

## Global Metals Weekly

## The zinc supply glut that never came

**Zinc mine production at 2011 levels, supporting prices**

Metal market participants have held perennially bearish zinc views, on expectations that mine supply increases would push the market into surplus. Granted, zinc has not been particularly tight. But the anticipated glut has so far not materialised, because mined and refined production have consistently underperformed. Zinc mine supply is still running at 2010 levels. Put differently, in 2010, market participants thought that supply could hit 20Mt in 2024. In the end, it may reach just 12.7Mt this year. Mine supply therefore remains the key constraint on zinc, which should continue to support prices, reflected in our average 2024 forecast of \$2,375/t (\$1.08/lb).

**Lack of supply means inventories were never built up**

The issues around mine supply are mirrored in the project pipeline. While Newmont's Penasquito mine is set to deliver the biggest output increase of any operation in 2024, this partially reflects resumption of activity after a strike that ended in October. Reflecting these persistent supply challenges, treatment charges have once again fallen, which could curtail activity at smelters. This would have a particularly strong impact on China, and may well push up refined imports, after purchases abroad have been hovering around multi-year lows in recent months on record domestic refined output. All in, the zinc market has not been massively oversupplied, with stocks still within longer-term ranges.

**Sentiment on the mend – US restocking has started**

Steel mills account for just over half of zinc demand and galvanised steel production turned the corner late last year. Steel and zinc may not be seen as essential for the energy transition, but the latest IEA decarbonisation scenario suggests that zinc consumption could expand by 2% on a sustained basis on the march to Net Zero. Meanwhile, the latest regional PMI reports shows that headline index levels remain below 50, although there are signs that sentiment is on the mend. Destocking has for instance been a persistent drag on metals demand. Yet, the US report notes that Fabricated Metal Product manufacturers have started to build inventories. This is worth following, as restocking can be a powerful amplifier of metals demand.

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# Zinc supply has been overestimated

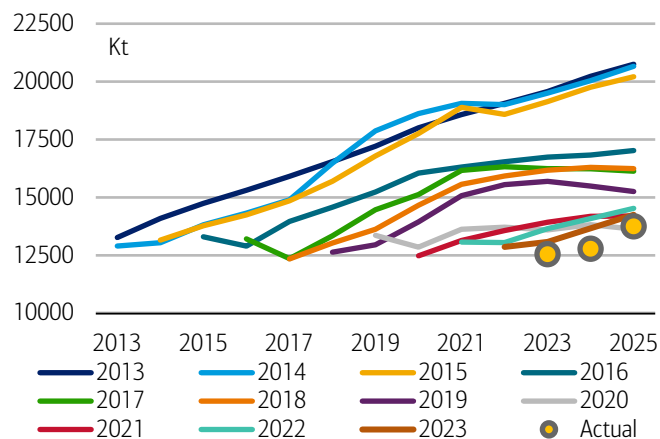
## Mine supply is a series of misses

### Treatment charges are once again falling

Metal market participants have held perennially bearish views on zinc on expectations that mine supply increases would push the market into surplus. Granted, zinc has not been particularly tight. But the anticipated glut has so far not materialised, because mined and refined production have consistently underperformed, as Exhibit 1 and Exhibit 2 highlight.

#### Exhibit 1: Zinc mine production forecasts

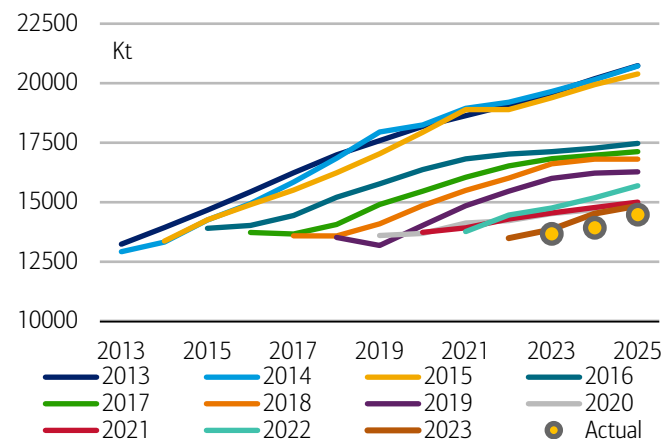
The market has overestimated zinc mine production



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#### Exhibit 2: Zinc refined production forecasts

Refined production has tended to come in lower than markets expected



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The persistent issues with supply have also been reflected in treatment charges<sup>1</sup>, which have spiked higher only for very short periods, before swiftly giving back those gains. Indeed, the smelter remunerations have once again fallen sharply in recent weeks over a series of disruptions at mines.

#### Exhibit 3: Zinc treatment charges

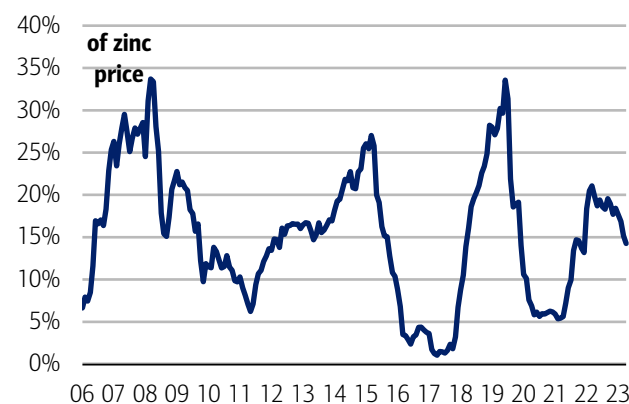
Periods of oversupply have been short-lived



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#### Exhibit 4: Zinc treatment charges as a % of the refined price

On average, smelters received 15% of the zinc price; at the moment, their take stands at 14%



