VALE

VBM Asset Review: Doubting Thomas

LatAm Metals & Mining

(i) Based on the asset review, the company identified a potential ramp-up (2024-2028) of +175Ktpa in copper, reaching a capacity of 500Ktpa (+54% in 5 years vs. current capacity). This represents an increase of +100ktpa vs. the previous guidance up to 2026 (not 2028), provided at the last Vale Day (Dec 2023). **(ii)** In nickel, Vale adjusted the ramp-up (2024-2028) to +85Ktpa, bringing capacity to 250Ktpa (+52% in 5 years vs. current capacity). This represents an increase of +40Ktpa vs. the previous guidance until 2026. **(iii)** Analysts and investors were presented with the full potential of the assets **up to 2026**, resulting in increased EBITDA for the base metals unit (+US$400mn up to 2026 or +20% vs. EBITDA 2023), through **(iv)** increased CAPEX (+US$800mn up to 2026) and creating **(v)** +US$2bn of additional value up to 2026 from Vale's perspective, using the reference multiple for the base metals sector (7x EV/EBITDA). **From 2028 onwards**, the capacity increase initiatives and an **(vi)** additional CAPEX level (+US$2.5bn 28E-29E), in turn lead to a **(vii)** long-term incremental EBITDA potential (+US$500mn 28E-29E or 25% vs. EBITDA 2023), according to Vale. **(viii)** Therefore, the total additional EBITDA (2024-2028+) could amount to +US$1.3bn in cumulative order. **(ix)** Considering the same reference multiple, in addition to the +US$2bn until 2026, the company believes it would unlock an extra +US$4bn from 2028+, **totaling +US$6bn of unlocked value** (2024-2028+), or **12% of the current market cap** (our calculation is lower than this due to execution risks, which were explored throughout the report). **(x)** We believe that investors, for the most part, prefer to **wait for clear signs of execution** before attesting to the viability of the asset review. **(xi)** Adjusting the assumptions for proportions in **less beneficial intensities** than those that Vale mentioned in yesterday's presentation for copper and nickel, we arrive at a value increase of **+US$3.5bn in Equity Value** (-42% vs. the company's disclosure). **(xii)** Therefore, although we have been conservative, due to the changes, we believe that **VBM will contribute more** to the company's fair valuation and **we increase** our **12M Target-Price** of **VALE3** to **R$78.50** (vs. 73.50 previously) and **12M Target-Price** of **ADRs-NYSE** to **US$14.50** (vs. US$13.70 previously), resulting in an **upside** of **+27.85%**.

On Thursday (June 20), Vale gave analysts and investors a presentation on the asset review of the metals for energy transition unit (Vale Base Metals - VBM). The focus of the presentation was on: **(i)** the expected business unit performance, **(ii)** positive changes in production guidance and cost reductions, **(iii)** the schedule for project start-up and capacity ramp-up, as well as the **(iv)** CAPEX required to implement the initiatives. The presentation ended with **(v)** a panel containing scenarios for the next 10 years with regard to supply and demand for nickel and copper, according to the company's own vision

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Company

VALE US Equity
Buy

Price: US$ 11.29 (20-Jun-2024)
Target Price 12M: US$ 14.50 (NYSE)

VALE3 BZ Equity
Target Price 12M: R$ 78.50 (B3)

Strong capacity increase combined with cost reduction

Copper. Based on the asset review, the company identified a potential ramp-up (2024-2028) of +175Ktpa, reaching a capacity of 500Ktpa (+54% in 5 years vs. current capacity). This represents an increase of +100ktpa vs. the previous guidance up to 2026, provided at the last Vale Day (Dec 2023). Therefore, although the revision extended the previous deadline by +2 years (end of 2026 vs. 2028), the volume still rose significantly. The increase compared to the base up to 2026 is +5% vs. previous guidance. With the +100Ktpa of the asset review up to 2028, +60Ktpa will come from the set of assets in Salobo (+27% vs. previous guidance of 2026), +15Ktpa in Sossego (+19% vs. previous guidance) and +25Ktpa in the Canadian operations (+25% vs. previous guidance).

