

Vale

# 4Q23 EBITDA beat and \$1.2bn additional Renova provision

Maintain Rating: BUY | PO: 20.00 USD | Price: 13.51 USD

## EBITDA of \$6.7bn above BofAe and consensus

Vale reported 4Q23 results and Adj EBITDA of \$6,730mn (+50.2% q/q; +34.6% y/y) which was above our estimate and Bloomberg consensus by 4.2% and 5.3%, respectively. On a quarterly basis, results were boosted by stronger iron ore shipments (+12.1% q/q), higher realized iron ore fines prices (+12.6% q/q) and higher copper and nickel volumes, driving base metals EBITDA up. We maintain our Buy on Vale as valuation looks attractive at 3.3x EV/EBITDA 2024 with FCF yield at 18%.

## US\$1.2bn additional Renova provision below estimates

Vale increased their Renova Foundation provision by US\$1.2bn, due to a potential global settlement. The US\$1.2bn additional provision came close to the bottom end of the US\$1-2bn range we were expecting and is significantly lower than the \$3.2bn additional provision (post-tax) booked by BHP in their latest results, as well as most of the market estimates between US\$2-3bn. However, we highlight that given that a final settlement has still not been struck, there is still potential for provisioned amounts to change. We calculate that FCFE (OCF – capex) came in at US\$2.7bn, ahead of our \$715mn forecast given lower Brumadinho – and de-characterization-related expenses. Vale announced ~US\$2.4bn of dividends and interest over capital to be paid on Mar 19th, for a 4.0% yield. This comes after Vale paid \$2bn in dividends last quarter, which was an extraordinary distribution, related to the Base Metals stake sale. Net Debt/EBITDA was 0.5x (down 0.1x q/q), while expanded net debt increased to US\$16.2bn from US\$15.5bn in 3Q23 (still within target leverage range of US\$10-20bn).

*Continued on page 3.*

Estimates(Dec) (US\$)	2021A	2022A	2023E	2024E	2025E
EPS	5.00	3.73	2.40	3.01	2.00
EPS Change (YoY)	354.5%	-25.4%	-35.7%	25.4%	-33.6%
Consensus EPS (Bloomberg)			2.30	2.64	2.42
DPS	2.79	1.47	1.30	1.20	0.95
Common EPS (US\$)	5.00	3.73	2.40	3.01	2.00
Common DPS (US\$)	2.79	1.47	1.30	1.20	0.95
<b>Valuation (Dec)</b>					
P/E	2.7x	3.6x	5.6x	4.5x	6.8x
Dividend Yield	20.6%	10.9%	9.6%	8.8%	7.0%
EV / EBITDA*	2.8x	4.6x	5.1x	4.8x	6.4x
Free Cash Flow Yield*	33.8%	23.4%	16.6%	16.3%	9.3%

\* For full definitions of *IQmethod*<sup>SM</sup> measures, see page 6.

23 February 2024

### Equity

**Caio Ribeiro**  
Research Analyst  
BofAS  
+1 646 855 4051  
[caio.ribeiro@bofa.com](mailto:caio.ribeiro@bofa.com)

**Leonardo Neratika** >>  
Research Analyst  
Merrill Lynch (Brazil)  
+55 11 2188 4200  
[leonardo.neratika@bofa.com](mailto:leonardo.neratika@bofa.com)

**Guilherme Rosito** >>  
Research Analyst  
Merrill Lynch (Brazil)  
+55 11 2188 4363  
[guilherme.rosito@bofa.com](mailto:guilherme.rosito@bofa.com)

### Stock Data

Price (ADR / Common)	13.51 USD / 67.22 BRL
Price Objective	20.00 USD / 95.00 BRL
Date Established	20-Nov-2023 / 9-Jan-2024
Investment Opinion	B-1-8 / B-1-8
52-Week Range	12.22 USD - 17.49 USD
Market Value (mn)	59,984 USD
Free Float	63.1%
Average Daily Value	334.27 USD
Shares Outstanding (mn)	4,440.0 / 4,440.0
BofA Ticker / Exchange	VALE / NYS
BofA Ticker / Exchange	VALEF / SAO
Bloomberg / Reuters	VALE US / VALE.N
ROE (2023E)	27.1%
Net Dbt to Eqty (Dec-2022A)	21.4%

>> Employed by a non-US affiliate of BofAS and is not registered/qualified as a research analyst under the FINRA rules.