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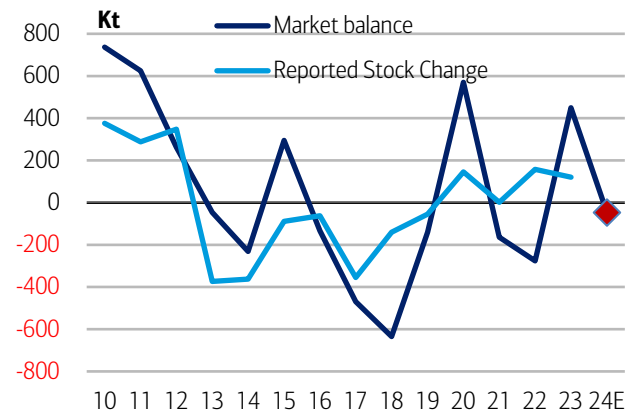
<sup>1</sup> Mines send zinc concentrates to smelters. Smelters receive a treatment charge (TC) from the miners for their services, while miners retain the zinc price less the treatment charge. TCs are an important indicator for constraints: when they fall, concentrates availability is insufficient. Hence, there are two zinc market balances: one for concentrates, the other for refined metal.

## We expect tight a zinc market also in 2024

Looking into 2024, we anticipate another year of constructive fundamentals, with the zinc market set to be balanced at best (Exhibit 5).

### Exhibit 5: Market balances and inventory changes

The zinc market has still not flipped into sustained surpluses



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

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Where is this support coming from? Mine supply is set to come in at 12.6Mt, compared to 12.7Mt in 2021 – the zinc market has stagnated for three years now. The dynamic behind this is to some extent also mirrored by Exhibit 6, which shows the 10 biggest mine production increases this year. Right on top is Newmont's Penasquito mine. But that is not a genuine supply addition, rather a resumption of activity after resolution of the labor strike with the National Union of Mine and Metal Workers on 13 October 2023. However, Newmont also notes that zinc production is set to increase as more content is delivered from the Chile Colorado pit.

Ivanhoe's Kipushi is perhaps the most notable exception in the project pipeline as it is a genuine addition. While the mine was at some stage a producing asset, albeit at much smaller volumes than Ivanhoe is looking to churn out now, it has been idle in recent years. The company noted during its recent results announcement that its first production is just a few months away, with construction of the 800,000 tonnes-per-annum concentrator 85% complete and ahead of schedule for commissioning in Q2 2024. Mining of the ultra-high-grade Big Zinc orebody has commenced ahead of schedule, with 220,000 tonnes of lower-grade ore from development stockpiled on surface at an average grade of 22% zinc, including approximately 30,000 tonnes of "medium-grade" at 30% zinc.

### China's concentrates imports may come under pressure

The interplay of looser zinc market fundamentals in recent months was accompanied by sharp increases in concentrates imports from China, with a series of record highs in the second and third quarters (Exhibit 7). Not surprisingly, refined zinc production also rose sharply through 2023.

### Exhibit 6: Top-10 zinc mine production increases in 2024

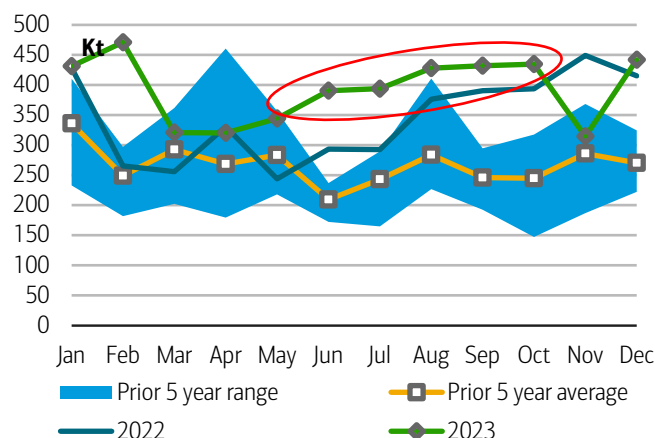
Penasquito's increase is partially a recovery of strike-related output losses

	Production	Change in Production, YoY					
	2023	2024	2025	2026	2027	2028	
Penasquito, Mexico	104.3	140.7	-91.5	0.0	-41.6	0.0	
Kipushi, DRC	0.0	81.9	133.1	30.7	0.0	0.0	
Zhaimen, Kazakhstan	95.0	55.0	10.0	0.0	0.0	0.0	
Antamina, Peru	407.3	53.9	-25.6	-22.3	-22.3	-22.3	
Buenavista, Mexico	0.0	40.0	40.0	65.0	-67.0	52.0	
Mount Isa, Australia	287.2	32.8	30.0	-100.0	25.0	25.0	
Dugald River, Australia	151.8	30.7	-2.5	0.0	0.0	0.0	
Zhugongtang, China	0.0	30.0	50.0	30.0	20.0	0.0	
Azulcocha, Peru	5.0	30.0	0.0	0.0	0.0	0.0	
Gamsberg, South Africa	179.5	29.6	11.5	24.4	80.0	75.0	
<b>China</b>	<b>1,230</b>	<b>525</b>	<b>155</b>	<b>28</b>	<b>-6</b>	<b>130</b>	
<b>World</b>	<b>12,202</b>	<b>818</b>	<b>465</b>	<b>-29</b>	<b>-228</b>	<b>-161</b>	
<b>Top-10 of total</b>	<b>10%</b>	<b>64%</b>	<b>33%</b>	<b>-96%</b>	<b>2.6%</b>	<b>-81%</b>	

Source: company reports, CRU, Woodmac, Bloomberg, Platts Bloomberg, BofA Global Research  
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**Exhibit 7: China, net concentrates imports**

