Global Metals Weekly

Aluminium supply growth falling by half

Aluminium fundamentals are strengthening

Aluminium prices have found support around $2,200/t (100c/lb), notwithstanding persistent macro headwinds. That support has been driven by a confluence of factors. Most importantly perhaps, global aluminium supply is expanding by an average of only 2.4% out to 2025, compared to 4.7% between 2011 and 2017. Tying in demand, we expect consumption growth of 4% per annum until 2030 in our base case, compared to an average of 5% pa in the past decade, implying sustained deficits. The stronger fundamental backdrop is also mirrored by the tight physical market in China, which had been the most oversupplied in the past.

Sanctions not affecting LME – so far

We usually determine the strength of fundamentals and hence pricing pressures by looking at supply and demand. However, there are increasing "non-traditional" or "technical" risks impacting on the aluminium market. Indeed, the LME is running physically backed contracts. As inventories have fallen steadily in recent years, Rusal's material now accounts for 90% of stocks, though this hasn't caused any issues in the market so far. While the UK has imposed limits on British entities to trade in Russian material, sanctions from the EU and the US have so far not been specific enough to impact the LME. Yet this could change if consumers/traders were no longer accepting Russian aluminium due to tighter sanctions. Different sanctions scenarios could have varying impact on prices and premia. As to time spreads, the contangos may initially increase, but metal shortages could ultimately flip the curves into backwardation.

EU imports more aluminium with higher carbon footprint

European imports from Russia have fallen from 840Kt in 2020 to 567Kt in 2023, with the United Arab Emirates and India gaining market share. Incidentally, the shift in trading patterns also means that Europe has replaced low-carbon with high-carbon aluminium units (see Weak EU economy captures carbon again). In any case, the data shows that aluminium has been re-routed. Looking at this from a different angle, with more material moving from East to West, the Red Sea issues have had an impact on physical markets, with premia (paid on top of exchange-quoted prices and an indicator of regional prices) gradually pushing higher. That said, we don't view these shipping issues as a genuine supply curtailment, but more as a logistical headaches resulting in longer lead times.

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Commodities
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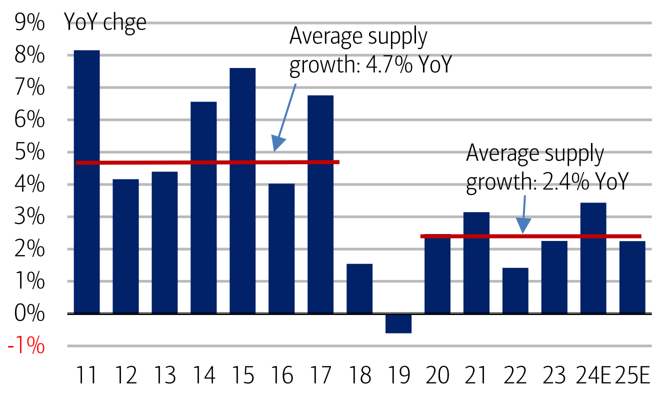
Steady aluminium fundamentals

Fundamentals are strengthening

Aluminium prices have found support around $2,200/t (100c/lb), notwithstanding persistent macro headwinds. That support has been driven by a confluence of factors. Most importantly perhaps, global aluminium supply is expanding by an average of only 2.4% out to 2025E, compared to 4.7% between 2011 and 2017 (Exhibit 1). Exhibit 2 also ties in demand. In our base case, we expect consumption growth of 4% per annum until 2030, compared to an average of 5% annually in the past decade, so the white metal is set to be in a sustained deficit.

Exhibit 1: Global aluminium production growth
Supply growth has slowed markedly



Source: company reports, Woodmac, BofA Global Research

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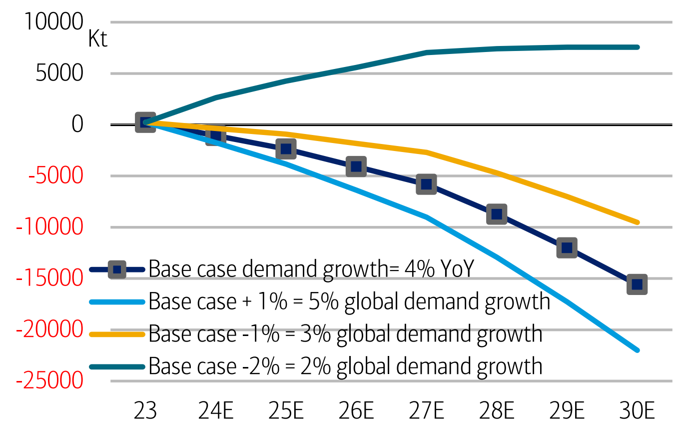
Exhibit 2: Aluminium balances under different demand scenarios
We expect deficits except under a very bearish demand scenario



