



Moody's atualiza opinião de crédito sobre a Vale

Vale Rio de Janeiro, 07 de outubro de 2024 – Em continuidade ao relatório divulgado em 2 de outubro de 2024 pela Moody's Investor Service ("Moody's" ou a "agência"), a Vale S.A. ("Vale" ou "Companhia") informa que a agência atualizou hoje seus relatórios com opinião de crédito sobre a Companhia, com *rating* Baa2, e sobre a Vale Canadá Ltd. (subsidiária da Vale Base Metals Ltd.), com *rating* Baa3. O relatório emitido pela Moody's no idioma inglês está disponível para consulta. Uma versão em tradução livre para a idioma português será divulgada ao mercado em breve.

Murilo Muller
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CREDIT OPINION

4 October 2024

Update

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RATINGS

Vale S.A.

Domicile	Rio de Janeiro, Brazil
Long Term Rating	Baa2
Type	LT Issuer Rating - Dom Curr
Outlook	Positive

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Vale S.A.

Update following upgrade to Baa2, outlook remains positive

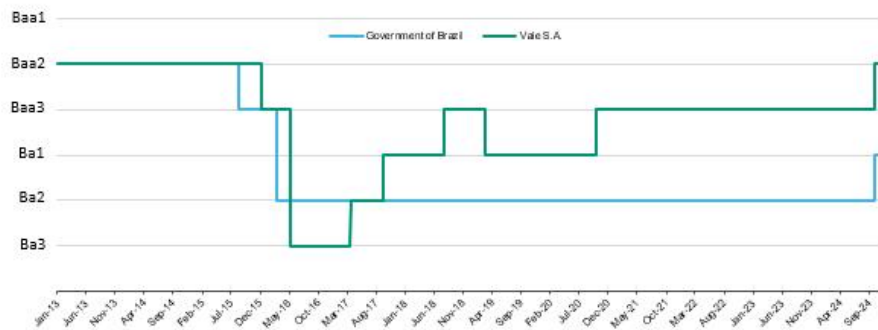
Summary

On 2 October, we upgraded [Vale S.A.](#)'s rating to Baa2, maintaining the positive outlook. The rating action follows the upgrade of the [Government of Brazil](#)'s issuer and senior unsecured ratings to Ba1, maintaining the positive outlook on 1 October. Vale's rating is constrained by the sovereign rating as a result of its asset concentration in Brazil (about 69% of total fixed assets). To be rated more than two notches above the sovereign rating, Vale would need to have a substantial majority of its operating assets located outside the country and generate a substantial majority of its cash flow from outside the country.

Vale's rating continues to reflect its strong business profile as one of the largest iron ore producers and one of the largest nickel producers globally, and its ability to resume operations under stricter risk and safety controls after the dam incident in Brumadinho in January 2019, with greater production flexibility. Vale's portfolio of long-lived assets (in iron ore, nickel and copper), relatively low cost position and strong balance sheet, with leverage below 1x (total debt/EBITDA) since 2020, further support the rating.

Exhibit 1

Vale's rating is constrained by Brazil's sovereign rating



Source: Moody's Ratings

Credit strengths

- » Large scale in the global iron ore and nickel markets, with growing position in copper
- » Competitive cost position and focus on profitability in iron ore and base metals
- » Low leverage and comfortable debt amortization schedule, which help it better manage commodity price volatility
- » Reduction in environmental, social and governance (ESG) risks with an improvement in corporate governance, risk management and operational safety

Credit challenges

- » Cash outflow related to the tailings dam accidents — in Brumadinho and Mariana (Samarco Mineração S.A. [Samarco]) — and uncertainty around the amount of support Samarco will require from Vale
- » Concentration in iron ore, which makes the company's performance dependent on steel industry fundamentals, in particular the steel production levels in China
- » Building a track record of stable operations, in particular related to the safety of tailings dams

Rating outlook

The positive outlook reflects the expectation that Vale will maintain its strong business profile and credit metrics, keeping its financial discipline in capital allocation, strong liquidity and a conservative balance sheet while it continues to invest in growth, with the expansion in nickel and copper leading to a more balanced cash flow contribution between iron ore and base metals. The positive outlook also incorporates our expectation that there will be no significant increase in provisions and cash disbursements related to Brumadinho or Samarco that could affect the company's liquidity or leverage.

Factors that could lead to an upgrade

An upward rating movement would require a sustainably strong performance through different industry cycles and continued disciplined approach to capital allocation related to capex and shareholder returns. Moreover, an upgrade of Vale's rating would require continued evidence of enhanced risk control and governance oversight, with production gradually normalizing and no material additional provisions or cash disbursements related to the incidents in Brumadinho or Samarco. An upgrade would also depend on the maintenance of a solid liquidity and positive free cash flow generation, supported by leading market positioning in its main segments and low-cost operations. Quantitatively, an upgrade would also require:

- » Moody's-adjusted total debt/EBITDA to remain below 1.5x
- » EBIT/interest expense to remain above 7x on a sustained basis and (cash flow from operations [CFO] - dividends)/debt to remain consistently above 45%

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

Factors that could lead to a downgrade

We could downgrade Vale's ratings should the ultimate costs related to the disasters in Brumadinho or disbursements related to Samarco be materially above the amounts already provisioned due to higher fines and settlements, litigations and class actions, or if operations do not fully recover within the expected time frame, affecting cash costs and free cash flow generation. Evidence that ESG initiatives are not on track to further de-risk the company could also lead to a negative rating action. A marked deterioration in the company's liquidity would also trigger a downgrade, as would a downgrade of the Government of Brazil rating. Quantitatively, negative pressure on the rating or outlook could arise if market conditions for iron ore and base metals deteriorate, leading to lower profitability, with:

- » leverage (total debt/EBITDA) trending toward 2.25x or above
- » EBIT/interest expense falling below 5.5x
- » (CFO - dividends)/debt remaining below 35%

Key indicators

Exhibit 2

Vale S.A.

US Millions	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	LTM (Jun-24)	Moody's Forward View for the Next 12-18 Months
Revenue	37,570.0	39,545.0	54,502.0	43,839.0	41,784.0	42,056.0	41,633.2
EBIT Margin %	17%	34%	50%	40%	32%	30%	34%
EBIT / Interest Expense	5.0x	14.9x	33.9x	19.9x	11.5x	11.2x	13.7x
Debt / EBITDA	1.6x	1.0x	0.5x	0.6x	0.9x	1.0x	0.8x
Debt / Book Capitalization	28%	30%	27%	25%	25%	28%	22%
(CFO - Dividends) / Debt	76%	71%	88%	39%	55%	42%	60%
FCF / Debt	52%	43%	51%	-4%	12%	0%	18%

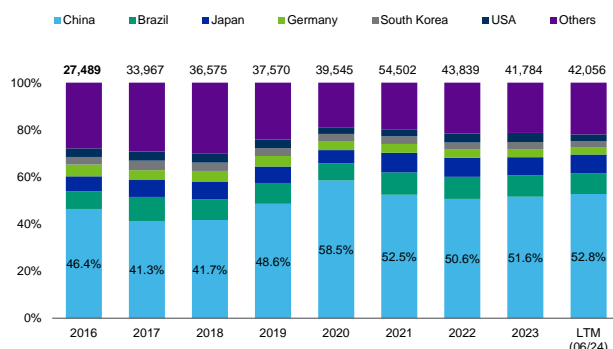
All figures and ratios are calculated using Moody's estimates and standard adjustments. Moody's forecasts (f) or projections (proj.) are Moody's opinion and do not represent the views of the issuer. Periods are financial year-end unless indicated.

