



Integrated
Report
2021



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Letter from the Chairman

GRI 102-14

Corporate governance is one of the foundations for leveraging the changes that Vale needs, especially after the Brumadinho tragedy, and for addressing challenges related to important issues that have the greatest impact for the company and society, such as dam management, climate change, human rights, diversity and many others.

In November 2020, the company took an important step towards an organizational structure that is aligned with these demands and challenges, by terminating the Vale Shareholders' Agreement and moving to the "corporation" model, with dispersed capital, without defined control.

The change was structural and encompassed changes to Vale's Bylaws, which included an independent majority on the Board of Directors, the adoption of the Lead Independent Director role, and the election of the Chairman and Vice Chairman of the Board directly by shareholders. During the 2021 General Meeting, 13 members were elected by multiple votes, including eight independent members, compared to three in 2020. Of the total, eight were appointed by the Vale Nomination Committee and four by shareholders. The employee representative director is elected in a specific vote.

Vale's structural change in corporate governance elected a **Board of Directors** with eight independent members

PHOTO: PERSONAL ARCHIVE



José Luciano Duarte Penido, Chairman of the Board of Directors of Vale



As a reflection of this change, we now have a Board of Directors that is committed to consolidating solid governance following the best international practices for a Corporation. The Board has given full attention to the cultural evolution of the company, prioritizing Vale's strategic reorientation and our commitment to the ESG agenda. A new Innovation Committee has given more visibility to innovation and the application of new technologies in processes, products and our climate agenda. This formation has led to rich and plural discussions, guided by a necessary critical view of Vale, in order to mitigate risks and maximize the company's delivery of value to its stakeholders.

We also monitor on a regular basis Vale's Global Integrated Risk Map, and we follow closely the progress of the Dams Decharacterization Plan. There has been an advance of about 23% in the decharacterization of structures and, by 2022, the forecast is to decharacterize five more upstream structures, reaching 40% of the plan. The plan also foresees the decharacterization of all upstream structures in Brazil by 2035.

Another topic of attention has been Vale's climate strategy, which includes commitments aligned with the Paris Agreement, such as being carbon neutral by 2050 in Scopes 1 and 2, considering projects and technologies focused on the reduction of greenhouse gas emissions and decarbonization. We increased our competitiveness in the iron ore business by developing the high-quality product portfolio with innovative and disruptive products such as the "green briquette". We set a Scope 3 climate target and are actively engaging in partnerships with customers to decarbonize the global steel industry.

Also, in the year, as a result of the structural and cultural changes that Vale has been going through, the company designed its new Social Ambition – focused on the creation of a positive legacy for society. This is a vision that aims to prevent repetition of the damage, such as that caused by Vale at Brumadinho, to encourage resilient communities, and to work in the direction of sustainable mining.

We also focused on continuing our strategy of divesting non-core assets, highlighting the binding agreement signed for the sale of the Moatize coal mine and the Nacala Logistics Corridor. We are close to completing the full reshaping of our business portfolio, focusing on opportunities in Iron Ore, Copper and Nickel.

Speaking of the future, in 2022 Vale's Board of Directors will be elected at a General Shareholders' Meeting. Continuing the evolution observed in 2021, we have set a Nomination Committee, composed mainly of independent directors, to structure the process for nominating candidates. The continuity and complementation of the mandate of the collegiate elected at the 2021 AGM was recommended as fundamental for the consolidation of Vale's new governance.

We know that we have many challenges to address, and we are attentive to the issues of greatest impact for Vale and its stakeholders, to seek safe productivity and to promote confidence

in the operation of our assets, as well as to the challenges related to the macroeconomic and geopolitical environment, in particular the escalating conflict between Russia and Ukraine.

Finally, despite the challenges, 2021 was a year of important advances, especially in terms of strengthening the governance structure necessary to ensure a better Vale, where I would like to highlight the creation of the Executive Vice-presidency of Sustainability. For the coming years, we will continue to be attentive to the demands of our stakeholders and committed to make the necessary transformations for Vale to represent to everyone, and especially to society, a safe and reliable company, operating under the concept of sustainable mining.

José Luciano Duarte Penido

Chairman of the Board of Directors of Vale

We are attentive to the pursuit of safe productivity and to promote confidence in the operation of assets



Letter from the CEO

GRI 102-14

PHOTO: ARTHUR TOLEDO



Eduardo Bartolomeo
Vale CEO

We are living a moment of deep transformation of the world, of mining and of Vale. On this journey, we seek to walk together with society, with responsibility, transparency and coherence. We arrive at places uninvited, so, in addition to mitigating the negative impacts, we want, as our social ambition states "To be a partner company in the development of resilient communities, engaged in relevant issues to humanity and committed to sustainable mining".

January 25 marked three years since the collapse of dam B1, the saddest day in our history. The tragedy, which will never be forgotten, caused the death of 270 people and several socio-environmental impacts, and made evident the need for us to learn together from everything that happened, to transform ourselves and assume the commitment that tragedies like this do not happen again and that no life are lost in our company.

Thus, in 2021, we settled an agreement with the Justice Institutions and the State of Minas Gerais, aiming at the continuity of the reparation initiatives that have been carried out since the occurrence of the tragedy, in 2019, with an estimated amount of BRL 37.7 billion. In addition to this, more than 11.4 thousand people have already been indemnified, with individual and labor agreements signed.

Regarding dam safety, a critical point in our operations, we had important advances during the year. We updated our plan to decharacterize and eliminate upstream structures, which now includes 30 geotechnical structures, 100% of the portfolio of dams and Tailings Storage Facilities (EARs in Portuguese), of which seven have already been decharacterized since 2019. With this our commitment was also updated: decharacterize 60% of upstream dams in Brazil by 2025, 90% by 2029 and 100% by 2035. We completed the construction of downstream containment structures for all dams at emergency level 3.

Regarding the critical point of dam safety, we concluded the **decharacterization of the seventh upstream dam since 2019**



We advanced in the implementation of solutions and technologies for monitoring, using radar, satellite images and drones to follow conservation status and soil displacement, among other control technologies. We seek to advance in the use of tailings to produce new materials, fostering the circular economy, and in natural humidity processing as a substitute for wet processing.

Among the themes of greatest impact and influence at Vale are contributions to the fight against climate change. Our goal is to zero our net emissions by 2050 (Scopes 1 and 2), and to reduce Scope 3 emissions by 15% by 2035. The efforts of our low carbon agenda contributed to our recognition as one of the leading companies in the Climate Change Program at the CDP Latin America Awards 2021. In the same year, we published our first report on climate change, in line with the Task Force on Climate-related Financial Disclosures (TCFD).

In addition to investing in sustainable products, such as the "green briquette", we continued our strategy of divesting non-core assets in 2021. As for productivity, we recorded a 5% increase in Iron Ore production, still below expectations for the period, due to the lower-than-expected performance at S11D (our largest mining complex, located in the municipality of Canaã dos Carajás, Brazil) and we had impacts on base metals production due to the employee strike in Sudbury, Canada, for about two months. At the time, Vale continued negotiations for ratification of a new agreement, signed in August 2021.

We recorded pro-forma adjusted from continuing operations EBITDA of USD 31.3 billion, USD 13.8 billion higher than the previous year, due to higher iron ore and pellet sales volumes and the prices charged, which also contributed to a USD 15.0 billion increase in net operating revenues from continuing operations, which totaled USD 54.5 billion in 2021. Payments for taxes and royalties totaled USD 7.7 billion and our investments totaled USD 5.2 billion in the year, of which USD 4.2 billion were dedicated to the maintenance of operations.

With three priority pillars – sustainable mining, resilient communities, and global causes – we define our social ambition with commitments related to creating social value, promoting education, health and income generation, and protecting human rights. More than projects, we want to articulate alliances and promote structuring programs capable of contributing to social justice and to the autonomy of communities.

Regarding these aspects, from the management point of view, we reached 100% of Vale's operations with risk assessment for human rights violations. We also undertook external due diligence in all operations and critical projects in three-year cycles. Also, to ensure Human Rights, with the understanding that mining can only be carried out with Free, Prior and Informed Consent, and with legislation that allows and adequately regulates the activity, we have renounced all our mining processes on indigenous lands in Brazil, which includes requirements for research and mining.

Strengthening a culture oriented to diversity, equity and inclusion is a priority. We anticipate to 2025 our commitment to double the representativeness of women in our workforce (from 13% to 26%), we have established the goal of reaching 40% of leadership in Brazil made up

of black people by 2026, and we have strengthened our anti-racist positioning. Also as part of the cultural transformation process experienced by the company, our Whistleblowing Channel was restructured, with a 33.8% increase in the number of reports received. All confirmed violations triggered correction plans.

In socioeconomic expenditures in the territories, we spent USD 473.5 million on social actions. Through the Vale Foundation, our initiatives impacted more than 860 thousand people in 50 municipalities in six Brazilian states. In addition, since 2020, we have donated over USD 153 million to governments and institutions in Brazil and abroad for Covid-19 related humanitarian aid actions.

In 2022, we will complete 80 years of operation. Over these decades, we have learned that our role goes beyond mining and, for this reason, in all of Vale's decisions, people are at the center. We seek, as our purpose says, to improve lives and transform the future. Together.

Eduardo Bartolomeo
Vale CEO

We have defined our social ambition with three priority pillars – sustainable mining, resilient communities, and global causes



Reporting Process

In this second year of the Integrated Report, referring to the period between January 1 and December 31, 2021, we share our learnings, challenges and advances the result of reflecting on and listening to our different stakeholders. This document provides indicators, management approaches, and accountability on relevant environmental, social and governance topics, according to our materiality matrix (see **Materiality**). The information comprises the companies over which Vale has operational control and their activities identified on [Form 20-F](#). GRI 102-45, 102-46, 102-49, 102-50

The document preparation is aligned with the guidelines of the International Integrated Reporting Framework (Value Reporting Foundation). This report has been prepared in accordance with the GRI Standards: Comprehensive option, and includes the Mining and Metals Sector Supplement. We report our efforts to adhere to the Mining Principles of the International Council on Mining and Metals (ICMM), of which we are an active member. This report and its appendices also include indicators from the Sustainability Accounting Standards Board (SASB), the Task Force on Climate-related Financial Disclosures (TCFD), the World Economic Forum (WEF) key metrics, and the United Nations

(UN) Sustainable Development Goals (SDGs). PwC performed limited assurance on the report according to the Assurance Report on page 122. The Integrated Report 2021 has been checked and approved by the Executive Committee, the Sustainability Committee, and the Board of Directors. GRI 102-32, 102-54, 102-56

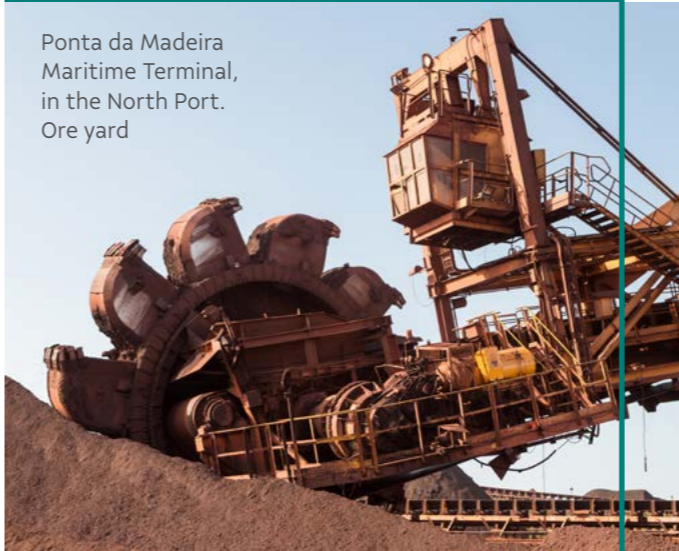


We want to hear from you. Contact us to send questions, criticism and comments about this publication through the Contact Us channel.
GRI 102-53

More information about Vale's results is available at:

- [20-F, Report from Administration, Tax Transparency Report and Reference Form](#)
- [Report of Governance](#)
- [ESG Portal](#)
- [Reparation Report](#)
- [Other editions of Vale's sustainability reports](#)
GRI 102-51, 102-52

Conversion adopted for the dollar amounts published in this report: throughout the report, the amounts in Brazilian reais were converted to **USD** at the rate of **BRL 5.39**, with the exception of the financial disclosure figures, already published in other Vale documents.



Ponta da Madeira Maritime Terminal, in the North Port. Ore yard

PHOTO: RICARDO TELES

Subsequent event

On April 28, 2022, the U.S. Securities and Exchange Commission ("SEC") filed suit against Vale in the U.S. District Court for the Eastern District of New York, alleging that certain Vale disclosures violated U.S. securities laws. The lawsuit focuses on disclosures related to Vale's dam safety management prior to the tragic dam failure in Brumadinho, Minas Gerais, Brazil in January 2019. Vale denies the SEC's allegations, including the allegation that its disclosures violated U.S. law, and will vigorously defend this case. The Company reiterates the commitment it made right after the rupture of the dam, and which has guided it since then, to the remediation and compensation of the damages caused by the event.

Note 1: This document may include statements that present Vale's current expectations regarding future events or results. All forward-looking statements involve various risks and uncertainties. Vale cannot guarantee that such statements will prove to be accurate. These risks and uncertainties include, among others, factors related to: (a) countries where Vale operates, especially Brazil and Canada; (b) the global economy; (c) capital markets; (d) mining and metals prices and their dependence on global industrial production, which is cyclical in nature; (e) the high degree of global competition in the markets where Vale operates; (f) mining and tailings storage operations; and (g) the estimation of mineral resources and reserves, their exploration and the development of mining facilities, our ability to obtain or renew new licenses, and the depletion and exhaustion of mines and mineral reserves and resources. For additional information on factors that may give rise to results different from those estimated by Vale, please consult the reports filed by Vale with the U.S. Securities and Exchange Commission (SEC), the Brazilian Securities and Exchange Commission (CVM) and, in particular, the factors discussed in the sections "Forward-looking Statements" and "Risk Factors" in Vale's Annual Report Form 20-F."



ESG Databook

See the [ESG Databook](#), an appendix of this report, including GRI Standards content; the Sustainability Accounting Standards Board (SASB) Metals and Mining segment; the Task Force on Climate-related Financial Disclosures (TCFD); the World Economic Forum (WEF) key metrics; and the Sustainable Development Goals (SDGs), as well as adherence to the Mining Principles of the International Council on Mining and Metals (ICMM). The basis of preparation cited in the Assurance Report is in the Databook as well.

Materiality

Our materiality matrix was updated in 2021 according to the GRI Reporting Framework and International <IR> Framework guidelines. The process involved the identification of priority topics that significantly impact the organization's value creation in the short, medium and long term, and prioritization of relevant themes by the company's main stakeholders. The review process can be summarized in four major phases:

Phase 1

Document analysis and review of material and emerging topics identified in the 2020 cycle: sustainability ratings, the World Economic Forum global risk report, sector trends studies, the Global Compact progress report, and critical analysis of Vale's 2020 reporting by the World Business Council for Sustainable Development (WBCSD);

Phase 2

Evaluation of continuous engagement channels: a survey of the main stakeholder demands, identified by structured engagement channels that already exist in the company, and consolidation of the inputs obtained;

Phase 3

Strategy and impact vision: evaluation of documents relating to Vale's strategy and benchmarking studies of companies in the mining and metals sector;

Phase 4

Broad quantitative and qualitative consultation: a quantitative questionnaire was sent to stakeholders and interviews were conducted with representatives from academia, subject matter experts, local communities, institutions, and investors.

For each topic, GRI content, indicators from the Metals and Mining segment of the Sustainability Accounting Standard Board (SASB), and Sustainable Development Goals (SDGs) were associated. The 2021 materiality review process was validated by the Sustainability Committee. GRI 102-21, 102-29, 102-46

To prioritize most relevant topics, **1,192 people were consulted**

Through consultation, we captured a total of 1,192 contributions, 910 from the internal public and 282 from the external public, considering the following stakeholder groups: GRI 102-21, 102-42

- Employees and contractors
- Class associations or entities
- Local community
- Civil society
- Academy or experts
- Suppliers
- Non-governmental organizations
- Government/regulatory bodies
- Private companies not linked to Vale
- Investors
- Customers
- Traditional communities or indigenous peoples
- The press
- Mining companies
- Capital markets



Material Topic: Dams GRI 102-47



Scope

- Mineral waste
- Dam risk management
- Decharacterization or elimination of dams
- Emergency response



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | G4 MM3
- SASB EM-MM-150a.1, SASB EM-MM-150a.2 and SASB EM-MM-150a.3
- ODS **3** **6** **9**
12



Risks

- Dam rupture
- Socio-environmental impacts
- Evacuation of territories



Opportunities

- Technologies for less dependence on dams
- Byproducts from tailings



Goals

- Risk management: 100% of dams and tailings storage facilities portfolio Hazard Identification and Risk Analysis (HIRA) by the end of 2022; 100% connected to Vale's Integrated Business Risk Management (ERM)
- 100% of tailings facilities operated with potential consequences "extreme" or "very high" in compliance with the GISTM (Global Industry Standard on Tailings Management) by 2023
- 100% of tailings facilities in compliance with the GISTM by 2025
- Dam decharacterization plan: 60% of upstream dams in Brazil decharacterized by 2025, 90% by 2029, and 100% by 2035



Advances

- 100% of the Tailings Storage Facilities (EAR) with extreme consequence ratings from the Church of England's Tailings Storage Facilities Disclosure list have been assessed by HIRA risk management program
- Dam Decharacterization Plan: 23% of the program completed in 2021, and the schedule for decharacterizing all of its upstream structures in Brazil has been renegotiated with the public agencies
- All dams at emergency level 3 with downstream containment structures built



Improvement Points

- Decrease the number of structures with emergency levels 1, 2 and 3
- Overcome the technical challenges to decharacterize/eliminate upstream dams in the shortest possible time

What do stakeholders want to know?

Stakeholders are interested in the reparation measures in Brumadinho and evacuated areas and Mariana (see more in [Focus on Reparation](#)) and how Vale has been working to prevent the recurrence of this type of event.

Directly and/or indirectly impacts all Vale's operations and society. GRI 103-1



Material topic: Governance and Compliance GRI 102-47



Scope

- Governance structure
- Risk management
- Fight against corruption
- Socio-environmental and economic compliance
- Cybersecurity



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 205 | 206 | 307 | 406 | 419
- SASB EM-MM-510a.1.
- ODS **16**



Risks

- Market risks
- Operational risks
- Legal and tax risks
- Mergers, acquisitions and divestments
- Abusive and discriminatory practices
- Strategic, financial and cyber risks
- Changing laws and regulations



Opportunities

- Cultural transformation
- Innovation and new technologies



Goals

- Eliminate main ESG gaps in relation best practices



Advances

- Of 63 gaps mapped as of 2019, 54 have already been completed, with 17 in 2021
- Held Board of Director elections in 2021: of the 13 full members elected, 8 are independent
- Created the position of Executive Officer of Sustainability
- Revised corporate policies
- Created the position of Executive Officer of Strategy and Business Transformation



Improvement Points

- Increase gender and racial diversity on the Board of Directors

What do stakeholders want to know?

Stakeholders are interested in the Board composition process, the measures we are taking for independent and transparent decision making and the alignment between our speech and practice.

Impacts, directly and/or indirectly, all of Vale's operations and stakeholders. GRI 103-1



Material topic: Climate Change GRI 102-47



Scope

- Energy consumption and efficiency
- Greenhouse gas emissions
- Risks and opportunities related to climate change



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 201 | 302 | 305
- SASB EMMM-110a.1, SASB EM-MM-110a.2 and SASB EM-MM-130a.1.
- ODS **7** **13**



Risks

- Transition risks: changes in the demand pattern, changes in public policies to restrict emissions (including carbon taxing), and reputational risk, among others
- Physical risks: increase in average temperature, extreme weather and sea conditions



Opportunities

- Develop of decarbonization solutions
- Use proprietary technology to offer more premium products



Goals

- Reduce Scope 1 and 2 emissions by 33% by 2030
- Use 100% renewable energy in Brazil by (2025) and globally (2030)
- Achieve net-zero Scope 1 and 2 emissions by 2050
- Reduce Scope 3 net emissions by 15% by 2035
- Improve 5% of the global energy efficiency indicator from the 2017 baseline by 2030



Advances¹

- Reduced Scope 1 and 2 emissions by 24% compared to 2017
- 98% renewable energy in Brazil, in relation to the estimated consumption for the year 2025, and 88% globally, in relation to the estimated consumption for the year 2030
- Reduced Scope 3 emissions by 15% compared to 2018



Improvement Points

- Assess the alignment of 2030 Scope 1 and 2 targets with the 1.5°C scenario
- Analyze offsetting exclusion in 2035 Scope 3 target and alignment with WB2C scenario
- Evaluate inclusion of Scope 3 in the Net Zero strategy
- Define intermediate targets, for before 2030
- Accelerate the deployment of emission reduction initiatives
- Clarity the post-2030 Roadmap

¹ Most of the reductions in the emissions of Scopes 1, 2 and 3 are related to lower levels of production, in 2021, when compared to the base year. An increase in production is expected in the short term, which may lead to an increase in emissions, although in the medium term (starting in 2026) a decrease is expected due to the implementation of low carbon initiatives.

What do stakeholders want to know?

Stakeholders are interested in mitigation measures (reduction of emissions, product life cycle, i.e, carbon footprint, and business models) and adaptation (reduction of physical impacts on territories and climate resilience). They also expect alignment of targets with those of the Paris Agreement and transparency on the annual evolution and trajectory of emissions, and that the company demonstrates the ability to deliver on its commitments. In addition, they want information about the financial impacts related to these changes.

Impacts, directly and/or indirectly, all of Vale's operations and the whole society. GRI 103-1



Material topic: Biodiversity GRI 102-47



Scope

- Biodiversity conservation and restoration
- Impacts of the operations on fauna and flora
- The Amazon



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 304 | G4 MM1 | MM2
- SASB EM-MM-160a.1, SASB EM-MM-160a.2 and SASB EM-MM-160a.3.
- ODS 6 12 14 15



Risks

- Impacts in areas highly relevant to biodiversity



Opportunities

- Intensifying our contribution to the Amazon biome
- Investment in Biodiversity research and conservation
- Develop of impact businesses for biome restoration
- Develop new technologies that support the prevention of fires and other risks



Goals

- Forestry target: recover and protect an additional 500,000 hectares of areas beyond the company's borders by 2030, of which at least 100,000 ha will be through socio-environmental impact businesses
- Pursue neutral net impact in projects and expansions



Advances

- 62,248 hectares of protected forests and 5,125 hectares of recovered areas
- The Vale Fund supported the development of five agroforestry impact businesses that productively recovered an area of 5,125 hectares in 2021
- Development, by the Vale Institute of Technology Sustainable Development, of genetic studies for knowledge of the Amazon DNA in order to contribute to biodiversity conservation
- The Vale Fund supported the development of the PrevisIA tool, which anticipates information on regions with higher risk of fire
- Establishment of biodiversity management guidelines into our management model and applied them to new projects



Improvement Points

- Globally apply biodiversity standards and plans (global vision)
- Further integrate biodiversity management into the value chain

What do stakeholders want to know?

Stakeholders are interested in the impacts of mining, especially in the Amazon, and in conservation and restoration actions.

Directly and/or indirectly impacts all Vale operations, communities and territories near our operations, including habitats and species important for conservation. GRI 103-1



Material topic: Ecoefficiency GRI 102-47



Scope

- Consumption and efficiency in water management
- Disposal and quality of effluents
- Atmospheric emissions (except GHG) and air quality



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 303 | 305
- SASB EM-MM-120a.1, SASB EM-MM-140a.1 and SASB EM-MM-140a.2
- ODS **3** **6** **12** **14** **15**



Risks

- Water crisis and lack of available water resources
- Compliance with ICMM quality standards for effluent discharge
- Atmospheric emissions from operations



Opportunities

- Expansion of the water monitoring network and search for new technologies
- Efficient use of water resources through dry processing
- Global strategy for reducing atmospheric emissions



Goals

- Water target: reduce the specific use of new and fresh water withdrawn and used in our processes by 10% per ton produced by 2030, compared to 2017
- Particulate matter emissions, NOx and SOx: Reduce particulate matter emissions by 16%; Reduce sulfur oxides emissions by 16%; and Reduce nitrogen oxide emissions by 10%



Advances

- 11.7% reduction in the specific use of fresh water withdrawal in 2021
- 23% reduction in sulfur oxide emissions



Improvement Points

- Consolidate the implementation of the Integrated Data Management System
- Manage controversies related to particulate emissions
- Globally management considering local specificities

What do stakeholders want to know?

Stakeholders are interested in measures that minimize impacts, such as water availability and air pollution.

Impacts all Vale operations and, directly and/or indirectly, communities near our operations. GRI 103-1



Material topic: Mine closure and future use GRI 102-47



Scope

- Planning and progressive closure of assets
- Management of social and environmental impacts associated with Mine closure
- Promoting a legacy in the territories and future land use



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | G4 MM10
- ODS 1 2 6 8
11



Risks

- Non-achievement of compliance and legislation targets
- Non-recovery of biodiversity
- Invasion and misuse of land
- Low economic diversification, maintaining local dependence on mining activities



Opportunities

- Minimize risks in the territories and generate aptitude for future uses
- Generate value for the territories, through economic diversification and implementation of new businesses



Goals

- Disclose information about Mine closure plan, including the community engagement process



Advances

- Standards and KPIs in the planning and executing progressive asset closure
- Projects for future use in two complexes: Águas Claras Mine (MAC) and parts of the Itabira Complex territory
- Social participation mechanism for the Mine closure stage



Improvement Points

- Structure governance reflecting the Mine closure strategy and future use globally, incorporating society's expectations
- Implement future use and new business in territories undergoing Mine closure

What do stakeholders want to know?

Stakeholders are interested in our biodiversity recovery, local economic impacts, land development, and the risk of land invasion and misuse.

Impacts, directly and/or indirectly, Vale's operations and value chain, as well as the communities near our operations. GRI 103-1



Material topic: Health and safety GRI 102-47



Scope

- Occupational health and safety
- Process Safety Risk Management
- Promotion of workers' health beyond occupational issues (chronic diseases, healthy habits, etc.)



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 403
- SASB EM-MM-320a.1
- ODS 3 8



Risks

- Risks related to workplace accidents and fatalities
- Risks related to employee health
- Risks of process accidents (Process Safety)



Opportunities

- Structuring of critical control checks
- Accelerate the use of technology to remove people from risk



Goals

- Reduce to zero the number of recordable high-potential injuries (precursors to fatalities) by 2025
- Reduce by 50% the number of exposures to agents harmful to health in the workplace by 2025



Advances

- Lowest recordable accident frequency rate (TRIFR) in Vale's history (1.41)
- Reduced by 35% the number of exposures to agents harmful to health in the workplace compared to the baseline (2019)



Improvement Points

- Improve the incident investigation process and organizational learning
- Improve the quality of safety inspections (proactive indicator)
- Advancing the operational change management process

What do stakeholders want to know?

Stakeholders are interested in measures to ensure the employees and contractors safety, and operations safety in general.

Directly and/or indirectly impacts all Vale employees, contractors and suppliers. GRI 103-1



Material topic: People GRI 102-47



Scope

- Employee attraction, retention, training, and careers
- Working conditions for contractors and third parties
- Diversity, equity and inclusion



Correlated Indicators

- GRI 102-8, 102-15 | 103-1, 103-2, 103-3 | 401 | 404 | 405 | 407
- ODS **5** **8**



Risks

- Local labour laws
- Hiring of outsourced labour
- Leadership succession plan



Opportunities

- Implement and accelerate the Technical Training Program for our employees
- Training/activation of operational leaders in Cultural Transformation



Goals

- Double the representativeness of women in our workforce, from 13% to 26%, by 2025
- Guarantee that 40% of leadership is made up of black people* by 2026, compared to the 29% registered through a self-declaratory census

* Includes black and brown people according to Brazilian Institute of Geography and Statistics (IBGE in Portuguese) categories.



Advances

- 18.7% women in the workforce
- 20.9% women in leadership positions
- Achievement of 5.29% of professionals with disabilities in Brazil (reaching the legal quota)
- Hiring of 95 professionals who declared themselves black or brown race in the Trainee Program, which represents 66% of the total number hired
- Conducting the first diversity census in Brazil and Canada with 68.5% participation in Brazil and 58% in Canada
- Adherence to the Mover: Movement for Racial Equity
- Expected culture and behaviors positioned as fundamental to achieving strategic objectives
- Critical processes (security, risk management, community relations, among others) disseminated in the organization



Improvement Points

- Apply an employee engagement survey
- Set broader diversity, equity and inclusion goals (including issues beyond race and gender)

What do stakeholders want to know?

The stakeholders are interested in the Vale's cultural transformation, promoting the development of employees and diversity.

Directly and/or indirectly impacts all of Vale's own employees, contractors and suppliers. GRI 103-1



Material topic: Human Rights GRI 102-47



Scope

- Respect and promote human rights in developing its activities, partnerships, and in production chain, during the entire life cycle of its ventures



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 201 | 406 | 408 | 409 | 410 | 412
- SASB EM-MM-210a.1, SASB EM-MM-210a.2 and SASB EM-MM-210a.3
- ODS **3** **8** **16**



Risks

- Risks of human rights violations in its operations, along the value chain



Opportunities

- Advance the inclusion of the human rights perspective in all company processes and decision-making
- Help to promote the human rights agenda in mining companies and in other sectors, in joint ventures and with customers



Goals

- Perform human rights due diligence on all operations in 3-year cycles
- Help Indigenous peoples and Traditional Communities to promote their rights, and ethnodevelopment and appreciate their culture
- Combat and prevent sexual exploitation of children and forced or compulsory labor
- Broaden the representation of underrepresented groups at Vale



Advances

- Launched the Social Ambition in 2021
- 100% of our operations with risk analysis related to human rights
- Performed human rights due diligence on 14 operations and projects
- Consolidated of the human rights risk management process in critical suppliers



Improvement Points

- Advance human rights management in the value chain, including increasing the number of human rights due diligence processes

What do stakeholders want to know?

Stakeholders are interested in Vale's commitments on the topic and how this is shared with the value chain.

Directly and/or indirectly impacts all of Vale's operations and projects and value chain, as well as society as a whole. GRI 103-1



Material topic: Local Communities GRI 102-47



Scope

- Impacts on local communities
- Conflict resolution mechanisms with communities
- Promotion of territorial development
- Direct and indirect economic impacts
- Indigenous Peoples and Traditional Communities



Correlated Indicators

- GRI 102-15 | 103-1, 103-2, 103-3 | 201, 203 | 411 | 413 | G4 MM5 | MM6 | MM7 | MM9
- SASB EM-MM-210b.1 and SASB EM-MM-210b.2
- ODS

1	2	3	5	7
8	9	10	11	17



Risks

- Socio-environmental impacts resulting from the operation
- Health and safety risks in the communities where we operate
- Risks of involuntary resettlement and land use conflicts
- Risks of conflicts with Indigenous Peoples and Traditional Communities



Opportunities

- Maximizing value generation for communities



Goals

- Place within the Top 3 in the leading external assessments of sustainable mining by 2030, in the social requirements
- Lift 500,000 people out of extreme poverty
- Indigenous communities neighbouring all Vale operations with UNDRIP* rights plans



Advances

- Launched our Social Ambition in 2021, guided by the pillars: Sustainable Mining, Resilient Communities, and Global Causes
- Inclusion of the indicator of reduction of events (incidents) with communities in the variable remuneration of leaders



Improvement Points

- Reduce number of events (incidents) involving communities

What do stakeholders want to know?

Stakeholders are interested in managing impacts on local communities, emphasizing the most vulnerable populations and the territorial development agenda.

Direct and/or indirect impacts in all territories and communities located near Vale's operations, projects, or socio-economic, environmental, and cultural initiatives GRI 103-1



Vale

- 1. Profile
- 2. Business Model
- 3. Purpose and Values
- 4. Strategic Pillars
- 5. Focus on Reparation
- 6. Dams



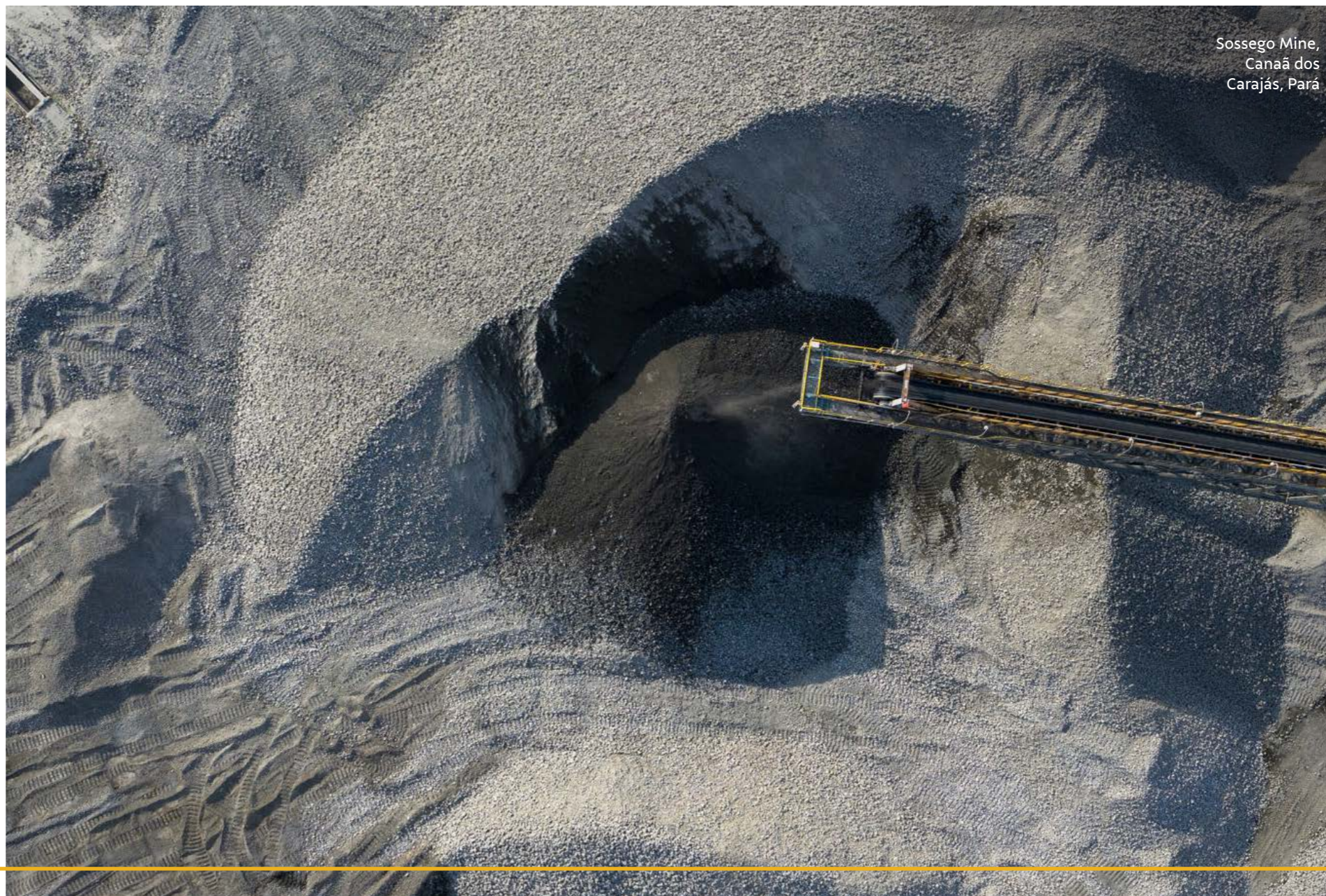
Profile

Founded in 1942 and headquartered in the city of Rio de Janeiro, Brazil, Vale is one of the world's leading producers of Iron Ore and Nickel. We also produce Iron Ore pellets, Copper, Manganese Ore, Metallurgical and Thermal coal, Platinum Group Metals (PGM), Gold, Silver, and Cobalt.

We have a mineral exploration process and operate logistics systems, including railroads, marine terminals and ports, that are integrated with our mining operations. We also have distribution centers to support the delivery of Iron Ore throughout the world. Directly and through affiliates and joint ventures, we have investments in energy and steel businesses. GRI 102-2, 102-4, 102-7

Vale has been publicly-held corporation since 1970 and its shares are traded on the New Market of the São Paulo Stock Exchange (B3) and on the New York (NYSE) and Madrid (Latibex) stock exchanges. GRI 102-1, 102-5

PHOTO: RICARDO TELES



Sossego Mine,
Canaã dos
Carajás, Pará



Business Model

Inputs



FINANCIAL CAPITAL

- Financing
- Revenues
- USD 89.4 billion total assets



NATURAL CAPITAL

- Minerals, water resources and energy resources
- 10 thousand sq km of protected areas



HUMAN CAPITAL

- 72,300 employees and 141.2 thousand contractors



INTELLECTUAL CAPITAL

- Technology: Vale Institute of Technology, R&D&I and own technologies



SOCIAL AND RELATIONSHIP CAPITAL

- Relationship with priority stakeholders
- 2,092 local relationship communities in 8 countries
- Around 18 thousand suppliers in the supply chain, and local procurement represent 53% of the total financial volume



MANUFACTURED CAPITAL

- Logistic structure (ports, railroads, roads)
- Production infrastructure (mines and mills)

PURPOSE
We exist to improve life and transform the future. Together.

STRATEGIC PILLARS

- Safety and Operational Excellence
- New pact with society
- Base Metals Transformation
- Discipline in capital allocation
- Maximize the flight-to-quality in Iron Ore

COMMITMENTS

People
Put the safety of people and the environment at the core of our business decisions, acting with respect, care and integrity. Build a positive social, economic and environmental legacy in areas where we operate.

Security
Make Vale one of the safest and most reliable mining companies in the world.

Reparation
Fully repair Brumadinho, taking a leading role in restoring the dignity of affected families and communities.

PRODUCTS AND SERVICES

- Iron Ore
- Manganese Ore
- Nickel
- Cobalt
- Pellets
- Coal
- Copper
- Gold
- Energy
- Passenger transport on Railroads

BYPRODUCTS

- Effluents
- Emissions
- Non-mineral waste
- Mineral waste
- Patents
- Products from tailings



BUSINESS ACTIVITIES

- Exploration and mineral research
- Development and implementation of projects
- Operation (Mining/Processing/Logistics/Power generation)
- Commercialization
- Distribution
- Mine closure and future land use

Main Impacts

- Environmental**
- ✓ Consumption of 103.7 million m³ of water and a 20% reduction in the withdrawal of new water in relation to the base year of 2017
 - ✓ Reduction of emissions due to greater consumption of renewables
 - ✓ Development of new technologies and solutions for the decarbonization of steel and mitigation of other impacts
 - ✓ Recovery of degraded areas
 - ✓ Decharacterization of dams and other structures
 - Impacts on water, soil and air
- Social**
- ✓ 860 thousand people in 50 Brazilian municipalities impacted by Vale Foundation projects in Brazil
 - ✓ Training, engagement and development of employees
 - ✓ Income and employment generation
 - ✓ Transmission of knowledge
 - ✓ Social projects
 - ✓ Social license to operate
 - Land use disputes
 - Fatalities and changed lives
 - Impacts on local communities
 - Reputation
 - ✓ Relationship with socio-environmental organizations for communities development, environment preservation and recovery
- Economic**
- ✓ Adjusted EBITDA of USD 31.3 billion
 - ✓ Dividends and shareholder value
 - ✓ Fostering the local economy
 - ✓ Infrastructure for society
 - ✓ Net income from continuing operations of USD 24.8 billion
 - ✓ Payment of taxes and provisions
 - Migrations caused by Vale's presence, increasing demand for infrastructure, services and products

✓ positive
— negative



Purpose and Values

GRI 102-16

We exist to improve life and transform the future. Together.

Mining is essential for the development of the world. Therefore, we seek to serve what society needs and wants, with raw materials and other resources to improve life, caring for the planet and generating prosperity for all.

This is a story of transformation: of the ore, the country, and the company, which is currently present in more than 20 countries. Along this transformation journey, we seek to walk together with society, with responsibility, transparency, and coherence.

Doing it together means listening, but this listening will only be valuable if it is comprehensive: society, partners, customers, and the people who make Vale what it is in all the places it operates. Doing it together means creating a collective capacity to think, dialogue, design, and accomplish possible futures for all. For mining and for the planet.

Values



- **Life** matters most.
- **Act** with integrity.
- **Value** the people who build our company.
- **Make** it happen.
- **Respect** our planet and communities.

Levers



- **Safety.**
- **VPS** (Vale's integrated management system).
- **People.**
- **Innovation.**
- **Sustainability.**

Key Behaviours



- **Obsession** with safety and risk management.
- **Open** and transparent dialogue.
- **Empowerment** with accountability.
- **Ownership** for the whole.
- **Active** listening and engagement with society.

Our Ambitions



- **A benchmark** in safety.
- **A best-in-class** reliable operator.
- **A talent-driven** organization.
- **A leader** in sustainable mining.
- **A reference** in creating and sharing value.



Strategic Pillars

We seek to constantly evolve, to consolidate Vale as a leader in supplying products that are essential to society's the development. To maximize value generation, we rely on five strategic pillars that guide how we conduct our business and operations:

We made progress in 2021 and continue the **efforts to address our challenges**

OUR STRATEGIC PILLARS

PILLAR	SCOPE	ADVANCES IN 2021	MAIN CHALLENGES
<p>SAFETY AND OPERATIONAL EXCELLENCE</p>	<p>To be a reference in safety and reliability, transforming, through VPS, the way we operate and maintain our assets, with people at the center of decision making.</p>	<ul style="list-style-type: none"> • VPS assessments performed by the 2nd line of defense in 100% of areas. • Progress in the implementation of the VPS with a focus on improving working conditions (5S), performance management, discipline in complying with routines and asset maintenance. • 256% increase in the participation of employees in continuous improvement programs. • Reduced by 34% high-potential recordable injuries between 2020 and 2021. • Achieved the lowest recordable injury frequency rate (TRIFR) in Vale's history (1.41). • Hazard Identification and Risk Analysis (HIRA), a risk management program, assessed 100% of Vale sites*. • 100% of the Tailings Storage Facilities classified as Extreme Consequence on the Church of England Tailings Storage Facilities Disclosure list were assessed by HIRA in 2021. • Achieved 60% adherence to the requirements of the Global Industry Standard on Tailings Management (GISTM). • Decharacterized 2 upstream dams in 2021, bringing the total to 7 since 2019. • Brought all dams to emergency level 3 with downstream containment structures built • Reduction of 2,900 employee exposures to occupational risk above the Occupational Exposure Limit (OEL). 	<ul style="list-style-type: none"> • Reduce people risk exposure and increase company's competitiveness by intensifying focus on change of processes, through remote and autonomous operations. • Advance the maturity of VPS in a deep and comprehensive way to enable safe and environmentally responsible operations, and ensure the integrity of our assets. • Operational discipline in complying with established routine and standards. • Overcome the technical challenges to decharacterize/eliminate upstream dams in the shortest possible time. • Achieve full compliance with the GISTM standard for all tailings dams by 2025.

*Considers the assets grouped in operational sites, which underwent HIRA implementation.



PILLAR	SCOPE	ADVANCES IN 2021		MAIN CHALLENGES
<p>NEW PACT WITH SOCIETY</p>	<p>To be a partner company in the development of resilient communities, engaged in relevant issues to humanity and committed to sustainable mining.</p>	<ul style="list-style-type: none"> • Defined our Social Ambition and respective long-term indicators (2030). • Brumadinho Reparation: 43% evolution in total payments provided for in the Comprehensive Reparation Agreement in 2021; 99% of victims with at least one family member have a compensation agreement signed with Vale, with 100% of these agreements already paid. • Implemented electric locomotive pilot. • Engagement with customers who, together, represent more than 40% of Scope 3 emissions. • First voyage of ships equipped with rotating sails and air lubrication, achieving efficiency gains and reducing fuel consumption and emissions. 	<ul style="list-style-type: none"> • Forestry target: 62,248 hectares of protected forests and 5,125 hectares of recovered areas by 2021. More than 700 families engaged, 670 direct jobs and 421 indirect jobs created. • Reduced by 11.7% fresh water withdrawal, and by 20% considering the cumulative (since the 2017 baseline). • Achieved a 39% increase in female representativeness in Vale's workforce and a 80% increase in female representativeness in senior leadership positions compared to 2019. • Announced the target to have 40% of Vale's leadership in Brazil composed of black people by 2026 (up from 29% in 2021). 	<ul style="list-style-type: none"> • Implement the shared value lens in our projects and operations. • Establish and execute a strategy to support the removal of 500,000 people from extreme poverty. • Collaborate with indigenous communities neighboring all Vale operations in the development and execution of their plans in pursuit of their rights under the UNDRIP* • Advance sustainability management and mitigation of controversies, improving performance in key external assessments of sustainable mining. • Evolve the investment programs to reach the commitments made • Contribute to the regeneration of the Amazon ecosystem through combined strategies and partnerships. • Adapt the GHG emission reduction target of Scopes 1 and 2 to the 1.5°C scenario. • Include Scope 3 in the net zero emission strategy.
<p>BASE METALS TRANSFORMATION</p>	<p>To apply best operational and management practices throughout all operations of the Base Metals business unit.</p>	<ul style="list-style-type: none"> • Produced our first ore at the Voisey's Bay and Copper Cliff Mine expansion projects. • Signed an Agreement with OEM to sale 5% of our Class I nickel. • Approved phase 1 of the Manitoba extension. 	<ul style="list-style-type: none"> • Conducted a Comprehensive review of maintenance processes, mainly at Salobo, with a focus on improved operational safety and recovery of the maintenance backlog. 	<ul style="list-style-type: none"> • Stabilize production at the North Atlantic and Onça Puma mines. • Ensure replacement and growth of production capacity through the Salobo 3, Alemão, Cristalino and Hu'u projects, among others. • Achieve 30–40% of Nickel supply to the North American electric vehicle industry within five years.