Source: company reports, Woodmac, BofA Global Research

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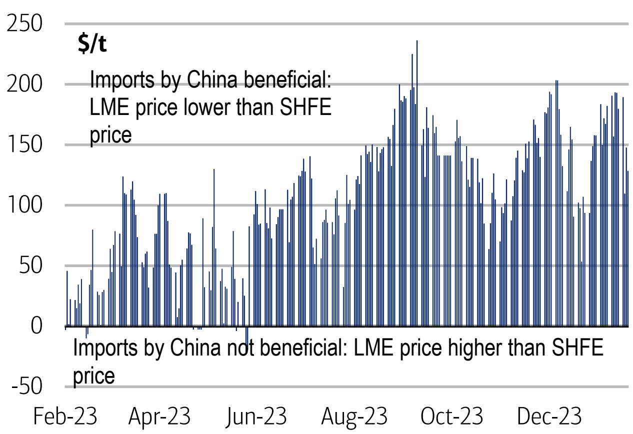
What could save the market? Beyond an acceleration of supply growth, which looks unlikely, a slowdown in demand would help. Indeed, if demand averaged somewhere between 2% and 3%, the aluminium market would be balanced. But then again, this would imply a decline in global demand growth of 50%, compared to the past decade. This looks difficult in an environment where the global economy is now accelerating and aluminium is required in many green applications, including solar and EVs.

China's aluminium market has remained remarkably tight

That tightness has already been reflected in regional markets, with fundamentals in China – in the past the most oversupplied region – remarkably strong of late.

Exhibit 3: Price differentials SHFE and LME
Prices on shanghai Futures Exchange have been trading at a premium



Source: Bloomberg, BofA Global Research

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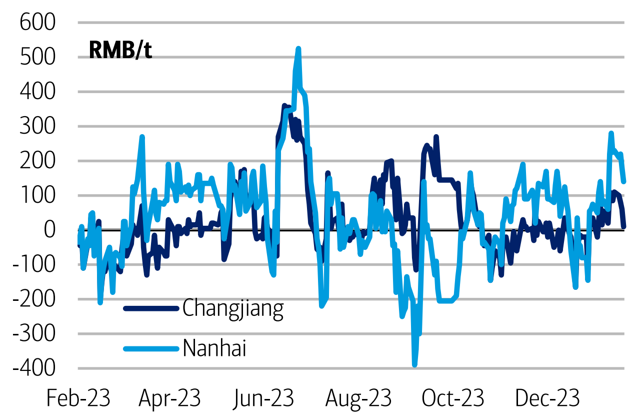
Exhibit 4: Price differentials local physical markets and SHFE
Local physical markets in China have been trading at a premium to SHFE



Source: Bloomberg, BofA Global Research

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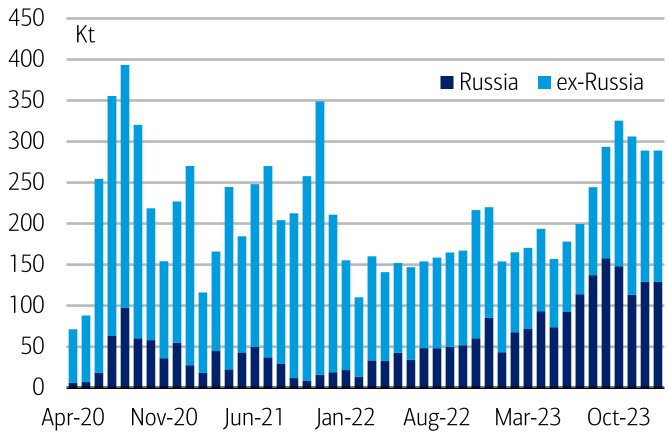
Exhibit 3 and Exhibit 4 show that import premia (i.e. the price differential between Shanghai Futures Exchange and London Metals Exchange) and premia[1] on domestic physical markets have remained healthy. This is remarkable, keeping in mind that China also absorbed almost 1Mt of Russian aluminium units last year (see Exhibit 5). Of course, this is aluminium that had been re-routed from Europe.

Exhibit 5: China, breakdown of aluminium imports
China has absorbed more Russian aluminium units



Source: Bloomberg, BofA Global Research

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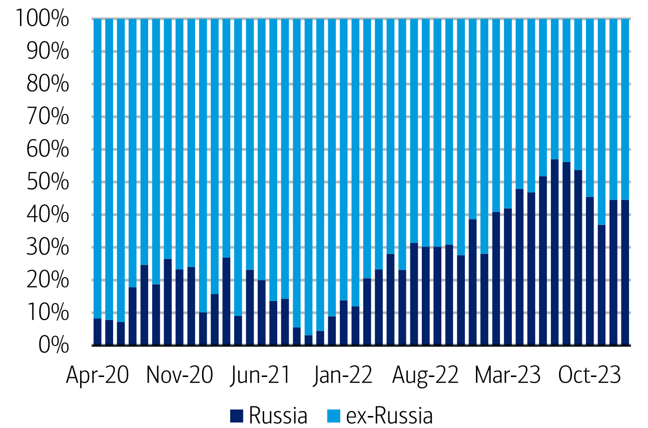
Exhibit 6: China, breakdown of aluminium imports
At the peak, Rusal accounted for almost half of China's aluminium imports



