secondary stock owners need to stop putting up for sale their vacant units (possible if they feel more confident, or if prices keep falling to below cost level), or new starts will have to run low for a few years to allow destocking to take place. Either way, while the property sector has been stabilising at a low level, it is unlikely to make a meaningful contribution to copper demand again. That's why grid investment and car production matter so much.

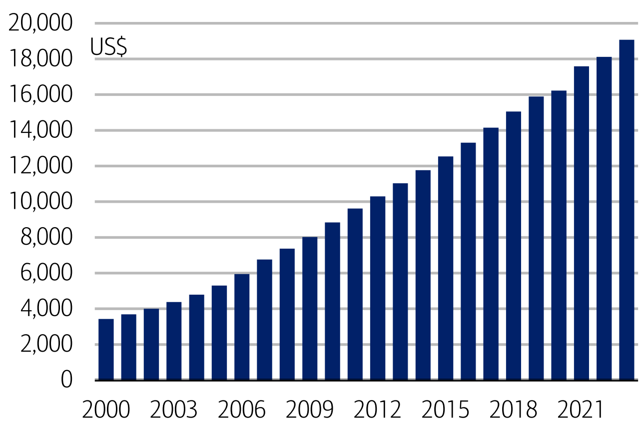
China has a structural issue

Productivity growth has slowed; debt is less effective in generating growth

Sticking with headwinds in China, the country industrialised rapidly after joining the WTO in 2001, with GDP per capita rising almost tenfold over the past 20 years (Exhibit 12). Yet those growth rates have now slowed visibly (Exhibit 13). This deceleration is not unusual for emerging markets, often giving rise to concerns over falling into the middle-income trap, whereby rising wages erode competitiveness, making it hard for EMs to compete with DMs, which tend to be more productive and innovative.

Exhibit 12: China, GDP per capita

GDP per capita has risen steadily



Source: IMF, BofA Global Research

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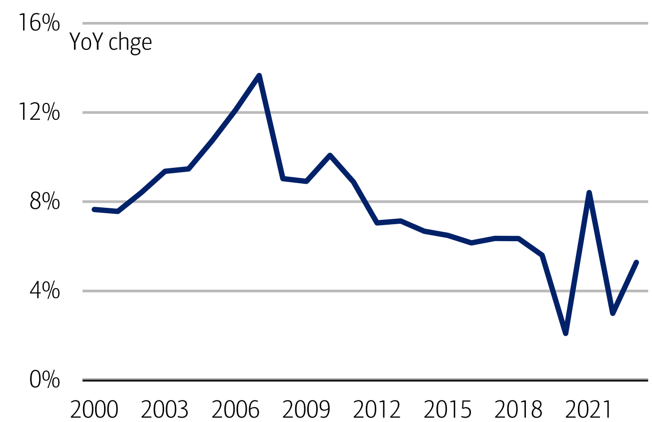
Exhibit 13: China, GDP per capita

The growth in GDP per capita has slowed gradually



Source: IMF, BofA Global Research

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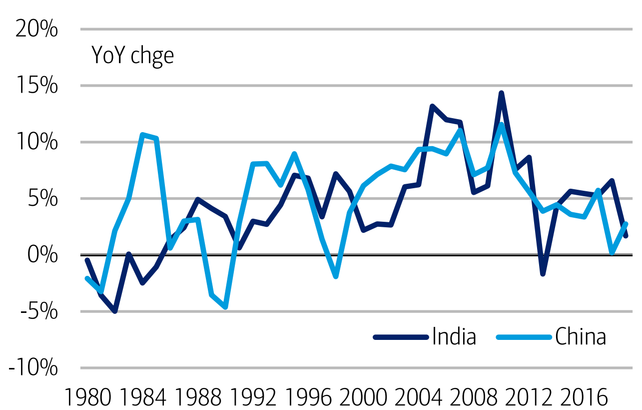
These issues are reflected in various growth metrics. Exhibit 14 shows, for instance, that China outpaced India's productivity growth in the decade before the Financial Crisis, but it has since fallen behind. The structural headwinds to growth have also been mirrored in debt dynamics, with China now forced to spend more bucks to generate a unit of GDP growth (Exhibit 15). Overcapacity, not just in housing, is a big issue here.