*UN Declaration on the Rights of Indigenous Peoples



PILLAR	SCOPE	ADVANCES IN 2021		MAIN CHALLENGES
<p>DISCIPLINE IN CAPITAL ALLOCATION</p>	<p>To keep a focus on value creation and asset safety, investing in sustainable production and in protecting/increasing margins.</p>	<ul style="list-style-type: none"> • Signed the Comprehensive Judicial Reparation Agreement, allowing for greater predictability in Vale's disbursements. • Simplified our portfolio with divestitures or binding agreements for divestitures of non-core assets (including VNC, California Steel Industries, Moatize Coal Mine and Nacala Logistics Corridor, Vale Manganese) leading to a significant decrease in our cash drains. 	<ul style="list-style-type: none"> • Distributed dividends of BRL12.60/share to shareholders and bought back approximately 6% of shares. 	<ul style="list-style-type: none"> • Unlock greater value by ensuring that 100% of critical decisions are driven by data and Artificial Intelligence across the value chain and critical assets/risks.
<p>MAXIMIZE THE FLIGHT-TO-QUALITY IN IRON ORE</p>	<p>To leverage our strengths in Vale's world-class reserves, assets and logistics to maximize the value in our premium portfolio of products.</p>	<ul style="list-style-type: none"> • Increased Iron Ore production capacity from 322 Mt in 2020 to about 340 Mt in 2021. • Resumed asset capacity, such as Serra Leste, Timbopeba and Fábrica. • Resumed production at the pelletizing plant in Vargem Grande. • Maintained ~70% of Iron Ore production by the natural humidity processing method. 	<ul style="list-style-type: none"> • Started-up the Vargem Grande waste filtration plant, the first of four plants under construction in Minas Gerais, to reduce dependence on dams. • Investments for producing "green briquettes" as a portfolio solution to support the decarbonization of the steel industry. 	<ul style="list-style-type: none"> • Implement buffer capacity plan to 400 Mtpa ensuring additional flexibility. • Cooperate with partners for greener steel industry solutions.



Learn more

About [progress on public commitments](#).



Learn more

[ESG Databook](#).



Maximizing our value delivery

DE-RISKING	RESHAPING	RE-RATING
<ul style="list-style-type: none"> Brumadinho Mariana Dam safety Resumption of production 	<ul style="list-style-type: none"> Focus on core business Elimination of cash reducers Opportunity for growth with value creation Cost efficiency 	<ul style="list-style-type: none"> Benchmark in safety Best-in-class reliable operator Talent-driven organization Leader in sustainable mining and ESG Practices Reference in creating and sharing value

SOLID CASH FLOW GENERATION

DISCIPLINE IN CAPITAL ALLOCATION

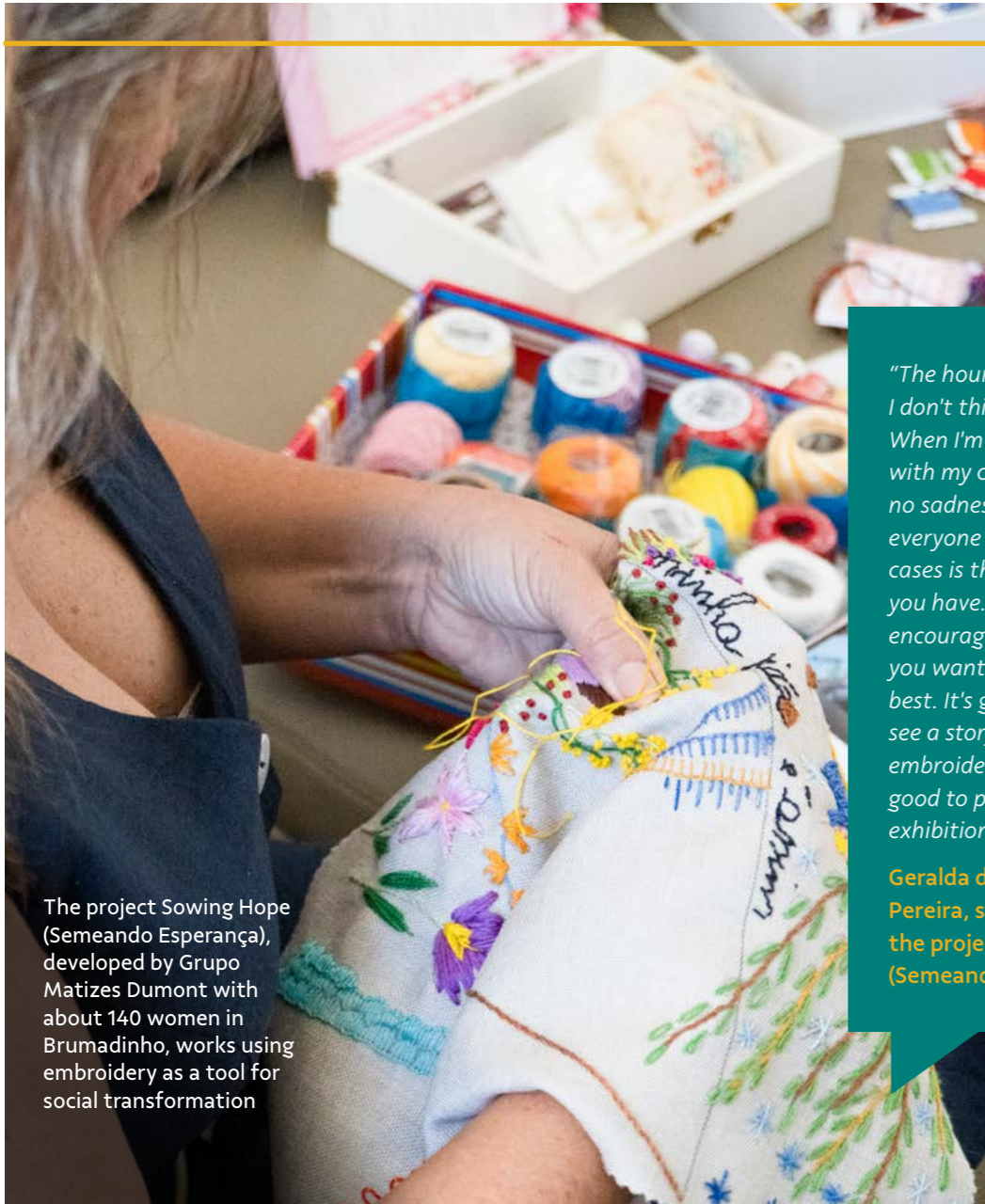


Our Management System (VPS)

We are on a journey to become a safer, more reliable company every day, and our management system, VPS, is a key lever in our Cultural Transformation. The VPS is results-focused and provides for the deep and comprehensive implementation of policies and practices to enable safe and environmentally responsible operations and ensure the integrity of our assets. The VPS contains practices that must be adopted daily by all employees. These practices are based on three dimensions: leadership, technical and management, which in turn break down into 17 elements. Each

element has minimum compliance requirements that are verified in annual cycles of formal assessments conducted by the 2nd Line of Defense. Learn more about [here](#).

The VPS is a management model in constant evolution that consolidates and continuously improves its approach, methods, techniques, and tools used according to what has been learned. Its application is mandatory: being adopted globally in operational and administrative areas.



The project Sowing Hope (Semeando Esperança), developed by Grupo Matizes Dumont with about 140 women in Brumadinho, works using embroidery as a tool for social transformation

PHOTO: VALE ARCHIVE

"The hours I am embroidering I don't think in nothing bad. When I'm in the workshops with my colleagues, there's no sadness, it's always everyone laughing, counting cases is the best thing you have. The monitors encourage us and every time you want to do something best. It's gratifying people see a story in that that you embroidered. He was too good to participate of the exhibition in Inhotim."

Geralda de Fátima Ribeiro Pereira, student from the project Sowing Hope (Semeando Esperança).

Focus on **Reparation**

Brumadinho and **evacuated territories**

We will never forget Brumadinho and we remain determined to provide comprehensive reparation and to compensate the damage caused to people and territories by the collapse of the B1 Dam at the Córrego do Feijão Mine in Brumadinho, Minas Gerais, Brazil. In addition to the 270 fatalities, five of whom were still unaccounted for as of the publication of this report, the dam's rupture caused profound environmental and social impacts.

We understand the profound significance that locating the remains of the missing victims has for the affected families. For this reason, we continue to give priority and unrestricted support to the continuity of the search conducted by the Fire Department of Minas Gerais, which has entered a new phase. Four automated search stations have been implemented to operate simultaneously, while a fifth (reserve) station is available, increasing the efficiency of the activity and the safety of those involved. Our connection with the association representing

the victims' relatives and the support of the Forensic Medical Institute have been invaluable throughout this process and we are very thankful for both.

In line with the Judicial Comprehensive Reparation Agreement signed with the Justice Institutions and the State of Minas Gerais in February 2021 and homologated by court decision in April, we reaffirmed our commitments to continue the initiatives underway since 2019. The total amount of the agreement, estimated at BRL 37.7 billion (BRL 23 billion have already been disbursed since the document was signed), will fund Vale's obligations to do and to pay, encompassing socioeconomic and socio-environmental reparation actions for the damage resulting from the dam failure. This amount does not include compensations referring to individual rights, which follow their normal flow of execution by Vale.

The actions of the Agreement have been detailed and implemented together with society. The socio-economic projects in



Brumadinho and 25 municipalities of the Paraopeba River Basin were submitted for popular consultation conducted by the State of Minas Gerais Government in November 2021. More than 10,000 people participated in the consultation and were able to indicate priority areas for investments in socio-economic repair projects in their cities.

The disbursed amount of the Agreement also includes BRL 4.4 billion to deploy the Income Transfer Program (PTR), which replaced the Emergency Payment.

More than 11,400 people have already been compensated, with individual and labour agreements signed. Out of a total of BRL 3 billion committed, BRL 2.6 billion have already been paid out under the formalized agreements.

The reparation actions are validated by public and justice institutions: the Government of Minas Gerais, Public Prosecution Office of the State of Minas Gerais, Federal Public Prosecution Office, Public Defender's Office of the State of Minas Gerais. Reparation actions have been inspected by independent audits: Getulio Vargas Foundation for socio-economic reparations and EY for financial issues. The company responsible for the environmental reparation audit is still being defined.

The implementation of the actions foreseen in the agreement poses challenges to all the parties. Through several weekly meetings, involving different technical and coordination groups, the difficulties of governance and interpretation of details of the Agreement have been overcome. At Vale we have the challenge of detailing hundreds of projects defined by the communities and municipalities of the affected municipalities, aligning schedules and budgets with current restrictions, and delivering projects that add the expected value to the territories.

Although we know we have a long way to go, we share the advances in the commitments made in the Comprehensive Reparations Agreement, on the socioeconomic and environmental fronts.

More than 11.4 thousand people compensated and USD 2.6 billion paid referring to agreements formalized

Relationship with affected communities* GRI 103-2

In addition to the Community Relations team that works in the field, we have provided a toll-free phone number for general assistance to all people who feel directly or indirectly affected by the Brumadinho dam collapse or the preventive evacuations carried out and other territories served by the Special Board for Reparation and Development.

In 2021, of the 20,254 manifestations* registered on the channel, 19,946 were finalized, with 12,490 fulfilled, 4,607 responded to, and 2,849 denied.

**Service Centre:
0800 031 0831**

*Related to all municipalities attended by Reparation, including territories evacuated due to emergency levels of dams.

"Since January 25, 2019 our lives have changed in the worst possible way. We never imagined that the dam in Brumadinho could break. Neither could our family members. They imagined they were in the safest place in the world. They loved working for the company, they were proud to wear the uniform. And today, all that is left is a lot of pain, suffering and longing. We expect the company to have a transparent dialogue with the employees, inform them if there is any risk of loss of life, and to do everything to prevent it. For us family members, everything that has happened is very difficult."

Alexandra Andrade, president of Avabrum (Association of Families of Victims and People Affected by the Córrego do Feijão Mine Dam Collapse in Brumadinho)



Learn more

Watch the testimonial on the link.



"We don't want reparation. Reparation is for the damage they have done. We want compensation. I want to tell my children in the future, I want to be able to say: Antônio Pereira was like this, but the company provided support and today we are developed. We want a better district and we are able to make it happen."

Resident of the Antônio Pereira district, Ouro Preto/ Minas Gerais (Source: 2021 RepTrak Survey)

SOCIO-ECONOMIC REPARATION

On the socio-economic front, we continue to work together with communities to rebuild infrastructure and promote livelihoods. Initiatives include:

- The Family Referral Program, created in 2019 to provide psycho-social assistance. About 94% of eligible families have joined the program so far (approximately 3,500 people).
- Conclusion of the construction of a new daycare centre for the Palhano community in Brumadinho (MG), with a capacity to care for 108 children, from infants to 5 years old;
- Renovation of the Cachoeira do Choro Community Association in Curvelo (MG), benefiting at least 70 people;
- Delivery of 5,500 new pieces of equipment to 143 Basic Health Units in 15 municipalities served (Brumadinho, Mario Campos, Sarzedo, Inhaúma, Pará de Minas, Paraopeba, Pompéu, São Joaquim de Bicas, Fortuna de Minas, Papagaios, Pequi, Morada Nova de Minas, Itabirito, Nova Lima and Barão de Cocais), in addition to the training of 2,168 health professionals, benefiting the population of these cities, which amounts to about 400,000 people;

- Construction of a social center for the victims' families, serving about 100 people a day since February 2021;
- Ongoing works for Território Park, a joint action with residents for the urban development of Córrego do Feijão, with the purpose of rescuing the bond of the population with the territory, besides enabling a new dynamic for the local economy, less dependent on mining. The project foresees social spaces such as a grove, trails, an overlook, a school, and a soccer field, in addition to a community market and a culture and crafts centre, where local businesses will operate, which have been receiving consulting services and resources for professionalization. The area will be managed by the community itself, which has been participating in training workshops to sustainably manage these spaces since July 2021. The objective is to turn Território Park into a tourist destination and combine quality of life with jobs and income generation of. Twenty percent of the work has already been completed;
- Deployment of sewage collection and treatment systems is underway in the Pires community, in Brumadinho, serving 500 people;

- 75 organizations and 61 projects enrolled in the Valorizar Program public notice, and 28 have been awarded in several categories, such as Work and Income Generation, Tourism, and Education and Culture, totaling an investment of BRL 1.4 million in local projects;
- Supporting small entrepreneurs with income generation, professional qualification in construction or gardening, and expansion of production capacity for 300 farmers;
- Encouraging tourism – one of the levers to diversify the local economy, generate employment and income, and reduce dependence on mining. Through the Strengthening the Competitiveness of the Private Tourism Sector project, in partnership with Circuito Veredas, we have supported the qualification of entrepreneurs, to help them structure their businesses and improve and expand their services and offers. The project takes place in Brumadinho, Igarapé, Juatuba, Mário Campos and São Joaquim de Bicas and has been extended until June 2023. In addition to providing training for 50 entrepreneurs since 2020, we will support new entrepreneurs, totalling 90 beneficiaries in total.



ENVIRONMENTAL REPARATION

Removing tailings is our first step to achieving environmental reparation. Environmental reparation planning begins as tailings removal progresses and affected areas are cleared by the Fire Department, with all projects submitted for approval by the environmental agencies before any activity begins. So far, of the approximately nine million cubic meters of material to be removed from the channel of the Ferro-Carvão stream due to the collapse of Dam B1, more than 50% have been moved and are in the process of final disposal.

Considering the areas impacted by the rupture and its surroundings, we have reforested 26 hectares (of a total of 140) by planting approximately 30,000 seedlings of species native to the region. This process began with the collection of fruits and seeds in the region's forests. We have collected about 600 kg of fruits and seeds from 80 different species so far. Thousands of seedlings have been produced from this, including those at the Vale Natural Reserve in Linhares, Espírito Santo state, for planting in Brumadinho. Preliminary monitoring results from the areas in recovery indicate the presence of dispersing and pollinating species that will contribute to the recovery process.

The monitoring of the water quality of the Paraopeba River is a central factor for the repair

operations throughout the entire basin, because as long as the raw water is not adequate for abstraction, the riverside populations and rural producers along the river banks continue to be served with a constant supply of mineral water, water tank trucks and water from new wells drilled, for animal watering and irrigation. The distribution of water involves a large logistical operation, drastically increasing the circulation of large trucks through the communities, which brings inconveniences of dust, noise, and increased circulation of outsiders in the impacted municipalities.

Since January 2019, the water quality of the Paraopeba River has been monitored by the Water Management Institute of Minas Gerais (IGAM) and Vale. Significant results of iron and aluminum were identified in stretches most impacted by the contribution of tailings, with attenuation as we move away from the confluence region of the Ferro-Carvão stream with the Paraopeba River. The iron and manganese contents, in total form, show an increase during the rainy season and a reduction during the dry season, and the current condition indicates that the water quality is in a transition phase, with a progressive reduction in the metal concentrations.

Detailed results of the monitoring of the water quality of the Paraopeba River in the stretch impacted by the rupture are available at [Vale website](#).

A factor preventing the stabilization of a faster pace for environmental remediation in the areas impacted in Brumadinho is the fact that the work will only move forward after the final release by the Fire Department of the areas for total tailings removal, once the search operations for each stretch of land under analysis have been completed. We are confident that the new search stations in operation will allow a major advance in the pace of the search operations, which will speed up the entire flow of management and final disposal of the tailings and revegetation of the impacted areas.

In Córrego do Feijão, the foundations have been completed and now the structures are being built for the memorial to honour the victims, scheduled to be unveiled in January 2023. The project, designed by architect Gustavo Penna, involved the participation of the entire local community and Avabrum. Our intention is to build a space of belonging, identification and collective interest and a memorial to the victims of the tragedy.

EVACUATED TERRITORIES

Since the collapse of Dam B1 in Brumadinho, we have adopted more conservative dam assessment standards. In this sense, we have adopted preventive procedures for removing people from risk areas when recommended through timely monitoring of the dams. ([read more in Dams](#))

Although our structuring actions have evolved in the territories, we are aware of the impacts and our failure to meet expectations at times. We try to learn from these cases and remain vigilant of residents' needs, advancing our execution of projects and delivery of new or revitalized public equipment to the communities.

In the territories where emergency evacuations occurred – Barão de Cocais, Nova Lima, Itabirito, and preventive actions in Ouro Preto – based on dialogue with the residents and public authorities of each municipality, we advanced the construction and execution of the Compensation and Development Plans. We have invested a total of BRL190 million to minimize the impacts caused by elevated dam safety requirements.

One of the goals of our operations in 2021 was to encourage the creation of new business fronts and to strengthen existing production chains, thus contributing to increase the family income of the population and diversify the economy. Since March 2021, we have trained more than 1,200 entrepreneurs directly and indirectly in the evacuated municipalities through the Horizonte Project, which encourages innovative solutions to the problems residents face. Of these, 39 projects are being accelerated and, as a whole, entrepreneurs will receive more than BRL2.3 million in seed capital to start their activities.



ONGOING ACTIONS IN THE EVACUATED TERRITORIES

Municipality	Dam/site and Emergency Level	Projects in progress or completed in 2021	Key Challenges
Nova Lima	B3/B4 Dam, Mar Azul Mine (emergency level 3)	<ul style="list-style-type: none"> • Launching the Horizonte Project, which seeks to boost local entrepreneurship and stimulate initiatives with innovative solutions to the problems faced by local residents; • Renovating the Capela Velha football field, the Jardim Amanda court and the Marcinho and Grota Fria bridges; 	<ul style="list-style-type: none"> • Accelerate the region's reparation and development program; • Close the existing ACP (Public Civil Actions) in the territory via conciliation (CEJUSC);
Barão de Cocais	<p>Sul Superior Dam, Gongo Soco Mine (emergency level 3)</p> <p>Norte Laranjeiras Dam, Brucutu Mine (emergency level downgraded from 2 to 1 in November 2021)</p>	<ul style="list-style-type: none"> • Building the Territorial Development and Social Transformation Program; • Supporting entrepreneurship projects and local projects; • Acting to protect cultural and religious heritage; • Revitalizing Praça da Lagoa; • Supporting and strengthening public health; • Supporting and structuring the Barão de Cocais Emergency Care Unit (UPA); 	<ul style="list-style-type: none"> • Conclude the indemnity process with the relocated families who opted for the extrajudicial solution; • Address frequent requests from the population to complete the decharacterization plan of the Sul Superior Dam ahead of schedule, which is not recommended due to the complexity of the works;
Itabirito	<p>Forquilhas I, II and III Dams, and Grupo, at the Fábrica Mine:</p> <p>Forquilha I, II and Group: emergency level 2</p> <p>Forquilha III: emergency level 3</p>	<ul style="list-style-type: none"> • Reinforcing the public health network with the inauguration of the new Basic Health Unit (UBS) Nossa Senhora de Bonsucesso, in addition to training more than two hundred professionals through the Health Cycle program and renovating half of the city's ambulance fleet, as well as donating more than 450 items to the city's UBSs, including stretchers, thermometers, oximeters, chairs for blood collection, computers, tablets, routers, chairs and tables through the Health Cycle program; • Holding public consultations with 300 people from the São Gonçalo do Baçõ community about paving the remaining 5.2 km of the MG-030 access stretch to the district, held in 2021; • Conducting a study of conceptual solutions to minimize flooding in the Itabirito River, with the objective of helping municipal management find solutions for flood prevention; • Illuminating tourist spots; • Building Itabirito's Territorial Development and Social Transformation Program, to foster the city's protagonism and local entrepreneurship culture, with the participation of 35 individual entrepreneurs and 14 associations from Itabirito; • Completing the renovation and construction of courts in five municipal schools in Itabirito; 	<ul style="list-style-type: none"> • Complete indemnities; • Return Secondary Safety Zone (ZSS) families to their original homes;

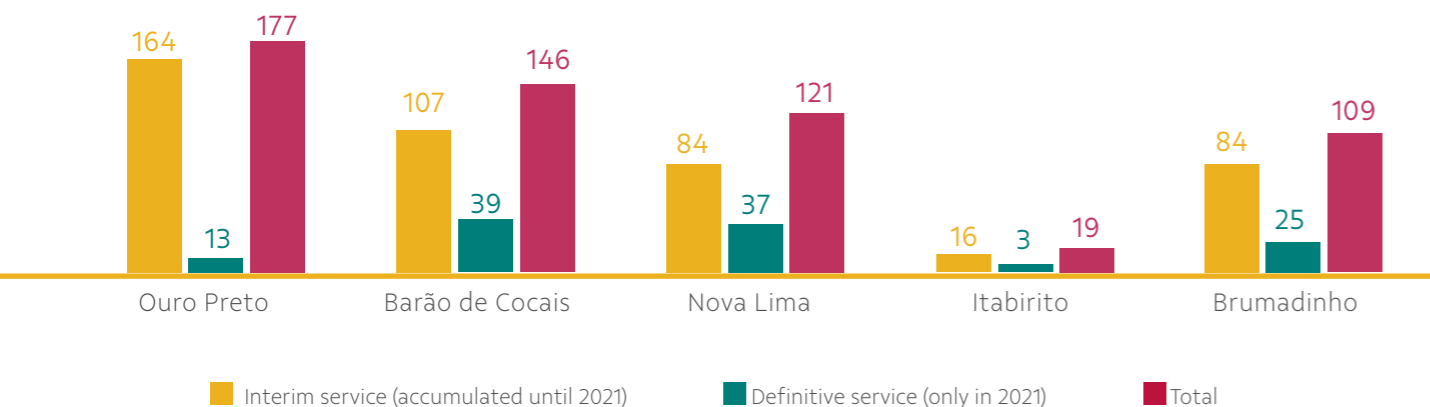


Municipality	Dam/site and Emergency Level	Projects in progress or completed in 2021	Key Challenges
Ouro Preto	Doutor Dam, Timbopeba Mine (emergency level 1)	<ul style="list-style-type: none"> Renovating the Daura de Carvalho Neto State School in partnership with the Minas Gerais Secretary of Education to benefit more than 600 children; Renovating the Social Assistance Reference Centre (CRAS) to benefit more than 840 families, with an investment of BRL 1.6 million; Renovating the Sorria Foundation to improve the oral health care for about 600 children and adolescents, with an investment of BRL 847,000; Supporting to strengthen the public health policy in the district of Antonio Pereira through the Cooperation Agreement with the Municipality of Ouro Preto to expand health and psychosocial care 	<ul style="list-style-type: none"> Insecurity for the remaining population, after the sequence of resettlements that took place Impact Management of the dam's decharacterization works due to the proximity of the community

In Conselheiro Lafaiete, 648 students were preventively relocated due to the technical reassessment of the stability of a waste rock pile in the operations near Meridional School. Work on the new headquarters of the school started in

September 2021, and is expected to be completed in 2022. Since March 2020 the students have occupied a transitional structure created by Vale on the premises of the Presidente Antônio Carlos University Centre (Unipac).

INVOLUNTARY RESETTLEMENT IN BRUMADINHO AND OTHER EVACUATED TERRITORIES GRI G4 MM9



Key lessons learned:

- **Taking responsibility** for the facts and their consequences is the first sign of our commitment to remediate.
- **Empathy and compassion** take on a deeper meaning in light of the losses of those affected.
- **Active listening and presence** in the field to understand and legitimize demands.
- **Discussions based on technical grounds** and KPIs defuse ideological conflicts
- **Humility** is a must for dealing with such a sensitive situation.
- Strong **management and operational discipline** are crucial for successful recovery.
- **Communication** cannot be perceived as advertising. The tone of voice should respect the perspective of those affected.
- Not being afraid of **difficult conversations** with critical stakeholders is key to **building trust**.

Access our [Reparation Report](#), with the main initiatives from 2021. Learn more about [our initiatives](#)



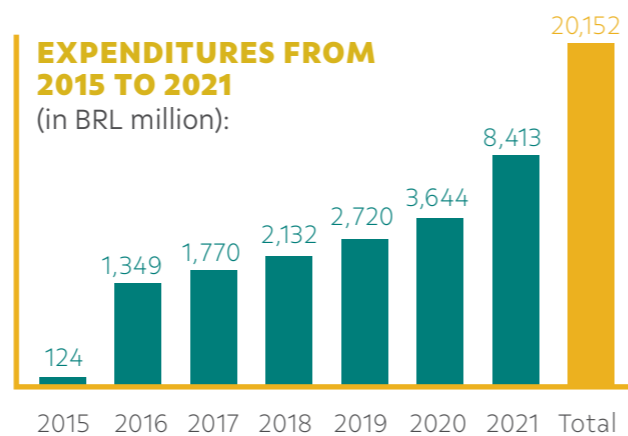
The Renova Foundation and reparation in Mariana

Nineteen people died and thousands of livelihoods were impacted due to the breach of the Fundão Dam in Mariana (MG) on November 5, 2015. The dam was operated by Samarco through a joint venture with an equal stake owned by Vale and BHP (50%/50%).

Reparation in Mariana has been a complex and challenging mission, both because of the breadth of territories impacted by the rupture of the Fundão Dam, and because of the multiple social, cultural and economic characteristics of the region, which covers 39 municipalities in two states (Minas Gerais and Espírito Santo).

Throughout this period, the Renova Foundation, created in 2016 through the Transaction and Conduct Adjustment Agreement (TTAC), has followed through with the commitment to fully repair the damage caused to all those affected and the environment. In December 2021, BRL 20.2 billion had already been disbursed by the Renova Foundation for the reparation, of which BRL19.6 billion went to execute the reparation and compensation programs and the difference went to administrative and governance expenses. Of this total, BRL 4.7 billion was funded by Samarco and BRL15.5 billion was funded by Vale and BHP in equal shares. In 2021, Renova received BRL 3.7 billion from Samarco, BRL 2.15 billion from

Vale, and BRL 2.15 billion from BHP, and spent a total of BRL 8.4 billion on its activities (BRL 7.6 billion on reparatory programs, BRL 0.7 billion on compensation programs, and BRL 0.1 billion on administrative/governance expenses). Since its creation, the three sponsors have contributed BRL 19.6 billion of financial resources and spent BRL 20.2 billion: BRL 18.0 billion in reparatory programs, BRL 1.6 billion in compensatory programs, and BRL 0.6 billion in administrative/governance expenses. Expected disbursements in 2022 are BRL 10.4 billion, and a further BRL 6.5 billion approximately by the end of the Foundation's mission.



In August 2018, the Governance Conduct Adjustment Term (TAC) was signed, which changed the governance established in the TTAC to a more

independent and participatory model. This model involve more than 70 entities working in partnership with the support of more than 25 universities and 40 NGOs and partners; about 6,000 people who contribute to obtaining solutions to the challenges together; and the direct participation of the local committees of those affected to negotiate indemnities and advance solutions in the resettlement process.

These two agreements continue to guide the actions of the Renova Foundation. Vale will continue to seek an expedited reparation through Renova's governance bodies and is open to discussions that may speed up the reparation efforts. Vale is aware that the speed of the Mariana reparation does not meet society's expectations and has been supporting to speed up this process.

ADVANCES AND CHALLENGES IN INDIVIDUAL INDEMNITIES

With regard to the indemnity process, the Mediated Indemnity Program (PIM in Portuguese) was initially installed to pay emergency financial aid and individual indemnities. However, a challenge was identified from the beginning: how to compensate informal workers, such as fishermen, cart drivers, washerwomen and artisans, who had no way to prove the damage caused to them by the rupture.

A new solution came through a court decision, which instituted the Simplified Indemnity System (Novel), in August 2020, which allowed for advances in the compensation process. By December 2021, more than 363,000 people along the Rio Doce River Basin had received BRL 8.7 billion in total indemnities and emergency financial aid (AFEs) paid out. Of this total, more than 51,800 people along the Rio Doce River Basin received BRL 5.1 billion in indemnities paid through the Simplified Indemnity System.

DELAYS IN THE RESETTLEMENT PROCESS

The Renova Foundation faces challenges related to the resettlement process that have contributed to delays, mainly related to the Covid-19 pandemic. Of about 600 consultations planned for the restitution of the right to housing in the resettlement process, 107 were concluded by 2021.

The process relies on the participation of the community and other stakeholders, such as justice institutions and government agencies. In parallel to housing construction, initiatives are underway to provide integrated support to micro and small businesses, which serve, in addition to the rest of the territory, about 160 families from the resettlements; support school and cultural integration activities; and provide guardianship and protection for rescued animals, among others. All these initiatives make up an integrated solution to restore the affected population's rights to shelter and livelihoods.



ATTENDANCES IN 2021

Bento Rodrigues Collective	Family Resettlement	Pecuniary Assistance	Gesteira Services
46 (42 Houses and 4 Public Assets)	25*	9	27

*24 new houses and 1 rebuilt

To conclude these services, the restitution of the right to housing is granted through the following modalities:

Collective Resettlement of Bento Rodrigues

In 2021, infrastructure was completed for Bento Rodrigues, which includes four public assets: a school, health care unit and service station, multi-sports court, and sewage treatment plant, in addition to other infrastructure such as public lighting and pavement. Additionally, a total of 47 houses were built, 42 in 2021 and 5 in 2020.

Collective Resettlement of Paracatu de Baixo

In Paracatu de Baixo, about 93% of the infrastructure has been completed, such as access and drainage, and construction on the school and 11 houses began in 2021.

Family Resettlement

Through this modality, a family can choose a nearby property to live in, or even a plot of land where their new home will be built. By 2021, 36 houses had been delivered, and 29 had been built (five by 2020 and 24 in 2021) and seven rebuilt (six by 2020 and one in 2021).

Gesteira Services

By 2021, Gesteira had 29 completed letter of credit processes (similar to family resettlement). Two had been completed by 2020 and 27 by 2021.

Pecuniary Assistance

In the Pecuniary modality, affected parties, within their liberality and safeguarding all of their rights, request a cash payment in an amount equivalent to their right to housing. In total, 10 families had their right to housing restored through cash payments: one by 2020 and nine by 2021.

Until the properties are delivered, the resettling public can reside in temporary housing, where all the costs of maintenance and guarantee of habitability are borne by the Renova Foundation, which also provides transportation to the temporary schools and leisure and integration activities. The original cultural manifestations of the affected villages are encouraged and their continuity is guaranteed by the Renova Foundation as well, which promotes several actions to maintain and strengthen these activities.

Vale recorded an additional provision of BRL2.8 billion, which went to disbursements expected to support Samarco and the Renova Foundation due to budget overruns in the resettlement works – mainly related to delays due to the pandemic. Some of these funds also went to include new communities and categories in the indemnity program.

REPARATION AGREEMENTS WITH INDIGENOUS PEOPLES AND TRADITIONAL COMMUNITIES

In 2015, the collapse of the Fundão dam impacted the Krenak indigenous peoples in the municipality of Aimorés, state of Minas Gerais and the Tupiniquim and Guarani people located in the Comboios, Caieiras Velhas II and Tupiniquim Indigenous Lands in the municipality of Aracruz, state of Espírito Santo. The Degredo quilombola community, located in the municipality of Linhares, state of Espírito Santo, was also impacted by the event.

In 2021, full reparation agreements, including the payment of family compensation, were signed with the Tupiniquins and Guarani indigenous peoples on all affected indigenous lands, benefiting 1,322 families.

These agreements with the Indigenous populations were built together with the communities, respecting their self-determination and the due consultation process. Besides family compensation, the negotiation prompted the creation of a program to support economic activity resumption and a fund to indemnify immaterial and collective damages, and the detailing of the actions of the Indigenous Basic Environmental Plan to be executed in the communities.

An agreement was also signed with the Quilombola Community of Degredo, which has also been receiving individual compensation and its Basic Environmental Plan will be, at the request of the community itself, executed by the Local Community Association that also acts as Technical Advisor, strengthening the community's autonomy.



Learn more

All the information can be checked at [Renova's website](#).



Renegotiation of the Programs of the Mariana Reparation Agreement

The Governance TAC also provides for a single process for renegotiating the socioeconomic and socioenvironmental programs to remediate the damage resulting from the collapse of the Fundão dam. Considering the judicialization of several themes, by several players; the advent of the creation of the Priority Thematic Axes in the 12th Court; and in view of the need to confer greater celerity, efficiency, and definitiveness, the renegotiation was initiated. This procedure, which is currently underway, aims to improve the programs without, however, confusing, inhibiting or harming the reparatory and compensatory actions, already carried out and/or in progress. Thus, in April 2021, the National Council of Justice (CNJ in Portuguese), started to promote the mediation of this renegotiation process, together

with the parties: Samarco, its shareholders Vale and BHP, as well as several justice institutions and representatives of the public power. There was also the participation of those affected, through the holding of public hearings on the Mariana case, as well as other face-to-face meetings in Brasília, Belo Horizonte and Vitória, with representatives of the parties involved in order to seek conciliation regarding the full reparation process for the damage in Mariana. In June 2021, a letter of principles was signed between the parties with the guidelines that aim to guide the renegotiation of these programs, as well as discussion on the simplification of governance and measures to confer definitiveness in the reparation process. The meetings are still ongoing.

The mediation of the renegotiation process with the parties started to be promoted by the **National Council of Justice in April 2021**



Aerial View of Bento Rodrigues Resettlement

PHOTO: FUNDAÇÃO RENOVAR ARCHIVE

Judicial Reorganization of Samarco

In 2021, Samarco filed for judicial reorganization before one of the Business Courts of the District of Belo Horizonte in the state of Minas Gerais to preserve its ability to produce, ship, receive exports and finance the normal course of its activities, and to comply with the obligations of the Transaction and Conduct Adjustment Agreement (TTAC).

The judicial reorganization request does not and will not impact compliance with the reparation commitments assumed as a result of the breach of the Fundão Dam.



Commitment of non-repetition

One of the pillars of our work in the committing to non-repetition of ruptures such as Brumadinho and Mariana, is the decharacterization of all our upstream dams* in Brazil, always placing the safety of people and the environment as our top priority.

By decharacterizing seven such structures since 2019 – four in Minas Gerais and three in Pará, out of the 30 mapped – we have achieved 23% of our Decharacterization Plan. By 2022, our forecast is to decharacterize more five upstream structures. With this, the company expects to end 2022 with 40% – 12 of the 30 mapped dams and structures – decharacterized.

At the same time and in line with the best practices for dam management, we have intensified actions to prevent, correct and monitor unsafe structures, advancing toward the goal of having no dam in a critical condition (emergency level 3) by 2025.

These actions also increase the safety of the upstream structures that will be decharacterized, until the preparatory and engineering steps for decharacterization are completed. See more in Dams (chapter link).

*The term dam includes dams and dam systems, called Tailings Storage facilities (EAR in Portuguese), dry stacking, and saddle and internal dikes.

SOME QUOTES FROM VALE'S REPUTATION SURVEY THAT ASSOCIATE THE TERM "DAM" WITH THE COMPANY:

<p>Dam, environmental destruction <i>"You have to do something impressive about what happened in Brumadinho and show that it is doing something differently in other locations." (representative from Pará state)</i></p>	<p>Dam <i>"The company needs to improve investment in safety" (representative from Espírito Santo state)</i></p>
<p>Dams <i>"Trying to repair its mistakes, seeking improvement and safety in the way of mining." (representative from Maranhão state)</i></p>	<p>Dam, destruction <i>"Don't let things like this ever happen again, you have to assume responsibilities." (representative from Rio de Janeiro state)</i></p>
<p>Dam Breach <i>"The company needs to show more about its safety procedures of safety, what they changed after the accident, how they are preventing themselves." (representative from São Paulo state)</i></p>	<p>Dam, destruction <i>"You need to take your responsibilities and make sure that you won't make the same mistakes." (representative from Minas Gerais state)</i></p>

Dams GRI 103-2, 103-3

The Brumadinho and Mariana events have changed the global perspective on the use and management of dams in mining. Since then, we have been working on decharacterizing or eliminating upstream structures in Brazil and have been progressing in developing technologies to reduce and dispose of tailings. We know that we have a long way to go.

The issue of dams is currently one of the biggest challenges in the mining sector and

especially at Vale, because, while they are important for continued production, they cause the perception of insecurity in the communities near the operations, especially in the state of Minas Gerais.

In the following topics, we present the key measures we have taken to ensure the robust risk management and to reduce the dependence on dams in our operations.

DAM RISK MANAGEMENT MODEL

The management of dam assets, which include dams to contain water, tailings and sediment, is guided by a Policy for Dam Safety and Geotechnical Mining Structures. The policy establishes guidelines and commitments for managing these structures in line with ABNT NBR ISO 9001:2015 – Quality Management System (QMS), the documents of the Canadian Dams Association (CDA), the Australian Committee on Large Dams (ANCOLD), the International Committee on Large Dams (ICOLD), the Mining Association of Canada (MAC), the International Council on Mining and Metals (ICMM), and the International Finance Corporation (IFC), among others.



In 2021, the Independent Committee for Extraordinary Advisory on Dam Safety published its final report (CIAE-SB, in Portuguese acronym – [Final Report, 2021](#)), and has now been discontinued. To support governance of dam safety, the committee’s members became independent members of the Independent Tailings Review Board (ITRB), acting as external reviewers of Vale’s risk management system in line with the recommendations of the

Global Industry Standard on Tailings Management (GISTM). Our Geotechnical Executive Risk Committee continues to monitor our Upstream Dam Decharacterization Plan and our progress in implementing the Dam and Tailings Management System (TDMS) in alignment with the GISTM. It also analyzes our governance model, composition, duties and accomplishments of the ITRBs.

MANAGEMENT SYSTEMS

Vale has been implementing its Tailings & Dams Management System (TDMS) since 2020, which covers the Routine, Performance and Risk pillars, all strategic aspects of dam and tailings storage facilities (EARs). In 2021, the TDMS also included all business units with clearly defined roles and responsibilities. For 2022, the consolidation of the system is planned, and training for all geotechnical teams.

Based on the TDMS, the work of the Engineer of Record (EoR) for continuous monitoring of the structures is required for dams and Tailings Storage Facilities with a consequence classification of High, Very High and Extreme. The EoR performs regular safety inspections and issues monthly technical reports in order to continuously interpret the results of the inspection and monitoring activities of the structures, among other duties. External to operations, the EoR is integrated into Vale’s lines of defense.

- 100% connected to Vale’s Enterprise Risk Management (ERM)
Status in 2021: The risks related to the rupture of dams and EARs are inserted in the Business Risk Management (GRN in Portuguese) system with established standardized controls. These risks will be gradually migrated to the operational risk base considering the specific critical assessments and controls defined in the HIRAs. Operational risks must also be identified as business risks according to criteria established in the company’s risk management standards.
- 100% of tailings storage facilities operated with potential very high and extreme consequences should comply with the GISTM by 2023, and the others by 2025.
Status in 2021: The methodology was developed in 2021 and the first round of GISTM self-assessment was performed, with an average result of 60% adherence to its requirements.

Risk Assessment GRI 102-11

- 100% of the portfolio of dams and tailings storage facilities with high, very high and extreme consequence classification will have Hazard and Risk Assessment (HIRA) for geotechnical structures by the end of 2022, covering 56 structures.
Status in 2021: In 2020 and 2021 HIRAs were conducted for the Dams and EARs with Extreme consequence classification and others considered priority, contemplating 64 structures.



Learn more
[About our dam management approaches](#)



[Access the GISTM](#)



Where are Vale's dams located

In Ferrous Mineral operations, all located in Brazil, Vale has:

124 dams registered*

with the National Mining Agency (ANM in portuguese), of which:

85%

are located in Minas Gerais

43

are taillings dams

93 dams and 2 dry stacking

are subject to the Regular Safety Inspection Report on a semi-annual basis covered by the National Dam Safety Policy.

In the North Atlantic Base Metals operations, there are 64 tailings dams or tailings storage facilities (EARs), located in Canada (Ontario, Manitoba, Newfoundland and Labrador), totaling 67 structures for the business (added to the 3 Base Metals operations in Brazil). Of this total, 43 are active tailings dams and 24 are inactive dams.

All dams located in Canada have their performance publicly reported in according to the Towards Sustainable Mining (TSM) program of the Mining Association of Canada (MAC).

Understand [Vale's dams](#).

PHOTO: VALE ARCHIVE



In 2021, the construction of the downstream containment structure (ECJ) that serves the dams Forquilhas I, II, III, IV and Group

*The 124 registrations account for dams, tailings storage facilities and dam/structure systems, such as the Pontal System.



SOLUTIONS AND TECHNOLOGIES TO MONITOR AND REDUCE DAM USE

In recent years, the company has sought to significantly reduce its dependence on the use of dams. To this end, it has invested in new potential solutions and intensified the frequency of monitoring and conservation status assessments of its dam structures.



Three Geotechnical Monitoring Centres (CMGs), with 24-hour instrumented and video monitoring



Water level monitoring at different points of the dam, with specific instruments



Measuring the dam's response to seismic activity with specific instruments



Radars monitoring



Using of satellite and drone images to monitor soil conservation and displacement



Installing of sirens

Vale has already invested USD 19.5 billion in facilities and projects that seek to **reduce dependence on dams**

Processing to natural moisture

To replace the wet processing, where tailings are disposed of in dams, or in piles after the humidity reduction process, Vale has advanced in the process of reducing dam dependence.

In the last 13 years, the company has invested about USD 19.5 billion in facilities and projects that seek to reduce dependence on dams, and in 2021 natural moisture processing reached 70% of Vale's Iron Ore production. The main advance towards the goal was the approval of the NS04 project, which uses the dry technique and concentration in Vargem Grande and will contribute 1.5 Mta. Currently, there are three more dry concentration projects for anticipated development in the coming years.

Another potential solution that is being studied is the dry magnetic concentration of Iron Ore based on technology developed by New Steel, a company acquired by Vale. The technology eliminates the use of water in the low-grade ore concentration process, allowing the generated waste minerals to be stacked, instead of being sent to dams.

Learn more

[About the solutions.](#)



In 2021, Vale began tailings removal with unmanned equipment operated from a remote center. Among the emergency level 3 dams, we initiated tailings removal in two of them, and continued this process in relevant structures, such as the Vargem Grande Dam. We also adopted remotely controlled probing equipment was also adopted, which allows probing to a depth of 100 meters at the dams, with more flexibility to maintain and monitoring of the structures.

EMERGENCY ACTION PLANS FOR MINING DAMS (PAEBM)

Part of the Dam Safety Plan (PSB in Portuguese), the PAEBM is a technical document that defines immediate actions in case of emergency. It is filed with the City Halls and Brazilian Municipal, State, and National) Civil Defense that defines immediate actions in case of emergency.

Under the scope of community safety, as a preventive measure, Vale performs a social data survey of all people inserted in the Self-Rescue Zones (ZAS*) on its floodplains. Included in the PAEBM, the data involves information about the people concerned in the risk zone, especially those with any mobility restrictions or any physical, social, or territorial vulnerability associated with the ability to self-rescue.



When the Emergency Level of a dam is raised, the PAEBM should be activated, and from level II on, the communities located in Self-Rescue Zones* should be resettled to safe areas, outside the floodplain.

The resettlement process is intended to occur in a planned manner, considering previously collected information, in synergy with the Municipal Civil Defense and respecting and protecting the human rights of those involved. It is important to emphasize that Brazilian law requires people to be resettled when dams are at Emergency Level III, but Vale, aiming to reduce the risk, promotes the resettlement of families whenever dams are at Emergency Level II. See more in [Evacuated Territories](#).



Learn more

Access the [PAEBMs](#).

*The Self-Rescue Zone (ZAS) is the region located below the structure of a dam, at a distance of 10 km or with an arrival time of the tailings, in the extreme case of a breach, of 30 minutes. Due to its proximity, it is considered a priority in risk or emergency situations. Under Brazilian law, there is an obligation to evacuate the areas closest to the dam if it is considered an emergency level 3. As a preventive measure, however, Vale indicates that the action takes place at level 2.