China's smelters boosted concentrates imports substantially

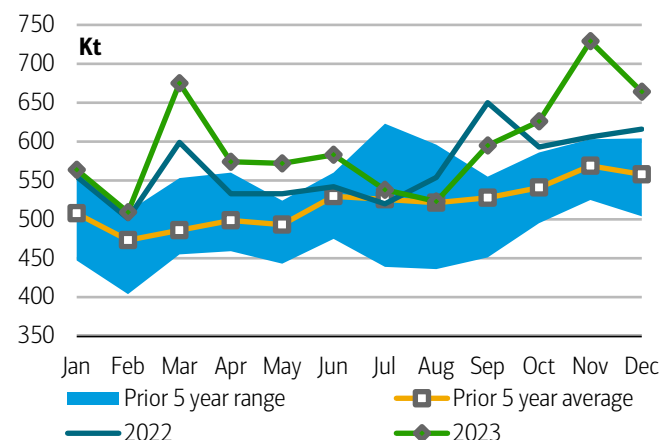


Source: Bloomberg, BofA Global Research

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**Exhibit 8: China, refined zinc production**

Rising concentrates availabilities resulted in record refined zinc production



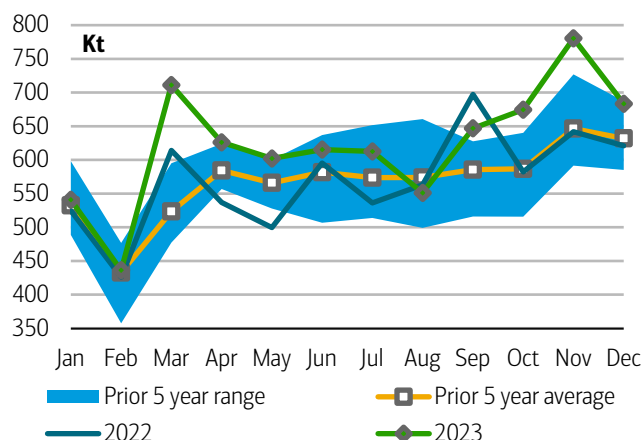
Source: Bloomberg, BofA Global Research

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Apparent demand (refined production + refined imports – refined exports) also expanded at a healthy clip, rising to a record high in 4Q23. Yet given how well supplied the domestic market has been, this has not fed into refined imports, which have been hovering around multi-year lows, capping the upside to zinc prices (Exhibit 10).

**Exhibit 9: China, apparent refined zinc demand**

China's zinc demand has been healthy

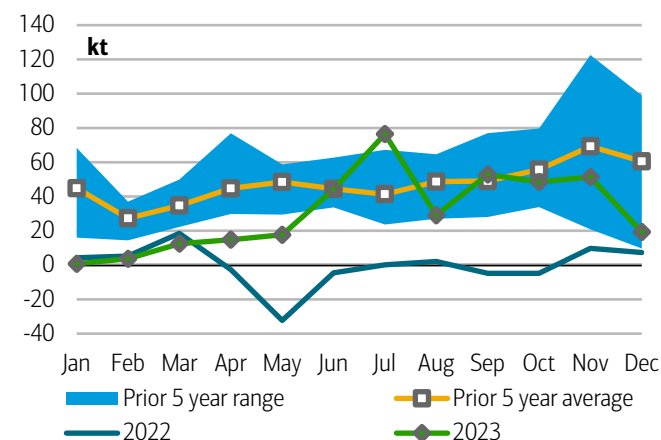


Source: Bloomberg, BofA Global Research

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**Exhibit 10: China, net refined imports**

Rising domestic production has meant subdued refined zinc imports



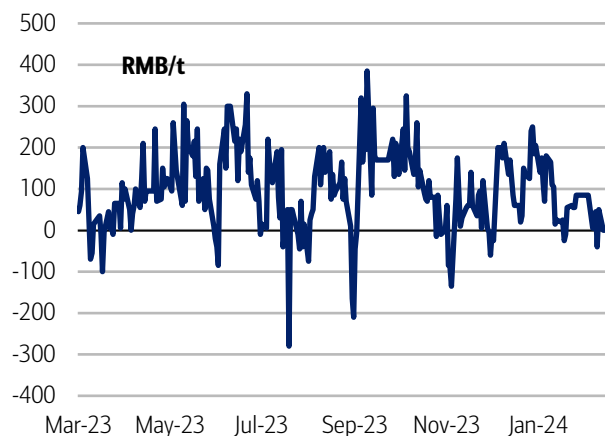
Source: Bloomberg, BofA Global Research

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Mirroring dynamics in copper (see [Global Metals Weekly: Copper markets tighten, despite China's battle with the 3Ds 13 February 2024](#)), low treatment charges have put smelters at risk. Closures could then lead to a tighter domestic Chinese market, pushing refined imports up. Looking at this from a different angle, any smelter closures may come through at older and smaller sites. At the same time, operators in the country keep adding to capacity. Factoring in our cautious view on mine supply growth, Exhibit 12 highlights that capacity utilisation rates at smelters will likely decline in the coming years. This will put downstream operators in a difficult position, as treatment and refining charges will likely remain low. In the end, mine supply is the constraining factor.

**Exhibit 11: Domestic zinc premium, physical over futures**

China's physical market remains within a range

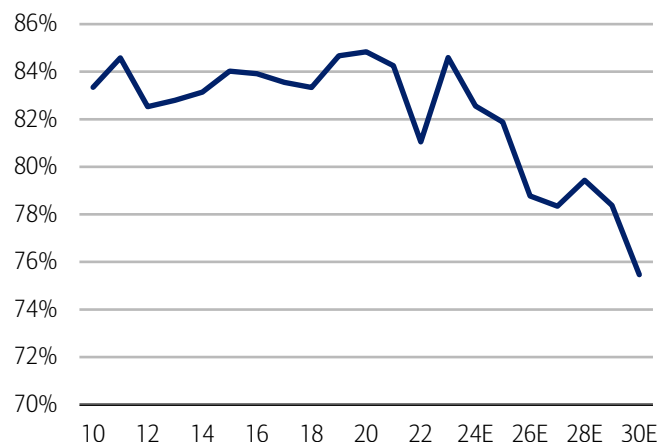


Source: Bloomberg, BofA Global Research

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**Exhibit 12: Smelter capacity utilization rates**