Exhibit 14: Labour productivity per hour worked

China has fallen behind India



Source: Bloomberg, BofA Global Research

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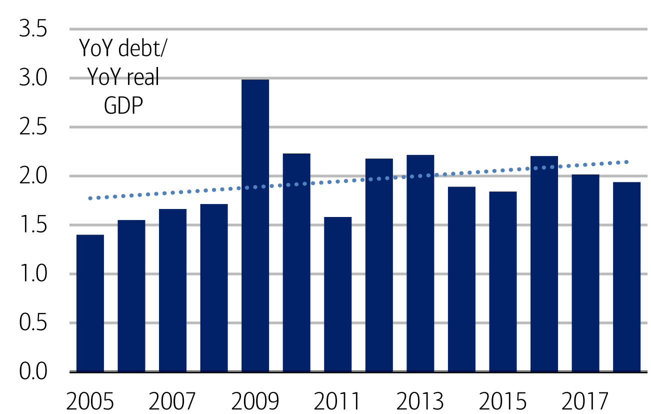
Exhibit 15: China, debt versus real GDP increases

Debt has delivered less bang for the buck



Source: Bloomberg, BofA Global Research

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China tackling shortcomings, which matters for metals

Encouragingly for the metals, China's authorities have acknowledged the issues at hand and are investing heavily in updating the country's industrial base to give the economy a sustained boost. Indeed, maintaining elevated growth is a focus of China's Communist Party, so it is not surprising that authorities are increasingly concerned about issues like youth unemployment. The government's ambitions have been captured in industrial policies like Made in China 2025, which ultimately targets making China the leading manufacturing power by 2049. Importantly for commodities, many of the industries with government focus are metals-intensive. Exhibit 17 highlights that new materials, along with energy savings & new energy vehicles, are seen as critical for the country.

Exhibit 16: Key milestones in China
China aims to be the leading manufacturing power by 2049

Main Steps	Milestones
2025	Major manufacturing power
2035	Global manufacturing power
2049	Leading manufacturing power

Source: BofA Global Research

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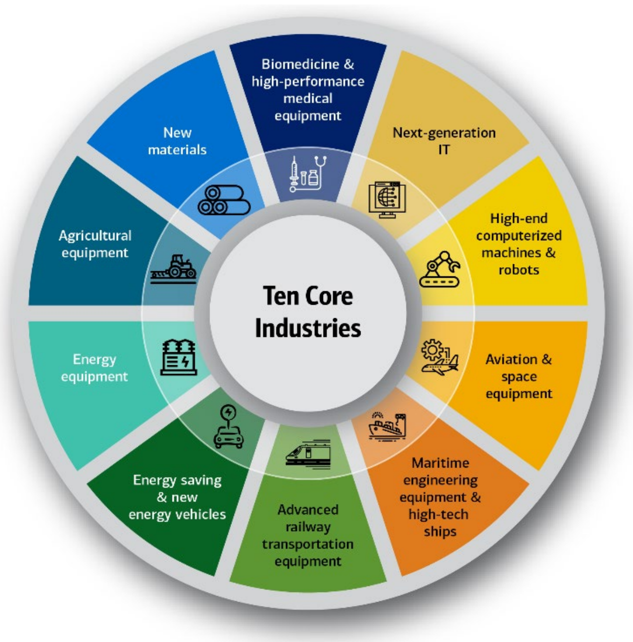
Exhibit 17: China's 10 core industries
The government focuses on 10 core industries, many of which are metals-intensive



Source: BofA Global Research

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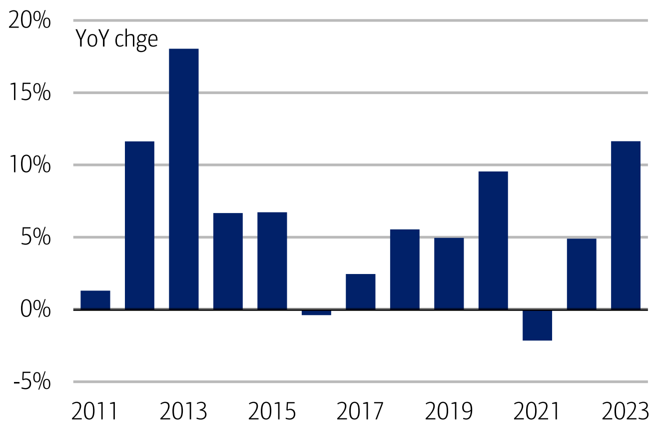
Indeed, the government takes a hands-on approach with industrial policy, guiding on capital allocation, policy coordination and tech-related innovation. Of course, this ultimately aims at lifting the country out of the middle-income trap through a transformation of the manufacturing base, which is set to focus on higher value-adding activity, that is increasingly independent of foreign technology.