DAM DECHARACTERIZATION PLAN

One of Vale's main initiatives is the decharacterization of all upstream geotechnical structures in Brazil, including dams, dikes and drained stacks. Once the decharacterization is completed, the area is reincorporated into the local environment.

In 2021, Vale's plan to decharacterize or eliminate upstream structures was reviewed. It includes 30 geotechnical structures, encompassing now the Área IX Dam, at the Fábrica Mine in Ouro Preto (MG) which had its construction method re-evaluated and changed.

During the period, Vale concluded the decharacterization of the Fernandinho dam and also decharacterized the seventh upstream structure and completed works on Dike 5 of the Pontal Dam in Itabira, which is awaiting regulatory agencies' evaluation and no longer has the tailings storage capability.

We also completed the construction of the downstream containment structure serving the Forquilhas I, II, III, IV and Grupo Dams. With this delivery, all the dams at emergency level III now have a downstream back up dam.

Vale's plan also includes the construction of three other downstream containment structures for certain dams and dikes to hold tailings in case these structures fail, protecting the downstream area during the decharacterization works. The first of these structures is scheduled for completion in the second half of 2022, and the other two are in the preliminary engineering analysis phase.

By the end of 2021, Vale completed 23% of the Dam Decharacterization Plan. Since this is a rather complex process, several steps were taken

to ensure that all work is in line with the best engineering practices and carried out as safely as possible. After completing deeper technical studies on the structures, taking into account peer reviews, and audit evaluations, more appropriate solutions have been defined for the decharacterization program, therefore some previously reported deadlines had to be revised and an additional provision of USD 1.7 billion was made.

Due to the technical impossibility of meeting the deadlines established in the legislation governing the decharacterization of upstream structures, in



Rio de Peixe dam, decharacterized in 2021



ECJ Sul Superior dam, in Barão de Cocais

PHOTOS: VALE ARCHIVE



February 2022 Vale signed a Term of Commitment with the Minas Gerais Government, regulatory agencies, and State and Federal Public Prosecutors' Offices. Through this document the schedule and our commitment of the decharacterization of all upstream structures in Brazil were formalized, besides placing the safety of people and protection of the environment as absolute priorities. Under the term of the agreement, Vale will contribute with USD 43.7 million for investments in social and environmental projects, to be disbursed over eight years.

The most recent update of the Decharacterization Plan indicates that 90% of the upstream dams in Brazil are slated to be decharacterized by 2029 and 100% will be decharacterized by 2035. The structures with a longer deadline are those of higher risk, and greater complexity.



Learn more

Access the lists of structures at emergency levels, of geotechnical structures, and the details of the tailings dams.

FORECAST FOR DECHARACTERIZATION OF GEOTECHNICAL STRUCTURES

Number of upstream geotechnical structures (cumulative)	Year of decharacterization
7	2019 to 2021
5	2022
4	2024
2	2025
1	2026
3	2027
5	2029
3	2035

MEASURES FOR UPSTREAM DAMS AT EMERGENCY LEVEL 3

Measures for upstream dams under critical safety conditions

	Sul Superior	B3/B4	Forquilha III
Downstream containment structure (ECJ) ¹	2020	2020	2021 ²
Decharacterization	2029	2027	2035

¹The Downstream containment structure (ECJs) were designed considering the tailings containment of the structures for which they are intended, and updates and adaptations may be necessary. The company monitors extreme weather events and, in the occurrence of these events, the technical teams are mobilized to evaluate and implement improvements that are necessary for the adequacy of the structures.

² Structure with the capacity to retain the tailings from the Forquilha I, II, III, IV and Grupo structures, in case of simultaneous rupture.

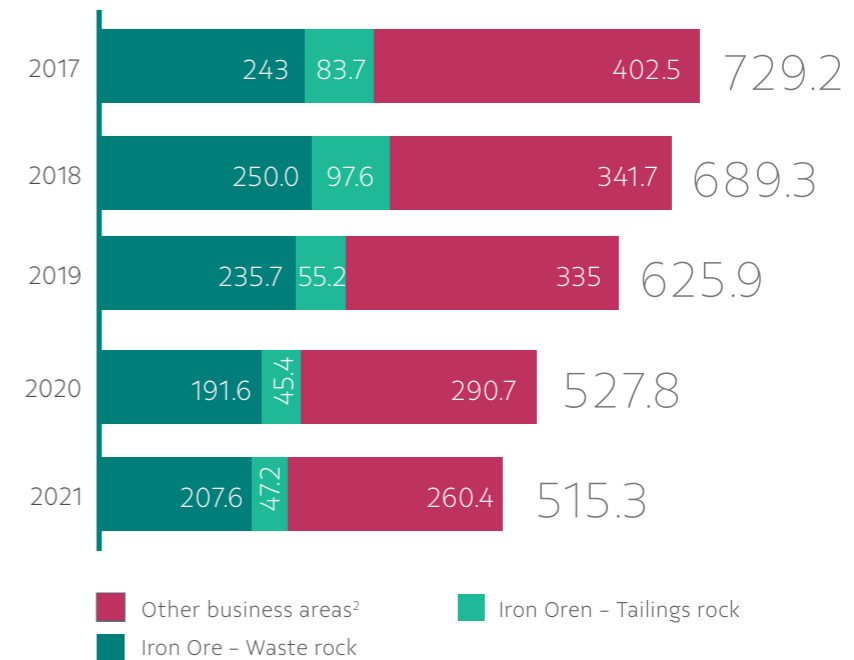
MINERAL WASTE MANAGEMENT

GRI 103-2, 103-3, MM3

Mining–metallurgical waste includes waste rock, tailing rock, slag, and other wastes generated in the metallurgical processes of Nickel, Copper, Cobalt, Iron Ore, and Manganese. The topic is managed based on the Mining and Metallurgical Waste Management Policy, which comprises a set of guidelines to encourage the circular economy.

TOTAL MINING AND METALLURGICAL

in millions of tons



²Other business areas include coal mining waste rock and tailings, nickel, copper, manganese, slag (manganese–nickel alloy), non-inert waste rock (nickel).



Sustainable sand from tailings

With R&D an investment of approximately USD 9.3 million, Vale developed in 2021 a certified sand for the civil construction market, based on adjustments to its Iron Ore processing operations in Minas Gerais. This material, that was previously discarded through piles and dams, is now processed and transformed into a product, following a strict quality control process.

In 2021, 250,000 tons of sand were processed and sent for sale or donation to be used in concrete, mortar, precast, artifacts, cement, and road paving.



Filtered tailings piles

To reduce the use of dams, Vale have announced an estimated investment of USD 2.2 billion between 2019 and 2026 to deploy dry stacking technology for tailings in Minas Gerais. The technique would allow the water from the tailings to be filtered, reused and stacked to reduce the use of dams.

One of the main progresses in 2021 was the execution of the Experimental Landfills at Itabira and Brucutu, this enabled the implementation of the filtered tailings pile (PDR in Portuguese) projects. Besides, 16 different tailings have been characterized allowing a tremendous progress in more than 10 PDR projects. Operations of at least three more PDRs are planned for 2022.



Vargem Grande filtration plant

In 2021, operations began at the Vargem Grande filtration plant, the first of four filtration plants in Minas Gerais, reducing dependence on dams and improving the average quality of the product portfolio through wet processing.

Production capacity was increased by 4Mtpa and began operations at the Maravilhas III Dam, which is planned to receive only the ultrafine tailings from the plants, equivalent to approximately 30% of the total tailings generated by this operation.



Learn more

About the process.



Learn more

ESG Databook.



Governance and Compliance

- 1. Governance structure
- 2. Risk management
- 3. Compliance

Serra Sul Complex, S11D. In the photo, the Vale employees, Amanda Neves Lirio (trainee), Wellington dos Santos Lemos (in middle of the photo) and Luciano France Palhares (on the left of the photo) in the mine workshop

PHOTO: RICARDO TELES

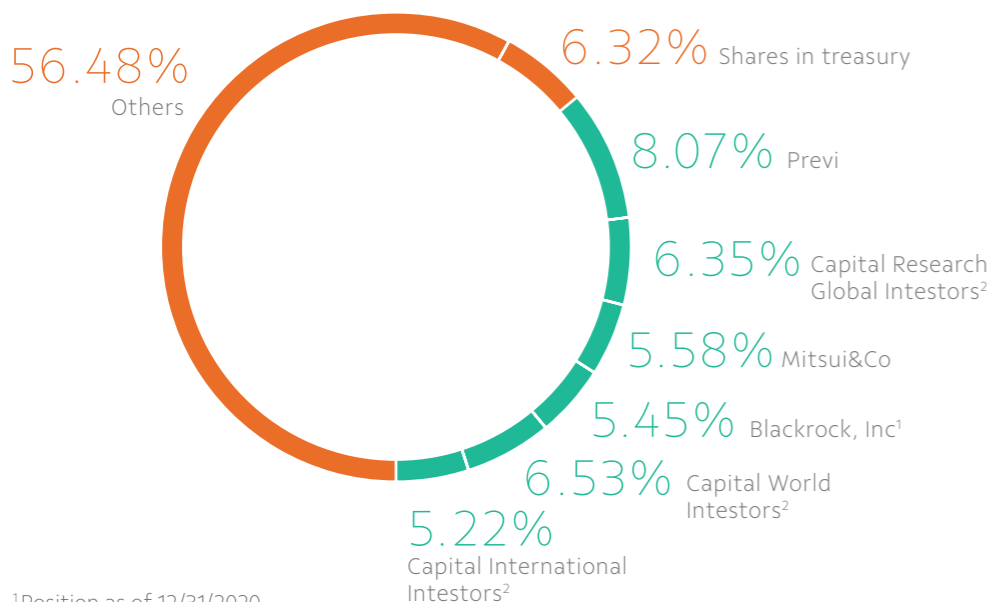


Governance Structure GRI 102-18 | 103-2, 103-3

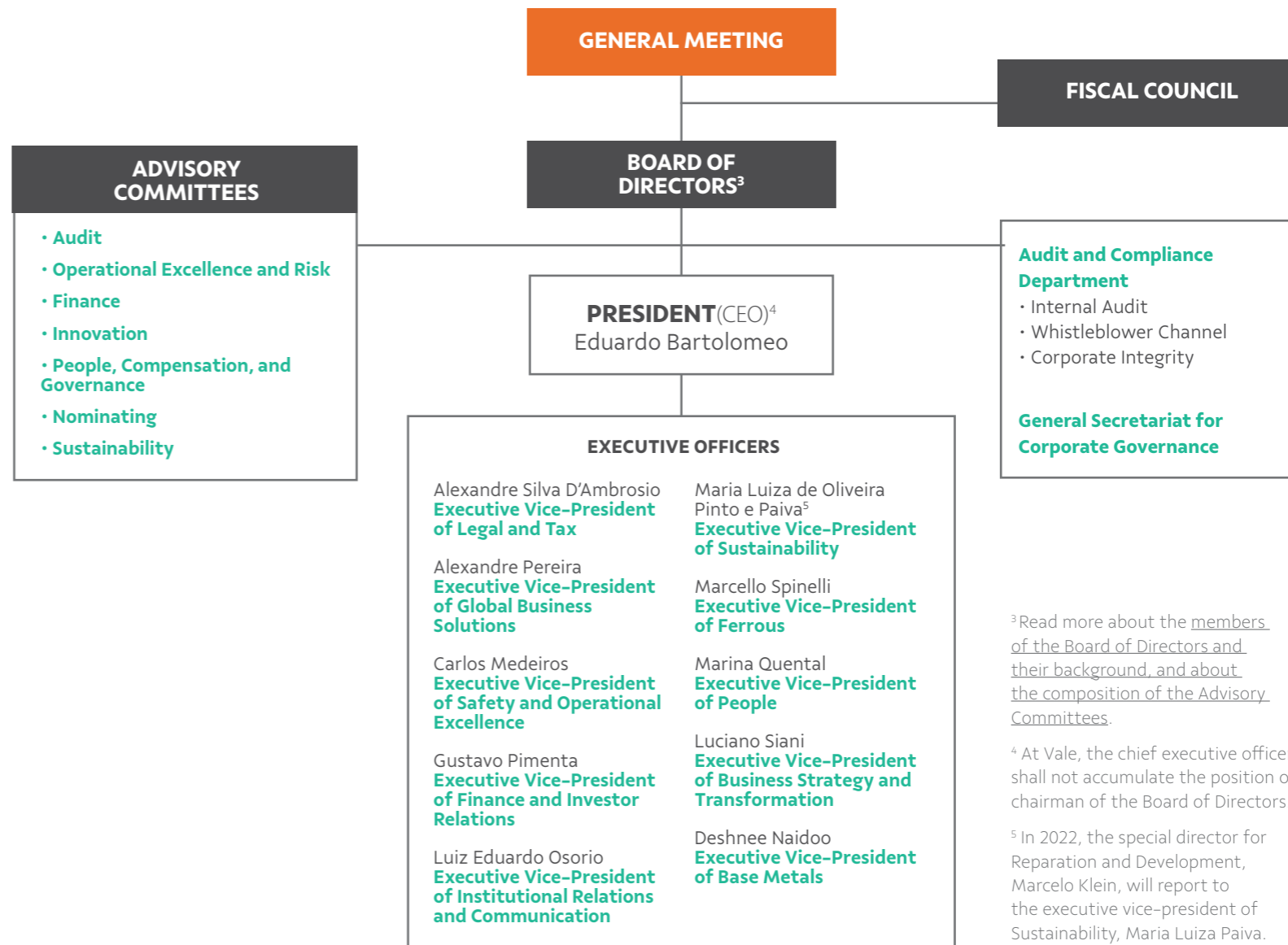
On December 31, 2021, Vale S.A.'s share capital consisted of 5,132,458,398 common shares and 12 special class preferred shares (golden shares). In February 2022, the Board of Directors approved the cancellation of 133,418,347 common shares issued by the Company acquired in a previous repurchase program and held in treasury, with no reduction in the value of its share capital. GRI 102-10

TOTAL SHARES AS OF FEBRUARY 28, 2022

- Others
- Shareholders with more than 5% of total capital



¹Position as of 12/31/2020
²Position as of 09/28/2021



³Read more about the [members of the Board of Directors and their background, and about the composition of the Advisory Committees.](#)

⁴At Vale, the chief executive officer shall not accumulate the position of chairman of the Board of Directors.

⁵In 2022, the special director for Reparation and Development, Marcelo Klein, will report to the executive vice-president of Sustainability, Maria Luiza Paiva. GRI 102-23



BOARD OF DIRECTORS

The Board of Directors is responsible for overseeing the company's guidelines and strategic plans, monitoring and evaluating its economic and financial performance, electing and evaluating the members of the Executive Board, and deliberating on corporate policies, among other duties. In 2021, Vale continued to evolve its governance, seeking references in national and international best practices and deepening its understanding of the perspective of its main stakeholders. In addition, it is also responsible for ensuring compliance with commitments related to respect for human rights, corporate governance rules, accountability, and information disclosure. GRI 102-20, 102-26, 102-27

Governance practices

As required by the Brazilian Securities and Exchange Commission (CVM), Vale publishes an annual Report on the Brazilian Code of Corporate Governance – Publicly Held Companies ("the Report"). Through the Report, Vale sets forth the practices recommended by the Brazilian Institute of Corporate Governance (IBGC) and that are adopted by the company. Access the [Report](#).

"Today we have a Board of Directors committed to consolidating solid governance following international best practices for a corporation. The Board has paid full attention to the cultural evolution of the company, prioritizing Vale's strategic reorientation, and our commitment to the ESG agenda."

José Luciano Duarte Penido
Chairman of Vale's Board of Directors

Board election and migration to the "corporation" model

In 2021, the Annual Shareholders' Meeting (AGO) was held to elect of Vale's Board of Directors. It was the first AGO to be held after the expiration of Vale's Shareholders' Agreement in November 2020. Vale's migration to the "corporation" model, or to being a company with dispersed capital – with no defined control – is a landmark in the company's history.

There were also changes to Vale's Bylaws in order to implement governance improvements, mandating a Board of Directors composed of 11 to 13 full members and one alternate (with the exception of the employees representative), of which at list seven must be independent, under a more restricted concept of independence provided for in the Bylaws; the individual election of Board members, except for employee representatives,

who continue to be elected in a separate vote; and the election of the chairman and vice-chairman of the Board by the Shareholders' Meeting, with the adoption of a lead independent director in case of the election of a non-independent chairman of the Board.

The Board is now composed of 13 members, eight of whom are independent (up from three in 2020), most of whom have expertise in mining or related industries, sustainability and governance.

Of the 13 current members of the Board (term 2021–2023), one is an employee representative, eight were nominated by Vale's Nomination Committee and four were nominated by shareholders.



Learn more

See the [Board of Directors' regulations and its entire composition](#). GRI 102-22, 102-24



PERFORMANCE EVALUATION OF THE BOARD AND ADVISORY COMMITTEES

GRI 102-27, 102-28

The Board of Directors recognizes that a robust and constructive evaluation process is an essential component of good corporate governance and its effectiveness.

Therefore, the Board has adopted the practice of conducting annual performance evaluations with the support of the People, Compensation and Governance Committee areas. These will be used to analyze and recommend the evaluation methodology, seeking opportunities to continuously improve its governance and relying on the engagement of the board members throughout this process. Based on the input obtained in these processes, a development plan will be created for the Board and its members, focusing on the evolution of Vale's governance.

In 2021, due to the recent election of the new Board of Directors, we decided not to carry out the evaluation, and this process is planned to be carried out during 2022 with external consulting support. For more information on the regular evaluation process of the Board of Directors, please visit the company's [ESG Portal](#), Board and Leadership Section.

See the highlights of the last evaluation, conducted in 2020, in the [Integrated Report 2020](#).

FISCAL COUNCIL

The Fiscal Council is a permanent body that performs independent oversight of the Executive Board and the Board of Directors and seeks to contribute to the best performance of the organization through the principles of transparency, equity, and accountability.

The Council's duties include supervising the managers, reviewing management's annual reports and financial statements, and maintaining constant dialogue with the external auditors.



Learn more

Access the [regulations of Vale's Fiscal Council](#).

The Innovation Committee was created in 2021

• Finance Committee

• Sustainability Committee

GRI 102-18

• People, Compensation and Governance Committee

• Audit Committee

• Operational Excellence and Risk Committee

• Innovation Committee

• Nomination Committee

ADVISORY COMMITTEES

GRI 102-29, 102-31

The mission of the Advisory Committees is to advise the Board of Directors, supervise the performance and effectiveness of their business risk management efforts and propose improvements related to their areas of operation to promote more efficient and effective decisions from the Board of Directors.

The Advisory Committees define their annual work plan for priority topics of their areas. Additionally, demands for discussions and evaluations coming from the Committee itself, the Board of Directors, or the Executive Board are dynamically incorporated throughout the year.

The committees are composed of independent members with expertise in the related areas. One of the highlights of 2021 was the Innovation Committee creation to devote greater attention to new technologies and initiatives that provide more safety, sustainability, efficiency and competitiveness to Vale's businesses. GRI 102-11, 102-18, 102-19, 102-20, 102-24, 102-29, 102-30, 102-32



Learn more

Information about the [duties and composition of each committee](#).

GRI 102-22, 102-24, 102-29



EXECUTIVE BOARD

Vale's Executive Board is responsible for executing the business strategy approved by the Board of Directors, developing plans and projects to ensure the company's efficient operational and financial performance. The Board of Directors elects the members of the Executive Board, and the CEO is responsible for submitting the candidates for the Executive Vice-President positions for the Board of Directors' approval. In this process, the Board is supported by the People, Compensation and Governance Committee.

In 2021, the structure of the Executive Board was reviewed and four new positions were created: Sustainability, People, Legal and Tax, and Business Strategy and Transformation. Existing roles were also reviewed to ensure greater alignment with the company's strategy and promote the evolution of our corporate governance, as well as to standardize the executives' contractual conditions and align and clarify responsibilities. We also nominated the first non-white female leader for the Executive Board for the Base Metals business. GRI 102-10, 102-19

Currently, the Executive Board is composed of the CEO and ten statutory Executive Officers¹, nine of whom are statutory². [Learn more.](#)

¹Vice Presidents appointed as Executive Officers as per Company's Bylaws

² They are the Company's legal representatives, responsible for day-to-day operations and business decisions and for implementing the general policies and guidelines set by the Board of Directors.

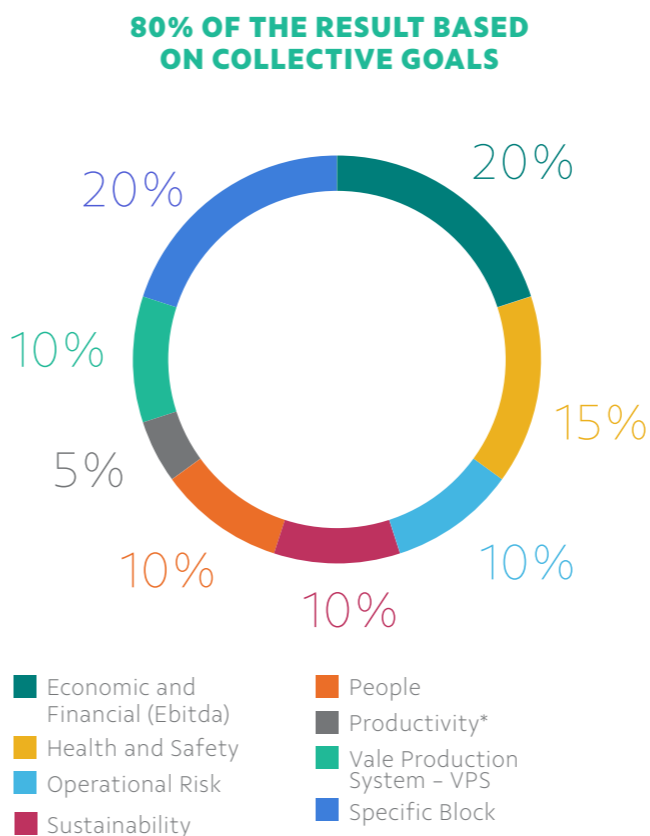
DEFINITION OF COMPENSATION

GRI 102-35, 102-36, 102-37 | 103 | 202

As set forth in Vale's Bylaws, the overall annual compensation paid to the members of the Board of Directors, Executive Board, Fiscal Council and Advisory Committees is established at the Annual Shareholders' Meeting. The Board of Directors, with the support of the People, Compensation and Governance Committee, is responsible for distributing the approved compensation.

The compensation of the members of the Executive Board varies according to metrics focused on environmental, social, and governance (ESG) goals, among others, especially in long-term compensation.

Short term: In 2021, the short-term goals associated with variable compensation for the CEO and other executive officers included:



* The Productivity indicator was not included in the President's panel and its weight of 5% was transferred to the Economic and Financial block, totaling 25%.

The remaining 20% is awarded based on the individual targets defined for each of the executives, in line with their focus and scope of operation. Under consideration are elements such as asset optimization; partnerships with customers; resumption of production; reparation and company reputation; dam management; ESG agenda; integrated innovation; diversity, equity and inclusion; safety and risk; new products development; replacement of Nickel reserves; plant operation; cavities; release for mining; conducting transformative social projects.

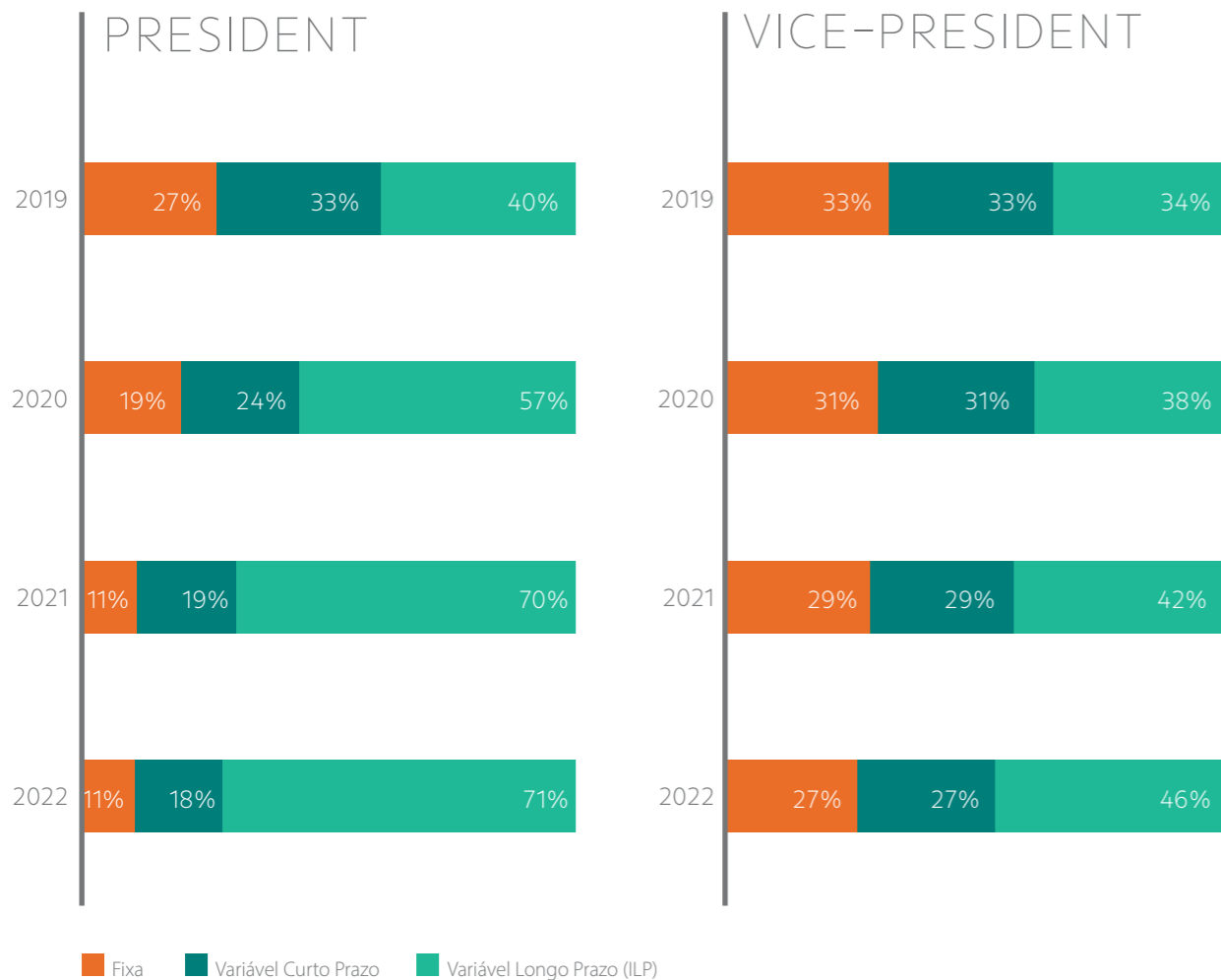
The Health, Safety, Geotechnical, Reparation and Compliance areas do not have financial and productivity targets in their compensation dashboard.

Long term: The long-term variable compensation is based on shares (Matching and PAV programs). In the cycle beginning in 2022, it was proposed to increase the weight of the ESG metric in the PAV from 20% to 25%, reinforcing Vale's commitment to best environmental, social and governance practices.

Four new positions were created: Sustainability, People, Legal and Tax, and Business Strategy and Transformation



CEO AND EXECUTIVE OFFICERS – EVOLUTION TOTAL COMPENSATION MIX



* ILPs: refer to the long-term variable remuneration programs (share-based) Matching and PAV (Vale Stock Program).

Risk Management

GRI 102-11, 102-15, 102-30, 102-33, 102-34

Risk management in all activities is a crucial topic when conducting our business. To that end, we have a Risk Management Policy, which was revised and approved in 2021, that determines the main methodologies, guidelines, processes, and responsibilities on the topic.

Guided by ISO 31000, ISO 55000, COSO-ERM and, by an operational safety management system called Risk Based Process Safety (RBPS), Vale's risk management is structured under the lines of defense model, in an effort to ensure robust governance and efficient controls. [Learn more.](#)

In addition to the Board's Advisory Committees, responsible for overseeing the scope and effectiveness of the executive officers' business risk management, there are also Business Risk Executive Committees, created by Vale's Board of Directors: Operational Risks; Geotechnical Risks; Strategic; Financial and Cyber Risks; Compliance Risks; and Sustainability, Institutional Relations

and Reputation Risks. All of these act in a preventive manner their mission is to support Vale's executive officers in monitoring risks and necessary deliberations.

The Integrated Risk Map is assessed and approved at least once a year by the Board of Directors, on the recommendation of the Executive Board and aims to contemplate risks that need to be assessed and monitored in all units.



Learn more

[Access the Risk Management Policy.](#)

The Integrated Risk Map is evaluated and approved at least once a year by the **Board of Directors**



First full load of a Valemax type vessel at the Tubarão Port Complex, in Espírito Santo

KEY LONG-TERM EMERGING RISKS MAPPED

EPIDEMICS AND PANDEMICS

Collective manifestation of a disease that rapidly spreads, by direct or indirect contamination, reaching a large number of people in a given territory (e.g., Covid-19, ebola, avian influenza, etc)

RUSSIA - UKRAINE WAR AND INTERNATIONAL SANCTIONS

Escalation of the conflict could lead to disruption of international trade flows, extreme pricing, high volatility in the markets, with particular impact on the energy sector, increased regulatory and contractual uncertainty, and geopolitical tensions around the world. It may also lead to a cooling off of the international Sanctions landscape by imposing new restrictions on selling or purchasing products, or conducting business with specific countries, companies and individuals.

CYBERSECURITY

Vale's business relies heavily on technological systems for its operations. Cyber events or attacks can have a significant impact on our business. Cyber risk management discipline addresses situations in which the availability, integrity, and confidentiality of information technology and operational technology systems can be compromised.

CLIMATE CHANGE

Increased sense of urgency to address the challenges that threaten not only the mining industry, but society as a whole. Low-carbon mining is one of our priorities for the coming years.



Learn more

See the [main causes, impacts, and risk mitigation actions of the main emerging risks.](#)

RISK MANAGEMENT PROGRAM - HIRA

Vale relies on the Hazard Identification and Risk Analysis (HIRA) program for operational risk management. The program is designed to map and analyze high-severity operational safety risks or those of a very high-risk amplitude, identify and define performance criteria and establishes assurance of the appropriate critical controls, as well as the mitigation plans.

In 2021, the 1st HIRA cycle was completed as part of our strategy to improve operational risk management. The 2nd cycle has already started and will last and will be completed in the next three to five years. As part of the HIRA program, the Integrated Risk Management tool was updated, as it now consolidates all the risk related information in a single platform, which contemplates the inclusion of the information from the Risk Management area and other lines of defense in a single platform.

We concluded the 1st cycle of HIRA in 2021

PHOTO:TADEU BIANCONI / MOSAICO IMAGEM



Compliance

GRI 103-2, 103-3 | 205, 205-1, 205-2

Ethics and integrity are principles that guide how we conduct all of our activities. In 2021, Vale launched its Global Ethics & Compliance Program, consolidating activities to promote ethical conduct and anti-corruption behaviour.

The program has six pillars, which guide the expected behaviour and decision making in an ethical and responsible manner: (1) Governance, (2) Guidelines, (3) Communication and Training, (4) Monitoring and Risks, (5) Whistleblower Channel, and (6) Consequence Management. GRI 102-16

In 2021, Vale hired an independent external consulting firm to conduct a diagnosis of the company's compliance culture. This diagnosis allows us to identify the maturity level of the implemented processes, the impact of the actions, and employee perception of the topic. In the last year, the consulting firm's analysis demonstrated

what it found to be a step-change evolution in Vale's compliance culture. Among the topics that presented the most evident advances are training for employees, appropriation of the compliance theme, adaptation of policies and guidelines to different realities, and dissemination of the company's Whistleblower Channel. Additionally, the diagnosis also points out opportunities for improvement that are incorporated into the program's annual planning. These include training for contractors, accountability of the Reporting Channel, and wider dissemination of the structure, tools, and methodologies used by the area. We will perform this compliance culture diagnosis at least once every two years. In addition, the activities of the Ethics & Compliance Program, including the Whistleblower Channel, will also be submitted to an external audit once every two years, starting in 2022.

In 2021, we carried out a diagnosis on Vale's compliance culture to identify the processes maturity level

LEARN A LITTLE ABOUT EACH OF THE PILLARS OF VALE'S ETHICS & COMPLIANCE PROGRAM:

Governance

The Audit and Compliance Department is the area responsible for the program. Reporting directly to Vale's Board of Directors, the department is supervised by the Audit Committee and works in conjunction with the Conduct and Integrity Committee, which has had an independent external member since 2021. This structure ensures the necessary autonomy and independence for the Audit and Compliance Department to conduct of Internal Audit, Whistleblowing Channel and Corporate Integrity areas, the latter being the 'guardian' of Vale's Ethics & Compliance Program.

Guidelines

Vale's Code of Conduct brings together the company's ethical principles, which are based on our values and purpose. The new edition of the document, published during the launch of the Ethics & Compliance Program in 2021, is available in nine languages and has audiobooks available for the visually impaired. Employees were invited to renew their commitment to ethics by signing the code's statement of awareness and commitment. In 2021, 85.74% of the employees signed the document. New employees sign the Code of Conduct when they are hired.

In 2021, three new editions of the Ethics & Compliance Program documents were also published. The Global Anti-Corruption Manual, revised during the year, details the rules defined in the Global Anti-Corruption Policy. The company also published its Global Guidelines on Conflicts of Interest and launched its first Consequence Management Policy, a document that establishes guidelines for applying disciplinary measures for confirmed misconduct. GRI 205-2



Communication and Training

The communication and training strategy of the Ethics & Compliance Program includes mandatory actions for all employees and specific training for areas classified as priorities due to their exposure to the risk of corruption.

In 2021, as part of the communication actions for the program's launch, we released four short films on relevant topics – Ethics, the Whistleblower Channel, Harassment, and Corruption and Fraud. We also produced educational booklets detailing the ethical principles of the company's Code of Conduct.

In addition, an online course on ethics and compliance was launched and, taken by 89% of Vale employees globally, totaling the participation of 64,330 people. A total of 1,886 employees from priority areas also received specific training on anti-corruption rules. The first global edition of the conflicts of interest campaign was also held, with 34,422 employees participating (64.17% of employees with computer access). GRI 205-2

Risks and Monitoring

In 2021, using tests and controls, Vale strived to reinforce the continuous monitoring of processes and risk management actions to track how the company was adhering to the Ethics & Compliance Program guidelines in practice.

Whistleblower Channel and Consequence Management

GRI 102-17, 102-34 | 406-1

In 2021, Vale's Whistleblower Channel underwent a restructuring process through which we implemented of new protocols. In 2021, there was a 33.8% increase in the number of reports received by the channel, totaling 6,248 reports that included allegations, inquiries and complaints. Throughout the year, 5,526 of these reports were closed. All confirmed violations have been assigned remediation plans. During the year, 3,014 corrective actions were established, including actions to dismiss 157 employees.

During this period, 11 cases of sexual harassment were confirmed in Vale's Brazilian operations. In all 11 cases, all the victims were women. There were also three confirmed cases of discrimination – two involving gender issues and one related to sexual orientation. Vale classified all these cases as very high severity, according to the company's Consequence Management Policy launched in 2021, and they resulted in termination actions. In the cases involving contractors, on the other hand, the

companies were notified and the employees were demobilized. Eighteen cases of moral harassment were confirmed, which generated action plans involving training, coaching, feedback, warnings, dismissal and/or contractors demobilization.

Additionally, Vale adopts preventive measures to promote a culture of integrity in teams that have had confirmed misconduct. Action plans for dealing with allegations confirmed in 2021 also included promoting round-table discussions and holding health and safety dialogues on a culture of respect, moral and sexual harassment, discrimination, among other topics.

More information on Vale's Whistleblower Channel and actions to promote a culture of ethics and integrity at the company are reported in the [Ethics & Compliance Program's Annual Report](#).



ANTI-CORRUPTION RULES

GRI 205, 205-1

Vale has zero tolerance for corruption and bribery. The company's anti-corruption rules are mechanisms intended to ensure compliance with all applicable anti-corruption laws, including the U.S. Foreign Corrupt Practices Act (FCPA), the Brazilian Anti-Corruption Law (Law No. 12,846/2013), and local laws in each country in which we operate.

In 2021, Vale's operations were submitted to corruption-related risk assessment. These risks are broken down internally among the areas according to the degree of exposure to corruption and has associated controls and clear anti-corruption rules.

In total, 16 controls are related to Vale's anti-corruption rules, six of these are classified as key controls and related to approvals of socio-environmental investments, specific conditions for donations and sponsorships, suppliers in general, high-risk suppliers, hiring of public agents and training in the Ethics & Compliance Program.

In 2021, no cases of corruption involving public agents were identified. Through the company's Whistleblower Channel, three cases of bribery involving private companies were identified, all of which resulted in actions to dismiss the employees involved. GRI 205-3

SOCIOECONOMIC AND ENVIRONMENTAL COMPLIANCE

GRI 103-2, 103-3 | 307-1 | 419-1

In 2021, the Vale group companies received 21 significant fines (amounts equal to or higher than USD 10,000) for non-compliance with environmental laws and regulations, totaling about USD 10.2 million, and 11 non-monetary sanctions related to various aspects, such as alleged non-compliance with environmental conditions, pollution, and activities performed without the necessary environmental authorizations/licenses.

The company also received five significant fines, totaling USD 868,000, and three non-monetary sanctions (warnings) for non-compliance with socioeconomic laws and regulations, applied in the scope of administrative proceedings filed by the National Land Transport Agency (ANTT in Portuguese) and related to providing passenger rail transport service. Vale emphasizes that it constantly invests to continuously evolve its control and monitoring systems, and that the fines and non-monetary sanctions applied to the company are discussed in the scope of the respective administrative and judicial processes.

ANTITRUST, UNFAIR COMPETITION, AND CONFLICTS OF INTEREST

GRI 102-25 | 206-1

Besides having a specific **Anti-corruption Policy**, the main references in antitrust management are the guidelines and decisions of the jurisdictions in the regions where we operate. In 2021, no critical facts of antitrust or unfair competition were identified or reported.

In 2021, the company published an internal document "Global Guidelines on Conflicts of Interest". The absence of conflicts of interest is one of the ethical principles of the new edition of Vale's Code of Conduct. The company repudiates and rejects any action, influence or decision motivated by interests contrary to the standards that are not exclusive and legitimate to Vale.



Dois Irmãos Train station at Vitória-Minas Railroad

PHOTO: GUSTAVO BAXTER



DATA PRIVACY

Privacy is a Fundamental Individual Right, which should have the same rigorous treatment and level of protection as any other fundamental rights. With rapid digitalization, growing digital dependence, and the volume of personal data circulating in the digital world, several laws aimed at strengthening privacy and data protection practices are being implemented globally.

In 2021 Vale created an independent Executive Management of Personal Data Privacy, defining an executive responsible for the global management of the program at the company. The objective of the Privacy area is to preserve the right to privacy and protection of personal data of individuals who have a relationship with Vale, acting in an independent and multidisciplinary manner.

The creation of the Privacy Department was the result of work that began in 2018, with the hiring of specialized consultants who have conducted, over the years, assessments of the company's maturity in relation to the main privacy legislations in the areas where we operate (especially but not limited to Brazil, Europe, China and Canada), with the implementation of specific actions in each region to adapt our operations to privacy rules.

Company executives and employees have been receiving regular training in privacy practices. The

company's main systems and personal data flows are permanently evaluated, to ensure their correct treatment in adherence to the requirements and guiding principles of the applicable laws.

Governance

The executive management reports to the Executive Vice President of Legal/Tax, acting in partnership with other areas of the company such as the Vice President of People, Corporate Security, Department of Technology and Information Security, Repair Management, Supplies, among other areas of the company.

Privacy Guidelines

Vale's Privacy guidelines were established in a Global Policy published in 2020, which sets out the minimum conditions for Vale and other group companies to handle personal data.

The program also has a direct communication channel with the privacy team and with the DPO – Data Privacy Officer, so that data subjects can make requests concerning their data, or even submit complaints or suggestions.

The communication channel, as well as Vale's external privacy notice, is available on [our website](#).

SOCIO-ENVIRONMENTAL EXPENDITURES

GRI 203-1

In 2021, Vale contributed USD 1.3 billion in socio-environmental expenditures, including those related to Brumadinho, which represented a 28% increase compared to 2020. As for environmental expenditures, the contribution totaled USD 804.2 million, of which water resources, environmental liabilities, and energy accounted for the largest expenses. Social expenditures totaled USD 473.5 million, 73% with our own resources and 27% through incentive laws. The main expenditures were in urban infrastructure and mobility, culture, health, and social protection.



Learn more

[About Social Investments.](#)

Vale created an independent executive management of Personal Data Privacy. The purpose of the area is **to preserve the right to privacy and data protection**



Manufactured Capital



Sossego Mine,
in Canaã dos
Carajás, Pará

PHOTO: RICARDO TELES



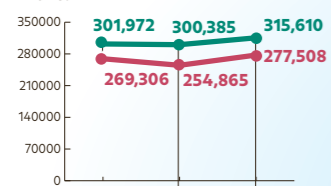
MANUFACTURED CAPITAL

Vale completed the year with around 340 Mtpy of iron ore production capacity and expects to reach 370 Mtpy by the end of 2022

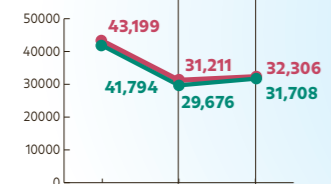
PRODUCTION AND SALES

Mtpy
— Production
— Sales

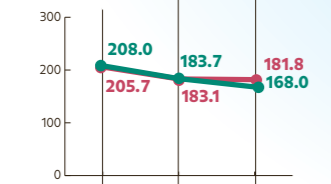
Iron ore:



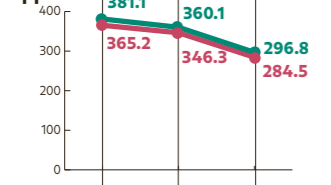
Pellets:



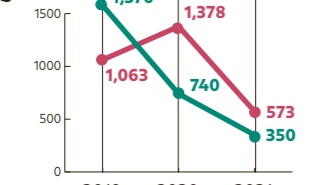
Nickel:



Copper:



Inganese:

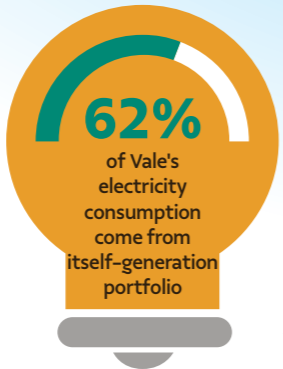


VALE SERVES INDUSTRIES, SUCH AS STEEL INDUSTRY, ON ALL CONTINENTS GRI 102-6

- Americas**
South, Central and North America
- Europe**
including Turkey
- Asia and Africa, considering**
- Middle East North Africa and India (Menai) – Middle East, North Africa and India

- China, Japan, Korea, Taiwan, Southeast Asia (Vietnam, Indonesia, Malaysia and Philippines)

- Oceania (Australia)

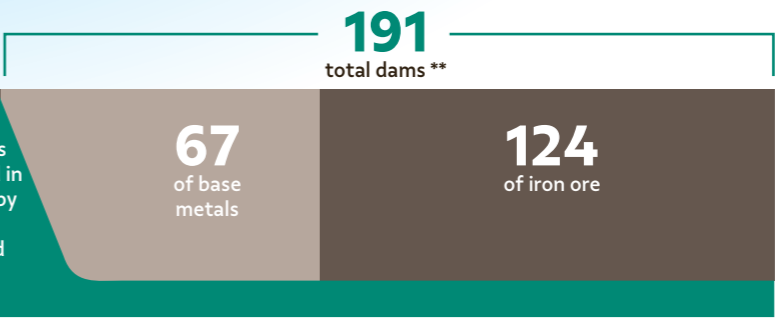


2,324 MW was the total of Vale's electricity self-generation

NUMBER OF STRUCTURES BY EMERGENCY LEVEL



30* upstream geotechnical structures will be decharacterized in Minas Gerais and Pará by 2035, of which 7 have already been concluded since 2019



*It accounts for the number of structures (EARs) to be decharacterized, some of which are part of the same dam/ EAR system, such as the dikes 1A and 1B that make up the Conceição System (accounted for in the total of 191 dams/ EARs). **Also includes dam/tailings storage facilities systems that contain more than one structure.

ENERGY CONSUMPTION MATRIX BY SOURCE



Other fuels:
- Other gases: 0.1
- Shipping oils: 0.1
- Other liquid fuels: 0.1



VALE PRODUCTS GRI 102-2

Where we operate:

Iron Ore: Brazil, Oman, Malaysia and China.

Nickel: Brazil, Canada, Indonesia, Japan, China, UK.

Coal: Mozambique.

Copper: Brazil and Canada.

Manganese and ferroalloys: Brazil.

Divestments in non-core assets GRI 102-10

In 2021, we completed the sale of Vale New Caledonia (VNC) to the Prony Resources New Caledonia consortium, in line with our commitment to withdraw from New Caledonia in an orderly and responsible manner. A total of USD 555 million were disbursed as part of a USD 1.1 billion package to provide VNC with the means to build a trajectory with sustainable operations.

In December 2021, we signed a binding agreement with Vulcan Resources (Vulcan) regarding the sale of the Moatize Coal Mine and the Nacala Logistics Corridor (CLN), in line with the company's decarbonization strategy, adapting its investment portfolio to a low-carbon economy. The transaction involves a total of USD 270 million, comprised of USD 80 million at the completion of the transaction and USD 190 million from the existing business until completion – plus a 10-year Royalty Agreement subject to certain conditions of Mine production and coal prices. The completion of the transaction is subject to the fulfillment of customary preceding conditions, including the approval of the Ministry of Mineral Resources and Energy of Mozambique, and the approval of the Government of Mozambique under the Concession Agreements for the change of control and antitrust.