Source: Bloomberg, BofA Global Research

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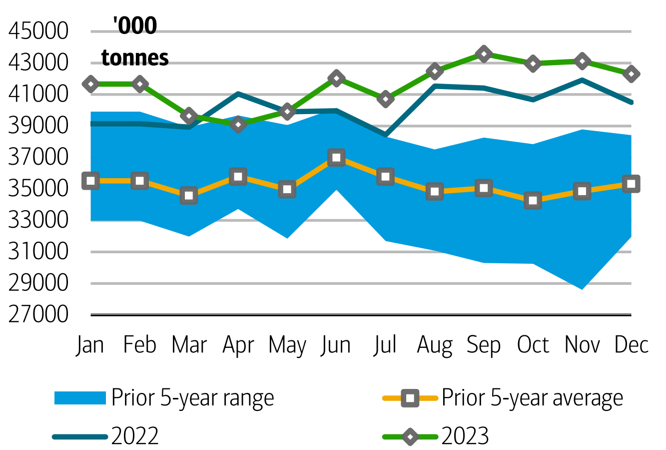
With regards to the resilience of China's aluminium market, Exhibit 7 shows that domestic smelters also boosted supply to record levels in 2H24. Still, China had to reduce aluminium exports YoY to feed its domestic demand (Exhibit 8).

Exhibit 7: China, aluminium production
China's smelters operated at the capacity cap of 45Mt



Source: Bloomberg, BofA Global Research

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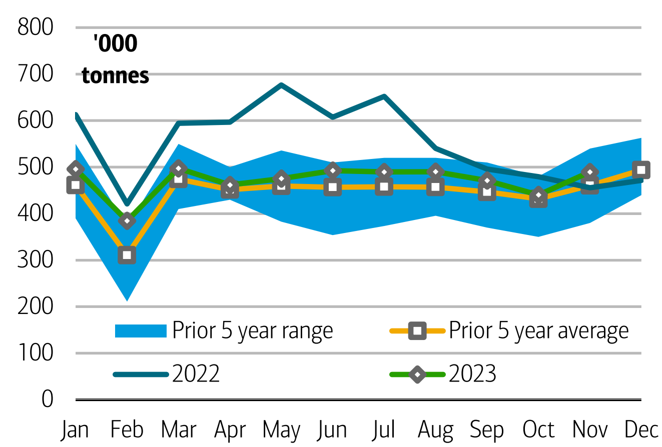
Exhibit 8: China, net exports of primary aluminium and products
China has reduced aluminium exports in 2023



Source: Bloomberg, BofA Global Research

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Sanctions on Russia and LME are key concerns

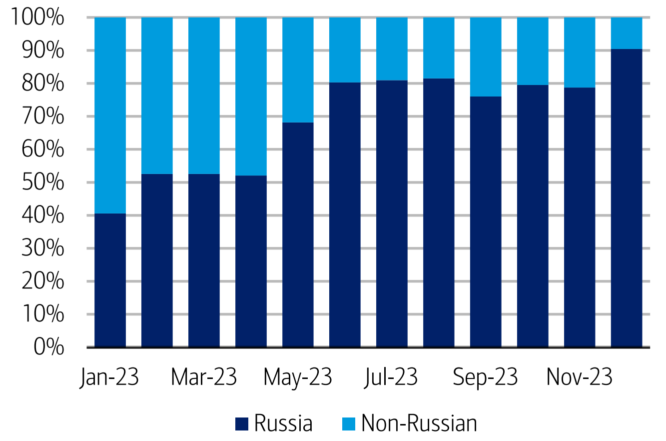
The LME is dominated by material from Rusal

We usually determine the strength of fundamentals and hence pricing pressures by looking at supply and demand. However, there are increasing "non-traditional" or "technical" risks impacting on the aluminium market. Picking up on the LME, the exchange is running physically backed contracts. This means that metal stored in

[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 for the tightness of regional markets

warehouses is essential for an orderly market. Yet, inventories have fallen steadily in recent years. In addition, Exhibit 9 shows that split of metal stored in the exchange's warehouse network has changed in recent months, with Rusal now accounting for 90% of inventories.

Exhibit 9: LME, breakdown of inventories by origin
Rusal aluminium units dominate LME



Source: LME, BofA Global Research

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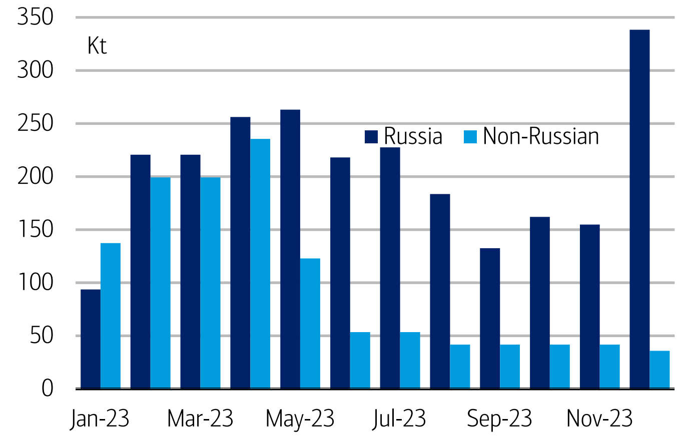
Exhibit 10: LME, breakdown of aluminium inventories in tonnes
Russia accounts for an increasing share of LME stocks on large deliveries