Notwithstanding, the three Ds – deflation, debt and demographics – are formidable challenges for the CCP. Managing those, while re-configuring the economy will be tricky. Wider demand weakness is the key issue in China, and that is unlikely to be remedied with measures targeting the supply side of the economy, like credit easing. Indeed, the government ultimately needs to put together a policy mix that lifts sentiment. Testament to that, authorities are now looking to boost equity markets. Overall, from a metals perspective, we are focused on how committed the authorities are to invest in the 10 core industries to keep metals demand going.

Supply issues coming to a head

Exhibit 18 confirms that China's copper demand growth was very strong last year. Exhibit 19 breaks down apparent demand and shows that refined production increased visibly, hitting a series of record highs in 2023. This was possible because mine supply was still quite ample; in addition, SMM noted that domestic smelters have been destocking on feedstock, with concentrates inventories on site and in port falling to 3 weeks, down from a recent high of 4.5 weeks. This is still slightly above the historical low of 2.5 weeks.

Exhibit 18: China, apparent demand
Last year, China's apparent copper demand has been expanding at the fastest since 2013



Source: Bloomberg, BofA Global Research

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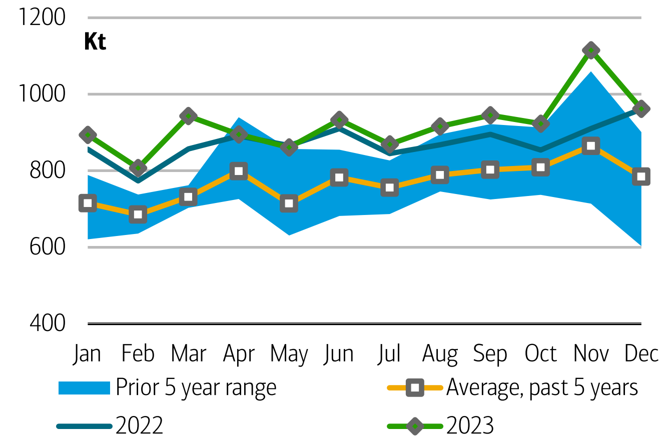
Exhibit 19: China, refined production
China's smelters have maximised copper production



Source: Bloomberg, BofA Global Research

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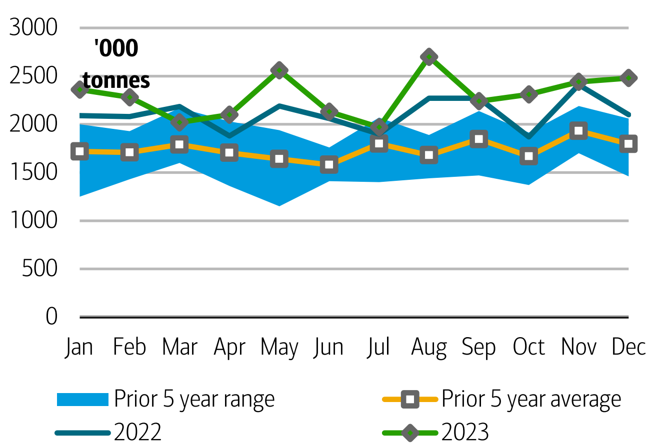
Of course, strong domestic production has limited the need to import refined copper Exhibit 20 shows that copper ore imports were extremely healthy in 2023, while refined imports were somewhat more subdued (Exhibit 21).

Exhibit 20: China, ore imports
China's copper concentrates imports were elevated



Source: Bloomberg, BofA Global Research

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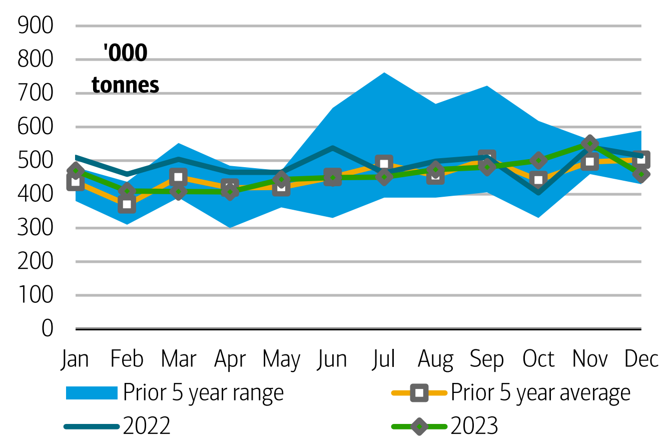
Exhibit 21: China, refined imports
Refined imports have remained within longer-term ranges