Given our commitment to a just transition, Vale conducted a responsible investor search process for Mozambique's assets, and the new operator, Vulcan, a private company that is part of the renowned Jindal Group, has extensive experience working in Mozambique.

Also in December, we announced the sale of our 50% interest in California Steel Industries to Nucor Corporation (Nucor), completed in February 2022. As a result of the transaction, we received a purchase price of USD 436.7 million in cash, of which USD 400 million is related to 50% of the value of the negotiations and the remainder related to adjusted net debt and working capital at the closing of the transaction.

In January 2022, we completed the sale process of Vale Manganês assets, including the Ferroalloy production units in Barbacena and Ouro Preto, and the Morro da Mina manganese ore mine, in Conselheiro Lafaiete, Minas Gerais. The VDL Group, a business conglomerate that operates in the transportation, mining, and steelmaking segments, has definitively taken over the management of the assets of the three units, ending our activities in the production and sale of Manganese Ferroalloys. The transaction did not involve the manganese

ore assets that our company owns in the states of Pará and Mato Grosso do Sul. The strategy of divesting Vale Manganês's Ferroalloy operations streamlines our company's operations, allowing continued focus on core assets.

The transactions reinforce the discipline in Vale's capital allocation, with a focus on its core businesses and a commitment to portfolio optimization, based on our goals to preserve our operational continuity and a responsible and sustainable exit.

PRODUCTION AND SALES HIGHLIGHTS IN 2021

The production and sales highlights in 2021 were: (a) the volume increase in Iron Ore production (5% p.a.) and sales (9% p.a.) driven by higher production at our Minas Gerais operations (17% p.a.), partially offset by weaker performance at S11D (-11% p.a.); (b) a favourable market price scenario (46% p.a.); (c) the strike in Sudbury, interrupting our operations for 70 days and contributing to a 9% reduction in Nickel production and an 18% reduction in Copper production; and (d) the stronger performance of Coal production in Moatize (45% p.a.), along with the signing of a binding agreement to sell the asset.



Learn more

[Production and sales highlights in 2021](#)

We completed the sale of assets in line with our strategy to **focus on core businesses**



Industrial Complex S11D, in Canaã dos Carajás, Pará (PA)

PHOTO RICARDO TELES

Financial Capital

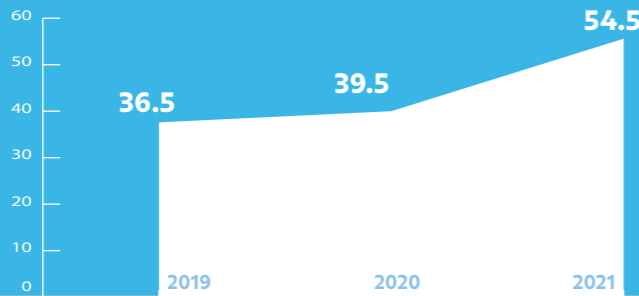


FINANCIAL CAPITAL

In a year still marked by the persistent effects of the Covid-19 pandemic and market volatility, we were able to reach significant milestones in creating sustainable value for our stakeholders

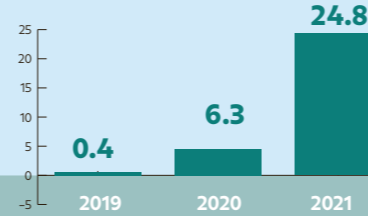
NET OPERATING REVENUE FROM CONTINUING OPERATIONS

In USD billion



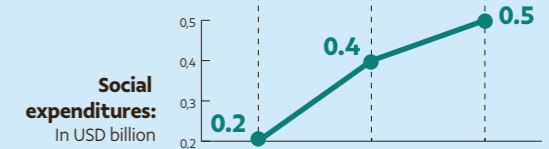
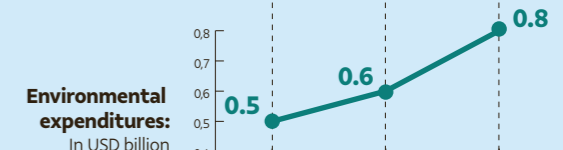
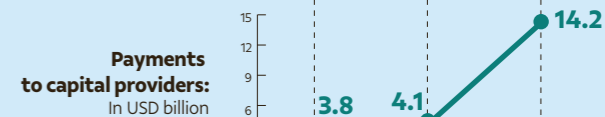
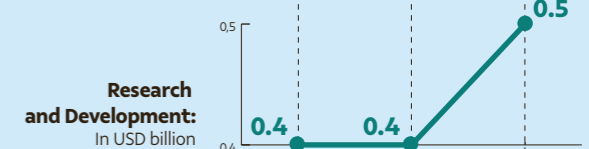
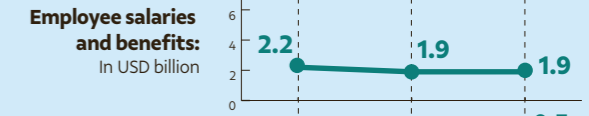
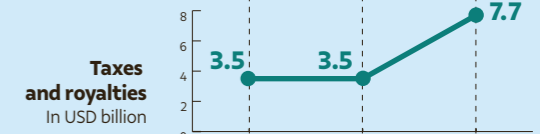
NET INCOME FROM CONTINUING OPERATIONS

In USD billion



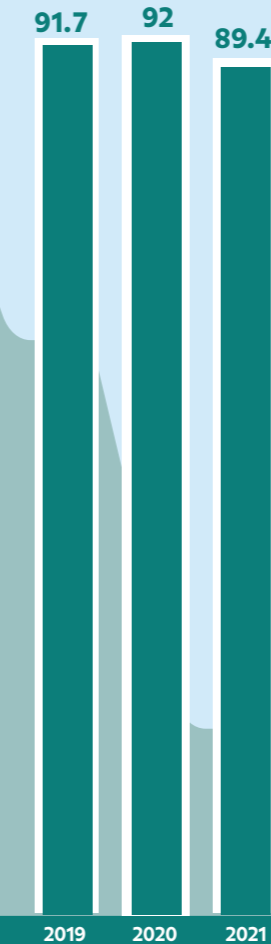
RESULTS AND IMPACTS

2019 2020 2021



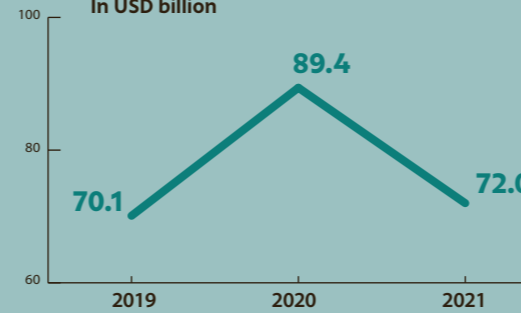
TOTAL ASSETS

In USD billion



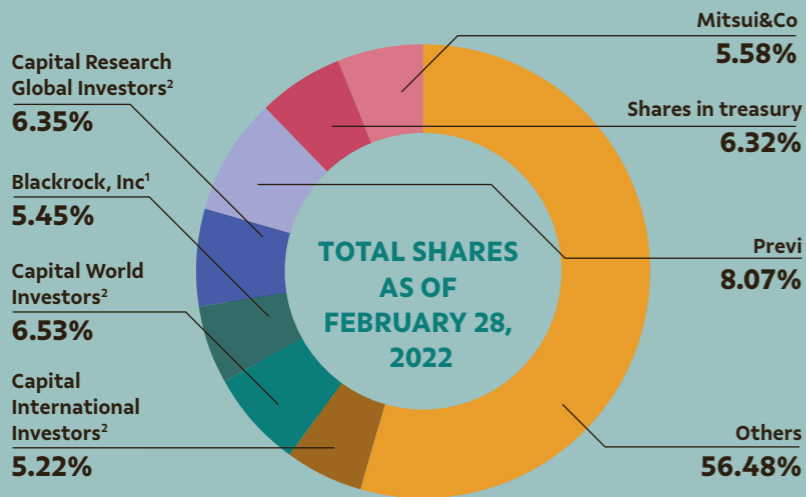
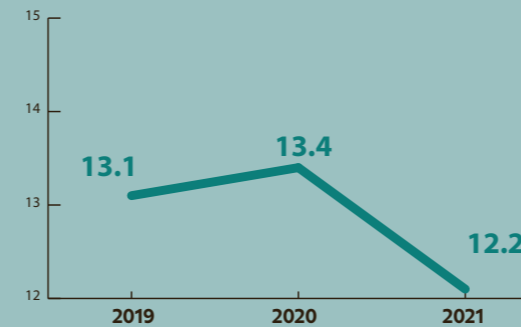
MARKET CAP

In USD billion



GROSS DEBT

In USD billion



1. Position as of 12/31/2020
 2. Position as of 09/20/2021

Adjusted EBITDA from continuing operations

USD 31.3 billion



Economic-financial performance GRI 103-2, 103-3 | 201

In 2021, Vale achieved adjusted EBITDA from continuing operations* of USD 31.3 billion, 13.8 billion higher compared to 2020, mainly due to higher realized prices and sales volumes of Iron Ore and Pellets, partially offset by certain costs and expenses that included third-party purchases and royalties, higher freight costs and higher maintenance and service costs.

Net income from continuing operations was USD 24.8 billion for the period, USD 18.6 billion higher compared to 2020, mainly due to higher proforma EBITDA and higher financial results.

Net operating revenues was USD 54.5 billion, an increase of USD 15.0 billion compared to 2020. The increase is due to better market conditions and higher realized Iron Ore prices. Costs and expenses from continuing operations, including the Brumadinho reparation, totaled BRL 142.9 billion (USD 26.4 billion), remaining BRL 11.5 billion (USD 969 million) more than the amount spent in 2020.

Our investments in the period were USD 5.2 billion, of which USD 4.2 billion were dedicated to the maintaining operations and USD 1 billion to

executing growth projects. The amount invested represents an increase of 18% compared to 2020, due primarily to: (a) the advance in Salobo III, expansion of the Voisey's Bay Mine and the Serra Sul 120 Mtpy project, as planned; and (b) the start of execution of the Capanema (Iron Ore) and Sol do Cerrado (solar energy) project.

PERFORMANCE INDICATORS

USD 54.5 billion

Net operating revenue from continuing operations

USD 31.3 billion

Adjusted EBITDA from continuing operations

USD 27.7 billion

Operating income from continuing operations

USD 24.8 billion

Net income from continuing operations

USD 24.7 billion

Net income from continuing operations attributable to Vale shareholders

USD 5.2 billion

Investments

*Continuing operations: does not consider the result of the coal operation

RESULTS OF EQUITY HOLDINGS BY BUSINESS AREA (IN USD MILLIONS)

	2021
Ferrous Minerals	166
Base Metals	1
Coal	-
Others	327
TOTAL	494

BALANCE SHEET (IN USD MILLIONS)

	2021
Current assets	22,360
Non-current assets	14,389
Property, plant and equipment, net and intangible assets	50,942
Investments in associates and joint ventures	1,751
Total assets	89,442
Current liabilities	15,198
Non-current liabilities	38,938
Total liabilities	54,136
Stockholders' equity	35,306
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	89,442



STATEMENT OF VALUE GENERATED AND DISTRIBUTED GRI 201-1

Vale's statement of value generated and distributed includes revenues, operating costs, employee compensation, donations and other social investments, retained earnings and payments to capital providers and governments.

In 2021, the earnings with regards to the balance sheet for the fiscal year reached a total of BRL 12.62 per share, between interest on capital and dividends.

Results center

Access [Vale's complete 2021 financial statements](#).

See Vale's global tax contributions in our annual [Tax Transparency report](#).

VALUE GENERATED AND DISTRIBUTED (IN USD MILLIONS) GRI 201-1

Country/ Region	North America, except Canada	Canada	South America, except Brazil	Brazil	Europe	Africa	Australasia	Middle East	TOTAL
Revenues	-	1,805.5	1.3	5,272.6	44,317.2	-	3,104.9	(0.0)	54,501.5
COUNTRY/REGION	-	1,805.5	1.3	5,272.6	44,317.2	-	3,104.9	(0.0)	54,501.5
Operational costs	-	2,312.5	13.3	10,565.4	6,097.5	-	796.0	240.6	20,025.3
Employee salaries and benefits	-	435.0	6.9	1,252.4	30.8	-	106.2	41.0	1,872.3
Research and development	-	110.2	26.4	324.1	20.9	-	67.1	-	548.6
Payments to capital providers	421.9	252.0	-	13,475.8	26.2	-	-	-	14,176.0
Payments to government	17.5	(194.3)	2.8	7,740.4	(21.8)	60.0	86.3	3.7	7,694.6
Environmental expenditures	-	106.5	0.7	670.8	1.2	19.7	1.5	3.7	804.2
Social expenditures	-	6.0	0.0	449.2	1.7	14.2	1.6	0.8	473.5
DISTRIBUTED ECONOMIC VALUE	439.4	3,027.9	50.0	34,478.1	6,156.6	93.9	1,058.9	289.7	45,594.6
ACUMMULATED ECONOMIC VALUE	(439.4)	(1,222.4)	(48.8)	(29,205.5)	38,160.7	(93.9)	2,046.0	(289.7)	8,906.9



Intellectual Capital

Tubarão Port receives the first large ore carrier in the world equipped with a rotating sail system (rotor sails). The Sea Zhoushan vessel is a VLOC (Very Large Ore Carrier), with a capacity of 325 thousand tons

PHOTO: ANDERSON BIBICO



- 1. Innovation
- 2. Vale Institute of Technology (ITV)



INTELLECTUAL CAPITAL

Our pillars for innovation are: Protecting lives, Sustainable mining, Market differentiation, Learning Journey and Open Innovation

VALE'S TECHNOLOGICAL DEVELOPMENT CENTERS

Mineral Development Center (CDM), in Sabará (MG)

Ferrous Technological Center (CTF), in Nova Lima (MG)

Vale Technological Institute - Sustainable Development (ITV DS), in Belém (PA)

Vale Technological Institute - Mining (ITV MI), in Ouro Preto and Santa Luzia (MG)

Artificial Intelligence Center (AI Center), in Vitória (ES)

GEOTECHNICAL MONITORING

Team and roles

+20

people work 24 hours divided into 3 or 4 shifts. They are:



A dashboard displays all the analysis tools available in real time to the professionals. Check it out below.



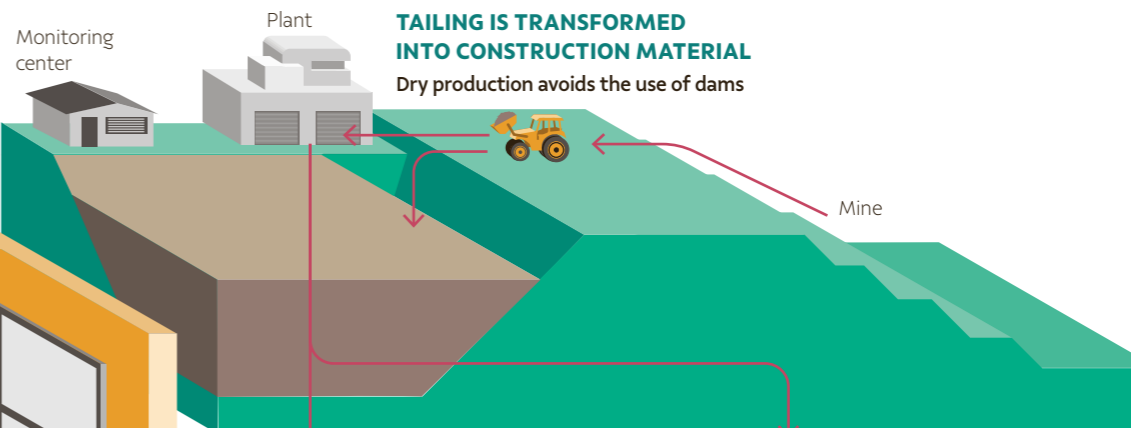
1 Interpretation of monitoring and mapping data of dams

2 Data collected by radars is able to point any displacements of structures

3 Monitoring of earthquakes induced by operations in the surroundings

4 Video monitoring for anomaly detection

5 Video analytics can differentiate geological and non-geological movements



TAILING IS TRANSFORMED INTO CONSTRUCTION MATERIAL

Dry production avoids the use of dams

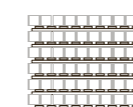
Blocks production



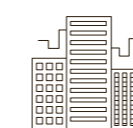
1. The tailings are placed in the mixer together with water, cement and binders



2. The mixture is placed in a press, which by means of vibration and compression is transformed into blocks



3. The blocks are packed, stacked and stored



4. And so both the blocks and the sand are ready to be used in civil construction

Sand production



1. The process of removing mud from iron ore is carried out



2. The residue is concentrated



3. Then it goes through sorting and filtering processes



ITV IN NUMBERS (2011 TO 2021):

USD 209.2 million

already invested in research

747

published scientific articles

154

supported R&D projects



Development of the world's first large ore carriers equipped with rotating sails and air lubrication.



Implementation of an electric locomotive in Tubarão Port in Vitória. In 2022 the electric locomotive project will also be tested in the port of São Luis.



Launch of the "green briquette", a new agglomerated iron ore product.



Off-road trucks are using Artificial Intelligence to reduce fuel consumption



Innovation

For us, innovation is an essential asset for creating shared value with society and for mitigating the impact of our activities. Innovation at Vale is considered one of the levers for achieving our purpose. We have a vision where our production is increasingly automated, reducing our people's exposure to risk and increasing the agility and productivity of our operations. We will have artificial intelligence solutions supporting all major decisions. We use technology to redesign our ways of working, reducing risk scenarios, with the goal of becoming a reference in safety and risk management. We have a complete view of the value chain and collaborate with clients to create differentiated products and services. Teams collaborate remotely, creating a more accessible environment, attracting a more diverse workforce. We seek to transform people and digitize processes through new ways of working, promoting agility, collaboration and integration. Renewable energy drives our business, we will develop and use new mining and processing technologies to promote sustainable development by reducing carbon emissions, promoting reforestation and accelerating social and environmental technologies. We innovate to contribute to the sustainable development of our businesses and communities, generating a positive

impact on society. Innovation is supported by four main pillars: Protecting lives, Sustainable mining, Market differentiation, Learning Journey and Open Innovation.

PROTECTING LIVES

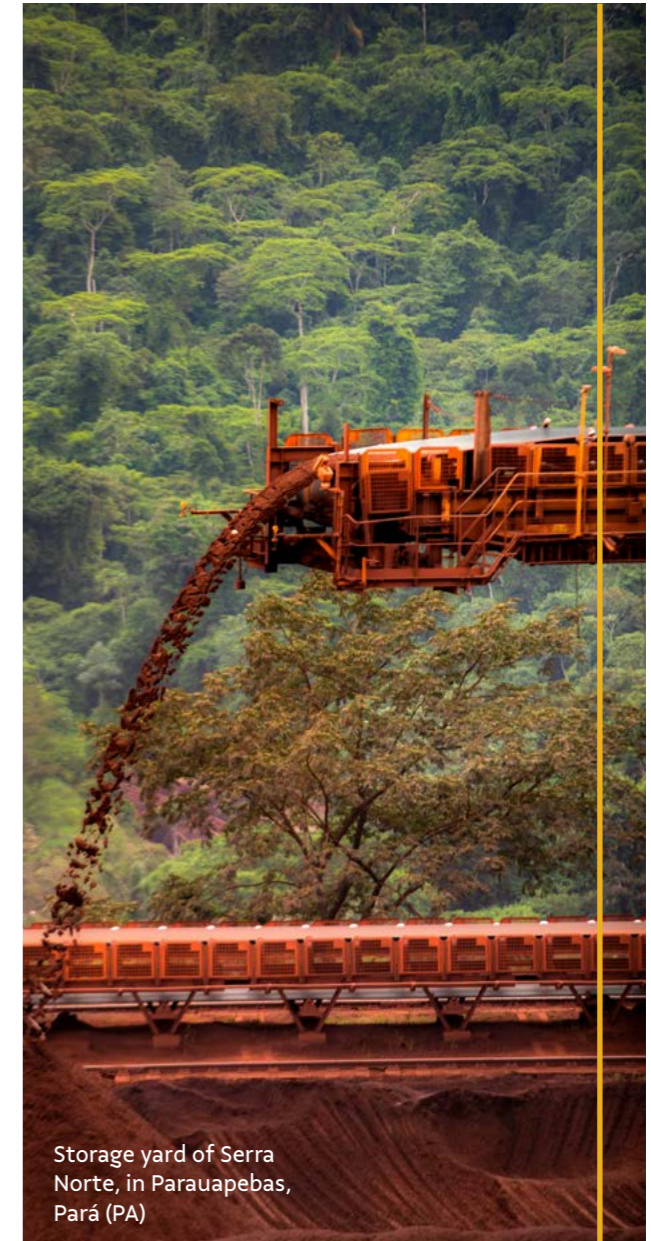
For us, life comes first and there is no productivity without safety. Innovation is a catalyst to transform the way we operate, prioritizing people's health and safety. Life first is a non-negotiable value for us. To become the safety reference, we redesigned our work to eliminate exposure to risks, adopting remote work on a large scale, as well as maintaining priority based on "Impacted Lives".

In 2021, Vale established the Safety Transformation Program to have global governance to maximize the impact of health and safety actions, using technology and innovation. The Program works by scaling protection solutions and ensuring adherence to minimum safety requirements; accelerating the implementation of mitigation controls and the adoption of remote operation to remove or reduce risk to people; and ensuring that the prioritization of safety technology initiatives is based on their potential to impact lives. As a result, the program has already ensured that more than 9,500 sensors have been installed to protect against fatigue, collision and electrical hazards, and more than 17,000 people are now using

location sensors, allowing the monitoring of the position and exposure of professionals to critical risks, through the Global Safe Access Program. With this, more than 40 thousand people received protection barriers against accidents and more than 10 thousand people were effectively enabled to work remotely through Jornada Vale.

In addition to the growing application of remotely operated equipment, we developed applications for robotics and increased the use of autonomous equipment in our operations. These technologies allow us to achieve better and safer production levels. The increased productivity of the mine assets also represents a reduction in GHG emissions from our operations. We have more than 100 pieces of equipment operating in our Self-Employed Portfolio, removing more than 545 people from risk. We expect a robust expansion of this portfolio in 2022, particularly in the northern system.

Also in 2021, we will expand the use of new technologies in our dam management model. In addition to 24-hour video and radar monitoring, we are using satellite images and drones to track the state of conservation and ground displacement in our structures. See [here](#) how Vale's Geotechnical Monitoring Centre works.



Storage yard of Serra Norte, in Parauapebas, Pará (PA)

PHOTO: RICARDO TELES



SUSTAINABLE MINING

We are committed to fostering sustainable development. The PowerShift Program is working in the ecosystem of start-ups and partnerships to develop and accelerate the maturity of solutions to reduce Scope 1 and 2 emissions in our value chain. The program involves, among other things, the use of waste to produce new materials, fostering the circular economy and reducing greenhouse gas (GHG) emissions. This occurs through the acceleration of low-carbon technologies, bioenergy and product development that assist our customers in their emission reduction goals, in addition to carbon removals via reforestation, protection and capture technologies.

We are part of the communities where we operate and, therefore, we encourage the generation of shared value through our actions in the territories. We develop technologies to reduce GHG emissions from our operations, such as, for example, the first electric locomotive of its kind and the application of biochar in our operations to replace the anthracite used in pelletizing. In partnership with the ecosystem, we are developing options for substituting diesel fuel for trucks.

In partnership with the Vale Institute of Technology (ITV), we advanced in the maturity of our portfolio of technologies to reduce Scope 3 emissions, through successful tests of new technologies for the ship fleet, such as rotorsail (a ship that uses rotating

sails), which enables the use of wind to reduce fuel consumption, and air lubrication, which reduces GHG emissions by minimizing friction on the hull.

MARKET DIFFERENTIATION

We explore opportunities to strengthen the industry's production chain, create new products, services, and business models in a co-creative way with our audiences and customers. We are developing new products and strategies to support the energy transition through electrification, improving and expanding our product portfolio in base metals. In Ferrous to increase the value of the company in a sustainable way, we developed a portfolio of initiatives where the "green briquette" has a prominent position as a new product with low energy intensity and with the potential to reduce our emissions and those of our customers. The briquette is Vale's exclusive technology, the result of several years of technological development and already patented in more than 47 countries, with three plants already approved and another five in the analysis phase. We also offer high iron content products, generated through our new natural humidity processing technology, a sustainable process that eliminates the need for dams. In 2021, we informed the market about our new bio-carbon pilot plant, a technology capable of reducing the use of traditional carbon sources, reducing total GHG emissions and enabling the production of "green" pig iron, using our modular Tecnoed plants. Also within our portfolio of new

For us, innovation is an essential asset for creating shared value with society and for mitigating the impact of our activities.

products, we announced the creation of a new company focused on Green Cement, a type of low emission geopolymers cement that will use mining waste sand. This company will use state-of-the-art technology to produce cement with high quality, lower cost and significant carbon emission reduction potential.

INDUSTRY 4.0

In line with the technological trends advocated by Industry 4.0, Artificial Intelligence and Machine Learning-based algorithms are used in our operations to predict the behavior of important process variables. Today 17% of our critical assets are monitored by Internet of Things (IoT) and Advanced Analytics.

At our Artificial Intelligence (AI) Center in Vitória, Espírito Santo, we develop projects involving optimization of asset maintenance and improvement in the management of processes at ore beneficiation and pelletizing plants, as well as the improvement of environmental, health and safety and corporate integrity controls.

Smart Safety, which currently reaches 50% of Vale's employees, is a predictive analysis solution based on Artificial Intelligence that calculates the probability of risk events in operational areas. Strategically, this solution adds an intelligent and dynamic protection barrier in operations, identifying potential risk areas and acting proactively to take preventive actions. In Base Metals, for example, there is now assertive monitoring of actions to be taken to avoid accidents. In the Southeast Corridor, in Ferrous Minerals, the tool contributed to the decrease of the Total Recordable Injury Frequency Rate (TRIFR) in the year 2021.

We use AI to further promote the sustainability of our operations by reducing the fuel consumption of off-highway trucks, avoiding the emission of more than 74,000 tons of CO₂ per year, in line with our goal of reducing direct and indirect emissions by 33% by 2030. We also highlight the use of a platform with artificial intelligence called [PrevisiA](#) to identify deforestation and fire risk areas in the Amazon,



promoting a strategic preventive action. This project is the result of a partnership between the Instituto do Homem e Meio Ambiente da Amazônia (Imazon), Microsoft and Fundo Vale. Finally, Artificial Intelligence is also used in our Asset Monitoring Centre (CMA), which seeks to expand integration between the Planning and Asset Management areas with two purposes, enabling decisions:

- Reduce risk exposure in processes and assets, through status visibility of critical controls and asset health.
- Optimize the reliability and performance of assets throughout their life cycle, allowing greater adherence to Operational Plans.

LEARNING JOURNEY AND OPEN INNOVATION

We seek to drive people development and digitize processes, through new ways of working that promote agility, collaboration and integration. We believe that collaboration in an open innovation ecosystem, through partnerships with universities, startups, government and other corporations is essential to accelerate innovation initiatives. We have built an innovation network within the company that today is connecting nine innovation hubs within our operations in order to address critical issues on the ground. New partnership models in the form of collabs (collaborative projects) are essential to strengthen our open innovation strategy that can accelerate our learning journey. Vale has advanced in Innovation initiatives, and we recognize that we can learn from our own journey.

An example of collaboration with the ecosystem in Brazil is MiningHub, an initiative to co-construct solutions with innovation in the mining industry.

Participants include 24 mining companies, 700 startups and 15 major suppliers, with a reach in 22 countries. Already, 90 proofs of concept have been carried out and 20 contracts have been signed between mining companies and start-ups.

In addition to these initiatives, Vale has also been seeking to establish partnerships in projects and initiatives to accelerate the development of solutions and knowledge, in line with its purpose to be a leader in low-carbon mining. These partnerships involve suppliers, research institutes, operators, technology consortiums, among others, as for example in the "Charge On" challenge held in 2021 for the development of truck battery systems. In Canada, we are part of the innovation hub that is focused on supporting early-stage technology startups and their founders. Vale helps by providing access to key resources and connections to the networks they need to start, expand and scale their ventures.

In the Mining Innovation for a New Environment 2.0 (MINE) Program, we seek to develop people, solve strategic problems for Vale and generate positive impact for society. In this program, Vale, in collaboration with universities and innovation institutes, offers participating professionals the opportunity to build a safer, more sustainable and efficient future for mining through open innovation. During the program, participants

developed solutions to solve real challenges in the areas of decarbonization, circular economy, health and safety.

In 2021 we structured our Corporate Venture Capital (CVC) strategy and made our first investment: Boston Metal, owner of a new technology for iron oxide reduction through electrolysis called Molten Oxide Electrolysis (MOE). Through this investment, we are supporting the development of low GHG emission steelmaking technologies, in line with our decarbonization commitments and the new pact with society.



Learn more

[About our innovation initiatives.](#)

We evolved from 166th position in 2019 to 12th in 2021 in the **"100 Open Startups"** awards; and from 31st place to 4th in the **Valor Innovation Award in 2021.**



Vale Institute of Technology (ITV)

ITV is a non-profit institution, maintained by Vale that operates through ITV Sustainable Development, located in Belém (PA), and ITV Mining, located in Ouro Preto and Santa Luzia (MG), to promote scientific research. Since 2010, ITV has been developing technological and scientific solutions to solve the challenges of the mining chain in search of a more just and sustainable society. It currently has a group of 281 researchers, 224 of whom are fellows.

ITV IN NUMBERS (2011 TO 2021):

About

USD 209 million

already invested in research

747

scientific papers published

154

R&D projects supported

ITV SUSTAINABLE DEVELOPMENT (ITV DS)

ITV DS works in the generation of socio-environmental scientific knowledge for the characterization and conservation of the biotic and abiotic environments and their relationship with communities in connection with sustainable development goals. The research groups include: Biodiversity and Ecosystem Services; Environmental Genomics; Environmental Technology; Environmental Geology and Water Resources; Socioeconomics and Sustainability; and Data Science.

Research is conducted collaboratively with research institutions and companies in Brazil and abroad and shares knowledge with society through scientific publications in open journals, deposits of raw data in open access global databases and scientific communication through documentaries,

videos, podcasts and newsletters.

ITV DS has research laboratories with the analytical capacity for state-of-the-art techniques such as next-generation DNA sequencing, proteomics, imaging equipment, and high-capacity computers, among others.

ITV DS is also active in training young researchers through the Professional Master's in Sustainable Use of Natural Resources in Tropical Regions. More than 120 professionals from all over the country had been trained by 2021. On this front, we highlight the research scholarship and project subsidies program for young residents in Pará whose dissertations in line with one of the United Nations Sustainable Development Goals (SDGs).

ITV MINING (ITV MI)

ITV Mining seeks to develop solutions widely used in the mining chain that prioritize energy efficiency, safety in the mineral chain processes, and the reduction of CO₂ emissions.

It operates on two fronts: the teaching front, which is related to the purpose of contributing to the disseminate knowledge in the company and in society, and the research and development front

in the areas of Tribology, Automation, Control & Robotics, Mining, and Extractive Metallurgy & Mineral Treatment.

An example of a project that benefitted from the cooperation of ITV is Ecoshipping, created by Vale to meet the challenge of reducing its carbon emissions, in line with what has been discussed within the scope of the International Maritime Organization (IMO).

Ecoshipping

Vale's project to create the first large ore ship equipped with a rotating sail system won the International Wind Propulsion Innovation Award in November 2021.

Still in the testing phase, the innovative use of wind propulsion can offer an efficiency gain of up to 8% and a consequent reduction of up to 3,400 tons of CO₂ equivalent per ship per year. The initial results of the pilot test have already aroused the interest of partner shipowners, who are developing new projects with rotating sails. It is estimated that at least 40% of the fleet dedicated to the company's service is able to use the technology, which would impact to a reduction of almost 1.5% in annual emissions from Vale's maritime transport of Iron Ore. [Learn more.](#)



Giant Fern, at the Inhotim Institute, in the city of Brumadinho, Minas Gerais state, Brazil, the largest open-air museum in the world

PHOTO: EMILIANO CAPOZOLI

Natural Capital

- 1. Climate Change
- 2. Biodiversity
- 3. Ecoefficiency
- 4. Mine Closure and Future Use

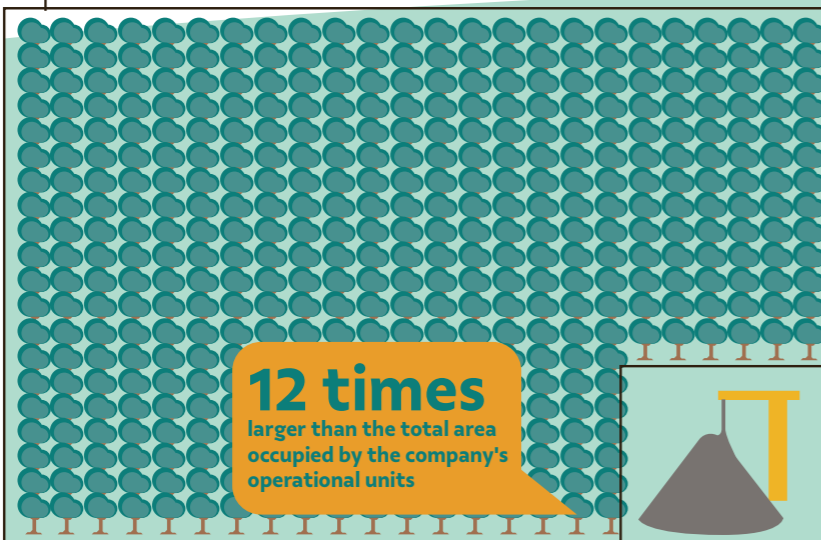


NATURAL CAPITAL

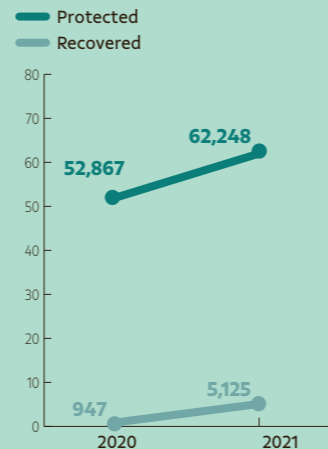
We recognize that making mining sustainable throughout our operations and value chain involves a conscious and continuous effort, dialogue, active listening, and the creation and re-enactment of relationships of trust

1 million hectares

approximately is the total area protected by Vale



ADDITIONAL AREAS RECOVERED AND PROTECTED in hectares



500 thousand

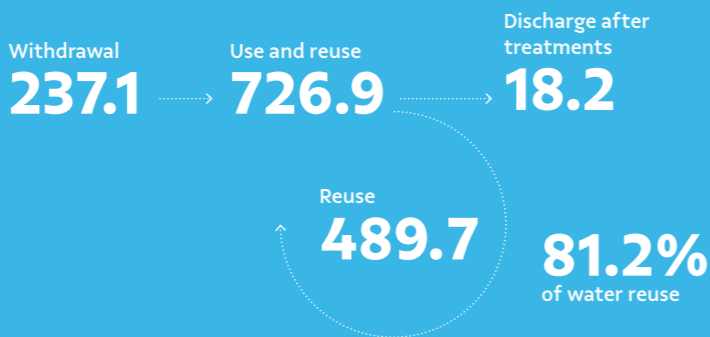
hectares of areas to be recovered and protected by 2030, of which at least 100 thousand hectares recovered through socio-environmental impact businesses

2030 WATER GOAL REACHED

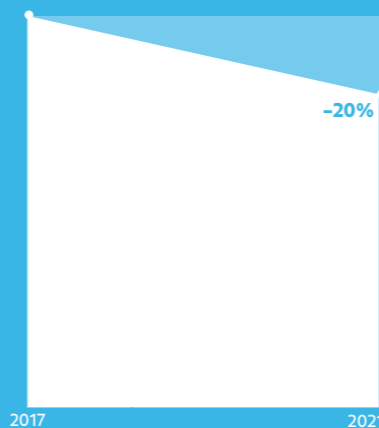
Vale has publicly committed not to operate in UNESCO Natural World Heritage Sites

WATER BALANCE

In millions of m³



REDUCTION OF WATER CONSUMPTION



GAS EMISSION REDUCTION TARGETS BY 2030

particulate matter
sulphur oxides
nitrogen oxides

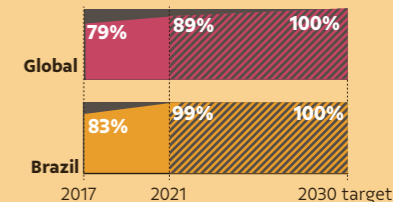
ENERGY EFFICIENCY



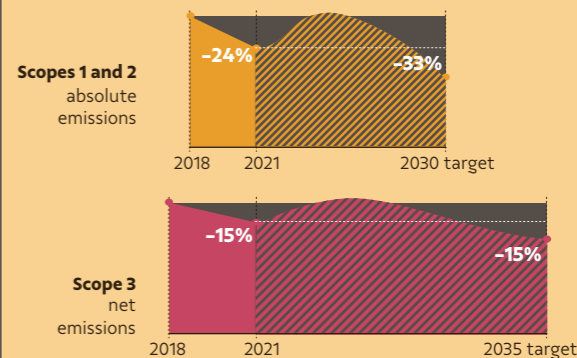
2017



CONSUMPTION OF RENEWABLE ELECTRICITY



GREENHOUSE GAS EMISSIONS EMISSION REDUCTIONS





Environmental management

Given the risks related to environmental issues arising from its activities, Vale follows international guidelines to manage environmental incidents*. These involve initial communication, adoption of immediate actions and investigation of causes, implementation of corrective actions to eliminate undesired effects of the event and recording of lessons learned.

In 2021, 28 environmental incidents were classified as severe, compared to 16 events registered in 2020, according to the company's risk classification criteria. We advanced in 2021, compared with 2020, with respect to critical and very critical incidents, with no occurrence in 2021, compared to three occurrences in 2020.



Employee José Marangon in the seedling nursery and Biofactory of Ferrous Technology Centre in Nova Lima/Minas Gerais

PHOTO: GUSTAVO BAXTER

All incidents were investigated by a multidisciplinary group and reported to the appropriate government agencies. Managing these topics involves reassessing the drainage system, deploying inspection routines in the control systems, conducting engineering works and projects, preparatory plans for the rainy season, and training employees. Proper investigation enables the identification of contributing factors, risk reduction, inclusion of new environmental controls, and improvement of industrial processes. GRI 303-2

For the socio-environmental programs and plans, we have targets and indicators correlated to risk management, prevention and mitigation measures for impacts related to water quality, air quality, soil quality or condition, community impacts, biodiversity, and relevant regulatory issues. This information supports Vale's analysis and concession process to help us obtain environmental licenses.

Country	Number of Severe Incidents	Environmental Impact
Brazil	11	Change in water quality
	6	Change or reduction in biodiversity
	5	Change in soil quality
Canada	2	Change in water quality
	2	Change in air quality
Indonesia	1	Change in soil quality
	1	Change in water quality



Learn more

About the [main mitigation actions for incident-related impacts](#).

*Environmental Incidents: Unplanned event that resulted in an adverse environmental impact.



Climate Change GRI 103-2, 103-3

Reducing emissions and making Vale resilient to the effects of climate change are strategic priorities. We maintain a program to manage risks and opportunities related to climate change, aligned with the guidelines of the Task Force on Climate-Related Financial Disclosures (TCFD). The topic is addressed by a robust governance structure that includes the Low Carbon Forum, a governance structure that monitor performance and which strives to ensure delivery of the climate agenda, which includes the periodic participation of the Executive Board and Vale's leadership.

Vale's decarbonization strategy is public and based on a global policy. Vale understands the importance of providing transparency on our roadmap for the delivering emissions reduction and Net-zero targets,

so it has been disclosing information on the Carbon Disclosure Project (CDP) since 2003, in Vale's ESG Portal, and published its **first climate report in 2021**.

In addition, our annual performance is assessed by specialized institutions such as Sustainalytics, Climate Action 100+ and RFC Ambrian, and in 2021 we received an "A-" rating in CDP's assessment, which is above average in the mining sector average. The points for improvement identified in the table above, such as the adaptation of strategies and targets to new temperature scenarios, definition of intermediate targets, and inclusion of Scope 3 emission in the 2050 target, come from an evaluation and comparison of Vale's performance with market best practices.

Vale's capital allocation is subject to a shadow carbon price of USD 50/tCO₂e in the valuation of its projects. We implement carbon pricing in the trade-off analysis of projects and during the decision-making process for new investments, with the objective of enabling and accelerating the transition to a Net-zero economy. In addition, we use the marginal abatement cost curve (MACC or MAC curve) tool to prioritize investments and resources in emission reduction initiatives. Our MAC curve has already mapped initiatives with reduction potential of approximately 10 MtCO₂e, enough to cover Vale's Scope 1 and 2 emissions reduction target.

At the institutional level, Vale participates in the main associations and institutions that promote positioning on climate change mitigation innovations and policies in line with the broader objectives of the Paris Agreement. Additionally, we are not involved with any association whose positioning and actions diverge from the goals of the Paris Agreement.

We maintain a program to manage risks and opportunities related to climate change, aligned with the guidelines of the **Task Force on Climate-Related Financial Disclosures**

Commitments to a **Low Carbon Economy**

GRI 103-2, 103-3 | 302-1, 302-2, 302-3 | 305-1, 305-2, 305-3, 305-4

Here are the main advances and results.

TARGET:
REDUCE SCOPE 1 AND 2 EMISSIONS BY 33% BY 2030

Our target to reduce Scope 1 and 2 emissions, by 2030 is aligned with the Paris Agreement goal to limit global warming to well-below 2°C and is based on 2017 emissions, which totaled 13.5 MtCO₂e¹. We built this target based on criteria for science-based target setting of Science Based Target initiative (SBTi)².

¹ Base year 2017 emissions would total 12.3 million tCO₂e considering manganese and coal divestments.

² SBTi – TWG-INF-002 | Version 4.2 April 2021, valid until June 2022.



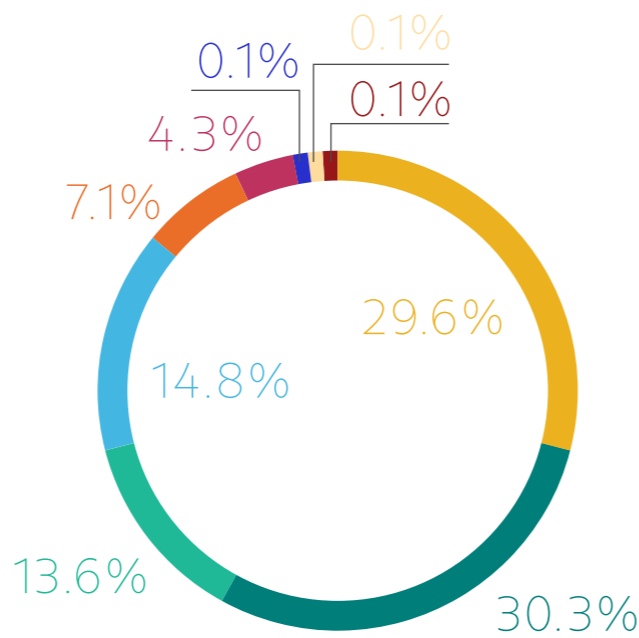
In 2021, Vale's activities resulted in the emission of 505 million tons of CO₂e adding Scopes 1, 2 and 3 together. The direct Scope 1 emissions (fuels, industrial processes and other minor sources) and indirect Scope 2 market-based emissions (electricity purchase) totaled 10.2 million tons of CO₂e in the period¹, an increase of 2% when compared to 2020 and reduction of 24% when compared to 2017². GRI 305-1 e GRI 305-2

Vale's indicator in 2021, of 24.4 kg CO₂e/t MFe-eq³, was about 5% lower than 2017 intensity, of 25.6 kg CO₂e/t MFe-eq⁴. Although the intensity indicator showed a slight improvement, the reduction seen in absolute emissions, of 24% (considering Scope 1 and marked based Scope 2), is mainly due to the drop in production levels compared to 2017. GRI 305-4

An increase in production is expected in the short term, according to Vale's production and sales report, which may lead to an increase in emissions. In the medium term, a drop in emissions is expected due to the implementation of low-carbon initiatives by the PowerShift program.

Considering the divestment of manganese (already completed in early 2022) and coal (sales agreement) assets, which will entail a revision of the baselines for the commitments undertaken⁵, Vale's 2021 Scope 1 and 2 market-based emissions totaled 9.0 million tons of CO₂e⁶, an increase of 2% compared to 2020 and reduction of 27%

ENERGY CONSUMPTION MATRIX BY SOURCE IN 2021



- Electricity
- Diesel Oil
- Natural Gas
- Coal and Coke
- Other oils
- Renewable fuels
- Shipping Oils
- Other gases
- Other liquid fuels

compared to 2017. The divestments are subject to Vale's commitment to a just transition for coal mining workers and communities. See more at Divestments in non-core assets [here](#) and [here](#).

Energy consumption was 146.2 thousand TJ, a small increase over the previous year, mainly due to the resumption of Iron Ore and Pellet production volumes and, more significantly, Coal, despite the reduction in Nickel and Copper production, mainly as a result of the strike in Sudbury. Due to this slight volume recovery and maintenance of the consumption level, the global energy intensity was 0.349 TJ/thousand tons of Iron Ore equivalent, a 1% reduction from that verified in 2020⁷. GRI 302-1 and 302-3

Vale's Energy Efficiency Program, which aims to drive initiatives that promote a reduction in the energy intensity in our production processes, has set a reduction target of 5% by 2030, compared to the 2017 baseline.

This work is being developed globally by means of multidisciplinary groups in each operation and relies on the direct involvement of more than 400 people, supported by SmartEnergy, a platform for managing energy consumption inputs throughout the company.