Source: Moody's Ratings

Profile

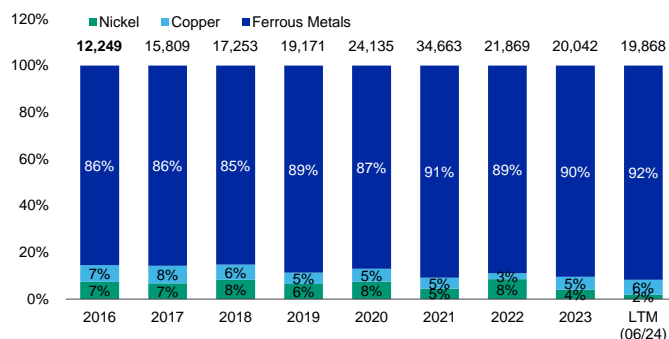
Headquartered in Rio de Janeiro, Vale S.A. is one of the world's largest mining companies. It is among the world's top producers of iron ore and nickel, with relevant operations in copper and supplemental positions in energy production. The company's principal mining operations are in Brazil, Canada and Indonesia. Despite Vale's geographic and commodity diversification, its Brazilian iron ore operations and its strong position in the seaborne iron ore markets remain the main drivers of revenue and cash flow. As of June 2024, ferrous minerals (primarily iron ore and pellets) accounted for around 84% of the company's net revenue, while the remaining 16% was mainly related to energy transition metals (primarily nickel and copper). In the 12 months that ended June 2024, Vale reported net operating revenue of \$42.1 billion.

Exhibit 3
Despite a diversified revenue base, China, as the largest steel producer globally, consistently accounts for majority of revenues
 In \$ millions



Source: Company filings

Exhibit 4
EBITDA remains highly concentrated in iron ore
 In \$ millions



Adjusted EBITDA from continuing operations reported in Vale's filings.
 Source: Company filings

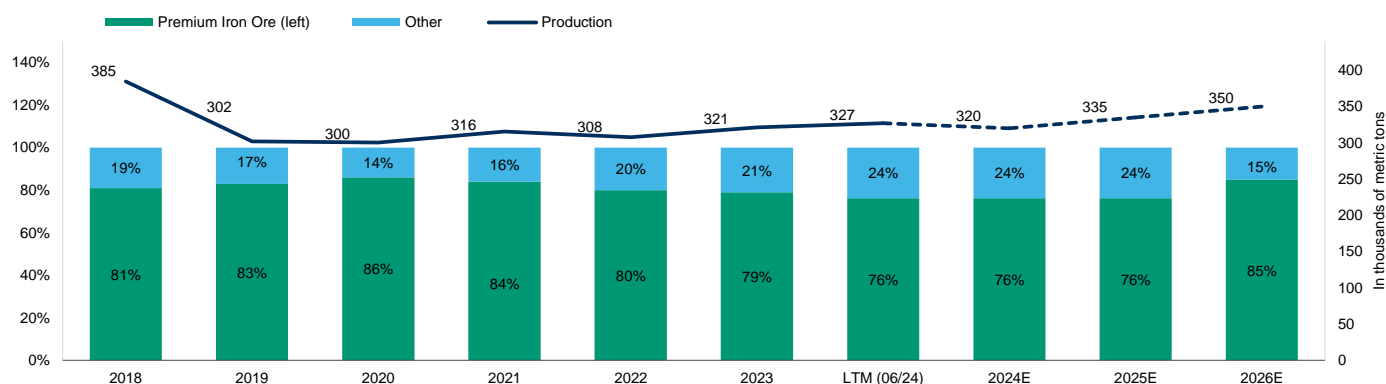
Detailed credit considerations

Continued expansion of iron ore production will support strong business profile and reduce costs

Vale is one of the world's largest diversified mining companies (along with [Rio Tinto Limited](#) [A1 stable], [BHP Group Limited](#) [BHP, A1 stable] and [Anglo American plc](#) [Baa2 stable]). Vale's large scale and low-cost profile have historically supported its strong credit metrics. Vale benefits from its global business platform, and significant strength in iron ore and base metals, in particular nickel. With growth projected in copper, the company will become a relevant global copper producer in the long run (beyond 2030).

Iron ore production volumes in 2024 will be within 323-330 million tons, from a previous estimate of 310-320 million tons. Vale expects to reach 340-360 million tons of annual production capacity by 2026 after completing its projects in the Vargem Grande complex (expected start-up in the fourth quarter of 2024), Capanema (expected start-up in H1 2025) and S11D (expected start-up in H2 2026). Beyond 2030, Vale aims to produce more than 360 million tons but with a much stronger focus on high-quality products, closer to 64%-65% iron content. Vale expects to increase the share of premium products (Carajas ore, Brazilian Blend Fines, pellets and briquettes) to 85% in 2026 and 90% in the long run from the current level of 79%, compared with 53% in 2015. At the same time, Vale will increase the share of high-grade iron ore agglomerates over time.

Exhibit 5
Vale will see its share of premium iron ore rise, which should bring higher margins



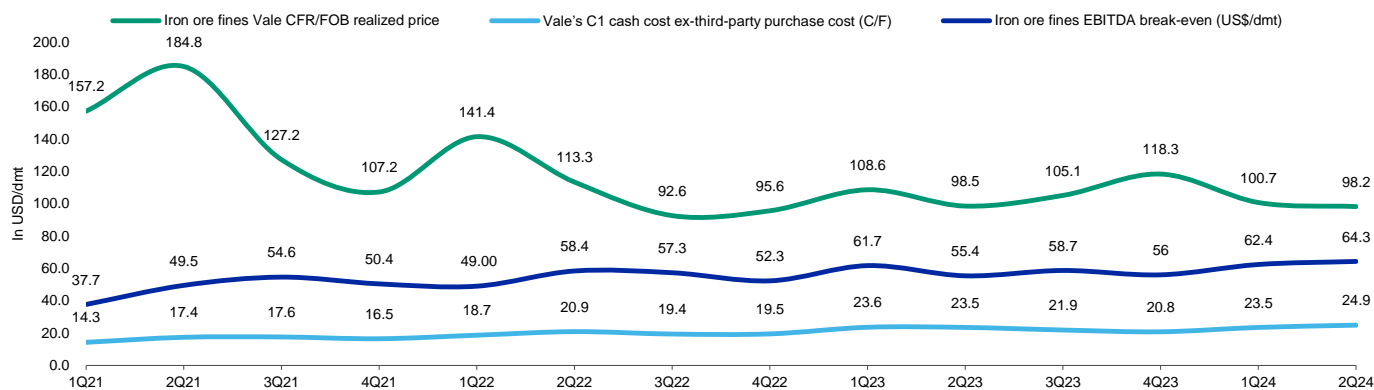
Source: Company's filings

Despite Vale's large scale, the company experienced an increase in costs in 2023-24. C1¹ cash costs totaled \$24.9 per ton (excluding third-party purchases) in Q2 2024, up from \$20.9 per ton in Q2 2022, but only slightly higher than the \$23.5 per ton in Q2 2023.

This significant increase is explained by the effect of overall inflationary pressures on the mining industry, such as on diesel and raw materials, including freight costs. Vale expects C1 cash costs to decline toward \$21.5-\$23.0 per ton by the end of 2024 and below \$20 per ton in 2026 and beyond, which is in line with that of large iron ore producers globally. This cost decline will be supported by higher volumes, allowing higher cost dilution, and productivity gains during the year.

Exhibit 6

Iron ore C1 cash costs (excluding third-party purchases) and breakeven cost increased because of industrywide cost pressures but will decline already in 2H2024
\$/dry metric ton (dmt)



Source: Company's filings

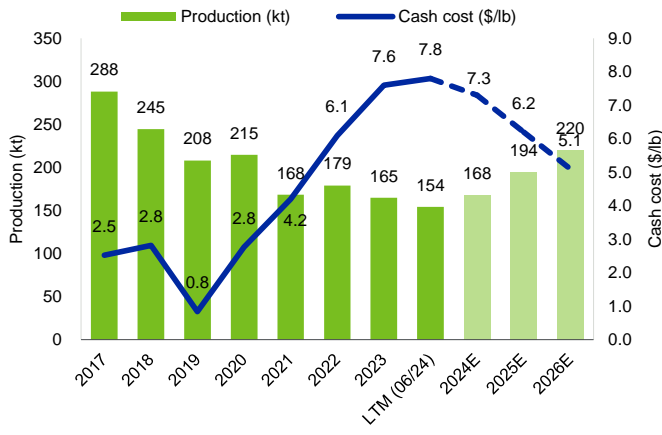
Expansion in base metals will enhance diversification and bring higher earnings stability

Vale has a significant pipeline of projects to expand production of copper and nickel, and increase the contribution of base metals in consolidated results.