Source: Bloomberg, BofA Global Research

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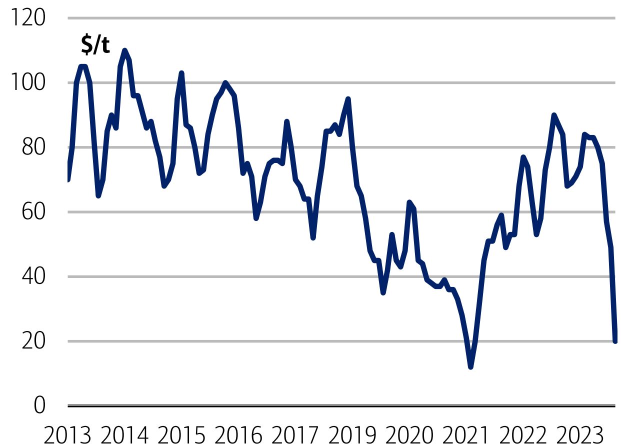
This dynamic is worth following because there have been a series of supply disruptions in recent months. These have already fed through into treatment and refining charges[1],

[1] Copper is produced through two production processes: the smelting/ refining route accounts for 80% of all copper output, while the SX-EW route accounts for 20%. Smelters receive concentrates from mines and produce anodes. The anodes are then sent to refineries, which process them into cathodes. Smelters/ refiners receive a treatment and refining charge (TC/RC) from the miners for their services, while miners retain the copper price less the treatment and refining charge. TC/RCs are an important indicator for constraints: when they fall, concentrates availability is insufficient. There are (at least) two copper market balances: one for concentrates, the other for refined metal.

as outlined in Exhibit 22 and Exhibit 23. Spot treatment and refining charges are currently below the levels smelters and refiners usually aim for, i.e., around $50/t and 5c/lb. Hence, we might well see production curtailments that would push China's consumers back into the international market for refined copper purchases.

Exhibit 22: Copper, treatment and refining charges
TC/RCs have collapsed



Source: Woodmac, Bloomberg, BofA Global Research

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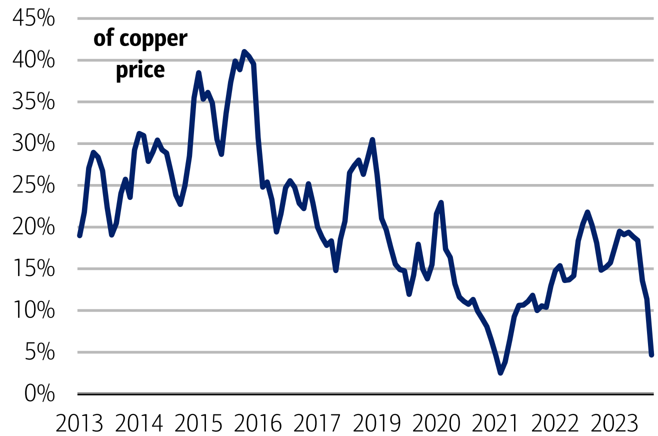
Exhibit 23: Copper, treatment and refining charges of copper prices
Smelters/ refiners receive only 5% of the copper price



Source: Woodmac, Bloomberg, BofA Global Research

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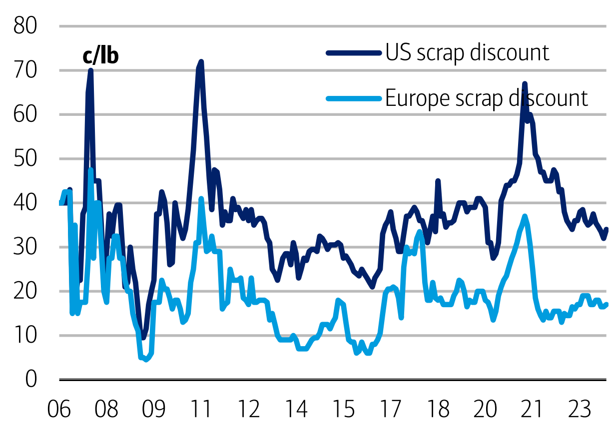
As treatment and refining charges have fallen sharply on tight copper mine supply, dynamics in scrap, an alternative feedstock, are worth following. Scrap is usually priced at a discount to refined copper and a fall in the discount would imply stronger fundamentals here too. Exhibit 24 and Exhibit 25 show that the scrap market has already tightened in recent years, although this was to some extent influenced by logistical issues during COVID. If concentrates supply is a constraint, the scrap discounts should decline further.