As smelting capacity increases and mine supply is constrained, capacity utilization rates at smelters is set to decline



Source: Woodmac, Bloomberg, BofA Global Research

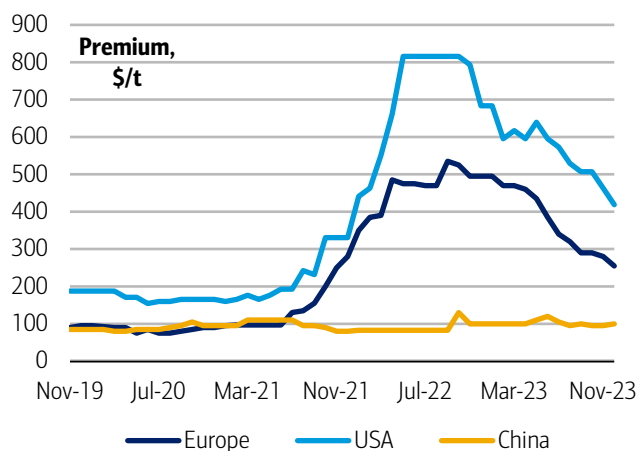
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**Premia are down, but above previous lows**

Incidentally, the lack of imminent shortages in the refined zinc market has also been reflected in physical premia<sup>2</sup>, which have been under pressure in recent months, following zinc prices down (Exhibit 13 and Exhibit 14). That said, premia remain above the levels seen just a few years ago.

**Exhibit 13: Zinc premia**

The physical market has eased



Source: CRU, BofA Global Research

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**Exhibit 14: Physical premia and prices**

The decline in premia has been accompanied by falling zinc prices



Source: CRU, BofA Global Research

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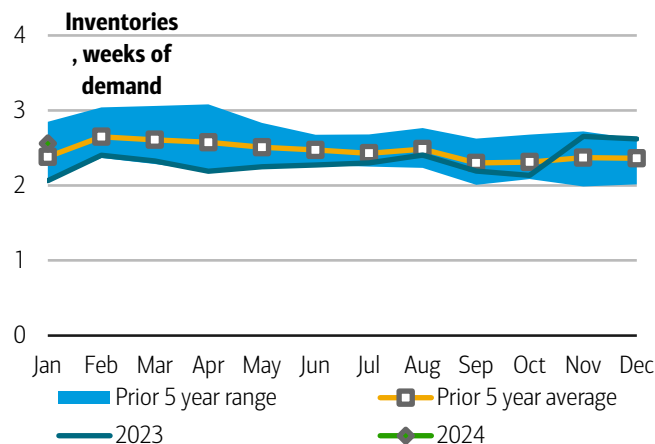
**Demand is turning the corner****Inventories remain low**

Weaker fundamentals have also been reflected in inventories, which were built especially in November and December (Exhibit 15). Still, stocks remain pegged within longer-term ranges and keep hovering well below the peak levels seen after the Great Financial Crisis (Exhibit 16).

<sup>2</sup> Physical premia have to be paid on top of the quoted LME (London Metal Exchange) price; they can include items such as transportation cost and insurance. However, they are also an indicator for the tightness of regional markets

**Exhibit 15: Zinc, visible and non-visible inventories**

While inventories increased in 4Q23, they remain within longer-term ranges

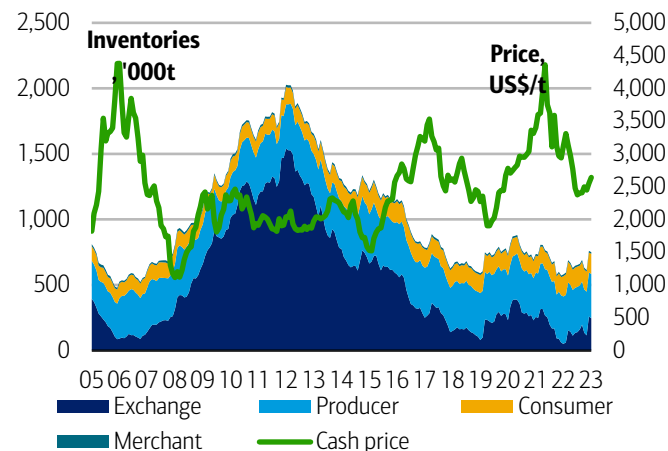


Source: CRU, Bloomberg, BofA Global Research

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**Exhibit 16: Zinc, visible and non-visible inventories**

Zinc inventories remain comparatively low



Source: CRU, Bloomberg, BofA Global Research

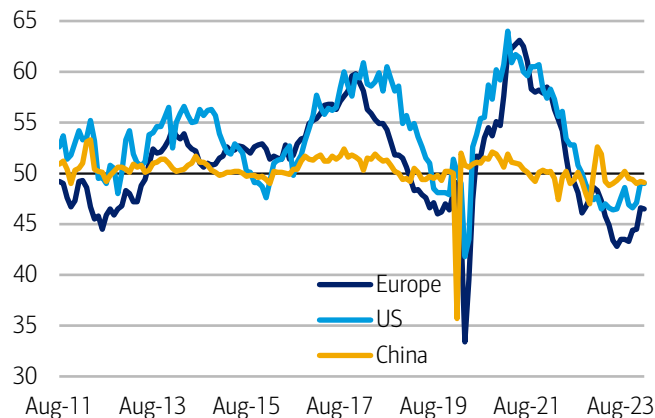
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**Demand is now starting to turn the corner**

So where do we go from here? Exhibit 17 shows that the headline manufacturing Purchasing Manager Indices remains below 50. Yet sentiment is off the lows in Europe and the US. If that dynamic continues, support for zinc prices should also strengthen (Exhibit 18).