Refer to "Other Important Disclosures" for information on certain BofA Securities entities that take responsibility for the information herein in particular jurisdictions.

**BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.**

**Refer to important disclosures on page 7 to 10. Analyst Certification on page 5. Price Objective Basis/Risk on page 5.**

12663034

Timestamp: 23 February 2024 02:35AM EST

# iQprofile<sup>SM</sup> Vale

## iQmethod<sup>SM</sup> – Bus Performance\*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Return on Capital Employed	29.0%	21.3%	17.1%	17.0%	11.4%
Return on Equity	68.9%	47.6%	27.1%	29.3%	17.3%
Operating Margin	49.6%	39.3%	35.2%	37.8%	30.1%
Free Cash Flow	20,302	14,036	9,983	9,793	5,605

## iQmethod<sup>SM</sup> – Quality of Earnings\*

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash Realization Ratio	1.0x	1.2x	1.6x	1.3x	1.5x
Asset Replacement Ratio	1.6x	1.7x	2.0x	2.0x	2.0x
Tax Rate	18.8%	10.4%	14.8%	20.0%	20.0%
Net Debt-to-Equity Ratio	5.8%	21.4%	28.6%	17.9%	19.1%
Interest Cover	16.1x	12.9x	8.3x	10.4x	7.4x

## Income Statement Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Sales	54,663	43,839	42,000	44,178	39,221
% Change	37.0%	-19.8%	-4.2%	5.2%	-11.2%
Gross Profit	32,594	19,811	18,076	19,299	14,333
% Change	53.4%	-39.2%	-8.8%	6.8%	-25.7%
EBITDA	33,755	20,973	18,971	19,978	15,104
% Change	52.5%	-37.9%	-9.5%	5.3%	-24.4%
Net Interest & Other Income	3,080	2,268	(1,085)	(1,175)	(1,558)
<b>Net Income (Adjusted)</b>	<b>24,175</b>	<b>16,744</b>	<b>10,247</b>	<b>12,502</b>	<b>8,295</b>
<b>% Change</b>	<b>328.6%</b>	<b>-30.7%</b>	<b>-38.8%</b>	<b>22.0%</b>	<b>-33.6%</b>

## Free Cash Flow Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Net Income from Cont Operations (GAAP)	24,491	17,390	11,640	12,502	8,295
Depreciation & Amortization	3,051	3,171	2,995	3,282	3,282
Change in Working Capital	871	476	657	661	397
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	(3,078)	(1,555)	691	(151)	237
Capital Expenditure	(5,033)	(5,446)	(6,000)	(6,500)	(6,605)
<b>Free Cash Flow</b>	<b>20,302</b>	<b>14,036</b>	<b>9,983</b>	<b>9,793</b>	<b>5,605</b>
<b>% Change</b>	<b>257.1%</b>	<b>-30.9%</b>	<b>-28.9%</b>	<b>-1.9%</b>	<b>-42.8%</b>
Share / Issue Repurchase	0	0	0	0	0
Cost of Dividends Paid	(13,483)	(6,603)	(5,539)	(4,965)	(3,944)
Change in Debt	(1,245)	(1,070)	915	(248)	584