Exhibit 24: Copper scrap prices
Scrap discounts have fallen



Source: CRU, Bloomberg, BofA Global Research

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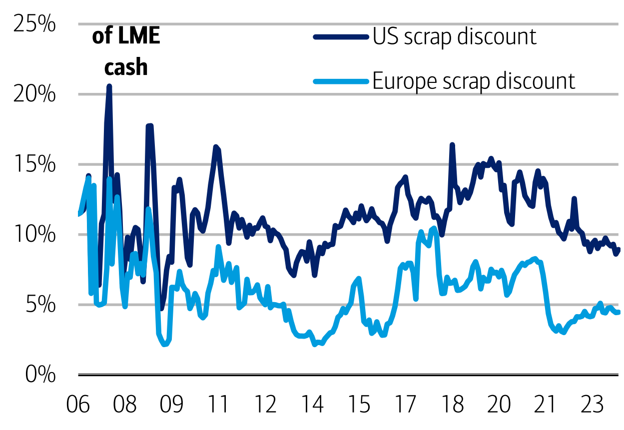
Exhibit 25: Copper scrap prices
The scrap market is not amply supplied



Source: CRU, Bloomberg, BofA Global Research

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Appendix

Table 1: 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	2,201	2,227	1.2%	0.7%
Copper	8,129	8,235	-1.4%	-1.5%
Lead	2,028	2,024	-4.0%	-4.3%
Nickel	15,783	16,040	0.2%	0.1%
Tin	27,092	27,299	10.4%	9.9%
Zinc	2,302	2,320	-4.4%	-4.1%
LMEX	3,587		-0.7%	
	Cash, c/lb	**3-month, c/lb**		
Aluminium	100	101		
Copper	369	374		
Lead	92	92		
Nickel	716	728		
Tin	1,229	1,238		
Zinc	104	105		
Other commodities, freight, exchange rates, equities and yields	**Spot**	**WoW change**		
Gold, $/oz	2,020	-0.2%		
Silver, $/oz	23	1.5%		
Platinum, $/oz	893	-0.8%		
Palladium, $/oz	898	-5.9%		
Iron ore, China fines cfr $/dmt	129	0.8%		
Brent, $/bbl	82	5.1%		
Baltic Dry Index	1,572	9.5%		
EUR/USD	1.077	0.3%		
Dow Jones Industrial Average	38,797	1.1%		
10-year US Treasury yield	4.180	0.5%		
ICE BofA Commodity index, ER	419	2.9%		
ICE BofA Commodity index Industrial Metals, ER	170	-0.9%		
ICE BofA Commodity index Precious Metals, ER	216	-0.3%		
ICE BofA Commodity index Energy, ER	509	5.2%		
Exchange stocks and cancelled warrants	**Stocks, tonnes**	**WoW change**	**Canc. warrants, tonnes**	**Canc. warr., of stocks**
Aluminium				
LME	525,225	-1.1%	199,825	38.0%
Shanghai	104,763	-1.3%		
Total aluminium	629,988	-1.2%		
Copper				
LME	135,450	-2.9%	22,300	16.5%
Comex	20,617	-6.7%		
Shanghai	86,520	25.8%		
Total copper	242,587	5.3%		
Lead				
LME	162,475	24.6%	17,550	10.8%
Shanghai	37,723	1.3%		
Total lead	200,198	19.4%		
Nickel				
LME	71,946	0.3%	5,580	7.8%
Shanghai	15,965	2.2%		
Total nickel	87,911	0.6%		
Tin	6,280	-0.2%	1,100	17.5%
Zinc				
LME	246,400	24.9%	31,650	12.8%
Shanghai	33,593	20.5%		
Total zinc	279,993	24.4%		

Source: BofA Global Research

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Exhibit 26: Price forecasts, fundamental drivers and risks
We are bullish a range of cyclical commodities

