Australian Metals & Mining

Year Ahead 2024: Remain broadly positive yet selective

Industry Overview

10 January 2024

Equity
Australia
Metals & Mining

Positive on iron ore, coal, copper and aluminium in 2024

Looking through 2024, we remain bullish iron ore in the near term owing to restocking and seasonal supply disruptions. We are positive on aluminium and copper with both markets expected to tighten in 2H24. Gold prices should stay supported given 100bps of cuts in US interest rate and a weaker USD. We are cautious on lithium near term given over supply and see further upside for uranium. China is key for commodities and BofA forecasts 4.8% GDP growth for 2024. We present our investment thesis, key drivers, issues and catalysts for RIO and BHP from page 9.

Idea #1: Buy BHP and Rio Tinto for 1Q restock in iron ore

Buy BHP and RIO for undervalued iron ore exposure. We expect steel producers to continue to restock in 1Q24, and if accompanied by the usual seasonal disruptions in the seaborne market, prices could rally to $150/t. Iron ore accounts for 65-75% of EBITDA for BHP and RIO.

Idea #2: Buy copper equities: BHP & RIO

Buy BHP for copper exposure. We expect copper to be a 2H24 story, supported by Chinese stimulus and a tighter market following further supply disruptions.

Idea #3: Buy met coal equities

We expect structurally higher met coal prices. We have raised our LT coking coal price to US$200/t (2024$) to reflect our view that higher incentive prices will be needed for marginal supply from the US (or Russia). Our revised US$100/t (2024$) LT FOB Newcastle reflects the dearth of Western miners building new thermal mines.

Idea #4: Buy gold equities

Buy gold equities as hike cycle peaks and softer USD lifts demand for yellow metal. If the Fed accelerates rate cuts, we feel gold could end 2024 at $2,400/oz.

Idea #5: Selective on lithium equities

We remain cautious in the near term as although we are rapidly approaching what we believe to be marginal cost, lepidolite producers have yet to meaningfully scale back production.

Idea #5: Buy uranium equities

We are constructive on uranium (U_3O_8) prices and believe the bull market has further to run. We expect the market to remain tight into 2025E when new mined supply is forecast to finally provide relief from lack of supply.

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Key themes for 2024

Overview

We like bulks (iron ore and coal) and copper and aluminium in 2024 while remaining cautious on a near term rebound in lithium. Iron ore is a 1H24 story while our expectations are for copper to outperform in 2H24. We like met coal from a structural perspective as unlike iron ore, which has a slew of new supply coming online from 2025, new met coal assets are not as apparent while global steel demand is expected to continue increasing over the next 20 years (largely driven by India). In lithium, with end demand coming under pressure and a glut of new supply coming online we are forecasting a surplus in 2024 (pending an acceleration in production curtailments). While we may hit a period of stabilisation, benchmarks are close to reporting SC6 prices of ~US$1,000/t which will squeeze margins further across our coverage.

Iron Ore in 1H24

Chinese port inventories are low, supply disruptions usually occur in Q1 and China may need to expand stimulus. The environment is well set for a strong 1H'24 in iron ore before a gradual decline throughout the remainder of the year as new supply (Onslow, Iron Bridge, South Flank expansion) comes online. We expect that with Chinese steel margins remaining under pressure, the spread between low grade (58% Fe) and benchmark (62% Fe) will narrow (positive for FMG and MIN). However, the real earnings momentum will be felt in BHP and RIO, underpinning our Buy recommendations.

Copper in 2H24

We had initially expected copper would be in a surplus in 2024, however with political unrest in Peru, Cobre Panama stoppage and re-stocking in China being undertaken ahead of the new year, there is potential the market will now be more balanced toward 2H'24. Copper remains a key mineral for the energy transition, and with mines getting deeper, grades lower, and late decade deficits expected, the long money is positioning in attractively priced copper exposure. Our top pick is BHP (and to a lesser degree RIO) which are expected to increase the % of earnings from copper over the next 5-years.

Met and thermal coal higher for longer

Our global commodities team is forecasting higher for longer coal prices driven by a structural tightening in met and thermal coal markets. We have raised our LT coking coal price to US$200/t (2024$) to reflect our view that higher incentive prices will be needed to bring on marginal supply from the US (or Russia) with little to no incremental investment from BMA. Furthermore, our revised US$100/t (2024$) LT FOB NEWC for thermal is a reflection that currently there are no Western companies planning to build new thermal coal mines.

Gold eyes rate cuts for >$2,000/oz support

While pushing higher on the continued instability in the Middle East, we expect gold to ultimately remain trading on rates, so once the Fed announces a decisive end to the hiking cycle in 2Q, new buyers should come into the market. If the Fed cuts earlier, gold could end the year at $2,400/oz.

Cautious on lithium's 2024 prospects

Lithium declined materially in 2023, albeit off an abnormally high base in 2022. During 2023, investors preferred exposure to the Western upstream, supported by a wave of consolidation which took place in Australia. In 2024, we remain cautious on the outlook as although we are rapidly approaching what we believe to be marginal cost, high-cost producers, especially Chinese lepidolite producers, have yet to meaningfully scale back production.

Commodity price forecasts

In November 2023, our BofA commodity research team revised price forecasts for 2024-25 (see Metals Strategist: Year Ahead 2024). Key changes for 2024 include coking coal +8% to $270/t, iron ore +28% to $125/t and copper -6% to $8,625/t ($3.91/lb). The BofA Global Metals & Mining team also recently raised its long-term commodity price assumptions. We now assume a long term (2024 real) price of $90/t for iron ore (vs $79/t prior), $200/t for coking coal (vs $140/t prior), $100/t for thermal coal (vs $75/t prior) and $8,500/t for copper (vs $7,168/t prior).

Reflecting our new commodity prices, we increased FY24 EBITDA and price objectives by an average 6%. For more detail, please refer to Australian Metals & Mining: Revising long term commodity prices - impact on equities 21 November 2023.

On a 12-month view, BofA forecasts a 23% increase in aluminium prices to $2,750/t, a 10% rise in copper prices to $9,250/t.

Exhibit 1: BofA price forecasts

The energy transition is increasingly feeding through into metal prices

		Spot	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	1Q25E	2023E	2024E	2025E	2026E	2027E	2028E	LT price
Base metals															
Aluminium	US$/t	2,228	2,250	2,250	2,500	2,750	2,750	3,000	2,268	2,563	3,000	3,250	3,015	2,781	2,546
	USc/lb	101	102	102	113	125	125	136	103	116	136	147	137	126	115
Copper	US$/t	8,361	8,000	8,000	8,500	8,750	9,250	10,000	8,442	8,625	10,500	9,500	9,539	9,578	9,617
	USc/lb	379	363	363	386	397	420	454	383	391	476	431	433	434	436
Lead	US$/t	2,042	2,200	2,000	2,000	2,000	2,000	1,750	2,156	2,000	1,750	2,024	2,217	2,409	2,602
	USc/lb	93	100	91	91	91	91	79	98	91	79	92	101	109	118
Nickel	US$/t	16,152	18,500	18,500	18,500	19,000	19,000	20,000	21,786	18,750	20,000	20,000	19,141	18,283	17,424
	USc/lb	733	839	839	839	862	862	907	988	851	907	907	868	829	790
NPI, 8-12%	CNY/t		1,000	1,032	1,032	1,032	1,032	1,062	1,129	1,032	1,062	1,102	1,138	1,174	1,210
Zinc	US$/t	2,538	2,500	2,500	2,500	2,250	2,250	2,250	2,648	2,375	2,250	2,424	2,596	2,769	2,942
	USc/lb	115	113	113	113	102	102	102	120	108	102	110	118	126	133
Precious metals															
Gold, nominal	US$/oz	2,028	1,900	1,950	1,950	2,000	2,000	2,100	1,924	1,975	2,150	2,096	2,095	2,094	2,093
Gold, real	US$/oz		1,900	1,950	1,950	2,000	2,000	2,049	1,924	1,975	2,098	1,995	1,946	1,898	1,850
Silver, nominal	US$/oz	23.11	22.50	22.50	23.00	23.53	24.00	24.50	23.20	23.26	24.75	26.07	27.18	28.30	29.42
Silver, real	US$/oz		22.50	22.50	23.00	23.53	24.00	23.90	23.20	23.26	24.15	24.81	25.21	25.60	26.00
Platinum	US$/oz	948	950	1,000	1,000	1,100	1,100	1,250	976	1,050	1,250	1,322	1,372	1,421	1,471
Palladium	US$/oz	999	1,250	900	800	700	600	500	1,379	750	500	500	824	1,147	1,471
		Spot	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Bulk Commodities															
Hard coking coal	US$/t fob	336	310	360	280	210	230	240	290	270	215	205	212	219	226
Semi-soft	US$/t fob	155	205	238	185	139	152	158	220	178	142	135	134	133	132
Thermal Coal	US$/t fob	132	145	148	148	151	153	125	176	150	125	112	112	113	113
Iron ore fines	US$/t CIF	139	110	150	130	120	100	90	115	125	90	90	94	98	102
		Spot	**4Q23E**	**1Q24E**	**2Q24E**	**3Q24E**	**4Q24E**	**1Q25E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**LT price**
Other materials															
Lithium spodumene	US$/t	1,300	2,000	1,950	1,850	1,750	1,500	1,500	3,802	1,763	2,188	1,858	1,722	1,586	1,450
Lithium carbonate	US$/t	13,575	20,000	18,000	17,000	16,000	15,000	15,000	37,386	16,500	21,875	21,250	20,833	20,417	20,000
Lithium hydroxide	US$/t	12,400	19,500	19,500	18,500	17,500	16,500	16,500	39,184	18,000	23,375	22,750	22,333	21,917	21,500
Alumina	$/t	360	331	340	340	340	340	348	343	340	348	357	375	394	412
Uranium	$/lb		72.50	75.00	77.50	80.00	80.00	75.00	58.91	78.13	75.00	70.00	65.00	60.00	55.00
Molybdenum	$/lb	20.6	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	$/dmtu	4.15	4.35	4.35	4.35	4.35	4.35	4.35	4.79	4.35	4.35	4.93	5.52	6.11	6.70
Steel, HRC															
HRC, Europe	US$/t	713	680	719	701	639	674	721	767	683	714				
HRC, US	US$/t	1,213	910	1,130	1,020	882	805	799	975	959	799				
HRC, China	US$/t	561	571	568	585	602	623	592	565	595	602				

Source: BofA Global Research

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Link to original note, Metal Strategist Year Ahead 2024, originally published 19 November 2023, lead author M. Widmer

The future is now: energy transition drives metals

Many of the factors that ensured prices held up this year despite weak macro should carry over into next year: **1) green spending** is increasingly offsetting muted demand from the traditional economy; and **2) supply growth** has generally been subdued. While the start of 2024 may be challenging, if those trends are accompanied by 3) **a wider economic rebound** (the sweet spot is 3Q24), then mined commodities may push higher again, potentially also supported by 4) **a weaker USD**/ **a decisive end to the hiking cycle**, along 5) an **end to destocking**. Overall, we recommend iron ore as a 1Q trade, gold in summer and copper/ aluminium in 2H24.

Base metals: copper rally in 2H24

Copper and **aluminium** are essential ingredients of the energy transition and we anticipate overall tight markets in 2024. That said, prices may face headwinds early next year as macro challenges especially in developed markets persist, before rallying in the second half, when global economic activity may be stronger. As an aside, one issue we increasingly face is that, factoring in the "official" energy transition targets, some deficits look implausible. **Nickel** fundamentals look challenged on production increases in Indonesia. Meanwhile, **zinc** should remain well supplied and continue to be a commodity that prices on marginal costs, with support at around $2,200/t ($1/lb).

Precious metals: the summer trade

Gold has pushed higher on the war in the Middle East. Yet the yellow metal ultimately remains a trade on rates, so once the Fed announces a decisive end to the hiking cycle next year, new buyers should come into the market. Meanwhile, **silver** is set to benefit from the rising popularity of EVs and solar panels, potentially also helped by a rebound in industrial demand. **Palladium** is a one-trick pony and the declining popularity of combustion engine cars will likely lead prices down. Production cuts could mitigate palladium oversupplies, while pushing **platinum**, which has better fundamentals to start with (autos are not as important for demand), into deficit.