## Balance Sheet Data (Dec)

(US\$ Millions)	2021A	2022A	2023E	2024E	2025E
Cash & Equivalents	11,721	4,736	1,847	5,009	4,154
Trade Receivables	3,914	4,319	4,182	3,532	3,136
Other Current Assets	6,725	6,471	7,695	7,815	7,817
Property, Plant & Equipment	41,931	44,938	50,417	53,301	59,726
Other Non-Current Assets	25,151	26,430	26,566	26,566	26,566
<b>Total Assets</b>	<b>89,442</b>	<b>86,894</b>	<b>90,707</b>	<b>96,224</b>	<b>101,398</b>
Short-Term Debt	1,204	489	948	930	971
Other Current Liabilities	13,994	13,402	13,036	13,166	13,169
Long-Term Debt	12,578	12,223	12,679	12,448	12,992
Other Non-Current Liabilities	26,360	23,422	22,798	22,798	22,798
<b>Total Liabilities</b>	<b>54,136</b>	<b>49,536</b>	<b>49,461</b>	<b>49,343</b>	<b>49,929</b>
<b>Total Equity</b>	<b>35,306</b>	<b>37,358</b>	<b>41,246</b>	<b>46,881</b>	<b>51,469</b>
<b>Total Equity &amp; Liabilities</b>	<b>89,442</b>	<b>86,894</b>	<b>90,707</b>	<b>96,224</b>	<b>101,398</b>

\* For full definitions of iQmethod<sup>SM</sup> measures, see page 6.

## Company Sector

Non-Ferrous-Mining

## Company Description

Vale is the largest producer of iron ore and pellets, and the largest nickel producer. Vale also produces copper, coal, copper, manganese, and ferroalloys and holds equity stakes in some steel producers/projects.

## Investment Rationale

We rate Vale as Buy. VALE's earnings are almost entirely driven by the iron ore price, and our rating reflects BofA's more optimistic iron ore house view. We see the higher iron ore prices driving higher FCF generation, which could open the possibility of higher shareholder returns. We also like Vale's exposure to copper and nickel prices and could see a turnaround in the operation after the recent stake sale.

## Stock Data

Average Daily Volume	24,742,278
Shares / Common	1.00

## Quarterly Earnings Estimates

	2022	2023
Q1	0.94A	0.42A
Q2	0.89A	0.22A
Q3	0.98A	0.67A
Q4	0.84A	1.07E

## Ferrous: miss on fines partially offset by pellets

As mentioned in our 4Q23 production review, total iron ore production of 89.4Mt was above Bloomberg consensus, up 3.7% q/q and up 10.6% y/y ([see our report](#)). Sales (including pellets and ROM) came in at 90.3Mt, up 12.1% q/q but down 1.8% y/y and in below our estimate. Ferrous EBITDA of \$6,411mn missed our forecast by 1.8%, driven by higher-than-expected C1 costs, but partially offset by better pellets results. Ferrous revenues rose ~24.5% q/q on a combination of higher volumes and realized prices on a q/q basis. Prices were aided on a q/q basis by the higher benchmark prices this quarter. C1 with 3<sup>rd</sup> party came in at \$24.7/t, down 3.5% q/q, but above our estimates. The higher revenues combined with lower costs sequentially drove EBITDA up q/q. Pellets results were above our estimates given higher realized prices and lower pellets costs. Freight of \$18.8/t was below our \$19.8/t estimate and dropped \$0.1/t q/q. All in, iron ore and pellets EBITDA breakeven reached \$53.3/t, down from \$55.7/t in 3Q23 and up from 4Q22's \$48.5/t.

## Base Metals: EBITDA beats on costs

As we wrote in our production review, copper volumes of 97.5Kt were slightly below our forecast, while nickel volumes of 47.9Kt were above our estimates. Copper and nickel realized prices were below our forecasts. All in, base metals revenue came in at US\$2.0bn, up ~15% q/q and in line with our estimate. The in line base metals revenue combined with base metals costs below our forecasts drove a base metals EBITDA of US\$523mn, down q/q but 4.2% above our forecast.

### Exhibit 1: Vale – 4Q23 review (US\$m)

Adj EBITDA of \$6.7bn increased 50.2% q/q and 34.6% y/y, and was above BofAe and consensus

US\$m	4Q23A	3Q23A	q/q	4Q22A	y/y	BofAe	Act vs Est	Cons	Act vs Cons
								13,14	
Revenue	13,054	10,623	22.9%	11,941	9.3%	13,270	-1.6%	3	-0.7%
Adj. EBITDA	6,730	4,482	50.2%	5,001	34.6%	6,458	4.2%	6,389	5.3%
EBITDA Margin	52%	42%	940	42%	970	41%	1070	49%	290
Adj. Net Income	2,418	2,836	-15%	3,724	-35%	4,553	-47%	4,062	-40.5%