Source: LME, BofA Global Research

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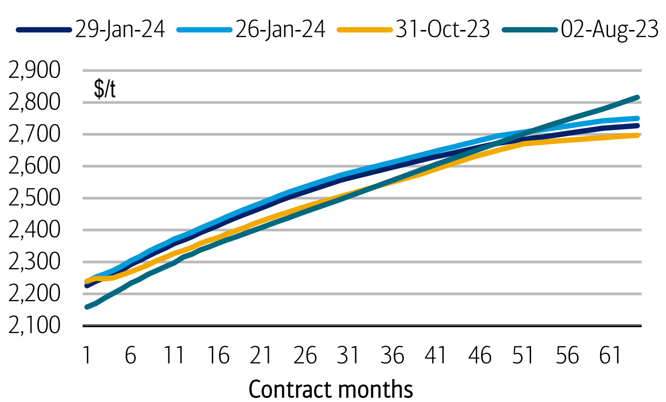
Granted, this hasn't caused any issues in the market so far. While the UK has imposed limits on British entities trading in Russian material, sanctions from the EU and the US have so far not been specific enough to have an impact on the LME. Yet this could change if consumers/traders no longer accept Russian aluminium due to tighter sanctions.

Exhibit 11: LME forward curves
Curves remain in contango



Source: Bloomberg, BofA Global Research

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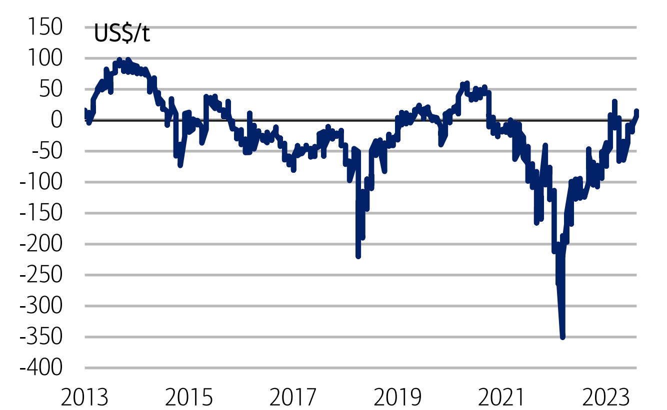
Exhibit 12: PnL of warehouse financing deals
Warehousing deals are profitable again



Source: Bloomberg, BofA Global Research

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So what are possible trajectories for LME-traded aluminium going forward? We see at least three:

- **Keep the status-quo**: given our projected deficits, LME prices would be supported, but given inventories are dominated by Russian material, which market participants may be reluctant to accept, any shortages would in all likelihood play out only partially through higher LME price, while physical premia could be pushed up more visibly. In terms of time spreads, forward curves may steepen initially as unwanted metal is delivered back into stocks. Ultimately though, a shortage of physical units could flip the curves into backwardation[2].

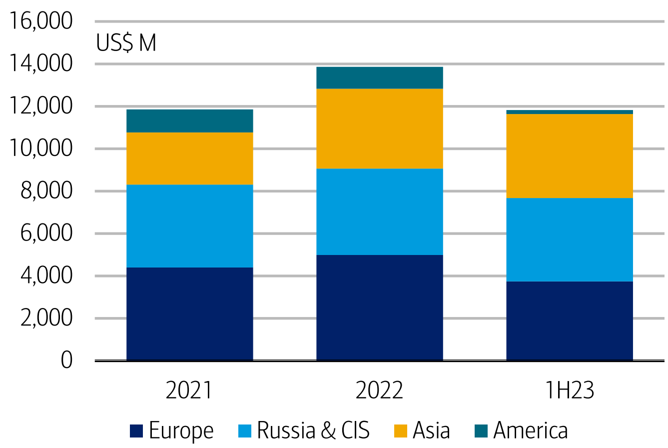
- **Sanctions and grandfathering raw material**: similarly, if sanctions came through and Rusal material already in LME warehouses was grandfathered, LME prices may remain stable, although physical premia would still rally.
- **Sanctions and de-listing Russian material**: yet, if Russian material was delisted, i.e. if Rusal tonnages were no longer accepted in transactions on LME, given the lack of non-Russian metal in warehouses, physical premia and LME prices would in all likelihood spike up violently, with curves also flipping into backwardation.

Europe's dependence on Russia has decreased

Reacting to sanctions imposed so far by the EU and the US, Rusal has been re-routing aluminium, as Exhibit 13 and Exhibit 14 show. Notwithstanding, some units still make it into the Western world.