Steel and bulks: the 1Q trade

An end to **steel** destocking in the US and Europe, along with a stabilisation of respective economies, should support steel markets. Meanwhile, China's property sector may be less of a drag next year, although we still expect a decline in production. With **iron ore** inventories remaining low, mills may be forced into the market, especially in 1Q24. This could take prices to $150/t, particularly if the usual supply disruptions kick in.

MIFTs and Exotics: lithium lower, uranium higher

Lithium prices have already come under pressure, but further production discipline is needed to rebalance the market. Output cuts can happen quickly, so we see scope for a rebalancing in 2024, potentially laying the foundations for a rally. Finally, we are also constructive **uranium, an essential commodity to decarbonise the economy.**

Valuation comps

Our primary valuation method for our Australian Resources coverage is to derive an NPV using a DCF methodology based on the life of mine/field cashflows and BofA commodity prices. In some instances, we also use a blended average of EV/EBITDA and NPV where deemed appropriate.

Exhibit 2: BofA Australian Metals & Mining valuation comps

Valuation comps for our Australian Metals & Mining coverage universe

	Price	Mkt Cap	EV	P/NPV	EV/EBITDA		Dividend Yield		FCF Yield	
Metals, Mining & Steel	$/shr	US$M	US$M	FY22	CY23	CY24	CY23	CY24	CY23	CY24
BHP Group Limited	48.66	165,152	170,745	0.85x	5.6x	5.6x	5.5%	5.1%	7.9%	8.4%
Rio Tinto Ltd	131.52	142,767	159,577	0.94x	6.6x	5.4x	5.2%	5.9%	7.0%	6.5%
Fortescue Ltd.	27.75	57,344	58,355	1.23x	5.6x	6.6x	6.7%	5.2%	8.2%	5.9%
Newmont	59.50	46,365	50,324	N/A	13.9x	8.4x	4.0%	4.0%	1.0%	2.8%
South32 Ltd	3.27	9,976	10,976	0.78x	5.9x	5.9x	2.8%	2.7%	6.1%	5.6%
Northern Star	12.84	9,903	10,608	0.99x	9.1x	6.5x	2.5%	3.2%	3.0%	4.9%
Mineral Resources	67.08	8,756	10,906	0.93x	9.4x	9.5x	2.3%	1.6%	-4.9%	-4.4%
Pilbara Minerals	3.80	7,675	6,797	0.90x	6.4x	10.0x	4.3%	2.5%	9.3%	-1.8%
BlueScope	22.17	6,664	7,014	0.82x	4.8x	5.1x	2.3%	2.3%	9.8%	2.5%
Evolution Mining	3.79	5,025	6,386	1.03x	8.5x	5.5x	1.5%	2.6%	2.7%	8.8%
IGO	8.53	4,335	4,160	0.97x	4.6x	6.5x	4.3%	1.1%	11.3%	4.3%
Whitehaven Coal	8.02	4,320	5,345	0.67x	3.3x	4.0x	5.9%	2.6%	-3.1%	-27.2%
Lynas Rare Earths	6.58	4,124	3,779	0.88x	13.4x	9.2x	0.0%	0.0%	-4.2%	2.4%
Champion Iron	8.17	2,840	3,195	0.97x	4.9x	4.3x	2.7%	2.7%	3.7%	11.7%
Liontown	1.54	2,497	2,629	0.84x	N/A	N/A	0.0%	0.0%	-13.7%	-10.2%
Paladin Energy	1.05	2,102	1,964	1.38	-45.8x	11.9x	0.0%	0.0%	1.3%	9.8%
Sandfire Resources	6.77	2,074	2,885	0.97x	8.9x	6.6x	0.0%	2.0%	-4.9%	7.6%
Coronado	1.74	1,958	2,247	1.00x	4.4x	4.8x	5.1%	1.7%	10.8%	3.5%
Nickel Industries	0.67	1,913	2,219	0.59x	4.5x	6.1x	5.8%	5.8%	4.6%	-25.7%
Sims Limited	14.08	1,826	2,315	1.17x	7.6x	6.9x	2.0%	2.1%	3.6%	2.3%
Deterra Royalties	5.12	1,817	1,804	1.19x	10.5x	9.7x	6.7%	7.2%	6.7%	7.3%
Iluka Resources	6.29	1,799	1,857	0.79x	7.2x	6.0x	1.0%	0.0%	-4.6%	-23.8%
Alumina Limited	0.91	1,772	2,094	1.12x	N/A	25.8x	0.0%	4.1%	-12.2%	4.1%
De Grey Mining	1.24	1,541	1,173	0.80x	N/A	N/A	0.0%	0.0%	-3.1%	-12.6%
Boss Energy	4.59	1,254	1,163	1.95	60.1x	15.5x	0.0%	0.0%	-3.0%	1.1%
Gold Road	1.70	1,228	1,207	0.80x	7.1x	5.6x	1.3%	2.4%	9.5%	11.7%
Capricorn Metals	4.37	1,103	1,098	1.01x	9.4x	9.2x	0.0%	0.0%	7.7%	0.2%
Regis Resources	2.13	1,080	1,260	0.99x	4.7x	3.7x	0.5%	0.9%	10.6%	9.7%
29Metals Limited	0.55	259	339	0.65x	-13.0x	4.1x	0.0%	0.0%	-32.6%	5.1%
Average				0.97x	6.4x	7.7x	2.5%	2.3%	1.3%	0.7%
Median				0.95x	6.5x	6.5x	2.3%	2.3%	3.6%	4.1%

Source: BofA Global Research, Bloomberg

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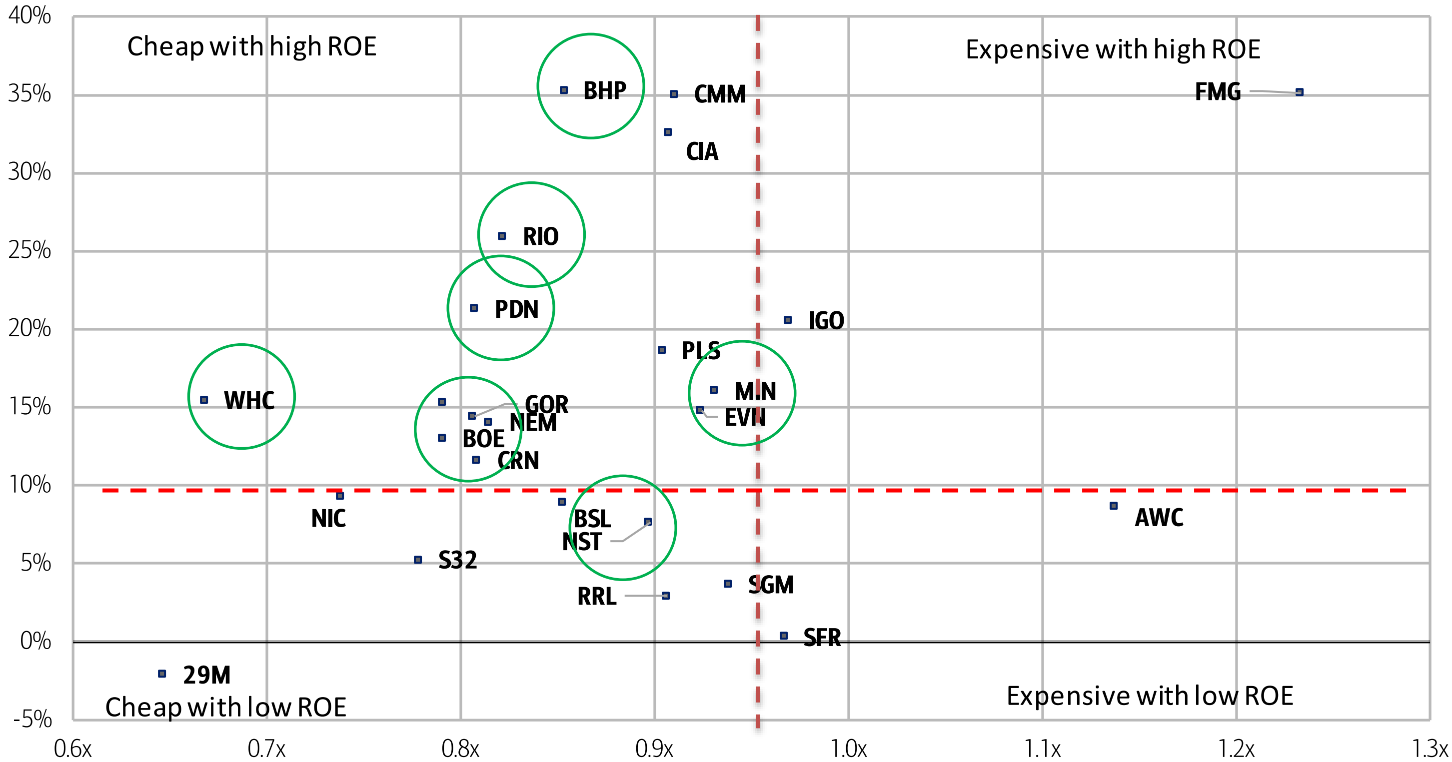
ROE vs P/NAV

We like to assess our coverage assessing both the long-term outlook (captured in our NPV assessment) versus equity returns on a 12-month forward basis. Here, we see the most opportunity in BHP and RIO given our positive view on iron ore, coal, aluminium, uranium and copper short and medium term.

Exhibit 3: 2024 ROE (y-axis) and P/NPV (x-axis) highlight overweight opportunities through 2024



Source: BofA Global Research estimates

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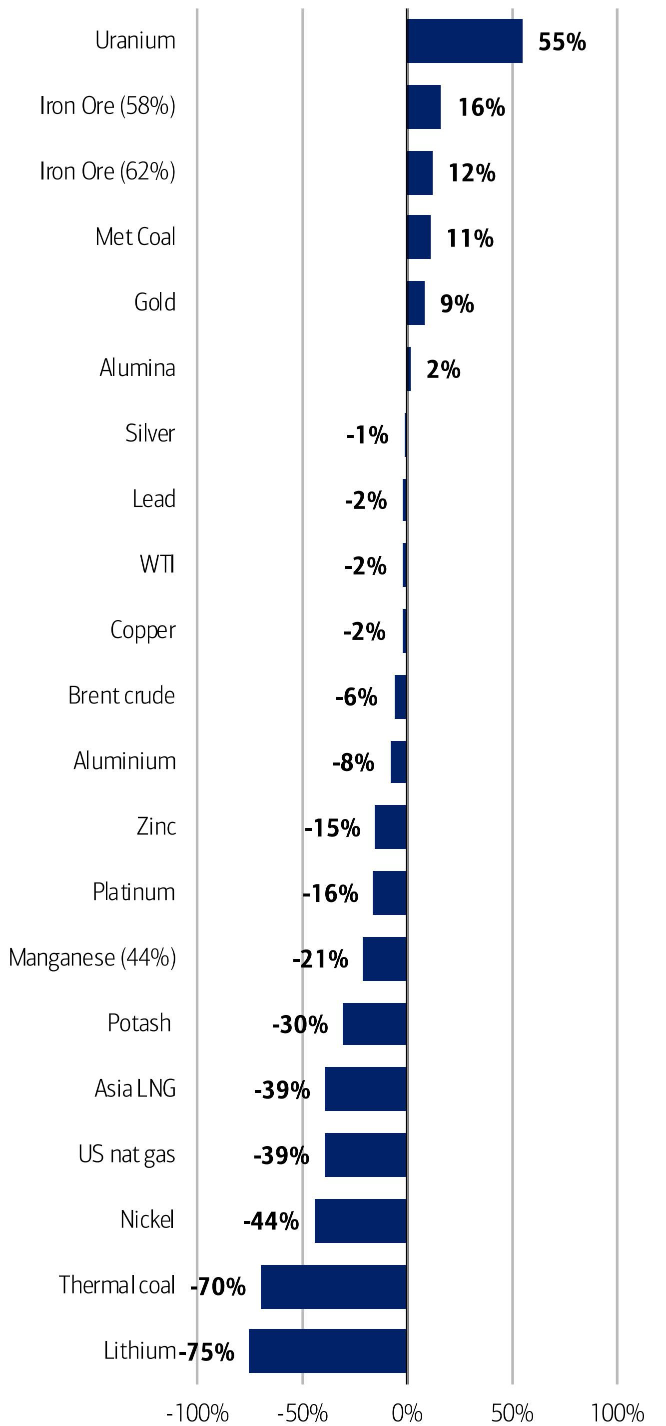
A glance at returns in 2023

Exhibit 4: Commodity returns in 2023
The best performers in 2022 were the worst performers in 2023...