Scope 1 and 2 emission reduction initiatives implemented in 2021 contributed to a reduction of approximately 78 thousand tCO₂e and are mainly related to energy efficiency initiatives. Matrix change technologies in mine, rail and metallurgical processing operations are still in technological development phase and will have a greater impact from 2026 onwards. GRI 305-5

¹ Vale's Scope 1 and 2 location-based emissions totaled 11.1 million tons of CO₂e, an increase of 6% from 2020 and 18% from 2017.

² Results reported in absolute emissions and do not include any type of offset.

³ In this indicator, production volumes of Vale's main products, such as Pellets, Coal, Nickel and Copper, are converted into tons of Iron Ore equivalent.

⁴ 2017 indicator recalculated considering VNC and Biopalma sales. If we consider Coal and Manganese divestments, Vale's indicator in 2021 would total 21.9 kg CO₂e/t MFe-eq, about 9% lower than the 2017 intensity of 24.0 kg CO₂e/t MFe-eq.

⁵ According to GHG Protocol methodology, divestments will only be removed from total emissions in the year of sale, that is, in 2022, implying a recalculation of the emissions of the base year 2017 for Scopes 1 and 2, and base year 2018 for Scope 3.

⁶ If we consider Coal and Manganese divestments, Vale's Scope 1 and 2 location-based emissions would total 9.8 million tons of CO₂e, an increase of 6% from 2020 and a reduction of 20% from 2017.

⁷ 2020 energy intensity indicator was adjusted from 0.362 to 0.352 TJ/thousand tons of Iron Ore equivalent, due to the revision of the iron ore equivalent production value used in the calculation. This change does not generate significant impact. GRI 102-48



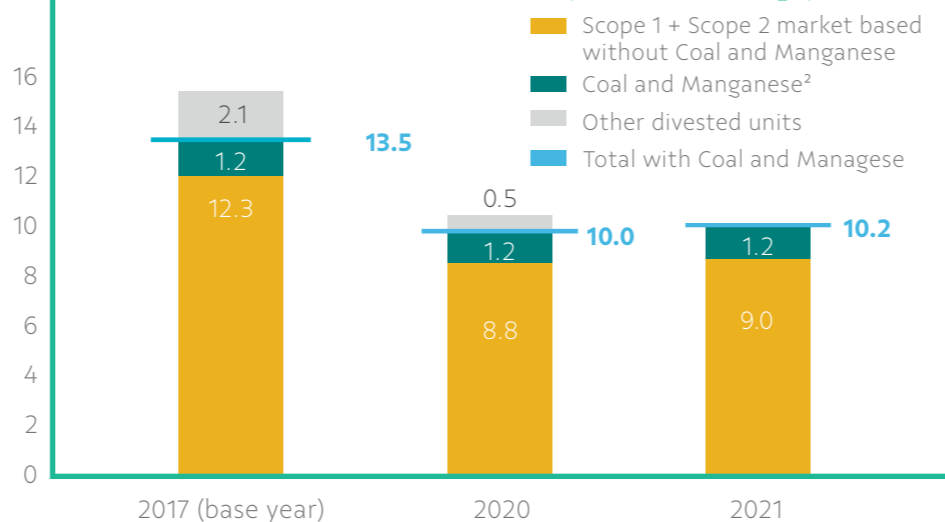
In 2021, Vale announced investments of USD 4 to 6 billion by 2030 to reduce its Scope 1 and 2 emissions. Reduction initiatives are prioritized by the company according to its emission abatement curve for 2030, which is public and can be accessed in the [Climate Change Report](#). About 75% of the abatement curve initiatives, consolidated in reduction potential by type of project graph showed positive NPV¹, at a shadow price of USD 50/tCO₂e.

It is important to emphasize that the adoption of the best technologies for each asset is under constant reassessment, due to factors such as technological maturity, costs of clean fuels or equipment and technical feasibility due to local operational characteristics. Therefore, the total reduction potential in the MAC curve could not be completely fulfilled.

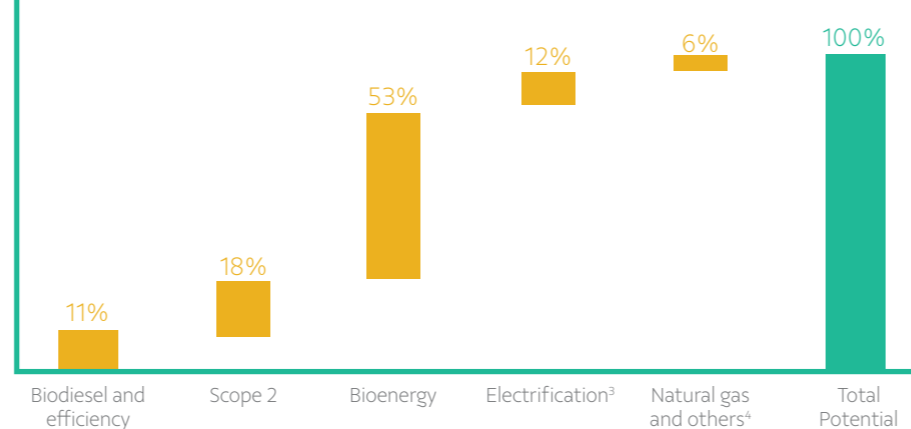
¹ Base date of June 2021. The values consider assumptions for low-maturity technologies, which bring uncertainty.

² The results consider the Nacala Corridor.

SCOPE 1 AND 2 GHG EMISSIONS (MILLION tCO₂e)



REDUCTION POTENTIAL BY TYPE OF PROJECT

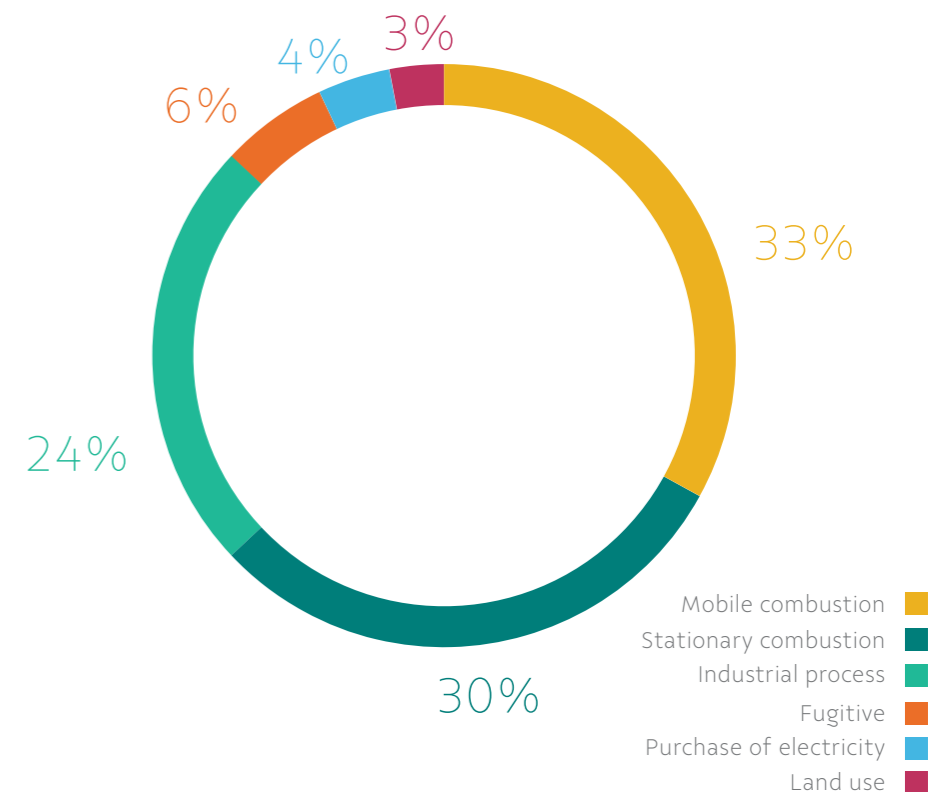


The graph above represents 2030 total emission reduction potential represented in the MAC curve of June 2021.

³ Electrical equipment, belts, trolley, green hydrogen and hybrid solutions on the railroad.

⁴ Includes new processes.

GHG EMISSIONS (SCOPES 1 AND 2) BY SOURCE IN 2021



In 2021, Vale announced investments of **up to USD 6 billion by 2030 to reduce its Scope 1 and 2 emissions.**



PowerShift – Vale Decarbonization Program

In the context of the decarbonization program in 2021, we conducted a number of tests in our operations, particularly the use of bio-oil, vegetable charcoal (biocarbon) and additives to reduce energy consumption in pelletizing plants. In addition, we successfully operated a battery powered locomotive in the Tubarão Port in Vitória, an unprecedented piece of equipment among large mining companies. 5% of the underground vehicle fleet in Canada's operations are already electric vehicles.

For the year 2022, we highlight:

- Providing a second zero-emission locomotive, for operations at the port of São Luís, using new battery technology.
- Introducing battery-powered trucks in Brazil and Indonesia.
- Implementing the trolley-assist system in Carajás, significantly reducing diesel consumption in off-road trucks and enabling the possible implementation of battery-powered trucks.
- Continuing of biocarbon tests in Pelletizing.
- Using a battery-powered electric locomotive to transport Iron Ore on the Vitória-Minas Railroad.

TARGET: NET ZERO SCOPE 1 AND 2 EMISSIONS BY 2050

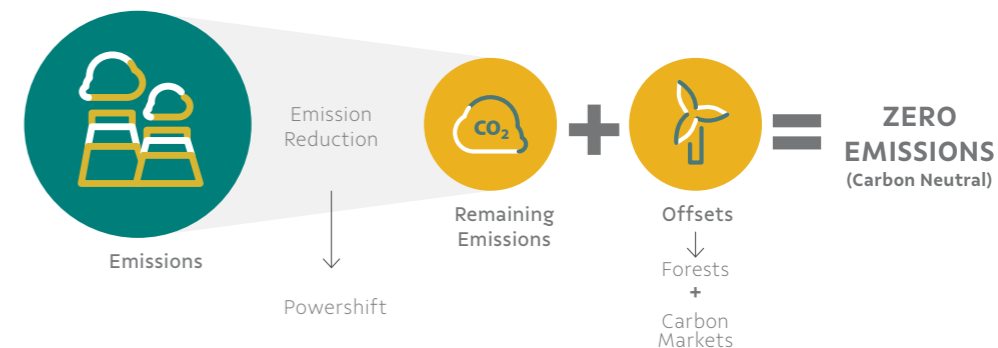
As mining is considered a hard-to-abate sector, any residual emissions from the company may be subject to neutralization using Nature-based Solutions (NBSs) with socio-environmental benefits, and qualified carbon credits with high credibility, aligned with international best practices.

TARGET: 100% RENEWABLE ELECTRICITY IN BRAZIL (2025) AND GLOBALLY (2030)

In 2021, electricity represented 29.6% of Vale's energy consumption matrix, with 89% coming from renewable sources. In Brazil, this percentage is even higher, 99% come from renewable sources, with 96%¹ guaranteed by concession contracts for own assets, as well as by Vale's energy acquisition contracts. This contracted renewable energy was attested through certificates or declarations from generators, having been audited by a third party.

Vale's electricity self-generation portfolio is 99% renewable. The installed capacity in 2021 was 2.3 GW, related to hydroelectric and wind power generation assets, directly and indirectly owned, located in Brazil, Canada, and Indonesia. These plants supply an average of 59% of Vale's global electricity consumption and 69% of Vale's consumption in Brazil², and contribute

VALE'S 2050 NET ZERO STRATEGY: WHAT IT MEANS TO BE NET ZERO



to our climate change commitment to reduce GHG emissions.

Initiatives for advances in renewable energy

The Sol do Cerrado Project stands out among the initiatives on this front for generating solar energy in the municipality of Jaíba (MG), in Brazil. With an installed capacity of 766 megawatts-peak, the project will produce a mean capacity of approximately 193 megawatts of energy per year for Vale's operations, corresponding to 13% of our demand for 2025. Scheduled to come online in late 2022, the solar project will be one of the largest in Latin America.

In addition to investing in generation, Vale entered into agreements in 2021 to use energy storage batteries in its operations at the Ilha da Guaíba Terminal and in Sudbury, Canada, thus helping to ensure greater competitiveness and security of energy supply to these operations.

¹90% from hydro and 10% from wind.

²Historical averages of the percentages of self-production globally and in Brazil since 2017. In the year 2021, these percentages represented about 62% and 72% respectively.



TARGET: REDUCE SCOPE 3 NET EMISSIONS BY 15% BY 2035

Our company's challenge is the reduction of emissions in its chain – Scope 3, since 98% of Vale's total emissions occur in the value chain. Therefore, we were pioneers among mining companies in establishing a Scope 3 quantitative emissions reduction target based on SBTi criteria. Vale has made the attainment of this target more flexible with the possibility of limited¹ use of offsets of high-quality carbon credits, for two main reasons: (I) challenge to reduce emissions at customers; (II) to foster the voluntary carbon market.

About 97% of Vale's Scope 3 emissions are downstream in its value chain, mainly in steelmaking, from processing, transportation and the use of products sold by the company.

In 2021 Scope 3 emissions totaled 495 million tons of CO₂e, representing an increase of 3% compared to 2020, and a reduction of 15% compared to the 2018 base year emissions

Upstream, on the other hand, emissions are associated with suppliers of raw materials, products, and services, as well as their transportation, and totalled about 3% of Scope 3 emissions in 2021.

Scope 3 emissions totaled 495 million tons of CO₂e in 2021, representing an increase of 3%

compared to 2020, and a reduction of 15% compared to the 2018² base year emissions. The variation is mainly due to changes in the sales volume of our products. Considering the divestment of manganese and coal assets, Vale's Scope 3 emissions in 2021 would total 480 million tCO₂e, an 2% increase from 2020 and an 16% reduction from 2018³. GRI 305-3

¹ Maximum 20%.

² 2018 base year emissions of 585 million tons of CO₂e are reduced to 568 million CO₂e, considering the divestment of manganese and coal assets, realized in 2022.

³ An increase in Vale's Scope 3 emissions is expected as a result of increased sales volumes due to a prospect of increased demand for our products, as indicated in the 2021 financial report.

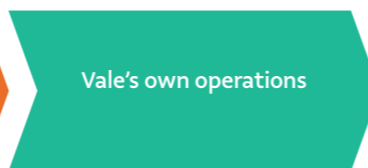
Scope 3 emission reduction initiatives

Scope 3 emissions Upstream



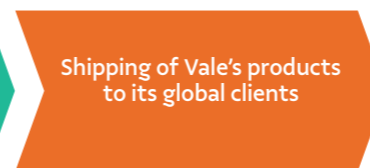
- Supplier engagement via CDP Supply Chain, with provision in contractual clause
- 375 suppliers engaged in 2021

Scope 1 and 2 emissions



- **Power Shift Program:**
- 2021 pilots are part of technologies roadmap with estimated potential to reduce more than 3 MtCO₂e /year by 2030
- 36% of the Sol do Cerrado Solar Project implemented in 2021. Operations start in 2022 and the project will reduce 145 ktCO₂e per year from Scope 2

Scope 3 emissions Downstream



- **Ecoshipping Program:**
- 2 pilots implemented in 2021
- Rotor Sails potential reduction of up to 3,400 tCO₂e per ship per year.
- Air Lubrication potential reduction of up to 5,600 tCO₂e per ship per year

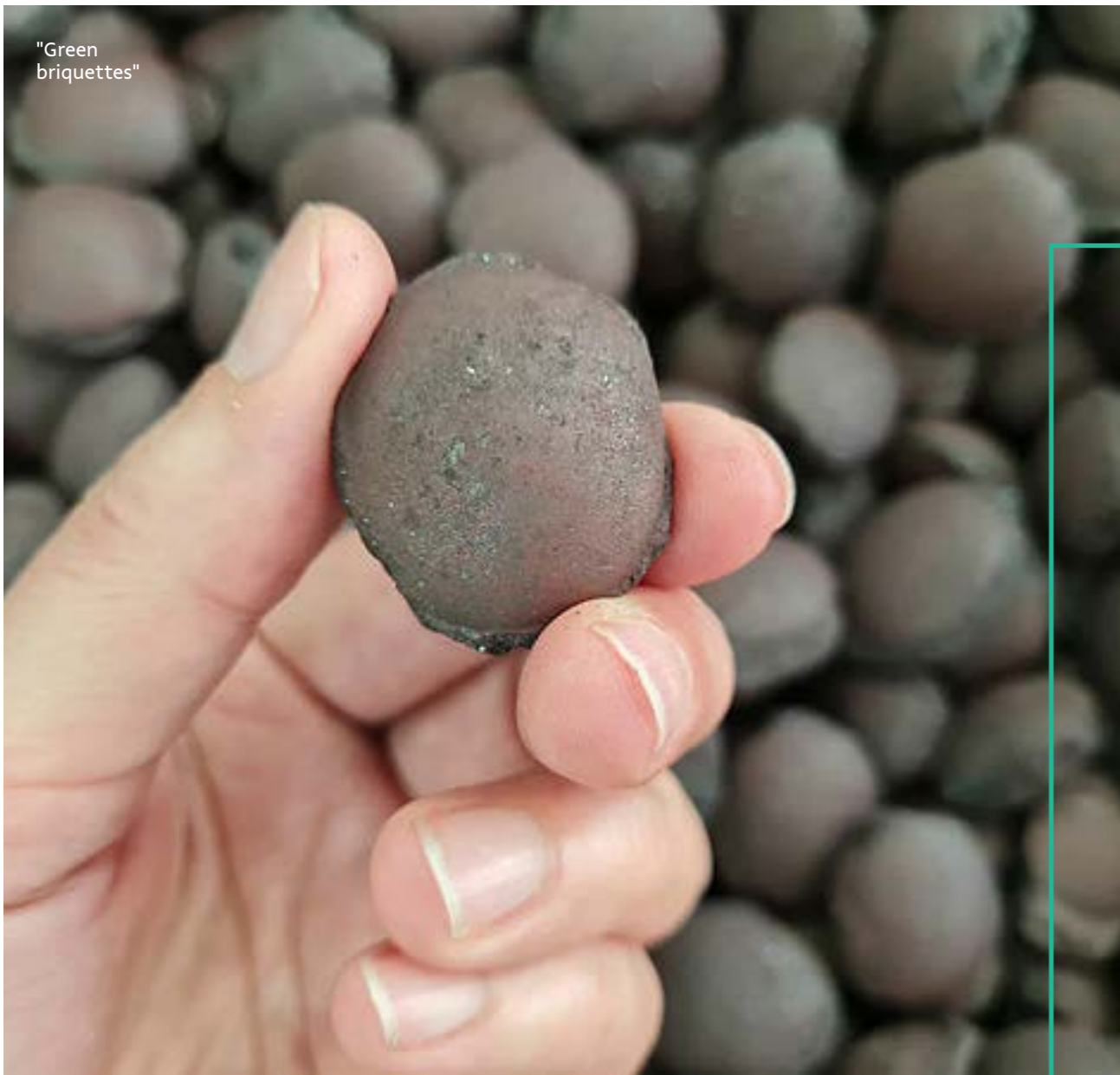


- Improvement in our high-quality portfolio
- New technologies, such as iron ore "green briquettes" and dry concentration technology
- Tecnoored technology, which can produce a "green" low-cost pig iron, using biocarbon instead of coal
- Biomass to replace coal



- Engaged clients represent approximately 30% of global steel production and about 40% of Vale's Scope 3 emissions
- Electrometallurgical Company¹ investment

⁴ Boston Metal is a pre-operating company, founded in 2012 by professors from the Massachusetts Institute of Technology (MIT), whose objective is the development of an innovative technology called molten oxide electrolysis (MOE), which reduces metallic oxides such as Iron Ore with the use of electricity. This MOE process will enable the transformation of Iron Ore for steel production with zero CO₂ emissions.



"Green
briquettes"

PHOTO: VALDIRENE RESENDE

We recognize that reducing emissions in our chain will only be possible through solid partnerships, which is why we signed a Memorandum of Understanding (MoU) with relevant steelmaking customers to develop joint solutions to decarbonize and test

new low-carbon products, such as the "green briquette" (see the box below). In total, engaged clients represent approximately 30% of global steel production and about 40% of Vale's Scope 3 emissions.

Low-carbon products

Vale already has low-carbon products in its portfolio, such as "green briquettes", a new agglomerated Iron Ore product, and low-carbon Nickel products produced in Long Harbour, Canada.

Long Harbour's Nickel products, Plating Rounds and Casting Nickel Wheels have a carbon footprint of 4.4 tons of CO₂ equivalent per ton of Nickel, about three times lower than the global average intensity reported by the Nickel Institute for Class I nickel.

The "green briquette" on the other hand, was a new product we developed internally by the company over almost 20 years and launched to the market in 2021. It is formed by using Iron Ore and a technological

binder solution, which contains sand from treated mining tailings and can withstand high blast-furnace temperatures without disintegrating.

The "green briquette" has the potential to reduce greenhouse gas (GHG) emissions in steel production by up to 10% for Vale's steel customers. The GHG reduction occurs because the product allows the steelmaker to reduce their dependence on sintering, a process prior to steelmaking in which fine Iron Ore is agglomerated (sinter feed).



Learn more

[Vale's Climate Change 2021 Report](#)

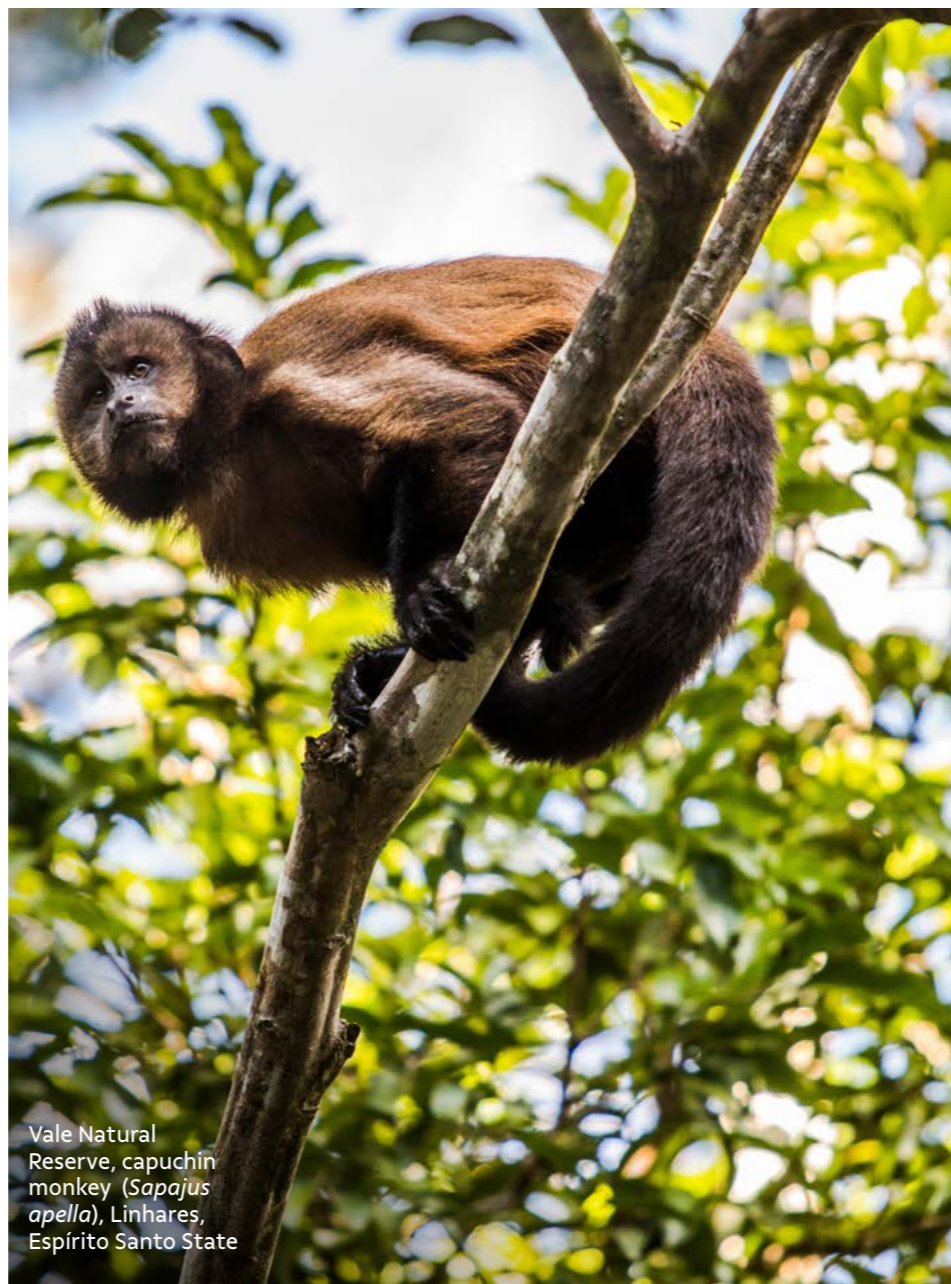


Among signed MoUs, we can highlight those signed with Ternium in Brazil, with the Chinese company, Baowu and with the Korean company, POSCO, which scopes seek decarbonization solutions in steel production that include our product portfolio, high quality Iron Ore, "green briquettes" metallic, alternative steel production routes, among others.

Through our EcoShipping program, Vale is also investing in several R&D initiatives, in partnership with external research institutions, to map and test new technologies capable of reducing emissions in maritime transport. In 2021, we developed pilots to test innovative technologies aimed at reducing the intensity of emissions, such as rotary sails, air lubrication, and hull cleaning with robots. See more about this initiative in [Innovation](#).

In relation to our Upstream emissions chain, via the CDP Supply Chain Program, approximately 500 suppliers were selected to participate in the program in 2021, with 75% adherence (375 suppliers) and 91% adherence of the 2020 respondents invited for the second year (221 suppliers). 22% of the suppliers were classified as leaders or with good management in the theme (CDP score A and B), with 63% evaluated as having low level of maturity. We identified a total of 288 opportunities with substantial strategic or financial impact, as well as emission reduction partnership opportunities with several suppliers.

PHOTO: RICARDO TELES



Vale Natural Reserve, capuchin monkey (*Sapajus apella*), Linhares, Espírito Santo State

Climate-related risks and opportunities

We have adopted the [Task Force on Climate-related Financial Disclosures](#) (TCFD) guidelines to manage the impacts of our transition to a low-carbon economy, and the physical impacts of climate change on our operations. Also, in 2020 Vale conducted a climate scenario analysis of its [portfolio](#) based on the International Energy Agency (IEA) scenarios and plans to structure an analysis for a 1.5 °C rise scenario in 2022.

MAIN RISKS AND OPPORTUNITIES MAPPED

TRANSITION RISKS	PHYSICAL RISKS	CLIMATE-RELATED OPPORTUNITIES
<ul style="list-style-type: none"> • Changes in public policies to restrict emissions, including carbon taxation • Climate-related litigation with impacts on the company's image • Changes in demand, favoring low-carbon products • Product substitution due to new technologies and processes 	<ul style="list-style-type: none"> • Chronic risks, such as rising average temperatures, rising sea level, and changes in rainfall patterns • Acute risks, such as extreme weather and sea conditions 	<ul style="list-style-type: none"> • Use of lower emission energy sources, with potential cost reductions • Diversification into higher quality, lower carbon products and services



Learn more

Access the description of risks and opportunities, as well as Vale's management actions for each, in the [Climate Change 2021 Report](#).



Biodiversity

GRI 103-2, 103-3

Vale prioritizes risk analysis and adopts measures intended to prevent, mitigate, recover, and compensate these impacts. In 2021, the area impacted by our operations totaled 814.57 sq km. New suppressed areas totaled 10.13 sq km and areas of permanent recovery totaled 18.2 sq km. (GRI 304-1, 304-3 | G4 MM1). Part of our operations, due to the locational rigidity of the business, overlap and interface with areas of high value for biodiversity, such as hotspots and key biodiversity areas, and approximately 30% interfere with protected areas. We remain committed to further reducing our impacts, as well as restoring and compensating the areas and habitats we affect, in line with our long-term goal of neutralizing impacts on biodiversity in new projects.

Operations that generate significant impacts in areas of high value for biodiversity require management programs, which we are implementing and improving either through legal obligations or voluntary commitments. Among the 61 operational units evaluated in 2021, 54 (88.5%) required the preparation of management programs. (GRI G4 MM2). For these units, 51 programs have already been implemented, seven are being prepared and one is a future proposal, and some of the units contemplate more than one project and, therefore, have more than one associated program.

The Carajás Biodiversity Management Plan (PGBio Carajás), published in 2021, is a dynamic document that integrates and consolidates all

our initiatives related to risk management and impacts on sensitive habitats and species in Vale's operations and projects in the region.

In 2021, we recorded 5,442 species as occurring in habitats impacted by Vale's operations or located near its operations, of which 2,968 were fauna and 2,471 flora. Of these, 135 fall within the International Union for Conservation of Nature (IUCN) threats classification scheme. GRI 304-4



Learn more

[About Carajás Biodiversity Management Plan.](#)

Protected areas GRI 304-3

We currently protect or help protect an area of approximately 10,000 sq km, equivalent to 12 times the area occupied by our operations. As a result of this work, developed through an integrated management of the territories and partnerships, it is also highlighted the protection of native fauna and flora species, including endemic and endangered species.

Biodiversity management in the value chain

Vale understands the challenge of integrating biodiversity management into the value chain. Therefore, it has addressed initiatives to help support the supply chain and commercial areas to adopt environmental requirements, which include biodiversity, in engaging with customers and suppliers. For example, customers that consume forest-based raw materials are required to provide documents attesting to their socio-environmental compliance in their production process supply chain. As next steps, the company intends to establish a more robust evaluation with an inspection routine, also seeking to evaluate issues involving illegal deforestation in the value chain and other concerns.

Our operations work to recover degraded areas by restoring forest and recovering habitats and important ecosystem services. By 2021, more than 5,000 hectares have been recovered in rural properties mostly located south of the Carajás National Forest within the Connectivity Project – Northern System Forest Corridor. This project goes beyond fulfilling legal requirements, aiming to increase the forest cover in areas previously occupied by agricultural activities and to promote connection in the landscape. In addition, we are fostering partnerships with a local cooperative to buy seeds of native species, generating alternatives for the sustainable use of the forest.



Vale's 2030 forestry commitment

RECOVERY OF 100,000 HECTARES OF FORESTS

The Vale Fund supported the development of five agroforestry businesses that implemented productive recovery models on 5,125 hectares in a pilot phase, adding up to an area of more than 6,000 hectares between 2020 and 2021.

The startups Belterra, Caaporã, Bioenergia, Inocas, and Regenera develop businesses related to the cocoa, cassava, açaí, baru, banana, and pupunha chains, among others, in seven Brazilian states and in four different biomes (Caatinga, Atlantic Forest, Cerrado, and the Amazon), generating jobs and income for family agriculture. We have earmarked investments of approximately USD 10.21 million to structure and leverage the business.

Belterra: Socio-environmental impact and recovery of degraded areas

Incubated as part of Vale's 2030 Forestry Commitment and supported by the Vale Fund, Belterra Agroflorestas was born with vision of being a company that would achieve a social and environmental impact in rural areas by restoring degraded areas throughout Brazil.

The business model that sustains the company's operations is based on deploying of regenerative production systems, such as the Agroforestry and Agro-silvopastoral systems, on small and medium-sized properties, through leasing and/or rural partnership agreements.

In its second year of operation, Belterra has raised investments with a European climate fund and is in advanced stages of negotiation with a Brazilian investment fund for a new round of expansion in the coming years. In addition, it is negotiating supply contracts with large companies in the cocoa and cassava chain.

"With the support of Belterra Agroflorestas, we were able to diversify our production. We started planting cocoa and increased the productive efficiency here at Recanto das Águas Farm. The project was so successful that it encouraged my daughter, who is a dentist, to take over the cocoa production, ensuring that we will have another generation at the head of our family property".

Ademir de Paulo Dan, Mr. Juca, from Parauapebas (PA)

Acceleration Program

At the end of 2021, the Vale Fund joined its partners to start an Acceleration Program with the purpose of being a catalyst for businesses that operate in sustainable value chains linked to Vale's forest recovery goals.

The expectation is to help companies move toward economic sustainability while scaling their field operations to meet recovery commitments. To achieve this goal, entrepreneurs receive support and guidance to develop, plan, and execute short, medium, and long-term strategies.

The Program also helps to strengthen a Sustainable Impact Business Ecosystem supported by partner institutions with specific and transversal skills to help entrepreneurs along their journey.



PROTECTION OF 400,000 HECTARES OF FORESTS

To protect forests, we formed partnerships in 2021 with three Conservation Units managed by the Chico Mendes Institute for Biodiversity Conservation (ICMbio in Portuguese). Together, these Biological Reserves (REBio) help to protect more than 62,000 hectares of Atlantic Forest in three Brazilian states.

In addition, we continue to work to protect and conserve the units covered by agreements we signed in 2020, which involve 52,848 hectares, adding up to an area of 115,093.96 hectares already protected in two years.

Building a legacy for the Amazon

More than 80% of the protected areas Vale owns and supports are located in the Amazon, where the company has promoted biodiversity conservation initiatives for more than 30 years. In the last decade, through the Vale Fund, we have supported more than 90 initiatives by research institutions, governments, NGOs and startups to protect forests.

Through the Vale Institute of Technology, the company has been investing around USD 220.8 million in research in science and technology since 2011. Of this amount, approximately USD 114 million has been applied to research for sustainable development, mainly in the areas of biodiversity, environmental genomics, and climate change.

Artificial intelligence in the fight against deforestation

In 2021, the Vale Fund and Microsoft supported the Institute of Man and Environment of the Amazon (Imazon) in developing PrevisIA, a platform that uses artificial intelligence (AI) in an aim to anticipate information about Amazon regions at risk of deforestation and fires.

PrevisIA analyzes diverse data such as topography, land cover, urban

infrastructure, official and unofficial roads, and socioeconomic data, among others, to identify forest conversion trends through deforestation.

This public information is available [here](#), and its analyses have been used strategically by public agencies to plan and execute preventive actions to combat and control deforestation.



Learn more

About our initiatives in the Amazon.

Environmental genomics of the Amazon

In 2021, the Vale Sustainable Development Technology Institute began genetic studies to learn about the DNA of the Amazon. The Amazon DNA project aims to help identify fauna and flora species and to support the challenges of biodiversity conservation through environmental monitoring.

Another biotechnology application is investigating species via DNA sequencing with economic purposes to generate income for families and native peoples by improving their cultivation.

The Amazon DNA project has also as partnered with the Federal University of Pará, The Rockefeller University, Dresden University Of Technology, Museu Paraense Emilio Goeldi, University of Copenhagen, PUC RS, Federal University of Minas Gerais, and the Brazilian Association of Zoos and Aquariums.



Learn more

About this initiative.



Commitments to biodiversity protection initiatives GRI 102-12, 102-13

The initiatives to protect and restore natural environments, maintain essential ecosystem services, and reduce threats to species are aligned with the commitments and targets set by the Convention on Biological Diversity (CBD).

As an ICMM member, Vale is committed to the principles established by the Council and to Performance Expectation 7, which is a call to respect areas of high value to biodiversity and implement and enforce an impact mitigation hierarchy, seeking to neutralize significant biodiversity losses.

In 2021, Vale made a public commitment not to operate in UNESCO Natural World Heritage Sites. The Vale Natural Reserve (RNV in Portuguese), a protected area owned by the company that is dedicated to the conservation of 23,000 ha of Atlantic Forest remnants, as well as the Sooretama Biological Reserve (REBio), a protected area that Vale protects in partnership with ICMBio, are part of the Discovery Coast Atlantic Forest Reserves World Heritage Site. They also constitute a Key Area for Biodiversity Conservation.

Additionally, since 2020 Vale has been part of the Brazilian Business Commitment to Biodiversity, proposed by the Brazilian Business Council for Sustainable Development (CEBDS) and the Business for Nature Call for Action, a union of companies and institutions seeking to reduce biodiversity loss. In 2021, Vale also joined yet another transparency tool for its biodiversity results – responding to CDP Forest, formerly known as the Carbon Disclosure Project and its call to disclose our environmental impact.

Learn more about initiatives and results in [Vale's 2021 Biodiversity report](#).

In 2021, Vale made a public commitment not to operate in UNESCO Natural World Heritage Sites

Ecoefficiency

GRI 103-2, 103-3

Water resources

Vale's main uses of water are ore beneficiation, machines and parts cleaning, environmental controls, sanitation and human consumption. Our effluents, on the other hand, come from industrial uses, drainage, and human consumption and are reused in the company's processes whenever feasible.

Aware of the risks associated with water scarcity, and in line with the guidelines of the International Council on Mining and Metals (ICMM), Vale has a Water and Water Resources Policy with guidelines for responsibly and rationally managing water resources and effluents.

WATER STRESS ASSESSMENTS

To assess water stress in the areas where it operates, Vale uses the Aqueduct tool, developed by the World Resources Institute (WRI). Applied in 43 units, the tool provides an overview of the region's most susceptible to river and coastal floods, as well as the severity of droughts and seasonal and inter-annual water variability and scarcity that can be expected. This helps the company to correlate our water use with the indicated degrees of risk.

2030 WATER TARGET

Aiming to promote water security in the regions where we are present – that is, to ensure water is available in sufficient quantity and quality for human supply, economic activities and aquatic ecosystem conservation – in 2018 we established the Water Target. Our commitment was to reduce by 10% the withdrawal of fresh water for use in our production processes by 2030 compared to 2017 as the base year.

To achieve this goal, we invested in (a) expanding our water monitoring network, (b) initiatives to reuse effluents in the company's processes, (c) using rainwater, (d) searching for new technologies, and (e) developing studies to continuously improve our responsible water resource management.

In 2021 our global result accumulated since the base year was a 20% reduction, which exceeded our initial goal set for 2030 (a 10% reduction). Highlights were our operations in the Amazon region and part of the operations in southeastern Brazil, which achieved an accumulated reduction of 47%. GRI 303-1

As a guideline of our Water and Water Resources Policy, when we reach our goal, we must define new goals. Thus, new targets based on responsible water resources management and effluents will be published in 2022.



Atmospheric emissions – particulate matter, NOx and SOx

Given the impacts of atmospheric emissions and with our ambition to be a leader in sustainable mining, Vale established the following targets in 2021 to reduce its particulate matter (PM), sulfur oxide (SOx) and nitrogen oxide (NOx) emissions by 2030, compared to 2018* as the base year.

In this context, Vale invested about USD 80 million in 2021 in operational improvements and adopted new technologies to control and manage atmospheric emissions. Other initiatives and projects are planned to reduce NOx, SOx and PM by 2030, such as the use of alternative fuels, specific technologies and improved operational efficiency. There was an adjustment of the emissions data at the PT Vale Indonesia (PTVI) unit to make it compatible with the method reported to the local environmental agency. These changes led to higher emissions of SOx and NOx in 2019 and 2020, as shown in the following graphs.

In 2021, particulate matter emissions were 47% lower, due to reduced production at the PTVI plant and at the Tubarão pelletizing plants, as well as the shutdown period at Sudbury.

Sulfur oxides emissions for 2021 were 77.1 tons. The most significant reductions occurred in Sudbury and PTVI, due to lower production. In addition, there were reductions due to the mass balance, a calculation methodology used in these units that is subject to variations in the characteristics of inputs and processes. In Pelletizing, the main reductions occurred in Tubarão and São Luís, due to the use of fuels with lower sulfur content and improved energy efficiency.



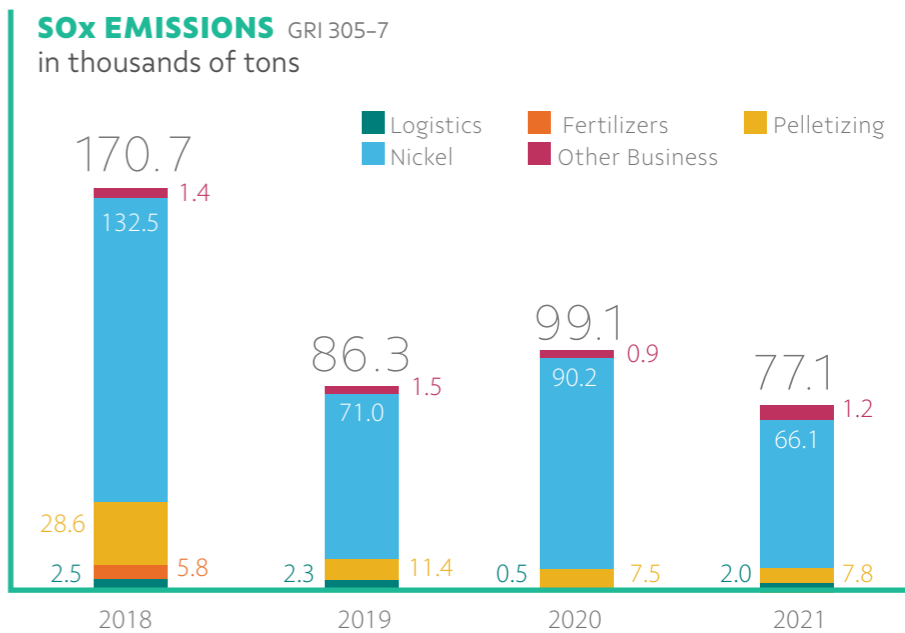
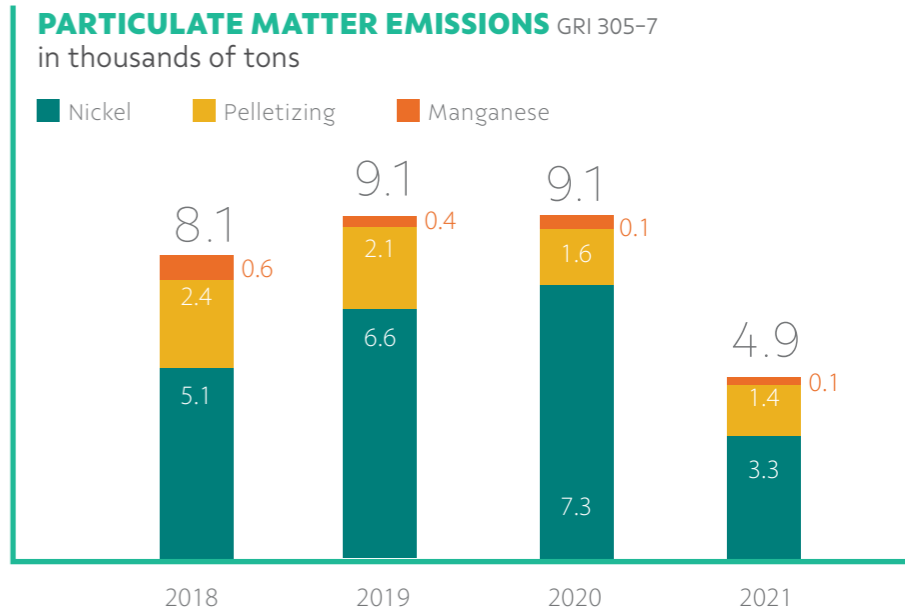
Learn More
About [emissions of particulate matter in Vitória](#).

*After the Brumadinho accident in 2019, there was a reduction in production due to the shutdown of some operations, consequently generating a reduction in emissions in this year and subsequent years. After the gradual resumption of operations and new projects to increase production until 2030, a proportional increase in the emissions curve is expected. With the planned initiatives, we project reductions in NOx, SOx and PM emissions.

Reduce by **16%** the Particulate Matter emissions

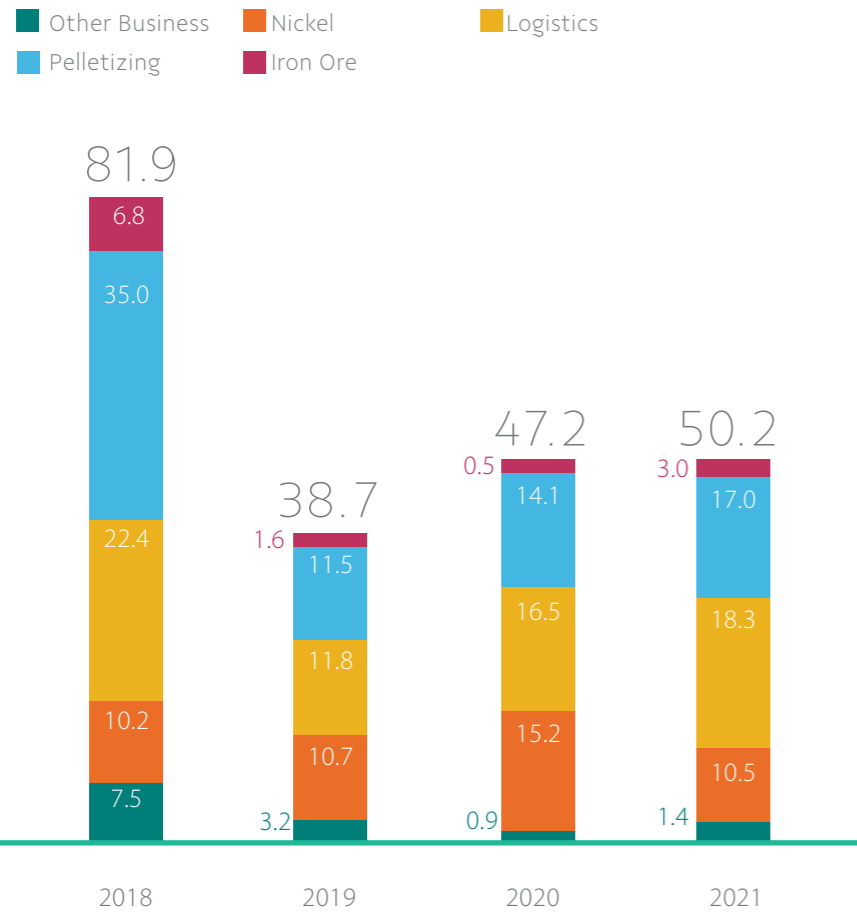
Reduce by **16%** the Sulfur Oxides emissions

Reduce by **10%** the Nitrogen Oxides emissions





NOx EMISSIONS GRI 305-7 in thousands of tons



Emissions of oxides of nitrogen, meanwhile, totaled 50.2 thousand tons. This reduction reflects the lower production at PTVI and Sudbury, while there was also an increase in emissions at the Oman pelletizing units, Nickel at Onça Puma and the Logistics and Iron Ore businesses, due to the higher production volumes.