The increase in base metal production volumes will reduce Vale's cash flow reliance on iron ore, expand its geographic diversification and position it as a relevant participant in commodities that will experience higher demand on the back of energy transition.

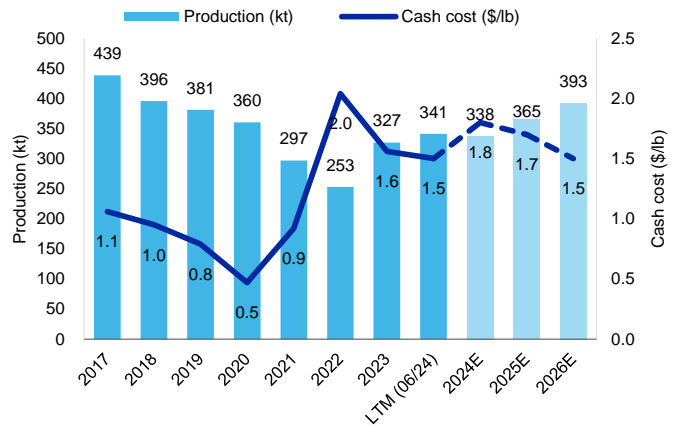
In nickel, Vale plans to reach annual production of 153,000-168,000 tons in 2024 supported by projects currently underway in Canada (Sudbury, Voisey's Bay and Thompson) from the current 154,000 tons, and to increase further to 210,000-230,000 tons (including participation in JV in Indonesia) supported by projects in Canada and Brazil (Onça Puma). To reach its long-term goal of 300,000 tons of annual production of nickel, Vale will rely mainly on its projects based in Indonesia and Canada. In copper, growth will come from projects in Brazil and Canada, with annual production estimated at 320,000-355,000 tons in 2024 and 394,000-431,000 tons in 2026. In the long run, Vale plans to reach around 900,000 tons of copper production on the back of growth in Brazil and Indonesia.

Exhibit 7
Nickel production will increase, while costs will decline



Historical includes New Caledonia. Moody's forecasts are Moody's opinion and do not represent the views of the issuer.
 Sources: Company's filings and Moody's Ratings

Exhibit 8
Copper production will increase as well, and Vale will become a key player in this commodity

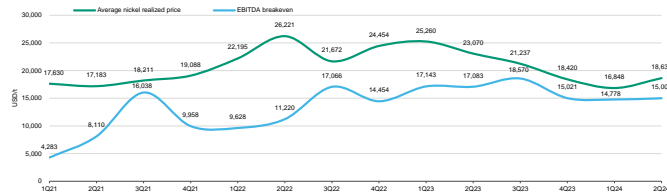


Moody's forecasts are Moody's opinion and do not represent the views of the issuer.
 Sources: Company's filings and Moody's Ratings

All-in costs for base metals (copper and nickel) remain below market prices. Vale expects all-in costs for nickel to remain within \$15,000-\$16,500 per ton in 2024, supported by higher volumes, but higher than the previous guidance of \$14,500-\$16,000 per ton. Copper cash costs should decline toward \$3,300-\$3,800 per ton, lower than the previous guidance of \$4,000-\$4,500 ton in 2024, with the ramp-up of Salobo and higher by-product volumes.

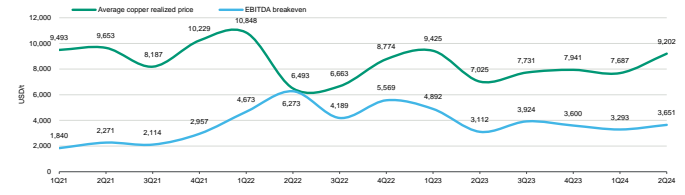
Over time, energy transition will further support demand for nickel and copper, and we expect stronger EBITDA contribution from these two metals to the consolidated cash flow of Vale.

Exhibit 9
EBITDA breakeven for nickel still high, close to average realized prices



Source: Company's filings

Exhibit 10
EBITDA breakeven for copper better positioned relative to average realized prices



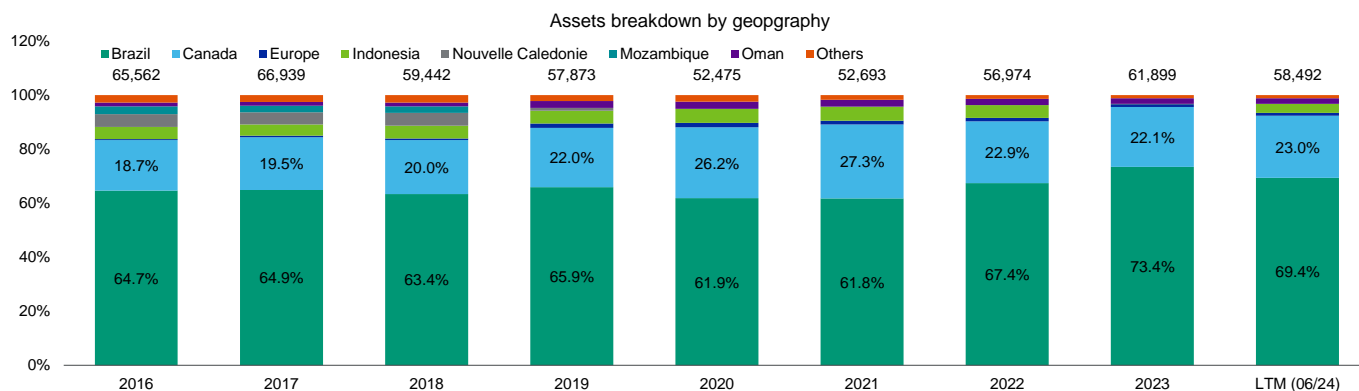
Source: Company's filings

Iron ore asset concentration in Brazil constrains the rating

Vale is currently rated two notches above the rating of the Government of Brazil, supported by Vale's position as the largest iron ore producer globally, with its cash flow and profitability having minimal correlation with domestic economic conditions. Vale is highly unlikely to default as a consequence of sovereign credit stress or default because its high reliance on China and large developed countries provides reasonable insulation from Brazil's macroeconomic and political environment. About 90% of Vale's revenue is generated outside Brazil. Moreover, cash generated outside Brazil covers debt service and principal payment, and, therefore, restrictions on capital flows are unlikely to constrain Vale's ability to service debt.

However, about 69% of Vale's total fixed assets are located in Brazil, most of which are iron ore, followed by Canada at about 24%. To be rated more than two notches above the sovereign rating, a company would need to have a substantial majority of its operating assets located outside the country and generate a substantial majority of its cash flow outside of the country. Given Vale's large share of assets in Brazil and high cash flow reliance on assets located in the country, the sovereign rating remains a constraint to the company's rating.