Source: BofA Global Research, Bloomberg

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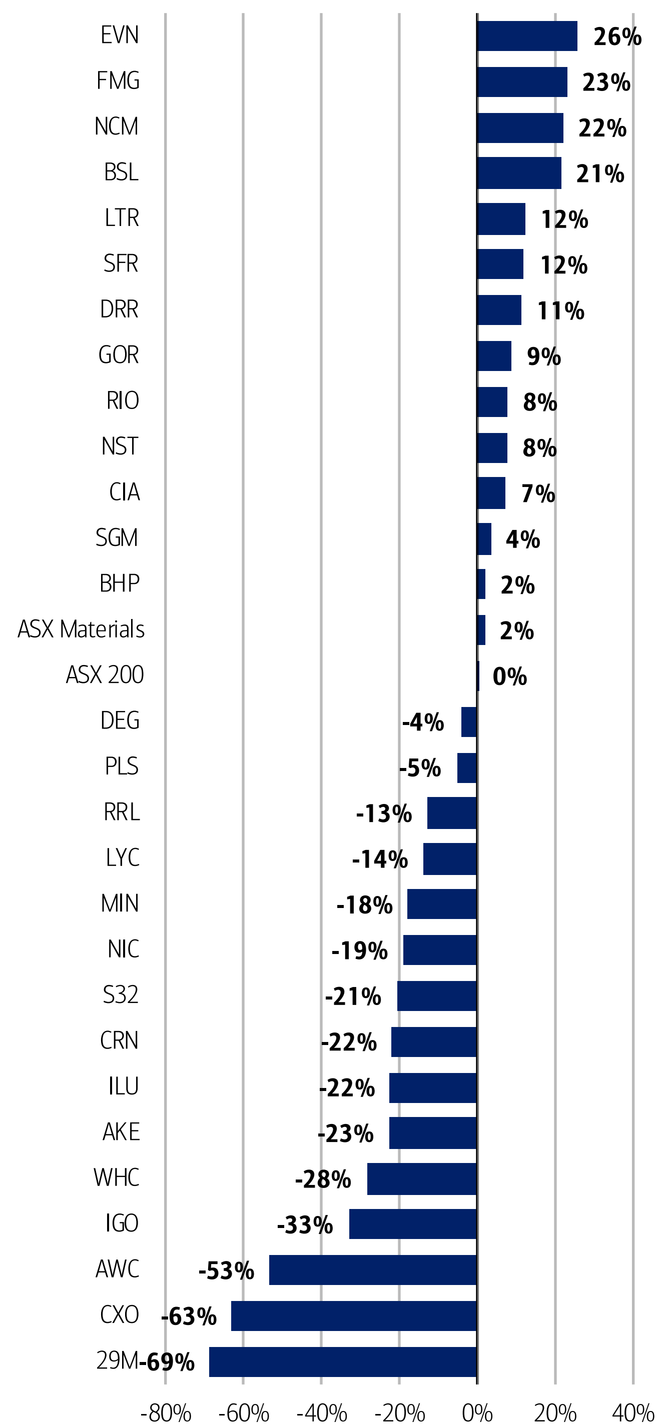
Exhibit 5: Australian Resources Equity returns in 2023
Evolution, Fortescue, Newcrest and BlueScope the best performers



Source: BofA Global Research, Bloomberg

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BHP Group (Buy, $57.00/share PO)

Investment thesis

We recently raised our price objective to a Street high of A$57/share (2,850 GBp/sh, US$70/sh US ADR) implying 23% potential return owing to our higher long term iron ore, copper and coal price forecasts. Near term, we expect iron ore prices to rise to $150/t in 1Q CY24 driven by restocking by Chinese steel mills and seasonal supply disruptions in Australia and Brazil. We now assume a long term (2024 real) price of $90/t for iron ore (vs $79/t prior), $200/t for coking coal (vs $140/t prior) and $8,500/t for copper (vs $7,168/t prior).

BHP trades on 0.85x Price/NPV and offers an attractive 5% DY in FY24e. In our view, BHP provides high quality exposure to an expected recovery in China and global economic activity, has a solid balance sheet and is led by a strong management team.

BHP has continued to execute on its strategy of optimising its portfolio by divesting its lower quality met coal assets with Blackwater and Daunia sold to Whitehaven for up to $2.05bn (see report dated 18 Oct).

BHP also recently approved a $4.9bn spend for Jansen Stage 2 as its push towards FFCs continues. We are attracted to BHP's solid base business comprising iron ore, copper and coking coal which is expected to generate EBITDA of $33bn in FY24 (55% margin) to sustain attractive shareholder returns and fund further growth focused on Future Facing Commodities (copper, nickel and potash).

Key issues

- Capex spend is forecast to increase from $7.1bn in FY23 to ~$10bn per year in FY24 and FY25 with 70% focused on BHP's Future Facing Commodities.
- Capex guidance of $1.1bn for the West Musgrave nickel project (acquired from OZ Minerals) is expected to be revised upwards with the 1H FY24 results in February.
- In FY25, BHP is expected to complete studies for a potential expansion of West Australian Iron Ore (WAIO) capacity from >305 Mtpa to 330 Mtpa.
- Other growth options include Chilean copper brownfield options while continuing to develop South Australia Copper to a potential 500 kpta copper production hub longer term.

Key catalysts

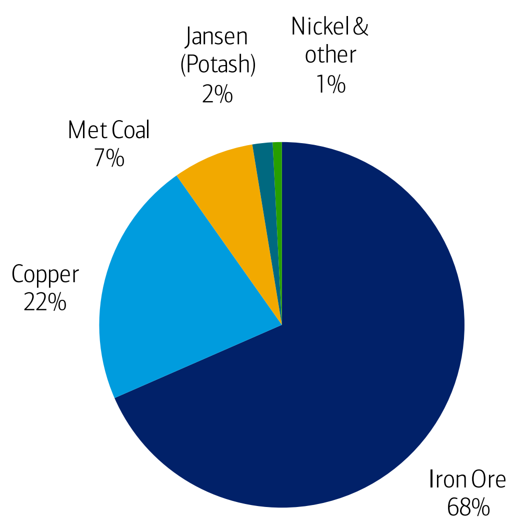
- Iron ore trading upwards in 1Q'CY24 driven by seasonal supply disruptions, low port and steel mill inventories and potential Chinese stimulus targeted.
- Updates on the potential synergies / opportunities at Copper South Australia and through the integration of the OZL assets into the BHP portfolio. As at the FY23 result, US$20m per annum of cost savings have already been delivered with the potential to increase this to over US$50m per annum.
- Updates on WAIO growth beyond 305Mtpa.
- Potential bolt on acquisitions or divestments.

Recent research

BofA Global Research Reports

Title: Subtitle	Primary Author	Date Published
BHP Group Limited: PO raised to Street high of $57/sh on higher long term commodity prices	James Redfern	21 November 2023
BHP Group Limited: Jansen Stage 2 approved as push towards FFCs continues, PO raised to $51.50/sh	James Redfern	01 November 2023
BHP Group Limited: Blackwater and Daunia sold to Whitehaven for up to $2.05bn, in line with BofAe	James Redfern	18 October 2023
BHP Group Limited: Sept-23 Q impacted by planned maintenance, FY24 guidance unchanged	James Redfern	18 October 2023
BHP Group Limited: Higher capex guidance the focus as FFC growth options become clearer	James Redfern	22 August 2023

Exhibit 6: NPV by segment (FY24E)
Iron Ore comprises 68% of our BHP Group NPV



Source: BofA Global Research estimates

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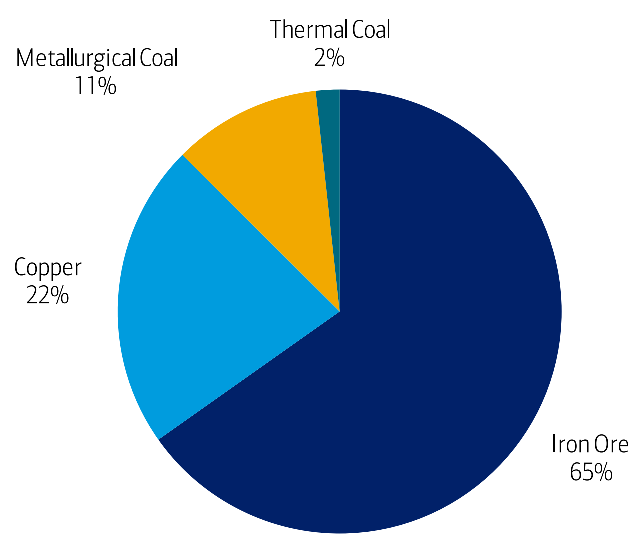
Exhibit 7: Underlying EBITDA by segment (FY24E)
Iron Ore EBITDA is increased by 22% in FY24E reflecting higher prices



Source: BofA Global Research estimates

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Rio Tinto (Buy, $160.00/share PO)

Investment thesis

We reiterate our Buy and $160/share PO with the shares trading on 0.9x P/NPV. RIO's Pilbara iron ore operations (75% of EBITDA) are improving while the company also provides exposure to an expected increase in aluminium and copper prices. On a 12-month view, BofA forecasts a 23% increase in aluminium prices to $2,750/t, a 10% rise in copper prices to $9,250/t which also underpins our Buy rating on RIO. RIO's balance sheet remains strong with 1% net gearing facilitating a 60% dividend payout for FY23e.

Moving into 2024, the age-old comparison between BHP and RIO remains. Although we have Buy ratings on both stocks, RIO retains higher leverage to iron ore while our upside case is also predicated on an expected aluminium price rally. We expect iron ore to rally through 1Q'24 and aluminium markets to tighten in 2H'24 driven by a reacceleration of global growth. However, iron ore remains the key driver of earnings and yield. We expect outperformance by RIO could come from its ~70% of EBITDA derived from the ferrous metal in 2024.

Key issues

- We forecast declining iron ore prices post 1Q'24 which may place downward pressure on earnings. However, RIO is a low cost producer while an expected increase in aluminium and copper prices should partially offset declines in iron ore.
- RIO remains attracted to lithium prices and is progressing with early-stage exploration and the small Rincon pilot project in Argentina. However, in our view a large-scale acquisition is required in order for lithium to be a business of scale.
- With a number of capital initiatives in copper (Oyu Tolgoi) and iron ore (Simandou, replacement mines), development risks, including delays and cost overruns are present.

Key catalysts

- Formal Final Investment Decision for the Simandou iron ore project
- Potential M&A focused on lithium
- Continued ramp of production at the Oyu Tolgoi copper project in Mongolia

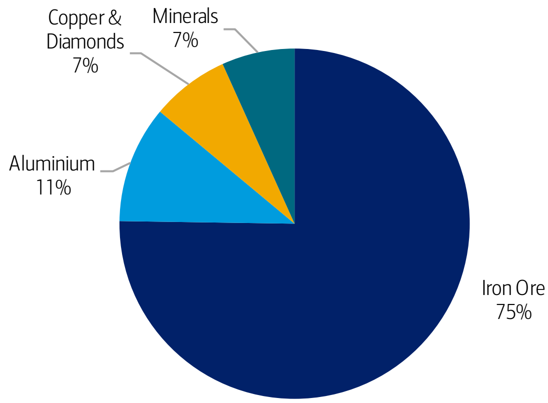
Recent research

BofA Global Research Reports

Title: Subtitle	Primary Author	Date Published
Rio Tinto Ltd: 2023 Investor Day: Simandou now "in" our model. Copper OT ramp-up. Decarb capex.	James Redfern	07 December 2023
Rio Tinto Ltd: 3Q23 in-line, 2023 guidance largely unchanged	James Redfern	17 October 2023
Rio Tinto Ltd: Iron ore: Fixed. Focus now on value & growth. Decarbonization = opportunity	James Redfern	10 October 2023
Rio Tinto Ltd: Pilbara Iron Ore site visit preview = 75% of group EBITDA, 67% of group NPV	James Redfern	04 October 2023

Exhibit 8: FY23E EBITDA by segment

Iron ore presents 75% of FY23E EBITDA



Source: BofA Global Research estimates

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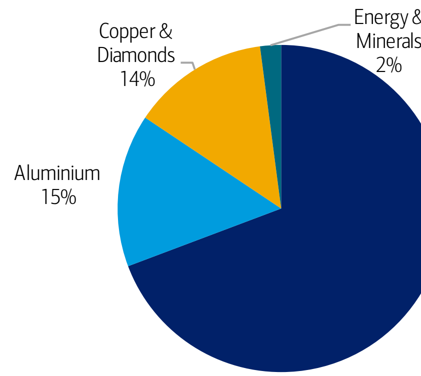
Exhibit 9: NPV by segment (2023)

Iron ore represents the largest share of our estimated group NPV



Source: BofA Global Research estimates

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Positioning: Materials net "Underweight"

According to our latest BofA Global Fund Manager Survey (see Global Fund Manager Survey: Contrarian Cs: Commodities, China & Cash 19 December 2023) allocation to materials increased 8ppt MoM to net 9% underweight. Current reading is 0.5 stdev below its long-term average.