Source: BofA Global Research estimates, Bloomberg, company reports

BofA GLOBAL RESEARCH

**Exhibit 2: Vale – 4Q23 operational review**

Summary of Vale operational and financial results

US\$m	4Q23A	3Q23A	q/q	4Q22A	y/y	BofAe
Revenue	13,054	10,623	22.9%	11,941	9.3%	13,270
Adj. EBITDA	6,730	4,482	50.2%	5,001	34.6%	6,458
EBITDA Margin	52%	42%	940	42%	970	41%
Adj. Net Income	2,418	2,836	-15%	3,724	-35%	4,553
Revenue	13,054	10,623	22.9%	11,941	9.3%	13,270
Iron ore	9,212	7,331	25.7%	7,767	18.6%	9,453
Pellets	1,680	1,388	21.0%	1,456	15.4%	1,684
Base metals	1,982	1,718	15.4%	2,549	-22.2%	1,986
EBITDA	6,730	4,482	50.2%	5,001	34.6%	6,458
Iron Ore	5,467	3,696	47.9%	3,955	38.2%	5,621
Pellets	925	712	29.9%	743	24.5%	832
Base metals	523	573	-8.7%	775	-32.5%	499
	4Q23A	3Q23A	q/q	4Q22A	y/y	
Production volume						
Iron ore (Mt)	89.4	86.2	3.7%	80.9	10.6%	N/A
Pellets (Mt)	9.9	9.2	7.4%	8.3	19.2%	N/A
Nickel (Kt)	44.9	42.1	6.7%	47.4	-5.3%	N/A
Copper (Kt)	99.1	81.6	21.4%	66.3	49.5%	N/A
	4Q23A	3Q23A	q/q	4Q22A	y/y	BofAe
Sales volume						
Iron ore fines (Mt)	80.0	71.9	11.3%	83.2	-3.8%	81.3
Pellets (Mt)	10.3	8.6	19.4%	8.8	17.0%	10.5
Total ferrous (Mt)	90.3	80.6	12.1%	92.0	-1.8%	91.8
Nickel (Kt)	47.9	39.2	22.2%	58.2	-17.7%	45.1
Copper (Kt)	97.5	73.8	32.1%	71.6	36.2%	98.2
Price						
Iron ore (\$/t)	118.3	105.1	12.6%	95.6	23.7%	116.3
Pellets (\$/t)	163.4	161.2	1.4%	165.7	-1.4%	160.3
Nickel (\$/t)	18,420.0	21,250.0	-13.3%	24,517.2	-24.9%	19,017.2
Copper (\$/t)	7,941.0	7,682.9	3.4%	8,291.7	-4.2%	8,166.3
Iron ore, Platts (\$/t)	128.5	113.9	12.8%	99.1	29.7%	111.0
Costs						
Iron ore - C1 (\$/t)	24.7	25.6	-3.5%	21.7	14.0%	21.5
Iron ore freight (\$/t)	18.8	18.9	-0.5%	18.8	0.0%	19.8
Iron ore EBITDA break-even (\$/dmt)	53.3	55.7	-4.3%	48.5	9.9%	57.4

Source: BofA Global Research estimates, Bloomberg, company reports

BofA GLOBAL RESEARCH

## Price objective basis & risk

### Vale (VALE / VALEF)

Our US\$20 (R\$95/local share) PO is based on a 50/50 blended valuation approach. On multiples, we use a 4.0x 2024E EV/EBITDA (slightly below its normalized 4.5-5x given elevated prices), and our DCF using a WACC of 12% and terminal growth rate of 2.5%. We use a below normalized 4.0x EV/EBITDA 2024E, below its 5x historical average given our above-normal iron ore forecasts.

