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# Message from the CEO [ GRI 2-22 ]

In 2022, we presented the new Tupy to the market, which we have dedicated ourselves to planning and building in recent years. This new Company is a combination of talents and competencies, which have been developed, improved and conquered over time with the acquisitions that permeate our history. In 2023, we celebrated our 85th anniversary and I am proud of our trajectory so far and of what we see on the horizon.

Our technology development and capital allocation decisions are based on research and an understanding of the value we deliver to society. It is with the application of this knowledge that we collaborate with the development of solutions that serve essential sectors such as transport, construction of basic infrastructure: water, sanitation, electricity, safe housing, roads and hospitals; as well as food production and distribution.

These activities contribute to quality of life. In a world with 8 billion people, with projections of rising and increasing life expectancy, it is estimated that there is a need to increase the availability of primary energy by 30% by 2040. The challenge is to collaborate to meet this demand in an economical way and reducing the effects of climate change. It is against this backdrop that Tupy seeks to develop products,

services and technologies that strengthen the fair and effective energy transition.

We believe that we can contribute to the future and, in parallel, change realities now. We dedicate our technological investment in three main axes: 1) promote the global **energy efficiency** of the equipment in which we supply components or systems; 2) Take advantage of available and wasted energy sources and 3) Research new Technologies that can be more efficient in the long term. Energy efficiency is related to improving the equipment in which our products are applied, from manufacturing to full use. Therefore, the structural components we develop include the adoption of new materials and technologies that increase efficiency and reduce environmental impact.

Although counterintuitive, while there is a lack of energy in the world, there is also a lot of waste. And promoting the use of all available energies is an important part of MWM's contribution to our sustainability strategy. These are technologies for the use of renewable and cleaner energy sources – such as biogas, biodiesel, biomethane, ethanol, natural gas, HVO and hydrogen. Combined, Tupy and MWM will present even more solutions in this direction. In the long term, there are new Technologies



**At Tupy, we have dedicated our technological investment to promoting solutions that increase energy efficiency throughout society, take advantage of all available energy and promote new technologies."**

Fernando Cestari de Rizzo, CEO



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that are not mature today and depend on investment in disruptive Research and Development to be made viable. These are new business opportunities related to the use of hydrogen and the recycling of lithium-ion batteries with low energy consumption.

This search for sustainable solutions to current challenges is also reflected in our internal practices. We act with respect for all stakeholders, the environment, and adopt the best corporate governance practices. All this also contributes to our economic performance. In 2022, we achieved solid results, with net revenue of R\$10.2 billion and an Adjusted Ebitda of R\$1.3 billion. Net profit, in turn, reached R\$ 502 million. Result of strong execution, derived from consistent strategic planning and governance, which underlie the organization's growth and the perpetuity of the business.

We continued to successfully advance in our acquisitions, important moves that brought Tupy new skills, possibilities and talents. These transactions, in line with the Company's long-term

strategy, also collaborate with our commitment to sustainability. In this trajectory, I highlight the contribution of the various Committees, advising the Board of Directors in decision-making and encouraging the adoption of best practices.

In 2023, we plan to invest BRL 100 million in order to guarantee a safer and healthier environment and less environmental impact, leading to better conservation of resources and management of impacts in all our operations.

In this Sustainability Report, we share our results and actions for 2022, which are part of a journey that is always being renewed and is built by many people to whom I am immensely grateful. Our customers, shareholders, directors, investors, suppliers, technology partners and, mainly, our more than 19,000 employees, who have dedicated themselves to exceeding goals and strengthening our trajectory of 85 years of growth.

Enjoy the reading!



**Fernando Cestari de Rizzo**  
CEO

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For the third consecutive year, we released our Sustainability Report. This edition includes operational highlights and results of our units between January 1st and December 31st, 2022.

The data refers to operations in Brazil (Joinville, Betim and Mauá), Mexico (Saltillo and Ramos Arizpe), Portugal (Aveiro) and offices in Brazil (São Paulo), United States (Detroit) and Europe (Munich, Germany; Turin, Italy; and Arnhem\*, the Netherlands). [ GRI 2-2, 2-3 ]

This report does not include information from MWM do Brasil, completed on November 30, 2022, which has operations in São Paulo (Brazil) and a parts distribution center located in Jundiaí, in the same state, except when mentioned.

Information from operations located in Betim (Brazil) and Aveiro (Portugal), acquired in October 2021, is considered for the first time, as well as new offices in Italy and the Netherlands. [ GRI 2-4 ]

In 2017, we started the process of discontinuing the plant located in Mauá (São Paulo). Since then, activities have been gradually distributed to other units and this process was completed in September 2022. Therefore, this report includes data up to that period.

The Financial Results, About Us and Value Generation Model sections include the 2022 figures for all operations mentioned above, including MWM do Brasil.

In line with best practices, this publication was prepared in accordance with the standards of the Global Reporting Initiative (GRI), in its 2021

version. Compared to the previous year, we increased the report with approximately 30 GRI contents, totaling 81. We have also incorporated elements of the International Integrated Reporting Framework (IIRC) proposed by the

Value Reporting Foundation. In this reporting cycle, we even reviewed our business model in line with the framework.

This material also meets, in an unprecedented way, the topics of disclosure and metrics of the Sustainability Accounting Standards Board (SASB) for the Metals and Mining segment, and the recommendations of the Task Force on Financial Disclosures Related to the Climate (TCFD). Performance data are also correlated with the Sustainable Development Goals (SDGs) of the United Nations (UN).

Another significant advance is the audit, by an independent third party, of our Greenhouse Gas (GHG) emissions inventory, ensuring even more accuracy and transparency in the communication of our performance.



**If you have any questions and/or suggestions, please send us an e-mail at:**  
[dri@tupy.com.br](mailto:dri@tupy.com.br)  
 [ GRI 2-3 ]

## Methodology

- In compliance with the new GRI standards
- Presents elements of the International Framework for Integrated Reporting (IIRC)
- Meets Sustainability Accounting Standards Board (SASB) topics
- Addresses the recommendations of the Task Force on Climate Related Financial Disclosures (TCFD)



## Units covered

**Factories**

-  **Betim, Joinville e Mauá** (Brazil)
-  **Saltillo e Ramos Arizpe** (Mexico)
-  **Aveiro** (Portugal)

**Offices**

-  **Arnhem\*** (Netherlands)
-  **Detroit** (United States)
-  **Munique** (Germany)
-  **São Paulo** (Brazil)
-  **Turim** (Italy)

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# Materiality [ GRI 3-1, 3-2, 2-14 ]

The priority topics for our sustainability management were identified based on a broad materiality process, started in 2020, which involved: analysis of internal materials including Strategic Planning and various sectoral and market studies (Yearbook SAM S&P 2020, GRI, SASB, MSCI ESG Rating, Bloomberg ESG, among others); benchmarking; online consultation with the Board of Directors, employees, customers, suppliers, government, community, press, strategic partners, resellers and unions, totaling 735 respondents; in-depth interviews with members of the Executive Board and final validation by the Board of Directors.

**In 2022, a new analysis was carried out focusing on significant economic, environmental and social impacts for the company and society, with the aim of improving the view of material issues, based on the new GRI 2021 standards.**

In this sense, our risk map was evaluated, considering all the manufacturing units, as well as updated sectoral studies, especially the books of the Sustainability Accounting Standards Council (SASB) for the Auto Parts sectors; Iron & Steel Producers and Metals & Mining.

The positive and negative impacts and respective stakeholders were then identified. Then, these impacts were prioritized based on their significance (magnitude x probability of occurrence). Impacts considered to be of high and medium significance were selected and grouped by theme to compose our new materiality.

Although, in some cases, presented with different nomenclatures, the themes did not change and were validated by the Board of Directors, Sustainability Committee and by the Executive Board.



**Previous materiality**

- Atmospheric emissions
- Health, safety and well-being
- Decarbonization
- Compliance, ethics, transparency and integrity
- Corporate governance
- Operating technology
- Socio-environmental criteria for suppliers
- Impacts on local communities
- Waste management
- People management and development
- Diversity and inclusion

**Materiality 2022**

- Atmospheric emissions
- Health, safety and well-being
- Decarbonization
- Ethics and compliance\***
- Corporate governance
- Innovation, process and product\***
- Sustainable supply chain \***
- Impacts on local communities
- Waste management and circular economy \***
- Developing people\***
- Diversity and inclusion

\* Revised nomenclature

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# Our priority material topics

CLICK ON THE MATERIAL THEMES TO FIND OUT MORE ABOUT THE LIMIT OF EACH THEME. 



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# 2022 Highlights



## FINANCE

**R\$ 10.2 billion**

Net revenue  
(+ 44% vs 2021)

**R\$ 1.3 billion**

Adjusted EBITDA  
(+ 44% vs 2021)

**R\$ 502 million**

Net Profit  
(+ 148% vs 2021)

**R\$ 402 million**

Operating cash generation  
(+ 24% vs 2021)



## ENVIRONMENT

More than  
**650 thousand tons**

of scrap metal transformed into high value-added products

**17% reduction**

of the intensity of GHG emissions: (Scope 1 and 2)

**R\$ 23 million**

invested in control and monitoring systems

**93% reuse**

of water (vs 73% in 2021)

More than  
**1 million tons**

of recycled waste



## GOVERNANCE

Creation of a  
**Sustainability Committee**

**16.4 thousand**

employees trained in the Code of Ethics and Conduct;

Approval and disclosure of the  
**Anti-Corruption and Anti-Bribery Policy**

**ESG goals**

linked to executive bonuses

Adherence to  
**Business Pact for Integrity and Combating Corruption**



## SOCIAL

**19,155**

direct jobs

**389 thousand hours**

of training

**970 hours**

of volunteering

About  
**19.2 thousand**

people impacted by social investments

**R\$ 9.8 billion**

added in economy

**+ 4.5 thousand**

Active suppliers



## INNOVATION

**R\$ 36 million**

invested in research and development

**1,897 improvements**

applied in the Creation Program

Inclusion in the ranking

**Brazil Innovation Value**

**85 startups**

enrolled in ShiftT Batch 02

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# Acknowledgments



## Volkswagen Award

Tupy was recognized as one of the best suppliers in the world by the Volkswagen Group, meeting more than 90% of the evaluated requirements, which include quality in processes and excellence in products.



## Exame's Best and Biggest 2022 Ranking

We are in the 34th position among the 400 best companies in the "Steel, Mining and Metallurgy" sector, evaluated by the Ranking EXAME's Best and Biggest 2022 Ranking.



## ESG Best Guide

We received the Best of ESG 2022 Award, from Exame, in the Capital Goods and Electronics category, in recognition of the Company's commitment to the best environmental, social and corporate governance practices.

## Innovation Value Ranking

Tupy joined the ranking of the 150 most innovative companies in the country, in the 2022 edition of Valor Inovação, promoted by Valor Econômico newspaper.



## Stemmer Award from the Research Support Foundation of Santa Catarina

Tupy won the Innovation Award from Santa Catarina Professor Caspar Erich Stemmer in the Service or Process category, held by Fapescc.

## Valor 1000 ranking

Tupy was positioned among the 10 largest companies in Brazil in the Metallurgy and Siderurgy sector, in the 22nd edition of the Valor 1000 ranking, produced by the Valor Econômico newspaper; in partnership with Serasa Experian and the Fundação Getúlio Vargas School of Business Administration in São Paulo.



## 500 Biggest in the South Ranking

Tupy rose four positions in the 500 biggest in the South ranking, carried out by Grupo Amanhã, occupying 33rd place. Among the companies from Santa Catarina, the Company is in ninth place.

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# Main indicators

For a quick look at our performance over the last three years, check out the scorecard below:

DIMENSION	INDICATORS	2020	2021	2022 <sup>1</sup>	RELATED MATERIAL THEMES
 <b>ENVIRONMENT</b>	Greenhouse Gases (scope 01 and 02) (tCO2/t iron)	1.32	1.30	<b>1.08</b>	Atmospheric emissions
	Greenhouse Gases (scope 01 and 02 by billing) (tCO2/R\$)	0.12	0.09	<b>0.07</b>	Atmospheric emissions
	Particulate matter (tMPT/t iron)	0.00132	0.00199	<b>0.00114</b>	Atmospheric emissions
	% of waste reused in the process	85	87	<b>81</b>	Circular economy and waste management
	% of recycled source material used in the process	99	97	<b>93</b>	Circular economy and waste management
	% of water reuse in the process	-	73	<b>93</b>	Circular economy and waste management
	Research and development expense (R\$ million)	-	25	<b>36</b>	Innovation, process and product
	% of R&D investments dedicated to sustainability	-	70	<b>57</b>	Decarbonization
 <b>SOCIAL</b>	Number of people benefited	40 thousand (considering COVID actions)	15 thousand	<b>19.2 thousand</b>	Impacts on local communities
	Volunteer hours	475	900	<b>970</b>	Impacts on local communities
	Value of social investment (R\$)	156,752	146,808	<b>2,119,199</b>	Impacts on local communities
	Added value in the economy <sup>2</sup> (R\$ billion)	3.8	6.8	<b>9.8</b>	Impacts on local communities
	Recall cases	0	0	<b>0</b>	Impacts on local communities

1. Data refer to operations in Brazil (Joinville, Betim and Mauá), Mexico (Saltillo and Ramos Arizpe), Portugal (Aveiro) and offices in Brazil (São Paulo), United States (Detroit) and Europe (Munich, Germany; Turin, Italy; and Arnhem, the Netherlands).

2. These values were calculated considering: (i) input purchased from third parties; (ii) employees' salaries, social charges, FGTS, profit sharing, management fees; and (iii) federal, state and municipal taxes, fees and contributions.

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DIMENSION	INDICATORS	2020	2021	2022 <sup>1</sup>	RELATED MATERIAL THEMES
<p><b>PEOPLE</b></p>	% of women in the company	8.24	8.28	<b>8.04</b>	Diversity and inclusion
	Health and safety rate index (frequency rate)	13.30	13.36	<b>13.96</b>	Health, safety and well-being
	Number of training hours per employee	9.47	29.71	<b>20.57</b>	Developing people
<p><b>GOVERNANCE</b></p>	% of women on the Board of Directors	22.2	33.3	<b>33.3</b>	Governance
	Proportion of independent members	1/3	1/3	<b>1/3</b>	Governance
	% of employees trained in ethical standards	-	-	<b>91.1</b>	Ethics and compliance
	Taxes and contributions (R\$ million)	116.7	318.8	<b>698.5</b>	Governance

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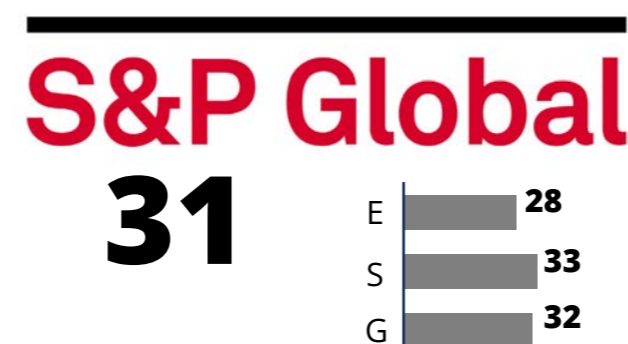
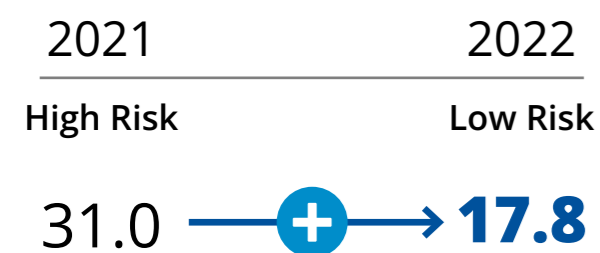
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## ESG Scores

The market's recognition of our sustainability journey is also an important indicator and contributes to the continuous improvement and evolution of the good practices already adopted.







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TUPY



# 3 About us

[ GRI 2-1, 2-6 ]







We are Tupy, a Brazilian multinational that develops structural components and services for the transport and cargo handling sectors, in all modes; agribusiness; infrastructure; and power generation. Our products and solutions are essential components used in machines, vehicles and equipment that contribute to improving people's quality of life, promoting access to basic sanitation, drinking water, food production and distribution and global trade.

## MWM Merger

In 2022, we acquired MWM do Brasil. Together, we have become a unique company in the market with the ability to provide casting, machining, assembly, technical validation and associated engineering activities through manufacturing contracts.

With the acquisition, we extend our presence in the Energy & Decarbonization sector, providing electricity generator sets for urban, marine and agribusiness applications, as well as decarbonization solutions for mobility; from the transformation of vehicles and agricultural machinery, which are now powered by biofuels or natural gas instead of diesel. In addition to entering the maritime segment with propulsion

systems for vessels, we are present in the spare parts market, based on an authorized network of more than 600 resellers, located throughout Brazil. The latter exposes us to a countercyclical sector, contributing to the diversification of our income.

Today, our businesses are inserted in five main sectors: automotive, capital goods, agribusiness, energy and maritime. Our performance in these segments is quite diversified, ranging from the development of technologies and solutions, to the supply of structural parts and components, energy conversion systems, to post-consumption, with technical assistance, replacement and recycling.



Learn more about our products on the [Tupy's](#) and [MWM's](#) websites 

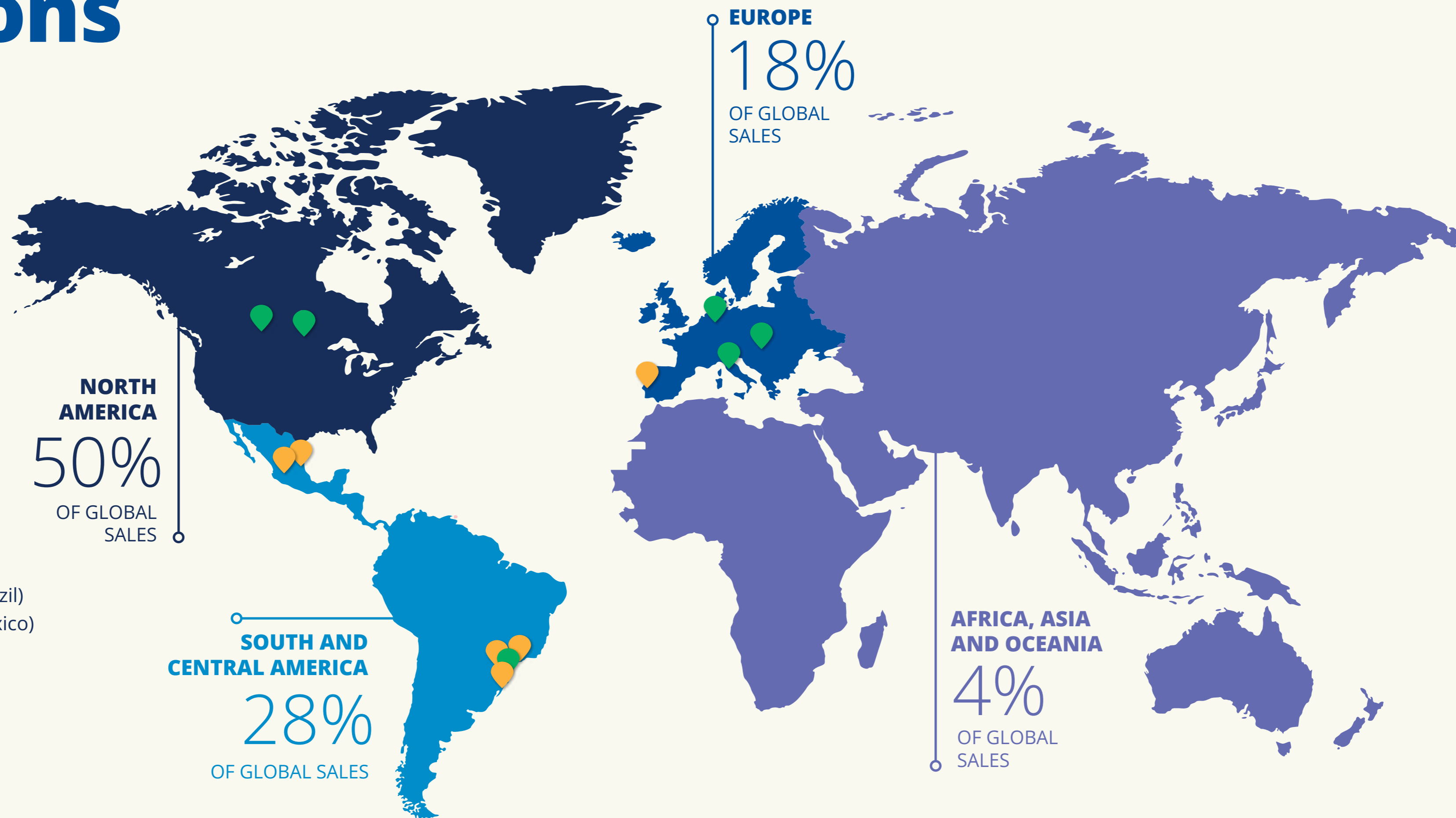
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# Operations

## Global presence



### FACTORIES

- Betim, Joinville, São Paulo (Brazil)
- Saltillo and Ramos Arizpe (Mexico)
- Aveiro (Portugal)



### OFFICES

- Arnhem (Netherlands)\*
- Detroit and Indianapolis (USA)
- Munich (Germany)
- São Paulo Brazil
- Turin (Italy)

NOTE: The Mauá Plant (São Paulo) was decommissioned in September 2022.