In practice, we usually need to see two to three months of "flow" (maybe more?) before claimed positioning is where people actually are (a former strategist once said, this is how people "wish" their portfolio was positioned).

Exhibit 55: Global Basic Materials claimed positioning

Allocation to materials increased 8ppt MoM to net 9% underweight. Current reading is 0.5 stdev below its long-term average.

Source: BofA Global Fund Managers Survey

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Metal Strategist macro view

Link to original note, [Metal Strategist Year Ahead 2024](), originally published 19 November 2023, lead author M. Widmer

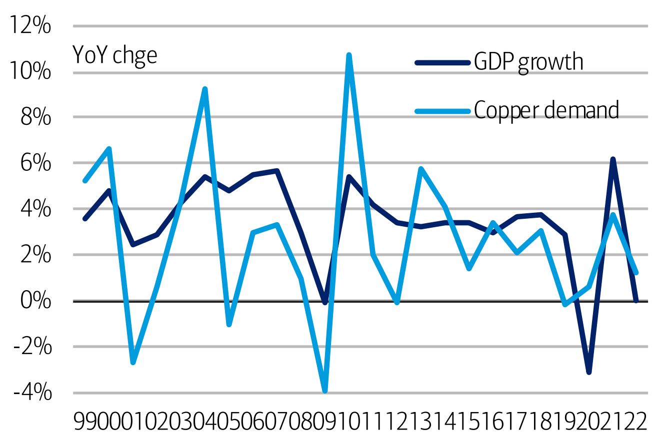
Green spending saves the day

While the energy transition has not pushed the mined commodities significantly higher in 2023 given the weak global macro backdrop, spending on green technologies has offset some of the cyclical headwinds. This should remain the case in 2024.

Base metals' beta to GDP growth has declined

Base metal prices have been remarkably resilient in recent months, notwithstanding the global economic headwinds. Granted, a lack of supply growth, for instance in copper, exacerbated by a series of disruptions earlier this year, meant subdued surpluses. Beyond that, as a cyclical asset, metal demand tends to be closely correlated with global GDP growth (Exhibit 56), but that sensitivity has been declining. This is reflected in Exhibit 57, which highlights that the beta of demand over GDP growth has fallen for all base metals in the past decade.

Exhibit 56: GDP growth and copper demand
Copper demand has become less volatile since the Global Financial Crisis (GFC)



Source: Woodmac, CRU, ICSG, Bloomberg, BofA Global Research

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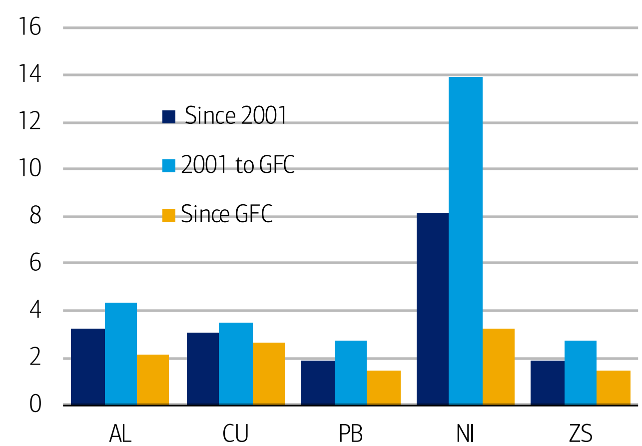
Exhibit 57: Beta of copper demand over GDP growth
Copper's beta has been declining since the GFC



Source: Woodmac, CRU, ICSG, Bloomberg, BofA Global Research

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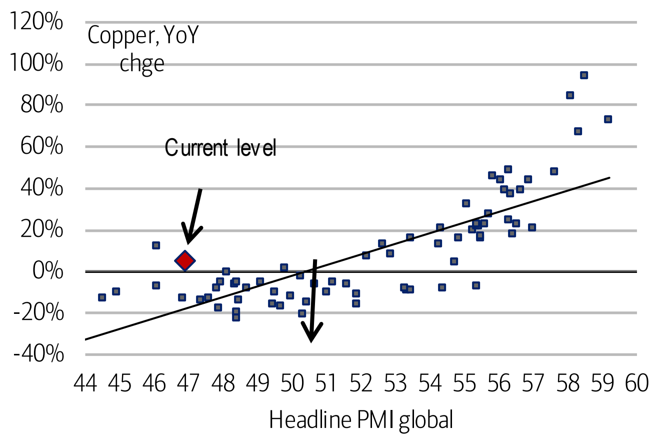
The decline in beta is multi-faceted. To start with, global economic growth has been weaker in the past decade compared to the run-up to the Great Financial Crisis, which also had an impact on stocking cycles, usually an amplifier of underlying demand. This has perhaps been most visible in China, where the government has refocused from purely quantitative growth targets, which were often accompanied by a misallocation of capital and overcapacities, towards higher-quality, healthier expansion.

Exhibit 58: Global average (US, Europe, China) PMIs and copper prices
PMIs would justify copper prices trading 20% lower



Source: Bloomberg, BofA Global Research

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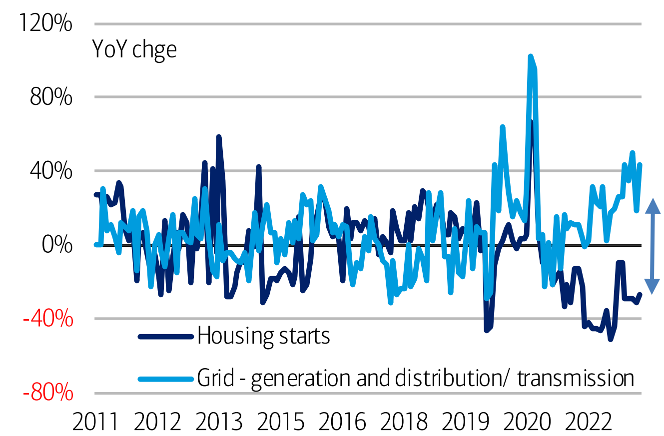
Exhibit 59: China, housing starts and grid investment
A gap has opened up between housing starts and grid investment



Source: Bloomberg, BofA Global Research

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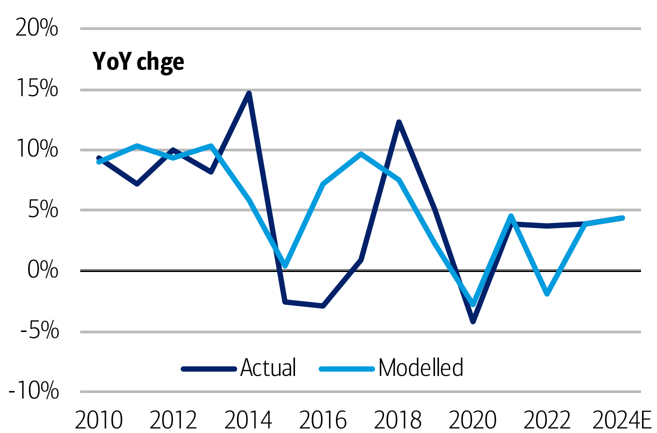
Green spending to support metals demand in 2024

Exhibit 58 also confirms that traditional relationships have weakened, showing that global average (China, US, Europe) Purchasing Manager Indices are very subdued and would justify copper prices trading around 20% below current levels. Taking China specifically, Exhibit 59 highlights that a gap has opened up between housing, a traditional growth driver, and spending by the grid, especially on renewables. In essence, while the energy transition has not pushed the mined commodities significantly higher given the weak global macro backdrop, spending on green technologies has still offset some of the cyclical headwinds.

Factoring this in, we have adjusted our demand growth models, breaking them down into green and traditional sectors; in China, we also split out housing. The results are mirrored by Exhibit 60 and Exhibit 61, which show that one of our analyses forecasts a slight expansion of demand next year, even though copper usage from housing is set to decline further (**this estimates may deviate from some of our other models, but they illustrate underlying dynamic well**).

Exhibit 60: China, copper demand ex-housing, renewables and autos
Copper demand growth has been slowing



Source: Bloomberg, BofA Global Research

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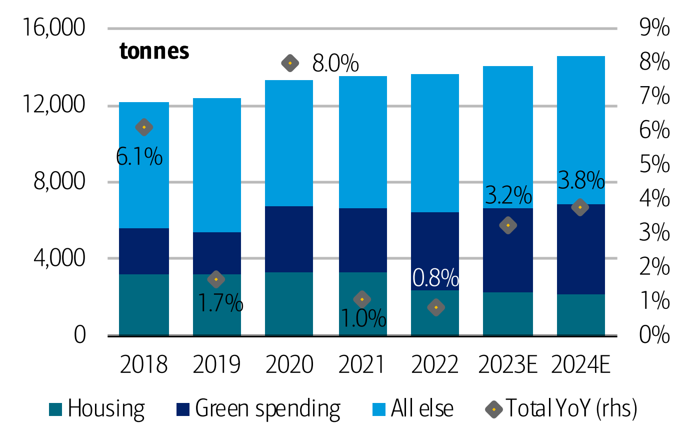
Exhibit 61: China, copper demand
One of our demand models projects an acceleration of demand growth



Source: Bloomberg, IEA, BofA Global Research

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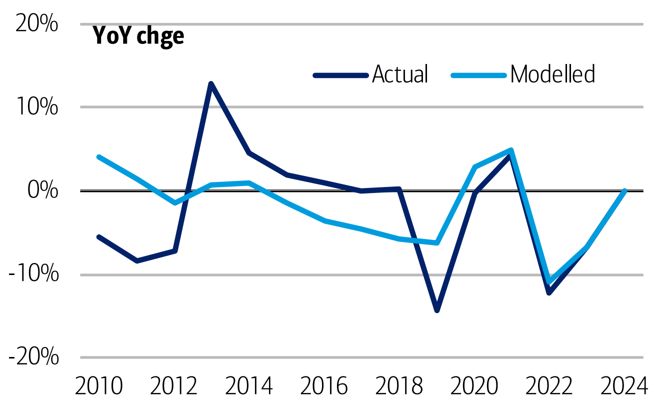
Using the IEA's renewable installation and BofA's electric vehicle production forecasts, the picture is similar in Europe. Indeed, with the EU looking to accelerate the roll-out of green energies, demand growth for many metals should accelerate next year.