**Exhibit 17: Headline manufacturing PMIs**

Sentiment has turned the corner in Europe and the US

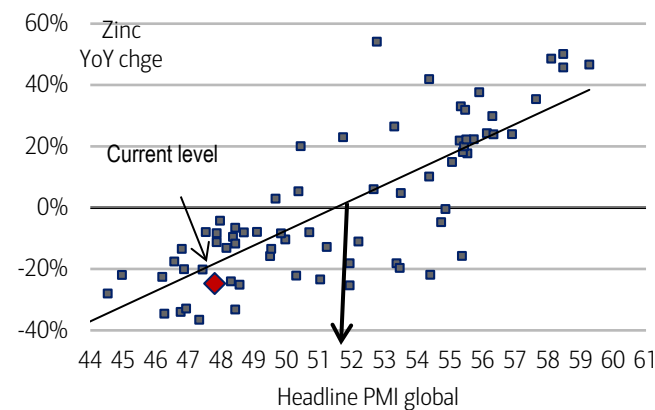


Source: Bloomberg, BofA Global Research

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**Exhibit 18: Headline manufacturing PMIs and zinc prices**

A push in PMIs above 50 would justify a zinc price rally



Source: Bloomberg, BofA Global Research

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Looking through the comments from the US report, manufacturers tend to be sanguine:

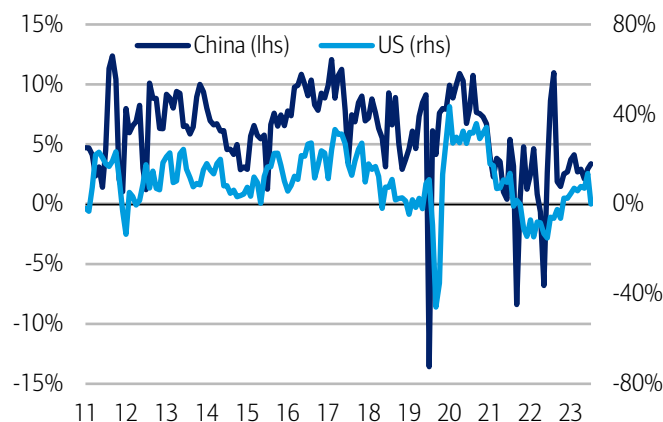
- A **Primary Metals** manufacturer notes that “The month seems to be getting stronger with each passing day and week. Lots of market volatility — pricing flat to downward. It will be interesting to see how the last days of the month play out, as indications seem to be all over the place.”
- An industry participant churning out **Fabricated Metal Products** outlined that “Customer orders are steady, neither up nor down compared to last month. This steady state is what we budgeted and forecast. We are forecasting business to increase 2 percent to 4 percent over the next couple of months.”
- Meanwhile, a producer of **Transportation Equipment** suggested that “The first quarter will be slower due to some customer order changes, but we are expecting the rest of 2024 to be strong. We may increase our growth projections.”

- **A Machinery** manufacturer noted that “Demand has finally picked up, with customer orders more closely resembling typical January and February levels. January was up 22 percent compared to December; February up 26 percent compared to January.”

A switch from destocking to restocking was one of our key calls in the [2024 Metals Outlook](#) and there are tentative signs that this will play out. Indeed, while the Institute for Supply Management notes that “The Inventories Index registered 45.3 percent in February, so manufacturing inventories kept contracting”, it also adds that two industries, Fabricated Metal Products is one of them, have boosted manufacturing stocks. Beyond that, the report also states that “overall, panelists’ companies are indicating a willingness to invest in manufacturing inventory to improve on-time deliveries, gain precision in revenue projections and improve customer satisfaction. Something to watch in the coming months: Supply chains catching up to growing demand is a scenario that typically results in manufacturing inventories expanding.”

#### Exhibit 19: PMI, new order to inventory ratios

Forward-looking order/inventory ratios have stabilised

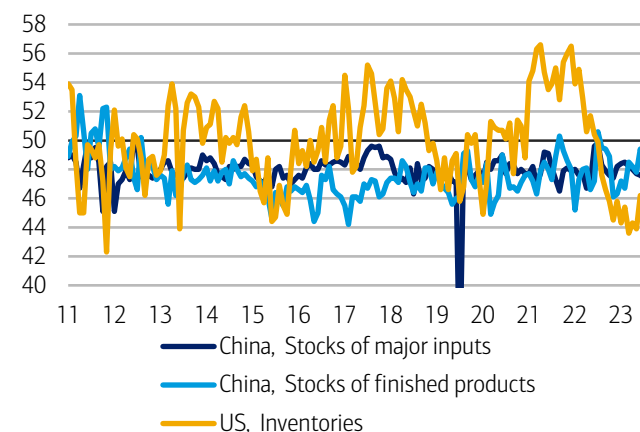


Source: Bloomberg, BofA Global Research

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#### Exhibit 20: PMI, inventory sub-indices

The inventory sub-index has pushed higher



Source: Bloomberg, BofA Global Research

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### Galvanised steel production turning the corner

Indeed, there are signs that demand has started to turn the corner, with Exhibit 21 highlighting sequential improvements in galvanised steel production growth rates across most regions.