Metal	2024E	2025E	Fundamental drivers	Risks (D = downside; U = upside)
Aluminium	$2,563/t 116c/lb	$3,000/t 136c/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. 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	$8,625/t 391c/lb	$10,500/t 476c/lb	• Demand in China has been patchy, but grid spending has completely offset weakness in housing. Demand may be more balanced in 2024, and should hold up. Copper to rally, if the government pushes lead to broader recovery • Inventories are low, which is supportive, but could also increase volatility • We expect a small surplus for 2024	• 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	$2,000/t 91c/lb	$1,750/t 79c/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	$18,750/t 851c/lb	$20,000/t 907c/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 2024, with prices increasingly supported by costs	• 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	$2,375/t 108c/lb	$2,250/t 102c/lb	• The zinc market has been better supplied, as demand from galvanisers has subsided • Zinc may remain an underperformer, but immediate downside more limited, also because costs have shifted higher on inflation • The surpluses could disappear, if more mine close	• 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	$1,975/oz	$2,150/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. • If rate cuts come before 2Q24, gold could end next year at $2,400/oz • Central bank buying has been strong, but not sufficient; a Fed pivot may bring more investors into the market • Gold to rally in 2H24	• 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	$23.26/oz	$24.75/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	$1,050/oz $750/oz	$1,250/oz $500/oz	• Palladium is slowly moving into surplus, keeping pressure on prices. • More production discipline is necessary. • Any supply cuts may reduce the palladium surpluses, but will likely push platinum into a deficit, so prices might diverge. • PGMs are in a difficult spot.	• 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	$125/t CIF	$90/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	$270/t $150t	$215/t $125/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

Colours indicate our stance on each commodity: Green = bullish, Yellow = neutral, Red = cautious. **Source:** BofA Global Research estimates

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Exhibit 27: Commodity price forecasts

Copper and aluminium are stabilizing, we are still bearish lithium

		Current	1Q24E	2Q24E	3Q24E	4Q24E	1Q25E	2Q25E	2023E	2024E	2025E	2026E	2027E	2028E	LT price
Base metals															
Aluminium	US$/t	2,201	2,250	2,500	2,750	2,750	3,000	3,000	2,268	2,563	3,000	3,250	3,015	2,781	2,546
	USc/lb	100	102	113	125	125	136	136	103	116	136	147	137	126	115
Copper	US$/t	8,129	8,000	8,500	8,750	9,250	10,000	10,000	8,442	8,625	10,500	9,500	9,539	9,578	9,617
	USc/lb	369	363	386	397	420	454	454	383	391	476	431	433	434	436
Lead	US$/t	2,028	2,000	2,000	2,000	2,000	1,750	1,750	2,156	2,000	1,750	2,024	2,217	2,409	2,602
	USc/lb	92	91	91	91	91	79	79	98	91	79	92	101	109	118
Nickel	US$/t	15,783	18,500	18,500	19,000	19,000	20,000	20,000	21,786	18,750	20,000	20,000	19,141	18,283	17,424
	USc/lb	716	839	839	862	862	907	907	988	851	907	907	868	829	790
NPI, 8-12%	CNY/t		1,032	1,032	1,032	1,032	1,062	1,062	1,129	1,032	1,062	1,102	1,138	1,174	1,210
Zinc	US$/t	2,302	2,500	2,500	2,250	2,250	2,250	2,250	2,648	2,375	2,250	2,424	2,596	2,769	2,942
	USc/lb	104	113	113	102	102	102	102	120	108	102	110	118	126	133
Precious metals															
Gold, nominal	US$/oz	2,028	1,950	1,950	2,000	2,000	2,100	2,100	1,924	1,975	2,150	2,096	2,095	2,094	2,093
Gold, real	US$/oz		1,950	1,950	2,000	2,000	2,049	2,049	1,924	1,975	2,098	1,995	1,946	1,898	1,850
Silver, nominal	US$/oz	22.91	22.50	23.00	23.53	24.00	24.50	24.50	23.20	23.26	24.75	26.07	27.18	28.30	29.42
Silver, real	US$/oz		22.50	23.00	23.53	24.00	23.90	23.90	23.20	23.26	24.15	24.81	25.21	25.60	26.00
Platinum	US$/oz	901	1,000	1,000	1,100	1,100	1,250	1,250	976	1,050	1,250	1,322	1,372	1,421	1,471
Palladium	US$/oz	912	900	800	700	600	500	500	1,379	750	500	500	824	1,147	1,471
		Current	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Bulk Commodities															
Hard coking coal	US$/t fob	316	360	280	210	230	240	190	290	270	215	205	212	219	226
Semi-soft	US$/t fob	153	238	185	139	152	158	125	220	178	142	135	134	133	132
Thermal Coal	US$/t fob	120	148	148	151	153	125	125	176	150	125	112	112	113	113
Iron ore fines	US$/t CIF	129	150	130	120	100	90	90	115	125	90	90	94	98	102
		Current	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Other materials															
Lithium spodumene	US$/t	850	850	500	500	750	1,000	1,500	3,821	650	1,438	1,750	1,650	1,550	1,450
Lithium carbonate	US$/t	13,500	13,500	10,000	8,250	10,250	12,000	16,000	40,469	10,500	15,500	18,000	18,667	19,333	20,000
Lithium hydroxide	US$/t	13,000	14,000	11,000	9,700	11,750	13,500	17,500	44,500	11,613	17,000	19,500	20,167	20,833	21,500
Alumina	$/t	368	340	340	340	340	348	348	343	340	348	357	375	394	412
Uranium	$/lb		75.00	77.50	80.00	80.00	75.00	75.00	58.91	78.13	75.00	70.00	65.00	60.00	55.00
Molybdenum	$/lb	20.0	18.10	18.10	18.10	18.10	18.10	18.10	23.99	18.10	18.10	18.10	16.32	14.54	12.76
Cobalt	$/lb	15.8	18.00	18.00	18.00	18.00	18.00	18.00	17.57	18.00	18.00	18.44	19.84	21.23	22.63
Manganese ore	$/dmtu	4.20	4.35	4.35	4.35	4.35	4.35	4.35	4.79	4.35	4.35	4.93	5.52	6.11	6.70
Steel, HRC															
HRC, Europe	US$/t	722	719	701	639	674	721	702	767	683	714				
HRC, US	US$/t	992	1,130	1,020	882	805	799	799	975	959	799				
HRC, China	US$/t	553	568	585	602	623	592	597	565	595	602				
		Current	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
WTI	US$/bbl	78	73	75	77	75	57	57	79	75	57	57	57	57	57
Brent	US$/bbl	83	78	80	82	80	60	60	83	80	60	60	60	60	60
Henry Hub	US$/MMBtu	1.8	2.9	2.5	3.0	3.6	2.6	2.6	2.7	3.0	2.6	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 2: Aluminium supply and demand balance
Deficits set to increase