Thereafter (2029-2030+), the company announced a further growth installment. The operations that will drive the increase in volume are associated with activities in Indonesia, more specifically in the Hu'u asset (+300-350Ktpa), as well as in Pará (PA), with the Alemão (+60Ktpa) and North Hub (+70-100Ktpa) projects. After the full ramp-up of these projects, Vale expects to reach a total capacity of ~900Ktpa (+177% vs. current capacity), showing significant growth in the long run.

Nickel. In nickel, Vale adjusted the ramp-up (2024-2028) to +85Ktpa, bringing capacity up to 250Ktpa (+52% in 5 years vs. current capacity). This represents an increase of +40Ktpa vs. the previous guidance until 2026, provided on the last Vale Day (Dec 2023). The gain strategy would occur through productivity improvements and low CAPEX initiatives. As with copper, the timeframe has been extended by +2 years (end of 2026 vs. 2028), but the volume has risen significantly. Considering the same basis in 2026, the increase is +10% vs. previous guidance. Looking ahead to 2028, the presentation showed an addition of +25Ktpa in Sudbury (+42% vs. previous guidance of 2026) and +15Ktpa in Voisey's Bay (+33% vs. previous guidance), both assets in Canada. In addition to these initiatives, in subsequent years (2029-2030+) Vale expects to reach a total capacity of ~300Ktpa (+82% vs. current capacity), with production growth in the Indonesian JV's (+20Ktpa) and in the ultramafic operations in Canada (+40Ktpa).

Financial impacts are quite prominent, according to Vale

Through these accumulations of production capacity mentioned above, as well as having benefits linked to increased efficiency and dilution of fixed costs (driven by the increase in volume), Vale expects a reduction, for both copper and nickel, of **-10% in the all-in cost by 2026** (vs. previous guidance). Analysts and investors were presented with the full potential of the assets until 2026, resulting in **(i)** an increase in EBITDA for the base metals unit (+US$400mn until 2026 or +20% vs. EBITDA 2023), **(ii)** an increase in CAPEX (+US$800mn until 2026) and **(iii)** +US$2bn in value creation, using the reference multiple for the base metals sector (7x EV/EBITDA). From 2028 onwards, the capacity increase initiatives (already mentioned) and an **(iv)** additional CAPEX level (+US$2.5bn 28E-29E), in turn lead to a **(v)** long-term incremental EBITDA potential (+US$500mn 28E-29E or 25% vs. EBITDA 2023), according to Vale.

(vi) Therefore, the total additional EBITDA (2024-2028+) amounts to +US$1.3bn in cumulative order. **(vii)** Considering the same reference multiple, in addition to the +US$2bn until 2026, the company believes it would unlock an additional +US$4bn from 2028+, **totaling +US$6bn in value** (2024-2028+), **or 12% of the current market cap** (our calculation is lower than this, due to execution risk).

How does Vale expect to achieve that kind of growth?

Salobo. The short-term focus at the Salobo mines is to improve asset reliability through a strategy of maintenance and equipment efficiency. The productivity of the electric excavators (Kt/h) has already shown a growth of +8% between 1Q23 and 1Q24. As part of the progress already expected, Vale also intends to remove bottlenecks at Salobo I and II and ramp up Salobo III. In addition, the company sees **(i)** potential for a significant increase in resources through additional drilling, **(ii)** extension of asset life through complementary resources and cut-off grade strategies and **(iii)** productivity increase of ~30% through technological development, such as flotation of larger particles, leading to a cost reduction of -10% for copper all-in in 2026 vs. previous guidance.

Salobo execution risks: overestimation of cost reduction. We believe that the risk linked to the procedure lies in the cost reduction calculation, with the improved efficiency brought about by the flotation of larger particles permeating the significant increase in resources, which today are measured at 551Mt of ore (equivalent to ~2.6Mt of copper). For the more skeptical, the increase in the volume of resources may be less than Vale believes there are reserves in the mine (1,089Mt), which would make it impossible (or at least quite difficult) to reduce costs by the magnitude the company is projecting (-10% for all in).

Sossego. At the Sossego complex, located in Pará (PA), there are opportunities to **(i)** maximize the use of the mill through sequencing, filling it with ~13Mtpa of total ore capacity. The focus is also on the approval of **(ii)** the Bacaba project, which is being analyzed together with the authorities, as well as **(iii)** optimizing the sequencing of the South Hub, which will be carried out through investments in geological surveys. According to the company, the target in 2026 is to reach an ore capacity of 11.6Mtpa and the long-term goal is 12.7Mtpa. The Sossego mines have an underground potential of ~50Mt of ore (which means a reserve of ~850Kt of copper), located in a considerable zone of high-grade penetration (Sequeirinho I and II and Baiano).