#### Exhibit 21: Galvanised steel production

Galvanised steel production turned the corner in most regions in 4Q

	USA	Japan	Europe	Asia ex-Japan, China, India	India	Other	World ex-China	China	World
1Q22	3,927	2,786	6,743	5,907	2,103		5,280	26,746	38,982
2Q22	3,985	2,519	6,714	5,712	1,910		5,058	25,898	38,560
3Q22	3,867	2,521	5,756	5,439	1,947		4,897	24,427	37,486
4Q22	3,605	2,705	5,624	4,620	2,137		4,906	23,597	36,748
1Q23	3,676	2,441	6,235	5,637	2,137		4,947	25,073	37,633
2Q23	3,936	2,363	5,853	5,764	2,214		5,349	25,479	39,119
3Q23	3,862	2,521	5,637	5,875	2,175		5,276	25,346	39,965
4Q23	3,731	2,817	5,608	5,332	2,134		5,092	24,714	39,536
YTD YoY	-1.2%	-3.7%	-6.1%	4.3%	7.0%		2.6%	-0.1%	8.9%
4Q23 YoY	3.5%	4.1%	-0.3%	15.4%	-0.1%		3.8%	4.7%	12.7%

Source: CRU, BofA Global Research

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Of course, galvanised steel accounts for around 55% of zinc demand, so the health of this sector matters. Granted, steel is often not viewed as a MIFT (metals important for

future technologies). Yet, Exhibit 22 shows that the commodity is essential on the march to Net Zero, as zinc is key to wider infrastructure, including the towers of windmills.

#### Exhibit 22: Zinc demand under the IEA Net Zero scenario

Zinc demand could expand by 2% YoY on a sustained basis

	CAGR 2023-30	2024	2025	2026	2027	2028	2029	2030
<b>TOTAL</b>	<b>15%</b>	<b>912,241</b>	<b>1,049,874</b>	<b>1,208,819</b>	<b>1,392,453</b>	<b>1,604,701</b>	<b>1,850,131</b>	<b>2,134,064</b>
Green for Net Zero	1%	793	912	1,050	1,209	1,392	1,605	1,850
Others	2%	12,720	12,858	12,996	13,137	13,279	13,422	13,567
Total		13,513	13,770	14,046	14,346	14,671	15,027	15,417
YoY			1.9%	2.0%	2.1%	2.3%	2.4%	2.6%

Source: IEA, Woodmac, 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	2,193	2,234	2.9%	2.5%
Copper	8,456	8,543	1.1%	0.9%
Lead	2,037	2,053	-3.5%	-2.1%
Nickel	17,714	17,945	4.6%	4.5%
Tin	26,705	26,833	3.3%	2.9%
Zinc	2,405	2,449	0.9%	1.0%
LMEX	3,712		1.4%	
	Cash, c/lb	3-month, c/lb		
Aluminium	99	101		
Copper	384	388		
Lead	92	93		
Nickel	804	814		
Tin	1,211	1,217		
Zinc	109	111		
Other commodities, freight, exchange rates, equities and yields	Spot	WoW change		
Gold, \$/oz	2,114	4.1%		
Silver, \$/oz	24	6.1%		
Platinum, \$/oz	899	2.1%		
Palladium, \$/oz	965	0.8%		
Iron ore, China fines cfr \$/dmt	117	-6.1%		
Brent, \$/bbl	83	1.4%		
Baltic Dry Index	2,297	22.8%		
EUR/USD	1.086	0.0%		
Dow Jones Industrial Average	38,990	-0.2%		
10-year US Treasury yield	4.214	-1.5%		
ICE BofA Commodity index, ER	420	1.2%		
ICE BofA Commodity index Industrial Metals, ER	176	1.8%		
ICE BofA Commodity index Precious Metals, ER	226	4.4%		
ICE BofA Commodity index Energy, ER	511	1.3%		
Exchange stocks and cancelled warrants	Stocks, tonnes	WoW change	Canc. warrants, tonnes	Canc. warr., of stocks
Aluminium				
LME	583,700	0.3%	230,725	39.5%
Shanghai	190,979	10.1%		
Total aluminium	774,679	2.6%		
Copper				
LME	114,075	-10.8%	11,050	9.7%
Comex	25,823	-2.7%		
Shanghai	214,487	18.3%		
Total copper	354,385	5.6%		
Lead				
LME	187,750	9.0%	10,175	5.4%
Shanghai	52,892	5.5%		
Total lead	240,642	8.2%		
Nickel				
LME	73,944	5.7%	3,978	5.4%
Shanghai	18,553	4.5%		
Total nickel	92,497	5.4%		
Tin	5,575	-7.1%	1,030	18.5%
Zinc				
LME	275,150	2.4%	44,100	16.0%
Shanghai	97,610	10.2%		
Total zinc	372,760	4.4%		