Downside risks to our price objective: 1) weaker than expected iron ore prices, 2) a global economic slowdown, negatively impacting metals prices, 3) appreciation of the Brazilian Real and the Canadian Dollar (80% of Vale's costs are denominated in those currencies), without an offsetting increase in metal prices, 4) slowdown in infrastructure spending or global steel production, mainly in China, 5) higher freight rates, reducing Vale's competitiveness in China, 6) higher government intervention, and 7) more fallout from its Brumadinho tailings dam tragedy.

Upside risks: 1) Stronger than expected iron ore prices, 2) stronger than expected global economic growth, 3) acceleration of infrastructure spending or global steel production, mainly in China, and 4) change in China's policy on steel production cuts.

## Analyst Certification

We, Caio Ribeiro, Guilherme Rosito and Leonardo Neratika, 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

The locally listed shares of Brazilian issuers may only be purchased by investors outside of Brazil who are eligible foreign investors within the meaning of applicable laws and regulations.

### Latin America - Natural Resources Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>				
	3R Petroleum	XPXXF	RRRP3 BZ	Leonardo Marcondes
	Alpek SAB de CV	ALPKF	ALPEKA MM	Leonardo Marcondes
	CSN	SIDHF	CSNA3 BZ	Caio Ribeiro
	CSN	SID	SID US	Caio Ribeiro
	Dexco SA	DURXF	DXCO3 BZ	Leonardo Neratika
	Empresas CMPC SA	XEMCF	CMPC CI	Leonardo Neratika
	Enauta Participacoes S.A.	QGEPF	ENAT3 BZ	Leonardo Marcondes
	Orbia	MXCHF	ORBIA* MM	Leonardo Marcondes
	Petro Rio	HRTPF	PRI03 BZ	Caio Ribeiro
	Petrobras	PBRQF	PETR3 BZ	Caio Ribeiro
	Petrobras	PBR	PBR US	Caio Ribeiro
	Petrobras PN	PBRA	PBR/A US	Caio Ribeiro
	Petrobras PN	PTRBF	PETR4 BZ	Caio Ribeiro
	PetroReconcavo	XPXYF	RECV3 BZ	Leonardo Marcondes
	Suzano	XXRTF	SUZB3 BZ	Caio Ribeiro
	Suzano S.A.	SUZ	SUZ US	Caio Ribeiro
	Ternium	TX	TX US	Caio Ribeiro
	Usiminas SA	USNZY	USNZY US	Caio Ribeiro
	Usiminas SA	USSPF	USIM5 BZ	Caio Ribeiro
	Vale	VALE	VALE US	Caio Ribeiro
	Vale	VALEF	VALE3 BZ	Caio Ribeiro
	Vibra Energia SA	XUBRF	VBBR3 BZ	Leonardo Marcondes



## Latin America - Natural Resources Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>NEUTRAL</b>				
	Bradespar	BRDQF	BRAP4 BZ	Caio Ribeiro
	Companhia Brasileira de Alumínio	XZUDF	CBAV3 BZ	Leonardo Neratika
	CSN Mineracao	XZRAF	CMIN3 BZ	Caio Ribeiro
	Ecopetrol S.A.	XESSF	ECOPETL CB	Caio Ribeiro
	Ecopetrol S.A.	EC	EC US	Caio Ribeiro
	Gerdau S. A.	GGBUF	GGBR4 BZ	Caio Ribeiro
	Gerdau S.A.	GGB	GGB US	Caio Ribeiro
	Metalurgica Gerdau	MZGPF	GOAU4 BZ	Caio Ribeiro
	Ultrapar	XLRUF	UGPA3 BZ	Leonardo Marcondes
	Ultrapar Pa-ADR	UGP	UGP US	Leonardo Marcondes
<b>UNDERPERFORM</b>				
	Empresas Copec SA	PZDCF	COPEC CI	Leonardo Neratika
	Grupo Mexico	GMBXF	GMEXICOB MM	Caio Ribeiro
	Klabn S.A	XLWDF	KLBN11 BZ	Caio Ribeiro
	Klabn S.A	KLBAY	KLBAY US	Caio Ribeiro
	Southern Copper	SCCO	SCCO US	Caio Ribeiro
	YPF SA	YPF	YPF US	Leonardo Marcondes
	YPF SA	YPSF	YPFD AR	Leonardo Marcondes
<b>RSTR</b>				
	Braskem SA-A	BAKAF	BRKM5 BZ	Leonardo Marcondes
	Braskem SA-ADR	BAK	BAK US	Leonardo Marcondes