'000 tonnes	2022	2023	2024	2025	2026
Global production	68,342	69,881	72,280	73,902	75,238
YoY change	1.4%	2.3%	3.4%	2.2%	1.8%
Global consumption	69,061	70,415	73,447	76,385	79,440
YoY change	0.7%	2.0%	4.3%	4.0%	4.0%
Balance	**-719**	**-534**	**-1,167**	**-2,483**	**-4,203**
Market inventories	8,576	9,120	0	0	
Weeks of world demand	6.5	6.7	0.0	0.0	
LME Cash ($/t)	**2,706**	**2,268**	**2,563**	**3,000**	**3,250**
LME Cash (c/lb)	**123**	**103**	**116**	**136**	**147**

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

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Table 3: Copper supply and demand balance
Small deficit in 2024

'000 tonnes	2022	2023	2024	2025	2026
Global production	24,717	26,418	26,508	27,655	28,318
YoY change	1.5%	6.9%	0.3%	4.3%	2.4%
Global consumption	25,164	26,061	26,868	27,943	29,061
YoY change	0.9%	3.6%	3.1%	4.0%	4.0%
Balance	**-447**	**357**	**-360**	**-288**	**-743**
Market inventories	1,030	1,016	656	367	
Weeks of world demand	2.1	2.0	1.3	0.7	
LME Cash ($/t)	**8,822**	**8,442**	**8,625**	**10,500**	**9,500**
LME Cash (c/lb)	**400**	**383**	**391**	**476**	**431**

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

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Table 4: Nickel supply and demand balance
Nickel to be oversupplied

'000 tonnes	2022	2023	2024	2025	2026
Global production	3,170	3,423	3,928	4,253	4,569
YoY change	16.2%	8.0%	14.8%	10.2%	10.9%
Global consumption	3,105	3,334	3,549	3,943	4,227
YoY change	0.4%	7.4%	6.4%	9.4%	6.5%
Balance, incl. NPI oversupply	**64**	**89**	**379**	**311**	**342**
Market inventories	456	545	924	1,235	1,577
Weeks of world demand	7.6	8.5	13.5	16.3	0.0
LME price ($/t)	**25,707**	**21,786**	**18,750**	**20,000**	**20,000**
LME price (c/lb)	**1,166**	**988**	**851**	**907**	**907**

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

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Table 5: Zinc supply and demand balance
Project pipeline not a significant risk