Exhibit 11
Significant asset concentration in Brazil, followed by Canada
 In \$ millions



Source: Company's filings

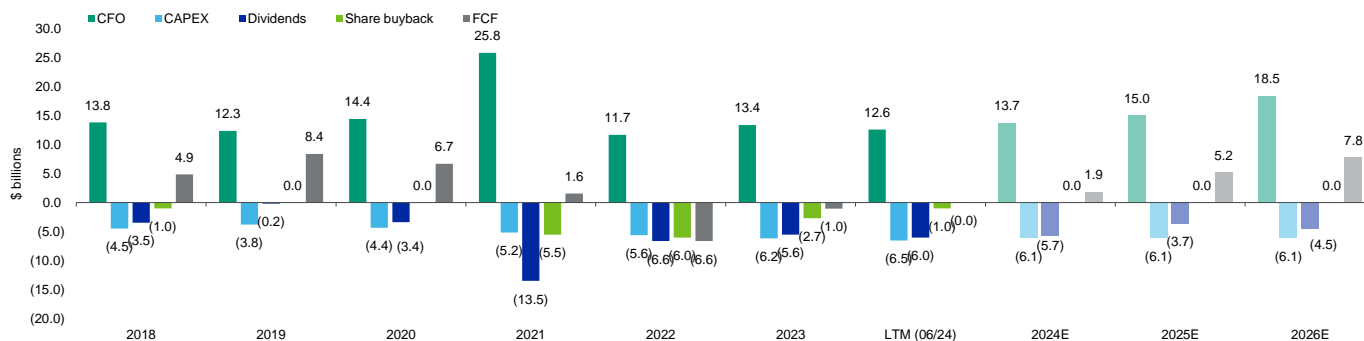
Disciplined capital allocation and conservative financial policy are relevant considerations to support a strong credit profile

Vale has a conservative approach to capital allocation relative to capital spending, dividend distribution and debt levels. Gross debt and leases increased to \$15.1 billion as of the end of June 2024, from \$13.9 billion at the end of 2023, a temporary increase, as Vale issued \$1 billion in bonds in June 2024, as part of a liability management initiative, while the settlement of the tender offer for some of its bonds happened in July 2024.

Because of the maintenance of a higher capital spending in the first two quarters of 2024, Vale posted a negative FCF, but improvements in working capital should improve FCF generation in the last two quarters of 2024 and in 2025.

Vale's dividend payout is based on the policy established in March 2018, which is 30% of (EBITDA - sustaining capital spending), with payments set twice a year — in September for H1 results and in March of the following year for H2 results.

Exhibit 12
Lower iron ore prices and higher capital spending temporarily reduced FCF generation, but we expect stronger positive FCF supported by higher volumes (iron ore and base metals)



Source: Company's filings

Vale's leverage (Moody's-adjusted total gross debt/EBITDA) was 1.0x for the 12 months that ended June 2024, and it has remained below 1x since 2020. Some of the company's financing documents contain covenants related to debt/EBITDA and the interest coverage ratio, but debt with financial covenants represents less than 20% of its total debt. The company is in full compliance with these covenants.

Although most of Vale's iron ore and mining operations are under the parent company, it also has subsidiaries, associates and joint venture (JV) interests, both domestically and abroad. Although some of these entities may have debt and creditor obligations, which have the first claim on cash flow before distribution to the parent, they are relatively modest compared with the assets held within and the earnings generated by the parent company. Vale's debt-financing requirements are met by bonds, bank loans, debentures and other trade finance vehicles. [Vale Overseas Limited](#) (Baa2 positive), incorporated as a Cayman Islands-domiciled company, is a wholly owned finance subsidiary of Vale and is used as a vehicle to issue US dollar-denominated notes.

Samarco debt restructuring plan reduced uncertainties, but uncertainties related to final agreement remains

Since 2001, Samarco has operated as a 50:50 JV between the mining companies Vale and BHP. On 5 November 2015, an incident involving a tailings dam led to the suspension of all operations at Samarco. The operations resumed only in late 2020, with a production capacity of 7 million–8 million tons per year (about 25% of total capacity), which will increase to 16 million in 2025 and 27 million tons from 2028 onward, subject to the startup of two concentrators.

In March 2016, Samarco, Vale and BHP signed a 15-year agreement with the federal authorities, with the creation of the Renova Foundation to fund environmental, social and economic remediation and reparation programs as set by the framework agreement. In June 2018, a new agreement was established to improve the governance mechanism of the Renova Foundation and establish a process for the revision of the remediation programs. Further revisions to the reparation programs are contemplated, which could potentially increase the amounts required to fund these programs.

Exhibit 14

Provisions and expenses related to the Samarco accident since 2016

In USD million	2016	2017	2018	2019	2020	2021	2022	2023	LTM (06/24)
Balance at the beginning of period		1,077	996	1,121	1,700	2,074	3,112	3,321	4,427
Provisions	1,163	38	403	758	1,095	1,700	89	1,200	(58)
Disbursements	(133)	(234)	(290)	(315)	(394)	(392)	(338)	(553)	(191)
Others adjustments	53	175	12	136	(327)	(270)	458	459	(471)
Balance at the end of period		1,077	996	1,121	1,700	2,074	3,112	4,427	3,707
Working capital contributions to Samarco	71	142	84	102	166	21	0	0	0

Source: Company filings

In April 2021, Samarco filed for judicial reorganization to restructure its liabilities. In H2 2023, Samarco had its judicial recovery plan confirmed by Brazilian and US courts. As part of this plan, Samarco issued \$3.9 billion in senior unsecured notes in December 2023 in exchange for the previous notes outstanding. Moreover, Samarco raised \$250 million with the issuance of senior unsecured notes due 2031, with a 100% backstop from the shareholders (Vale and BHP).

The rationale of the debt restructuring supported by the judicial recovery plan is to allow Samarco to invest as needed to increase production volumes while the company has a cap on obligations related to the Renova Foundation, which protects debtholders as it limits the risk of additional liabilities compromising Samarco's ability to service debt. However, as disbursements are capped at Samarco, any contribution above the cap or any additional obligations will be the responsibility of Vale and BHP as shareholders, through equity contributions to Samarco. As of June 2024, Vale had \$3.7 billion in provisions related to Samarco, including an additional \$1.2 billion, reflecting the changes in estimates of potential outflows related to Samarco's obligations. Our base case is that current provisions incorporate the risk of additional liabilities.

During 2024, Samarco, Vale and BHP Billiton Brasil LTDA, indirect subsidiary of [BHP Group Limited \(A1, Stable\)](#) have engaged in mediation with the Brazilian authorities for a definitive settlement of obligations under the Framework Agreement, the Federal Public Prosecution Office Claim and other claims by government entities relating to the Samarco dam failure. On 11 June 2024, Samarco, Vale and BHP submitted a new proposal for BRL140 billion, including BRL37 billion already invested in remediation and compensation, an BRL82 billion cash payment to be disbursed over 20 years and BRL21 billion in obligations yet to be fulfilled to be performed.

Samarco remains the primary obligor, while Vale and BHP will share the obligations that cannot be funded by Samarco in equal parts. There are no immediate credit implications for Vale as the final terms and conditions have not been settled. We will be able to assess the implications for Vale's liquidity when a final settlement is achieved. A final agreement would be positive in the sense that it would bring legal certainty on the final amount related to Samarco, bringing cash flow visibility and reducing the risk of additional amounts being disbursed in the future.

Moreover, in December 2022, BHP filed a "Contribution Claim" against Vale, requesting the company to share the indemnification established in the "UK Claim" against BHP in a group action for damages filed in the courts of UK and Wales by groups deemed affected by the Samarco dam breach. In July 2024, Vale has disclosed that entered into an agreement with BHP in relation to the UK claims. The Contribution Claim is still ongoing and there has not been any decision on their merits.

In March 2024, a court in Amsterdam granted a preliminary injunction freezing the shares in Vale Holdings B.V. and the economic rights attached to those shares, as a guarantee of an amount of around \$986 million (€920 million). The freezing orders were issued in anticipation of a legal action to be brought against Vale by certain Brazilian municipalities and an organization that represents individuals and small businesses that claim to have been affected by the collapse of the Samarco dam. The first court event for Vale in the Dutch court is likely to take place in Q1 2025.

Continued improvements in safety of tailings dams reduce risks related to Brumadinho

An important component of lowering the risk of tailings dam incidents is increasing the share of dry processing production using natural moisture of the ore to 69% of total iron ore production in 2023 from 40% in 2014, while 15.5% of total production relies on dry stacking and only 15.5% relies on tailings dams (not upstream dams), which significantly reduces the risk of tailings dams. Out of the 30 inactive upstream dams of Vale in 2019, 15 were de-characterized by September 2024 and 15 will go through the decharacterization process. As of the end of June 2024, Vale booked \$2.7 billion in provisions for the de-characterization of tailings dams and \$2.4 billion related to the Brumadinho dam incident, including provisions for remediation and reparation obligations under the judicial settlement for reparation, individual indemnification and other commitments.