Sossego execution risks: transition to underground mines. We asked Vale what the main difficulties are from the point of view of execution risk. In response, the company commented that the Sossego asset only has open pit mining (currently). In order to reach the high-grade penetration zone, Vale will have to make a transition to underground mining (digging deeper into underground areas) as the original ore body becomes exhausted in the first layers of the ground. So, it seems to us that the plan to go underground at Sossego is a more long-term idea, as there is still some degree of ore volume on the surface today. As imploding the ground to penetrate deeper layers can take some time, we believe that in the medium term the company's strategy should be to use the resource raised at Bacaba to provide the necessary feed for processing production when the Sossego open pit comes at full depletion.

Sudbury. For the Sudbury complex in Canada, the short-term strategy is to **(i)** bring the mill to ~5Mtpa by 2026, as well as **(ii)** increase mine development to ensure greater ore availability. For the long term, Vale expects to **(iii)** increase the mill's capacity by +7Mtpa by 2028+, including the allocation of resources.

Sudbury execution risks: change in extraction strategy and cut-off grade. Vale has mapped out opportunities to increase mine production in the future by freeing up mill feed through a bolder cut-off grade. The Garson mine, for example, already has a higher-grade cut-off grade method, but it has a very significant potential increase in low-grade nickel that doesn't require much effort to remove. A priori, there should be no impact of a reduction in the realized price by increasing the penetration of low-grade volume. However, for this not to happen, Vale will have to refine the product, consuming lower-grade feed in the processing phase. Vale argues that increased production of finished nickel would generate greater efficiency and dilution of fixed costs, which would more than offset the adverse effects of increased processing.

Voisey's Bay. At the Voisey's Bay operation, also in Canada, the action plan is to complete the implementation of the ramp-up project for underground mines (VBME), expected for 2H26. When exploration reaches fully the underground mines, production should jump to **(i)** 45Ktpa of nickel, **(ii)** 20Ktpa of copper and **(iii)** 2.6Ktpa of cobalt. In addition, the company wants to **(iv)** maximize the volume processed in the mill by 3Mt of ore (+10% vs. current level), using lower grade material and disseminated ore from the Eastern Deeps mine. Also included are projects to **(v)** improve the long-term mining plan and designs to better understand the resource potential.

Voisey's Bay execution risks: similar to Sossego, with deeper mine exploration. We believe that the execution risk is close to what we pointed out for Sossego in relation to the move to underground mines. The positive difference is that at Voisey's Bay underground mining has already begun and has proven to be feasible, with 2023 occupying ~20% of the 1.8Kpta via below-surface mining (not open pit). By 2024, Vale expects this proportion to jump to ~60% of the same 1.8Kpta, with ramp-up starting in 2025 (2.3ktpa). Even so, on the negative side, we point out that there is no alternative feed supply in Voisey's Bay regarding any setback in penetrating deeper, as there would be in Sossego through the use of the resource potentially raised in Bacaba, subject to the necessary approvals from the authorities.

Onça Puma. At Onça Puma, in the Pará (PA) complex, the plan is to continue implementing the Furnace II project, adding 12-15Ktpa which, together with improved productivity, would generate a cost reduction of more than -10%.

Onça Puma execution risks: difficulties in re-establishing the operating license. The big issue with Onça Puma is related to the suspension of the mine's operating license. If, on the one hand, Vale managed to stockpile feed while the furnace was stopped for refurbishment and maintenance in 1Q24, getting through 2Q24 and potentially 3Q24 with no change in sales, on the other hand, if the agreement to re-establish the operation takes too long to come through, the ramp-up schedule at Onça Puma, which seems to us to have shorter characteristics than other projects, could be made unfeasible.

With the suspension of the operating license by SEMAS (Pará State Environment Secretariat), rectified by the Brazilian courts in the second instance after an appeal that overturned the effect of the injunction that Vale had withdrawn in the first instance, today the resumption of operations is still an uncertain issue (and in our opinion, politically motivated). Vale should have had a hearing yesterday (June 20), which did not take place due to an order from Minister Luís Roberto Barroso, of the STF (Supreme Federal Court). In principle, no agreement was reached to re-establish the operation. Even so, the company announced that it is close to reaching a consensus with SEMAS, for approval by the STF.