Source: BofA Global Research

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**Exhibit 23: 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	<ul style="list-style-type: none"><li>China is almost operating at its 45mt capacity cap and smelters ex-China have closed capacity</li><li>China's smelters remain under pressure on hydro power shortages. At the same time, demand has been strong, so exports will likely remain capped</li><li>We expect rising deficits going forward</li></ul>	<ul style="list-style-type: none"><li>D: No production discipline in China/World ex-China</li><li>D: China exports more</li><li>U: Smelter restraint and/or production disruptions reduce output</li><li>U: Stronger-than-anticipated demand growth</li></ul>		
Copper	\$8,625/t 391c/lb	\$10,500/t 476c/lb	<ul style="list-style-type: none"><li>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 leads to broader recovery</li><li>Inventories are low, which is supportive, but could also increase volatility</li><li>We expect a small surplus for 2024</li></ul>	<ul style="list-style-type: none"><li>D: China re-exports metal</li><li>D: Global demand slows sharply into next year</li><li>U: Strong restocking through the supply chain on improved confidence</li><li>U: Continued production disruptions in coming quarters</li></ul>		
Lead	\$2,000/t 91c/lb	\$1,750/t 79c/lb	<ul style="list-style-type: none"><li>There are no immediate scrap or concentrates shortages, suggesting the market could flip back into surplus</li><li>China's demand has slowed structurally, as the ebike market has matured</li></ul>	<ul style="list-style-type: none"><li>D: Destocking in China or higher lead exports from the country.</li><li>U: Strong seasonal demand for replacement batteries after cold/hot winter/summer months</li></ul>		
Nickel	\$18,750/t 851c/lb	\$20,000/t 907c/lb	<ul style="list-style-type: none"><li>Nickel demand from electric vehicle producers should rise in the coming years, yet more NPI is being converted to nickel sulphate</li><li>China has built conversion capacity, which should take about 100Kt of Indonesian units into the refined market</li><li>Indonesian supply may prevent shortages near-term, but further out, more material is required</li><li>We expect a surplus for 2024, with prices increasingly supported by costs</li></ul>	<ul style="list-style-type: none"><li>D: NPI producers don't close shop; ore inventories last for longer and more ores are imported from the Philippines.</li><li>D: Faster ramp-up of Indonesian NPI production</li><li>D: Stainless steel demand remains subdued</li></ul>		
Zinc	\$2,375/t 108c/lb	\$2,250/t 102c/lb	<ul style="list-style-type: none"><li>The zinc market has been better supplied, as demand from galvanisers has subsided</li><li>Zinc may remain an underperformer, but immediate downside more limited, also because costs have shifted higher on inflation</li><li>The surpluses could disappear, if more mine close</li></ul>	<ul style="list-style-type: none"><li>D: Unreported inventories exist on the zinc market. More metal could become available</li><li>D: The zinc market is fragmented. There is evidence that miners, especially in China, could consider further output increases</li></ul>		
Gold	\$1,975/oz	\$2,150/oz	<ul style="list-style-type: none"><li>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.</li><li>If rate cuts come before 2Q24, gold could end next year at \$2,400/oz</li><li>Central bank buying has been strong, but not sufficient; a Fed pivot may bring more investors into the market</li><li>Gold to rally in 2H24</li></ul>	<ul style="list-style-type: none"><li>D: Deterioration of investor sentiment</li><li>D: Real rates become more positive; sustained USD rally</li><li>D: High gold prices deter buyers of physical gold; increased scrap supply</li></ul>		
Silver	\$23.26/oz	\$24.75/oz	<ul style="list-style-type: none"><li>The silver market has rebalanced on production discipline and demand from new applications including solar panels</li><li>As more spending on solar panels come through, silver should rally</li><li>Bottoming out of the global economy in 2024 should also help industrial demand</li></ul>	<ul style="list-style-type: none"><li>U: Investors returning to the market</li><li>U: China's imports to rise</li><li>D: ETF liquidation</li><li>D: More supply</li></ul>		
Platinum	\$1,050/oz	\$1,250/oz	<ul style="list-style-type: none"><li>Palladium is slowly moving into surplus, keeping pressure on prices.</li><li>More production discipline is necessary.</li><li>Any supply cuts may reduce the palladium surpluses, but will likely push platinum into a deficit, so prices might diverge.</li><li>PGMs are in a difficult spot.</li></ul>	<ul style="list-style-type: none"><li>D: Jewellery demand suffers due to rising prices</li><li>D: In palladium, the risk of deliveries from Russian stockpiles has not gone away</li><li>D: Demand from key buyers like Europe not increasing</li><li>U: Production disruptions reduce availability of PT and PD</li></ul>		
Palladium	\$750/oz	\$500/oz				
Iron Ore	\$125/t CIF	\$90/t CIF	<ul style="list-style-type: none"><li>Iron ore inventories at China's mills are extremely low.</li><li>Production cuts at mills, along with higher steel demand should support steel prices, likely pulling iron ore higher as well near-term</li></ul>	<ul style="list-style-type: none"><li>D: China's steel production slowing sharply</li><li>U: Mine closures/slowdown in production increases</li></ul>		
HCC	\$270/t	\$215/t	<ul style="list-style-type: none"><li>Thermal coal prices to come under pressure as supply is increasing and the energy emergency normalises</li><li>Normalisation of supply should also contribute to lower met coal prices</li></ul>	<ul style="list-style-type: none"><li>D: Lack of supply discipline</li><li>U: Chinese steel production stronger (HCC)</li><li>U: mine closures</li></ul>		
Thermal coal	\$150t	\$125/t				

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

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**Exhibit 24: 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
<b>Base metals</b>															
Aluminium	US\$/t	2,193	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
	US\$/lb	99	102	113	125	125	136	136	103	116	136	147	137	126	115
Copper	US\$/t	8,456	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
	US\$/lb	384	363	386	397	420	454	454	383	391	476	431	433	434	436
Lead	US\$/t	2,037	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
	US\$/lb	92	91	91	91	91	79	79	98	91	79	92	101	109	118
Nickel	US\$/t	17,714	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
	US\$/lb	804	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	2,405	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
	US\$/lb	109	113	113	102	102	102	102	120	108	102	110	118	126	133
<b>Precious metals</b>															
Gold, nominal	US\$/oz	2,127	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	23.83	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	886	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	944	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
<b>Bulk Commodities</b>															
Hard coking coal	US\$/t fob	307	360	280	210	230	240	190	290	270	215	205	212	219	226
Semi-soft	US\$/t fob	149	238	185	139	152	158	125	220	178	142	135	134	133	132
Thermal Coal	US\$/t fob	137	148	148	151	153	125	125	176	150	125	112	112	113	113
Iron ore fines	US\$/t CIF	117	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
<b>Other materials</b>															
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	14,000	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	13,800	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	365	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	20.3	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	16.0	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
<b>Steel, HRC</b>															
HRC, Europe	US\$/t	667	719	701	639	674	721	702	767	683	714				
HRC, US	US\$/t	882	1,130	1,020	882	805	799	799	975	959	799				
HRC, China	US\$/t	538	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	79	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	1.9	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	2024E	2025E	2026E
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%
<b>Balance</b>	<b>-719</b>	<b>-534</b>	<b>-1,167</b>	<b>-2,483</b>	<b>-4,203</b>
Market inventories	8,576	9,120	7,953	5,470	
Weeks of world demand	6.5	6.7	5.6	3.7	
<b>LME Cash (\$/t)</b>	<b>2,706</b>	<b>2,268</b>	<b>2,563</b>	<b>3,000</b>	<b>3,250</b>
<b>LME Cash (c/lb)</b>	<b>123</b>	<b>103</b>	<b>116</b>	<b>136</b>	<b>147</b>