\* Subsidiary

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# New Tupy

Our technology is based on metallurgy and in-depth knowledge of materials and, with each acquisition, new talents have joined our team and also brought new skills, such as machining, assembly, and engine engineering. All this makes us a unique company in the market, bringing together, in one supplier, manufacturing contracts that include foundry, machining, assembly, technical validation and associated engineering activities.

## Portfolio based on Trends and Skills

- **STRUCTURAL COMPONENTS:**
  - Engine Blocks and Heads
  - Engineering parts
- **MANUFACTURING CONTRACTS:**
  - Foundry
  - Machining and Assembly Services
  - Engineering services
- **ENERGY, AGRO, DECARBONIZATION AND NEW BUSINESSES:**
  - Generator sets
  - Vehicle conversion to biofuels and natural gas
  - Biogas solutions for agribusiness
  - Lighting towers
  - Production of biogas/biomethane from waste
  - Battery recycling
  - Hydrogen economy
- **DISTRIBUTION, REPLACEMENT AND HYDRAULICS:**
  - Technical assistance
  - Spare parts
  - Pipe fittings

Read more in [innovation and technology](#).

We seek to dedicate our technological skills to developing products and services that solve real and essential challenges of society. For this, we need to have in-depth knowledge about the different realities and global needs, thinking about alternatives that sustain growth and promote access to a dignified life.

As the population grows, so does the demand for food, clean water, sanitation, housing, etc. Access to this basic infrastructure needs to be economically viable and, for that, we depend on efficient capital goods – machines, equipment and vehicles.

All this means that more and more energy is needed, which needs to be economically viable and, successively, cleaner. This energy transition is essential to fight the effects of climate change and increase life expectancy and quality around the world. For this, there is no other way than to consider the economic, social and environmental impacts of each alternative.

We believe that it is necessary to prioritize alternatives that promote viable decarbonization in the short, medium and long term. There are technologies and energy sources available today, which are still unexplored and are cleaner than conventional ones. This is a way for us to execute the energy transition in a fair, safe and effective way.

Our efforts have been focused on three major areas of technological investment:

- 1. Energy efficiency:** materials, technologies, products and services that contribute to making machines, vehicles and equipment more efficient and able to adopt cleaner sources of energy.
- 2. Use of viable and available energy sources:** Decarbonization solutions that take advantage of the existing capital goods structure, combining it with different fuels and cleaner energy sources – often wasted – such as biogas, biodiesel, biomethane, ethanol, natural gas, HVO, hydrogen.
- 3. New technologies:** investment in disruptive R&D to make technologies that are not yet mature viable and efficient, and even find new ones that deliver performance equal to or superior to current ones, however, with less environmental impact throughout the value chain.

There is no sole, simple and low-cost solution that addresses all aspects, therefore, the order of investments is important to balance the economic, environmental and social impact of an energy transition. Expanding the rationalization of energy consumption each year and taking advantage of all available sources, we will reduce the consumption of fossil fuels without making access to energy for a dignified life unfeasible. At the same time, with investment in mature and disruptive technologies, we will achieve a cleaner energy source, moving towards a low-carbon economy.

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**DECARBONIZATION SOLUTIONS**

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# NEW TUPY



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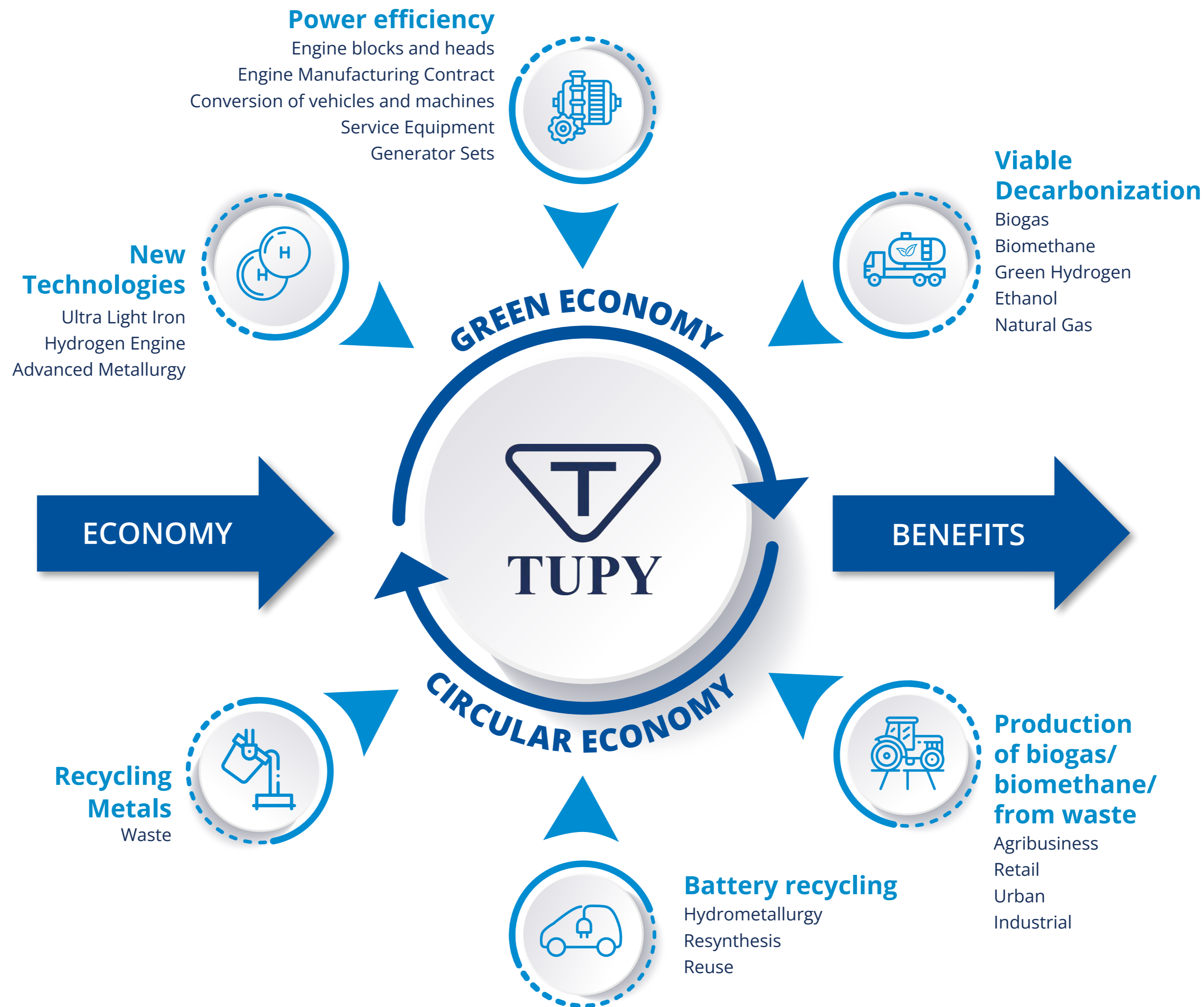




# Solutions for decarbonization

The growth in demand for infrastructure, transport, food and energy continues to be the solid foundations of this new Tupy. However, the reach of our solutions becomes much larger. And that means not only progress in manufacturing contracts, but also our entry into the aftermarket, into energy conversion systems and investment in research and new businesses, which are necessary for a low carbon economy.

In this context, we apply our experience in circular economy and materials engineering to enable the recycling of batteries and the use of hydrogen, ethanol, biogas, biomethane, natural gas and cleaner energy sources.



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# Solutions applied in the chain

Check out examples of partnerships and deals signed in 2022



## Complete solutions in the biogas chain:

We entered into an agreement with Sansuy for the development and production of biodigestion solutions to meet the different types of organic waste from agribusiness. The energy produced comes from a renewable source and can be used to power the biogas generators and biomethane engines, which are already used in trucks and buses. In addition, there is the generation of biofertilizers, which replace those of mineral origin. In March 2023, we announced a contract with the agricultural cooperative Primato – 13 properties will be served by a biogas plant, transforming waste into clean and renewable electricity. To learn more, click [here](#).



## Vehicle transformation - biomethane and NVG engines:

Changing the diesel engine to biomethane makes it possible to neutralize the vehicle's carbon footprint during use, and to reduce the emission of Greenhouse Gases (GHG) by 20% to 25% when operated on CNG. The replacement also eliminates the emission of particulate matter and a significant reduction, above 50%, of other pollutants, such as NOx. In addition to being better for the environment, biomethane and CNG engines reduce operating costs, as they offer easy maintenance, fast fueling and 20% lower noise emissions.

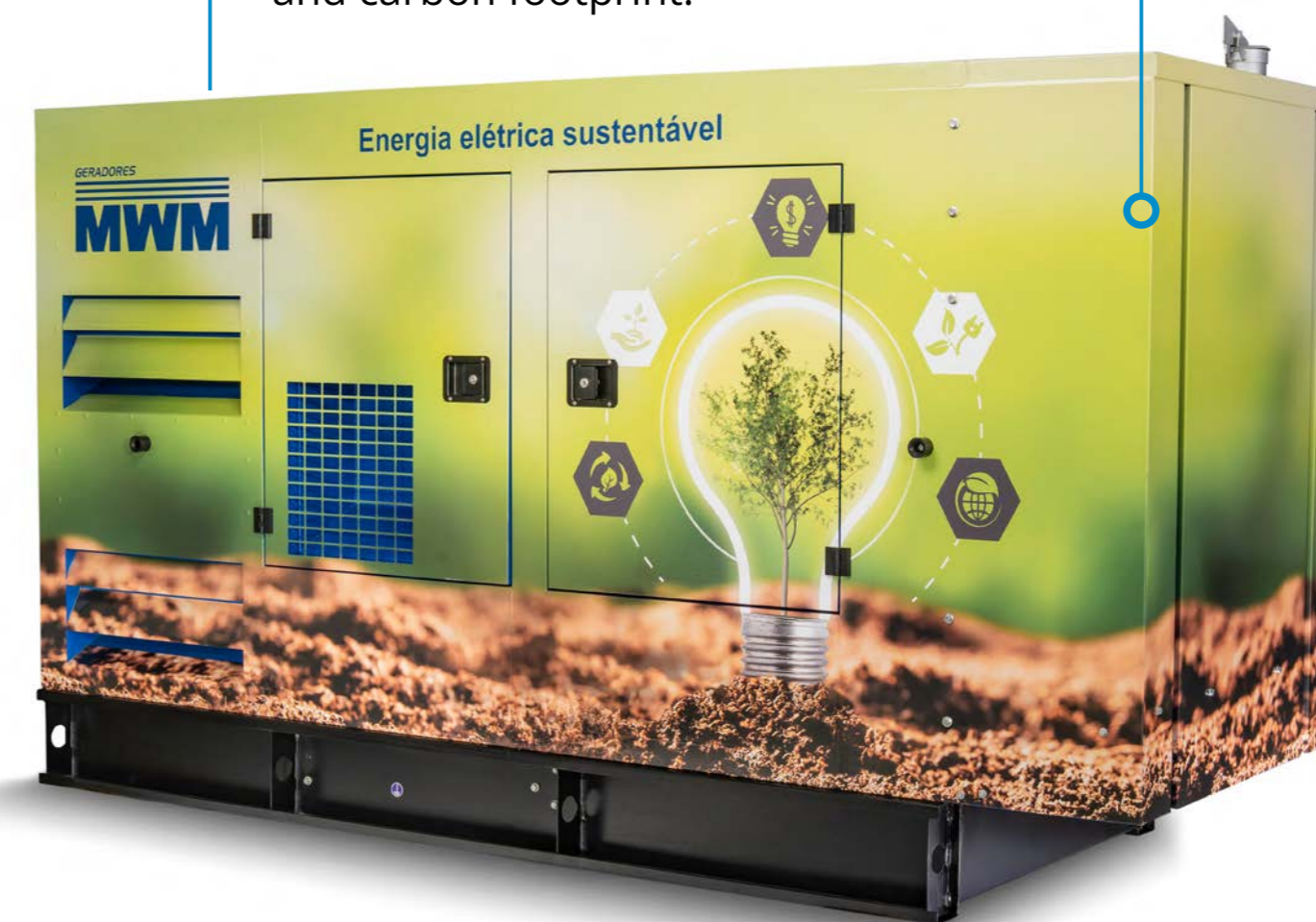
## Clean and portable light source:

With a compact design, ideal for practical and efficient transport, the photovoltaic lighting towers illuminate a wide range of areas and deliver high durability of use, with no noise emissions and a smaller carbon footprint.



## Biogas generator set:

With energy generation from biogas, this solution was developed exclusively for the use of this fuel. It has lower consumption and carbon footprint.



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# 4 Corporate Governance



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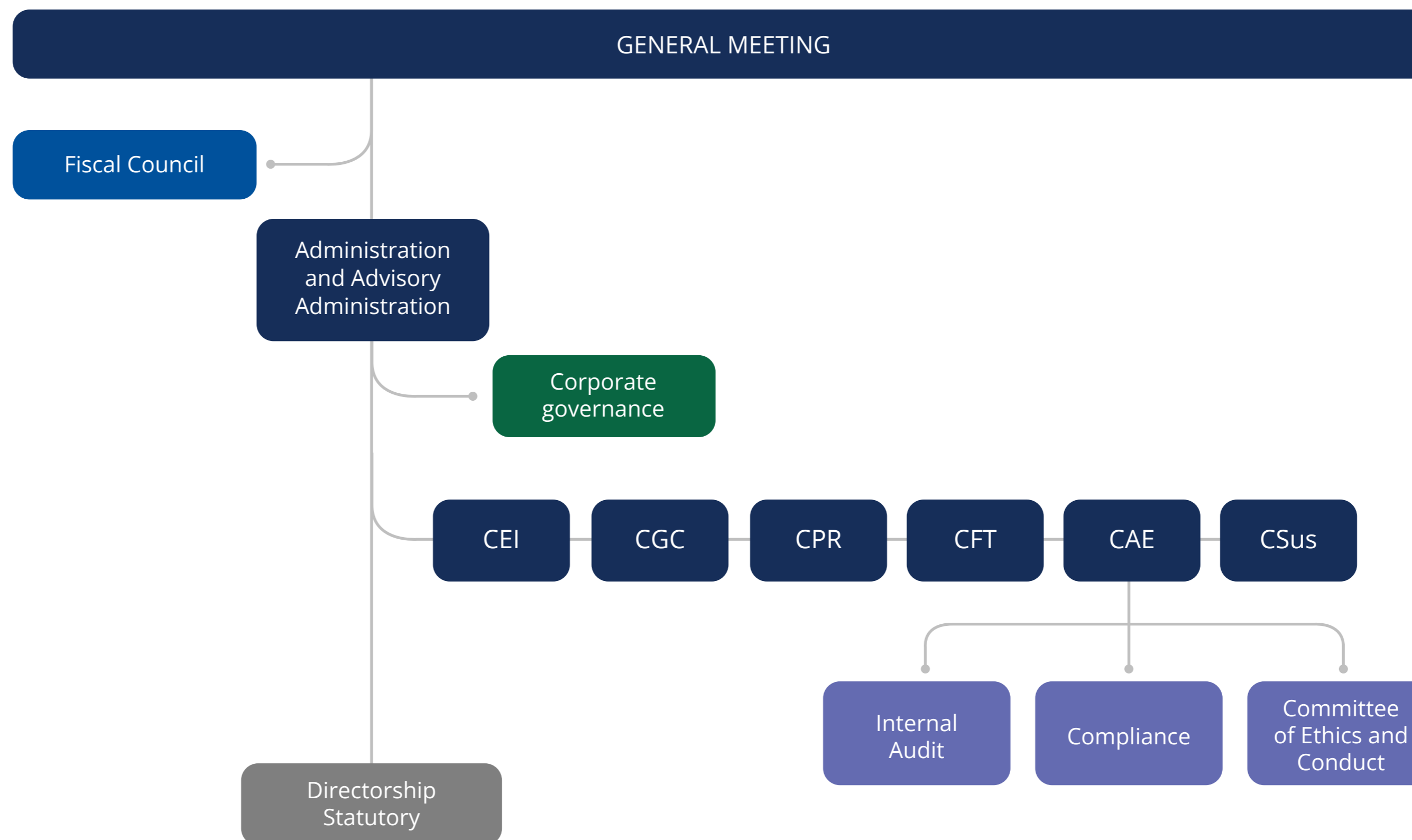
# Structure

[ GRI 2-9 ]

We are a publicly traded company, with shares traded on the Brazilian stock exchange since 1966, and in 2013 we became part of Novo Mercado, a qualified listing segment for trading shares issued by companies that are committed to adopting the best corporate governance practices in addition to those required by Brazilian law and the Securities and Exchange Commission (CVM).

Our management is made up of decision-making and advisory bodies that enable the adoption of strategies in line with our ethical principles, transparency and respect for stakeholders.

## Governance structure



Internal Audit, Compliance and the Ethics and Conduct Committee report to the Board of Directors through the CAE.

On January 1, 2023, the term of validity of the Shareholders' Agreement signed on September 20, 2013 ended, which is why the Company no longer has controlling shareholders as of that date.

**CAE:** Statutory Audit and Risk Committee  
**CGC:** Corporate Governance Committee  
**CEI:** Strategy and Innovation Committee  
**CFT:** Finance and Transactions Committee  
**CPR:** People and Compensation Committee  
**Csus:** Sustainability Committee

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## General Shareholders' Meeting

It meets once a year and, on an extraordinary basis, whenever necessary or when corporate interests require a statement from the shareholders.

### Shareholding structure

Find out about our shareholding structure [here](#).



## Board of Directors

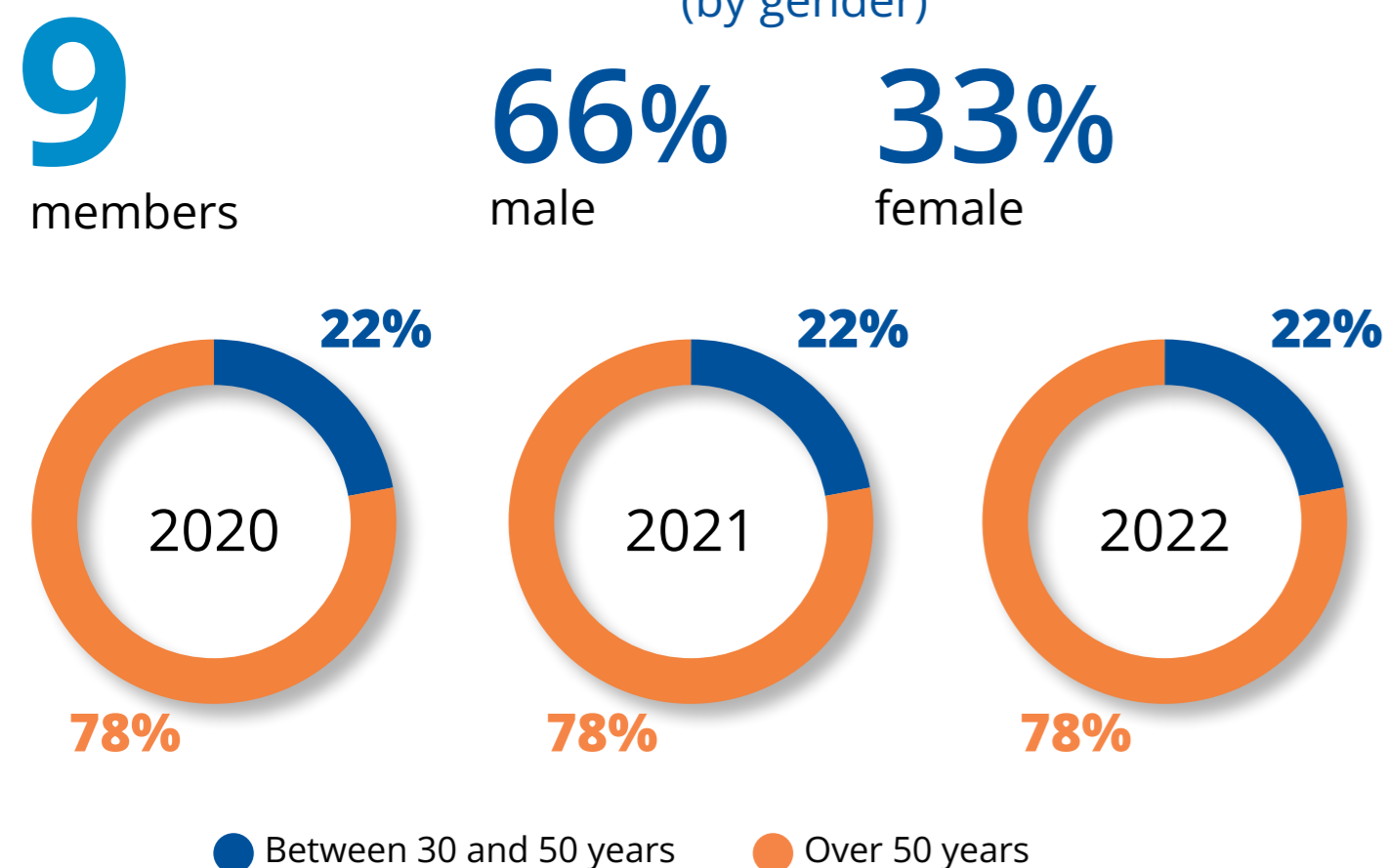
Guides, controls and supervises the business. In 2022, the body was composed of nine external members, of which three are independent (elected by minority shareholders) and three are women.

With the termination of the Shareholders' Agreement on January 1, 2023, from then on, no member of the Board of Directors has the right to exercise their voting rights linked to the decision of the Company's shareholders.



We are certified by Women on Board (WOB), an independent initiative, supported by UN Women, which endorses organizations that value corporate environments with the presence of women on boards of directors or advisory boards.