Project optimization

Alemão Project. The strategy for the Alemão project in Pará (PA) is to simplify the processing flowchart, which would reduce the CAPEX, and optimize the mining plan and method. According to the measurement provided by Vale, the Alemão project has 122.7Mt of resources (1.65% copper; 1g/t gold).

Hu'u. Vale listed significant opportunities for the asset in Hu'u, Indonesia. These include advances in solutions to solve technical challenges: **(i)** pre-mining cooling and water removal confirmed by extensive hydrogeological data collection program, **(ii)** lower than initially expected operating temperature confirmed, **(iii)** increased mine production rate through a two-stage development approach and **(iv)** solid foundation for project development provided by government and community support. The Hu'u operation has an ore reserve for exploitation of 2.1Bt (0.86% copper and 0.48g/t gold) and the company states that the investment would be made in 2028.

Thompson. As for the Thompson Nickel Belt operation in Canada, the opportunity lies in the ultramafic deposits (ore with very low silica content, resulting in a high-quality product). Vale commented during the presentation that metallic recovery has been technically proven in tests on the historic stacks of the Pipe Lake mine. The next steps will be to **(i)** scale up additional tons of Pipe to provide incremental ore production for the Thompson mill, **(ii)** improve the viability of projects with another cut-off grade and **(iii)** access the resource endowment with additional drilling campaigns.

Our Take on Vale

Good news in Base Metals doesn't usually excite investors very much. The entire operation and strategy presented in the Asset Review of Vale's base metals unit (VBM) **seems excellent to us**. However, our perception is that VBM doesn't usually end up putting a representative bullish catalyst for Vale's shares. This is unfortunate and goes against a partial movement of fundamentals since we believe that VBM is basically given “for free" within the company's current market valuation (trading well below the ~7x EV/EBTIDA multiple of the base metals sector).

When there is some bad news (such as the downward revision of the copper production guidance for 2023 in October last year), the shares can fall, especially if the market in general is already feeling bearish about the case, as it has been over the last 12M. This is because it ends up piling up reasons for investors who are short on the stock.

But when a big positive announcement is made, in the face of the strong volume increase and considerable cost reduction that were announced in yesterday's presentation, the shares still take a shy upward movement, having only risen by ~1% during the trading session.

We always mention in our reports the strong correlation (almost 1:1 ex overhangs) between the volatility of Vale's shares vs. the iron ore spot curve. Of course, this is already widely known. We think it's almost obvious to point out that, historically, what seems to condition investors' interest on Vale are **(i)** the macroeconomic outlook for China, as well as **(ii)** the fundamentals of iron ore, the company's flagship, in the balance between supply and demand for this particular commodity. Therefore, both factors have no connection with Vale's micro capacity to optimize its copper and nickel assets. Do we agree 100% with this view of the market? No... but it is what it is...

Doubting Thomas. VBM's EBITDA represented ~8% of Vale's total consolidated EBITDA in 2023, with revenue indicating ~20%, demonstrating the weak margin of the base metals business in relation to the iron ore business division. It is for this reason that, regardless of whether from a fundamentalist point of view the capacity expansions combined with cost reductions generate the value unlocking that is significant for the valuation (according to Vale's view, +US$6bn in the long term or 12% of the current market cap), investors still believe that Vale needs to show even clearer signs of execution first, before investors give any credit to the figures presented.

We believe that the market reacts to good news from VBM in a **skeptical process** similar to the biblical passage known as "The incredulity of St. Thomas", coining an expression that doubt can only be cured by direct, visual, and physical contact with the evidence. Therefore, even though the figures seem encouraging, we believe that the operation would have to be very well carried out in order to generate the value creation that the company estimates.

The base metals business will still be put to test. There are execution risks. Even though we know that most investors prefer to wait for clear signs of execution, and then attest to the viability of the asset review announced by Vale in the base metals' unit, as we have also commented, we believe that this skeptical movement is not fundamentalist. On the other hand, we cannot fail to recognize that there are some **execution risks**, and we cite examples throughout the report. To summarize: **(i)** overestimation by Vale of the cost reduction, **(ii)** longer transition from mines operated in the open pit model to underground, **(iii)** change in extraction strategy and cut-off grade may not result in the intended effect, **(iv)** potential difficulties in re-establishing operating licenses in Onça Puma and Sossego, or new licensing restrictions with regulatory bodies in the future in key assets of the expansion project.