In February 2021, Vale announced reaching a BRL37.7 billion (around \$7 billion) agreement with Brazilian authorities for the reparation of the environmental and social damage resulting from the accident at Brumadinho, which has largely resolved the uncertainty around the collective damage. Out of a total of BRL37.7 billion under the framework agreement, Vale had already achieved 75% of reparations as of June 2024, including disbursement in excess of 87% of the to-pay obligations and completing more than 25% of the to-do obligations.

Exhibit 15

Provisions and expenses related to the Brumadinho accident since 2019

In USD millions	2019	2020	2021	2022	2023	LTM (06/24)
Balance at the beginning of the period		5,472	6,864	7,060	6,611	6,511
Provisions	6,550	4,747	1,926	472	629	(151)
Disbursements	(989)	(2,122)	(1,726)	(1,440)	(1,788)	(651)
Other adjustments	(89)	(1,233)	(4)	578	1,059	(559)
Balance at the end of period	5,472	6,864	7,060	6,611	6,511	5,150

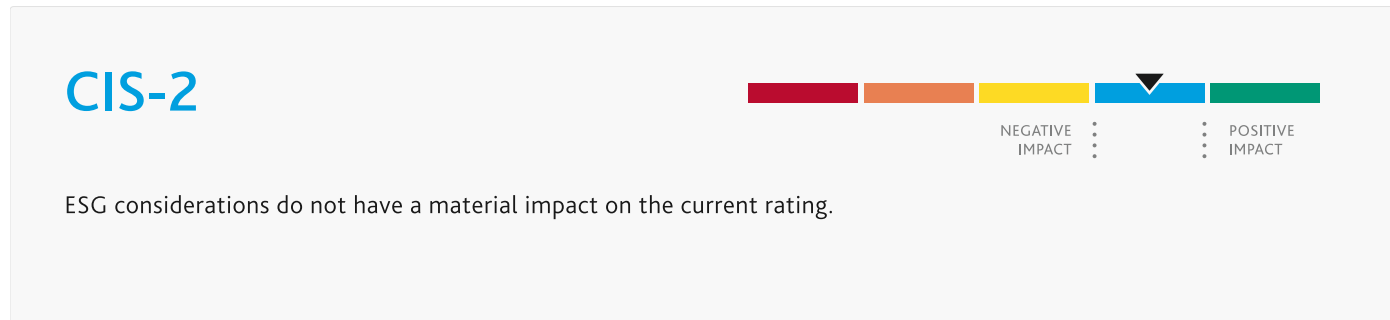
Source: Company's filings

ESG considerations

Vale S.A.'s ESG credit impact score is CIS-2

Exhibit 16

ESG credit impact score



Source: Moody's Ratings

Vale's credit Impact score reflects our assessment that ESG attributes are overall considered as having a neutral-to-low impact on the current rating, because the rating is constrained by the sovereign rating of the government of Brazil. Still, Vale has high exposure to environmental risks associated primarily with natural capital (mine closure and decommissioning of structures) and waste and pollution (including tailings dams). Vale's high exposure to social risks arise mainly from health and safety concerns around the operations as well as responsible production, given the previous tailings dams accidents. The company's governance considerations reflect Vale's financial strategy, strong balance sheet, solid liquidity and enhanced risk management following the dam collapse in 2019.

Exhibit 17

ESG issuer profile scores



Source: Moody's Ratings

Environmental

Vale credit exposure to environmental risks mainly related to natural capital and waste and pollution. The tailing dam incident in Brumadinho in 2019, which resulted in a large number of fatalities, extensive environmental damage and loss of production, and resulted in fines (\$7 billion settlement) and litigations is an important consideration, as tailings dam management is the primary waste and pollution risk for this sector. Vale's operations are located in areas of abundant water availability, but has certain exposure to physical climate risk, in particular floods during the summer season in southern Brazil. However, Vale's large scale and footprint, and mine diversification mitigates climate hazards. Moreover, carbon transition risk is mitigated by the growing portfolio of base metals products, including nickel and copper, which will benefit by growing demand from energy transition.

Social

Vale is exposed to social risks, in particular those related to health and safety and responsible production. Improvements in safety of operations through initiatives taken to enhance the risk management control, particularly as the company progresses with the decommissioning of upstream tailings dams, jointly with the construction of backup dams (containment structures) and preventive removal of workers and civil population of riskier areas, have reduced the exposure to social risks, in particular health and safety. However, the tailings dam incident and its implications related to safety of operations, employee well-being and community stakeholder engagement and reputation remains an important credit consideration, reflected mostly in responsible production. Vale's

exposure to other social risks such as human capital is not as high as most mining companies, given the absence of union disputes and strikes, while exposure to demographic and societal trends is somewhat mitigated by the company's exposure to commodities (copper, nickel) that are linked to battery production and the green economy, despite the concentration in iron ore.

Governance

Vale's governance score reflects Vale's solid financial strategy, strong balance sheet, robust liquidity and enhanced risk management after the tailings dam accident in January 2019.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

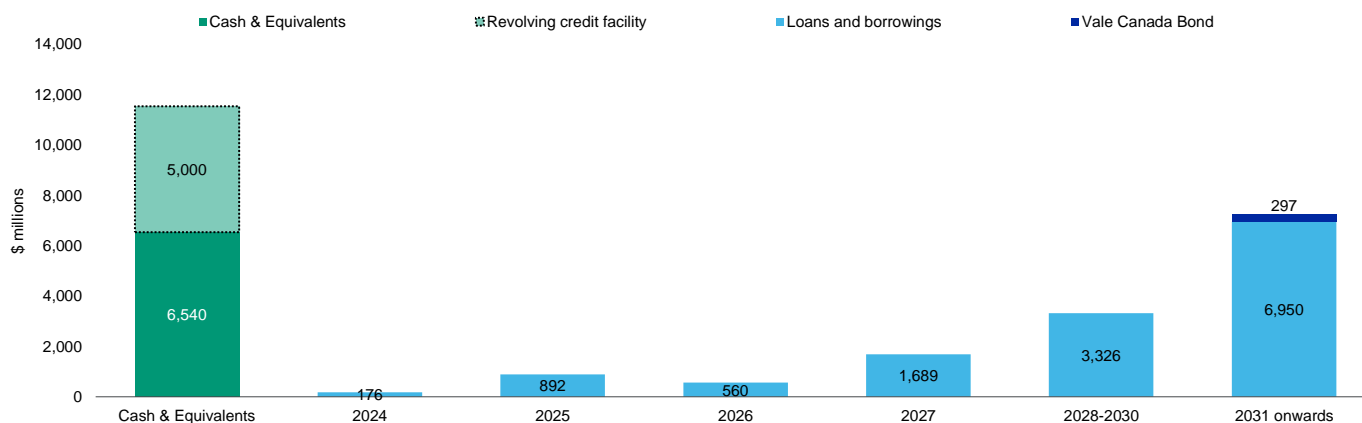
Liquidity analysis

Vale has excellent liquidity for the next 12 months. As of June 2024, the company had \$6.5 billion in cash and \$5.0 billion available under its revolving credit facility agreements (\$3 billion due in February 2029 and \$2 billion due in November 2026). The company generated cash flow from operations of \$12.6 billion in the 12 months that ended June 2024, and after dividend distribution of \$6 billion and capital spending of \$6.5 billion, FCF totaled \$122 million. Vale disbursed around \$979 million in share buybacks in the 12 months that ended in June 2024.

Vale has maintained stable financial debt levels (\$12 billion-\$14 billion) since 2019, with most of the maturities after 2028.