Source: SNL, Woodmac, CRU, Bloomberg, company reports, IAI, BofA Global Research  
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**Table 4: Nickel supply and demand balance**

Nickel to be well supplied

'000 tonnes	2022	2023	2024E	2025E	2026E
Global production	3,135	3,396	3,542	3,860	4,111
YoY change	16.3%	10.2%	8.8%	9.9%	10.7%
Global consumption	3,087	3,287	3,468	3,833	4,127
YoY change	0.1%	6.5%	5.5%	8.9%	6.0%
<b>Balance</b>	<b>48</b>	<b>109</b>	<b>75</b>	<b>27</b>	<b>-15</b>
Weeks of world demand	2.8	3.0	3.9	3.9	3.5
LME price (\$/t)	25707.4	21785.7	18750.0	20000.0	20000.0
<b>LME price (c/lb)</b>	<b>1,166</b>	<b>988</b>	<b>851</b>	<b>907</b>	<b>907</b>

Source: SNL, Woodmac, CRU, Bloomberg, company reports, INSG, BofA Global Research  
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**Exhibit 25: Iron ore supply and demand balance**

Flipping back into surplus

Wet Mt	2022	2023E	2024E	2025E	2026E
Global production	2,363	2,375	2,422	2,504	2,544
YoY change	2.2%	0.5%	2.0%	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%
<b>Balance</b>	<b>63</b>	<b>27</b>	<b>50</b>	<b>130</b>	<b>157</b>
<b>Iron ore price (US\$/t)</b>	<b>120</b>	<b>115</b>	<b>125</b>	<b>90</b>	<b>90</b>

Source: Woodmac, CRU, Bloomberg, company reports, BofA Global Research estimates  
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**Exhibit 27: Platinum supply and demand balance**

Supply cuts could flip the market into a deeper deficit

'000 ounces	2022	2023	2024E	2025E	2026E
Global production	6,561	6,711	7,157	7,607	7,706
YoY change	-13.5%	2.3%	6.6%	6.3%	1.3%
Global consumption	6,057	7,231	7,255	7,250	7,255
YoY change	-22.8%	19.4%	0.3%	-0.1%	0.1%
<b>Balance</b>	<b>504</b>	<b>-519</b>	<b>-99</b>	<b>357</b>	<b>451</b>
Spot (\$/oz)	964	976	1,050	1,250	1,322

Source: Matthey, company reports, BofA Global Research estimates  
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**Table 3: Copper supply and demand balance**

Balanced market in 2023E

'000 tonnes	2022	2023	2024E	2025E	2026E
Global production	24,717	26,418	26,526	27,655	28,318
YoY change	1.5%	6.9%	0.4%	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%
<b>Balance</b>	<b>-447</b>	<b>357</b>	<b>-342</b>	<b>-288</b>	<b>-743</b>
Market inventories	1,030	1,016	674	386	
Weeks of world demand	2.1	2.0	1.3	0.7	
<b>LME Cash (\$/t)</b>	<b>8,822</b>	<b>8,442</b>	<b>8,625</b>	<b>10,500</b>	<b>9,500</b>
<b>LME Cash (c/lb)</b>	<b>400</b>	<b>383</b>	<b>391</b>	<b>476</b>	<b>431</b>

Source: SNL, Woodmac, CRU, Bloomberg, company reports, ICSG, BofA Global Research  
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**Table 5: Zinc supply and demand balance**

Project pipeline not a significant risk

	2022	2023	2024E	2025E	2026E
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%
<b>Balance</b>	<b>312</b>	<b>487</b>	<b>1,046</b>	<b>1,500</b>	<b>1,447</b>
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
<b>LME Cash (\$/t)</b>	<b>3,482</b>	<b>2,648</b>	<b>2,375</b>	<b>2,250</b>	<b>2,424</b>
<b>LME Cash (c/lb)</b>	<b>158</b>	<b>120</b>	<b>108</b>	<b>102</b>	<b>110</b>

Source: SNL, Woodmac, CRU, Bloomberg, company reports, ILZSG, BofA Global Research  
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**Exhibit 26: Metallurgical coal supply and demand balance**

Deficit to persist

Mt	2022	2023E	2024E	2025E	2025E
Global production	904	950	977	1,001	1,010
YoY change	-0.6%	5.1%	3.3%	2.4%	0.9%
Global consumption	925	971	993	991	1,003
YoY change	-1.4%	4.9%	2.3%	-0.2%	1.2%
<b>Balance</b>	<b>-21</b>	<b>-21</b>	<b>-15</b>	<b>10</b>	<b>7</b>
Met coal price (US\$/t)	365	290	270	215	205

Source: Woodmac, McCloskey, company reports, BofA Global Research estimates  
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**Exhibit 28: Palladium supply and demand balance**

Rising surpluses ahead

'000 ounces	2022	2023	2024E	2025E	2026E
Global production	9,314	9,320	9,970	10,572	10,819
YoY change	-5.1%	0.1%	7.0%	6.0%	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%
<b>Balance</b>	<b>-515</b>	<b>-390</b>	<b>1,199</b>	<b>2,138</b>	<b>2,795</b>
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%
<b>Balance</b>	<b>-30,998</b>	<b>28,036</b>	<b>125,115</b>	<b>293,938</b>	<b>207,768</b>
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	2024E	2025E	2026E
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	186,279	210,900	250,033	291,266	335,607
YoY change	17.0%	13.2%	18.6%	16.5%	15.2%
<b>Balance</b>	<b>11,956</b>	<b>20,341</b>	<b>24,192</b>	<b>10,425</b>	<b>-26,351</b>
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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