Exhibit 13: Regional breakdown of Rusal's revenues

America barely featured in 1H23; Europe's contribution to revenues declined



Source: Rusal, BofA Global Research

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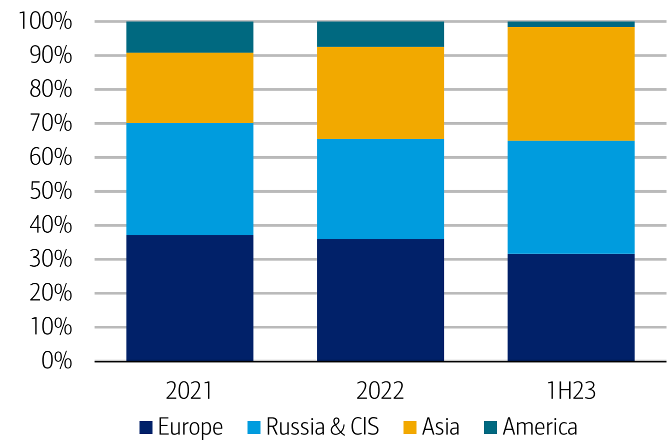
Exhibit 14: Regional breakdown of Rusal's revenues

Europe accounts for barely one-third of Rusal's revenues



Source: Rusal, BofA Global Research

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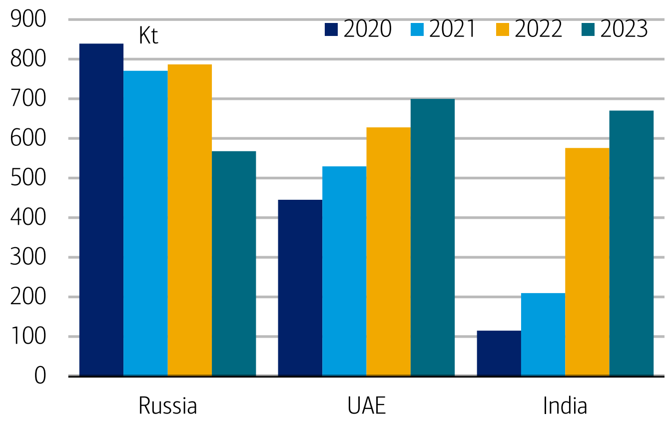
Of course, the reduction of purchases from Russia has also been visible in European trade data. Exhibit 15 shows that Europe's imports from its neighbour have fallen from 840Kt to 567Kt. With smelters in Europe closing over the energy crisis, these units were replaced by a range of countries. Indeed, the United Arab Emirates and India have gained market share.

Incidentally, India's market share gains are worth noting from an ESG standpoint: Rusal's aluminium is produced with hydro power, while India's smelters predominantly use electricity generated in coal power plants. This implies that Europe has been replacing aluminium with a carbon footprint of around 4t per tonne of aluminium produced with units that contain 16t of CO_2! As the Carbon Border Adjustment Mechanism is now kicking in, it will be interesting to see if those units stick. At current EUA prices, and once the CBAM is fully phased in by 2032, India's producers would face an incremental carbon cost of $970/t.

[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 15: EU-27, aluminium shipments from top-3 trading partners
Aluminium imports from Russia have fallen; India/UAE have gained



Source: Eurostat, BofA Global Research

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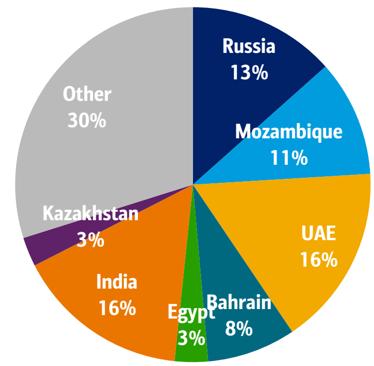
Exhibit 16: EU-27, breakdown of aluminium imports
Asia and the Middle East are a good part of Europe's imports



Source: Eurostat, BofA Global Research

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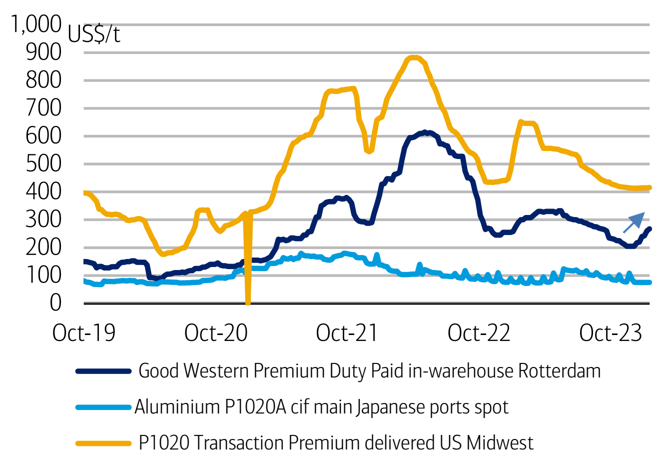
Red Sea disruptions

Of course, the displacement of Rusal's aluminium units with aluminium from the Middle East and Asia also matters logistically, especially with the ongoing Red Sea disruptions. Exhibit 17 shows that physical premia have been pushing higher. Notwithstanding, we think the Red Sea problems are a delivery issue, not really a disruption, i.e. metal still gets to Europe, even if the rerouting of ships around the Cape adds to travel times. This has also been mirrored in physical premia, which have pushed higher, but they remain within longer-term ranges.