### Percentage of Board members (by gender)



## Fiscal Council

It supervises the legal, regulatory and statutory compliance of the acts performed by the bodies and members of the management and opines on certain matters submitted for deliberation at the General Shareholders' Meeting.

## Sustainable management

The creation of the Sustainability Committee (CSus), in 2022, reinforces the strategic importance of this topic for our management. Integrated into the governance structure, the Committee supports the Board of Directors in defining strategies, guidelines and measures aimed at adopting best practices, as well as identifying and mitigating environmental, social, climate and regulatory risks. It originated from the ESG Working Group, a joint committee established in 2021, which already gave the topic strategic weight, with the involvement of the highest level of our governance.

Currently composed of three members – two of which are members of the Board of Directors and one is a specialist in climate change, biodiversity and corporate governance –, the CSus has among its main attributions and responsibilities to:

- Promote the alignment of concepts and strategic vision of sustainability;
- Support the Board of Directors in analyzing aspects related to the topic in the Company's governance documents;
- Analyze our performance in relation to the main ESG indicator frameworks, as well as propose adherence to thematic and sectoral initiatives related to the sustainable development agenda.

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# Statutory Board

Respecting the limits established by law and by our Bylaws, the Statutory Directors are responsible for carrying out all necessary acts to regulate business operations, in line with our strategic planning. None of the members of the Statutory Board are members of the Board of Directors or its Advisory Committees.

[ GRI 2-11 ]

For optimum performance, the Board of Directors is assisted by six committees, with objectives and attributions defined according to internal regulations.

- Statutory Audit and Risk Committee (CAE)
- Corporate Governance Committee (CGC)
- Strategy and Innovation Committee (CEI)
- Finance and Transactions Committee (CFT)
- People and Compensation Committee (CPR)
- Sustainability Committee (CSus)

**ESG and variable compensation**

One of the aspects that influence the short-term variable remuneration of executive leadership is the fulfillment of environmental, social and governance performance goals, such as: enhancing the positive impact on surrounding communities, prioritizing efficiency in controlling atmospheric emissions; ensure the health, safety and well-being of employees in all operations; and improve ESG assessment practices in the supply chain.

The CEO's individual goals are also considered, which are established by the Board of Directors, and of the other directors, proposed by the CEO and approved by the Board; all are reproduced, in a hierarchical line, for the other executives.



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## Nomination and selection process

[GRI 2-10]

The election of directors is carried out in accordance with the Brazilian Corporate Law (Law 6,404/76). The rules for nominating and selecting members of the Board of Directors are provided for in a specific policy, with the purpose of ensuring that the appointment complies with the legislation and rules and regulations that guide the matter.

It is up to the Corporate Governance Committee to evaluate, if and when requested by the Board, adherence to the policy for nominating candidates for the position of member of the Board of Directors and the reasons for verifying the classification of a candidate for independent director, to subsidize the manifestation of the Board to be included in management's proposal for the general meeting.

Click [here](#) to learn about the Policy for Nominating Board and Committee Members.

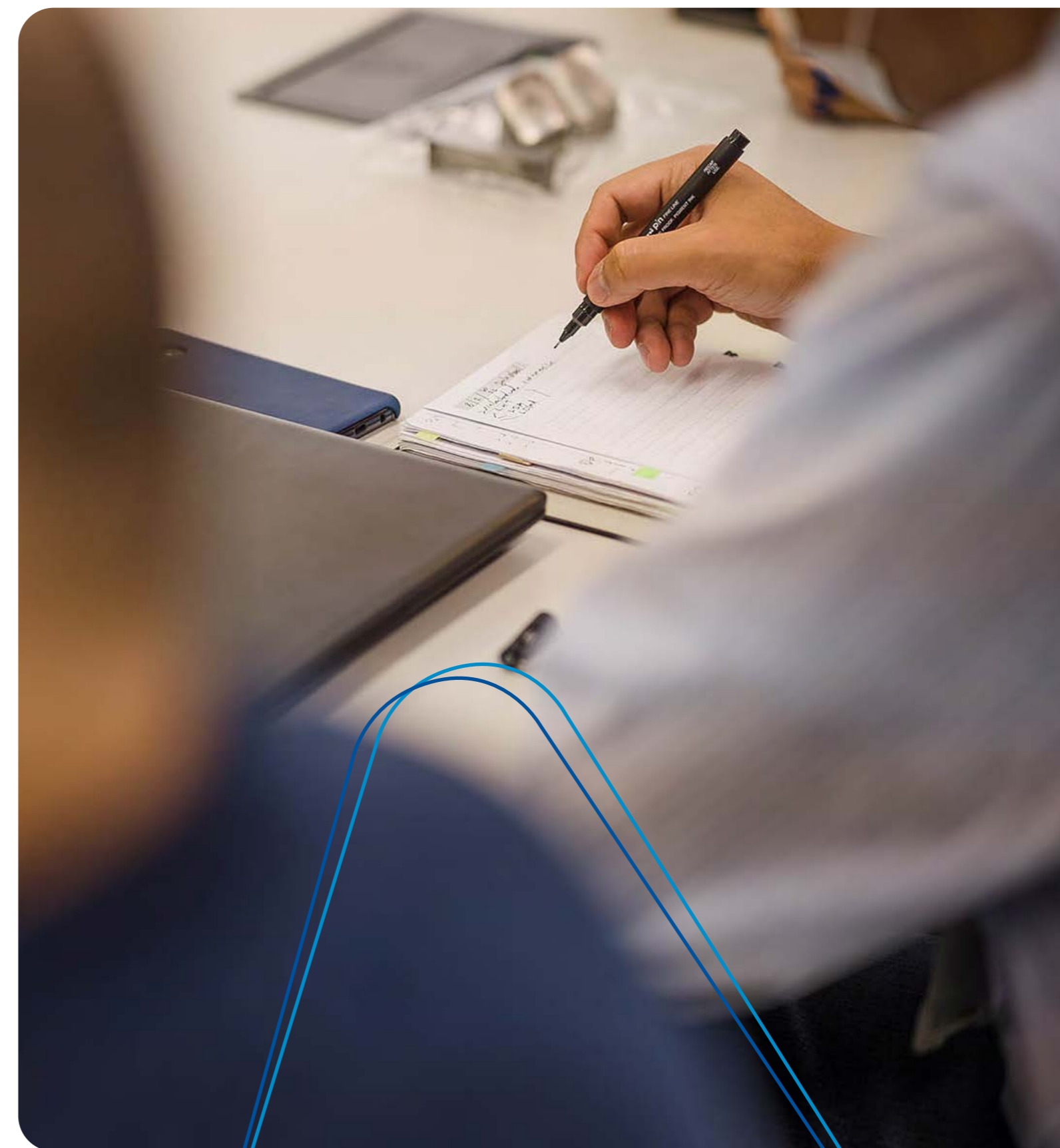
## Evaluation of the performance of the Board of Directors

[GRI 2-18]

The Board of Directors, since 2014, and its Advisory Committees, since 2015, carry out an annual self-assessment process on a collective and individual basis by the Chairman of the Board of Directors, the Coordinators of the Committees and the Governance Officer, conducted by a consulting company specialized in the subject. Since 2018, the members of the Fiscal Council have also started to carry out the self-assessment process, with a specific scope for their attributions and competences within the scope of the governance system.

In 2022, the self-assessment process of the Board of Directors and Committees, referring to the 2021 financial year, considered, in addition to the self-assessment of the joint committees, the individual assessment of the members of the Board of Directors and Committees, covering the following dimensions:

- For the Board of Directors: fulfillment of the mandate, composition and structure; processes and support structure; dynamics and effectiveness; contributions; and ESG engagement.
- For Advisory Committees: execution of the mandate; team dynamics; composition and structure; Law Suit; and contributions.
- Based on the opportunities for improvement identified and on the recommendations of external consultants, the evaluated bodies develop and implement action plans. Individual feedback is also offered, with the support of specialized external consultants.



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## Risk control and impact management

[ GRI 2-12, 2-13, 2-16 ]

The Board of Directors assesses our risk exposure by discussing the priority risk matrix and respective action plans, which are updated quarterly by managers and previously reported to the Statutory Audit and Risk Committee.

In 2022, we reviewed our Risk Management and Internal Controls Policy. Validation of the effectiveness of these controls is carried out by internal audit and reported to the Statutory Audit and Risks Committee and the Board of Directors. The Audit Committee is aware of the results of the effectiveness tests and is periodically updated on the conclusions of the independent auditors.

Within the scope of the risk management system, the Finance and Transactions and Strategy and Innovation Committees, together with the Statutory Audit and Risks Committee; monitor and evaluate key indicators (KPIs) and respective controls to mitigate financial and strategic risks.

The evaluation of the effectiveness of Internal Controls is carried out by the internal audit area, through the application of Tests of Effectiveness (ToE) and reported to the Audit and Statutory Risks Committee and the Board of Directors. Additionally, within the scope

of evaluating the effectiveness of internal controls, carried out by independent auditors; the respective report and its eventual points are examined and discussed by the Statutory Audit and Risks Committee and reported to the Board of Directors, with action plans for solution, when applicable. The Audit Committee examines and monitors the results of both the ToE and the report on internal controls by the independent auditors, and monitors the addresses given by Management.

We maintain an integrated Governance, Risk and Compliance (GRC) structure, with lines of defense distributed in specific areas of Risk Management and Internal Controls, Internal Audit, Compliance and Corporate Governance, the last three of which are linked to the Board of Directors; with formally and properly determined boundaries of action.

## Compensation policies

[ GRI 2-19, 2-20 ]

The total amount of the annual remuneration of the Managers (members of the Board of Directors and Statutory Board of Directors), of the members of the Statutory Audit and Risks Committee and of the Fiscal Council is fixed in the Ordinary General Meeting, based on a proposal prepared by the Personnel Board, revised by the Personnel and Remuneration Committee and approved by the Board of Directors, pursuant to the Remuneration Policy for Managers and Members of Advisory Committees.

This policy establishes the parameters for defining remuneration, among others: value of professionals' services in the market; responsibilities; time devoted to positions; and competence and reputation of the professional. It also considers external equity according to market research carried out by a specialized consulting firm with proven experience, and internal equity based on the relative weights between functions.

In 2022, the regulation of the long-term compensation program, for which executives who belong to the level of president, vice president or director are

eligible as Beneficiaries, was revised and, after approval by the General Meeting of Shareholders, now includes a portion of restricted shares units (RSUs), in addition to the hitherto exclusive plan of performance shares units (PSUs), with the purpose of ensuring the competitiveness of the total compensation levels practiced; support the alignment of interests between our main executives and shareholders; increase the levels of commitment of the main executives with the generation of sustainable results; and expand the retention power of top leaders. The remuneration of the members of the Board of Directors consists of a fixed monthly remuneration and is defined in order to be aligned with the Company's strategic objectives; with a focus on its perpetuity and the creation of value in the long term, and is proportional to the attributions, responsibilities and demand for time. Details of our Long Term Incentive Plan can be found [here](#).

More information on Management compensation is detailed in our [Reference Form](#), pursuant to the relevant regulation of the Brazilian Securities Commission (CVM).



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## About alienation of control

In order to ensure that all shareholders are treated fairly and equitably in the event of a direct or indirect transfer of control; our Bylaws establish that transactions involving the direct or indirect sale of share control must be accompanied by a public offer for the acquisition of shares (OPA) addressed to all shareholders, for the same price and conditions obtained by the selling shareholder. In addition, managers must express their views on the terms and conditions of corporate reorganizations, capital increases and other transactions that give rise to a change in control, and state whether they ensure fair and equitable treatment to shareholders.

In line with the best corporate governance practices, in June 2022, the Board of Directors, with the support of the Corporate Governance Committee, examined and discussed the defense mechanisms provided for in the Bylaws to prevent hostile acquisitions of significant portions of capital, and confirmed the understanding that such aspects are in line with best practices.

The understanding of the Board of Directors is that the OPA activation trigger (acquisition of 30% of the shares) and parameters for defining the share price do not impose excessive disadvantages to the eventual change in the power of control; protect the maintenance of adequate levels of stock liquidity and are in accordance with the best interests of our managers and shareholders.

### Participation in associations

[GRI 2-28]

Aware of our role in the markets in which we operate and seeking to induce more sustainable practices, we participate in sectoral associations and entities in order to reaffirm our values and expand the potential to promote transformation.

Currently, we participate in several entities in Germany, Brazil and Mexico, such as:

	Allianz Wassertoffmotor
	Brazilian Association of the Auto Parts Industry (Sindipeças/ Abipeças);
	Brazilian Hydrogen Association (ABH2);
	Brazilian Foundry Association (Abifa);
	Brazilian Industrial Internet Association (Abii);
	Joinville Business Association (Acij);
	National Association for Research and Development of Innovative Companies (Anpei);
	National Chamber of the Transformation Industry (Canacindra);
	Coahuila Automotive Industry Cluster (CIAC);
	Employer Confederation of the Mexican Republic (Coparmex);
	National Confederation of Industry (CNI);
	Federation of Industries of the State of Minas Gerais (Fiemg);
	Federation of Industries of the State of Santa Catarina (Fiesc);
	Federation of Industries of the State of São Paulo (Fiesp);
	Brazilian Institute of Corporate Governance (IBGC)
	National Auto Parts Industry (INA).

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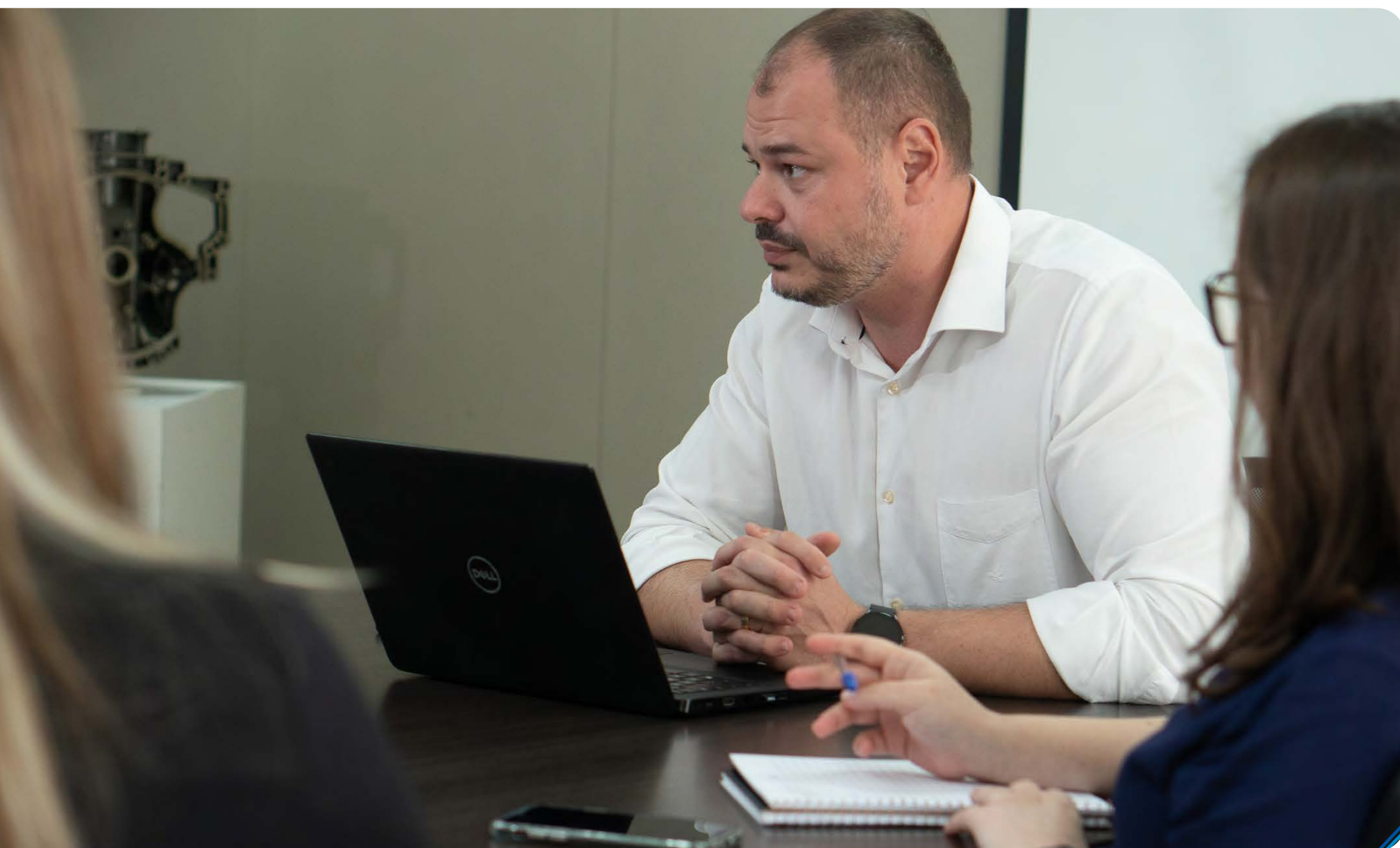
# Commitments and formal policies

[ GRI 2-23, 2-24 ]

Our commitments and practices are described in the Bylaws, in formal policies approved by the Board of Directors, and in internal rules and procedures.

Policies are constantly updated and published on our institutional and Investor Relations websites. Compliance with policies and main work standards is verified by the managers responsible for contact with their teams and in periodic meetings of their areas, and monitored by the Statutory Board and the Board of Directors.

Other forms of control are external and internal audits, which aim to ensure compliance with applicable technical, legal and regulatory requirements.



## Main Policies

### Integrity Policy

[Click here](#)

### Integrated Management Policy

[Click here](#)

### General Procurement Conditions Procurement

[Click here](#)

### Norm for Private Social Investments

[Click here](#)

- **Anti-Corruption and Anti-Bribery Policy**
- **Risk Management and Internal Controls Policy**
- **Crisis Management Policy**
- **Management Compensation Policy**
- **Policy for Nominating Board Members and Advisory Committees**
- **Securities Disclosure and Trading Policy**
- **Bylaws**
- **Code of Ethics and Conduct**
- **Internal regulations**

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# Risk management

We regularly monitor the operational and strategic risks of the business. Operational risks are assessed quarterly at our units. The main risks are presented in the risk map, which consider topics such as work safety, environment, labor and energy resources, which are related to ESG aspects. The risks and opportunities associated with the climate are evaluated separately, on an annual basis.

Strategic risks are assessed annually, based on long-term plans. The financial, image and strategy impacts, their probability and the moment when we will have more exposure to such events are taken into account.

## Risk management guidelines

In 2022, our Risk Management and Internal Controls Policy was reviewed by the Board of Directors. The document establishes the guidelines for the Risk Management and Internal Controls processes and their alignment with our strategic objectives, ensures adherence to good corporate governance practices, defines responsibilities of the parties involved and promotes risk management and internal controls in all units, business and support areas. The Executive Committee for Risk Management and Internal Controls was also created, responsible for monitoring these processes and periodically reporting them to the Statutory Audit and Risk Committee, with advice from the Board of Directors.

[\[GRI 2-25\]](#)



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# Information Security and Cybernetics

Our operations depend on the operational stability of data centers, cloud solutions and other systems that support our internal processes. Therefore, we continuously invest in improvements, development and updating of software and hardware, and improvement of internal controls and processes, aiming to mitigate cyber risks and possible impacts to the business.

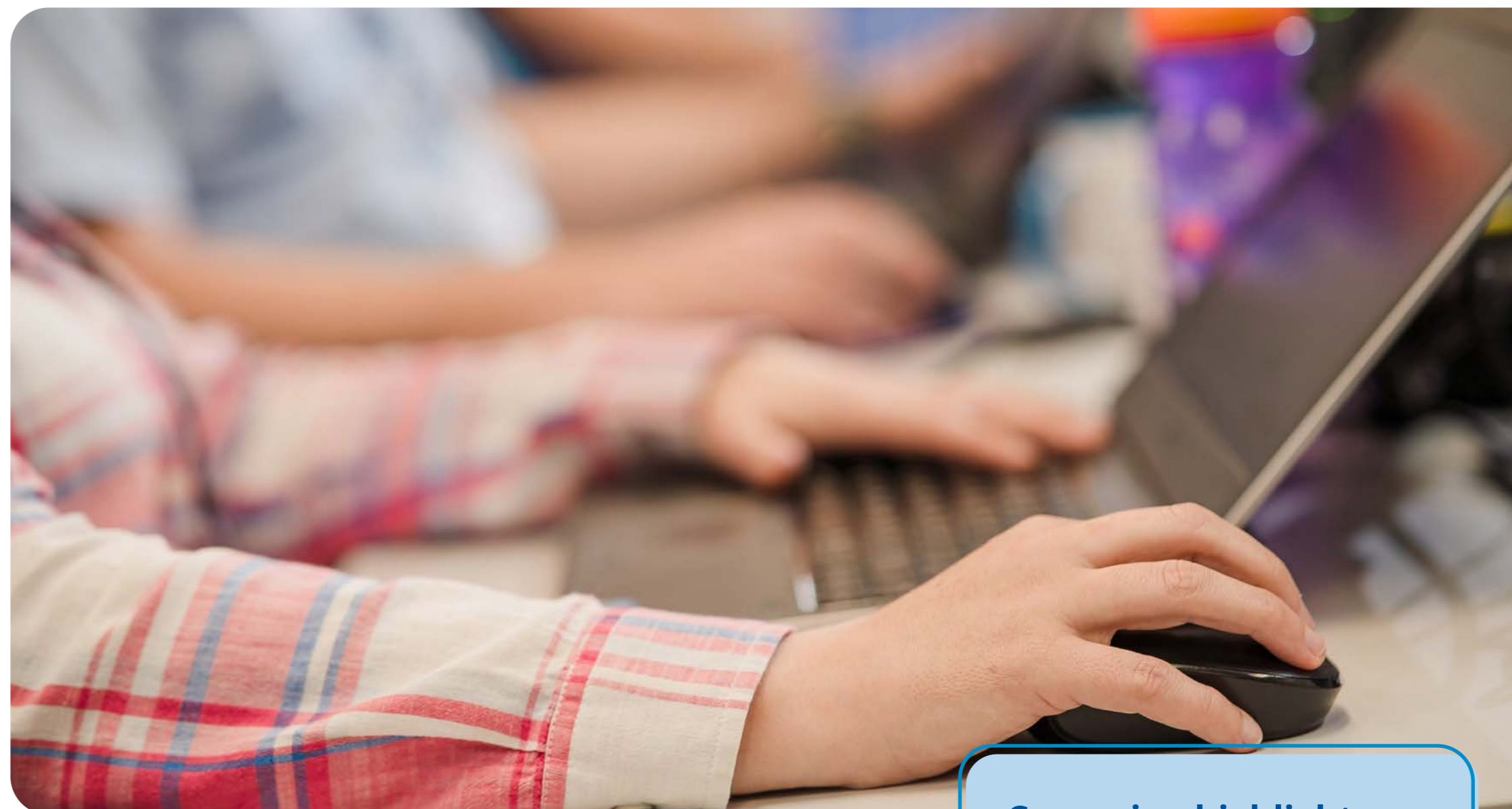
The guidelines followed by all professionals who use our Information Technology (IT) resources are set out in the Information and Cybersecurity Standard, approved by the Executive Board. The document aims to preserve the security and integrity of information. Noncompliance with any of the guidelines in this rule is grounds for applying disciplinary measures.