Mine Closure and Future Use GRI 103-2, 103-3

The process of planning for the closure of assets should occur in parallel to the operation, minimizing risks and maximizing opportunities to generate value for the territories. The possibilities of post-mining use must contemplate a vision of the territory that integrates constraints and opportunities. We have the great challenge of structuring the governance of these processes and building, together with society, proposals for the future use and transition of mined territories that is compatible with the environmental and socioeconomic vocations of the affected areas.

For iron ore operations, co-creation for the future use of mined territories is supported by integrated database management, which allows us to analyze and prioritize the progressive closure of our assets while also integrating a plan for operations and identifying the regional aptitudes that form the basis for advancing the future use assessments.

Currently, we work with an annual cycle to plan and execute the progressive closure of assets and study our territories' aptitudes and potentialities. Among the projects for future use in progress, we can highlight the Águas Claras Mine (MAC in portuguese) and parts of the territory of the Itabira Complex, both in Minas Gerais, Brazil.



Among the projects for future use in progress, we can highlight **the Águas Claras Mine (MAC) and parts of the territory of the Itabira Complex**

PHOTO: VALE ARCHIVE



FUTURE USE OF THE ÁGUAS CLARAS MINE

Located between Nova Lima and Belo Horizonte, in the Serra do Curral region, the Águas Claras Mine was shut down in 2002, after 30 years of operation by MBR, and is currently undergoing closure and decharacterization works.

The surrounding area contains condominiums and clusters of residential neighbourhoods with strong commercial intensity alongside rural areas and environmental preservation areas, so water is important in the region. Therefore, the closure process represents a complex and multifaceted reality that requires the involvement of various players and interests.

In 2020, we started to plan the future use of the enterprise. At that time, we consulted the local community to identify potentialities and restrictions for future occupation and society's expectations regarding the area, by means of a perception study. The result pointed to the valorization of the region's natural capital to drive the future use process, as it has potential in the social spheres of ecotourism, leisure, environmental conservation / education, real estate ventures and public services. With this guiding strategy, the next steps will involve feasibility studies and continued engagement in implementing the mapped actions.

FUTURE USE OF MINES IN ITABIRA

Itabira is the city where Vale was born in 1942. Today, we are looking for ways to continue operations there while beginning the closure process in a responsible, sustainable and gradual manner. Through projects to explore future use we are transitioning to post-mining activities. Our objective is to rely on the community's active participation and meet the aspirations of Itabira society.

In the initial stage, we sought to evaluate the potential and restrictions of future use, primarily in an area in the Pontal/Doze basin, surrounded by urban and rural areas. During the knowledge gathering stage, we identified several natural interferences and socio-economic pressures in the surrounding area, among them urban expansion vectors, the presence of vulnerable communities, protected forest fragments, as well as areas of interest and socio-cultural importance, which we compiled in an integrated territorial base.

In 2020 we carried out a survey to understand the relationship between the community and the conservation areas – natural capital assets – that are currently under our responsibility. Based on this research, we mapped initiatives with the potential to reconcile environmental conservation, the creation of shared value and financial

sustainability. Among the opportunities, according to compatibility and use restrictions, we identified renewable energy generation as a possible way to re-signify the territory in the feasibility stage of our future use approach.

In 2021, Vale and the Itabira City Hall established a group to plan, prioritize and integrate the company's activities in the municipality. The company provided the services of a specialized consultancy to build a short, medium and long-term strategy to direct the municipality's sustainable development. Actions are underway to link the sustainable development initiatives with the municipality's expected future perspectives in terms of mining dependency.

PROVISION FOR ASSET DECOMMISSIONING AND MINE CLOSURE

GRI G4 MM10

We prepare and review, on an annual basis, a cost estimate for decommissioning assets (pits, piles, dams, industrial facilities, etc.). To prepare this estimate we follow the Asset Retirement Obligation (ARO) methodology, provide full disclosure in our financial statements, and comply with the requirements defined by International Accounting Standard (IAS) 37 and the Securities and Exchange Commission (SEC) and the Sarbanes-Oxley Act. In the 2021 cycle, 100% of our operations* had Closure Plans and made provisions totalling approximately USD 4.2 billion.

Among the ESG gaps we identified is "Disclose information on mine closure planning, including community engagement process", with a deadline for completion in 2022. [See more here.](#)

100%

of our operations* have **Closure Plans**

*Considers mapped operations as applicable to those that have been identified through internal controls for the preparation of the Closure Plan.



In the photo (left to right), Dayanne Priscila Silva, Vera Araujo, Amanda Francisca Tenario de Almeida and Luciana Silveira

In the background: Learning together

Aprendendo juntos

Human Capital

1. Occupational Health and Safety

2. Covid-19

3. People

4. Diversity, Equity and Inclusion

PHOTO: GUSTAVO BAXTER



HUMAN CAPITAL

We aim to strengthen a culture of promoting and valuing an inclusive and safe environment for all

GOALS>

Increase the representation of women in the workforce until 2025 to

26%

Increase the representation of women in senior leadership by 2025 (executive manager positions and above) for

20%

Reach

40%

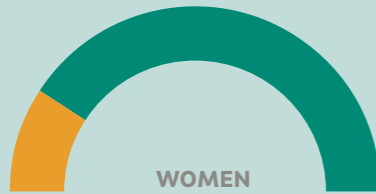
of the representativeness of black and brown people in leadership position (coordinators and above) in Brazil by 2026

Reduce the number of agent exposures harmful to health in the work environment by 2025 in

50%

Zero the number of high-potential recordable injuries (fatality precursors) by 2025

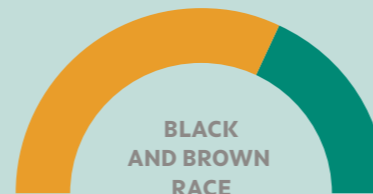
DIVERSITY



18.7%



20.3%



64%

in Brazil



3.6%

gay, lesbian, bisexual and others in Brazil



5.3%

in Brazil

72.266 Employees

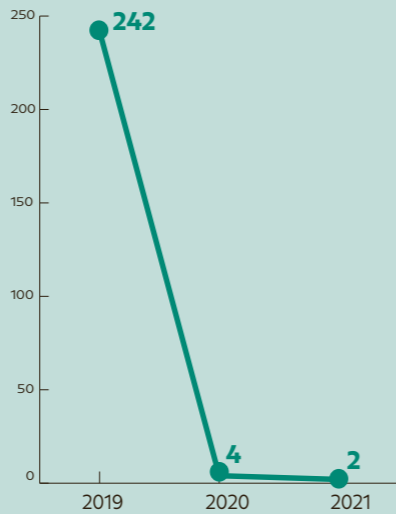
141.147 Contractors

OCCUPATIONAL HEALTH AND SAFETY

HIGH-POTENTIAL RECORDABLE INJURIES



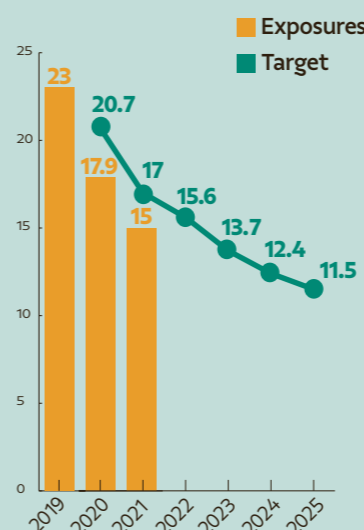
FATALITIES (OWN AND CONTRACTORS)



TOTAL ACCIDENT RATE



REDUCE THE NUMBER OF EXPOSURES ABOVE THE OCCUPATIONAL EXPOSURE LIMIT (OEL)



EMPLOYEE TURNOVER

In %



EMPLOYEES AND CONTRACTORS WORKFORCE



Maintenance Facility, Carajás Mine. Canaã dos Carajás/Pará

PHOTO: LUCAS LENCI

Occupational Health and Safety

GRI 103-2, 103-3 | 403

Vale's health and safety strategy is based on three pillars: preventing injuries and chronic diseases; preventing fatalities; preventing catastrophic accidents.

As part of a broad governance review, we implemented the Safety and Operational Excellence Executive Board in 2019, which acts as the second line of defense in managing safety and risks contemplated in our management model, the Vale's integrated management system (VPS). The Office also establishes policies and technical guidelines with the aim to ensure occupational health and safety aligned with ISO 45001 (Occupational Health and Safety Management System) standards.

As part of a broad governance review, in 2019, **Safety and Operational Excellence Executive Board was implemented**

Accidents and fatalities

GRI 403-9

In 2021, there were two fatalities at Vale. These events show that there is still a lot to be done to honour our commitment to achieve zero fatal accidents.

One of the fatalities involved a company employee (in Itaguaí, Rio de Janeiro) and the other involved a contractor in Moatize, Mozambique.

Below is the evolution of fatalities at Vale since 2018, followed by a brief description of the occurrences in 2021:

Year	Contractors	Employees	Total
2018	1	1	2
2019	118	124	242
2020	3	1	4
2021	1	1	2

FATALITIES IN 2021

In April, during a maintenance outage at Ship loader 01 in Sepetiba Bay Port Company Terminal (CPBS in Portuguese) in Rio de Janeiro, Brazil – an electrician who was a Vale employee fell from a height of approximately 18 meters upon finishing a repair and after releasing the equipment. The employee succumbed to his injuries and died in hospital.

In June, at the Moatize Mine in Tete, Mozambique, an employee of a contracted company was performing an operation on the 220 kV power transmission line when he came into contact with high-voltage electricity. Rescue efforts were unsuccessful, and he died.

Both occurrences underwent an investigation process. It was conducted by internal investigation teams, led by an executive in a neutral and impartial position from another operation, and involved global subject matter experts and employees both directly and through the Internal Commissions for Accident Prevention (CIPA in Portuguese).

The occurrences were shared via webcasts. Based on the investigations, we defined comprehensive actions that are now mandatory to prevent similar accidents in the future and compliance with these actions is required by all of Vale's areas.



Main initiatives

Vale's occupational safety management comprises a series of initiatives ranging from mapping and adopting measures for risk mitigation to protocols and requirements for certain activities. The initiatives include actions to promote the physical and emotional health and well-being of employees. They include:

- Hazard Identification and Risk Analysis (HIRA): a structured process that identifies hazards and analyzes risks, details the causes of the scenarios for process accidents, the existing protections and the criticality of the risks in the people and environment dimensions – during its first cycle (2019 to 2021). In the second cycle (2022 to 2025), critical and very critical operational scenarios with potential business interruption will also be considered. This process also aims to continuously improve the integrity of Vale's critical assets.
- Technical Standards of Asset Integrity (PNR): standards applicable to the asset's life cycle (engineering, construction, commissioning, operation and decommissioning) that define technical requirements to prevent and mitigate undesired events based on risk scenarios.

- Metrics for process accidents: guidelines for capturing and investigating process accidents (process safety) were standardized – events involving Vale's productive processes that result in uncontrolled release of energy and/or materials (toxic or not). In 2021 the pyramid of process events was created. When fully implemented, process accidents will become an important indicator in Vale's safety strategy.

- Safe Work Permit (SWP): process that assesses risks of routine and non-routine tasks considered critical or very critical. The process starts in the maintenance planning stage, continues with a discussion at the activity site, goes through the execution of the activity and ends with the delivery of the service and closing of the maintenance order.

- Critical Activity Requirements (RAC): internal compliance standards for the execution of critical and very critical tasks. They are critical requirements for the elimination of fatal accidents in these activities.

- Exposure to health risks: global corporate guidelines for the management and development of monitoring and control programs for employee occupational health, which includes quantitative objectives for the reduction of health risk scenarios in the medium term.

- Promoting Healthy Habits (VP GO): Global employee competition to achieve healthy habit challenges with 21,957 participants in 14 countries. As key outcomes of the program in 2021, we report that: 61% of participants are more active after the program, 76% improved at least 1 nutritional habit, 26% felt less stressed after participating, 20% felt more productive, and 24% reported feeling more energized.

- Process safety: Regarding operational risks, safety indicators for production processes were adopted in 2021.

The company also respects the conventions of the International Labour Organization (ILO) in

relation to labour laws, which include not allowing employees to work more than 48 hours a week on regular time and 60 hours including overtime.

In addition, Vale acts to promote employee health by complying with local legal requirements, considering the World Health Organization (WHO) global agenda to focus on themes such as the common flu, sexually transmitted diseases, pregnancy, men's and women's health, obesity, hypertension, diabetes, smoking, and mental health.

Disability prevention

In 2021, Vale implemented global guidelines to strengthen our efforts to prevent cases leading to employee disability. Musculoskeletal and mental disorders ranked first among common risks, both in Brazil and worldwide. In an effort to mitigate these and other risks, we instituted multidisciplinary committees to set guidelines; involve our Health and Safety, Human Resources and Management areas; and provide management indicators, tools, technology, and processes to reduce absences.



Incident underground at Totten Mine in Sudbury, Canada

In 2021, 39 Vale workers were trapped in the Totten underground mine Mine in Canada after a shaft blocking – a structure used to transport people and materials underground – incident.

The 39 employees returned safely to the surface with the support of the Vale rescue team and the municipality via a secondary exit. After the incident, Vale began an investigation to ascertain the causes of the incident and take measures to ensure that it does not happen again.

More than 40 recommendations have been implemented, including improvements in resource management, operational controls, hazard identification, and risk assessment.

INDICATORS AND GOALS

Vale has health and safety goals for 2025:

Reduce by

50%

the number of exposures to healthdamaging agents in the workplace by 2025.

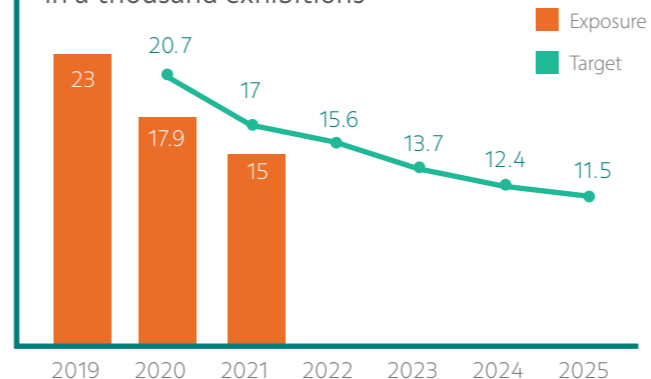
Reduce to

0

the number of recordable highpotential injuries by 2025.

REDUCE THE NUMBER OF EXPOSURES ABOVE THE OCCUPATIONAL EXPOSURE LIMIT (OEL)

In a thousand exhibitions

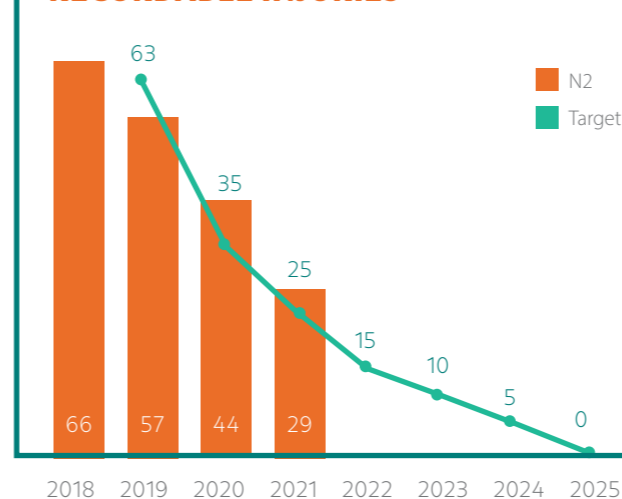


Note: The target data for 2022 is under analysis in the first quarter of 2022.

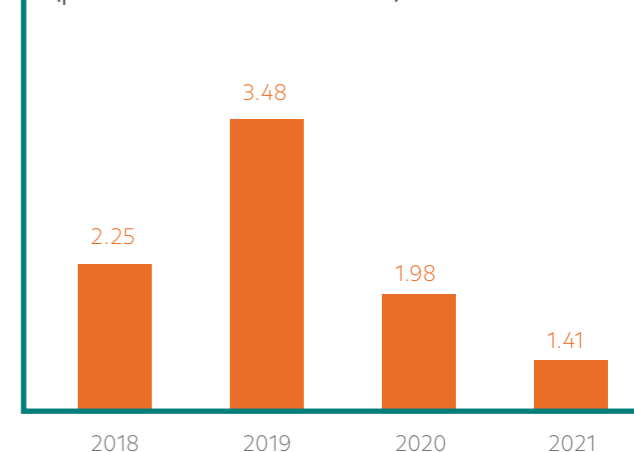
Note: The number of exposures is calculated by adding the number of exposures above the Occupational Exposure Limit (OEL) that occurred at Vale Global in the year in question;

The rationale for defining the reduction curve was to consider the goal of reaching 11.5 thousand exposures in 2025. From this, a curve was made that reduces more in the first years than in the last ones.

REDUCTION OF HIGH-POTENTIAL RECORDABLE INJURIES



TOTAL ACCIDENT RATE (per 1 million hours worked)



The targets associated with our strategic objectives to reduce risks to health, safety and operations are one of the criteria we use to set Vale's variable compensation levels. In case of a fatality, the indicators of health, safety, and risk management for that operation are reset to zero and there is no bonus in health, safety, and risk management targets.

Vale measures and analyzes health, safety and operational risk indicators following routine management. We also perform periodic internal audits with independent auditors, based on risk criteria defined according to the nature of the activities and the maturity level of the Health and Safety management system. Non-conformities identified are registered in a system that results in developing and monitoring action plans, as well as reporting to Vale's senior management.



Covid-19

Since 2020, we have donated more than USD 153 million to governments and institutions in Brazil and abroad for Covid-19 related humanitarian aid actions. In 2021, we supported the Butantan Institute (Brazil) in the expensing works of the Multipurpose Vaccine Production Centre, which will have a production capacity of up to 100 million doses per year, and we donated 50 million syringes and 400,000 pieces of personal protective equipment (PPE) to protect professionals on the vaccination front line. The Vale Technology Institute, in partnership with the Fiocruz Network, is collaborating to produce of genomes of the SARS-CoV-2 virus.

Reinforcing the solidarity actions, we joined other companies in the donating of intubation drugs, totaling 3.7 million analgesics, sedatives and neuromuscular blockers imported from China. These were all donated to the Brazilian Federal Government for subsequent distribution to the states through the Unified Health System (SUS in Portuguese).

In a concerted aim to ensure the health and safety of its employees, Vale has remained on high alert in Covid-19 prevention in all the

countries where we operate. Since March 2020, we have transitioned a significant number of employees to the home office regime as part of efforts to mitigate the spread of Covid-19. We have also implemented other social distancing measures, including shifts in operational areas, restrictions on face-to-face meetings, testing protocols, among others.

Screening for access to operational areas was implemented in the units globally, and an application to track proximity between people in case of need contact tracing was implemented in several of them. In Brazil, Indonesia, and Mozambique, the screening process included periodic testing of the workforce using thousands of serological or rapid antigen tests.

Employees identified as being at higher risk of developing the severe form of the disease were removed from operations and remained at home on full benefits awaiting vaccination before returning to work sites. As of January 2022, proof of complete Covid-19 vaccination is a mandatory requirement for own employees, contractors, and visitors to our Brazil locations.

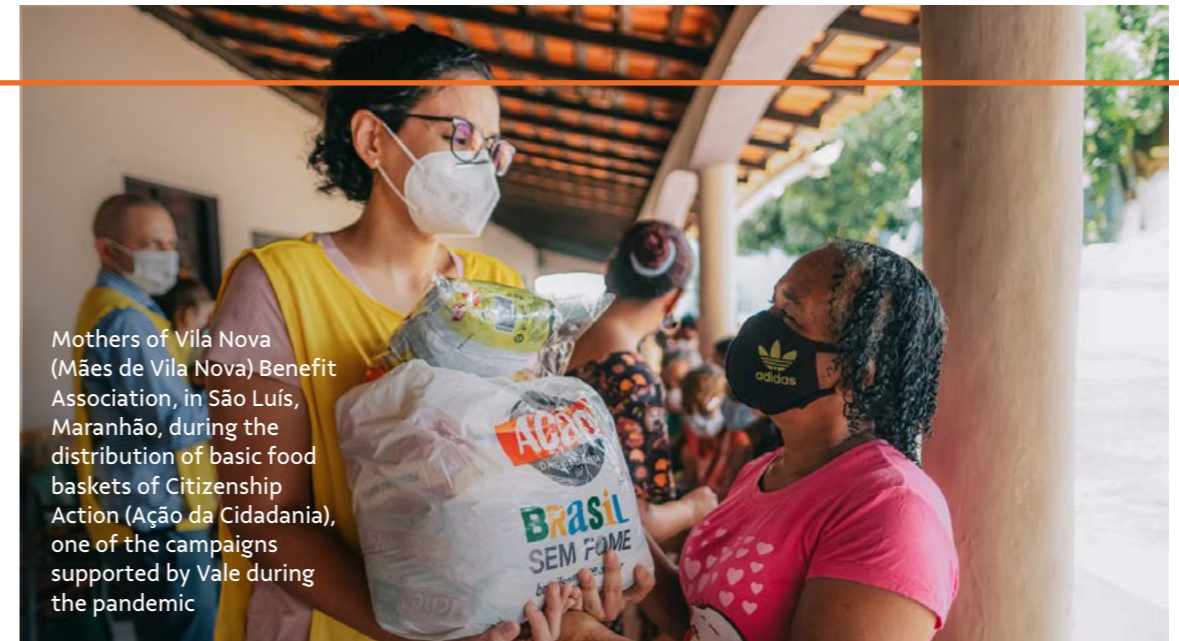


Learn more

[About Vale's crisis response plan.](#)

Humanitarian action to fight hunger

The pandemic has also aggravated hunger, endangering the food security and nutritional status of millions of people in Brazil and around the world. Given this scenario, Vale, the Vale Foundation and the Vale Voluntary Network joined forces with organizations that work to fight hunger in Brazil, such as Full Pot Movement (Movimento Panela Cheia), which was formed by Cufa, Gerando Falcões and the National Anti-racist Front, the Rio Union Movement and Citizenship Action (Movimento União Rio e Ação da Cidadania), among others. Together they delivered more than one million staple food baskets/food cards to more than 220,000 families in a situation of severe food insecurity in 2021.



Mothers of Vila Nova (Mães de Vila Nova) Benefit Association, in São Luís, Maranhão, during the distribution of basic food baskets of Citizenship Action (Ação da Cidadania), one of the campaigns supported by Vale during the pandemic

PHOTO: ISAAC JUNIOR



People

GRI 103-2, 103-3

TALENT ATTRACTION AND RETENTION

Under the recruitment strategy concept, implemented in 2020 and guided by the Vale's integrated management system (VPS), the company seeks to attract and retain talent that is aligned with its purpose, its cultural transformation, and its commitment to promote diversity, equity, and inclusion. Its practices involve everything from focusing on the candidate's experience to using artificial intelligence to assertively search profiles. The global expansion of this model began in 2021, starting in Canada.

The relationship with employees is guided by Vale's Code of Conduct, labour legislation, the eight Fundamental Conventions of the International Labour Organization (ILO), and by the guidelines of the Organization for Economic Cooperation and Development (OECD). GRI 102-8

EMPLOYEES AND CONTRACTORS WORKFORCE

GRI 102-7, 102-8

Year	Employees	Contractors	Total
2017	73,596	56,979	130,575
2018	70,270	54,644	124,914
2019	71,149	78,143	149,292
2020	74,316	111,921	186,237
2021	72,266	141,147	213,413

BY GEOGRAPHIC LOCATION – CONTRACTORS

Number of contractors	2021	2020
Brazil	114,757	90,877
South America (ex-Brazil)	113	140
North America	4,311	4,617
Europe	133	109
Asia	9,613	7,964
Oceania	6	198
Africa	12,214	8,016
Total	141,147	111,921

BY BUSINESS UNIT – CONTRACTORS

Number of Contractors	2021	2020
Ferrous	46,327	34,042
Coal	7,416	6,076
Base Metals	15,207	10,395
Energy	-	-
Corporate	27,690	26,877
Capital and decommissioning projects	44,507	34,531
Total	141,147	111,921

BY BUSINESS UNIT – EMPLOYEES

Number of Employees	2021	2020
Ferrous	44,235	44,342
Coal	5,492	3,320
Base Metals	12,903	13,762
Fertilizers	-	-
Energy	-	3,954
Corporate	8,261	7,914
Capital and decommissioning projects	1,375	1,024
Total	72,266	74,316

BY GEOGRAPHIC LOCATION – EMPLOYEES

Number of employees	2021	2020
Brazil	55,067	58,249
South America (ex-Brazil)	153	190
North America	6,448	6,169
Europe	279	293
Asia	4,382	4,454
Oceania	10	1,263
Africa	5,927	3,698
Total	72,266	74,316

TURNOVER RATE*	2021	2020
General	8.2%	10.7%

By gender

Men	7.0%	9.3%
Women	14.5%	19.7%

*The turnover rate is calculated based on data from Vale and its subsidiaries. Its formula is $[(\text{No. of employees who left the company} + \text{No. of employees hired}) \div 2] \div \text{No. of employees in the previous year}$. GRI 401-1



COLLECTIVE BARGAINING AGREEMENTS

GRI 102-41 | 407-1

In 2021, 100% of the employees in Brazil were covered by collective agreements with trade unions. Considering all the countries where Vale operates, the percentage was 92% for its own employees. In Brazil, 46 Collective Labour Agreements were signed, with 13 trade unions, most of which were for benefits, salary readjustment, working hours and profit sharing.

In the period, the company's proposed offer to production and maintenance employees in Sudbury, Canada, for a new five-year collective agreement was rejected, despite unanimous endorsement of that agreement by the union's bargaining committee. The event resulted in a shutdown of Sudbury operations, for approximately two months, and Vale continued negotiations until a new agreement was ratified in August 2021.

Four cases of risk or incidents were identified in which the right to exercise freedom of association and collective bargaining may have been violated. These cases occurred in operations in the VNL – Newfoundland and Labrador Vale region – and corrective measures were adopted according to the procedures provided for in the collective agreement.



PHOTO: GUSTAVO BAXTER

In the photo (left to right), Dayanne Priscila Silva and Vera Araujo, at Mutuca Mine in Nova Lima, Minas Gerais, Brazil

Vale respects the freedom of association and collective bargaining, and in all the countries where we operate, we strive to maintain good relations with trade unions or, in countries where this right is not assured by local legislation, with equivalent worker organizations. The company seeks to resolve conflicts through dialogue and continuous meetings with representatives of these associations. Since 2005, employees have

been electing a member of the Board of Directors and the respective alternate by direct vote. Elections are conducted jointly by the company and the unions.

As expressed in Vale's Code of Conduct and Global Human Rights Policy, all employees are free to join labour unions or equivalent workers' organizations.

COMPENSATION

GRI 102-36 | 103-2, 103-3 | 201-3 | 202 | 405-2

Vale's compensation adheres to the legislation of each country where it operates, and variations may occur due to employees' seniority and maturity levels. With regard to base wages, there are no differences between men and women performing the same job. In addition, Vale does not deduct or restrict compensation that could lead the worker to be in debt with the company. GRI 405-2

For more information about the indicator, access the [ESG databook](#).

Also, according to each country's legislation, the following benefits are assured but may vary: medical and dental assistance; life insurance; private pension plan; personal accident insurance; transportation allowance; educational training; food allowance; and employee assistance program.

**In 2021,
the turnover rate
was 8.2%**

SUCCESSION PLAN

Succession planning is a lever to generate opportunities, retain talent, and also to develop behaviours aligned to our culture. To this end, we have been counting on our Global Talent Review program since 2019, through which we discuss and continuously monitor the career, development and readiness of successors who will be needed – mainly for critical positions – in the short, medium and long term, in order to ensure business continuity.

In 2021, we found options for successors for 99% of our critical positions for the short, medium, and long term. Developing successors and getting them ready to assume new roles in the responsibility of our leaders and a key element of the VPS management model. The assurance of an assertive succession line for jobs and positions has become part of executive compensation targets.

The People, Compensation and Governance Committee monitors the succession planning of the top leadership through quarterly meetings on the topic, always reporting to the Board of Directors.

TRAINING GRI 103-2, 103-3 | 404

Vale's Corporate University (Valer) has structured a portfolio of training and development actions for technical, management and leadership skills aligned with the company's strategies such as safety, Vale's integrated management system (VPS), risk management and sustainability. More recently, Valer has been preparing employees and leaders to work in new ways that promote greater agility, collaboration and integration, and has also supported the digital inclusion strategy by developing a digital training program for operational employees. The Vale Institute of Technology has two courses recognized by Coordination for the Improvement of Higher Education Personnel (CAPES in Portuguese): a Professional Masters in Sustainable Use of Natural Resources in Tropical Regions and a Professional Masters in Instrumentation, Control and Automation of Mining Processes.

In 2021, in line with the commitment to employee safety, work began to review the technical-operational training model, through which diagnosed and trained were directed to employees in critical functions. About 4,000 of the 17,000 employees in these functions in Brazil were diagnosed as needing better training for technical competencies, aiming to strengthen accident prevention and operational excellence. The Entry Gates program (Portas de Entrada in Portuguese) was also implemented, focusing on the learning journey of interns, young apprentices, professional trainees, and global trainees.

PHOTO: GUSTAVO BAXTER



Employees of the Mutuca Mine, in Nova Lima/ Minas Gerais

AVERAGE HOURS OF TRAINING GRI 404-1

AVERAGE HOURS OF TRAINING IN 2021 (ANNUAL AVERAGE BY FUNCTIONAL CATEGORY)

Functional Category	Hours
Leadership	58
Specialist	42
Technical-Operational + Staff	77



Diversity, Equity and Inclusion

GRI 103-2, 103-3 | 405-1

Our diversity, equity and inclusion strategy aims to strengthen a culture that promotes and values an inclusive environment and addresses the challenges mapped out through affirmative policies. Since 2019, we have been addressing structured initiatives to create working conditions and opportunities that promote representation related to gender, race, and people with disabilities, among other fronts.

In 2021, our priority focus involved the preparing the Vale Diversity Census, to understand our challenges, and reviewing processes and systems, as well as initiatives to strengthen a culture oriented toward the promote diversity, equity and inclusion.

VALE DIVERSITY CENSUS

In 2021, Vale conducted its first diversity census, covering operations in Brazil and Canada. In Brazil, about 68.5% of the company's own employees participated voluntarily and confidentially, making self-declarations about how they see themselves and how they perceive the work environment at Vale.

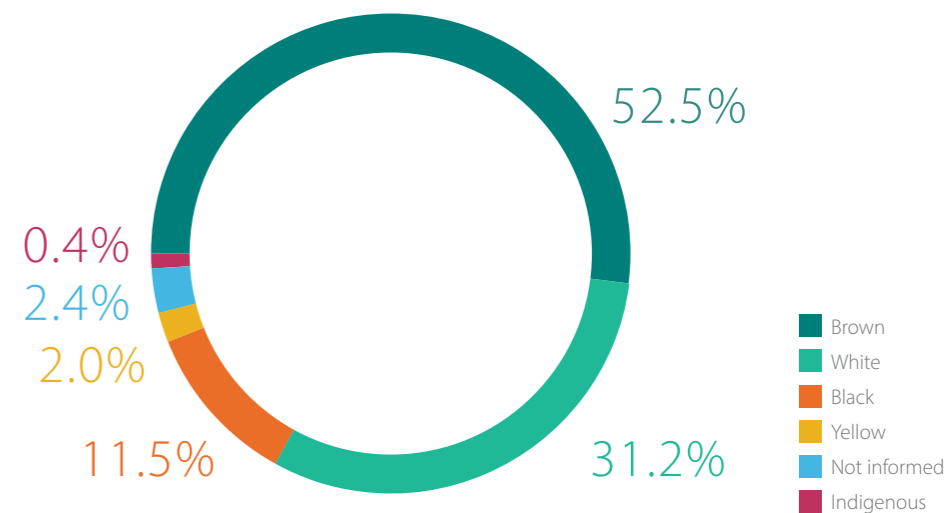
The result of this survey will help us map gaps and implement actions that adherent more closely to our needs, to build a more fair and inclusive company. Below are the results of the Brazil's census, considering a total of 53,391 employees.

LGBTQIA+ Pride – Jailson Sá Santana, process technician.

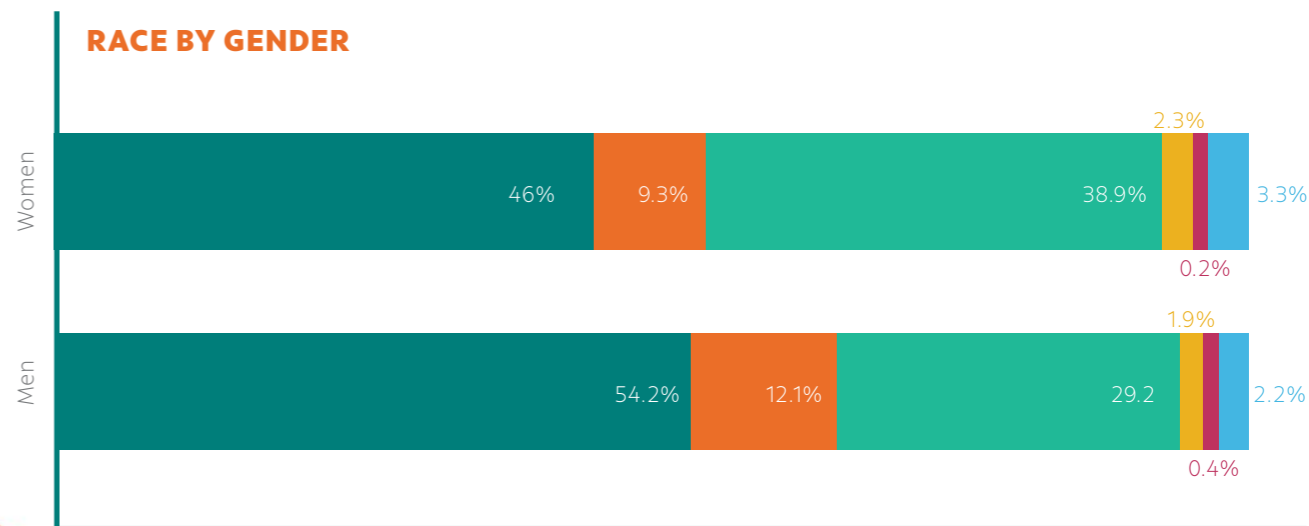


PHOTO: DANIEL DA COSTA GOMES MARTINS

RACE TOTAL



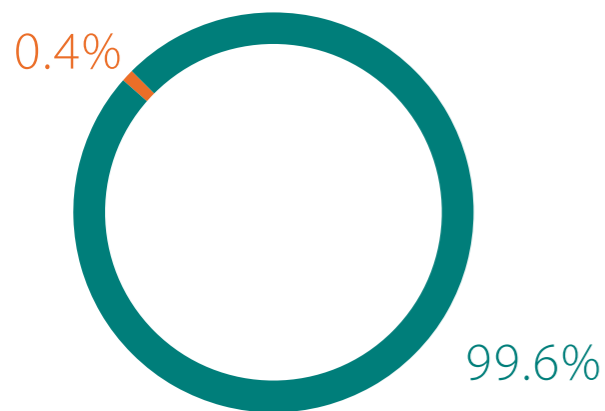
RACE BY GENDER



In 2021, Vale conducted its **first diversity census**

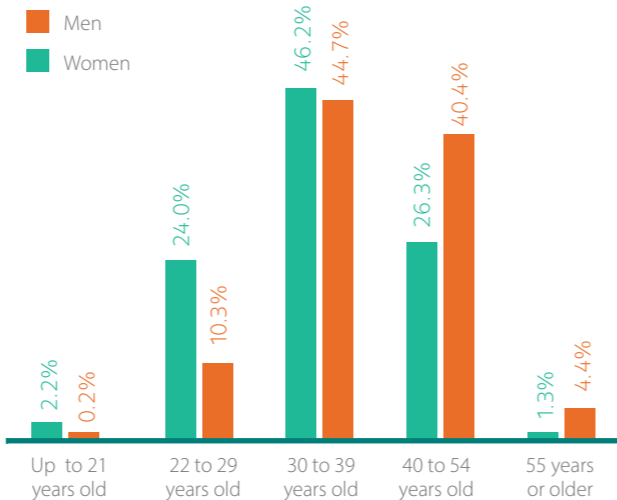


GENDER IDENTITY

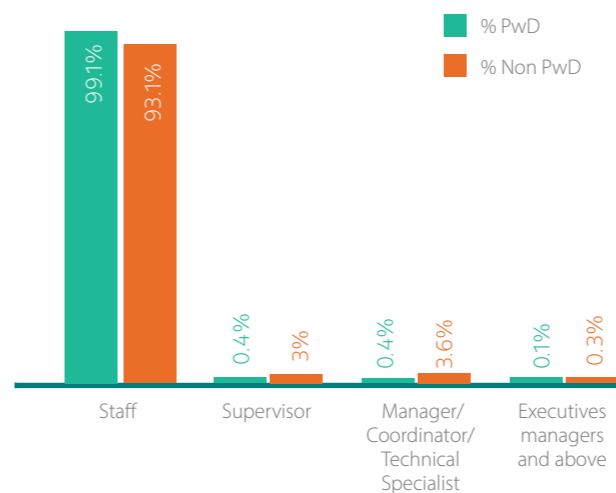


- Male and female
- Transgender, non-binary/fluid, prefer not to inform and others

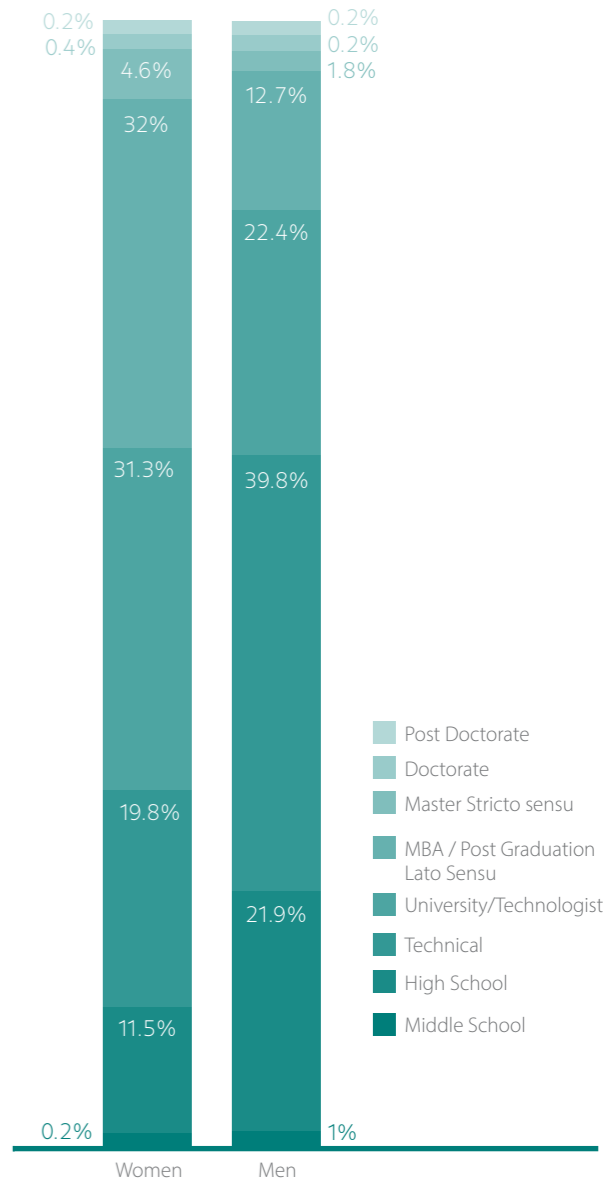
AGE GROUP BY GENDER



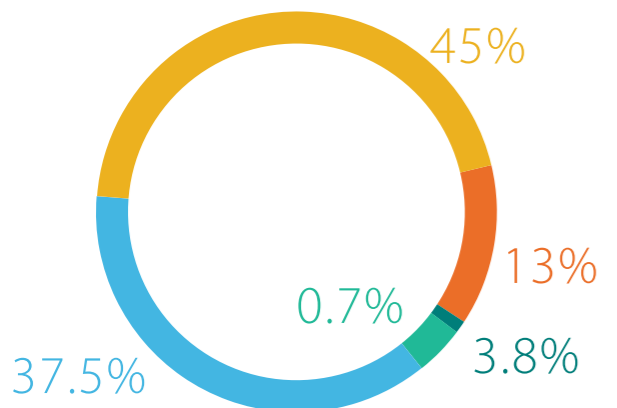
PROFESSIONALS WITH DISABILITIES BY FUNCTIONAL POSITION



EDUCATION BY GENDER

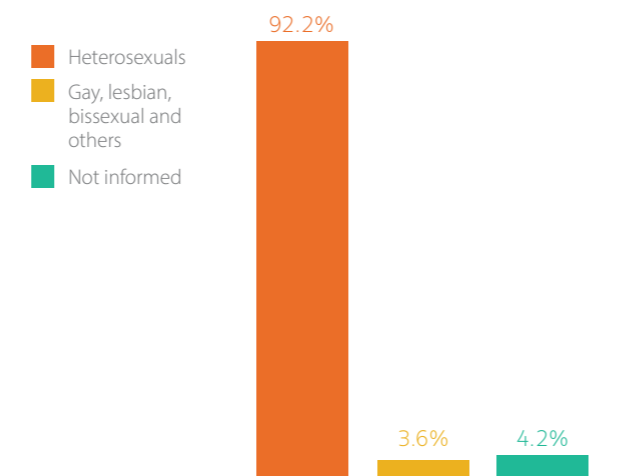


AGE GROUP TOTAL

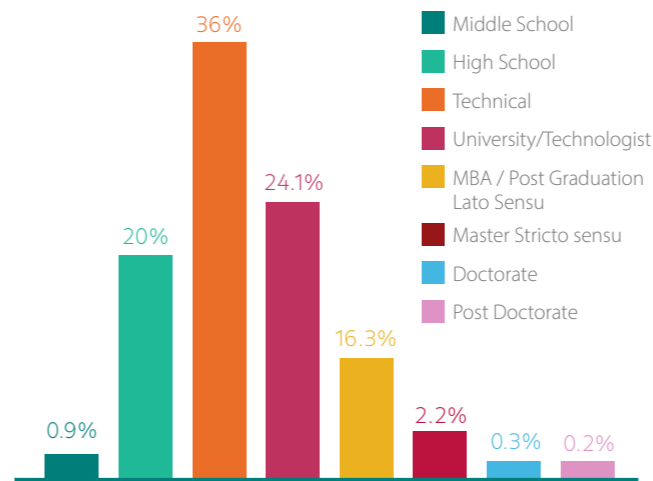


- Up to 21 years old
- 22 to 29 years old
- 30 to 39 years old
- 40 to 54 years old
- 55 years or older

SEXUAL ORIENTATION



CURRENT EDUCATION



GENDER EQUITY

Vale's goal was to double the representativeness of women in its workforce, from 13% to 26%, by 2030. In 2021, the company announced it had brought the commitment forward by five years, to 2025. During the year, it reached 18.7% representation of women globally, the equivalent of adding 4,400 women to its workforce. At the top leadership level, we reached 20.3% female representation, a 80% increase compared to 2019, when the goal was established.

PHOTO: GUSTAVO BAXTER



PROFESSIONALS WITH DISABILITIES

In 2021, Vale made concentrated efforts to ensure that 5% of our workforce is composed of professionals with disabilities (PwDs). We implemented the career acceleration program with these professionals in mind. The pilot edition included 25 professionals whose skills were strengthened. In 2022, the program's approximately 500 vacancies will be offered to this group of employees. It also remains a challenge to include PwDs in leadership positions.



Learn more

About our commitment and initiatives in the [Diversity, Equity & Inclusion Report 2020/2021](#).

ETHNIC AND RACIAL EQUITY

From the census results, we identified that Vale Brazil is made up of 64% black and brown professionals and that we have a great opportunity to expand this representation in middle and senior leadership positions. To this end, Vale has made the following commitments:

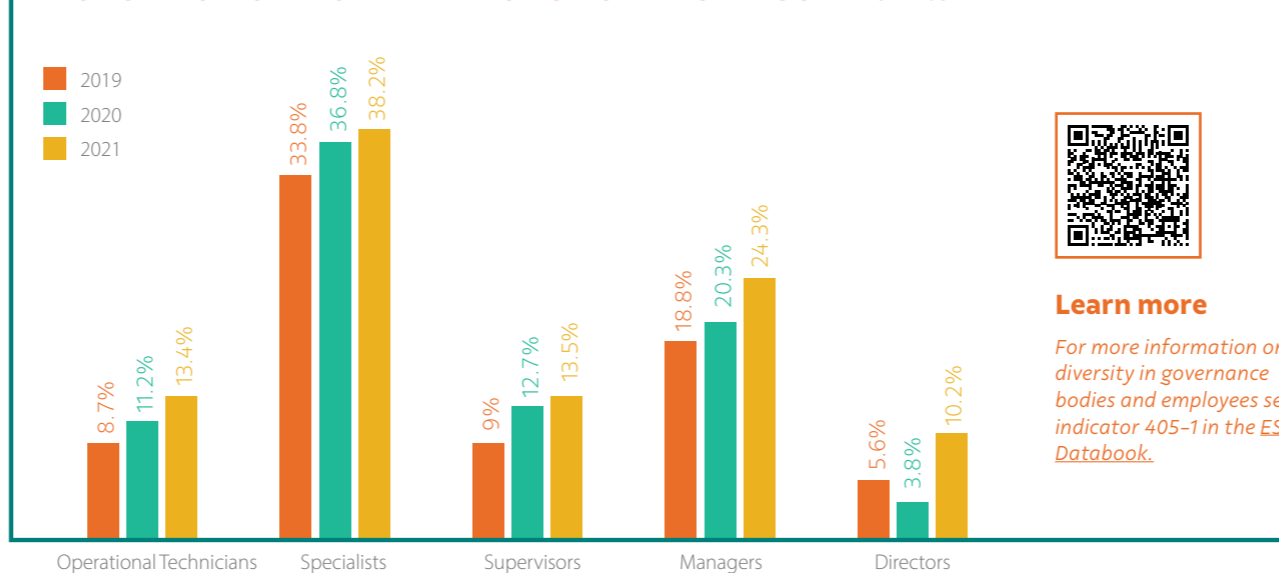
COMMITMENTS TO ETHNIC AND RACIAL EQUITY

- Achieve 40% of leadership in Brazil (managers and above) made up of black and brown people by 2026;
- Implement educational programs to intensify the professional training for black and brown people from the communities where Vale operates;
- Strengthen anti-racist positioning.