Exhibit 18

Debt amortization schedule as of June 2024; total reported financial debt of \$13.9 billion



Does not include accrued interest and leases.
Sources: Company filings and Moody's Ratings

Structural considerations

[Vale Canada Ltd.](#)'s Baa3 senior unsecured rating, at the same level as Vale Base Metals (VBM) rating, reflect the intrinsic operational, financial, strategic and legal links between Vale Canada, VBM and Vale S.A. The current one-notch differential to Vale's rating reflects the fact that Vale does not guarantee Vale Canada's 2032 notes (\$279 million outstanding as of June 2024). But the rating incorporates Vale's ability to support Vale Canada (the bond represents only 2% of the total financial debt held by Vale). Although Vale Canada's contribution to Vale's consolidated revenue (8.4% as of the last twelve months finished in June 2024 and 11% in 2023) is relatively small, the business is an important component of the main parent company's strategy for growth and diversification in base metals. Vale Canada is part of VBM, a company created in 2023 that incorporates base metal assets within Vale, namely nickel and copper assets in Brazil, Canada and Indonesia.

Methodology and scorecard

Vale's scorecard-indicated outcome under our Mining rating methodology is A3, based on data for the 12 months that ended June 2024. On a forward-looking basis for the next 12-18 months, the scorecard-indicated outcome is A2 under an iron ore price assumption of \$90/ton, which is below the average market price for the past 12 months. The current rating is Baa2, which remains constrained by the sovereign rating.

Exhibit 19

Rating factors

Vale S.A.

Methodology: Mining published on 30 Jun 2024	Current LTM (Jun-24)		Moody's Forward View Next 12-18 months (as of Oct-24)	
	Measure	Score	Measure	Score
Factor 1: SCALE (20%)				
a) Revenues (USD Billion)	\$42.1	A	\$41.0 - \$42.0	A
Factor 2: BUSINESS PROFILE (25%)				
a) Business Profile	Baa	Baa	Baa	Baa
Factor 3: PROFITABILITY AND EFFICIENCY (10%)				
a) EBIT Margin (EBIT / Revenue)	30.4%	A	33.0%-35.0%	A
Factor 4: LEVERAGE AND COVERAGE (30%)				
a) EBIT / Interest Expense	11.2x	A	12.0x - 15.0x	A
b) Debt / EBITDA	1.0x	Aa	0.7x - 0.8x	Aa
c) Debt / Total Capital	28.3%	Aa	21% - 23%	Aa
d) (CFO - Dividends) / Debt	42.2%	Baa	54% - 66%	Aa
Factor 5: FINANCIAL POLICY (15%)				
a) Financial Policy	Baa	Baa	Baa	Baa
Rating Outcome:				
a) Scorecard Indicated Outcome		A3		A2
b) Actual Rating Assigned				Baa2

[1] All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations. [2] As of 6/30/2024(L). [3] This represents our forward view, not the view of the issuer, and unless noted in the text, does not incorporate significant acquisitions and divestitures.

Source: Moody's Ratings

Ratings

Exhibit 20

Category	Moody's Rating
VALE S.A.	
Outlook	Positive
Issuer Rating - Dom Curr	Baa2
Senior Unsecured	Baa2
VALE OVERSEAS LIMITED	
Outlook	Positive
Bkd Senior Unsecured	Baa2
VALE BASE METALS LIMITED	
Outlook	Stable
Issuer Rating	Baa3
VALE CANADA LTD.	
Outlook	Stable
Senior Unsecured	Baa3

Source: Moody's Ratings

Appendix

Exhibit 21

Peer Comparison

Vale S.A.

(in US millions)	Vale S.A.			Rio Tinto			Fortescue Ltd			Anglo American plc			BHP Group Limited		
	Baa2 Positive			A1 Stable			Ba1 Stable			(P)Baa2 Stable			(P)A1 Stable		
	FYE Dec-22	FYE Dec-23	LTM Jun-24	FYE Dec-22	FYE Dec-23	LTM Jun-24	FYE Jun-23	FYE Jun-24	LTM Jun-24	FYE Dec-22	FYE Dec-23	LTM Jun-24	FYE Jun-23	FYE Jun-24	LTM Jun-24
Revenue	\$43,839	\$41,784	\$42,056	\$55,554	\$54,041	\$54,176	\$16,871	\$18,220	\$18,220	\$35,127	\$30,656	\$29,446	\$53,617	\$55,858	\$55,658
EBITDA	\$20,581	\$16,199	\$15,838	\$23,893	\$20,954	\$21,104	\$9,895	\$10,757	\$10,757	\$14,073	\$9,755	\$9,508	\$27,393	\$25,436	\$25,436
Total Debt	\$12,981	\$14,226	\$15,433	\$12,943	\$14,913	\$14,860	\$5,321	\$5,400	\$5,400	\$15,395	\$17,705	\$20,220	\$24,096	\$22,235	\$22,235
EBIT Margin	40.4%	31.7%	30.4%	34.3%	29.3%	29.0%	48.3%	47.3%	47.3%	32.7%	22.8%	22.1%	41.4%	36.2%	36.2%
EBIT/Avg. Tang. Assets	22.6%	16.6%	16.3%	20.0%	16.7%	16.5%	29.1%	29.9%	29.9%	18.1%	10.9%	10.0%	22.7%	19.9%	19.9%
EBIT / Int. Exp.	19.3x	11.5x	11.2x	23.6x	12.3x	12.7x	35.8x	27.5x	27.5x	14.1x	4.8x	4.0x	19.6x	12.1x	12.1x
Debt / EBITDA	0.6x	0.9x	1.0x	0.5x	0.7x	0.7x	0.5x	0.5x	0.5x	1.1x	1.8x	2.1x	0.9x	0.9x	0.9x
Total Debt/Capital	25.1%	25.4%	28.3%	18.9%	20.3%	20.0%	21.4%	20.4%	20.4%	28.8%	32.9%	35.9%	31.4%	29.9%	29.9%
(CFO - Dividends) / Debt	38.8%	55.0%	42.2%	34.3%	59.1%	57.0%	65.4%	69.3%	69.3%	27.2%	20.5%	26.4%	16.5%	49.6%	49.6%

Source: Moody's Ratings

Exhibit 23

Moody's-adjusted debt breakdown

Vale S.A.

(In USD Millions)	FYE Dec-19	FYE Dec-20	FYE Dec-21	FYE Dec-22	FYE Dec-23	LTM Jun-24
As Reported Debt	14,847.0	15,027.0	13,782.0	12,712.0	13,923.0	15,130.0
Pensions	695.0	641.0	204.0	269.0	303.0	303.0
Operating Leases	0.0	0.0	0.0	0.0	0.0	0.0
Non-Standard Adjustments	431.0	0.0	0.0	0.0	0.0	0.0
Moody's Adjusted Debt	15,973.0	15,668.0	13,986.0	12,981.0	14,226.0	15,433.0

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

Exhibit 24

Moody's-adjusted EBITDA breakdown

Vale S.A.

(In USD Millions)	FYE Dec-19	FYE Dec-20	FYE Dec-21	FYE Dec-22	FYE Dec-23	LTM Jun-24
As Reported EBITDA	6,080.0	11,434.0	33,299.0	23,489.0	15,252.0	15,177.0
Pensions	30.0	25.0	21.0	19.0	28.0	28.0
Unusual	3614.0	4824.0	(3,215.0)	(2,927.0)	919.0	633.0
Non-Standard Adjustments	0.0	0.0	0.0	0.0	0.0	0.0
Moody's Adjusted EBITDA	9,724.0	16,283.0	30,105.0	20,581.0	16,199.0	15,838.0

All figures are calculated using Moody's estimates and standard adjustments.

Source: Moody's Financial Metrics™

Endnotes

1 C1 cost is a standard metric of the mining industry to denote the direct production costs of mining operations.

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CREDIT OPINION

7 October 2024

Update

 Send Your Feedback

RATINGS

Vale Canada Ltd.

Domicile	Toronto, Ontario, Canada
Long Term Rating	Baa3
Type	Senior Unsecured - Fgn Curr
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Vale Canada Ltd.