The governance of Information Security and Cybernetics, based on market methodologies and frameworks such as NIST, ISO27001, CIS, MITRE ATT&CK, COBIT, ITIL and CyQu, prioritizes and develops action plans; which include monitoring and frequent technology updates to reduce the likelihood of exploiting any vulnerabilities. Emphasis on perimeter protection solutions, network segregation, anomaly analysis,

device defense and event correlation, which continuously report data to the security operations center, responsible for making timely decisions to identify and contain threats. In addition, vulnerability analysis and simulations of ransomware-type attacks are carried out in order to assess the environment's detection and protection capacity.

We are also subject to risks associated with non-compliance with the General Personal Data Protection Law (LGPD/ GDPR) and may be questioned and adversely affected by the application of fines and other types of sanctions. In this sense, we execute previously defined action plans, under the supervision of Management, and continuously monitor sensitive personal data essential for the operation, aiming to fully comply with the guidelines of the respective laws.

The topic is periodically presented to the Audit and Statutory Risks Committee, Fiscal Council and the Board of Directors.



## Cybersecurity training

In 2022, we carried out the internal campaign “Safe Information”, which aimed to present preventive measures for information security and increase employee awareness regarding the importance of the proper use of logins and passwords, preventive care to avoid scams and fraud, attention to sensitive data and information, and guidelines for accessing reliable websites and applications on the internet.

### Campaign highlights:

**4** Cybersecurity topics

More than **33 thousand** views on topics related to the General Data Protection Act.

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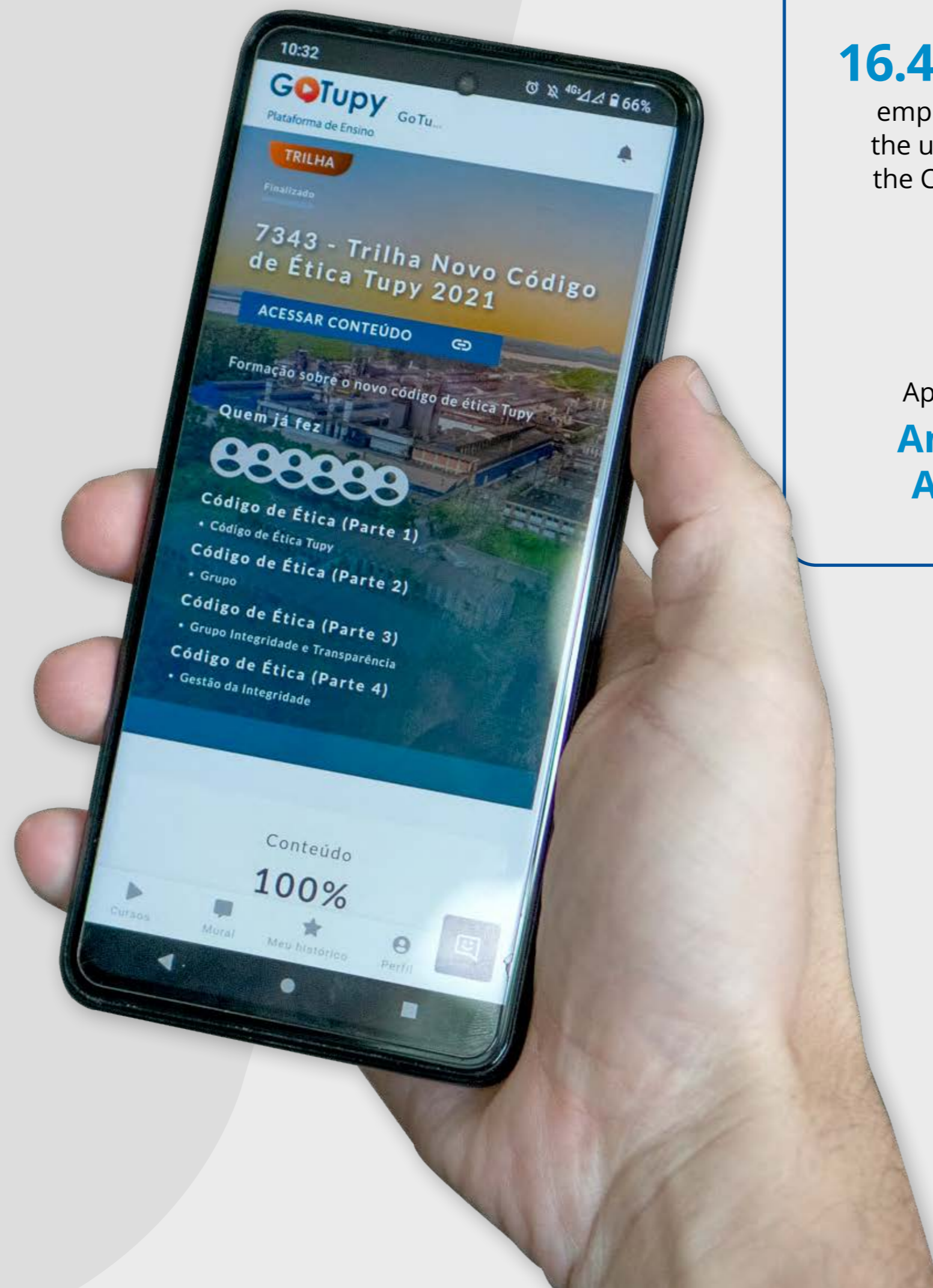
# Ethics and compliance

[ GRI 2-23, 3-3 ]

The solidity and longevity of our business are connected to the constant evolution of our Integrity Program, which involves all the publics with which we relate.

The Compliance area is responsible for improving existing initiatives and managing the Ethics channels and the Code of Ethics and Conduct, as well as the Integrity Program. To ensure its independence and impartiality, the area reports directly to the Board of Directors, through the Audit and Statutory Risks Committee, which monitors the quantitative and qualitative indicators of the Integrity Program every month, including reports of fraud and corruption.

Our ethical and integrity precepts are defined in policies and formal commitments and are disseminated through communication campaigns and periodic training.



## Highlights - 2022



**16.4 thousand**

employees trained on the updated version of the Code of Ethics and Conduct



**100%**

of employees aware of procedures and policies to combat corruption



Approval and disclosure of the **Integrity Policy**



Approval and disclosure of the **Anti-Corruption and Anti-Bribery Policy**



Adherence to the **Business Pact for Integrity and Against Corruption**

## Policies and commitments governing ethics and integrity issues

- **Code of Ethics and Conduct and its internal regulations**  
[Access here](#)
- **Anti-Corruption and Anti-Bribery Policy**  
[Access here](#)
- **Integrity Policy**  
[Access here](#)

Internal standards that guide issues of conflicts of interest, treatment and investigation of complaints and application of disciplinary measures.

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# Code of ethics

The dissemination and training of the new version of the Code of Ethics and Conduct were highlights in 2022. The disseminated content, in addition to reinforcing the guidelines, stimulated reflection on the importance of the topics addressed and their relationship with everyday life. Around 16,400 people participated in training on the document's principles and guidelines. Applicable to administrators, employees, suppliers and business partners, the Code of Ethics and Conduct is available on our website in five languages and clearly presents the values and ethical principles we value.

Employee training on the Code of Ethics and Conduct will be given every two years. The supplier training process regarding the Code of Ethics and Conduct, which began in 2022 and will continue in 2023, prioritized those with high risk in the first phase.

**Upon registration, all suppliers undertake to observe and comply with the principles and guidelines of the Code of Ethics and Conduct, through the general supply conditions and/or specific contract signed between the parties and; additionally, they formalize acceptance of the Code of Ethics and Conduct through the approval portal annually.**



Failure to comply with the provisions of the Code of Ethics and Conduct, internal policies, rules and procedures, or current laws may result, according to the seriousness of the act performed, in:

- **For employees:** application of disciplinary measures, which may vary from a verbal warning to termination of employment for just cause;
- **For third parties or intermediaries:** ranging from a warning and/or written notification to the interruption of the respective institutional and/or commercial relations, as well as the necessary legal measures.

## Our ethical principles

[Click here to read our Code of Ethics](#)

- 01 Promotion of Health and Safety;
- 02 Respect for Human Rights;
- 03 Respect for Work Relations;
- 04 Diversity and Inclusion;
- 05 Combating Harassment and Abusive Conduct;
- 06 Commitment to Sustainability;
- 07 Respect for Laws and Regulations;
- 08 Actions Without Conflict of Interest;
- 09 Responsibility in the Relationship with Third Parties;
- 10 Appropriate Use of Company Assets;
- 11 Secrecy, Privacy and Information Security;
- 12 Responsibility in the Disclosure of Information.

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# Whistleblowing Hotline

[GRI 2-26]

We provide the general public with channels for reporting conduct that is at odds with the law and with our ethical principles and internal rules, which are administered by an independent company, which adopts an international methodology for analysis, control and investigation, guaranteeing impartiality, reliability, anonymity and protection against retaliation.

Cases registered through these channels are forwarded to the Ethics Committee, formed by a group of executives appointed by the Board of Directors, whose main objectives are to promote ethical principles and expected conduct, as well as ensure their understanding and dissemination; update or modify its content and resolve on the complaints received.

The Audit and Statutory Risks Committee monitors the effectiveness of the Ethics Committee's performance in managing manifestations and complaints, and informs the Board of Directors about evidence of relevant error or fraud, which compromise the reliability of this governance.



**Ethics channels**

BRAZIL: **0800 721 7895**  
 MEXICO: **800 288 0150**  
 PORTUGAL: **800 180 431**  
 WEBSITE: **www.tupy.com.br/etica**  
 E-MAIL: **etica@tupy.com**

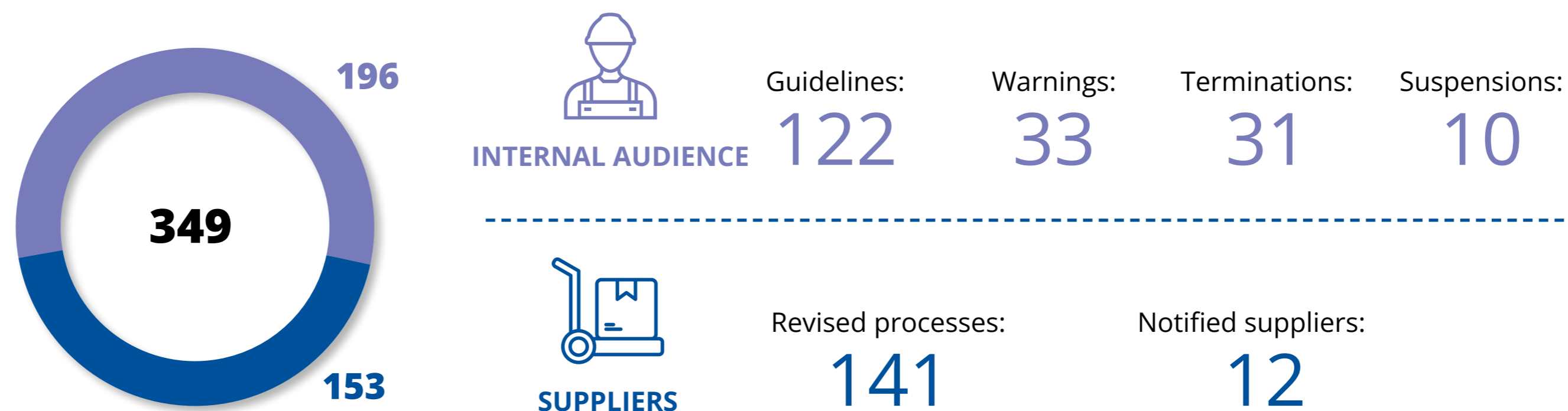
## Grievance Mechanisms

Grievance mechanisms	2020	2021	2022
Number of complaints identified through the mechanism	283	486	499
Number of complaints addressed	283	486	499
Number of complaints resolved	270	400	407
Number of complaints filed before the period covered by the report resolved during this period	69	106	153

Note: There were no confirmed cases of corruption. [GRI 205-3]

## Measures taken in 2022

For the cases decided as valid or partially valid, the actions were:



## Anti-corruption

[ SASB EM-MM-510a.1 ]

In 2022, we became signatories to the Business Pact for Integrity and Against Corruption, promoted by the Ethos Institute, reinforcing our commitment to the topic. In the same year, our Anti-Corruption and Anti-Bribery Policy was also approved by the Board of Directors. The document formalizes our guidelines regarding the fight against all forms of corruption and bribery, in addition to guiding employees.

**Throughout 2023, training and disclosures on this Policy will be carried out.**

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# 5 Value Generation Model

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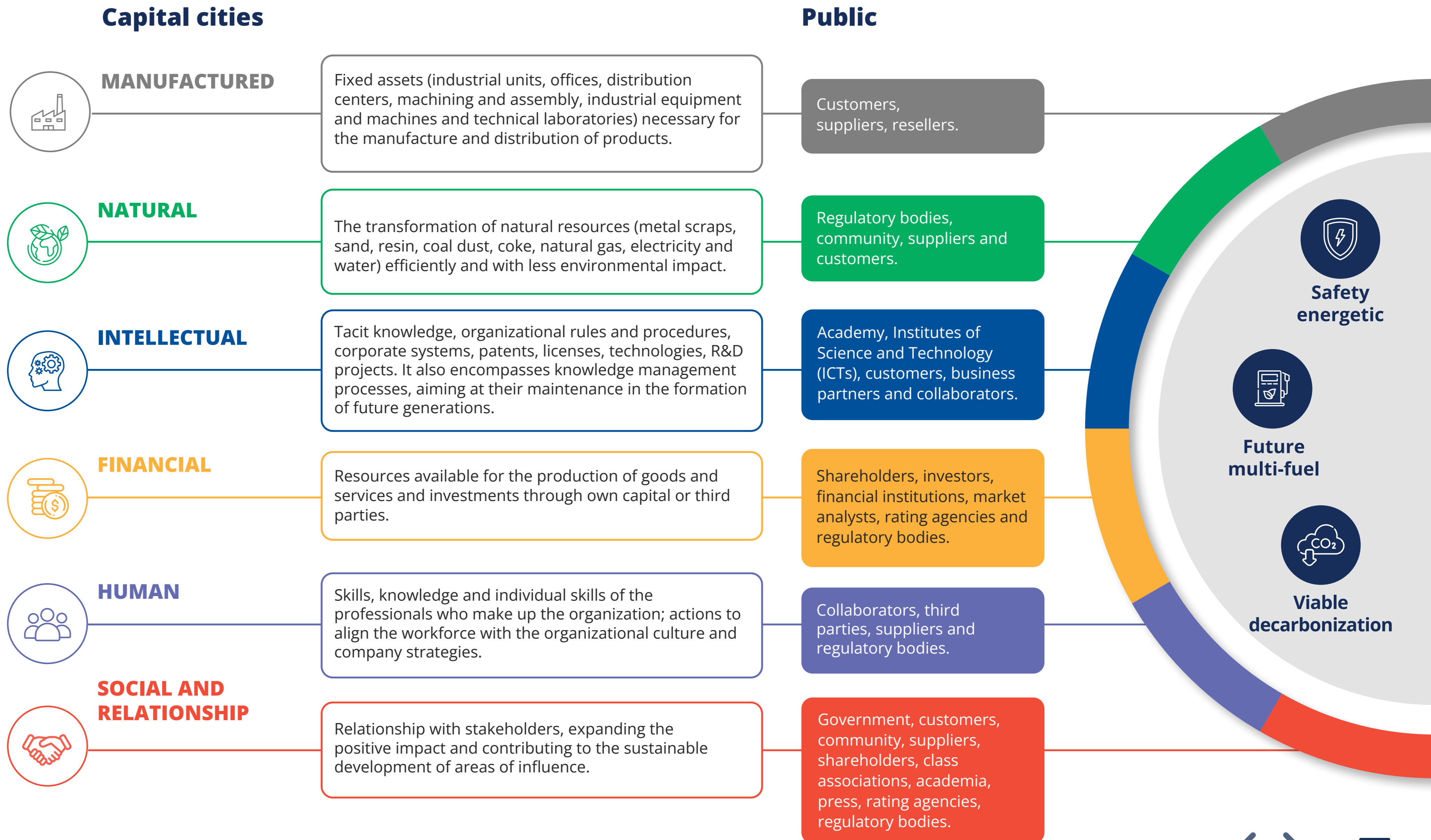




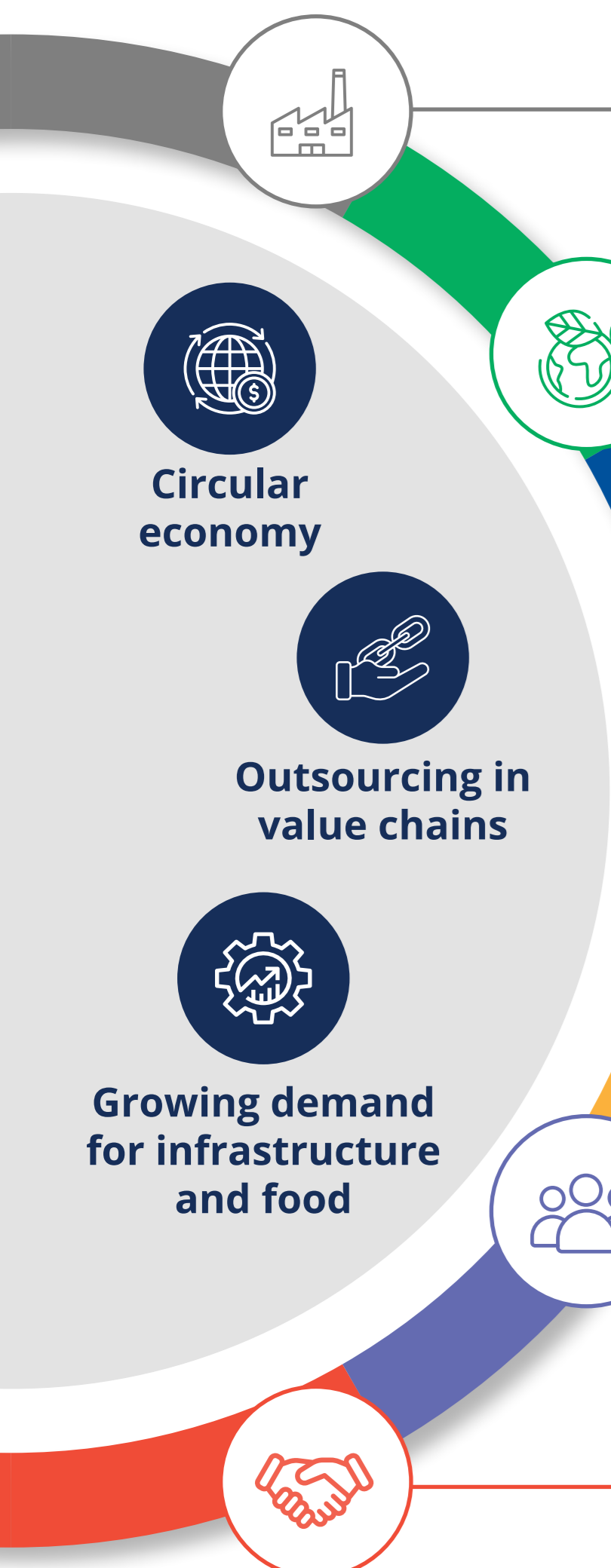
# Value Generation Model

In accordance with the methodology of the International Integrated Reporting Council (IIRC), we present the value creation process of our businesses over time. In this model, manufactured, natural, human, intellectual, social and relationship capital are classified.

These capitals, together, represent the inputs (resources) and outputs (impacts), as well as how they are transformed throughout the production cycle, allowing the achievement of the best results and the sharing of the value generated with all the parties involved (stakeholders).