WOMEN BY FUNCTIONAL CATEGORY

	2019	2020	2021	Increase in relation to 2019
Total women	9,050	11,443	13,488	49.0%
Staff	8,457	10,638	12,433	47.0%
Supervision	239	374	412	72.4%
Management and coordination	329	397	598	81.8%
Executive managers and directors	25	34	45	80.0%

PROPORTION OF WOMEN BY FUNCTIONAL CATEGORY GRI 405-1



Learn more

For more information on diversity in governance bodies and employees see indicator 405-1 in the [ESG Databook](#).

Here, we highlight our 2021 Global Trainee Program, which prioritized women and black people. Of the 144 trainees hired, 66% (95 professionals) were black and brown and 68% were women. In addition, in partnership with companies from various sectors, Vale has joined movements and indices that aim to implement and measure the effectiveness of actions to correct social inequalities within



PHOTO: ALEXANDRE REZENDE

Paulo Luiz Franco and his son Ebraim Pereira, in a cassava and vegetable plantation at Casa da Hora, in the Vila Nova community, one of the communities that Vale is engaged with in Parauapebas, Pará/Brazil

Social and Relationship Capital

- 1. Social Ambition
- 2. Human Rights
- 3. Indigenous Peoples and Traditional Communities
- 4. Local Communities
- 5. Private Social Investment
- 6. Suppliers and customers
- 7. Stakeholder Engagement



SOCIAL AND RELATIONSHIP CAPITAL

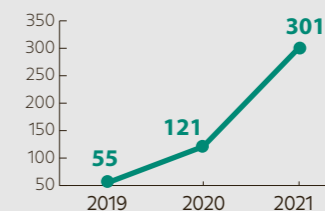
We have defined our social ambition: "To be a partner company in the development of resilient communities, engaged in relevant issues to humanity and committed to sustainable mining"

53%
of total purchases destined for purchases local

18 thousand
companies in Vale's supply chain

INVESTMENTS THROUGH THE LAW OF CULTURE INCENTIVE

In BRL million



The largest company that has encouraged culture in the country in the last 3 years, according to the investment ranking of the Federal Law for Cultural Incentive

CUSTOMERS

With regard to our Scope 3 emissions, engaged customers represent approximately 30% of global steel production and about 40% of global emissions

SOCIAL EXPENDITURES

USD 473.5 million destined mainly for: urban infrastructure and mobility, culture, health, and social protection, 73% with own resources and 27% through incentive laws.

HUMAN RIGHTS
100% of the company's operations with human rights risk analysis

RELATIONSHIP WITH COMMUNITIES

Relationship with 2,092 local communities, 29 Indigenous Peoples, and 57 Traditional Communities.

INVESTORS

Dividends of BRL12.60/share paid to shareholders and repurchase of approximately 6% of company's shares.

COMMUNITY GRIEVANCES

Total: 11.069

Answered **98.9%**

Attended **82.7%**

The main issues were support for social projects (1,316), access, roads and routes (1,200), and involuntary resettlement (862).



PHOTO: GUSTAVO BAXTER



School reinforcement activity for elementary 1 and 2 students at Aracy Novais Municipal School, in Santa Bárbara, Minas Gerais. The project is a partnership between Vale and the NGO Juventude Viração. In the photo, teacher Ana Paula de Oliveira with student Izabelly Aparecida Rodrigues Santos.

Social Ambition

"To be a partner company in the development of resilient communities, engaged in relevant issues to humanity and committed to sustainable mining."

The design of this ambition is the result of work that involved stakeholder engagement, an analysis of the social context in the countries where we operate, and benchmark studies.

"We have a history of social engagement and support and a relevant role in the places where we operate, but we want to do more. For this, we consider it our social ambition to be a partner that enables the development and autonomy of the communities with which we relate, based on the education-health-income tripod."

Eduardo Bartolomeo, CEO

By launching our social ambition, together we want to:

- Develop solutions with suppliers, customers and partners, in order to generate a sustainable mining cycle.
- Promote resilient communities by supporting sustainable development in the territories where we operate;
- Ensure and disseminate the practice of business and human rights;
- Contribute to greater social justice by implementing education, health, and income generation projects;
- Appreciate cultures and respect and promote the rights of Indigenous peoples and Traditional Communities;
- Ensure that our actions generate social and environmental value and promote effective, positive post-mining legacies.

"We want to articulate alliances and partnerships involving companies, governments and the voluntary sector around structuring actions and programs for the communities where we operate"

Maria Luiza Paiva, Vale Executive Officer of Sustainability

2030 Commitments

- Perform Top 3¹ in major external assessments of sustainable mining, in social requirements.
- To lift 500,000 people out of extreme poverty.
- Indigenous communities neighboring all Vale operations with UNDRIP² rights plans.

¹ MSCI, Sustainalytics and DJSI. At least 3rd position in the sector in all of them.

² UN Declaration on the Rights of Indigenous Peoples



Human Rights GRI 103-2, 103-3

Due to the inherent characteristics of its activities and the extractive sector where it operates, Vale recognizes that there are several challenges related to respect for human rights in its activities and throughout its value chain.

The topic is contained in the Integrated Risk Map, as well as in Vale's Risk Management system.

To guide its actions, the company has a Global Human Rights Policy, aligned with international initiatives and standards such as the UN Guiding Principles on Business and Human Rights, the UN Global Compact, the Universal Declaration of Human Rights, the principles and guidelines of the International Council on Mining and Metals (ICMM) and the International Finance Corporation (IFC) Performance Standards, among others.

In 2021, Vale trained 74,000 people via the two-hour online course that is mandatory for all its own employees, totaling 111,000 hours of training. For contractors, a video training program was provided focusing on the main human rights issues. GRI 412-2.

A specific front was also developed to train human rights multipliers in the operations, with more than 200 employees trained by 2021. In addition, more than 3,200 hours were dedicated to specific training on human rights and corporate security, according to the Voluntary Principles on Security and Human Rights, covering 80% of the total workforce. GRI 410-1.

HUMAN RIGHTS RISK MANAGEMENT

100% of Vale's operations* have assessed the risk of human rights violations and monitored them periodically along with other business risks. In addition, our operations have adopted prevention and mitigation control measures for these risks and conducted tests to ensure their effectiveness. GRI 412-1

Human rights risk assessment at Vale involves analyzing critical issues such as degraded working conditions and modern slavery, child labour and sexual exploitation of children and adolescents, violations in work relations, large-scale human rights violations.

*Considers as operations the risk management areas that contemplate the Company's business.

In these assessments, we gauge the probability of a risk's occurrence and the severity of its impact. From there, we develop and implement action plans and monitor their progress to reduce the exposure of people and company to risks. On a quarterly basis, our risks are monitored by the Risk Committee and reported to all levels of the company, including the Board of Directors.

For critical issues, such as forced labour, child labour, sexual exploitation of children and adolescents, and human trafficking, risk management processes are determined at all life cycle stages of Vale's ventures. We also mitigate these risks through an ongoing engagement process with our communities, and partnerships with Childhood Brasil and InPacto that help us take preventive and mitigating action.

In 2021, there were no records or allegations of occurrences of child or slave labour involving Vale's operations, however we recognize the fragility of the theme in our value chain and we are acting to minimize these impacts. GRI 408-1 | 409-1

"What I see, both from the impact of mining and other impacts from other ventures that arrive in the neighbourhood (Jardim Canadá, Nova Lima/MG – Brazil), is that they bring many people along with them, outsiders, who don't have this idea of belonging to the community. So they come with their families, stay here for a while, and many go away and leave their families. I also see the issue of vulnerable young people and children, because there are usually many lodging facilities housing males, and the girls hang around there, thinking about getting some affection because their father abandoned them, looking for some money to buy something, and I see the enticement of these adolescents is very strong... this saddens the neighborhood. I know that progress exists and that it is coming, but I also know that with good things come bad things for the neighbourhood."

Jaquelline Pinto, representative of the Transformar Social Space and a resident of Jardim Canadá for over 20 years.



Learn more

[Watch the testimonial.](#)



Due diligence in human rights

In 2021, Vale committed to conducting external due diligence in human rights for all its operations and critical projects in three-year cycles, using a methodology aligned with international human rights standards. During the year, 12 operations out of a total of 42, and two projects were contemplated*. Moral and sexual harassment were relevant human rights violation risks identified in all due diligence performed. As a result, action plans are elaborated to address the risk situations that are considered critical and are monitored periodically (at least quarterly).

With regard to Vale's suppliers, human rights management involves several stages, from certification, registration, selection and contracting to contract management and supplier development and training. In the period, we assessed 100% of our supplier base with active contracts in Brazil for risk of human rights violations. We also conducted in-person due diligence processes, which identified risks related to overtime management. The suppliers that present a higher degree of risk are engaged in several ways, including the monitoring of action plans for the treatment of deviations, meetings on Human Rights and sharing of good practices.

[Learn more about Vale's Human Rights management.](#)

²⁵ Considers the grouping into operations performed for internal due diligence control. The total number of enterprises may vary from one year to the next due to the other due to merger and acquisition processes, sale and new projects.



Iretuk Xikrin, in the Catete village (Indigenous Land Xikrin do Catete)

PHOTO: RAFAEL SCHERER

Indigenous Peoples and Traditional Communities

GRI 103-2, 103-3 | MM5

Vale's relationship with Indigenous Peoples and Traditional Communities is based on our respect for cultural diversity and for the rights of these populations. We recognize the different connection that they have with the territory, which involves not only physical and socio-economic aspects, but also cultural and spiritual aspects. Our relations are guided by Vale's Global Human Rights Policy, which is aligned with leading national and international references and legislation related to the topic. In addition to our commitment to build a constructive, mutually beneficial relationship, we make managing risks and their impacts on these populations a priority.

Currently, the company has relationships with 29 Indigenous Peoples, 13 in Brazil and 16 in other countries, in addition to 57 Traditional Communities in Brazil. The team responsible for conducting this relationship is made up of professionals dedicated to each people/community who have multidisciplinary backgrounds and consistent experience in Indigenous relations. They are dedicated to acting in these territories and to



forging permanent relationships with these populations. GRI G4 MM5

In addition, Vale qualifies the employees and suppliers who interface with these populations in areas impacted by its operations, to maintain consistency in our dealings in the various territories and to hold a qualified dialogue with these stakeholders.

In a aim to favour a solid relationship of partnership and trust, we also implement programs and voluntary agreements, built collaboratively with these populations, considering their cultural and territorial specificities.

STRATEGIC INITIATIVES WITH INDIGENOUS PEOPLES

Our company's planned voluntary action fronts involve:

- Preservation of Cultural Memory;
- Indigenous Protagonism;
- Sustainable Programs.

In 2021, we will start developing projects focused on methodologies to preserve Indigenous cultural heritage with the Xikrin do Cateté, Awá, Guajajara and Ka'apor Peoples, through the Cultural Institute.

Another prominent initiative was establishing the Indigenous Program for Permanence and Opportunities at the University (PIPOU in Portuguese), which aims to contribute to the higher education of Indigenous People in partnership with non-governmental organizations, experts in Indigenous higher education and representatives of the Indigenous movement. In 2021, 50 Indigenous people were awarded scholarships and infrastructure support.



Learn more

About our work on this topic.

"It is very complicated for us indigenous people to remain in university, this project is essential to help, I am very happy to be contemplated by the project"

Juliana Porang (Juliana Coutinho Cabidelli), indigenous of the Tupiniquim Guarani Indigenous Land, Medicine student at the University of Brasilia

We also support the National Plan to Fight Covid-19 in Indigenous Territories, which have been deeply affected. Equipment was acquired for all 34 Indigenous health centres in Brazil (100% coverage). The initiative aims to make telemedicine services available to the Indigenous people and will bring them consultation within the villages, avoiding the need to travel to large centres.

In 2021, we established the Indigenous Program for Permanence and Opportunities at the University

Withdrawal of all mining processes on Indigenous lands

Vale does not conduct any mineral research or mining activities on Indigenous lands in Brazil, and had already declined 104 mining processes, between 2019 and 2021.

In 2021, Vale gave up all mining processes on Indigenous lands in Brazil, as a result of the understanding that mining on Indigenous lands can only be carried out with the free, prior and informed consent (FPIC) of the Indigenous people themselves and legislation that regulates this activity.

Recognition of FPIC is critical to address the rights of Indigenous peoples to determine their own development and their right to exercise self-determination over decisions concerning their territories.



Indigenous Peoples and the Onça Puma Nickel Mine in Brazil

Vale's relationship with the Xikrin do Cateté peoples began in the 1980s. On the one hand, the relationship benefitted from infrastructure improvements made by Vale through voluntary agreements; on the other hand, associations representing these peoples and Brazilian public authorities allege that our operation has had a negative impact on the health of the communities near the Onça Puma Nickel Mines.

Since 2017, Vale has sought to dialogue with the peoples involved, with the Federal Public Prosecution Office and with all the stakeholders involved, contributing to the implementation of several actions, including the judicial investigation that issued reports not confirming the impacts indicated. In 2020, Vale, Federal Public Prosecution and the Xikrin do Cateté and Kayapó indigenous peoples reached a preliminary agreement which culminated in the suspension of the lawsuit filed by the Federal Public Prosecution Office and/or the Xikrin Associations. In 2021, Vale made progress in the dialogue,

negotiations, and deliberations for the construction of a global agreement that would put an end to all lawsuits in which they are parties.

In December 2021, the Xikrin Associations and Vale entered into an out-of-court agreement to terminate the lawsuits, which was presented to the Federal Civil Court Judge of Redenção (Pará state) for acknowledgement and ratification, which occurred on March 07, after recognition of validity declared in a positive opinion presented by the Federal Public Prosecution Office .

In March 2022, the Kayapó and Vale Associations also entered into an out-of-court agreement to terminate the lawsuits in which they are parties, which was submitted to the Federal Civil Court Judge of Redenção for cognizance and ratification, with a favorable opinion from the Federal Public Prosecution Office and recognition of the validity of the adjustment.

Learn more

About [Indigenous Peoples and the Onça Puma Mine](#).



PHOTO: RAFAEL SCHERER



In the photo, chief Zeca Gavião, right, with Mathias (Hàraxàre Krokti Konxart), from the Kyikatejê village

"Today I recognize that if we can have this condition of living the way we want to, to be able to eat meat, fish, you were also part of it. I would like to recognize, despite our fights, our struggles, that you were part of this. Our focus is to invest, always thinking about the future. And I recognize that Vale was part of it together with us. Through the agreement we found a result."

Pepkrakte Jakukreikapiti Ronore Konxarti (Zeca Gavião), Chief of the Kyikatejê Village, Indigenous Land Mãe Maria - Pará/Brazil.

Local Communities

GRI 103-2, 103-3 | 413-1

The activities of Vale and the mining sector in general involve social impacts on several fronts, including risks related to the safety of communities surrounding the company's operations, conflicts arising from involuntary resettlement and land use, and conflicts with Indigenous Peoples and Traditional Communities, among others.

Since 2020, we have adopted community relationship standards globally which compel us to identify, engage and monitor our relationship with these stakeholders.

Vale currently has 2,092 local community relationships mapped, of which 1,304 are in Brazil, 80 in Canada, 355 in Mozambique, 163 in Malawi, 47 in Peru, 27 in Oman, 110 in Indonesia and 6 in Malaysia. To engage them, Vale seeks to establish structured spaces for dialogue to build our Community Relationship and Investment Plans. These plans will be based on the principle of mobilizing the communities to participate in our efforts to define and prioritize actions that we will implement in their territory.



By 2021, in Brazil, we had 411 priority communities in Brazil to engage, out of a total of 1,304 communities, distributed among 130 municipalities. In the period, 69% of the communities were covered by Relationship and Investment Plans.

GRIEVANCE MECHANISM

GRI 102-34, 103-2, 103-3

Vale's Grievance Mechanism is composed of several listening channels, which are the structures responsible for managing community manifestations. These channels (phone, letter, email, among others) provide different means through which stakeholders can contact and interact with the company. In addition, our Grievance Mechanism is governed by human rights guidelines and complies with the General Data Protection Law.

In 2021, 11,069 community manifestations were registered, of which we answered 98.9% and fulfilled 82.7%. The main issues were related to support for social projects (1,316); access, highways and roads (1,200); and involuntary resettlement (862). These figures do not include the manifestations captured by the Service Centre reported in the [Reparation in Focus/Brumadinho chapter](#).



Learn more

[About Grievance Mechanism.](#)

Relationship with the community of Piquiá de Baixo

The Piquiá de Baixo community, located in the Açailândia Chemical Industrial Park in the state of Maranhão, claims that it is impacted by pollution caused by steel mills installed at the site over 30 years ago. Vale does not own any pig iron mills in Açailândia, but it acts as the main supplier of Iron Ore used to produce steel.

In line with its social performance guidelines, the company has supported initiatives such as preparing a socio-economic diagnosis of the families located in the region in question, and formalizing a partnership between the Vale Foundation and the Piquiá Community Association with the Caixa Econômica Federal Bank, to help construct 312 houses to create a new neighbourhood for the community.

ABOUT VALE'S NEW INVESTMENTS IN PIQUIÁ

Sensitive to the cause, to the history of claims and with the goal to build a positive legacy, Vale is increasing its contribution to the sustainable development of the Piquiá community. The new investments – which are divided into four areas described below – are the result of the company's constant dialogue with the community and are part of the steering committee's plan created by the City Hall of Açailândia that aims to ensure more infrastructure and quality of life for the Piquiá community.

In the housing area, Vale is making a financial contribution totaling more than USD 8 million, to facilitate and guarantee the conclusion of works on the new Piquiá da Conquista neighbourhood. Construction will include 312 housing units, including basic sanitation, proper public lighting

and infrastructure items. About 43% of the construction on the houses has been complete.

In the environmental area, a set of actions is underway to mitigate the emission of particulates during the road transportation of Iron Ore by paving the Açailândia yard and access roads. This includes articulation with plants installed in the region to comply with legal and market environmental standards.

At the social and institutional level, Vale is investing in preparing a participative plan for socio-economic development in Piquiá, which will be used as a blueprint for collaborating with public authorities to improve local infrastructure, such as proper rainwater drainage in the region. Vale is also conducting social projects aimed at income generation, education and health in the region.

COMMUNITY SAFETY

Vale is reviewing the ways in which its activities impact society. One of the vectors of this review includes community safety, which involves mitigating the risk to people's physical integrity that Vale's presence in the territories may present.

The challenge of enhancing our safety approach is extending risk and impact management to our communities. In this context, we are implementing a structured process to improve community safety, which will include executing preventive actions, responding to occurrences, performing crisis management, and investigating events as well as implementing actions to mitigate the risk of their recurrence. The direct participation of the communities in the process is evolving to become larger and larger.

Vale assumed the practice of recording events regardless of guilt or responsibility, transforming the analysis of these occurrences into learning that informs our actions to continuously improve operational safety to protect our communities. This practice demonstrates the way Vale is evolving to understand its role as an agent for transformative change in the territory.

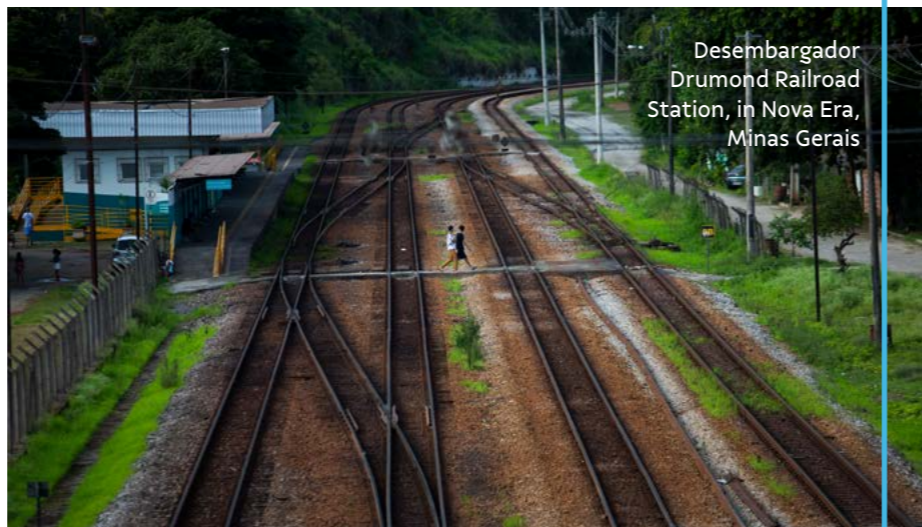


PHOTO: GUSTAVO BAXTER

Desembargador Drumond Railroad Station, in Nova Era, Minas Gerais

In 2021, 49 people died and 126 people were injured due to events associated with Vale's presence in the territory, representing an increase of 48% and 103%, respectively, over the previous year.

For 2022, reducing safety events that result in injury to community members represents 5% of the total variable compensation of all company leadership.

The reduction of safety events with the community will represent 5% of the variable compensation of all leadership

Coal transport derailment in Moatize

Despite our efforts to ensure the communities' safety wherever we operate, in October 2021, a train transporting coal from Vale's mines in Moatize to the port of Nacala, derailed in northern Mozambique. The coal cars overturned onto the ground and into the Namutimbua River, causing the fatalities of two children, in addition to seriously injuring two victims and lightly injuries to eight, totaling twelve victims.

As immediate measures, we provided medical assistance to the victims at the Cuamba District Hospital and transferred victims in serious condition to another, more structured hospital. We also assigned social monitors to the accident site.

To support the families, we provided emergency social aid to

those who lost loved ones and those whose family members were in serious condition and provided psychological support to the victims and relatives of those who lost their lives.

In this occurrence, among the lessons learned was the importance of making decisions quickly to mobilize all the necessary resources for the victims and their families to receive the best care available, according to the severity of the cases. The event also influenced the definition of criteria for immediate support (to victims and their families) in emergency situations. Besides promoting improvements in the operational procedures of permanent way maintenance and preventive monitoring controls.



PHOTO: GUSTAVO BAXTER

INVOLUNTARY RESETTLEMENT

GRI 103-2, 103-3 | G4 MM9

Vale is committed to ensuring that the Involuntary resettlement process provides the restitution of livelihoods in conditions equivalent to or better than those prior, which requires, among other measures, the replacement of impacted land, housing and economic activities. The process adopted by Vale follows the guidelines from international organizations such as the International Finance Corporation – IFC, the World Bank, the United Nations – UN, and the International Council on Mining and Metals – ICMM.

In 2021, 805 families were involved in Involuntary Resettlements in Brazil. Of this total, 572 families are being assisted due to dams decharacterization works in Minas Gerais.

On the Vitória–Minas Railroad, a dialogue was conducted to agree on measures to assist families living in the railroad's easement strip, in the municipalities of Antonio Dias, and Nova Era, in Minas Gerais. Even though this represents an eviction from a company-owned area, support is being provided to the 34 vulnerable families to obtain new housing and restore their livelihoods in a new location. On the same railroad, Vale has carried out studies to promote the involuntary resettlement of 161 families to duplicate and modernize the railroad stretch in Belo Horizonte.

Also in Minas Gerais, in the municipality of Itabira, 13 families were mapped for feasibility analysis for involuntary resettlement due to drainage works in the Pontal System.

In the north of Brazil, Vale carried out a social and economic diagnosis to examine the reality of 25 families who will be served by the project to duplicate the road-rail bridge over the Tocantins River in the municipality of Marabá in the state of Pará.

In Bela Vista, where Mr. João lives, our commitment is to avoid or minimize involuntary resettlements necessary for the execution of the project. Mr. João is one of the residents who was registered and is waiting for a definition from the company. At this moment we are discussing together with the Public Defender's Office – that is accompanying the process – the Specific Term of Commitment, that sets the indemnity parameters. Once this stage is completed – scheduled for May 2022, we will return to negotiations with the 13 families living in the Bela Vista neighborhood. Vale maintains a service station in the neighborhood, available to attend to the communities and clarify doubts about the process.

In Mozambique, Vale has promoted public consultations to resettle 96 farmers due to the construction of a new pipeline to supply the Moatize Coal Mine. In the same period, we held public consultations to resettle another

Resettlement in Itabira

In 2021, Vale progressed in the planning for decharacterizing the structures built by the upstream method of the Pontal Dam, in the Itabira Complex in Minas Gerais. Among the projects is the decharacterization of the Minervino and Cordão Nova Vista dikes. Vale is seeking solutions to minimize the involuntary resettlement of families due to project implementation.

*In 2021 a socioeconomic survey was carried out for Mr. João's family and 12 other families living in the Bela Vista neighbourhood in Itabira that will be involved in an involuntary resettlement process in 2022. The goal is to prevent families from being impacted by the works of drainage system improvement in Vale's area.



The resident João Batista Carlos

"We moved here in 1998, and little by little I adapted our house to the family's style, but I can't continue with that because we are in this situation of indefiniton – whether we will be resettled or not. So I can't make any more improvements to the house, in an area that we felt comfortable, and we don't have that anymore. My shop is my world. I ask the company to expedite this situation as much as possible."

Mr. João Batista Carlos*, resident of the Bela Vista community in the municipality of Itabira.

805 families were involved in involuntary resettlement processes in Brazil in 2021

PHOTO: ARQUIVO VALE



"I'm a resettler here from Cateme, I've been on a horticulture project here on the farm offered by Vale, since 2017. Vale taught me how to produce and I can teach other people. I produce onions, lettuce, tomatoes, peppers, and okra. I sell all these products and with the resources, I can send the children to school, buy panels for the house, in short, I thank Vale for this income generation project."

**Faruque Nito Sinalo Colher,
Cateme, Mozambique**

171 families from the Mphandwe and Ntchenga communities located in the future expansion area of the venture. After the host area was chosen by the communities, Vale promoted a participative process to create the resettlement project, which will include infrastructure that will also serve the host community. Vale built the 70m² model house, which was approved by the government and communities.

Vale built the Cateme Village to resettle 712 families from rural communities that were once located where the Moatize Coal Mine currently stands. At the site, Vale maintains a social project to enable agricultural and economic development for the resettled families. At Fazenda Modelo, farmers who own small plots of land are trained in sustainable food production techniques which generate revenue that provides income for the families, thus contributing to restore their livelihoods.

LAND USE DISPUTES

GRI 103-2, 103-3 | MM6 | MM7

Vale currently owns more than 9,000 properties in Brazil, corresponding to about 360,000 hectares. Of this total, 63% are operational areas and 37% are non-operational. Part of these areas are located in regions where land use disputes are part of the territorial context and require the company to

manage the relationship with communities that occupy these properties irregularly.

The main issues related to land use conflicts in Brazil are found in the northern region of the country and involve the actions of organized social movements. In the municipality of Canaã dos Carajás and Curionópolis, in Pará, around 400 families occupy company's properties in the region of the Cristalino Project. Vale is seeking, through dialogue, to build a solution, together with justice institutions, representatives and families linked to social movements, to vacate this area.

Vale does not conduct mineral research or mining activities of any nature on indigenous lands in Brazil, however, there is a controversy involving the Xikrin do Cateté people in relation to projects in the Carajás region. The issue was under discussion in recent years, and during 2021 a joint effort was made by all those involved in the legal proceedings, which culminated in an agreement that made it possible to extinguish most of the Public Civil Lawsuits.

The agreement reflects the result of a process of dialogue, engagement, and negotiation between the parties, aiming at resuming the relationship of partnership and good neighbourliness between the company and the Indigenous People as well as a conciliatory solution without recognizing



environmental damage, considering that judicial expert reports have already proven that there is no environmental damage resulting from the Onça Puma enterprise. The agreement has already been ratified by the Federal Court of Redenção and is awaiting ratification by the Federal Court of Marabá. Vale reiterates that its actions are based on compliance with environmental legislation and respect for the Xikrin do Cateté people.

Vale has decided to abandon its mining processes on Indigenous Lands in Brazil as of 2021, which includes requirements for research, exploration and mining. The necessary procedures are being taken by the company at the National Mining Agency – ANM (in Portuguese).

In Mozambique, Vale has started negotiations involving the community and the government for compensation of farmers who irregularly occupy the PIT 2 concession area in Section 2. The government has oriented the preparation of an Economic Resettlement Plan that will be carried out in 2022.

Private Social Investment

GRI 103-2, 103-3 | 203-1

Vale makes socio-economic investments in the territories where it operates and in initiatives that contribute to developing of society, through investment vehicles or structured initiatives. In 2021, USD 95.88 million were spent on voluntary social actions with own resources, in addition to the actions to support facing Covid-19 and complementary actions in Brumadinho. See the highlights in the [ESG Databook](#). GRI 203-1

Vale Foundation

The Vale Foundation seeks to strengthen public policies and contribute to the social development in the territories where Vale operates. In 2021, its initiatives impacted more than 860,000 people across 50 municipalities in six Brazilian states. We highlight the following projects:

LITERACY TRACKS (TRILHOS DA ALFABETIZAÇÃO)

This project promotes literacy in about 70,000 children in the public school network. During the year, 2,900 educators, managers, and technicians from 1,070 schools participated in the project's training. Developed in partnership with the Government of Maranhão, Fundação Getulio Vargas

and the City Halls of the 24 municipalities along the Carajás Railroad (EFC), the initiative is aimed at first, second and third grade public school students. The project has initiatives such as: strengthening of the municipal management; training of teachers, managers, and technicians; assessment and monitoring of learning; and production and distribution of educational materials.

NETWORKED TERRITORIES (TERRITÓRIOS EM REDE)

Launched in 2020, this project aims to identify the main challenges in guaranteeing the right to education and to propose actions that seek to combat school exclusion, together with the municipalities. Year to date, the project has identified 3,340 excluded children in Serra (Espírito Santo) and Marabá (Pará), of which 2,480 were returned to the educational system. In partnership with Apprentice School City (Cidade Escola Aprendiz) and the City Halls of Serra and Marabá, children and teenagers between 4 and 17 years old are identified as being out of school or at risk of dropping out. After being identified, the children are monitored by the project to ensure their school enrollment or attendance regularized. This is possible thanks to the assistance provided by the Networked Territories teams in collaboration with the schools and the municipal government, through home visits or phone contact. In addition to the Vale Foundation, the project has investments from Wheaton Precious Metals, in Pará, and from GHT, in Espírito Santo.

TerPaz

In 2021, we inaugurated the first community complex of the Paz Plant in the Icuí-Guajará neighbourhood in Ananindeua (Pará). This is one of six units Vale is building in Pará, as part of the Territories for Peace Program (TerPaz), conceived and managed by the state government.

The Plants are inclusive community spaces with sustainable architecture, built in regions with high rates of violence and social vulnerability and designed to serve local communities. They offer a wide range of sports and leisure activities, services such as legal advice and document issuing, vocational training, family health, a library, a swimming pool, digital inclusion rooms, among others.



HEALTH CYCLE (CICLO SAÚDE)

Health Cycle (Ciclo Saúde) is a technical cooperation program to strengthen primary care in the municipalities and aims to promote health through an integrated process. In 2021, we implemented the program in 18 municipalities, supporting 175 basic health units (UBS in Portuguese) and training 2,200 professionals. The project can potentially benefit up to 695,000 users of the Brazilian Unified Health System. The project includes training workshops, management support and furniture and equipment donation to improve conditions for the population. It is a Vale Foundation initiative in partnership with the Center for Health Promotion (CEDAPS), the Post-Graduate Family Health Program at Estácio de Sá University, and the municipal governments where it is implemented.



Learn more

About [The Vale Foundation](#).

The Vale Fund

The Vale Fund works to strengthen a more sustainable, fair and inclusive economy. Since 2010, it has supported the construction of a new economic reality by investing in business development, knowledge generation, the strengthening of the impact ecosystem, and financial arrangements

aiming to conserve and recover the environment, especially in the Amazon.

AMAZ - THE AMAZON IMPACT ACCELERATOR

Among the highlights of the Vale Fund in 2021 is the launch of AMAZ - impact accelerator of Amazon. This program supports startups in various areas such as financial and administrative management and articulates cooperative opportunities in logistics and market access. By 2030, we will select 30 businesses through annual calls for proposals. The selected candidates will receive total contributions of USD 2.3 million. Together, the startups should help preserve one million hectares of forest and benefit 930 families.

COVID-19 RESPONSE PLAN AND EMERGENCY CREDIT LINE

The Vale Fund provided about USD 1 million to family farming and extractive associations and cooperatives through the Covid-19 Response Plan, between 2020 and 2021. Our partnership with Conexsus and the CX Fund has already impacted 18,800 producers, invested in 85 community businesses (43% in the Amazon) and provided loans in the amount of USD 1.7 million through the Emergency Credit Line, catalyzing resources with other cofinanciers.



Literacy Tracks

PHOTO: ISAQUE JUNIOR

The Vale Fund aims to strengthen a **more sustainable, fair and inclusive economy**



AMAZON AT HOME, FOREST STANDING (AMAZÔNIA EM CASA, FLORESTA EM PÉ)

Developed by Climate Ventures, the Amazon Logistics and Commercialization Lab sought to unlock market barriers to leverage Amazonian socio-biodiversity products. As an innovation and co-creation space focused on prototyping and testing, the Lab tested solutions to boost region's bioeconomy. As a result, the movement Amazon At Home, Forest Standing (Amazonia em Casa, Floresta em Pé) was created, which relied on a partnership with Mercado Livre, increasing online sales of sustainable businesses in the biome.

STRENGTHENING THE IMPACT ECOSYSTEM

The Vale Fund supported several initiatives and networks in 2021 to strengthen skills, produce knowledge and support the environment by boosting social and environmental impact businesses. Partners such as the Corporate Citizenship Institute (ICE in Portuguese), Phi Institute, Latin American Venture Philanthropy Network (Latimpacto), Aspen Network of Development Entrepreneurs (ANDE), Pipe Social, and Move.Social have been part of this trajectory.



Learn more

[The Vale Fund.](#)

Vale Cultural Institute

In 2021, the Vale Cultural Institute supported and sponsored more than 200 projects in 160 Brazilian municipalities. The four cultural spaces of the Institute – Canãa dos Carajás House of Culture (Casa da Cultura de Canãa dos Carajás), Vale Maranhão Cultural Centre (Centro Cultural Vale Maranhão), Minas Gerais Vale Memorial (Memorial Minas Gerais Vale) and Vale Museu – initiated more than 1,900 projects, reaching more than 1.6 million people, and the Vale Música music training program held more than 622 classes.

Public calls for proposals were sent out, offering funds from the Federal Law for Cultural Incentives in an effort to foster cultural activities and drive the creative economy throughout Brazil. For example, the Vale 2021 Cultural Institute Call for Proposals allocated USD 4.6 million for projects to be carried out in 2022.



Learn more

[Vale Cultural Institute.](#)

The Vale Volunteer Network

In 2021, the Vale Volunteer Network united more than 5,000 volunteers, who took part in 150 actions. Among them are the Brazil Without Hunger and Christmas Without Hunger campaigns, which were part of Vale's humanitarian actions to fight hunger. Partners of the Brazil Without Hunger campaign included Microsoft, Deloitte, GHT, Komatsu, Epiroc, Arcadis and Acende Brasil. Partners of the Christmas Without Hunger campaign include Mascarenhas Barbosa, Ápia, Weir Esco, Barbosa Mello and Continental. Faced with the worsening pandemic and the fall in blood bank stocks, Rede and Pasa, a Vale Group company that operates in the health sector, signed partnerships with clinics and blood

banks in several states and expanded spaces in their own clinics to receive blood donations.

They also worked for the organ donation cause, by creating a card for volunteer donors, in partnership with Adote. Joining forces with the Vale Foundation, Itaú Social, Gimba, and BRSupply, they also promoted a school reception campaign, which guaranteed the delivery of school kits to children and young people enrolled in the Knowledge Stations in Arari (MA), Brumadinho (MG), Marabá (PA), Serra (ES), and Tucumã (PA). In addition to these, there are actions to promote reading, menstrual dignity campaigns, inclusive runnings and animal protection actions, among dozens of others.



Patricia Zacheu, Mercia Costa and Fabricia Zacheu, from the Vale Volunteers network in São Luís, Maranhão

PHOTO: ISAQUE JUNIOR



Learn more

[Participate, visit and register.](#)



Suppliers and customers

In 2021, around 18,000 suppliers made up Vale's supply chain, including consumer goods companies, service providers and consulting firms, among others.

The company prioritizes the hiring and development of local suppliers. Local purchases represented, in 2021, a financial volume of more than 53% of the total purchases in the period, which was USD 18.4 billion. GRI 102-9 | 103-2, 103-3 | 201 | 203 | 204-1

Value chain partnerships

POSCO, a South Korean steel producer headquartered in Pohang, South Korea, and a Vale customer, launched a matching fund with its global raw material suppliers. By joining forces with the mining and steel industries, they aim to an effective social contribution to the local communities where these partner companies operate.

Vale was one of the partners chosen to receive a social contribution. In its first year (2021), the program began in Brazil with investments in education for vulnerable young people at the Knowledge Station in Marabá, Pará. The program has implemented a Pre-College entrance exam preparatory course. In its second year, the program will be carried out with an institution to be selected by POSCO in South Korea.

Social development actions in the communities

Vale has sponsored the Share (Partilhar) Program since 2020, to promote the socio-economic development in the locations where it operates by joining forces with its supply chain.

The initiative encompasses a Community Value Index (IVC in Portuguese), which makes it possible to recognize and appreciate the suppliers that contribute most to each region's social progress through five levers: employment generation, investments in wage mass, local spending on products and services, taxes, and social investments.

In 2020, we incorporated the program's methodology and technical and commercial aspects into Vale's supplier contracting process, to value our suppliers and encourage them to help strengthen the communities where the company operates.

Through the program, Vale's suppliers have already committed to carrying out 55 voluntary social investment actions in Minas

Gerais and Pará. In addition, they closed 96 contracts using the program's innovative methodology, in which Vale generates a score for suppliers according to their socioeconomic contributions in the regions, making them more competitive during our procurement processes. In 2021, among our suppliers' voluntary social investments in the territories where Vale operates, we highlight the training of welder, seamstresses, truck drivers and Munk operators, among others.

A total of 434 suppliers participated in the competitive processes prepared with the Share (Partilhar) methodology, which is 77% of the companies invited. The volume of contracts awarded in the program exceeded USD 740 million.



Learn more

[About the social development actions in the communities.](#)



Supplier evaluation and monitoring

Supplier management is guided by adherence to compliance standards required by Vale, which include aspects of health and safety, social and environmental issues, ethics and integrity, and human rights.

The company's history in the market is also checked during the registration phase, including an analysis of the companies' compliance with the requirements of Vale's Ethics & Compliance Program. The public lists of forced or compulsory labor sanctions and of the Brazilian Federal Government (CEIS, CEPIM, and CNEP), among others, are also analyzed. If any irregularity is identified, the supplier is not registered and may be considered unfit to supply Vale.

For active suppliers, Vale also carries out periodic monitoring of aspects such as social, environmental, human rights, performance and government relations. Local labor obligations are monitored, as well as the black list of employers using forced or compulsory labor, and the list of public sanctions by the government on a monthly basis.

On a quarterly basis, public sanctions are monitored (in accordance with the [Sanctions Compliance Policy](#)), and every six months the Supplier Performance Index (IDF) is calculated. This is an evaluation of supplier performance on five criteria – technical quality, environmental protection, health and safety, respect for employees, and continuous improvement.

Program to manage carbon emissions in the value chain

Reducing greenhouse gas (GHG) emissions in line with the Paris Agreement is part of Vale's commitment to Agenda 2030. Since 2011, the company has monitored and encouraged suppliers to manage their emissions through a contractual clause and an annual questionnaire.

In 2020, Vale entered into a partnership with the Carbon Disclosure Project (CDP), an international non-profit organization that helps companies and cities to disclose their environmental impact. The partnership engages suppliers classified as critical in greenhouse gas emissions

in a specific program, the CDP Supply Chain, to encourage public carbon disclosure along the supply chain.

In 2021, we invited 496 suppliers, accounting for about 30% of the company's overall spending. Not included in this group were steel customers and shipping suppliers. Of this total, 375 answered the questionnaire on the CDP platform, which represents a 37% increase over last year.

Ninety-one percent of the suppliers who responded in 2020 also submitted their responses in this cycle, allowing us to assess their evolution and coordinate

actions focused on the low-carbon economy. The platform analyzes management data, governance and indicators to define risks and opportunities aimed at reducing emissions. The material is evaluated by CDP and passed on to the suppliers.

See more at [Climate Change](#).



Stakeholder engagement GRI 102-43

Aware of its potential impacts on society, Vale seeks to practice dialogue and active listening with its stakeholders to build a positive legacy for future generations. The following are our relationship and engagement initiatives with our main stakeholders.

STAKEHOLDER ENGAGEMENT INITIATIVES GRI 102-21, 102-40, 102-42, 102-43, 102-44

Stakeholders	Why we engage	How we engage	Main demands and concerns addressed
Communities	To share knowledge about our ventures and their risks and impacts. To listen, understand, and act to respond to communities' expectations and provide opportunities for territorial development	Making relationship plans with communities, forming management groups and holding participative meetings and, community visits; holding forums to monitor actions; implementing our Listening and Response Mechanism – to capture, register, treat and respond to community manifestations. Engaging throughout the entire life cycle, from the preliminary design and licensing phases, including the concept of progressive closure of our ventures in the territories.	<ul style="list-style-type: none"> • Community manifestations about the territorial development agenda (support for social projects and job vacancies) and mitigation of local impacts (safety and traffic on access roads and highways); • Demands related to managing impacts and Brumadinho reparation (transportation, access to water, care, animal rescue and indemnity); • Concerns about dam safety and transparency; • Techniques for environmental restoration and reforestation after mine closure.
Employees	We are committed to performing our activities safely, respecting the environment and people – our own employees, contractors, suppliers, and communities.	Maintaining internal communication channels (Talk 360, webinars, Vale@, Management Bulletins, Intranet, Teams Card, among others); Capacity building, training and the Sustainability Academy; creating thematic groups, maintaining interactive dialogue and, joint action and volunteer programs, and engaging in collective bargaining with trade unions or workers' organizations.	<ul style="list-style-type: none"> • People management practices; • Decent working conditions; • A diverse, inclusive, and psychologically safe environment; • Freedom of association and collective bargaining; • Managing risks, impacts and opportunities in dams; • Managing risks and opportunities in health and safety; • Deploying techniques for environmental restoration and reforestation after mine closure; • Innovating through investments in R&D, automation, robotization, and artificial intelligence.



Stakeholders	Why we engage	How we engage	Main demands and concerns addressed
Customers	We provide support to customers because of their strategic importance to the core business.	Staying in touch via commercial and technical meetings, visits, emails and phone calls; maintaining our Customer Portal; deploying a satisfaction survey; attending forums, seminars, and conventions.	<ul style="list-style-type: none"> • Dam management (policies, commitments, risks, impacts and opportunities); • Eco-efficient production and distribution technologies; • Techniques for environmental restoration and reforestation after mine closure; • Technological products and solutions for Vale’s Scope 3 Emission Reductions; • Carbon capture and storage systems.
Suppliers	We value agility in purchasing materials and services; to choose the correct items; to manage our materials inventory; and to maximize health, safety, and sustainability variables in our supply chain.	Low carbon forum; supplier chat; business round-table discussions; training, human rights risk management, and workshops with suppliers of global categories.	<ul style="list-style-type: none"> • Dam management (policies, commitments, risks, impacts and opportunities); • Local communities (risks, impacts and opportunities, objectives, goals and management practices results, as well as outstanding projects); • Investments in innovation, R&D and eco-efficient production and distribution technologies; • Techniques for environmental restoration and reforestation after mine closure.



Stakeholders	Why we engage	How we engage	Main demands and concerns addressed
<p>Investors</p>	<p>Vale is committed to achieving strong financial performance and to creating shareholder value.</p>	<p>Letters, meetings, questionnaires, shareholders' meetings, webinars, conferences, roadshows and calls, our ESG Portal, IR website and IR email, Board of Directors engagement.</p>	<ul style="list-style-type: none"> • Business performance, • Capital allocation, • Long-term strategy, • The Iron Ore, Nickel and Copper markets • Good governance practices: corporate (independence and transparency), environmental (water and biodiversity impacts), and social (labor and community safety, human rights, and local community relations); • Climate change and business model impacts, innovations in applications, and greenhouse gas emissions management; • Dam management • Reparation of Brumadinho, Mariana and other operations to address safety issues; • Innovation (life cycle of metals and ores, techniques for environmental restoration and reforestation after Mine closure) and eco-efficient production and distribution technologies.
<p>Partners, academia, experts, and non-governmental organizations (NGOs)</p>	<p>We have established partnerships and proximity with experts in various areas and expertises.</p>	<p>Meetings and events; expert Vale Foundation and Vale Cultural Institute panels; Sounding Panel – advisory board, under the Executive Board, composed of global ESG experts.</p>	<ul style="list-style-type: none"> • Cultural transformation and greater transparency about challenges with civil society; • Community (investment from human rights to dam and Mine closure impacts); • Innovation (life cycle of metals and ores, techniques for environmental restoration and reforestation after Mine closure) and investments in R&D; • Reparation of Brumadinho and Mariana; • Exploration in sensitive biodiversity areas.