Update following rating upgrade to Baa3, outlook changed to stable

Summary

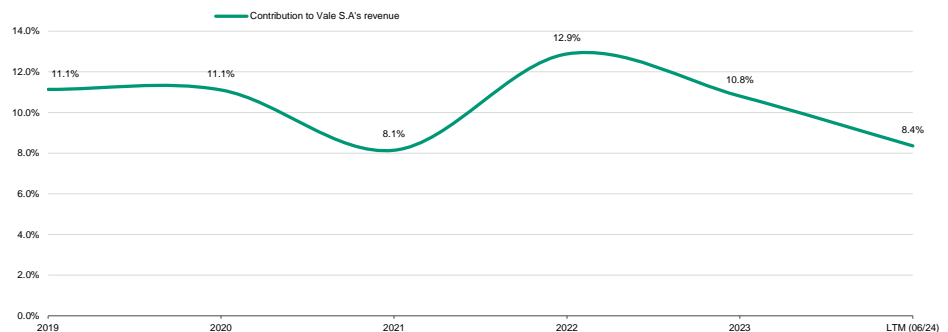
On 2 October 2024, we upgraded [Vale Canada Ltd.](#)'s (Vale Canada) Ba1 rating to Baa3 and changed the outlook to stable from positive. Vale Canada's Baa3 rating incorporates its strong position in the global nickel market, large asset base and strategic importance to its main parent, [Vale Base Metals Limited](#) (VBM, Baa3 stable) and indirect parent [Vale S.A.](#) (Vale, Baa2 positive), which owns 90% of VBM. Although Vale Canada's contribution to Vale's revenue is still relatively small, this business is an important component of the main parent company's diversification and strategy in the base metals business. In last 12 months that ended June 2024, Vale Canada accounted for around 8.4% of Vale's consolidated revenue.

Vale Canada's Baa3 rating, one notch below Vale's rating, reflects the fact that Vale does not guarantee its 2032 notes (\$279 million outstanding as of the end of June 2024), and incorporates the intrinsic operational, financial and legal links between Vale Canada, VBM and Vale. Vale Canada is rated at the same level as VBM because it represents most of the assets and cash flow of VBM.

Vale Canada's rating could be affected by any changes in the ownership or capital structures that result in significant shifts in the relative rights of payment, guarantees or collateral support related to the debt instruments of Vale and Vale Canada.

Exhibit 1

Vale Canada plays an important role in Vale's long-term strategic plan, but its contribution to the main parent company's revenue is still limited



Sources: Company's financials and Moody's Ratings

Credit strengths

- » Strong position in the nickel market and relevant assets in copper
- » Strategic importance to the main parent, Vale
- » Low leverage and robust liquidity

Credit challenges

- » Limited commodity and geographic diversification, with strong dependence on nickel and most of its assets based in Canada

Rating outlook

The stable outlook on Vale Canada's rating reflects the stable outlook on VBM's rating, which owns 100% of the company.

Factors that could lead to an upgrade

An upgrade of Vale Canada's rating could result from an upgrade of VBM's rating, but would also depend on the company's credit quality and relevance to VBM's business profile and cash flow.

Factors that could lead to a downgrade

A downgrade of Vale Canada's rating is likely to result from a downgrade of VBM's rating.

Profile

Headquartered in Toronto, Canada, Vale Canada Ltd. (Vale Canada) is a direct subsidiary of VBM, which is 90% owned by Vale International S.A., with Vale as the ultimate parent. Vale Canada operates most of Vale's nickel assets and produces value-added specialty nickel products. It also produces copper and several byproducts such as precious metals, platinum group metals and cobalt. In June 2024, Vale Canada reported net revenue of \$3.5 billion.

Vale Canada operates two integrated nickel sites in Canada — underground mines in Sudbury and an open-pit mine in the Voisey's Bay — and a third mine site in Thompson, which has discontinued the smelting and refining processes. In addition, Vale Canada still has a stake in the operations in Indonesia.

The main mines and operations are located in the Sudbury area of Ontario; the Thompson area of Manitoba; the Voisey's Bay area in Labrador and the Long Harbour area in Newfoundland, through Vale Newfoundland & Labrador Limited; and the Island of Sulawesi, Indonesia, through the subsidiary PT Vale Indonesia Tbk (PTVI). Vale signed an agreement on February 2024 regarding its divestment obligation of PTVI, and reduced its stake to 33.9% from 44.3% for \$160 million in cash following the completion of the transaction in June 2024.

Vale Canada also has operations through wholly owned metal refineries at Port Colborne, Ontario, and in the UK at Clydach, Wales. The company also has ownership interests in nickel refining capacity in Japan, operating the Matsusaka plant.

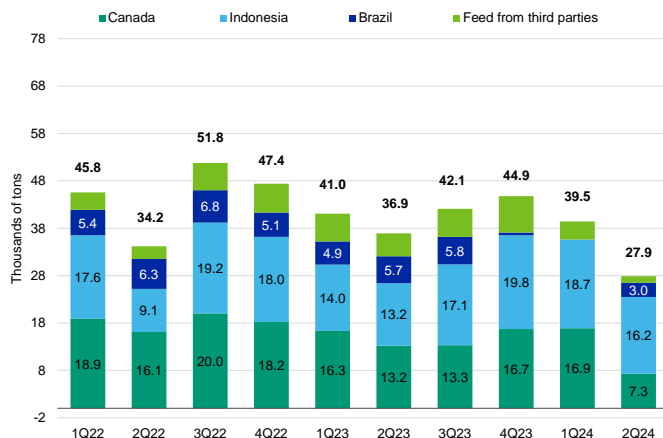
Vale Canada has a leading market share in the global nickel market, holding significant reserves and rights in two of the world's key nickel producing regions: Canada and Indonesia.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

Exhibit 2

Vale Canada's nickel production accounts for around 82% of Vale's total nickel production

Nickel production breakdown in thousand tons (kt)

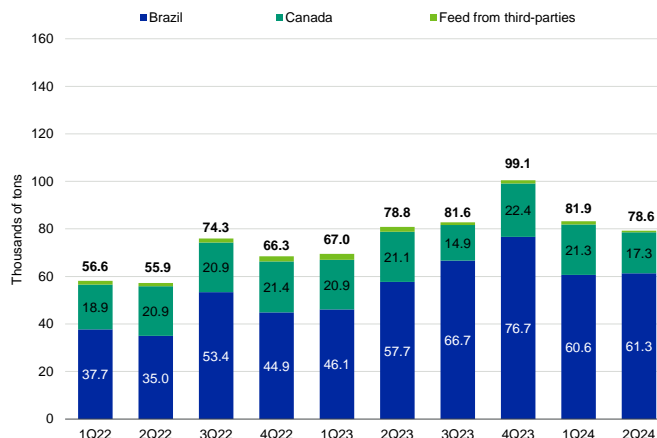


Breakdown includes Mineração Onça Puma, which is not a subsidiary of Vale Canada.
Source: Company filings

Exhibit 3

Vale Canada's copper production accounts for around 20% of Vale's total copper production

Copper production breakdown in thousand tons (kt)



Breakdown includes Salobo Metais, which is not a subsidiary of Vale Canada.
Source: Company filings

Detailed credit considerations

Vale's focus on the expansion of the base metal business will increase the segment's contribution to consolidated results, and enhance geographic and commodity diversification

Vale Canada is part of VBM, an entity created in 2023 to aggregate Vale's base metal assets, namely Vale Canada's assets and Vale's copper assets in Brazil. Vale has a large pipeline of projects to expand its production of nickel and copper in the next decade and increase the contribution of base metals in its consolidated results. Assets held under Vale Canada will play a significant role in the company's strategy regarding growth in base metals, supported by a pipeline of projects in Canada and Indonesia.

In July 2023, Vale announced a bidding agreement with Manara Minerals for an investment in VBM of \$2.5 billion in exchange for a 10% ownership. The sale was completed in April 2024 after approval from regulatory authorities. In July 2023, Vale also announced a bidding agreement with Engine No. 1 for a 3% equity stake but, in April 2024, both Vale and Engine No. 1 agreed to not proceed with the transaction, which was discontinued without any penalties for both parties.