## Impacts

- Products of high complexity of metallurgical engineering
- Products used in essential sectors for society
- Quality in products and processes
- Intensive use of energy and materials

- Consumption of natural resources
- GHG emissions
- Waste generation
- Change in air, water and soil quality
- Use of recycled materials
- Waste reuse and recycling
- Energy efficiency in machines, equipment and processes
- Environmental investments

- Investment in R&D and innovation in the transition to a low-carbon economy
- Cooperation agreements and strategic partnerships
- Fostering and generating new business
- Development and improvement of technologies that allow the use of available energies
- Dissemination of knowledge and training of professionals
- Support for scientific research in Brazil

- Perpetuity of the company
- Efficient use of resources
- Return to the shareholder
- Generation of shared value

- Generation of direct and indirect jobs
- Training of employees and third parties
- Health, safety and well-being of employees and third parties
- Occupational risks and diseases

- Private Social Investment
- Local community development
- Development and qualification of suppliers
- Tax payment
- Partnership with customers in the development of products and services
- Brand and reputation

## Forms of Value Generation

Solutions for the transport, infrastructure, agribusiness and power generation sectors.

Reduction in the consumption of natural resources, use of recycled materials, reuse and recycling of waste, and minimization of GHG emissions.

- Development of new products and solutions, with an enabling role in the decarbonization journey.
- Operational improvements through technologies and digital transformation.

It impacts other capitals, as it provides resources for investments and other activities related to the business. And, in the same way, it is impacted by the results generated by other capitals. The value generated is shared with all stakeholders.

- Talent development and expansion of individual knowledge.
- Promotion of health, safety and quality of life.

- Socioeconomic development through job creation, injection of resources into economies and social investment in the community.
- Brand and image management, which portray the organization's reliability and attractiveness.

## Indicators

- Equivalent production
- Total Physical Sales
- Investments in operational improvements
- Number of kaizen events

- Environmental investments
- % of materials of recycled origin
- % of waste recycled
- Recipe with byproduct
- GHG Emissions (Scope 1 and 2)
- Total energy consumed

- Investments in R&D
- % of investment in R&D dedicated to projects related to sustainability
- Number of intellectual properties

- Net Revenue
- EBITDA
- EBITDA Margin
- Net profit
- Return on invested capital (ROIC)
- Net Debt/EBITDA
- Investments

- Hours of training per employee/year
- Work accident rate
- Turnover rate
- Performance evaluation
- New hires

- Distribution of private social investment
- Number of projects implemented
- People impacted
- Number of employees
- Number of active suppliers



# 6 Human and intellectual capital



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# Health and safety [ GRI 2-23, 3-3 ]

## Management System

[GRI 403-1, 403-8]

The protection of the Health and Safety of our employees are non-negotiable values. We have an integrated policy, which highlights the importance of this issue for our operations.

Since January 2022, we have had a corporate board for the Health, Safety and Environment (HSE) areas, as an integral part of the People and Organizational Human Development (DHO) area. The structure gave even more relevance to the theme, contributing to the definition of priorities and the establishment of preventive actions, which are constantly being monitored, aiming to promote a healthy and safe work environment.

Our health and safety management system covers all operations as well as our employees, third parties and all people who access our facilities. In the case of outsourced workers, the contracts include the obligation to comply with legal requirements and our safety procedures.

**We maintain ISO 45001 certifications for health and safety management systems at the operating units in Betim, Brazil, and Aveiro, Portugal. For 2023, investments of approximately R\$ 28 million are planned, aimed at preventing accidents and improving working conditions.**

## Occupational accidents [GRI 403-9]

We monitor performance indicators on a monthly basis, including frequency and severity rates, as well as high-impact accidents. These indicators are presented weekly to senior management.

We adopt rules and procedures defined based on current legislation, good safety practices and the characteristics of each activity. We believe that life is our most valuable asset, which is why we also have "Golden Rules". Non-compliance with any of them is considered a serious misconduct and subject to punishment, according to the disciplinary code.

We also have several forums for discussing health and safety issues, such as the high potential event prevention committee, weekly leadership meetings, Merger Safety Committee, daily operation meetings, among others.

Additionally, we conduct routine audit and inspection

programs, among which stand out: behavioral observations, safety walks, safety blitz, inspection of critical equipment and emergency systems.

In 2022, we recorded an increase in the number of hours worked and accidents at work with mandatory reporting due to the inclusion of the units in Aveiro and Betim.

Tupy recognizes that it needs to go even further with this issue, and is committed to ensuring a healthy and safe environment. To reduce accidents at work, specific actions were carried out, with emphasis on the installation of safety locks and devices for handling parts and equipment, improvements in electrical installations, installation of barriers and electronic and physical protections, in addition to training and awareness actions, workplace audits to identify and correct possible risks and behavioral observations.

Occupational accidents <sup>1 2</sup> - employees <span>[GRI 403-9]</span>	2020	2021	2022
Number of hours worked	20,825,972	29,781,718	37,619,498
Number of deaths resulting from occupational accidents	0	2	0
Rate of deaths resulting from occupational accidents	0.00	0.07	0.00
Number of occupational accidents with serious consequences (except deaths)	4	6	1
Rate of occupational accidents with serious consequences (except deaths)	0.19	0.20	0.03
Number of mandatory reporting occupational accidents (includes deaths)	277	398	525
Compulsory report of accidents at work (includes deaths)	13.30	13.36	13.96

1. The calculation of the accident rate is obtained by the number of occurrences x 1,000,000/number of hours worked. Information referring to occupational accidents does not include workers who are not employees.

2. In 2022, the concept was implemented that considers an occupational accident with serious consequences to be those that cause fatality or permanent disability.

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# Risk assessment and prevention systems

[ GRI 403-2, 403-5, 403-7 ]

We identify hazards and assess risks in our operations – both in routine and non-routine activities. We define priorities and action plans to control risks with potential impacts on health and safety.

Risk analyses are updated whenever changes occur in processes that may impact the health and safety of our employees.

Non-routine activities are only carried out after assessing the associated risks and completing the Special Work Permit. Routine activities, on the other hand, respect work instructions that describe how the activities must be performed as well as the control measures to be followed to prevent occupational accidents or illnesses.

New employees undergo health and safety integration programs. In addition, some operational areas offer Acclimatization and Knowledge Fusion Programs, strengthening topics related to the safe operation of our processes. In addition to integration and onboarding training, our employees undergo periodic refresher training on important health and safety topics. Specific training is also given when required by the role.

In addition, periodic awareness campaigns are also carried out, reinforcing several relevant health and safety topics. We also demand that contracted companies train their employees as well.

Our units have emergency response plans, as well as properly trained and equipped emergency brigade structures, which work to prevent and respond to environmental and occupational incidents. We carry out simulations to continuously assess and improve our response capacity in light of possible emergency scenarios.

## Collaborative Safety

In addition to the systematic monitoring of health and safety risks, our employees are encouraged to report deviations or incidents that could become accidents. Communication is done through forms made available at strategic points and which guarantee the anonymity of the person who made the report.

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# Health and wellness

[ GRI 403-3, 403-6 ]

Our health service is made up of internal outpatient clinics and specialized, trained teams, which work 24 hours a day, all year round, and serve both our own and outsourced employees.

Within the scope of our Occupational Health Medical Control Program, we developed campaigns throughout the year, disseminating information on disease prevention and healthy habits. Some examples of these campaigns include: combating dengue, musculoskeletal diseases, vaccination against influenza, healthy eating, prevention of high blood pressure and obesity, eye health, mental health, and women's and men's health. In addition, in Joinville (BR), our employees are assisted by the nursing team during pregnancy and postpartum.

We also seek to identify, through occupational consultations, the most common and chronic pathologies, such as high blood pressure, diabetes, obesity, respiratory diseases, among others. This allows us to guide the initiatives we undertake internally and the benefits offered, such as the health plan for regular appointments and routine exams. Additionally, all employees are covered by life insurance, with extensive coverage in an accredited and recognized network in the market.

A healthy lifestyle is also encouraged through leisure and cultural and sports programs. In Joinville, employees have access to an athletic association that offers a gym, sports courts and space for events. Every year there is a brigade competition, bicycle rides and several other activities. At our units in Mexico, we promote cultural events and sports tournaments, in addition to campaigns open to employees' families.



## Employee participation

[GRI 403-4]

The participation of workers in occupational health and safety (OHS) management is necessary for the development, planning and performance evaluation of management system improvement actions.

In Brazil, we have the internal Accident Prevention Committee (CIPA). In Portugal, there is the Commission for Safety and Health at Work (CSST) and the Workers Commission (CT). In Mexico, we maintain the Joint Safety and Hygiene Committee. These committees meet monthly, promoting discussions and proposing actions aimed at preventing occupational accidents or illnesses.



**The program, launched in 2022, reinforces Tupy's commitment to the overall health of its employees, promoting well-being and mental health actions.**

### Health and safety tools available to employees

- Safety Committees;
- Daily Safety Dialogue (DDS);
- Campaigns and training;
- Safety walks;
- Recognition of accident-free days;
- Participation in the investigation and analysis of occurrences and preparation of the corrective and preventive action plan;
- Participation in determining actions to reduce/eliminate risks;
- Weekly Safety and Environmental Report (RSSA) weekly meetings;
- Channel and Code of Ethics and Conduct;
- Forms for recording unsafe conditions and near misses; and
- Internal communication channels: green boards (physical), Communicating (e-mail), Tupy-On (app) and Intranet.



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# People management [GRI 3-3]

Among our values, people come first. This is because our human capital allows us to evolve, transform ourselves and achieve our purpose. We offer a healthy and safe environment for our teams to develop their work, be recognized, acquire knowledge and be respected in all their diversity.

We generate more opportunities and direct and indirect jobs. When compared with the previous year, we grew 21%. This means that we started to employ almost 5,000 more people – mainly due to the operations that we are considering in this report –, also benefiting their families and local economies.

**We integrated new employees - units in Betim, Aveiro and offices, as well as MWM do Brasil - incorporated into the culture, rules, policies and benefits.**

Annually, we carry out the talent and leadership management cycle, which evaluates the operational performance and the potential succession of employees. As a result, more than 2,000 people were promoted internally, equivalent to around 10% of employees.

**Our workforce:**  
**19,155<sup>1</sup>** employees are in our operations and offices

1. In this total, we consider collaborators (employees), interns and apprentices, who belong to the category of workers, to whom we extend the same benefits and treatment offered to the other functional categories.



## Employee information



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# Development and retention

We value learning and innovation at all levels, with a collaborative environment in which internal and external exchanges of knowledge and the search for solutions for continuous improvement are encouraged. Therefore, we continuously expand actions in education and training.

In 2022, we resumed our training schedule, which had been impacted by the Covid-19 pandemic restrictions. Priority was given to training in safety and health, as well as the development of leaders, mainly in the operational areas.

**In all, 4,508 training sessions were carried out, totaling 388,952 hours of training**

We reviewed training content to ensure it covered the latest organizational competencies. An important transformation in the Tupy Training program was the launch of the GoTupy e-learning platform, in July last year.



Average hours of training per year, per employee <sup>1</sup> [GRI 404-1]	2020	2021	2022
BY GENDER			
Men	9.53	30.63	20.30
Women	8.67	18.67	23.97
BY FUNCTIONAL CATEGORY			
Directorship	3.27	-	13.92
Management	11.38	10.29	43.88
Leadership/Coordination	12.06	8.83	39.83
Technical/Supervision	11.29	20.34	32.41
Administrative	10.33	13.58	20.11
Operational	9.31	31.45	19.13
<b>TOTAL</b>	<b>9.47</b>	<b>29.71</b>	<b>20.57</b>

1. For training hours, all employees who attended the actions are considered, and the total hours per employee considers the workload/number of participants.

## Qualification and training projects

### EJA

Our commitment to education includes the inclusion of employees who have not completed elementary school. In 2022, 61 employees graduated from Youth and Adult Education (EJA), through the partnership with SESI which, since 2006, has already benefited around 1,400 people.

### MBI Foundry 4.0

To enable our workforce to promote the digital transformation journey, we held the Master in Business Innovation (MBI) in Foundry 4.0. The course addresses concepts of innovation and technology applied to Industry 4.0. Specialization began the previous year, with 47 professionals impacted and who will graduate in 2023.

### Technical education

Other complementary fronts of technical development are the internal Machining, Foundry and Maintenance schools. The latter had a strong role in the development of employees at the units in Mexico, with a total of 576 people trained. In addition to internal schools, we have partnerships with external institutions for Technical Level training in the areas of Foundry and Metallurgy in Joinville, Maintenance and Electrotechnics in Betim and metallurgy in the Mexican units.

### Portuguese for foreigners

Regarding cultural diversity, we offer Portuguese language classes for employees from other countries. In 2022, 43 employees graduated from the Portuguese for Foreigners course, also held in partnership with SESI.

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## Future leadership

The leadership training cycles are aimed at all hierarchical levels and had, in 2022, the participation of 920 people, 620 in Brazil and 300 in Mexico. New for the year was the First Leadership training, focused on coordinators. The program, whose objective is to prepare new leaders for their challenges, involved the participation of 14 employees at the Joinville unit.

### Digitization of communication and internal training – Launches 2022



The launch of the TupyOn app intensified our internal communication, strengthening transparency, agility and interaction. The app uses gamification to make the internal public aware of various topics, including information security. The 97% adherence in Brazil demonstrates the satisfaction of employees with the new channel.



Teaching Platform

A highlight in 2022 was the launch of the GoTupy e-learning Training Platform, which allowed us to further stimulate the learning and development of our employees, promoting autonomy and facilitating knowledge management. For 2023, it is planned to expand the courses offered on the platform.

## Performance Management

[GRI 404-2]

Competences guide the development processes of employees and are aligned with the challenges faced in the markets in which we operate. For this reason, the performance evaluation system for our employees involves individual goals in carrying out their work, as well as the behavioral skills and adherence of each professional to our values and challenges. The process involves the steps of self-assessment, assessment by the immediate manager, presentation of the result to a joint committee and feedback to the employee.

For leaders, we are implementing specific development actions for 2023, including a training roadmap for management and the adoption of actions that improve the experience of employees. In parallel, we are also developing individual development plans for employees, as well as professional development tracks.

### New talents

Our trainee program lasts 15 months, during which young professionals get to know our business, working on different projects and leading initiatives in their areas. For this, a development track was created that includes training on the markets in which we operate, digital transformation, sustainability, operational excellence, metallurgical processes, leadership and culture, in addition to specific knowledge according to each one's area of activity.

During the year, we also carried out selection processes for the Young Apprentice program, carried out in partnership with the National Industrial Apprenticeship Service (Senai). The program offers free theoretical training in Quality, Machining and Administrative Routines.

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## Compensation and benefits

[GRI 401-2]

We recognize and reward the performance of employees according not only to the result and delivery of each person, but also to their area and team. Our compensation package covers 100% of the workers and is made up of a fixed part and a variable part, based on indicators and strategic targets for individual performance and the performance of the organization.

In addition to the benefits guaranteed by law or by Collective Agreement, our employees and dependents have:

- Health care;
- Dental assistance (subscription);
- Private pension plan (subscription);
- Life insurance (subscription);
- Meal and food allowances;
- Extended maternity leave;
- Internal clinic;
- Participation in variable remuneration.

**Associação Atlética Tupy (AAT) is located in Joinville (SC), open to employees, their families and the community. The recreational area, with more than 60,000 m2, has infrastructure for the practice of various sports, in addition to coworking, an inclusive walking track, movie theater, bee garden, sports courts, restaurant, gym and playground.**

## Private pension

[GRI 201-3]

We offer a private pension plan for all our industrial units and offices, with the exception of the plant in Portugal. In Joinville (SC) and São Paulo (SP), it is managed by BrasilPrev. In Betim (MG), by Itaú Vida e Previdência; and, in Mexico, by IXE Banorte.

Employees who have been with our team for at least seven years are entitled to a full withdrawal from social security after leaving. The percentage of the salary contributed by the employee varies from 1% to 10%, depending on the location where he/she is allocated and his level of activity.

Employee participation levels:

Betim:	Joinville:	Mexico:
<b>3.52%</b>	<b>24.44%</b>	<b>11.26%</b>



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# Diversity and inclusion [GRI 3-3]

We respect and value diversity, ensuring equal opportunities and fair treatment for all, regardless of ethnicity, nationality, race, gender, age, sexual orientation, religious belief and physical ability. Therefore, we seek to provide a healthy, safe and inclusive work environment, in which people can express themselves and exchange experiences and stories, which is always enriching for everyone.

Some of the highlights of 2022 were the inclusion of the diversity and inclusion theme in our Leadership Development Program; the adoption of an action plan for attracting talent; and training in Brazilian Sign Language.

For 2023, we are planning to carry out a Diversity Census, which will contribute to the creation of a specific policy for the theme, establishing guidelines and actions that can increase our creative and innovative potential, through diversity and inclusion.

### Multinational team:

Diversity also applies to opportunities for employees from other countries. In 2022, we employed people from 26 nationalities.



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## Employee participation

In 2022, we hired more women and made progress in terms of gender diversity in management positions compared to the previous year. In technical and supervisory positions, the variation was also positive, increasing from 2.26% to 5.49%. It is also possible to perceive a greater balance in the attraction of young talents, interns and apprentices, in which the percentage of women is 53.33% and 50.98%, respectively.

The Tupy Women Program, created in 2022, includes:

- **Attracting and retaining talent:** expanding the offer of opportunities and carrying out a dedicated development program. In 2023, two initiatives will be launched: the Management Training Program; and the Empowerment Program.
- **Positive and inclusive work environment:** evaluation of jobs and working conditions. One of the results of this process was the installation of a nursing room as a pilot project at the Joinville unit, inaugurated in March 2023.

The plan is to substantially increase female representation across the workforce by 2026.

### Diversity by functional category and gender (%)

[GRI 405-1]

	2020		2021		2022	
	Men	Women	Men	Women	Men	Women
Directorship	90.91	9.09	100.00	0.00	100.00	0.00
Management	92.65	7.35	90.12	9.88	89.09	10.91
Leadership/Coordination	85.21	14.79	88.44	11.56	88.83	11.17
Technical/Supervision	98.10	1.90	97.74	2.26	94.51	5.49
Administrative	72.21	27.79	73.87	26.13	70.94	29.06
Operational	94.01	5.99	93.67	6.33	93.88	6.12
Interns / Trainees	0.00	0.00	66.67	33.33	0.00	0.00
Interns / Trainees	60.00	40.00	54.17	45.83	46.67	53.33
Apprentices	41.53	58.47	38.62	61.38	49.02	50.98
<b>TOTAL</b>	<b>91.76</b>	<b>8.24</b>	<b>91.72</b>	<b>8.28</b>	<b>91.96</b>	<b>8.04</b>



### Combating discrimination

In updating our Code of Ethics and Conduct, we reinforced the importance of respect for diversity. It is clear that we do not tolerate discrimination based on race, ethnicity, gender, sexual orientation, religion, origin, social class, age, nationality, physical ability or any other diversity, visible or otherwise. In training related to the code, we reinforce the channels for reporting these acts.

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# Innovation and technology

[GRI 3-3]

Our knowledge base is metallurgy. From it, we think about the properties of materials, the interaction between them and the most diverse applications in different markets. This has enabled us, throughout our history, to serve customers from various segments.

For a company to remain in the market for 85 years and continue innovating, it is necessary to develop other competencies, technologies and skills. For this, we always invest in our innovation ecosystem. Whether in partnerships with universities, which began in the 1970s, or in the development of solutions in partnership with our customers, or in the opportunities for continuous improvement identified from the collaboration between our areas.

As sustainability, innovation and technology are not isolated areas, as they permeate all internal processes and are intrinsic to our strategic planning.

## Excellence operational

### Development process

The partnership between our customers and our team of technicians and engineers begins in the initial stages of projects, covering the Research and Development (R&D) and production phases; complex steps involving product geometry, failure analysis, casting process simulation, approval and manufacturing. It also includes rigorous verification of the raw material to be used (scrap, pig iron, ferroalloys), as well as strict quality control. In addition to co-development, our team is dedicated to the development of new metal alloys, processes and applications, including evaluating the reduction in the use of natural resources, greater energy efficiency and competitiveness.

Our research team has the support of its own laboratories and partnerships established with universities around the world in the quest to meet the technical specifications of customers with excellence, respecting the standards of each sector, and the usability of the product, both in terms of quality and safety.



### Certifications

We have certifications in the IATF 16949, ISO 9001 and ISO 14001, ISO 50001 and ISO 45001 standards. In addition to the certifications that attest to the quality of our management systems, the pipe fittings that we manufacture and sell comply with national and international technical standards and we have certifications for specific products, which are mentioned in the description of each part.

**+ 2.5 thousand** technicians and engineers

**44** own laboratories

**19** Alloy Combinations

See our certifications by accessing the website.

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## Continuous Improvement



We maintain a continuous process improvement program and people training in order to reduce waste, generate efficiency and contribute to better performance. The methodology applied is the Tupy Production System (SPT), based on the concept of Lean Manufacturing and the theory of constraints. The methodology covers six pillars – safety, productivity, customer service, lead time, flexibility, quality and environment – which are supported by continuous improvement tools such as kaizen, 5 Senses Program, Creation Program, Communication, Training and Six Sigma . The basis of the SPT is constituted by the commitment and effort of each one of our collaborators.

Already adopted at the Joinville, Ramos Arizpe and Saltillo units, the System began to be implemented in Betim in 2022. To this end, there was a strong effort to train operational leaders, with more than 2,840 hours of training, 25 kaizens and the development of a model area.