Exhibit 62: Europe, non-green copper demand
Traditional sectors have been a drag on copper demand



Source: Bloomberg, BofA Global Research

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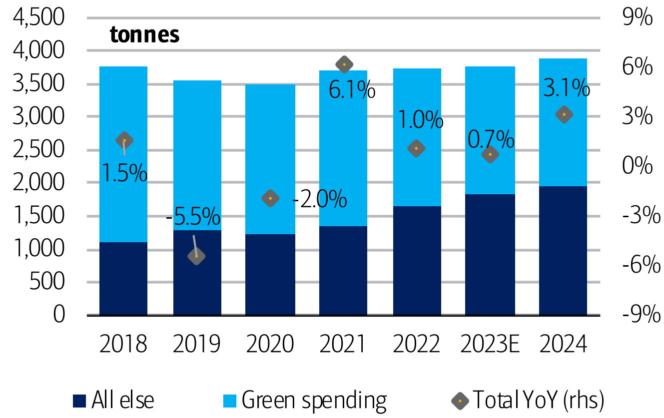
Exhibit 63: Europe, copper demand
Copper demand is set to expand on the rising popularity of EVs and the grid



Source: Bloomberg, IEA, BofA Global Research

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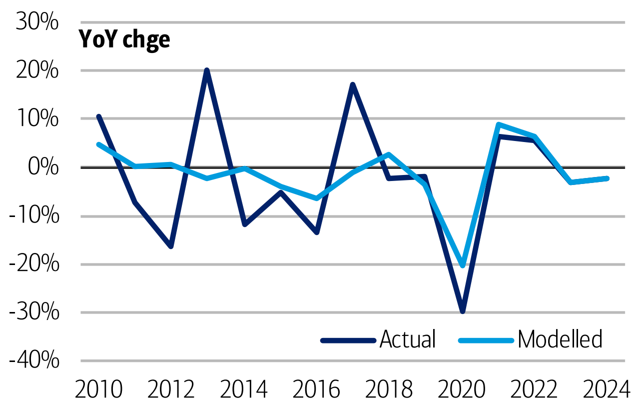
This dynamic is also visible in the US, where increased spending to greenify the economy should completely offset the drag on demand from the "traditional" sectors.

Exhibit 64: US, non-green copper demand
Outsourcing and offshoring have long been a drag on copper demand



Source: Bloomberg, BofA Global Research

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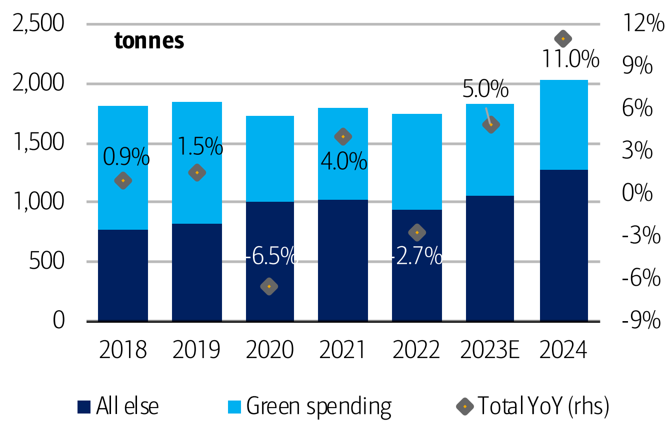
Exhibit 65: US, copper demand
Investment in the grid and rising EV production to support copper demand in 2024



Source: Bloomberg, IEA, BofA Global Research

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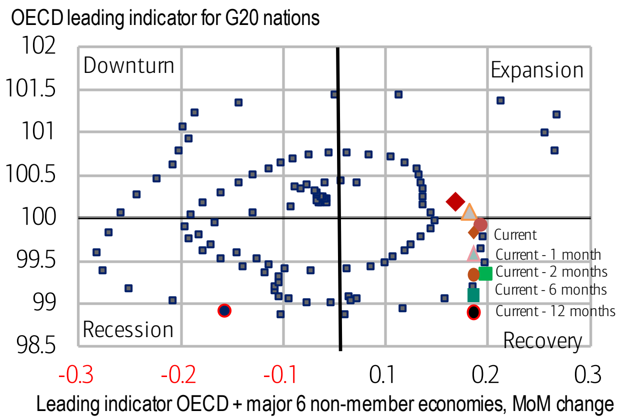
Traditional economy should also become more supportive

As green spending becomes more of a growth driver, we are also cautiously optimistic that the global economy, and hence traditional demand, will become less of a drag. This is picked up by Exhibit 66, which shows one of our business cycle analyses. This tool is 8 months forward-looking and has flipped into the "Expansion" stage, usually the most bullish period for the cyclical commodities.

Exhibit 66: Metals business cycle
The 8-month forward-looking business cycle has flipped into "Expansion"



Source: Bloomberg, BofA Global Research

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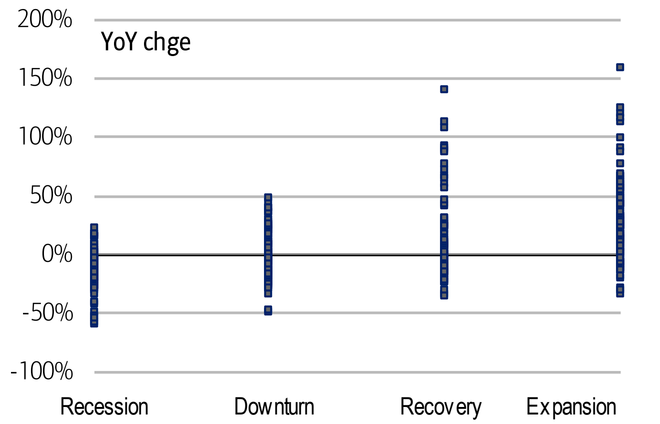
Exhibit 67: Copper prices and business cycle stages
Copper tends to perform best during the "Recovery" and "Expansion" phases



Source: Bloomberg, BofA Global Research

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Exhibit 68 shows that the improvement in our business cycle model has been driven by China, although the US backdrop has also become less bearish.

Exhibit 68: OECD leading indicators by country and region
China has led the improvement in leading indicators. The US is getting better too, while Europe is flat

Region/ country	Sep-23	Aug-23	Jul-23	Jun-23	May-23	Apr-23	Mar-23	Feb-23	Jan-23	Dec-22	Nov-22	Oct-22	Sep-22
G20	100.17	100.05	99.92	99.78	99.63	99.49	99.34	99.19	99.05	98.95	98.88	98.87	98.92
US	99.43	99.33	99.22	99.10	98.99	98.90	98.85	98.84	98.85	98.87	98.93	99.03	99.16
Europe	99.22	99.20	99.20	99.20	99.19	99.15	99.04	98.87	98.66	98.45	98.26	98.16	98.19
China	101.96	101.62	101.26	100.88	100.50	100.11	99.72	99.30	98.88	98.52	98.22	98.00	97.88

Source: Bloomberg, BofA Global Research

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China's government is stimulating traditional sectors

Where could support from the wider economy come from? Taking a closer look at China, the government has increasingly focused on the "traditional" sectors. Property, part of construction, has become a particular focal point, as our China economists outline, with the government announcing a flurry of policies in recent weeks, including:

- Tier-1 cities could **relax their home purchasing restrictions** (HPR) in non-core areas while more Tier-2-and-lower cities may ease their HPR in all areas.

- Meanwhile, the cities subject to HPR could **reduce downpayment ratios** to, or near, the PBoC floor, further unleashing housing demand. Some cities could go further, offering subsidies to cover part of deed taxes or parking spaces, as cities such as Nanjing recently announced. More cities could relax controls on home pricing to boost transactions.

- **Urban village refurbishment** in big cities could also help boost housing demand and property investment, if the project is large, well-funded and combined with monetary compensation. Policy makers have reportedly decided to issue special-purpose bonds to finance such programs next year, potentially creating new home demand equalling 4% of national home sales volume or 18% of the home sales volume in the 21 largest cities involved, according to our property analysts. Guangzhou city plans to roll out a guideline for refurbishment by end-2023, indicating a similar timeline to other cities.

Exhibit 69 summarises the timeline of some policy announcements.

Exhibit 69: Policy-easing measures since mid-August
The government has started to deliver policy easing from property, monetary and capital market perspectives

Type	Date	Detail
Property	25-Aug	MOHURD, PBoC and NFRA issued new mortgage guidance - borrowers with no local housing are considered as first-time homebuyers v This guidance has been confirmed by all Tier 1 cities: Shenzhen and Guangzhou on Aug 30; Shanghai and Beijing on Sep 1. More than 70 Tier-2 and Tier-3 cities include Xiamen, Wuhan, Zhongshan, Xi'an, etc. followed the guidance.
	31-Aug	(1) The PBoC cut the nationwide minimum down payment requirement to 20% (from 30%) for first-time home buyers and 30% (from 40%) for second-time buyers; (2) The mortgage interest floor for second-time homebuyer was cut to LPR plus 20bp (from LPR plus 60bp previously); (3) Homeowners with outstanding mortgage loans can apply for refinancing, negotiating with the bank to determine the new loan's interest rate. (effective from Sep 25)
	7-Sep	Following PBoC guidance, six big state banks announced details of mortgage back-booking repricing, which apply to first home residential mortgages issued before Aug 31, 2023. The definition of first home will use the newly loosened standard. Rate of LPR-based mortgage loans will be the higher of a) the national floor and b) the local floors announced by PBoC local branches for first-home mortgages during the respective period.
	11-Sep	Tier-1 city Guangzhou reduced first/second-home mortgage rate and second home down-payment ratio. Guangzhou also reportedly abandoned its strict developer pricing control.
	Early Sep	Tier 2 cities such as Qingdao, Nanjing, Dalian and Shenyang removed their HPRs.
Monetary	15-Aug	The PBoC cut the 1-year MLF rate by **15bp** to 2.50% and the 7-day reverse repo rate by **10bp** to 1.80%.
	21-Aug	The benchmark 1-year LPR declined by **10bp** to 3.45%.
	1-Sep	Major banks started another round of deposit pricing cuts with 1-5 year time deposit pricing lowered by 10-25bp.

Source: BofA Global Research, government statements

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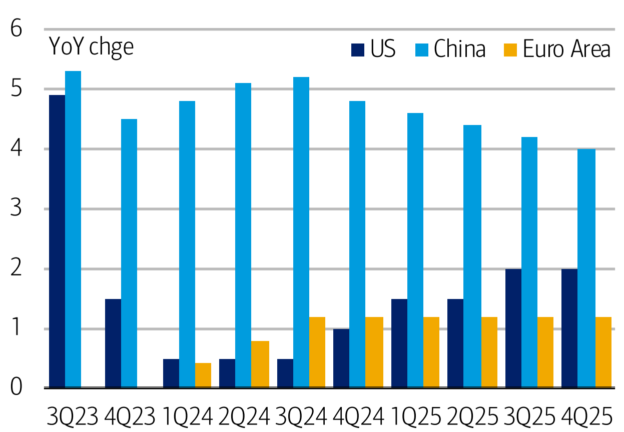
3Q24 may be the sweet spot from a growth perspective

Incidentally, Exhibit 70 shows the GDP growth estimates from our colleagues in the economics team, outlining that 3Q24 could be a sweet spot: Europe and the US are then accelerating, while China's growth rate has not yet peaked.

Exhibit 70: Global GDP growth estimates
3Q24 looks to be the sweet spot next year



Source: BofA Global Research

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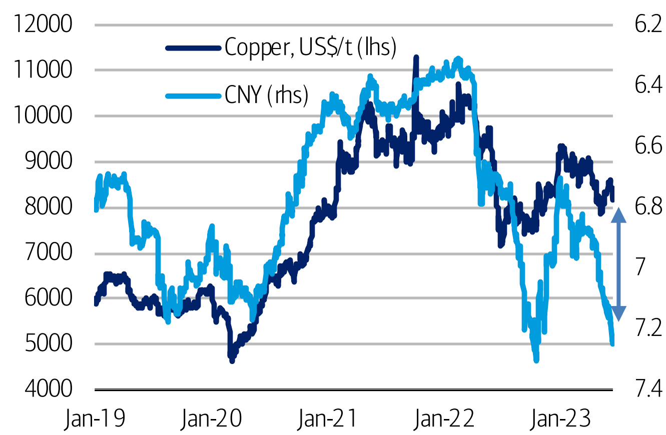
Exhibit 71: Copper and CNY
A weaker CNY has been a headwind for copper



Source: Bloomberg, BofA Global Research

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Rates and USD also becoming less of a headwind

USD and rates have also been headwinds to the mined commodities this year. Exhibit 71 shows how pronounced the CNY weakness has been. At the same time though, and mirroring correlations with other macro data, copper has been remarkably resilient. With the rates cycle turning (Exhibit 72), sustained USD strength would be unusual next year.