Exhibit 17: Regional aluminium premia
Europe's aluminium premia have risen



Source: Bloomberg, BofA Global Research

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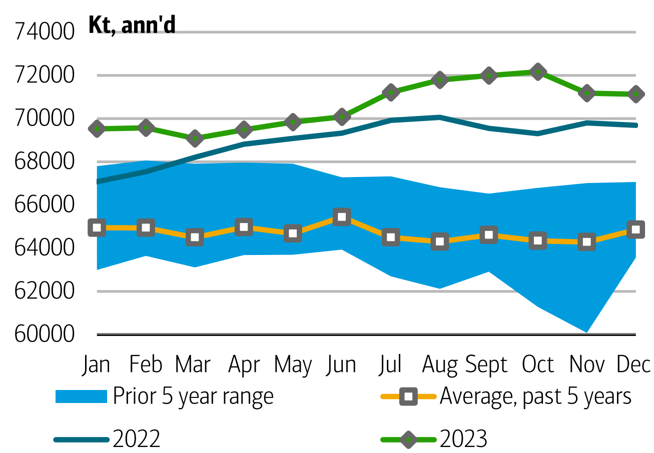
Exhibit 18: Global aluminium production
Aluminium production has stabilised just under 72mt in 2023



Source: company reports, Woodmac, BofA Global Research

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Supply increases more subdued

European smelters remain under pressure

Shifting to supply, Exhibit 19 shows that global production grew at a relatively anaemic 2.3% YoY, confirming the data from Exhibit 1. In terms of production losses, Europe sticks out: smelters in the region remain under pressure, partially because electricity prices have not fully normalised. Beyond that, governments also remain cautious to support the industry. This was perhaps best reflected in the closure Delfzijl aluminium smelter in the Netherlands, with the site requisitioned to build a battery storage facility. A bit of historic context: that smelter had been established to exploit low energy prices offered by the Dutch government for industrial development based on the discovery of natural gas in the North Sea in the 1960s.

Exhibit 19: Regional aluminium production
Global aluminium production increased by 2.3% YoY

	CY 2023	CY 2022	YoY change	Annualised Dec-23	Annualised Dec-22	YoY change	Annualised Nov-23	MoM change
Africa	1,596	1,620	-1.5%	1,566	1,648	-5.0%	1,606	-2.5%
North America	3,896	3,743	4.1%	3,991	3,780	5.6%	4,003	-0.3%
Latin America	1,466	1,288	13.8%	1,484	1,436	3.3%	1,497	-0.9%
Asia	4,686	4,591	2.1%	4,721	4,604	2.6%	4,733	-0.2%
West Europe	2,713	2,913	-6.9%	2,720	2,732	-0.4%	2,725	-0.2%
E.Europe	4,015	4,081	-1.6%	4,062	4,039	0.6%	4,039	0.6%
Oceania	1,884	1,843	2.2%	1,907	1,884	1.3%	1,910	-0.1%
Middle East	6,216	6,074	2.3%	6,240	6,134	1.7%	6,242	-0.0%
Other non-IAI nations	2,455	2,455	0.0%	2,461	2,461	0.0%	2,446	0.6%
IAI ex-China	28,927	28,608	1.1%	29,153	28,717	1.5%	29,200	-0.2%
China	41,666	40,430	3.1%	41,975	40,974	2.4%	41,975	0.0%
IAI Total	**70,593**	**69,038**	**2.3%**	**71,128**	**69,691**	**2.1%**	**71,175**	**-0.1%**

Source: IAI, BofA Global Research

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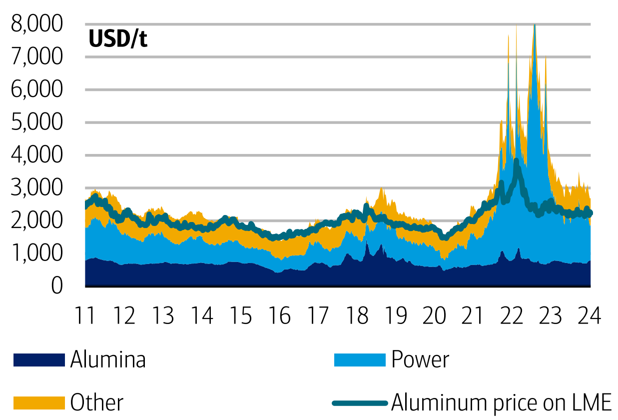
Ongoing pressure on European smelters is also mirrored by Exhibit 20, which shows that a Western/ Central European smelter purchasing spot alumina and power is loss-making. This is a sharp contrast to a producer in China, where margins are positive; economics there would incentivise smelters to expand supply, but the government will not let them given a 45Mt capacity cap.