### SPT Actions in 2022

**77%**  
improvements implemented in the process;

**58**  
kaizen events;

Recognition based on bronze, silver and gold certifications in **5 Senses methodology**;

More than **6.7 thousand hours** of training in leadership, methodologies and operational routines;

**57 projects** implemented, focusing on safety, ergonomics, quality and productivity.

## Product Safety and Quality

The care and attention to the quality of the products we develop are reflected throughout our production chain. To ensure that all stages are carried out with excellence, we annually invest in training and updating our employees. Last year, **10,972 hours of training** were given on topics related to product quality and safety, including Internal Audit, Standards and ISO, Methodologies and procedures, techniques, quality controls and product specifications.

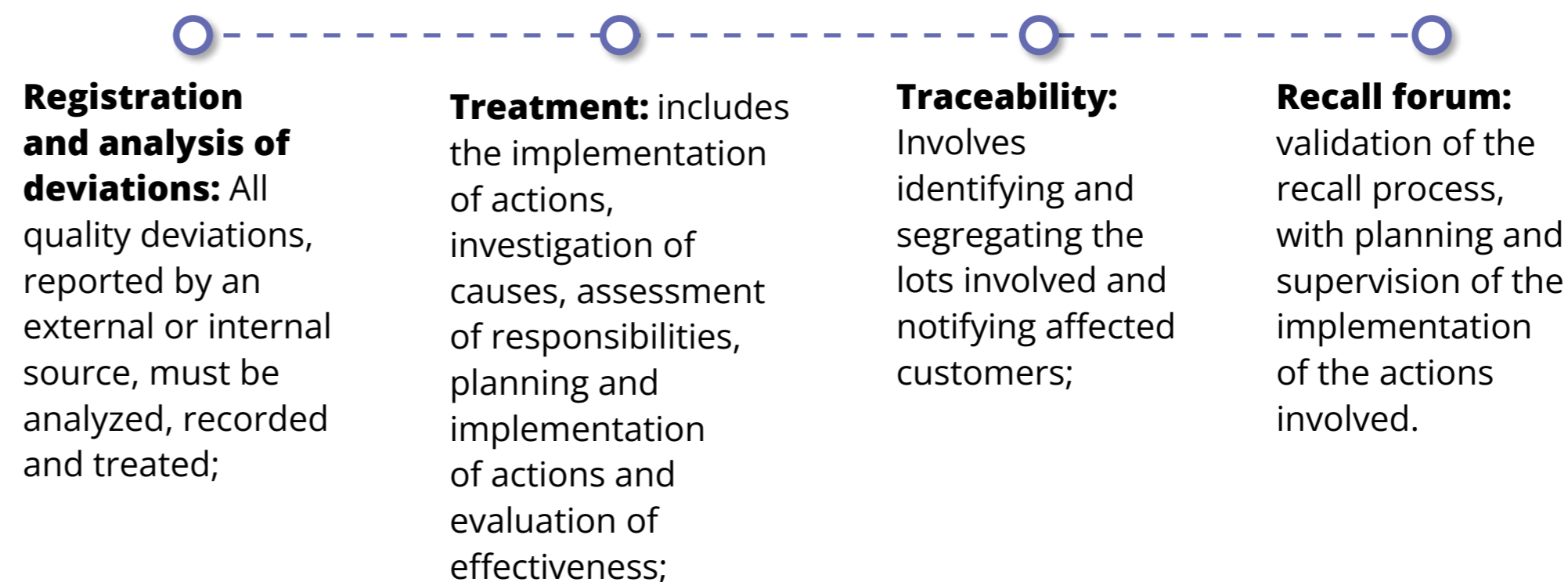
Our Recall Policy, published in 2021, establishes the guidelines for the quality and safety of the products we supply, in addition to defining the activities to be adopted to prevent potential risks to the safety and health of consumers or material damage to their property.

**In 2022, there were no cases of recalls and costs related to the replacement of components and parts on a large scale.**

The policy guidelines are as follows:

- Appropriate communication with interested parties, including customers, suppliers and regulatory authorities;
- Interruption of the production process, distribution and sale of affected products;
- Removal of affected products from the market, stocks and distribution centers;
- Correct disposal of affected products;
- Analysis of the causes of the defect and implementation of the necessary actions to prevent its recurrence;
- Conducting a post-recall critical analysis to assess the effectiveness of the entire process.

### Recall process



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# Tupy Tech

Focused on disruptive Research and Development (R&D) projects, Tupy Tech leads technological development initiatives in research fields that have synergy with our strategic planning. The projects rely on the engagement of internal and external specialists, masters and doctors - through partnerships with other companies, universities and technological institutes. In addition, we interact with entities that promote technical discussions relevant to the development of the sectors in which we operate. In 2022, for example, we joined the Alliance for Hydrogen Engines (Allianz Wasserstoffmotor), in Germany, which promotes the use of hydrogen as a fuel for automotive engines.

All projects are also premised on the three major axes of technological investment - Energy Efficiency; Use of viable and available energy sources; and New Technologies.

Read more in the chapter - The New Tupy



## Research and development expense

Last year, we invested

**R\$ 36 million**

in research and development, an increase of 10 million reais compared to 2021. Of this amount, 57% was dedicated to projects related to sustainability. For the coming years, our objective is to continuously increase investment in cleaner technologies and ensure that at least 70% of these resources continue to be applied to developments connected to our sustainability strategy, both in our internal processes and in the solutions we offer to the market.



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# Tupy Tech Projects

## Battery recycling:

The project conducted in partnership with the Polytechnic School of the University of São Paulo (USP) has advanced and is about to start the development phase on a pre-industrial scale, which is fundamental for its production and commercialization. The object of study is hydrometallurgy, a chemical process that uses less energy than conventional means of recovery and allows greater reuse of materials – including lithium, which is not restored in pyrometallurgy (conventional process). In addition, it is possible to significantly reduce (by more than 70%) CO2 emissions in the process, increasing the recovery rate of rare metals by more than 90%; which reduces the environmental impact of producing new batteries, as it reduces dependence on mining.



Technological Readiness Level (TRL)



Click [here](#) to learn more about the project.



TUPY



## Hydrogen-powered engines:

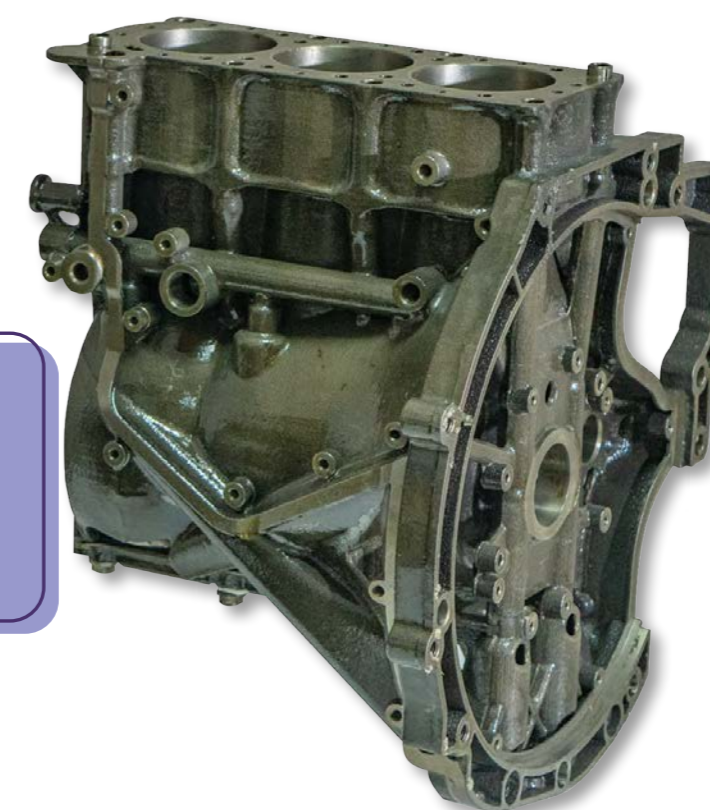
this initiative also gained momentum in 2022. This involves transforming a series diesel engine for trucks into hydrogen (through design, simulation and testing activities) using high-pressure hydrogen injection. This gives these vehicles the possibility of increasing efficiency, while at the same time contributing to eliminating CO2 emissions into the atmosphere. The project is carried out in partnership with the engine company AVL (Austria) and the producer of nozzle-injectors for internal combustion engines Westport Fuel Systems (Canada). To deal with the material challenges, we started a project with the Technological Research Institute (IPT) and the Brazilian Company for Industrial Research and Innovation (Embrapii) to study metal corrosion caused by hydrogen (which can reduce engine durability) and the development of a high-strength alloy that provides hydrogen combustion engines with the same durability as diesel engines.

Technological Readiness Level (TRL)



Click [here](#) to learn more about the project.

See the block in detail and in augmented reality, here.



## Ultra Light Iron Technology:

the combination of thin-walled casting with high-strength alloys makes it possible to produce structural parts in cast iron with the same weight as aluminum. This is Ultra Light Iron Block, an engine block specially developed for small engines running on gasoline, ethanol or synthetic fuels, as well as hybrid applications. The project was carried out in partnership with the automotive engineering company Ricardo PLC (United Kingdom) and SinterCast (Sweden), specialized in technologies related to vermicular cast iron (Compacted Graphite Iron or CGI). In 2022, the development phase was completed and the design patent filed. The initiative was presented firsthand at the 43rd edition of the International Vienna Motor Symposium, which annually brings together the main global players in the automotive industry. The advantages of this application compared to aluminum are:

- Same weight level
- Noise and vibration reduction
- CO2 reduction in production (-50%)
- Cost reduction (-25%)

Technological Readiness Level (TRL)



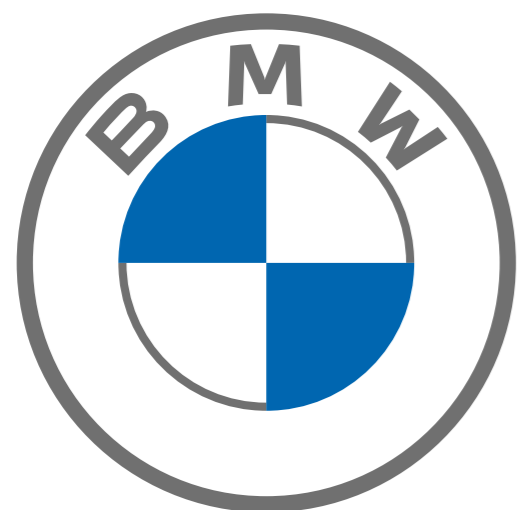
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# Tupy Tech Projects



## Resynthesis of materials:

As a result of a partnership with the National Service for Industrial Learning in Paraná (Senai-PR) and BMW, this project is aimed at resynthesizing recycled material from batteries, i.e. obtaining cells as good as new ones. In this way, it is possible to recover lithium, nickel, manganese and cobalt and ensure that they have the appropriate degree of purity. This is essential so that a battery made from 100% recycled material has the same performance as one made from freshly mined minerals. By reducing demand for extraction, the initiative lessens the environmental impact of battery production.

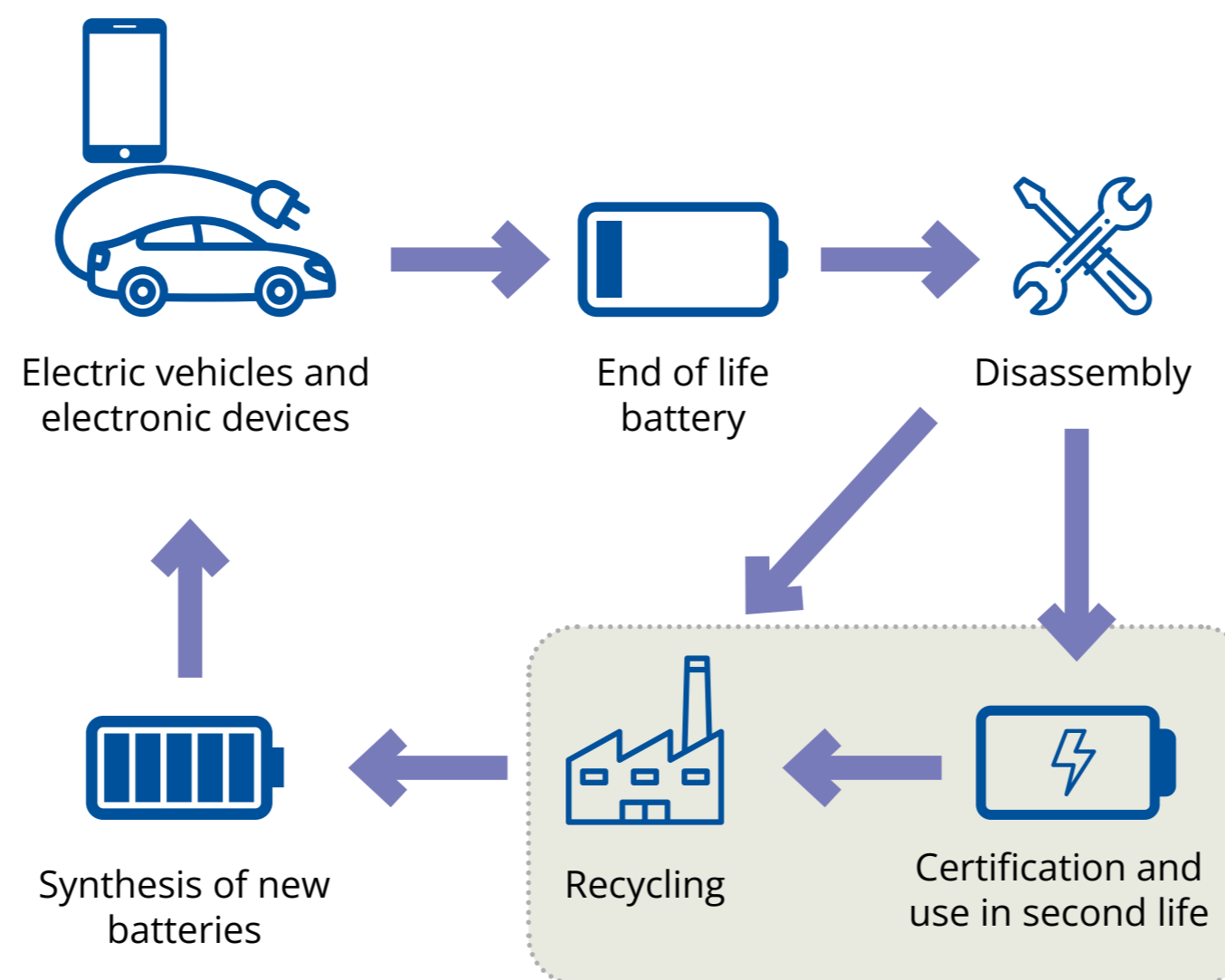
Technological Readiness Level (TRL)



Click [here](#) to learn more about the project.

## Reuse of electric vehicle batteries:

involves repurposing batteries at the end of their first useful life for stationary applications such as battery banks and supporting intermittent energy such as solar and wind. This project, developed in partnership with Senai-PR and Embrapii, makes it possible to technically analyze the battery cells or modules and identify whether they are qualified to be reused. With this, it is possible to extend their useful life by at least another 5 years before they are sent for recycling.



Technological Readiness Level (TRL)



Click [here](#) to learn more about the project.



## Biomass briquettes:

in partnership with Senai in MG, USP and UFMG, we started the project to develop biomass briquettes to replace mineral material in their ovens – thus reducing the carbon footprint of the production process.

Technological Readiness Level (TRL)



Click [here](#) and access.

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# Tupy Up

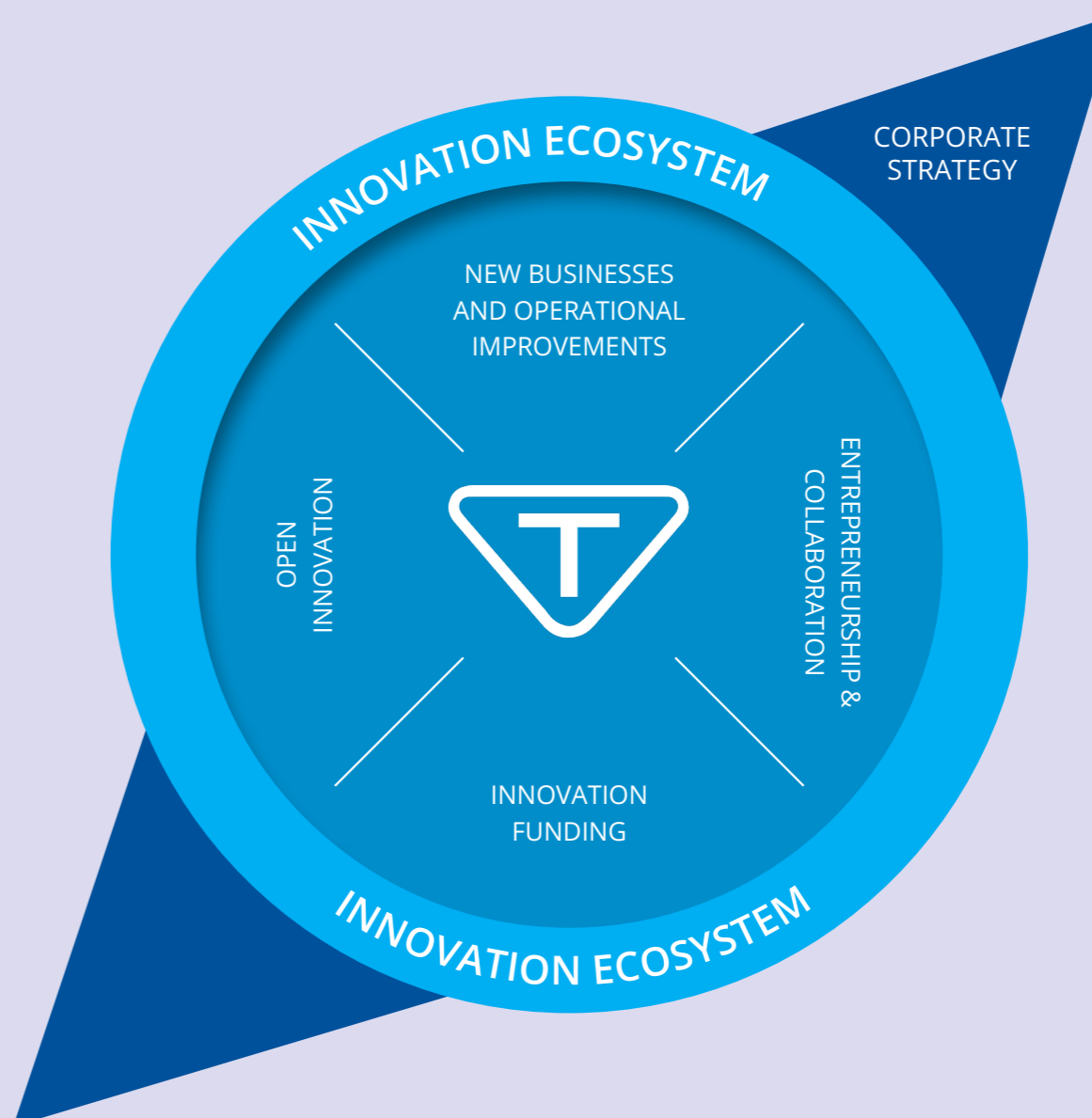
Focused on creating a culture of innovation and digital transformation, Tupy Up aims to convert and scale new business opportunities or improve existing ones through digitalization, innovation and collaboration – internal and external.



## Innovation

Tupy Up works in coordination with our ecosystem through LABs, the platform of our innovation process that operates in four dimensions: open innovation; intrapreneurship & collaboration; promotion; and generation of new business & operational improvements.

### Corporate Innovation Process



LABs was recognized in 2022 with the Innovation Award from Santa Catarina Professor Caspar Erich Stemmer, granted by FAPESC, an institution that promotes innovation in Santa Catarina. In addition, the process contributed to our inclusion in the Valor Inovação Brasil ranking, which brings together the 150 most innovative companies in the country.



The advancement of innovation products generated from LABs, during 2022, demonstrate Tupy Up's consistency and strength as a link between internal and external competences, involving universities, research institutes, startups, students, communities, public authorities, partners and suppliers, among others.

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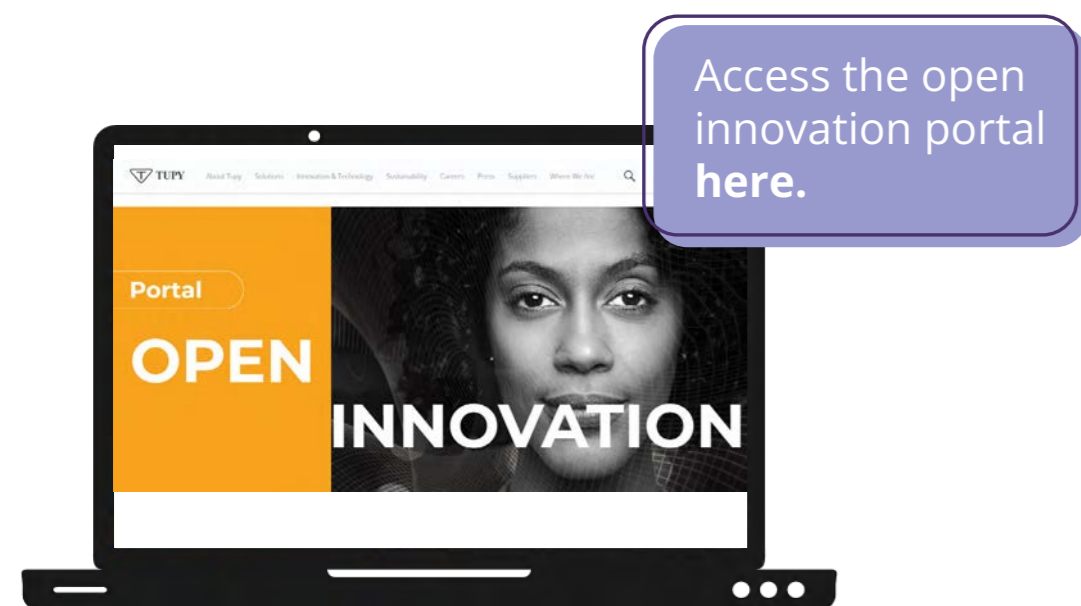




## OPEN INNOVATION PORTAL

It allows us to share relevant challenges faced by our businesses, stimulating the proposition of viable solutions. The methodology filters the proposed solutions and, when feasible, forwards them to the proof of concept or implementation phase.