**iQmethod<sup>SM</sup> Measures Definitions****Business Performance**

Return On Capital Employed

Return On Equity  
Operating Margin  
Earnings Growth  
Free Cash Flow

**Quality of Earnings**

Cash Realization Ratio  
Asset Replacement Ratio  
Tax Rate  
Net Debt-To-Equity Ratio  
Interest Cover

**Valuation Toolkit**

Price / Earnings Ratio  
Price / Book Value  
Dividend Yield  
Free Cash Flow Yield  
Enterprise Value / Sales

EV / EBITDA

**Numerator**

NOPAT = (EBIT + Interest Income) × (1 – Tax Rate) + Goodwill Amortization

Net Income  
Operating Profit  
Expected 5 Year CAGR From Latest Actual  
Cash Flow From Operations – Total Capex

**Numerator**

Cash Flow From Operations  
Capex  
Tax Charge  
Net Debt = Total Debt – Cash & Equivalents  
EBIT

**Numerator**

Current Share Price  
Current Share Price  
Annualised Declared Cash Dividend  
Cash Flow From Operations – Total Capex  
EV = Current Share Price × Current Shares + Minority Equity + Net Debt + Other LT Liabilities  
Enterprise Value

**Denominator**

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill  
Amortization  
Shareholders' Equity  
Sales  
N/A  
N/A

**Denominator**

Net Income  
Depreciation  
Pre-Tax Income  
Total Equity  
Interest Expense

**Denominator**

Diluted Earnings Per Share (Basis As Specified)  
Shareholders' Equity / Current Basic Shares  
Current Share Price  
Market Cap = Current Share Price × Current Basic Shares  
Sales

Basic EBIT + Depreciation + Amortization

**iQmethod<sup>SM</sup>** is the set of BofA Global Research standard measures that serve to maintain global consistency under three broad headings: Business Performance, Quality of Earnings, and validations. The key features of iQmethod are: A consistently structured, detailed, and transparent methodology. Guidelines to maximize the effectiveness of the comparative valuation process, and to identify some common pitfalls.

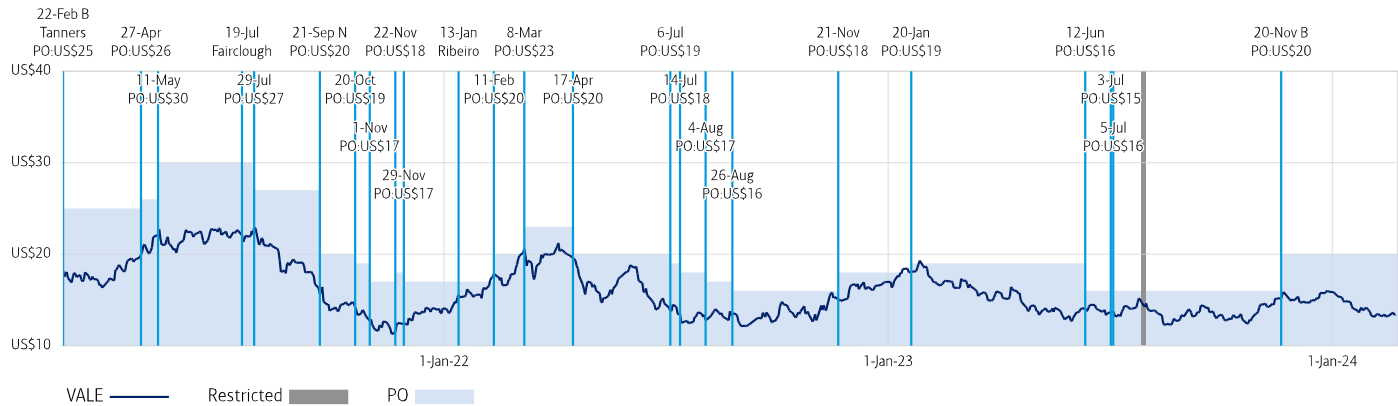
**iQdatabase<sup>®</sup>** is our real-time global research database that is sourced directly from our equity analysts' earnings models and includes forecasted as well as historical data for income statements, balance sheets, and cash flow statements for companies covered by BofA Global Research.