	2022	2023	2024	2025	2026
Global production	13,919	14,000	15,150	15,900	16,150
YoY change	-2.8%	0.6%	8.2%	5.0%	1.6%
Global consumption	13,607	13,513	14,104	14,400	14,703
YoY change	-3.2%	-0.7%	4.4%	2.1%	2.1%
Balance	**312**	**487**	**1,046**	**1,500**	**1,447**
Market inventories	3,482	2,648	2,375	2,250	2,424
Weeks of world demand	13.3	10.2	8.8	8.1	8.6
LME Cash ($/t)	**3,482**	**2,648**	**2,375**	**2,250**	**2,424**
LME Cash (c/lb)	**158**	**120**	**108**	**102**	**110**

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

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Exhibit 28: Iron ore supply and demand balance
Flipping back into surplus

Wet Mt	2022	2023E	2024E	2025E	2026E
Global production	2,363	2,376	2,422	2,504	2,544
YoY change	2.2%	0.5%	1.9%	3.4%	1.6%
Global consumption	2,301	2,348	2,372	2,374	2,386
YoY change	-5.0%	2.1%	1.0%	0.1%	0.5%
Balance	**63**	**28**	**50**	**130**	**157**
Iron ore price (US$/t)	**120**	**115**	**125**	**90**	**90**

Source: Woodmac, CRU, Bloomberg, company reports, BofA Global Research estimates

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Exhibit 29: Metallurgical coal supply and demand balance
Deficit to persist

Mt	2022	2023E	2024E	2025E	2025E
Global production	904	950	981	1,003	1,012
YoY change	-0.6%	5.1%	3.3%	2.3%	0.8%
Global consumption	925	971	993	991	1,003
YoY change	-1.4%	4.9%	2.3%	-0.2%	1.2%
Balance	**-21**	**-20**	**-12**	**12**	**8**
Met coal price (US$/t)	365	290	270	215	205

Source: Woodmac, McCloskey, company reports, BofA Global Research estimates

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Exhibit 30: Platinum supply and demand balance
Flipping into a small surplus

'000 ounces	2022	2023	2024	2025	2026
Global production	6,530	6,584	7,333	7,760	7,858
YoY change	-13.9%	0.8%	11.4%	5.8%	1.3%
Global consumption	6,057	7,231	7,411	7,516	7,662
YoY change	-22.8%	19.4%	2.5%	1.4%	1.9%
Balance	**473**	**-647**	**-78**	**244**	**196**
Spot ($/oz)	964	976	1,050	1,250	1,322

Source: Matthey, company reports, BofA Global Research estimates

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Exhibit 31: Palladium supply and demand balance
Rising surpluses ahead

'000 ounces	2022	2023	2024	2025	2026
Global production	9,377	9,400	9,956	10,568	10,807
YoY change	-4.5%	0.2%	5.9%	6.1%	2.3%
Global consumption	9,829	9,710	8,771	8,434	8,024
YoY change	-3.2%	-1.2%	-9.7%	-3.8%	-4.9%
Balance	**-452**	**-310**	**1,185**	**2,134**	**2,783**
Spot ($/oz)	2,110	1,379	750	500	500

Source: Matthey, company reports, BofA Global Research estimates

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Table 6: Lithium supply and demand balance
The lithium market is increasingly oversupplied

tonnes	2022	2023	2024E	2025E	2026E
Global production	657,337	897,532	1,245,682	1,704,066	1,986,158
YoY change	-2.5%	36.5%	38.8%	36.8%	16.6%
Global consumption	688,335	869,496	1,120,566	1,410,128	1,778,390
YoY change	48.5%	26.3%	28.9%	25.8%	26.1%
Balance	**-30,998**	**28,036**	**125,115**	**293,938**	**207,768**
Spot ($/t)	71,531	45,980	10,500	15,500	18,000

Source: Company reports, Woodmac, Bloomberg, BofA Global Research estimates
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Table 7: Cobalt supply and demand balance
The cobalt market needs some supply cuts

tonnes	2022	2023	2024	2025	2026
Global production	198,235	231,241	274,225	301,692	309,256
YoY change	25.4%	16.6%	18.6%	10.0%	2.5%
Global consumption	190,766	221,379	267,117	313,163	355,209
YoY change	18.1%	16.0%	20.7%	17.2%	13.4%
Balance	**7,469**	**9,862**	**7,109**	**-11,471**	**-45,953**
Spot ($/t)	68,428	38,733	39,681	39,681	40,652

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