Expansion in base metals will support leading position in the global nickel market and significantly increase Vale's share in the global copper market

Nickel and copper demand will increase substantially over the next decade supported by incremental demand from energy transition goals and lower emission targets. Regulatory requirements and fiscal incentives will stimulate the production and sales of electric vehicles (EVs), which will require nickel for batteries and infrastructure associated with EVs, while copper will be key to fostering growth in renewable energy as well as EVs. Vale has a relevant pipeline of projects to expand the production of copper and nickel, and increase the contribution of base metals in its consolidated results.

In nickel, Vale plans to reach annual production of 153,000-168,000 tons in 2024 supported by projects underway in Canada (Sudbury and Voisey's Bay & Thompson) from 154,000 tons as of the last twelve months finished in June 2024. As of the last 12 months that ended June 2024, about 54,200 of Vale's total nickel production came from Vale Canada's assets. Vale plans to increase its nickel production further to 210,000-230,000 tons supported by projects in Canada and Brazil (Onça Puma owned by VBM), both likely to contribute 30,000 tons each until 2026. To reach its long-term goal of 300,000 tons of annual production of nickel, VBM will rely mainly on its projects based in Indonesia (Badohopi, Pomalaa and Sorowako).

In copper, on the other hand, most of Vale's production comes from assets in Brazil, owned by VBM. Of Vale's total production of 341,200 tons as of the last 12 months that ended June 2024, 265,000 tons were produced in Brazil, while 76,000 tons came from Vale Canada's assets. Growth will continue to come mainly from projects in Brazil, but Canada will also increase its contribution in total

copper production by 2026. Vale's annual copper production is estimated at 320,000-355,000 tons in 2024 and 375,000-410,000 tons in 2026. In the long run (beyond 2030), Vale plans to record roughly 900,000 tons of copper production, supported by growth in Brazil and Indonesia.

For details on the credit profile of Vale, please refer to its [Credit Opinion](#).

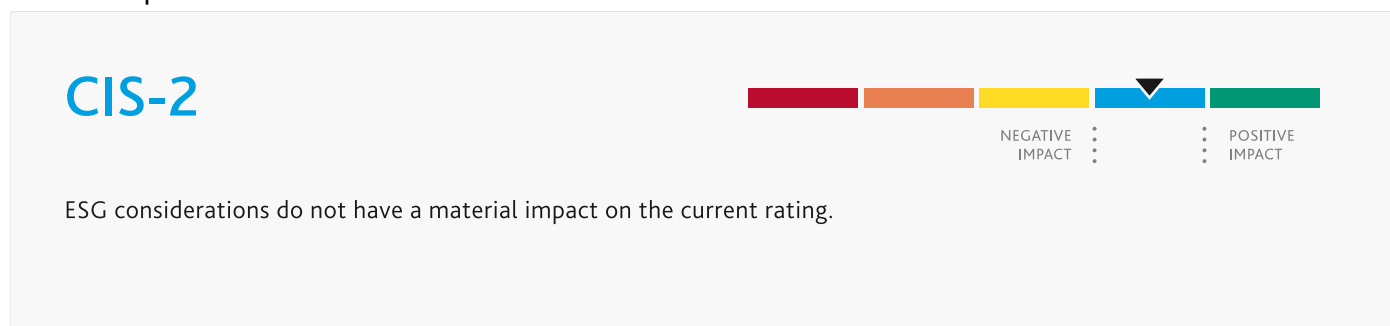
ESG considerations for Vale Canada reflect Vale's ESG considerations.

ESG considerations

Vale Canada Ltd.'s ESG credit impact score is CIS-2

Exhibit 4

ESG credit impact score



Source: Moody's Ratings

ESG scores and narratives are aligned with those of Vale S.A.. Vale's credit Impact score reflects our assessment that ESG attributes are overall considered as having a neutral-to-low impact on the current rating, because the rating is constrained by the sovereign rating of the government of Brazil. Still, Vale has high exposure to environmental risks associated primarily with natural capital (mine closure and decommissioning of structures) and waste and pollution (including tailings dams). Vale's high exposure to social risks arise mainly from health and safety concerns around the operations as well as responsible production, given the previous tailings dams accidents. The company's governance considerations reflect Vale's financial strategy, strong balance sheet, solid liquidity and enhanced risk management following the dam collapse in 2019.

Exhibit 5

ESG issuer profile scores



Source: Moody's Ratings

Environmental

ESG scores and narratives are aligned with those of Vale S.A.. Vale credit exposure to environmental risks mainly related to natural capital and waste and pollution. The tailing dam incident in Brumadinho in 2019, which resulted in a large number of fatalities, extensive environmental damage and loss of production, and resulted in fines (\$7 billion settlement) and litigations is an important consideration, as tailings dam management is the primary waste and pollution risk for this sector. Vale's operations are located in areas of abundant water availability, but has certain exposure to physical climate risk, in particular floods during the summer season in southern Brazil. However, Vale's large scale and footprint, and mine diversification mitigates climate hazards. Moreover, carbon

transition risk is mitigated by the growing portfolio of base metals products, including nickel and copper, which will benefit by growing demand from energy transition.

Social

ESG scores and narratives are aligned with those of Vale S.A.. Vale is exposed to social risks, in particular those related to health and safety and responsible production. Improvements in safety of operations through initiatives taken to enhance the risk management control, particularly as the company progresses with the decommissioning of upstream tailings dams, jointly with the construction of backup dams (containment structures) and preventive removal of workers and civil population of riskier areas, have reduced the exposure to social risks, in particular health and safety. However, the tailings dam incident and its implications related to safety of operations, employee well-being and community stakeholder engagement and reputation remains an important credit consideration, reflected mostly in responsible production. Vale's exposure to other social risks such as human capital is not as high as most mining companies, given the absence of union disputes and strikes, while exposure to demographic and societal trends is somewhat mitigated by the company's exposure to commodities (copper, nickel) that are linked to battery production and the green economy, despite the concentration in iron ore.

Governance

ESG scores and narratives are aligned with those of Vale S.A.. Vale's governance score reflects Vale's solid financial strategy, strong balance sheet, robust liquidity and enhanced risk management after the tailings dam accident in January 2019.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Liquidity analysis

Vale Canada's liquidity is supported by \$190 million in cash as of June 2024 and availability under Vale's \$5 billion revolving credit facilities (\$3 billion due in February 2029 and \$2 billion due in November 2026), compared with its total financial debt of around \$614 million. Its leverage (Moody's-adjusted total gross debt/EBITDA) was negative 9.8x as of the last 12 months that ended June 2024.

Please see Vale's liquidity discussion in its [Credit Opinion](#).

Structural considerations

Vale Canada's Baa3 senior unsecured rating, at the same level as VBM's rating, reflect the intrinsic operational, financial, strategic and legal links between Vale Canada, VBM and Vale S.A. The one-notch differential to Vale's rating reflects the fact that Vale does not guarantee Vale Canada's 2032 notes (\$279 million outstanding as of June 2024). But the rating incorporates Vale's ability to support Vale Canada (the bond represents only 2% of the total financial debt held by Vale). Although Vale Canada's contribution to Vale's consolidated revenue (8.4% as of the last twelve months finished in June 2024 and 11% in 2023) is relatively small, the business is an important component of the main parent company's strategy for growth and diversification in base metals. Vale Canada is part of VBM, a company created in 2023 that incorporates base metal assets within Vale, namely nickel and copper assets in Brazil, Canada and Indonesia.

Ratings

Exhibit 6

Category	Moody's Rating
VALE CANADA LTD.	
Outlook	Stable
Senior Unsecured	Baa3
PARENT: VALE S.A.	
Outlook	Positive
Issuer Rating -Dom Curr	Baa2
Senior Unsecured	Baa2

Source: Moody's Ratings

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