**iQprofile<sup>SM</sup>**, **iQmethod<sup>SM</sup>** are service marks of Bank of America Corporation. **iQdatabase<sup>®</sup>** is a registered service mark of Bank of America Corporation.

# Disclosures

## Important Disclosures

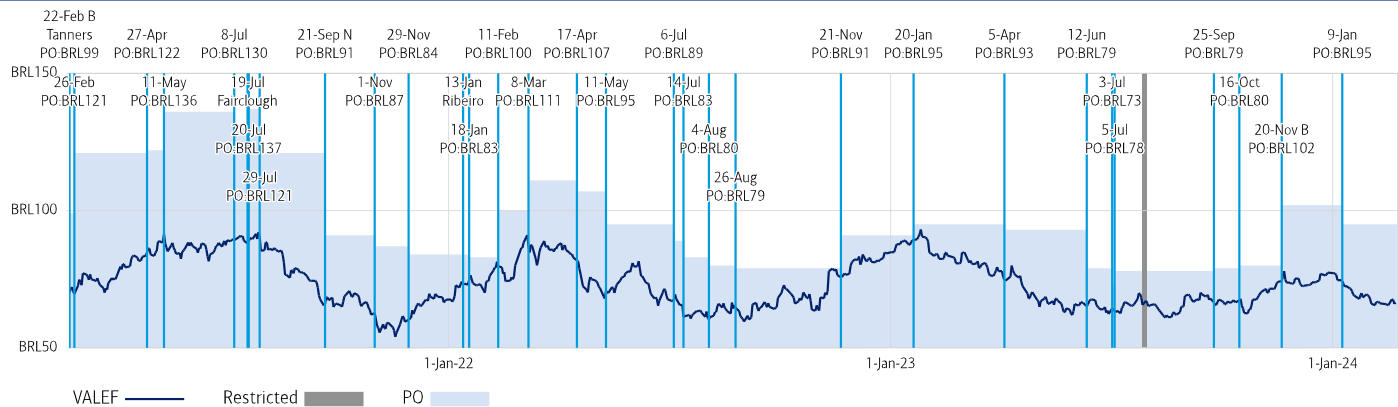
### Vale SA (VALE) Price Chart



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.

### Vale (VALEF) 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.

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

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	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: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	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%

<sup>R1</sup> 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.



**FUNDAMENTAL EQUITY OPINION KEY:** Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. **VOLATILITY RISK RATINGS**, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. **INVESTMENT RATINGS** reflect the analyst's assessment of both a stock's absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). Our investment ratings are: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. An investment rating of 6 (No Rating) indicates that a stock is no longer trading on the basis of fundamentals. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster <sup>R2</sup>
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

<sup>R2</sup>Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

**INCOME RATINGS**, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. **Coverage Cluster** is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

Price Charts for the securities referenced in this research report are available on the [Price Charts website](#), or call 1-800-MERRILL to have them mailed.

BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: Vale SA.

The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: Vale SA.

BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: Vale SA.

The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: Vale SA.

BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Vale SA.

BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: Vale SA.

BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: Vale SA.

The country in which this issuer is organized has certain laws or regulations that limit or restrict ownership of the issuer's shares by nationals of other countries: Vale SA.

BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: Vale SA.

The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: Vale SA.

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

## Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofAS or one of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

**'BofA Securities' includes BofA Securities, Inc. ('BofAS') and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. 'BofA Securities' is a global brand for BofA Global Research.**

**Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:**

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at [www.bofam.com/BofASEdisclaimer](http://www.bofam.com/BofASEdisclaimer); BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSCF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.

This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA



and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

#### General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

#### Copyright and General Information:

Copyright 2024 Bank of America Corporation. All rights reserved. IQdatabse® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS or any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BofA Securities policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.