Since its creation in 2021, the Open Innovation Portal has received more than 80 proposals, six of which are in the proof of concept phase. The solutions were shared by several players in this ecosystem, 39% were startups; 29%, research institutes; 28%, technology companies; and 4%, employees.



Access the open innovation portal [here](#).

## CREATION PROGRAM

Focused on internal innovation, the **Creation Program** was updated in 2022. With 25 years of existence, it is one of the oldest continuous improvement initiatives applied uninterruptedly in Brazil. With the revision, the program began to operate digitally, through the TupyOn corporate application, and received adjustments in its format to cover more modern innovation and intrapreneurship practices. During the year, 1,897 innovations were implemented and registered by the Program.



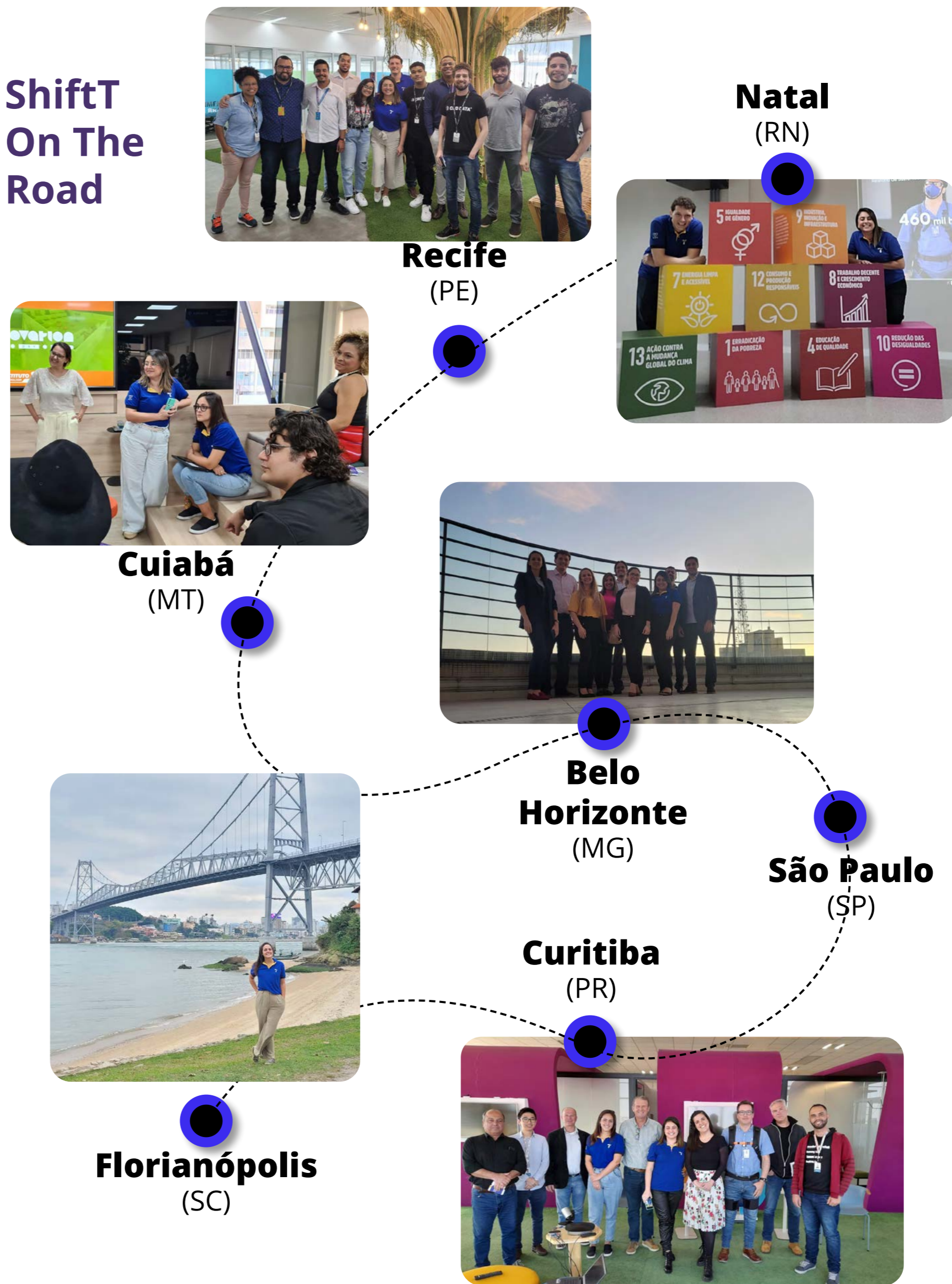
## ShiftT – STARTUP ACCELERATOR

Launched in 2021, ShiftT seeks startups that have synergy with our business; promote sustainable development; act in Industry 4.0 and digital transformation; or offer innovative business models, applicable in our value chain. In 2022, those selected from the first cycle underwent the acceleration process. Concept tests and exclusive mentorships were carried out, guided by our employees, professionals with experience in the most different areas of knowledge and who were specially trained in innovation and the new economy.

Also in 2022, we started the second cycle of acceleration. In all, there were 85 startups registered from all over Brazil and the United States, Portugal and Venezuela. To expand ShiftT's connections in Brazil, a road show was held - ShiftT On The Road - which toured the capitals Belo Horizonte (MG), Curitiba (PR), Cuiabá (MT), Florianópolis (SC), Natal (RN), Recife (PE) and São Paulo (SP). With this, we were able to diversify the origin of these projects, accessing other innovation ecosystems in different Brazilian regions. If in the first cycle 70% of the registered startups were in the South region, in the second we already registered a greater participation of projects from the Northeast, which correspond to 40% of all registrations.

ShiftT initiatives can be accessed [here](#).

## ShiftT On The Road



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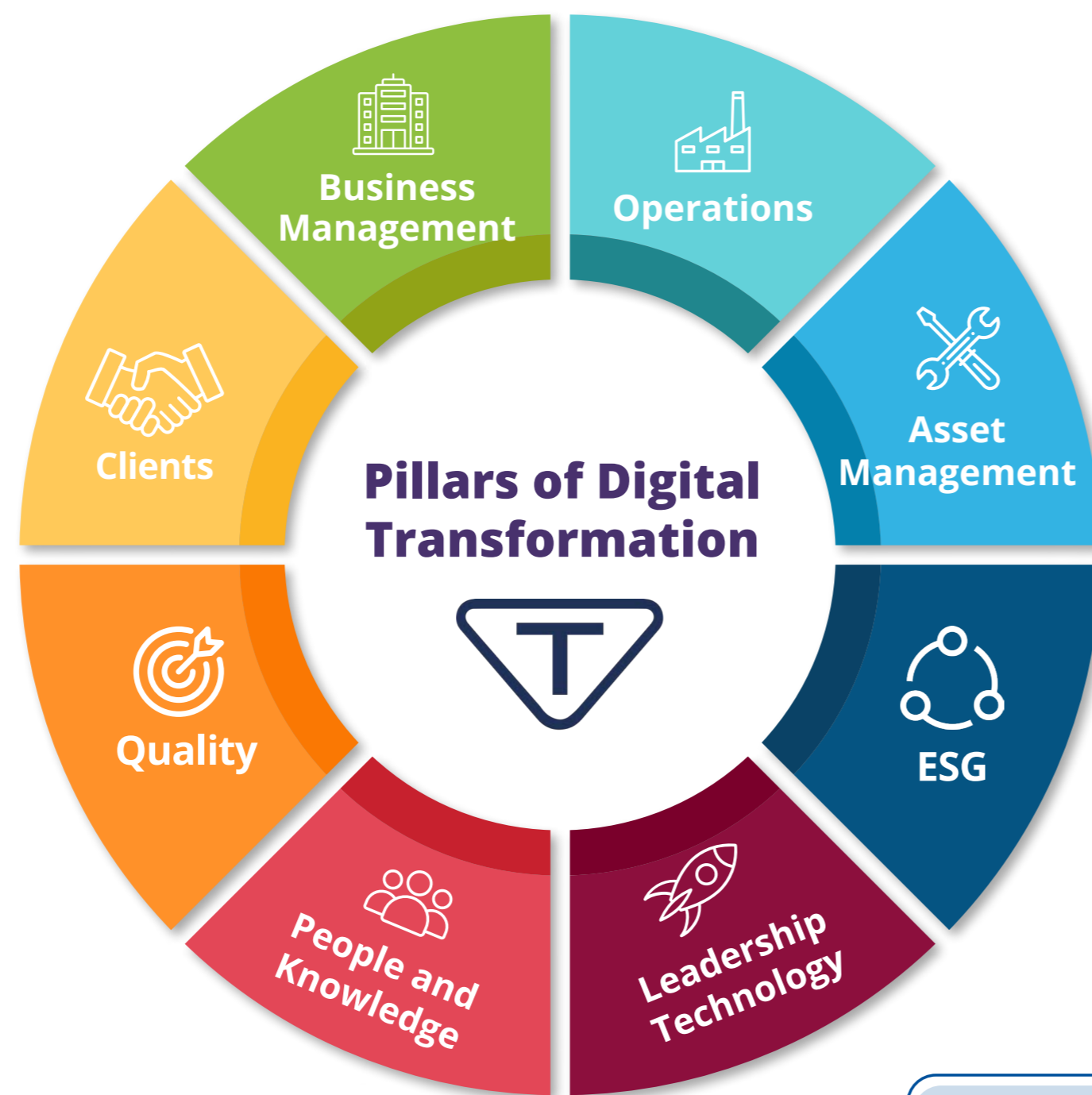
# Digital transformation

Our concept of digital transformation is seen from two perspectives: digital, which comprises the various enabling technologies that allow us to access the benefits of industry 4.0 and digitization; and transformation, referring to cultural aspects and people – after all, if they don't adopt technologies, nothing changes. It is our employees and the partnerships we build that really transform the environment.

To prioritize activities, resources, investments and project execution, our digital transformation journey is based on eight pillars.

In 2022, one of the main highlights was the MBI in Foundry 4.0, in partnership with Senai-SC. The specialization course developed especially for our needs allowed students to develop Industry 4.0 skills that could already be applied in their work environments. Currently, around 47 employees from Joinville and Betim are enrolled in the course.

Another important contribution was the execution of our roadmap of digital transformation projects and initiatives, which covers all operating units. The Joinville operation is used as a development, experimentation and acceleration center for the main digital technologies that are later replicated at the other plants. Thus, it is possible to accelerate developments and reduce existing implementation risks in new technologies.



CLICK THE ARROWS TO FIND OUT MORE.

## Recognition

We are among the four finalists for the ABII 2022 Award, granted by the Brazilian Industrial Internet Association. The case presented, Journey from Data to Intelligence, dealt with the path taken by us to transform industrial data into intelligence based on various traceability technologies.



## Digital transformation in practice



• **Manufacturing Execution System (MES):** we implemented our own control, management and data collection system for the industrial process. Developed in accordance with our know-how, the tool meets the need to protect our intellectual property in the metallurgical process, in addition to providing more flexibility in customization for the various business operations, in addition to offering

capacity for expansion. Currently, MES allows us to transform industrial data into management information and business insights digitally and in real time.

• **Traceability Module:** We have developed a production process traceability module, a solution that contributes to the digital pillars of quality and operations. With the application of QR Code RFID and laser marking solutions, all parts, by-products and produced parts now have their data indexed per unit. This gives each step and product a unique identity. With this technology, developed internally with the support of local partners and supported by the Financier of Studies and Projects (Finep), it is possible to access the context of the production process by product, which generated important results in efficiency, in the indicators of quality and created a relevant database for evolutions through data mining and digital models.



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# 7 Social And Relationship Capital

[GRI 2-29]







# Suppliers

[GRI 3-3]

The complexity and scope of our products and solutions means that we have a very diversified supply chain, including small, medium and large companies of direct materials (inputs used in manufacturing) and indirect (services and other activities that support the production process). Considering the volume and complexity, the main supply categories are scrap, electricity and logistics.

The selection and approval phase of new suppliers includes a broad verification procedure, in which, for example, the risks related to the supply, the quality management system and the technical capacity of each

supplier are evaluated. In specific cases, we carry out an environmental and quality audit at the supplier's plant. Once selected, suppliers are also monitored periodically, with a view to ensuring high performance in providing the contracted service or product.

In 2022, the total number of active suppliers was 4,580, in a base of more than 12,000 registered, which is formed by 93% nationals (Brazil, Mexico and Portugal) and 7% of other nationalities. Our expenses with the entire supply chain added up to R\$7.2 billion during the year, making it possible to inject resources into the economies of the countries in which we operate.

## Supplier selection and monitoring

Pre selection:

In this process, we assess the technical and commercial viability of suppliers, including analysis of risk, capacity and supply potential. All companies wishing to work with us must register on our [website](#).



### 4 AGREEMENT

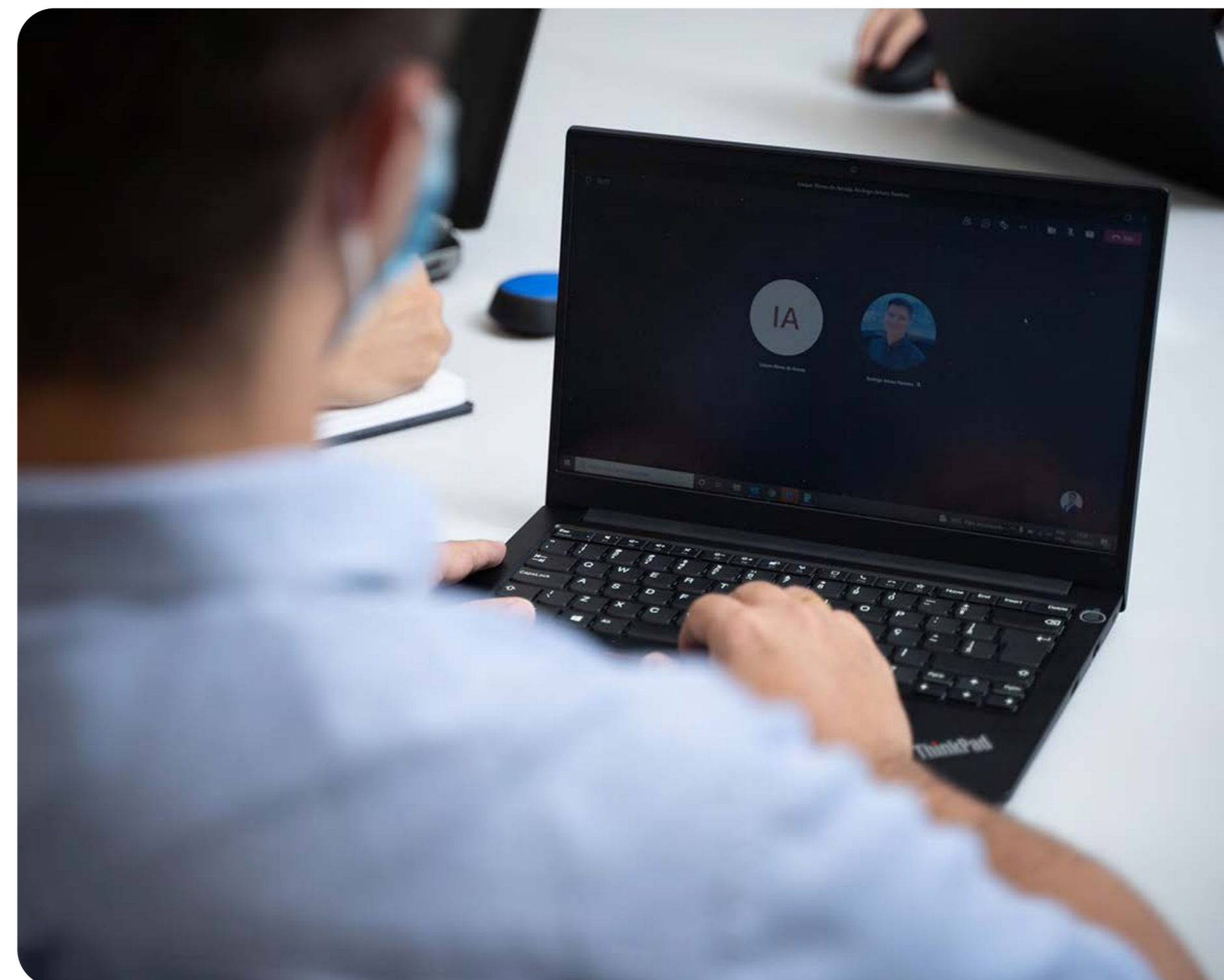
100% of suppliers must comply with our general terms and conditions of supply.

### Performance monitoring and evaluation:

Environmental and quality audits are carried out at the plant of specific suppliers with monitoring through monthly performance indexes.

### Homologation:

Analysis based on documents and legal criteria that vary according to the type of supply.



## Sustainable supply chain

To incorporate ESG criteria into the chain and mitigate possible risks, we are committed to evaluating 100% of our suppliers with the greatest socio-environmental impact. 370 companies were selected, 8% of the total number of active suppliers, who completed evaluation questionnaires and started to be monitored in the risk matrix. Selection criteria were based on factors, supply quantity and purchase volume. This work, managed by the Procurement area, aims to identify significant risks in environmental, social and governance issues, and ensure the execution of activities always in accordance with applicable laws and regulations, and in line with good industry practices.

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## Product quality and safety assurance

Annually, on-site audits are carried out at suppliers that have the greatest impact on the quality of our products or processes. The performance of these companies is monitored based on the supplier's quality index and the risk matrix. The index is made up of four metrics: material and service quality, delivery quality, quality system and commercial attitude. The risk matrix considers aspects such as quality, delivery, sustainability criteria and financial analysis of the supplier.

### OUR SUPPLIERS

**+ 4.5 thousand**  
active suppliers

**8%**  
classified as having the greatest socio-environmental impact

**R\$ 7.2 billion**  
injected into the economy

Social, environmental, anti-corruption and anti-bribery clauses contemplated in

**100% of supply terms**

## Work conditions

[GRI 408-1, 409-1]

Issues such as child, forced or slavery-like labor are covered in our Supplier Management Policy and in the Code of Ethics and Conduct, which all suppliers undertake to observe annually on the purchasing management portal. In 2022, no suppliers were identified with a significant risk of child, forced or slavery-like labor.

Our General Purchasing Conditions also define supplier obligations related to anti-corruption practices, such as: ensuring that its employees; representatives or agents will not divert or pay, directly or indirectly, any amount to any person or use any amount due in a way that constitutes an illegal or tortuous payment; ensure that no amounts paid due to the business relationship with us will be used for any illegal or illicit payment; and monitor its employees or entities that are acting on its behalf or on our behalf in order to ensure the fulfillment of its obligations.

This same attention is applied to issues related to the environment. In addition to complying with current legislation and acting to reduce waste, prevent pollution and conserve energy, we also encourage our suppliers to seek external verification, such as ISO 14001 certification.

The Procurement area is responsible for monitoring and ensuring compliance by companies with the Supplier Management Policy and the Code of Ethics and Conduct. In 2022, we terminated business relationships and terminated contracts due to non-compliance with the requirements and guidelines in these documents. We also trained suppliers on the new Code, prioritizing critical suppliers. In 2023, the training will be extended to everyone else.

[Click here to access the Term of General Purchasing Conditions.](#)

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# Customers

We seek to establish long-term relationships and partnerships with our customers, which are supported by mutual trust, operational excellence, quality and technological leadership.

Our customer base is well diversified in terms of applications and geographies. We are one of the main contributors to the Brazilian trade balance in our segment, with more than 70% of revenue coming from abroad. Inserted in the capital goods industry, we are present in sectors essential to society, such as transport, in all modes; construction, infrastructure, agriculture and power generation.

We have a portfolio of products and services customized to the needs of each customer, and we will play an increasingly relevant role in their decarbonization journey through a wide range of economically viable solutions for sustainable vehicles and equipment,

We supply structural components to all Western machine, equipment and vehicle manufacturers. Our partnership with these customers begins with product development, including foundry, machining and assembly, in addition to other engineering services,

which we started to offer after the acquisition of MWM. In this way, we are uniquely positioned to capture outsourcing and nearshoring trends in the industries we serve. Our production units are located in countries with competitive operating costs that enable our customers to benefit from trade agreements, such as the USMCA (United States-Mexico-Canada Agreement).

At the end of 2022, we supplied more than 1,200 parts and components, which demonstrates the diversification of our revenues and the level of customization of the products we develop – which are aimed at national and international customers and, in most cases, large global players.

## Characteristics of the distribution process

In the case of pipe fittings, sales are made to around 3,000 customers (resellers) who, in turn, sell to industries, builders, installers, among others. Structural components are sold directly to original equipment manufacturers (OEMs) and distributed via road transport.