As a result of these execution risks, in our model we have modified the assumptions to reflect the asset review promoted by Vale, but with a lighter tone than those commented on in the presentation.

This approach allows us to continue with a **more conservative stance** and prove that even using assumptions that, in general, result in worse outputs than the various production, cost and CAPEX guidance's that Vale provides for VBM and the ferrous division, our model still generates a Target Price well above the company's current market valuation levels, giving us comfort to state that the **shares continue to have a high degree of discount vs. their fair value**.

Thus, after modifying assumptions enabling the **(i)** expansion of production (~70% of what was announced), **(ii)** increase in CAPEX (+10% above what was announced), as well as a **(iii)** cost cut (~20% less efficient vs. what was announced), with all 3 points at less beneficial intensities than what Vale mentioned in yesterday's presentation for copper and nickel, we arrived at an **increase of +US$3.5bn in Equity Value** (-42% vs. what was disclosed by the company). Therefore, although we have been conservative, due to the changes, we believe that **VBM will contribute more to the company's fair valuation** and we **increase our 12M Target-Price** of **VALE3** to **R$78.50** (vs. 73.50 previously) and **12M Target-Price** of **ADRs-NYSE** to **US$14.50** (vs. US$13.70 previously), resulting in an **upside** of **+27.85%**.

Appendix: Vale

Figure 1. Vale – Income Statement in US$ Millions (Genial Est. 2024-2029)

Income Statement	2024E	2025E	2026E	2027E	2028E	2029E
Net Revenue	**37.042**	**41.308**	**42.539**	**44.345**	**45.317**	**48.849**
(-) COGS	(23.877)	(26.217)	(26.498)	(27.575)	(29.043)	(31.387)
Gross Profit	**13.165**	**15.091**	**16.042**	**16.770**	**16.273**	**17.461**
(-) Expenses	(3.420)	(3.321)	(3.186)	(2.796)	(2.448)	(2.584)
Adjusted EBITDA	**12.894**	**15.535**	**16.332**	**17.612**	**17.636**	**18.850**
(-) D&A	(3.194)	(3.373)	(3.543)	(3.715)	(3.895)	(4.066)
EBIT	**9.700**	**12.162**	**12.789**	**13.897**	**13.741**	**14.785**
(+/-) Financial Result	(1.865)	(1.927)	(2.244)	(2.321)	(2.286)	(2.353)
(-) Taxes	(1.010)	(1.395)	(1.509)	(1.661)	(1.644)	(1.791)
Net income	**6.825**	**8.840**	**9.037**	**9.914**	**9.811**	**10.641**
Profitability						
Net margin (%)	18,43%	21,40%	21,24%	22,36%	21,65%	21,78%

Figure 2. Vale– Cash Flow in US$ Millions (Genial Est. 2024-2029)

Cash Flow (FCFF)	2024E	2025E	2026E	2027E	2028E	2029E
Net Revenue	**37.042**	**41.308**	**42.539**	**44.345**	**45.317**	**48.849**
(-) COGS	(23.877)	(26.217)	(26.498)	(27.575)	(29.043)	(31.387)
Adjusted EBITDA	**12.894**	**15.535**	**16.332**	**17.612**	**17.636**	**18.850**
Adjusted EBIT	**9.700**	**12.162**	**12.789**	**13.897**	**13.741**	**14.785**
(-) Taxes	(1.010)	(1.395)	(1.509)	(1.661)	(1.644)	(1.791)
(+) D&A	3.194	3.373	3.543	3.715	3.895	4.066
(+/-) Brumadinho and Samarco	(570)	(2.198)	(1.874)	(1.389)	(1.221)	(923)
(+/-) Δ WK	3.444	835	151	(49)	(176)	(70)
(-) Capex	(6.719)	(6.792)	(6.792)	(7.333)	(7.333)	(7.333)
FCFF	**8.039**	**5.984**	**6.308**	**7.179**	**7.261**	**8.732**

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	Definition	Coverage
Buy	Expected return above +10% in relation to the Company's sector average	**49%**
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