Exhibit 72: Policy rates
The rates cycle is set to turn in 2024

	2023	2024	2025
US	5.5-5.75	4.75-5	3.75-4
China	3.5	3.5	3.4
EA	4.0	3.3	2.0

Source: BofA Global Research

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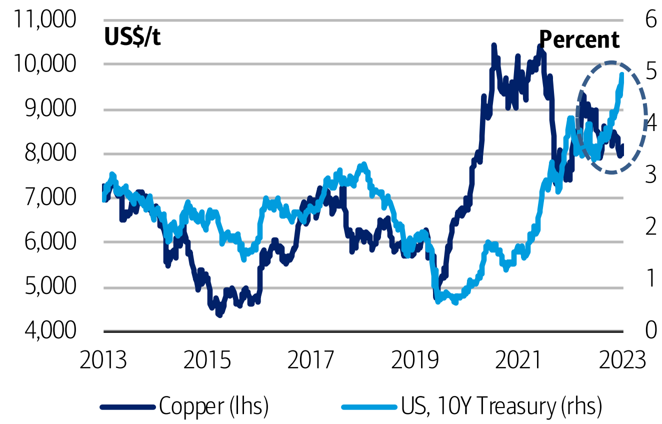
Exhibit 73: Copper and US 10Y Treasuries
Recent rate increases have pushed copper prices lower



Source: Bloomberg, BofA Global Research

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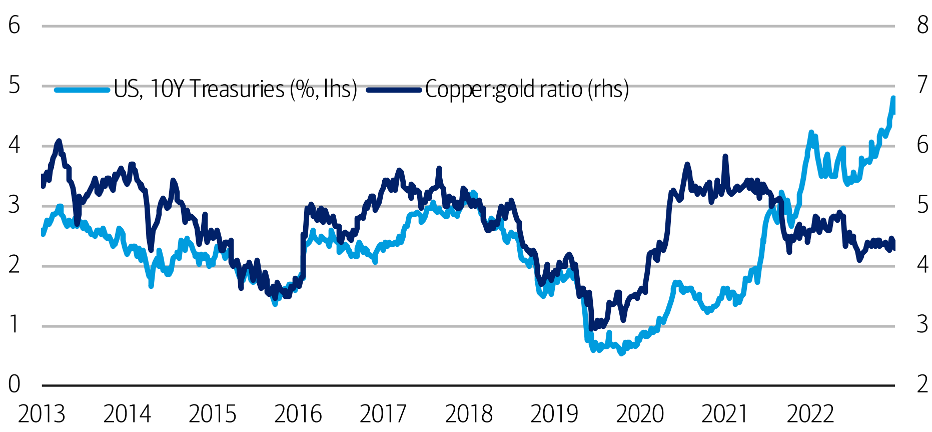
Sticking with rates, the recent sharp drop in US Treasuries has compounded headwinds to the metals (Exhibit 73). Linked to that, possible causes of rising US rates have been much discussed. High/rising US fiscal deficits, apprehension that inflation may remain elevated, along with the decoupling of bonds/equities have all been seen as potential candidates.

The following chart shows the correlation between Treasuries and the copper:gold ratio. Somewhat simplified, taking gold's current spot price of $1,950/oz as a starting point, the implication is that copper should be trading at $14,400/oz ($6.53/lb). Yet we would caution that much lower spot prices are an indicator that the bond vigilantes have come out in force. In fact, we believe both copper and gold are fairly priced at present, while rates had pushed higher after the market had been re-pricing the Fed rate paths. As such, we follow dynamics in the rates market closely and acknowledge the risk that any volatility may spill over into the mined commodities. Yet we don't think that US fiscal dynamics are an immediate risk (more on this in the gold section).

Exhibit 74: US Treasuries and copper:gold ratio
Treasures have risen faster than the copper:gold ratio



Source: Bloomberg, BofA Global Research

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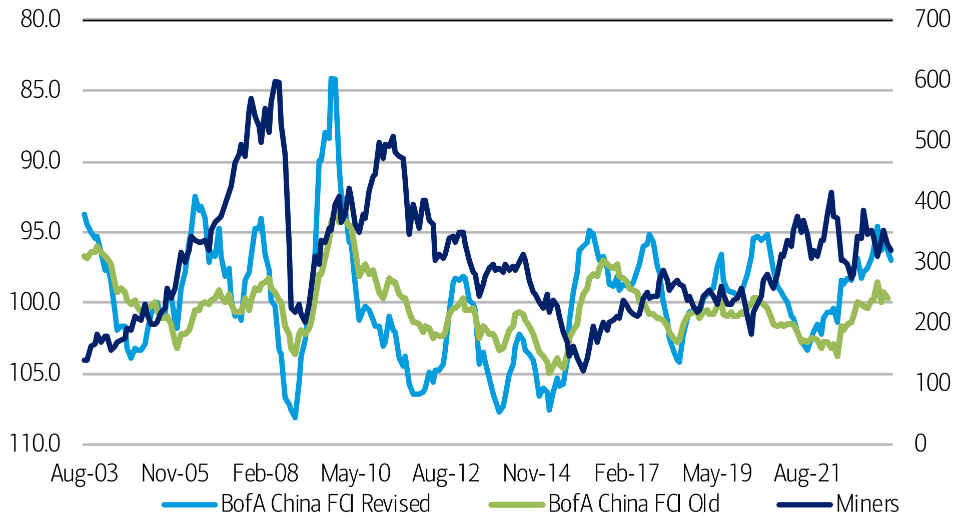
Macro: Eyes on China. COVID vs. stimulus.

We often wonder, "Is this the only chart that matters?" The China Financial Conditions Index (FCI) shows whether China is easing or tightening financial conditions. Historically, mining equity has tended to trade well when China financial conditions were loosening. After COVID, 2021 was a year of fairly loose monetary conditions. Our proprietary China Financial Conditions Index hit its point of maximum looseness in April 2020 and saw tightening through April 2022. With China reopening, we see FCI loosening. As concerns grow about the Chinese recovery, our economists think stimulus, further loosening is necessary. We note that the China economics team recently revised its calculation of the FCI adding an element of "credit impulse", which for choice, appears to make the metric more volatile.

Exhibit 30: BofA China Financial Conditions index vs. Miners (MSCI Global Mining Index)
Some signs of loosening. Is it enough?



Source: Bloomberg, BofA Global Research estimates. Disclaimer: The indicator identified as the BofA China FCI above are intended to be indicative metrics only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. These indicators were not created to act as benchmarks

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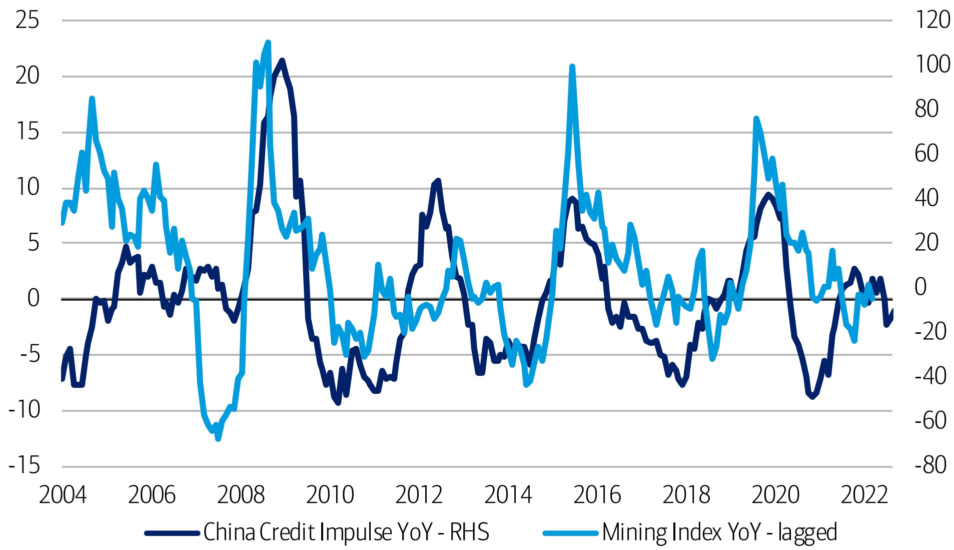
We also think Exhibit 76 is intriguing. 12M % change in China Credit impulse vs. 12M % change in Miners (lagged by eight months). So, based on this chart, turning point? But the market has real doubts on Chinese policy, particularly for property.

Exhibit 31: China credit impulse 12-month change vs. Mining index 12-month change, lagged

Miners track the 12-month change in China credit impulse. But with a lag.



Source: Bloomberg, BofA Global Research estimates.

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After last year's (surprise) lifting of zero-COVID restrictions, China-related assets performed strongly. More recently, however, key manufacturing and demand metrics have disappointed down. Our China economist, Helen Qiao, thinks more stimulus is required and coming. Link: China Watch,13 October 2023.

According to Karl Choi, our China Property analyst, Link: More policies needed to restore confidence, soft home price expectations s (esp. in Tier 2 cities) in the Oct survey despite policy easing seem consistent with the lacklustre recovery in property sales in Sept.

Summary Metal Views

Table 4: 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 (Bullish)	$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 (Bullish)	$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 (neutral)	$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 (neutral)	$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 (neutral)	$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 (Bullish)	$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 • Central bank buying has been strong, but not sufficient; a Fed pivot may bring more investors into the market • Gold to rally into 2024	• D: Deterioration of investor sentiment • D: Real rates become more positive; sustained USD rally • D: High gold prices deter buyers of physical gold; increased scrap supply
Silver (Bullish)	$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 (Cautious)	$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 (neutral)	$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 (neutral)	$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
Brent and WTI crude oil (neutral)	$90/bbl $86/bbl	$60/bbl $57/bbl	• We project Brent and WTI to average $90/bbl and $86/bbl, respectively, in 2024 • The global oil balance should stay tight in 2024, as OPEC+ withholds supply from the market as demand growth slows • We forecast global demand growth to slow to 2mn b/d YoY in 2023 and 1.1mn b/d in 2024 • Non-OPEC supply should grow roughly 2mn b/d YoY in 2023 and 1.2mn b/d in 2024 • We project total US crude and NGL supply to rise 1.27mn b/d in 2023 and 540k b/d in 2024 • OPEC crude oil supplies are set to fall 490k b/d in 2023 and 80k b/d in 2024 as OPEC+ actively manages balances	

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

BofA GLOBAL RESEARCH

Commodity Supply-demand balances

Table 1: Aluminium supply and demand balance

Deficits set to increase

'000 tonnes	2022	2023	2024	2025
Global production	68,412	70,338	73,363	73,793
YoY change	1.3%	2.8%	4.3%	0.6%
Global consumption	69,106	71,074	74,842	77,836
YoY change	0.7%	2.8%	5.3%	4.0%
Balance	**-694**	**-736**	**-1,479**	**-4,043**
Market inventories	8,448	7,711	6,232	2,189
Weeks of world demand	6.4	5.6	4.3	1.5
LME Cash ($/t)	**2,706**	**2,268**	**2,563**	**3,000**
LME Cash (c/lb)	**123**	**103**	**116**	**136**

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

BofA GLOBAL RESEARCH

Table 2: Copper supply and demand balance

Balanced market in 2022E

'000 tonnes	2022	2023	2024	2025
Global production	24,646	25,983	27,195	27,659
YoY change	2.2%	5.4%	4.7%	1.7%
Global consumption	25,152	25,694	27,052	28,134
YoY change	0.9%	2.2%	5.3%	4.0%
Balance	**-506**	**289**	**143**	**-476**
Market inventories	658	947	1,090	614
Weeks of world demand	1.4	1.9	2.1	1.1
LME Cash ($/t)	**8,822**	**8,442**	**8,625**	**10,500**
LME Cash (c/lb)	**400**	**383**	**391**	**476**

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

BofA GLOBAL RESEARCH

Table 3: Lead supply and demand balance

Lead should not be in short supply

'000 tonnes	2022	2023	2024	2025
Global production	13,952	13,712	13,837	13,908
YoY change	5.8%	-1.7%	0.9%	0.5%
Global consumption	13,501	13,729	14,033	14,343
YoY change	1.8%	1.7%	2.2%	2.2%
Balance	**451**	**-17**	**-196**	**-435**
Market inventories	316	299	104	
Weeks of world demand	1.2	1.1	0.4	
LME Cash ($/t)	**2,149**	**2,156**	**2,000**	**1,750**
LME Cash (c/lb)	**97**	**98**	**91**	**79**