Exhibit 20: European smelters, spot costs and prices
Smelters procuring electricity on the sport market at are loss-making



Source: Bloomberg, BofA Global Research

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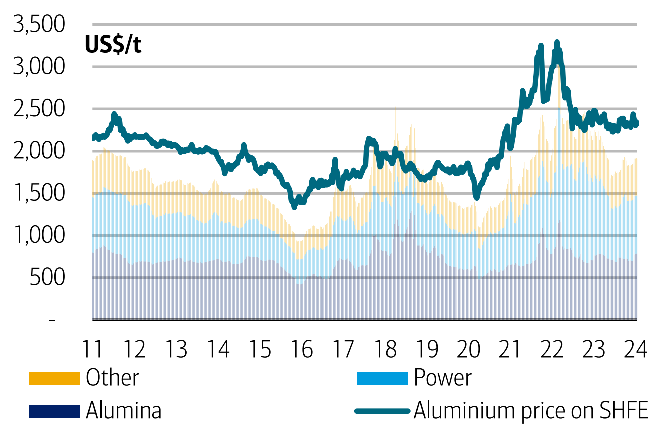
Exhibit 21: China smelters, spot costs and prices
An average Chinese smelter is profitable, but a government-imposed capacity cap means production is not increasing



Source: Bloomberg, BofA Global Research

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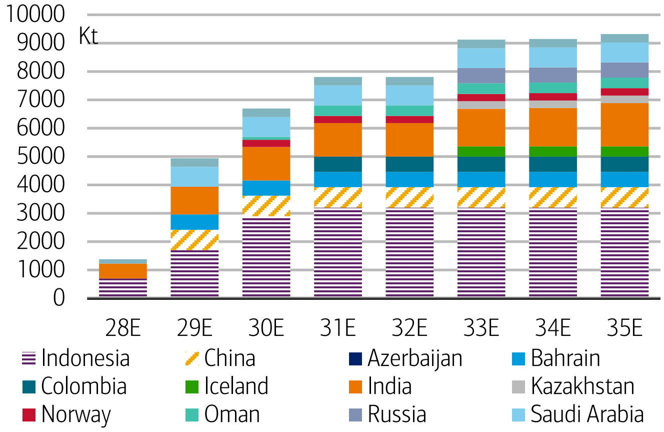
Indonesia is leading the project pipeline

Looking ahead, Exhibit 22 and Exhibit 23 show that smelting projects currently in the pipeline could add around 9Mt of supply to the market. Interestingly, with China capping its domestic capacity, the country will likely contribute only limited additional tonnages to the market. However, this comes with a caveat: more aluminium units will emerge from Indonesia, where Chinese companies are now building smelters. All in though, these supply increases are unlikely to be sufficient to keep the aluminium market out of deficit.

Exhibit 22: Regional breakdown of aluminium projects

Projects could deliver 9Mt of additional aluminium units



Source: company reports, Woodmac, BofA Global Research

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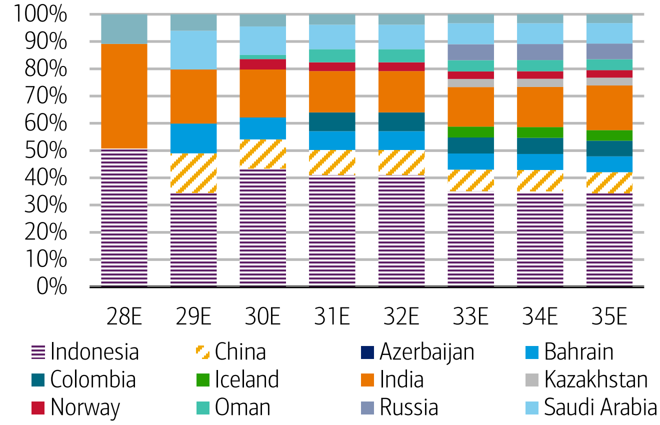
Exhibit 23: Regional breakdown of aluminium projects

Indonesia and China account for almost 50% of production increases



Source: company reports, Woodmac, 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	2,196	2,234	-1.9%	-1.8%
Copper	8,374	8,482	-0.9%	-0.7%
Lead	2,146	2,145	-1.3%	-0.9%
Nickel	15,985	16,235	-3.3%	-3.3%
Tin	25,295	25,550	-4.5%	-4.2%
Zinc	2,440	2,451	-5.1%	-4.9%
LMEX	3,667		-1.9%	
	Cash, c/lb	**3-month, c/lb**		
Aluminium	100	101		
Copper	380	385		
Lead	97	97		
Nickel	725	736		
Tin	1,147	1,159		
Zinc	111	111		
Other commodities, freight, exchange rates, equities and yields	**Spot**	**WoW change**		
Gold, $/oz	2,040	1.1%		
Silver, $/oz	23	-0.5%		
Platinum, $/oz	897	-2.0%		
Palladium, $/oz	949	-1.2%		
Iron ore, China fines cfr $/dmt	128	-5.4%		
Brent, $/bbl	77	-6.8%		
Baltic Dry Index	1,407	-7.3%		
EUR/USD	1.079	-0.6%		
Dow Jones Industrial Average	38,654	1.4%		
10-year US Treasury yield	4.022	-2.8%		
ICE BofA Commodity index, ER	407	-3.8%		
ICE BofA Commodity index Industrial Metals, ER	174	-1.9%		
ICE BofA Commodity index Precious Metals, ER	218	0.8%		
ICE BofA Commodity index Energy, ER	479	-5.7%		
Exchange stocks and cancelled warrants	**Stocks, tonnes**	**WoW change**	**Canc. warrants, tonnes**	**Canc. warr., of stocks**
Aluminium				
LME	531,175	-2.8%	212,600	40.0%
Shanghai	106,165	4.6%		
Total aluminium	637,340	-1.6%		
Copper				
LME	139,425	-7.9%	24,625	17.7%
Comex	22,390	1.3%		
Shanghai	68,777	36.1%		
Total copper	230,592	2.9%		
Lead				
LME	130,350	17.8%	21,525	16.5%
Shanghai	37,252	1.5%		
Total lead	167,602	13.7%		
Nickel				
LME	71,724	3.5%	4,956	6.9%
Shanghai	15,622	3.3%		
Total nickel	87,346	3.5%		
Tin	6,295	-3.4%	895	14.2%
Zinc				
LME	197,275	3.0%	31,250	15.8%
Shanghai	27,882	23.1%		
Total zinc	225,157	5.1%		