Stakeholders	Why we engage	How we engage	Main demands and concerns addressed
Public agencies	<p>We seek to maintain a close relationship guided by principles of public administration (legality, impersonality, administrative morality, publicity, and efficiency). These stakeholders are active in political decision-making process and public policy formulation, on which our company's highly regulated business depends. They influence Vale's regulatory risks, in addition to acting directly in the process of obtaining authorizations, grants and licenses to which the company and its businesses are subject.</p>	<p>Strategic, political-institutional, and technical meetings; thematic groups and events, and actions of mining sector entities.</p>	<ul style="list-style-type: none"> • Legal compliance in social, environmental, and production methods; • Reparation of Brumadinho and Mariana; • Dam management (risks, impacts and opportunities); • Innovation (life cycle of metals and ores, techniques for environmental restoration and reforestation after Mine closure) and investments in R&D; • Topics on the agenda for the year: mining waste, water, particulate emissions, conflicts with communities, and mine closures.
Press	<p>We are accountable and value a policy of transparency in our relationship with stakeholders and image and reputation management.</p>	<p>Maintaining a positive relationship with the media, answering requests for interviews with Vale executives and information about the company's business and operations.</p>	<ul style="list-style-type: none"> • We respond in a reactive manner, when journalists seek information about the company's various issues; and in a proactive way, based on positive agendas provoked by the Press Office; • Most common reactive agendas include: issues about our business, reparation and dams; • Main proactive agendas include our commitment to sustainability (carbon and biodiversity), cultural transformation, innovation, and diversity.
Institutions	<p>We seek engagement and relationships with key entities focused on sustainability issues, analysis and mitigation of geopolitical and socio-political risks, discussion of public policies, sustainable development initiatives and responsible investments, and defense of the mining sector interests – globally.</p>	<p>Strategic, political-institutional, and technical meetings; thematic groups, forums, and actions through mining sector entities globally.</p>	<ul style="list-style-type: none"> • Best practices related to environment (climate change, mining waste, biodiversity and water resources), social responsibility (impacts on local communities and human rights, and the vulnerability of these populations, including at Mine closure) and governance (cultural transformation, promotion of ethics, transparency, and reparations for Brumadinho and Mariana); • Managing risks and opportunities in dams, biodiversity, human rights, and local communities.



Participation in external organizations

Vale is committed to the UN Global Compact. Although our company withdrew in 2019 out of respect for the institution and its members following the Brumadinho tragedy, we have worked diligently to implement the **Ten Principles of the UN Global Compact**.

Our engagement with external organizations involves the company's senior leadership and includes institutions such as the International Council on Mining and Metals (ICMM), the World Business Council for Sustainable Development (WBCSD), the Brazilian Business Council for Sustainable Development (CEBDS in Portuguese), the World Economic Forum (WEF), and others. See the complete list of entities and associations in which Vale participates.



Learn more

[Information on the 10 principles of the Global Compact.](#)

"After the Brumadinho tragedy, Vale committed itself to full reparation of the impacts caused. It is also committed to the principles of precaution and non-repetition, re-evaluating all aspects of its business. As part of this review, Vale has reinforced the implementation of the Ten Principles of the UN Global Compact. Following them is a strategic step in strengthening our sustainability performance."

Eduardo Bartolomeo, CEO



PHOTO: VITOR NOGUEIRA

Railroad Vitória
Minas, Brazil



Participation in entities and associations

Vale participates in the following entities and associations. Many abbreviations refer to Portuguese acronyms. GRI 102-13

- ABEC BRASIL (Brazilian Association of Scientific Editors), via ITV
- Brazilian Society of Sciences (ABC)
- Citizenship Action (Ação da Cidadania)
- Aspen Network of Development Entrepreneurs (ANDE), via the Vale Fund
- Brazilian Association of Soil Mechanics (ABMS)
- Brazilian Metallurgy, Materials and Mining Association (ABM)
- Brazilian Foreign Trade Association (AEB)
- Brazilian Association of Port Terminals (ATP)
- National Association of Rail Carriers (ANTF)
- Brazil–Canada Chamber of Commerce
- Business at OECD (BIAC)
- Business for Social Responsibility (BSR)
- France–Brazil Chamber of Commerce
- Centre National de Recherche Technologique Nickel et Son Environnement (CNRT Nickel)
- Brazilian Center for International Relations (CEBRI)
- Reference Centre for Integral Education, via the Vale Foundation
- Childhood Brasil
- Brazil Climate Coalition Forests and Agricultures
- Covid Radar Collective
- Columbia Center on Sustainable Investment (CCSI)
- Brazilian Committee on Large Dams (CBDB)
- Brazilian National Confederation of Industry (CNI)
- Brazilian Corporate Volunteer Council
- China–Brazil Business Council (CEBC)
- Brazilian Business Council for Sustainable Development (CEBDS)
- Brazil–Japan Business Council (CEBJ)
- BRICS Business Council (CEBRICS)
- European Association of Metals (Eurometaux)
- Extractive Industries Transparency Initiative (EITI)
- National Forum of Pro-rectors for Research and Postgraduation (FOPROP), via ITV
- Foundation for Foreign Trade Studies Centre (Fundação Centro de Estudos do Comércio Exterior / Funcex)
- Global Business Initiative on Human Rights (GBI)
- Group of Corporate Institutes and Foundations (GIFE), via the Vale Foundation
- Institute for the National Pact to Eradicate Slave Labour (InPACTO)
- Instituto Acende Brasil
- Brazilian Mining Institute (IBRAM)
- International Council of Museums Brazil (ICOM)
- International Council on Mining & Metals (ICMM)
- Latimpacto – Latin American Venture Philanthropy Network, via the Vale Fund
- Mining Hub
- National Pact for Early Childhood, via the Vale Foundation
- Partnership Platform for the Amazon (PPA)
- National Education and Research Network (RNP), via ITV
- Sustainable Development Solutions Network (SDSN)
- Task Force on Climate-related Financial Disclosures (TCFD)
- The Cobalt Development Institute
- The Indonesian Mining Association (IMA)
- The Mining Association of Canada (MAC)
- The Nickel Institute
- All for Education, via the Vale Foundation
- Voluntary Principles on Security and Human Rights
- Wise Group
- Women in Mining Brazil
- World Business Council for Sustainable Development (WBCSD)
- World Economic Forum (WEF)



Independent reader letter

It is crucial for long-term investors to understand how companies create value over time. This includes how resources are deployed and relationships are cultivated. As such, it is hoped that integrated reporting can be a tool to help providers of financial capital allocate their investments in a more efficient way—and therefore act as a force for sustainability.

Vale's journey into integrated reporting, now in its second year, shows increased maturity in the presentation of the factors that materially affect the ability of the company to create value over time. As the company progresses, further evidence is expected around how the integrated report reflects the company's development and decision-making framework. This should be an area of attention at the next reporting cycle.

Before we comment in greater detail on key aspects of the report, we acknowledge the company's commitment to the reparation of the damage caused by the Brumadinho and Samarco accidents. As those events have been one of the main driving forces in the transformation process being implemented at the company, it is right that its progress and challenges around social and environmental matters are disclosed at the beginning of the report.

We would like to comment on some key principles of the integrated reporting framework, how Vale applied them, and to offer suggestions for improvement at the next reporting cycle.

STRATEGIC FOCUS AND STRATEGY DELIVERY

The narrative about Vale's business model, purpose and strategic pillars is presented in a clear way. The main achievements in the past year, and challenges for the year ahead, are detailed for each of the five strategic pillars of Safety and Operational Excellence, New Pact with Society, Transformation of Base Metals, Discipline in Capital Allocation, and Maximisation of Flight-to-Quality in Iron Ore. The company explicitly outlines a long-term ambition for each strategic pillar.

In the table, it would be useful to include a summary of the key short-, medium- and long-term targets, and the achievements in the previous year, plus a summary of the management's assessment of its progress and challenges. This should come at the beginning of the report as a key tool for stakeholders to hold management to account, therefore providing consistency and comparability over time and with peers.

MATERIALITY

The report explains the process used to identify the material issues that affect value creation at Vale. According to best practice, it included, among other steps, a survey of internal and external stakeholders ranging from employees to investors, suppliers, clients and non-governmental organisations. In our opinion, there are no glaring omissions and we were encouraged to see priority areas for investment stewardship, such as biodiversity, human rights, occupational safety, tailings storage facilities management, and climate change mapped by the company as material to its long-term success.

The implication of the material issues to Vale's capacity to create value and the company's strategic response to each one can be found throughout the report.



TOWARDS CLARITY AND CONNECTIVITY

The report presents a great level of detail, resulting in an extensive document. Yet at times it is difficult to navigate. This is often the case when a company chooses to begin the implementation of the integrated reporting framework by combining existing annual and sustainability reports.

We would expect an increased emphasis on the streamlining of the information in the next reporting cycles, evidencing the thinking behind the integrated reporting and how the capitals employed by the company (financial, manufactured, intellectual, human, social and natural) interconnect in the process of value creation.

The report brings some examples of interconnected capitals. For instance, the natural, financial and manufactured capitals employed in the context of the development of low-carbon products, such as the 'green briquettes'.

We encourage Vale to go further in this thematic, and to demonstrate how it impacts value creation.

GOVERNANCE

The report describes the board's structure and its recent evolution following the company's now-dispersed shareholder base. This is a key input to the governance. However, it is important to report the outcomes of the governance structure, for example: how the board members and the committees support the strategy; which primary activities took place in the reporting cycle; and how these activities impacted the company's capitals and the strategy delivery.

STAKEHOLDER RELATIONS

The full reparation of the damage caused by the Brumadinho and Samarco accidents is an essential element in the strategy of de-risking the company and rebuilding trust with stakeholders. Understandably, the reparation process is still a source of controversy between Vale and the affected communities. The detailed disclosure provided helps the reader assess the company's progress and challenges. It is critical that the company continues to show evidence that it understands, considers and responds to the needs and interests of this key group of stakeholders.

Beyond reparations, we highlight the "New Pact with Society" strategic pillar, which includes targets related to climate change, water management, biodiversity, diversity across the workforce and the reduction of poverty. We were pleased to see that a challenge Vale sets out to address in this strategic pillar is the implementation of the social value lens in its projects and operations. This is evidence of integrated thinking and the interconnection between social, financial, human and manufactured capitals.

In summary, Vale has demonstrated progress in the implementation of the integrated reporting framework and the integrated thinking upon which it is founded. We encourage Vale to continue in its integrated reporting journey, gradually evolving from a combination of the standard annual and sustainability reports, towards a tool to succinctly communicate the key factors which materially affect its ability to create value over time and how they are interconnected.

Areas of focus for future reports should be (i) conciseness, by striking a balance between keeping the report no longer than it needs to be and ensuring the completeness of the information; (ii) connectivity between the different forms of capital employed by the company in the process of creation, preservation and erosion of value; and (iii) further evidence of the integrated thinking applied to decision-making.

Jaime Gornsztejn

Engineer, specialist in Governance, Director of Corporate Governance at Federated Hermes

It is crucial for long-term investors to understand **how companies create value** over time



Independent reader letter

The Integrated Report is an innovative instrument for managing information about Vale's performance, which stimulates objective analysis by its managers, employees and partners, and also allows external observers and the public to view it in a comprehensive and synthetic way, even considering the magnitude of the company.

However, there is no way for an independent observer to gauge the accuracy of the information in the Integrated Report, which underscores the importance of independent auditor analysis. It is not the case of incurring in the redundancy of commenting on it here in this space, but it is good to register the importance of each Report highlighting the steps taken by Vale, in the course of the year, in relation to the observations of the auditors contained in its previous edition.

I shall start with the issue of the disasters that occurred in Brumadinho and Mariana, which is the most uncomfortable in the 2021 Report, to note that there is a great distance between the expectations of public opinion and the actual pace of social and environmental reparations. The inherent slowness of judicial processes and the technical challenges of reparations do not satisfy people, in general, who expect a gentler end to these tragedies. The anxiety of the public opinion and of those directly involved recommends that Vale do everything possible to build agreements that speed up the results, the overcoming of the trauma and the recovery of its image.

In this same sense, the weighting of climate change scenarios in the dam risk assessment routines, highlighted in the Report, always leaves doubts, since the climate threat is growing. What would be the margins of error considered in these evaluations, considering, for example, the intensity of this summer's rainfall in southern Bahia, in Minas Gerais, in the mountains of the state of Rio de Janeiro, and in Greater São Paulo? Since these are extremely sensitive hypotheses, all true information can be cautionary and deserves space.

The inclusion in the 2021 Report of a component relating to "mine closure" is very important, since it refers, after all, to how the company "gives back" to society the areas that have been exploited, whatever the permanence of the enterprises there may have been. There is an ethical and historical issue involved, which is crucial for legal, formal, and efficient mining to objectively demonstrate its difference in relation to the predatory activities that are advancing in Brazil.

Vale's decision, in 2021, to give up the requests for mineral research on indigenous lands that it was keeping with ANM – Agência Nacional de Mineração (National Mining Agency) – deserved applause. This attitude gives coherence to the company's statement that mineral exploration on these lands is not included in its business plans for the next decades in Brazil.

It is also worth noting, in this same vein, Vale's critical statement regarding the Executive Branch's Bill 191/2020, which deals with mineral exploration and mining on indigenous lands. The company's objection was based on the need for indigenous protagonism in the process of prior and informed consent (FPIC), in accordance with the internationally established standard through Convention 169 of the International Labor Organization, which is far from recognized in the government's proposal. This manifestation occurred in 2022 and should be reported in the next edition of this Report, but it is an unfolding of discussions on the subject that have been ongoing since 2021, within IBRAM (Brazilian Mining Institute) and other civil society organizations.



However, Vale's decision to file, with ANM, new requests for research on the surroundings of indigenous lands requires action and clarification. Although legally feasible, these applications, assuming that they result in mining activities, raise doubts about probable irreversible impacts on contiguous areas. The occurrence of such damages in previous similar projects, as in the case of the Xikrin do Cateté Indigenous Land (Itacaiúnas River), raises the expectation that they will not be repeated in eventual future mining projects in areas neighboring indigenous lands.

Vale's creation, in 2021, of the Executive Vice-presidency of Sustainability is encouraging, as it represents a step forward in the corporate commitments to the social and environmental agenda, a measure that signals its acceptance at the highest hierarchical level of the company. Thus, it is expected that, as early as 2022, this initiative will result in consistent and visible advances in the interlocution with the various actors with whom Vale has relationships, and in the specific territories where it operates.

Considering that Vale obtained a record profit in 2021, mainly due to the increase in the price of iron ore in the international market, a scenario that should intensify this year due to the climate of war instigated by the invasion of Ukraine by Russia, I suggest that the company consider the possibility of expanding, in the same proportion, its investments in sustainable socio-environmental projects.

Finally, the current war situation could not have been foreseen in 2021 and, therefore, is not considered in the respective Integrated Report. However, Vale urgently needs to evaluate the impacts of the crisis on the perspectives that were then being taken into account. Above all, regarding the ethical implications and the commercial retaliations that will influence the markets and public opinion, as the conflict itself develops.

Márcio Santilli

Philosopher, founding partner of the Socio-environmental Institute (Instituto Socioambiental - ISA)

Vale's creation of the **Executive Vicepresidency of Sustainability** is encouraging, as it represents a step forward in the corporate commitments to the social and environmental agenda



(A free translation of the original in Portuguese)

Independent auditor's limited assurance report on the non-financial information included in the 2021 Integrated Report of Vale S.A.

**To the Board of Directors and Stockholders
Vale S.A.
Rio de Janeiro – RJ**

INTRODUCTION

We have been engaged by Vale S.A. (“Company” or “Vale”) to present our limited assurance report on the non-financial information included in the 2021 Integrated Report of Vale for the year ended December 31, 2021.

Our limited assurance does not cover prior-period information, or any other information disclosed together with the 2021 Integrated Reporting, including any incorporated images, audio files or videos.

RESPONSIBILITIES OF THE MANAGEMENT OF VALE

The management of Vale is responsible for:

- selecting or establishing adequate criteria for the preparation and presentation of the information included in the Integrated Report;
- preparing the information in accordance with the criteria and guidelines of the Global Reporting Initiative (GRI – Standards), with the basis of preparation developed by the Company, and with Guidance CPC 09 – Integrated Report issued by the Brazilian Federal Accounting Council (CFC), related to the Basic Conceptual Framework for Integrated Reporting, prepared by the International Integrated Reporting Council (IIRC);
- designing, implementing and maintaining internal controls over the significant information for the preparation of the information included in the Integrated Reporting, which is free from material misstatement, whether due to fraud or error.

INDEPENDENT AUDITOR'S RESPONSIBILITY

Our responsibility is to express a conclusion on the non-financial information included in the 2021 Integrated Reporting, based on our limited assurance engagement carried out in accordance with the Technical Communication CTO 01 – Issuance of Assurance Reports related to Sustainability and Social Responsibility, issued by the Federal Accounting Council (CFC), based on the Brazilian standard NBC TO 3000, "Assurance Engagements Other than Audit and Review", also issued by the CFC, which is equivalent to the international standard ISAE 3000, "Assurance engagements other than audits or reviews of historical financial information", issued by the International Auditing and Assurance Standards Board (IAASB). Those standards require that the auditor complies with ethical requirements, independence requirements, and other responsibilities of these standards, including those regarding the application of the Brazilian Quality Control Standard (NBC PA 01) and,

therefore, the maintenance of a comprehensive quality control system, including documented policies and procedures on the compliance with ethical requirements, professional standards and relevant legal and regulatory requirements.

Moreover, the aforementioned standards require that the work be planned and performed to obtain limited assurance that the non-financial information included in the 2021 Integrated Report, taken as a whole, is free from material misstatement.

A limited assurance engagement conducted in accordance with the Brazilian standard NBC TO 3000 and ISAE 3000 mainly consists of making inquiries of management and other professionals of Vale involved in the preparation of the information, as well as applying analytical procedures to obtain evidence that allows us to issue a limited assurance conclusion on the information, taken as a whole. A limited assurance engagement also requires the performance of additional procedures when the independent auditor becomes aware of matters that lead him to believe that the information disclosed in the Integrated Report taken as a whole might present significant misstatements.

The procedures selected are based on our understanding of the aspects related to the compilation, materiality, and presentation of the



information included in the 2021 Integrated Report, other circumstances of the engagement and our analysis of the activities and processes associated with the significant information disclosed in the 2021 Integrated Report in which significant misstatements might exist. The procedures comprised, among others:

- (a) planning the work, taking into consideration the materiality and the volume of quantitative and qualitative information and the operating and internal control systems that were used to prepare the information included in the 2021 Integrated Report;
- (b) understanding the calculation methodology and the procedures adopted for the compilation of indicators through inquiries of the managers responsible for the preparation of the information;
- (c) applying analytical procedures to quantitative information and making inquiries regarding the qualitative information and its correlation with the indicators disclosed in the 2021 Integrated Report; and
- (d) when non-financial data relate to financial indicators, comparing these indicators with the financial statements and/or accounting records.

The limited assurance engagement also included the analysis of the compliance with the guidelines and criteria 1) of the Global Reporting Initiative (GRI-Standards); 2) the provisions established in the basis of preparation developed by the Company; 3) the principles for the Integrated Report, pursuant to Guidance CPC 09 – Integrated Report, related to the Basic Conceptual Framework for Integrated Report, prepared by the International Integrated Report Council (IIRC) applicable in the preparation of the information included in the 2021 Integrated Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our limited assurance conclusion.

SCOPE AND LIMITATIONS

The procedures applied in a limited assurance engagement vary in nature and timing and are less detailed than those applied in a reasonable assurance. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the level that would be obtained in a reasonable assurance engagement. If we had performed a reasonable assurance engagement, we might have identified other matters and possible misstatements in the information included in the 2021 Integrated

Report. Therefore, we do not express an opinion on this information.

Non-financial data are subject to more inherent limitations than financial data, due to the nature and diversity of the methods used to determine, calculate and estimate these data. Qualitative interpretations of the relevance, materiality, and accuracy of the data are subject to individual assumptions and judgments. Furthermore, we did not consider in our engagement the data reported for prior periods nor future projections and goals.

The preparation and presentation of non-financial information and indicators followed the definitions of the basis of preparation developed by the Company and the guidelines of the Global Reporting Initiative (GRI-Standards) and, therefore, the information included in the 2021 Integrated Report does not have the objective of providing assurance with regard to the compliance with social, economic, environmental or engineering laws and regulations. However, the aforementioned standards establish the presentation and disclosure of possible cases of non-compliance with such regulations when sanctions or significant fines are applied. Our assurance report should be read and understood in this context, inherent to the criteria selected and previously mentioned in this paragraph.

CONCLUSION

Based on these procedures performed, described herein, and on the evidence obtained, no matter has come to our attention that causes us to believe that the non-financial information included in the Integrated Report for the year ended December 31, 2021 of Vale S.A. has not been prepared, in all material respects, in accordance with the criteria and guidelines of the Global Reporting Initiative (GRI)(GRI-Standards), with the basis of preparation developed by the Company, and with the Guidance CPC 09 – Integrated Report.

São Paulo, May 6, 2022

PricewaterhouseCoopers
Auditores Independentes Ltda.
CRC 2SP000160/O-5

Maurício Colombari
Contador CRC 1SP195838/O-3



GRI Content Index GRI 102-55

For the Materiality Disclosure Services, GRI Services reviewed that the GRI content index is clearly presented and the references for Disclosures 102-40 to 102-49 are aligned with appropriate sections in the body of the report.



ORGANIZATIONAL PROFILE

GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-1 Name of the organization	Page 20	Mandatory				
	102-2 Activities, brands, products, and services	Pages 20 and 56	Mandatory				Activity metrics; EM-MM-000.A
	102-3 Location of headquarters	Page 55	Mandatory				
	102-4 Location of operations	Pages 20 and 55	Mandatory				
	102-5 Ownership and legal form	Page 20	Mandatory				
	102-6 Markets served	Page 55; further information can be found in the 2021 Reference Form - Section: Information on products and services related to operating segments - 2.1.3 Customers and sales (Pages: 259, 260, 262 and 266)	Mandatory				
	102-7 Scale of the organization	Pages 20 and 55; further information can be found in the 2021 Reference Form - Section: 7.2 - Information on operating segments	Mandatory				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-8 Information on employees and other workers	Page 90; More information can be found in the "Social" tab of the ESG Databook	Mandatory				Activity metrics; EM-MM-000.B
	102-9 Supply chain	Pages 110; further information can be found in the 2021 Reference Form - Section: 7.3 - Information on products and services related to operating segments. e. Main inputs and raw materials	Mandatory				
	102-10 Significant changes to the organization and its supply chain	Pages 44, 47 and 56; Further information can be found in the 2021 Reference Form - Topic: 7.3 - Information on Products and Services Related to Operational Segments/e. Main inputs and raw materials (page 277) Note: This topic will be updated with the 2021 information on 05/31/2022.	Mandatory				
	102-11 Precautionary Principle or approach	Pages 37, 46 and 48; further information can be found in Form 20F 2021 - Section: 4. Risk factors	Mandatory			2; 4	
	102-12 External initiatives	Page 80; further information can be found on Vale's website	Mandatory			10	
	102-13 Membership of associations	Pages 80 and 117; further information can be found on Vale's website	Mandatory			9	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
STRATEGY							
GRI 102: General Disclosures 2016	102-14 Statement from senior decision-maker	Pages 03 and 05	Mandatory			2	
	102-15 Key impacts, risks, and opportunities	Pages 9 to 18 and 48	Mandatory			2; 4	
ETHICS AND INTEGRITY							
GRI 102: General Disclosures 2016	102-16 Values, principles, standards, and norms of behavior	Pages 22 and 50	Mandatory		16	1; 2	Business Ethics & Transparency; EM-MM-510a.1
	102-17 Mechanisms for advice and concerns about ethics	Page 51; further information can be found in the 2021 Reference Form - Section: 5.4 – Integrity Program (Page 219)	Mandatory		16	1; 2; 4	Business Ethics & Transparency; EM-MM-510a.1
GOVERNANCE							
GRI 102: General Disclosures 2016	102-18 Governance structure	Pages 44 and 46	Mandatory		16	1; 2; 4	
	102-19 Delegating authority	Pages 46 and 47	Mandatory		16	1; 2; 4	
	102-20 Executive-level responsibility for economic, environmental, and social topics	Pages 45 and 46	Mandatory		16	1; 2; 4	
	102-21 Consulting stakeholders on economic, environmental, and social topics	Pages 8 and 112	Mandatory		16	1; 2; 10	
	102-22 Composition of the highest governance body and its committees	Pages 45 and 46	Mandatory		5; 16	1; 2	
	102-23 Chair of the highest governance body	Page 44; The CEO does not accumulate the position of Chairman of the Board of Directors	Mandatory		16	1; 2	
	102-24 Nominating and selecting the highest governance body	Pages 45 and 46; further information can be found in Form 20F 2021 : Section: Management and employees	Mandatory		5; 16	1; 2	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-25 Conflicts of interest	Pages 52; further information can be found in the Policy on Related Party Transactions and Conflict of Interest .	Mandatory		16	1; 2	
	102-26 Role of highest governance body in setting purpose, values, and strategy	Page 45	Mandatory		16	1; 2	
	102-27 Collective knowledge of highest governance body	Pages 45 and 46; further information can be found in the Proxy Statement Annual General Meeting of Shareholders 2022 : Section - Performance of the Board of Directors (Page 36)	Mandatory		4	1; 2	
	102-28 Evaluating the highest governance body's performance	Page 46; further information can be found in the 2021 Reference Form - Section: Administrative structure	Mandatory		16	1; 2	
GRI 102: General Disclosures 2016	102-29 Identifying and managing economic, environmental, and social impacts	Page 46	Mandatory		16	1; 2	
	102-30 Effectiveness of risk management processes	Pages 46 and 48; further information can be found in Form 20F 2021 - Section: 4. Risk factors	Mandatory		16; 6	1; 2; 4	
	102-31 Review of economic, environmental, and social topics	Page 46; further information can be found in the Internal Rules of the Sustainability Committee , Chapter 5 - Meetings	Mandatory		16	1; 2; 4	
	102-32 Highest governance body's role in sustainability reporting	Pages 7 and 46	Mandatory		16	1; 2	
	102-33 Communicating critical concerns	Page 48; further information can be found in the Form 20F -2021	Mandatory		16	1; 2; 10	
	102-34 Nature and total number of critical concerns	Pages 48 and 103; further information can be found in the 2021 Reference Form - Section: Risk Factors	Mandatory		16	1; 2; 10	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-35 Remuneration policies	Page 47; further information can be found in the 2021 Reference Form – Section 13.1 – Compensation policy or practice of the board of directors, statutory and non-statutory board, fiscal council, statutory committees and audit, risk, financial and compensation committees	Mandatory			1; 2	
	102-36 Process for determining remuneration	Pages 47 and 91; further information can be found in the 2021 Reference Form – Section: Seção – 13.1 – Compensation policy or practice of the board of directors, statutory and non-statutory board, fiscal council, statutory committees and audit, risk, financial and compensation committees	Mandatory			1; 2	
	102-37 Stakeholders' involvement in remuneration	Page 47; further information can be found in the 2021 Reference Form – Section: Seção – 13.1 – Compensation policy or practice of the board of directors, statutory and non-statutory board, fiscal council, statutory committees and audit, risk, financial and compensation committees	Mandatory			10	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-38 Annual total compensation ratio	Omitted	Mandatory	Information subject to specific confidential restrictions: Vale does not disclose the annual total compensation of the organization's highest-paid individual due to the sensitivity of the information and for confidentiality reasons. We are in a process of gradual improvement in order to disclose this information to the market	8; 10	1; 2	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 102: General Disclosures 2016	102-39 Percentage increase in annual total compensation ratio	Omitted	Mandatory	Information subject to specific confidential restrictions: Vale does not disclose the annual total compensation of the organization's highest-paid individual due to the sensitivity of the information and for confidentiality reasons. We are in a process of gradual improvement in order to disclose this information to the market	8; 10	1; 2	

STAKEHOLDER ENGAGEMENT

GRI 102: General Disclosures 2016	102-40 List of stakeholder groups	Page 112	Mandatory			10	
	102-41 Collective bargaining agreements	Page 91	Mandatory		8	3	
	102-42 Identifying and selecting stakeholders	Pages 8 and 112	Mandatory			10	
	102-43 Approach to stakeholder engagement	Page 112	Mandatory			10	
	102-44 Key topics and concerns raised	Page 112	Mandatory			10	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
REPORTING PRACTICE							
GRI 102: General Disclosures 2016	102-45 Entities included in the consolidated financial statements	Page 07; The financial statements can be checked at the following link . All entities controlled by Vale are covered in the Integrated Reporting.	Mandatory				
	102-46 Defining report content and topic Boundaries	Page 07 and 08; further information can be found in Form 20F 2021	Mandatory				
	102-47 List of material topics	Pages 9 to 18	Mandatory				
	102-48 Restatements of information	Page 71	Mandatory				
	102-49 Changes in reporting	Page 07; There have been no significant changes in the material topics since the last Integrated Report.	Mandatory				
	102-50 Reporting period	Page 07	Mandatory				
	102-51 Date of most recent report	April 2021; further information can be found on page 07	Mandatory				
	102-52 Reporting cycle	Annual; further information can be found on page 07	Mandatory				
	102-53 Contact point for questions regarding the report	Page 07	Mandatory				10
	102-54 Claims of reporting in accordance with the GRI Standards	This report has been prepared in accordance with the GRI Standards: "Comprehensive option"; more information can be found on page 07	Mandatory				
	102-55 GRI content index	Page 124	Mandatory				
102-56 External assurance	Page 07 and 122; Vale's external verification process is required by its membership of the International Council on Mining and Metals (ICMM) and the GRI Sustainability Reporting Standards. In 2021, for publication of the text of the Integrated Report, the document was validated by the Executive Committee, the Sustainability Committee, and the Board of Directors.	Mandatory					



GRI Standards

Disclosure

Page number(s) and/or URL
and/or direct answersMaterial /
Non-Material

Omission

SDG

ICMM
Principles

SASB

MATERIAL TOPICS – 200 SERIES (ECONOMIC TOPICS)**ECONOMIC PERFORMANCE**

GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 11	Material			
	103-2 The management approach and its components	Page 11 and 59	Material			
	103-3 Evaluation of the management approach	Page 11 and 59	Material			
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Page 59, 60 and ESG Databook: "Governance"	Material		2; 8	9
	201-2 Financial implications and other risks and opportunities due to climate change	ESG Databook: ""GRI – Economic"" tab Vale Climate Change Report 2021 ; Form 20F –2021 Section: Description of Risk Factors	Material		13	4; 6 Greenhouse Gas Emissions; EM-MM-110a.2
	201-3 Defined benefit plan obligations and other retirement plans	Page 91; further information can be found in the 2021 Reference Form (Item "14.3 – Description of Employees' Compensation Policy" sub-item "b. benefits policy")	Material		3	3
	201-4 Financial assistance received from government	No government assistance was received	Material			

INDIRECT ECONOMIC IMPACTS

GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 18	Material			
	103-2 The management approach and its components	Page 18 and 107	Material			
	103-3 Evaluation of the management approach	Page 18 and 107	Material			



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	Pages 53 and 107 and "Social" tab – topic: Social Investment	Material		7; 9; 11	9	
	203-2 Significant indirect economic impacts	ESG Databook: "GRI – Economic" tab	Material		1; 2; 3; 8	9	

MATERIAL TOPICS – 200 SERIES (ECONOMIC TOPICS)

PROCUREMENT PRACTICES

GRI 204: Procurement Practices 2016	204-1 Proportion of spending on local suppliers	Page 110	Non-material				
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ANTI-CORRUPTION

GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Pages 10	Material				
	103-2 The management approach and its components	Pages 10, 50 and 52	Material				
	103-3 Evaluation of the management approach	Pages 10 and 50	Material				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	Pages 50 and 52	Material		16	1	Business Ethics & Transparency; EM-MM-510a.1; EM-MM-510a.2
	205-2 Communication and training about anti-corruption policies and procedures	Pages 50 and 51	Material		16	1; 2	Business Ethics & Transparency; EM-MM-510a.1
	205-3 Confirmed incidents of corruption and actions taken	Pages 52	Material		16	1	Business Ethics & Transparency; EM-MM-510a.1
ANTI-COMPETITIVE BEHAVIOR							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Pages 10	Material				
	103-2 The management approach and its components	Pages 10 and 52	Material				
	103-3 Evaluation of the management approach	Pages 10 and 70	Material				
GRI 206: Anti-competitive Behavior	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Pages 52 and 70	Material		16	1	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
300 SERIES (ENVIRONMENTAL TOPICS)							
ENERGY							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 11	Material				
	103-2 The management approach and its components	Page 70	Material				
	103-3 Evaluation of the management approach	Pages 11 and 70	Material				
GRI 302: Energy 2016	302-1 Energy consumption within the organization	Pages 70 and 71	Material		7	6; 8	Energy Management; EM-MM-130a.1
	302-2 Energy consumption outside of the organization	Page 70; further information can be found in the ESG Databook: "GRI - Environmental" tab	Material		7	6; 8	Energy Management; EM-MM-130a.1
	302-3 Energy intensity	Pages 70 and 71	Material		7	6; 8	Energy Management; EM-MM-130a.1
	302-4 Reduction of energy consumption	ESG Databook: "GRI - Environmental" tab	Material		7	6; 8	Energy Management; EM-MM-130a.1
	302-5 Reductions in energy requirements of products and services	Disclosure not applicable to mining setor	Material		7	6; 8	Energy Management; EM-MM-130a.1



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
WATER AND EFFLUENTS							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 13	Material				
	103-2 The management approach and its components	Page 80	Material				
	103-3 Evaluation of the management approach	Page 80	Material				
GRI 303: Water and effluents 2018	303-1 Interactions with water as a shared resource	Page 80; further information can be found in the ESG Databook: "GRI - Environmental" tab	Material				
	303-2 Management of water discharge-related impacts	Page 69; further information can be found in the ESG Databook: "GRI - Environmental" tab	Material				
	303-3 Water withdrawal	ESG Databook: "GRI - Environmental" tab	Material		6	6	Water Management; EM-MM-140a.1
	303-4 Water discharge	ESG Databook: "GRI - Environmental" tab	Material		6	6; 8	Water Management; EM-MM-140a.1
	303-5 Water consumption	ESG Databook: "GRI - Environmental" tab	Material		6; 12		
BIODIVERSITY							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 12	Material				
	103-2 The management approach and its components	Pages 12 and 77	Material				
	103-3 Evaluation of the management approach	Pages 12 and 77	Material				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 304: Biodiversity 2016	304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Page 77	Material		14; 15	2; 7	Biodiversity Impacts; EMMM-160a.1
	304-2 Significant impacts of activities, products, and services on biodiversity	ESG Databook: "GRI - Environmental" tab	Material		14; 15	7	Biodiversity Impacts; EMMM-160a.1; Community Relations; EMMM-210b.2
	304-3 Habitats protected or restored	Page 77	Material		14; 15	6; 7	Biodiversity Impacts; EMMM-160a.1
	304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations	Page 77	Material		14; 15	7	
EMISSIONS							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 11	Material				
	103-2 The management approach and its components	Pages 11 and 70	Material				
	103-3 Evaluation of the management approach	Pages 11 and 70	Material				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	Page 70 and 71	Material				
	305-2 Energy indirect (Scope 2) GHG emissions	Page 70	Material				
	305-3 Other indirect (Scope 3) GHG emissions	Pages 70 and 74	Material				
	305-4 GHG emissions intensity	Pages 70 and 71	Material				
	305-5 Reduction of GHG emissions	Page 71	Material				
	305-6 Emissions of ozone-depleting substances (ODS)	ESG Databook: "GRI - Environmental" tab	Material				
	305-7 Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Pages 81 and 82	Material				
ENVIRONMENTAL COMPLIANCE							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 10	Material				
	103-2 The management approach and its components	Pages 10 and 52	Material				
	103-3 Evaluation of the management approach	Pages 10 and 52	Material				
GRI 307: Environmental Compliance 2016	307-1 Non-compliance with environmental laws and regulations.	Page 52	Material			6	Water Management; EM-MM-140a.2



GRI Standards

Disclosure

Page number(s) and/or URL and/or direct answers

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Omission

SDG

ICMM Principles

SASB

400 SERIES (SOCIAL TOPICS)

EMPLOYMENT

GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 16	Material			
	103-2 The management approach and its components	Pages 16 and 90	Material			
	103-3 Evaluation of the management approach	Pages 16 and 90	Material			
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	Page 90	Material		5, 8, 10	3
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Page 91	Material		3, 5, 8	3
	401-3 Parental leave	ESG Databook: "GRI - Social" tab	Material		5, 8	3

OCCUPATIONAL HEALTH AND SAFETY

GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 15	Material			
	103-2 The management approach and its components	Pages 15 and 86	Material			
	103-3 Evaluation of the management approach	Pages 15 and 86	Material			



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-2 Hazard identification, risk assessment, and incident investigation	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-3 Occupational health services	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-4 Worker participation, consultation, and communication on occupational health and safety	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-5 Worker training on occupational health and safety	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-6 Promotion of worker health	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	ESG Databook: "GRI – Social" tab	Material		3; 8		
	403-8 Workers covered by an occupational health and safety management system	ESG Databook: "GRI – Social" tab	Material		3; 8	5	
	403-9 Work-related injuries	Page 86	Material		3; 8	5	Workforce Health & Safety; EM-MM-320a.1
	403-10 Work-related ill health	ESG Databook: "GRI – Social" tab	Material		3; 8	5	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
TRAINING AND EDUCATION							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 16	Material				
	103-2 The management approach and its components	Pages 16 and 92	Material				
	103-3 Evaluation of the management approach	Pages 16 and 92	Material				
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	Página 92	Material		8		
	404-2 Programs for upgrading employee skills and transition assistance programs	Página 92	Material		8		
	404-3 Percentage of employees receiving regular performance and career development reviews	ESG Databook: aba "GRI - Social"	Material		8		
DIVERSITY AND EQUAL OPPORTUNITY							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 16	Material				
	103-2 The management approach and its components	Pages 16 and 93	Material				
	103-3 Evaluation of the management approach	Pages 16 and 93	Material				
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	Pages 94, 95 and ESG Databook: "GRI - Social" tab	Material		5	3	
	405-2 Ratio of basic salary and remuneration of women to men	Página 91	Material		5	3	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
NON-DISCRIMINATION							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Pages 17, 50 and 51	Material				
	103-3 Evaluation of the management approach	Pages 17, 50 and 51	Material				
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	Page 51	Material		5; 8; 16	3	
FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 16	Material				
	103-2 The management approach and its components	Pages 16 and 91	Material				
	103-3 Evaluation of the management approach	Pages 16 and 91	Material				
GRI 407: Freedom of Association and Collective Bargaining 2016	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Page 91	Material		8	3	Labor Relations; EM-MM-310a.1



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
CHILD LABOR							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Pages 17 and 99	Material				
	103-3 Evaluation of the management approach	Pages 17 and 99	Material				
GRI 408: Child Labor 2016	408-1 Operations and suppliers at significant risk for incidents of child labor	Page 99	Material		3; 8; 16	3	
FORCED OR COMPULSORY LABOR							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Pages 17 and 99	Material				
	103-3 Evaluation of the management approach	Pages 17 and 99	Material				
GRI 409: Forced or Compulsory Labor 2016	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	Page 99	Material		3; 8; 16	3	



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
SECURITY PRACTICES							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Pages 17 and 99	Material				
	103-3 Evaluation of the management approach	Pages 17 and 99	Material				
GRI 410: Security Practices 2016	410-1 Security personnel trained in human rights policies or procedures	Page 99	Material		16	3	
RIGHTS OF INDIGENOUS PEOPLES							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Page 17, 100 and 101	Material				
	103-3 Evaluation of the management approach	Page 17, 100 and 101	Material				
GRI 411: Rights of Indigenous Peoples 2016	411-1 Incidents of violations involving rights of indigenous peoples	ESG Databook: "GRI - Social" tab	Material		11	3	Security, Human Rights & Rights of Indigenous Peoples; EMMM-210a.2; EM-MM-210a.3



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
HUMAN RIGHTS ASSESSMENT							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 17	Material				
	103-2 The management approach and its components	Pages 17, 99 and 100	Material				
	103-3 Evaluation of the management approach	Pages 17, 99 and 100	Material				
GRI 412: Human Rights Assessment 2016	412-1 Operations that have been subject to human rights reviews or impact assessments	Pages 99	Material		16	3	
	412-2 Employee training on human rights policies or procedures	Page 99	Material		16	3	
	412-3 Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	There were no significant agreements and contracts, i.e. investments related to transactions involving acquisitions, mergers or incorporation of companies, in 2021. All of the company's contracts include Human Rights clauses.	Material		16	3	
LOCAL COMMUNITIES							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 18	Material				
	103-2 The management approach and its components	Pages 18 and 102	Material				
	103-3 Evaluation of the management approach	Pages 18 and 102	Material				
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	Page 102	Material		8; 11	9; 10	Community Relations; EMMM-210b.1
	413-2 Operations with significant actual and potential negative impacts on local communities	ESG Databook: "GRI - Social" tab	Material		8; 11	9; 10	Community Relations; EMMM-210b.1



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
SOCIOECONOMIC COMPLIANCE							
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 10	Material				
	103-2 The management approach and its components	Pages 10 and 52	Material				
	103-3 Evaluation of the management approach	Pages 10 and 52	Material				
GRI 419: Socioeconomic Compliance 2016	419-1 Non-compliance with laws and regulations in the social and economic area	Page 52	Material			9	
MATERIAL ISSUE NOT COVERED BY A SPECIFIC GRI STANDARD							
Dams GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 9	Material				
	103-2 The management approach and its components	Page 9 e 36	Material				
	103-3 Evaluation of the management approach	Page 9 e 36	Material				
SECTOR SPECIFIC INDICATORS							
Biodiversity - GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 12	Material				
	103-2 The management approach and its components	Pages 12 and 77	Material				
	103-3 Evaluation of the management approach	Pages 12 and 77	Material				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
Biodiversity	MM1 – Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated	Page 77	Material		6; 12; 15	6; 7	Biodiversity Impacts; EMMM– 160a.3
	MM2 – The number and percentage of total sites identified as requiring biodiversity management plans according to stated criteria, and the number (percentage) of those sites with plans in place	Page 77	Material		14; 15	2; 6; 7	Biodiversity Impacts; EMMM– 160a.3
Efluentes and Waste – GRI 103: Management Approach 2016	103–1 Explanation of the material topic and its Boundary	Page 9	Material				
	103–2 The management approach and its components	Pages 9 and 41	Material				
	103–3 Evaluation of the management approach	Pages 9 and 41	Material				
Efluentes and Waste	MM3 – Total amounts of overburden, rock, tailings, and sludges and their associated risks	Page 41	Material		3; 6; 9; 12	6	Waste & Hazardous Materials Management; EM–MM–150a.1; EM–MM–150a.2; EM–MM–150a.3; Biodiversity Impacts; EMMM– 160a.2
Indigenous Rights – GRI 103: Management Approach 2016	103–1 Explanation of the material topic and its Boundary	Page 18	Material				
	103–2 The management approach and its components	Pages 18 and 100	Material				
	103–3 Evaluation of the management approach	Pages 18 and 100	Material				



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
Indigenous Rights	MM5 – Total number of operations taking place in or adjacent to indigenous peoples’ territories, and number and percentage of operations or sites where there are formal agreements with indigenous peoples’ communities	Page 100	Material		11	3	Security, Human Rights & Rights of Indigenous Peoples; EMMM–210a.2
Local Communities – GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 18	Material				
	103-2 The management approach and its components	Pages 18 and 106	Material				
	103-3 Evaluation of the management approach	Pages 18 and 106	Material				
Local Communities	MM6 – Number and description of significant disputes relating to land use, customary rights of local communities and indigenous peoples	Page 106	Material		11	3	Security, Human Rights & Rights of Indigenous Peoples; EMMM–210a.1
	MM7 – The extent to which grievance mechanisms were used to resolve disputes relating to land use, customary rights of local communities and indigenous peoples, and the outcomes	Page 106	Material		11	9; 10	Security, Human Rights & Rights of Indigenous Peoples; EMMM–210a.3



GRI Standards	Disclosure	Page number(s) and/or URL and/or direct answers	Material / Non-Material	Omission	SDG	ICMM Principles	SASB
Resettlement – GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 18	Material				
	103-2 The management approach and its components	Pages 18 and 105	Material				
	103-3 Evaluation of the management approach	Pages 18 and 105	Material				
Resettlement	MM9 – Sites where resettlements took place, the number of households resettled in each, and how their livelihoods were affected in the process	Pages 32 and 105	Material		11	3	Community Relations; EMMM-210b.1; EM-MM-210b.2
Closure Planning – GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Page 14	Material				
	103-2 The management approach and its components	Pages 14 and 82	Material				
	103-3 Evaluation of the management approach	Pages 14 and 82	Material				
Closure Planning	MM10 – Number and percentage of operations with closure plans	Page 83	Material				Community Relations; EMMM-210b.1; EM-MM-210b.1



PHOTO: VITOR NOGUEIRA



Wagons full of Iron Ore at Tubarão unit, in Vitória, Espírito Santo state

Credits

Realization
Executive Vice-presidency of Sustainability

ESG Consulting in Integrated Reporting and integrated editorial project
grupo report – rpt.sustentabilidade and rpt.com

Materiality
usina82

Technical support GRI, SASB, WEF indicators
EY

External assurance
PwC

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