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

BofA GLOBAL RESEARCH

Table 4: Nickel supply and demand balance

Class 1 nickel may remain tight

'000 tonnes	2022	2023	2024	2025
Global production	3,220	3,617	3,980	4,230
YoY change	16.2%	12.3%	10.0%	10.5%
Global consumption	3,105	3,334	3,549	3,943
YoY change	0.4%	7.4%	6.4%	9.4%
Balance, incl. NPI oversupply	**114**	**283**	**431**	**288**
Market inventories	506	789	1,220	1,508
Weeks of world demand	8.5	12.3	17.9	19.9
LME price ($/t)	**25,707**	**21,786**	**18,750**	**20,000**
LME price (c/lb)	**1,166**	**988**	**851**	**907**

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

BofA GLOBAL RESEARCH

Table 5: Zinc supply and demand balance

Project pipeline not a significant risk

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

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

BofA GLOBAL RESEARCH

Table 6: Iron ore supply and demand balance

Flipping back into surplus

Wet Mt	2021	2022	2023E	2024E
Global production	2,311	2,363	2,361	2,443
YoY change	1.0%	2.2%	-0.1%	3.5%
Global consumption	2,421	2,301	2,346	2,372
YoY change	0.6%	-5.0%	2.0%	1.1%
Balance	**-109**	**63**	**15**	**72**
Iron ore price (US$/t)	160	120	115	125

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

BofA GLOBAL RESEARCH

Table 7: Platinum supply and demand balance

Substitution, a rebound of auto and hydrogen are all bullish

'000 ounces	2022	2023	2024	2025
Global production	6,721	6,663	7,716	8,034
YoY change	-13.3%	-0.9%	15.8%	4.1%
Global consumption	6,057	7,231	7,538	7,649
YoY change	-22.8%	19.4%	4.2%	1.5%
Balance	**664**	**-568**	**178**	**385**
Spot ($/oz)	964	976	1,050	1,250

Source: Matthey, company reports, BofA Global Research estimates

BofA GLOBAL RESEARCH

Table 8: Palladium supply and demand balance

Palladium will likely be oversupplied in the medium term

'000 ounces	2022	2023	2024	2025
Global production	9,513	9,252	10,384	10,826
YoY change	-4.8%	-2.8%	12.2%	4.3%
Global consumption	9,829	9,710	8,944	8,583
YoY change	-3.2%	-1.2%	-7.9%	-4.0%
Balance	**-316**	**-458**	**1,440**	**2,243**
Spot ($/oz)	2,110	1,379	750	500

Source: Matthey, company reports, BofA Global Research estimates

BofA GLOBAL RESEARCH

Table 9: Cobalt supply and demand balance

Better supplied in 2022/23E

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

Source: company reports, CRU, BofA Global Research

BofA GLOBAL RESEARCH

Table 10: Lithium supply and demand balance

Supply discipline needed in 2022/23E

tonnes	2022	2023	2024	2025
Global production	637,116	862,360	1,192,640	1,602,992
YoY change	24.5%	35.4%	38.3%	34.4%
Global consumption	754,288	840,430	1,171,963	1,605,634
YoY change	45.1%	11.4%	39.4%	37.0%
Balance	**-117,172**	**21,930**	**20,677**	**-2,642**
Spot ($/lb)	71,531	45,980	16,500	21,875

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

BofA GLOBAL RESEARCH

Price objective basis & risk

BHP Group Limited (BHPLF / BHP)

Our price objective of A$57.0/share (US$70.0/share) represents approximately 1.0x our DCF-derived NPV. Our DCF is based on BofA commodity price forecasts and assumes a 9% discount rate. Diversified miners have historically traded in a range of 0.7-1.4x NPV with lower multiples paid during periods of economic slowdown and higher multiples paid during periods of rising commodity prices and earnings.

Downside (upside) risks to our price objective are: Global economic slowdown (growth), volatility in commodity prices, operational risks associated with mining, project execution risk, currency pressures and mining cost inflation (deflation).

BHP Group Limited (ZBHPF)

Our price objective of 2,850 GBp represents approximately 1.0x our DCF-derived NPV. Our DCF is based on BofA commodity price forecasts and assumes a 9% discount rate. Diversified miners have historically traded in a range of 0.7-1.4x NPV with lower multiples paid during periods of economic slowdown and higher multiples paid during periods of rising commodity prices and earnings.

Downside (upside) risks to our price objective are: Global economic slowdown (growth), volatility in commodity prices, operational risks associated with mining, project execution risk, currency pressures and mining cost inflation (deflation).

Rio Tinto Plc (RTPPF / RIO)

Our price objective of GBp 8000 (ADR: US$98) is based on c.1.0x our NPV estimate. Our NPV uses 9% WACC and 2% terminal growth rate. Diversified miners have historically traded in a range of 0.7-1.4x NPV.

Downside risks :1) commodity prices, which could be lower than our forecasts, resulting in lower-than-forecast earnings, 2) unsuccessful project execution, and 3) operational problems at mines and smelters.

Upside risks: 1) China growth is higher vs. our expectations, 2) Iron ore price surprises to the upside.

Analyst Certification

We, James Redfern and Jason Fairclough, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Special Disclosures

BofA Securities iscurrently acting as Financial Advisor and Financer to Whitehaven CoalLtd in connection with its proposed acquisition of Daunia and Blackwater coalmines from BHP Group and Mitsubishi Development Pty Ltd, which was announced on 18 Oct 2023.

BofA Securities is currently acting as Financial Advisor and Financer to Whitehaven Coal Ltd in connection with its proposed acquisition of Daunia and Blackwater coalmines from BHP Group and Mitsubishi Development Pty Ltd, which was announced on October 18, 2023.

EMEA - Metals & Mining, Steel, Paper Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Acerinox	ANIOF	ACX SQ	Patrick Mann, CFA
	Alleima AB	SAMHF	ALLEI SS	Patrick Mann, CFA
	Anglo American	AAUKF	AAL LN	Jason Fairclough
	Anglo American plc	NGLOY	NGLOY US	Jason Fairclough
	Antofagasta	ANFGF	ANTO LN	Jason Fairclough
	Atalaya Mining Plc	XPGBF	ATYM LN	Jason Fairclough
	Befesa	BFSAF	BFSA GY	Cameron Needham
	Centamin Plc	CELTF	CEY LN	Jason Fairclough
	Centamin Plc	YCEE	CEE CN	Jason Fairclough
	DS Smith plc	DITHF	SMDS LN	Patrick Mann, CFA
	Ecora Resources Plc	ECRAF	ECOR LN	Cameron Needham
	Eramet	ERMAF	ERA FP	Jason Fairclough
	Glencore	GLCNF	GLEN LN	Jason Fairclough
	Glencore Plc	GLNCY	GLNCY US	Jason Fairclough
	Hochschild Mining plc	HCHDF	HOC LN	Jason Fairclough
	Mondi plc	MONDY	MONDY US	Joffrey Bellicha Meller
	Mondi Plc	MONDF	MNDI LN	Joffrey Bellicha Meller
	Mondi Plc	XDPMF	MNP SJ	Joffrey Bellicha Meller
	Norsk Hydro	NHYDY	NHYDY US	Jason Fairclough
	Norsk Hydro	NHYKF	NHY NO	Jason Fairclough
	Rio Tinto Plc	RIO	RIO US	Jason Fairclough
	Rio Tinto Plc	RTPPF	RIO LN	Jason Fairclough
	SCA	SVCBF	SCAB SS	Joffrey Bellicha Meller
	SIG Group	SCBGF	SIGN SW	Patrick Mann, CFA
	Smurfit Kappa	SMFTF	SKG ID	Joffrey Bellicha Meller
	Smurfit Kappa	XNKFF	SKG LN	Joffrey Bellicha Meller
	Smurfit Kappa	SMFKY	SMFKY US	Joffrey Bellicha Meller
	Stora Enso	SEOJF	STERV FH	Joffrey Bellicha Meller
	Stora Enso	SEOAY	SEOAY US	Joffrey Bellicha Meller
	Thyssenkrupp	TYEKF	TKA GY	Jason Fairclough
	Verallia	VRLAF	VRLA FP	Patrick Mann, CFA
	Yellow Cake Plc	YLLXF	YCA LN	Jason Fairclough
NEUTRAL				
	ArcelorMittal	AMSYF	MT NA	Patrick Mann, CFA
	ArcelorMittal	MT	MT US	Patrick Mann, CFA
	Horizonte Minerals	HZMMF	HZM LN	Jason Fairclough
	Imerys	IMYSF	NK FP	Jason Fairclough
	Salzgitter	SZGPF	SZG GY	Patrick Mann, CFA
	Voestalpine	VLPNF	VOE AV	Patrick Mann, CFA
UNDERPERFORM				
	Aperam	XASPF	APAM NA	Patrick Mann, CFA
	Aurubis	AIAGF	NDA GY	Jason Fairclough
	Billerud AB	BLRDF	BILL SS	Joffrey Bellicha Meller
	Billerud AB	BLRDY	BLRDY US	Joffrey Bellicha Meller
	Boliden	BOLIF	BOL SS	Jason Fairclough
	Ferrexpo plc	FEEXF	FXPO LN	Jason Fairclough
	Fresnillo plc	FNLPF	FRES LN	Jason Fairclough
	Outokumpu	OUTFF	OUT1V FH	Patrick Mann, CFA
	Sappi Limited	SPPJF	SAP SJ	Joffrey Bellicha Meller
	Sappi Limited	SPPJY	SPPJY US	Joffrey Bellicha Meller
	SSAB	SSAAF	SSABA SS	Patrick Mann, CFA
	UPM-Kymmene	UPMKF	UPM FH	Joffrey Bellicha Meller

Australia - Materials & Industrials Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	29Metals Limited	XMLNF	29M AU	James Redfern
	AGL Energy	AGLNF	AGL AU	Reinhardt van der Walt
	APA Group	APAJF	APA AU	Reinhardt van der Walt