Source: BofA Global Research

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Exhibit 24: 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 leads 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 25: 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$/t	2,196	2,250	2,500	2,750	2,750	3,000	3,000	2,268	2,563	3,000	3,250	3,015	2,781	2,546
	USc/lb	100	102	113	125	125	136	136	103	116	136	147	137	126	115
Copper	US$/t	8,374	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	380	363	386	397	420	454	454	383	391	476	431	433	434	436
Lead	US$/t	2,146	2,000	2,000	2,000	2,000	1,750	1,750	2,156	2,000	1,750	2,024	2,217	2,409	2,602
	USc/lb	97	91	91	91	91	79	79	98	91	79	92	101	109	118
Nickel	US$/t	15,985	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	725	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$/t	2,440	2,500	2,500	2,250	2,250	2,250	2,250	2,648	2,375	2,250	2,424	2,596	2,769	2,942
	USc/lb	111	113	113	102	102	102	102	120	108	102	110	118	126	133
Precious metals															
Gold, nominal	US$/oz	2,016	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	22.28	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	900	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$/oz	944	900	800	700	600	500	500	1,379	750	500	500	824	1,147	1,471
		Current	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Bulk Commodities															
Hard coking coal	US$/t fob	320	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	117	148	148	151	153	125	125	176	150	125	112	112	113	113
Iron ore fines	US$/t CIF	127	150	130	120	100	90	90	115	125	90	90	94	98	102
		Current	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Other materials															
Lithium spodumene	US$/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	19.4	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	712	719	701	639	674	721	702	767	683	714				
HRC, US	US$/t	1,168	1,130	1,020	882	805	799	799	975	959	799				
HRC, China	US$/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$/bbl	72	73	75	77	75	57	57	79	75	57	57	57	57	57
Brent	US$/bbl	77	78	80	82	80	60	60	83	80	60	60	60	60	60
Henry Hub	US$/MMBtu	2.1	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	69,648	73,336	76,269	79,320
YoY change	0.7%	0.9%	5.3%	4.0%	4.0%
Balance	**-719**	**233**	**-1,056**	**-2,367**	**-4,082**
Market inventories	8,423	8,656	7,600	5,233	
Weeks of world demand	6.3	6.5	5.4	3.6	
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

Balanced market in 2023E

'000 tonnes	2022	2023	2024	2025	2026
Global production	24,646	25,751	26,407	27,455	28,249
YoY change	2.2%	4.5%	2.5%	4.0%	2.9%
Global consumption	25,152	25,694	26,833	27,906	29,023
YoY change	0.9%	2.2%	4.4%	4.0%	4.0%
Balance	**-506**	**57**	**-426**	**-452**	**-773**
Market inventories	840	897	471	19	
Weeks of world demand	1.7	1.8	0.9	0.0	
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 well supplied

'000 tonnes	2022	2023	2024	2025	2026
Global production	3,170	3,423	3,959	4,284	4,569
YoY change	16.2%	8.0%	15.7%	10.4%	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**	**409**	**342**	**342**
Market inventories	456	545	954	1,296	1,638
Weeks of world demand	7.6	8.5	14.0	17.1	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 26: Iron ore supply and demand balance

Flipping back into surplus

Wet Mt	2022	2023E	2024E	2025E	2026E
Global production	2,363	2,358	2,427	2,504	2,541
YoY change	2.2%	-0.2%	2.9%	3.2%	1.5%
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**	**10**	**55**	**130**	**155**
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 27: 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 28: Platinum supply and demand balance

Flipping into a small surplus

'000 ounces	2022	2023	2024	2025	2026
Global production	6,530	6,564	7,184	7,536	7,634
YoY change	-13.9%	0.5%	9.4%	4.9%	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**	**-667**	**-227**	**20**	**-28**
Spot ($/oz)	964	976	1,050	1,250	1,322

Source: Matthey, company reports, BofA Global Research estimates

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Exhibit 29: Palladium supply and demand balance

Rising surpluses ahead

'000 ounces	2022	2023	2024	2025	2026
Global production	9,377	9,390	9,841	10,388	10,627
YoY change	-4.5%	0.1%	4.8%	5.6%	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**	**-320**	**1,070**	**1,954**	**2,603**
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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