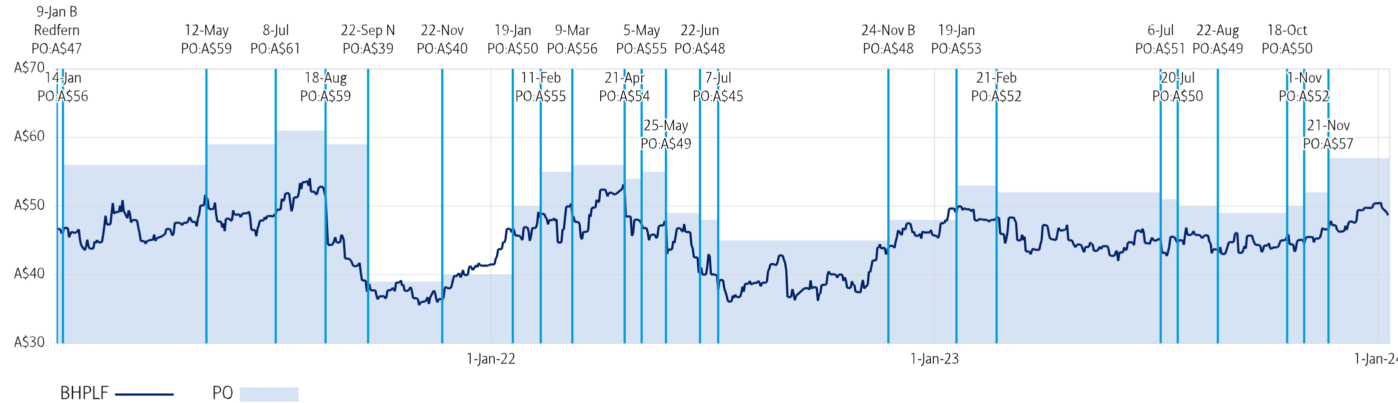
Australia - Materials & Industrials Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	BHP Group Limited	BHPLF	BHP AU	James Redfern
	BHP Group Limited	ZBHPF	BHP LN	James Redfern
	BHP Group-ADR	BHP	BHP US	James Redfern
	BlueScope	BLSFF	BSL AU	Chen Jiang
	Boral	BOALF	BLD AU	Shaurya Visen
	Boss Energy	BQSSF	BOE AU	Cameron Taylor
	Brambles Limited	BMBLF	BXB AU	Reinhardt van der Walt
	Champion Iron	CIAFF	CIA AU	Chen Jiang
	Champion Iron	YCIA	CIA CN	Chen Jiang
	Coronado	CODQL	CRN AU	Chen Jiang
	Gold Road Resources	ELKMF	GOR AU	Meredith Schwarz
	GWA Group	GWAXF	GWA AU	Shaurya Visen
	Incitec Pivot	ICPVF	IPL AU	Reinhardt van der Walt
	Mineral Resources	MALRF	MIN AU	Matt Chalmers, CFA
	Monadelphous	MDPHF	MND AU	Josephine Forde
	Nickel Industries	NICMF	NIC AU	Cameron Taylor
	Northern Star Resources	NESRF	NST AU	Meredith Schwarz
	NRW Holdings	NRWWF	NWH AU	Josephine Forde
	Nufarm	NUFMF	NUF AU	Reinhardt van der Walt
	Orica	OCLDF	ORI AU	Reinhardt van der Walt
	Orora	ORRAF	ORA AU	Roy Harrison
	Paladin Energy	PALAF	PDN AU	Cameron Taylor
	Regis Resources	RGRNF	RRL AU	Meredith Schwarz
	Reliance Worldwide Corporation Limited	RLLWF	RWC AU	Shaurya Visen
	Rio Tinto Ltd	RTNTF	RIO AU	James Redfern
	Seven Group Holdings	XSEVF	SVW AU	Shaurya Visen
	South32 Ltd	SHTLF	S32 AU	James Redfern
	South32 Ltd	XKTPF	S32 LN	James Redfern
	South32 Ltd	XMWTF	S32 SJ	James Redfern
	Transurban Group	XTRAF	TCL AU	Reinhardt van der Walt
	Transurban Group	TRAUF	TRAUF US	Reinhardt van der Walt
	Ventia	XVXGF	VNT AU	Roy Harrison
	Whitehaven Coal Limited	WHITF	WHC AU	Chen Jiang
NEUTRAL				
	ALS Limited	CPBLF	ALQ AU	Reinhardt van der Walt
	Codan	CODAF	CDA AU	Sriharsh Singh
	CSR Limited	CSRLF	CSR AU	Shaurya Visen
	Deterra Royalties	DETRF	DRR AU	Chen Jiang
	Downer EDI Limited	DNERF	DOW AU	Roy Harrison
	Evolution Mining	CAHPF	EVN AU	Meredith Schwarz
	Fletcher Building	FRCEF	FBU NZ	Shaurya Visen
	Fletcher Building	YFLBF	FBU AU	Shaurya Visen
	James Hardie Industries Plc	JHIUF	JHX AU	Shaurya Visen
	James Hardie Industries Plc	JHX	JHX US	Shaurya Visen
	Pilbara Minerals	PILBF	PLS AU	Matt Chalmers, CFA
	Qube Holdings	QUBHF	QUB AU	Reinhardt van der Walt
	Reece Limited	REECF	REH AU	Shaurya Visen
	Sandfire Resources	SFRRF	SFR AU	James Redfern
	Sims Limited	SMUPF	SGM AU	Chen Jiang
	Worley Limited	WYGPF	WOR AU	Cameron Taylor
UNDERPERFORM				
	Alumina Limited	AWCMF	AWC AU	Chen Jiang
	Atlas Arteria Ltd	MAQAF	ALX AU	Reinhardt van der Walt
	Cleanaway Waste Management	TSPCF	CWY AU	Reinhardt van der Walt
	Fortescue Ltd.	FSUMF	FMG AU	James Redfern
	IGO	IPGDF	IGO AU	Matt Chalmers, CFA
	Vulcan Steel Limited	XVULF	VSL AU	Shaurya Visen
	Vulcan Steel Limited	XVSTF	VSL NZ	Shaurya Visen

Disclosures

Important Disclosures

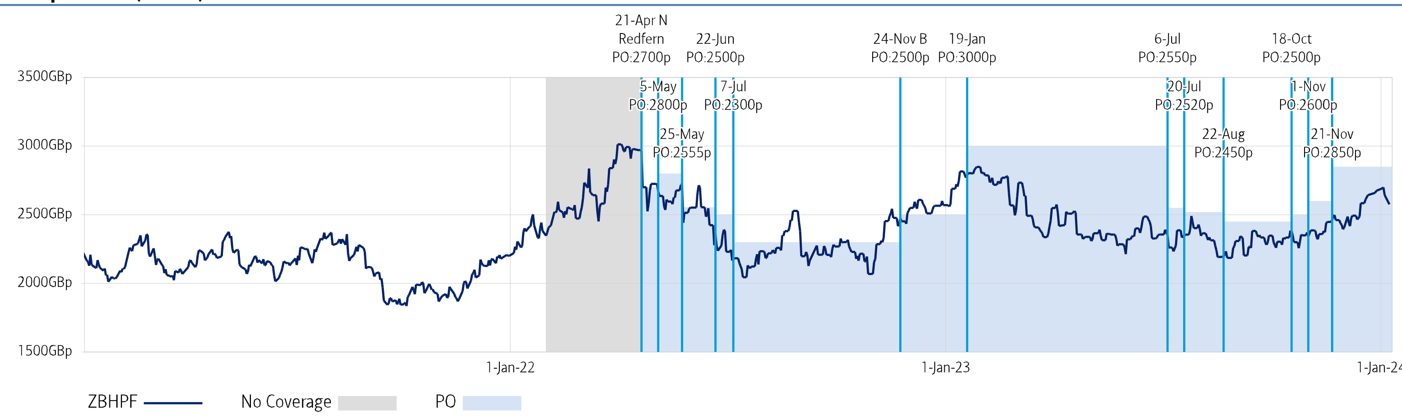
BHP Group Limited (BHPLF) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

BHP Group Limited (ZBHPF) Price Chart



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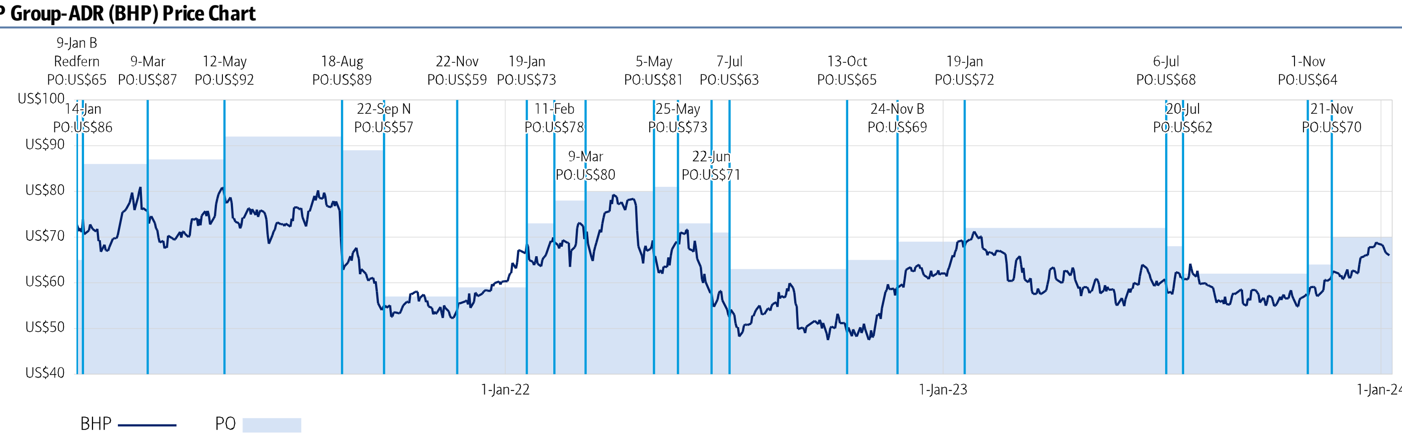
BHP Group-ADR (BHP) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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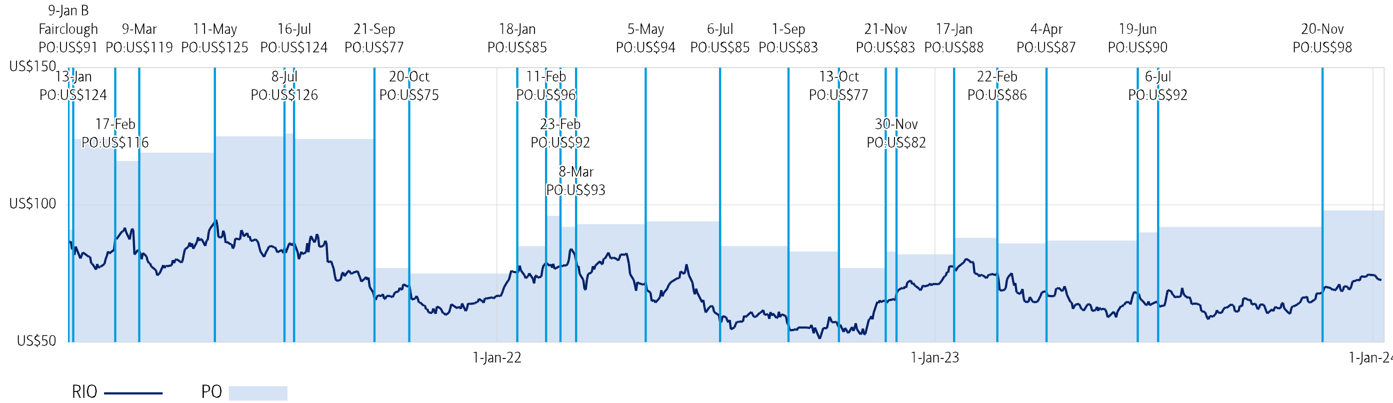
Rio Tinto Plc (RIO) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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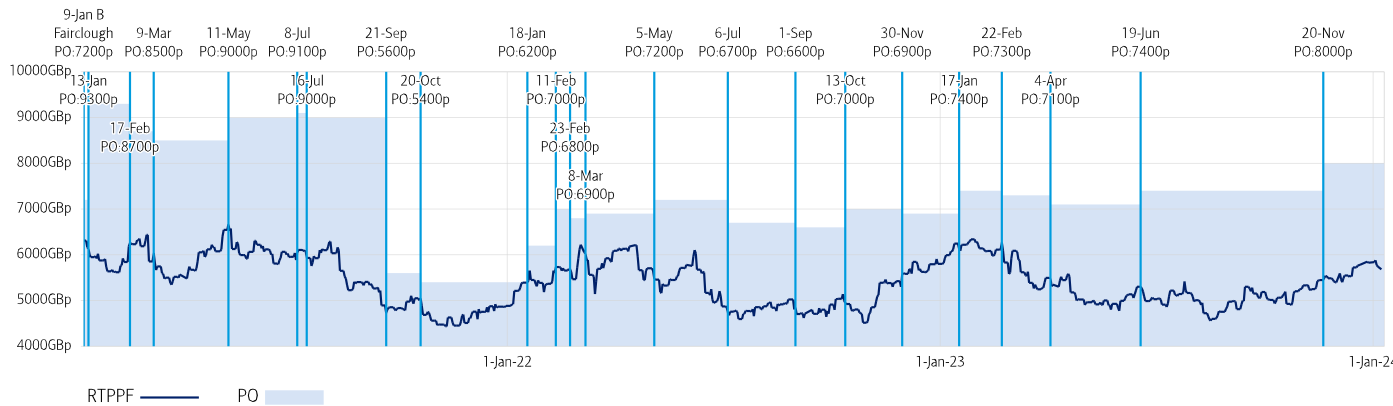
Rio Tinto Plc (RTPPF) Price Chart



B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Equity Investment Rating Distribution: Non-Ferrous Metals/Mining & Minerals Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships R1	Count	Percent
Buy	58	53.70%	Buy	26	44.83%
Hold	24	22.22%	Hold	10	41.67%
Sell	26	24.07%	Sell	13	50.00%

Equity Investment Rating Distribution: Steel Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships R1	Count	Percent
Buy	14	43.75%	Buy	9	64.29%
Hold	12	37.50%	Hold	7	58.33%
Sell	6	18.75%	Sell	3	50.00%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships R1	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

R1 Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster[R2]
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Underperform	N/A	≥ 20%

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