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# Communities

[GRI 3-3]

Since its foundation, Tupy has had a very close relationship with the community. In 1954, the installation of operations in the industrial park where the Company's headquarters are currently located, in Joinville, influenced the population growth in the region; in addition to accelerating the installation of electricity and treated water supply services, which took place in the early 1950s.

Over the years, we have expanded our business and, consequently, the indirect impacts on the communities where we operate, such as: job and income generation, professional training and movement in the local market.

In 2022 alone, we hired 5,821 people – totaling 19,155 direct jobs with an injection of more than 9.8 billion reais into the economy.

## Corporate Social Investment

[GRI 203-1, 203-2, 413-1]

We adopt several actions to contribute to the social reality of the surrounding communities, whether through investments with our own resources, use of tax incentives, promotion of corporate volunteering or donation of products and materials.

Since 2011, these activities have been governed by a Private Social Investment Standard, which has as its guideline the alignment of social practices with our objectives and strategies. In 2022, this standard was updated in order to enhance the positive impact of our actions on communities. The most significant changes were:

- **Focus of action:** definition of Health, Environment, Education and Equity & Inclusion as priority themes.
- **Impact assessment criteria:** creation of its own tool for analyzing high social impact projects, based on the Theory of Change.
- **Approval flowchart:** inclusion of the Compliance area and the Private Social Investment Analysis Group (GAIS).
- **Impact zones:** definition of priority regions around our units, taking into account, among other aspects, potential externalities.
- **Partnership practices:** establishment of a formal relationship with the social partners and promotion of transparency.

[Click here to access the Corporate Social Investment Standard](#)

## Social Action 2022

**R\$ 2.1 million<sup>1</sup>**

Invested in social projects

**19.2 thousand**

People impacted

**64**

Social actions

About

**9.8 billion<sup>2</sup>**

Injected into the economy

**The plan is to leverage the positive impact on communities through the continued growth of private social investment.**

1. Investments in Social Responsibility and Institutional Relations with 64.5% of own resources and 35.5% through tax incentives.

2. These values were calculated considering: (i) input purchased from third parties; (ii) employees' salaries, social charges, FGTS, profit sharing, management fees; and (iii) federal, state and municipal taxes, fees and contributions.

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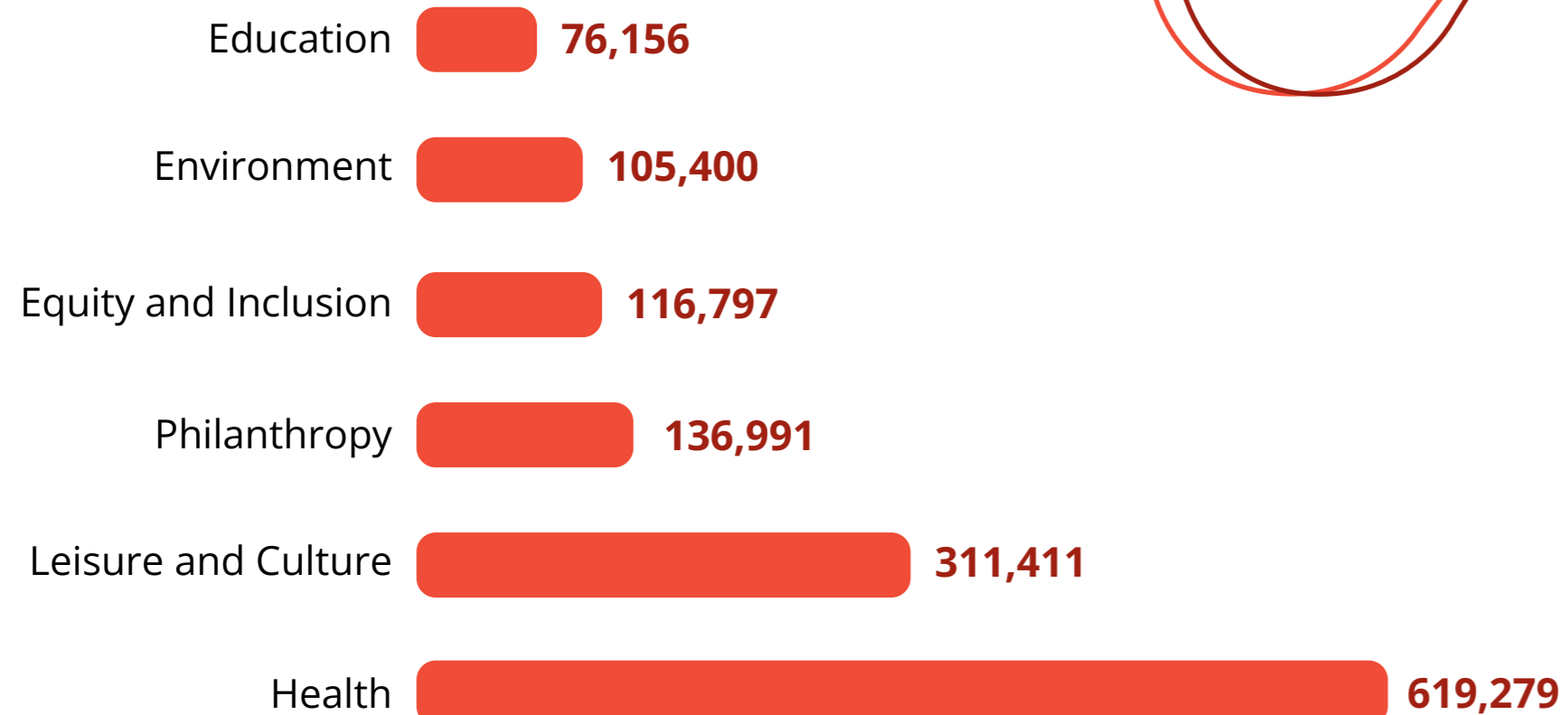




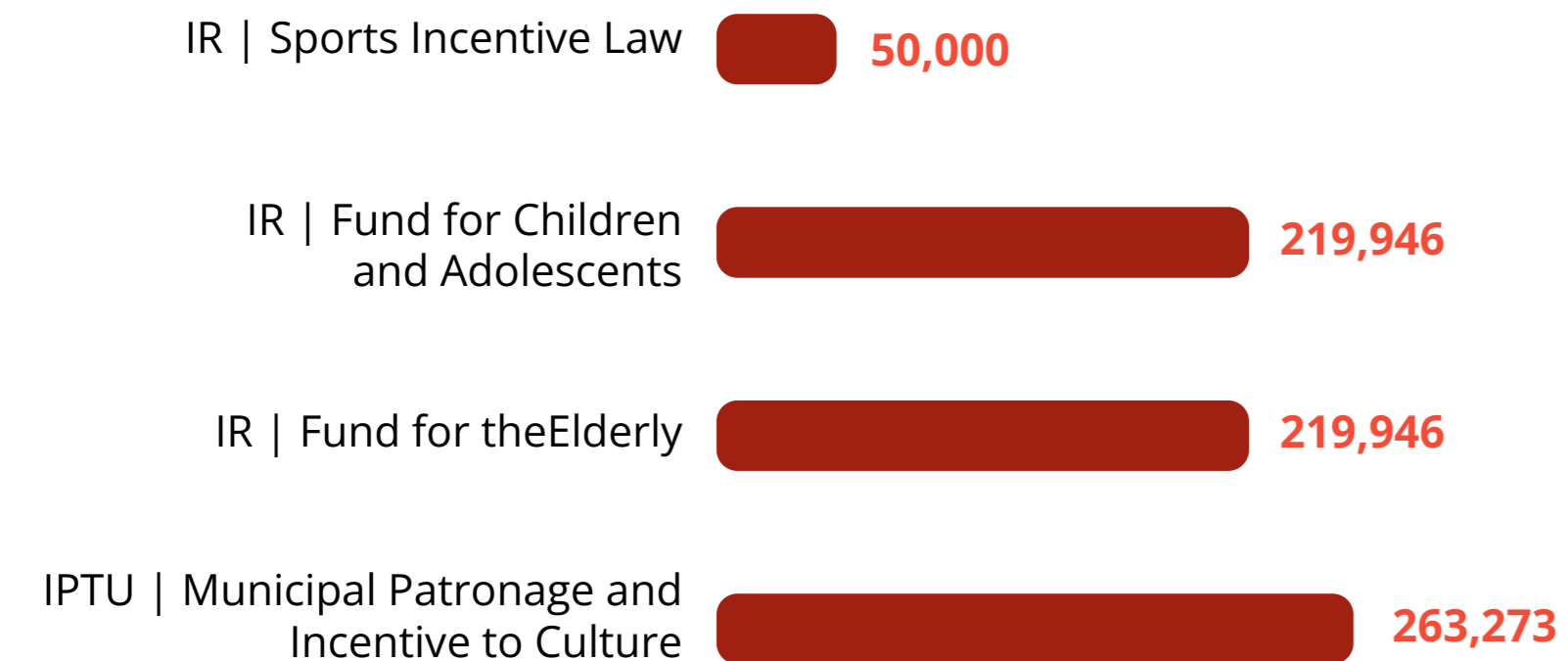


## Distribution of corporate social investment:

### OWN RESOURCE (R\$)



### TAX RESOURCE (R\$)



## Highlights Donations and Sponsorships

### EDUCATION



#### Girls in Tech:

Project in partnership with the Federal University of Santa Catarina (UFSC) to boost the development of technology environments in public schools and disseminate programming and robotics learning among female students. The initiative brought together 340 students and teachers from 28 public schools in the city, who received 72 hours of training in logic, programming and educational robotics. [Learn more.](#)

**Donation of computers** to the Filhote unit at the Salão do Encontro - Betim/BR

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ENVIRONMENT



**SOS Manguezais:**

We support the SOS Manguezais Project, carried out by the Comar Institute. The initiative promotes environmental education in schools in Joinville (SC). The activities carried out encourage students to observe the reality of their neighborhoods and experience the local ecological dynamics. During the year, 1,309 male and female students from ten municipal schools participated in the project. [Learn more.](#)

**Donation of flame retardant to contain fire** in Sierra de Zapaliname and Canon de San Lorenzo – Saltillo/MX

HEALTH



**Donation of material** to the Brasil AVC Association (ABAVC) – Joinville (BR)

[Learn more.](#)

**Cover reconstruction** of the Equotherapy Chaleira Preta institution – Joinville (BR)

**Participation in the** Anjos do Natal campaign at the Children's Hospital of Joinville – Joinville (BR)

**Donation of an equipped ambulance** to expand assistance to incidents in the municipality of Ramos Arizpe (MX)

EQUITY AND INCLUSION

**Construction of a Paralympic bocce court** at Apae Centro-Dia in Betim (MG), which will make it possible to expand the experience of the 70 students assisted by the institution and contribute to their therapeutic development.

**Sustainable Sewing Workshops** at Associação Lar Renascer – Joinville (BR)

**Donation of adapted furniture and bathrooms** to the institution Universo Down –Joinville (BR)



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# Tupy Transformers

Since its creation in 2017, the Tupy Transformers corporate volunteer program has encouraged our employees to participate in social actions in the community. In five years of operation, we dedicated more than 5,000 hours in the communities of Joinville (BR), Betim (BR), Saltillo (MX) and Ramos Arizpe (MX), contributing to local development and generating value for the volunteers involved.



## 2022 HIGHLIGHTS

**970 hours**  
OF VOLUNTEERING

**+200**  
REGISTERED EMPLOYEES

**36**  
ACTIONS TAKEN

### Expansion of the program in Betim-MG

In the week in which we celebrate the National Volunteer Day, we launched the Tupy Transformers program at the Betim (MG) unit, increasing the program's scope to 80% of our manufacturing units.

## Communication with the community

[GRI 413-2]

We have a procedure to control occurrences, managed by our Communication and Social Responsibility teams. In this way, it is possible to respond more quickly and efficiently to the demands of communities – such as requests for support, sponsorship, donations and partnerships. Possible risks that could have a negative impact on communities are identified, assessed, dealt with and communicated.

At the Joinville (BR) and Betim (BR) units, only five reports were registered regarding the deposition of sedimentable particles, two related to noise and three about solid waste in the industrial landfill. In the other units, there were no records of communication.

The 33% reduction compared to the previous year in the number of complaints at the Joinville unit represents a direct reflection of investments in environmental control and monitoring systems, which prioritized efficiency in controlling atmospheric emissions.

[Read more on atmospheric emissions](#)

### Transparency in Communication



In order to strengthen our relationship with communities, we provide channels dedicated to receiving questions, suggestions, complaints and requests for support:

Contact us: **Site**  
E-mail: [comunidade@tupy.com.br](mailto:comunidade@tupy.com.br)

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# Financial Results

The year 2022 represented another important advance in the construction of New Tupy. This process, carried out over the last few years, makes us an even bigger, more sustainable and diversified Company. Our net revenue went from R\$5.2 billion in 2019, pre-pandemic period, to R\$10.2 billion in 2022. Adjusted EBITDA, in turn, increased 80% in the same period.

With the integration of the Aveiro and Betim operations, acquired in October 2021, our customer base was expanded and, today, we supply all manufacturers of trucks, agricultural and construction machinery in the West. In this, which was the first full year of joint action, we significantly increased Tupy's results, as we were able to anticipate the capture of synergies. However, there is still much to be done, with progress in the efficiency and flexibility of operations, both in the new plants and in the Mexico and Joinville units.

The period also marks the biggest transformation in our entire history, with the construction of a new strategic architecture, which contemplates new avenues of growth and moves towards a low-carbon economy, which will play a fundamental role in the Tupy of the future.

The year 2022 was full of challenges, with imbalances in supply chains resulting from the impacts of the COVID-19 pandemic, conflict in Eastern Europe and lockdowns in China. We faced significant increases in material costs and customer stoppages that affected our volumes, with reflections on margins, while, in the first half, we built inventories necessary for the ordinary working capital of the operations in Betim and Aveiro.

Despite this scenario, the Company achieved Adjusted EBITDA of R\$ 1.3 billion, the highest in its history. We also presented strong operating cash generation, which reached R\$402 million. Net income, also the highest in history, was R\$502 million, corresponding to an increase of 148%. The Return on Invested Capital (ROIC) reached 13.5% in 2022, against 10.6% in 2021.

## Record results and construction of a new Tupy

This is just the beginning of this New Tupy. There are still many opportunities to capture from gains in operational and purchasing efficiency in all operations, as well as price realization and new business. The possibility of adding value to cast products, backed by the technical qualification that MWM provided to Tupy, will open up many opportunities for growth.

**R\$ 10.2 billion**  
Net revenue (+ 44% vs 2021)

**R\$ 1.3 billion**  
Adjusted EBITDA  
(+ 44% vs 2021)

**R\$ 502 million**  
Net Profit  
(+ 148% vs 2021)

**13.5%**  
Return on Invested Capital  
(ROIC)

Click here to learn more

## Investments

Investments in 2022 totaled R\$ 475 million, an increase of 85% compared to the previous year. The amounts mainly refer to new foundry and machining programs, increased operational efficiency and synergies between operations, in addition to the implementation of a new ERP (Enterprise Resource Planning) system and investments in health, safety and the environment.

To support the investments, we have a solid financial situation. In September 2022, a debt was issued in local currency (debentures) in the amount of R\$ 1 billion, mainly intended to pay for the acquisition of MWM do Brasil. The cost of this debt is CDI +1.5% p.a., with semiannual interest and amortization in two installments (September 2026 and 2027). In November 2022, the disbursement was made, in the amount of R\$ 855 million. We ended the year with a cash and equivalent position of 1.5 billion, with leverage corresponding to 1.6x Adjusted EBITDA.

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# Environmental management

All our initiatives and investments to mitigate the impact on the environment involve environmental management actions both in production processes and in the optimized use of natural resources. Our commitment to environmental conservation is manifested by the continuous improvement of our management systems and carrying out activities that prevent the occurrence of environmental impacts.

In line with actions aimed at a circular and low-carbon economy, our Environmental Management System (SGA) and our Integrated Environmental Policy reinforce our commitment to creating value by reducing consumption and reusing natural resources, use of recycled materials, minimization of emissions of particulate matter and Greenhouse Gases (GHG) as well as development of technologies that contribute to the reduction of CO<sub>2</sub> in the segments in which we operate.

Since 2001, we have been certified by ISO 14001, which establishes the frequent monitoring of atmospheric emissions and air quality; groundwater and surface water; noise levels in our operations; generation and final disposal of waste; and applicable legal and environmental requirements. Annually, internal and external audits are carried out and the process items are dealt with in routine monitoring at the units.

The Environment area periodically reports results and indicators to the board, with emphasis on those related to atmospheric emissions and air quality. In addition, every week, a critical analysis of the same indicators is carried out by the Manufacturing management team, when actions are defined to improve performance and/or correct any deviations. Additionally, as part of the EMS routine, a monthly meeting is held to critically analyze the environmental indicators with the Board of Directors.

For 2023,

**R\$ 76 million**

are budgeted for investments related to environmental control and monitoring systems and energy efficiency, aimed at implementing technologies to promote the improvement of air, soil and surface and underground water quality, as well as greater recirculation of effluents in our processes.



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# Energy and Emissions

[GRI 3-3]

## Energy

In our operations, we use energy from different sources: electricity, natural gas and coke. In 2022, despite the small increase in the absolute numbers of fuel consumption from non-renewable sources – due to the acquisition of new units (Aveiro and Betim) – there was a 66% growth in the share of renewable sources. Consumption data is recorded in an electronic system and periodically monitored by the operational areas and by our Environment area. [GRI 302-4]

### Energy consumption within the organization (GJ)<sup>1</sup>

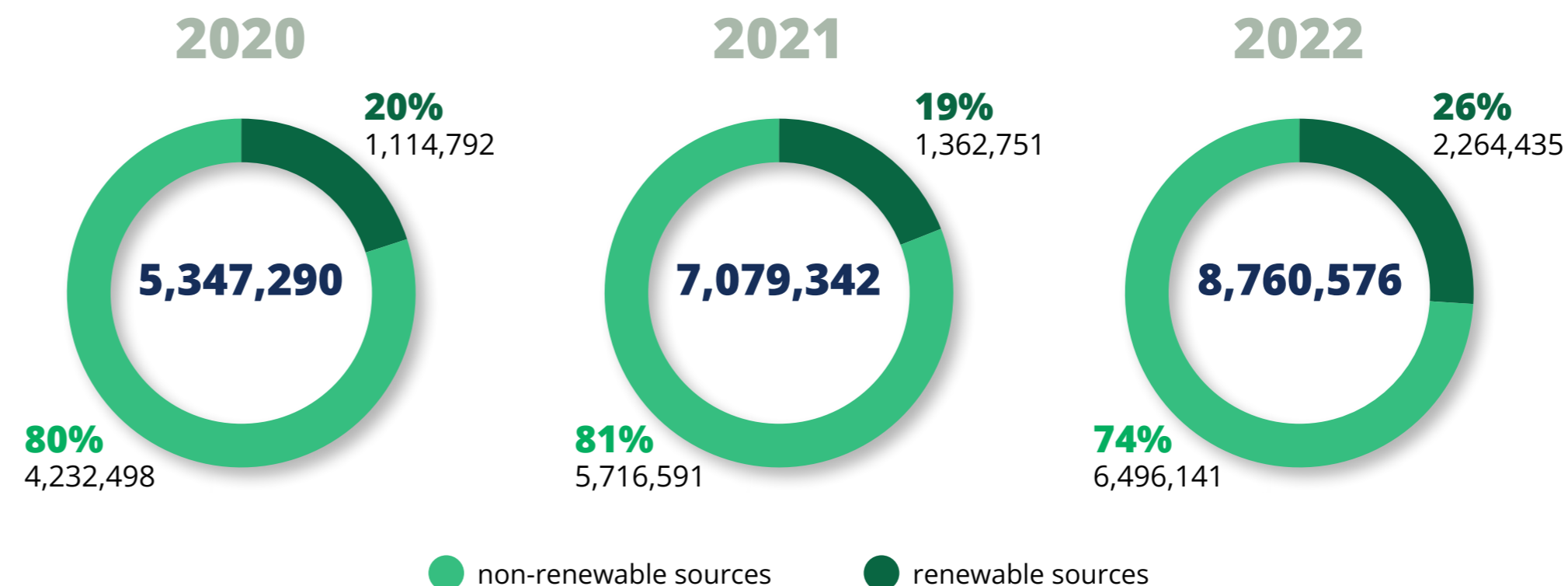
[GRI 302-1, 302-4; SASB EM-MM-130a.1]

	2020	2021	2022
<b>Consumption of fuels from non-renewable sources</b>	<b>4,232,498</b>	<b>5,716,591</b>	<b>6,496,141</b>
Coke	1,576,094	2,277,976	2,556,014
Electric power	1,324,543	1,734,434	1,961,862
Natural Gas	1,168,486	1,537,144	1,809,053
GLP <sup>2</sup>	19,601	25,497	0
Diesel	143,774	141,540	169,211
<b>Total consumed energy that was supplied by grid electricity</b>	<b>2,439,335</b>	<b>3,072,100</b>	<b>4,231,503</b>
Percentage of consumed energy that was supplied by grid electricity	46%	43%	48%
<b>Consumption of fuels from renewable sources</b>	<b>1,114,792</b>	<b>1,362,751</b>	<b>2,264,435</b>
Percentage of energy consumed from renewable sources	20%	19%	26%
<b>TOTAL</b>	<b>5,347,290</b>	<b>7,079,342</b>	<b>8,760,576</b>

1. The source for converting units to GJ was the National Energy Balance - base year 2022.  
 2. The LPG fuel source, in 2022, represented less than 0.5%, therefore, it was disregarded.

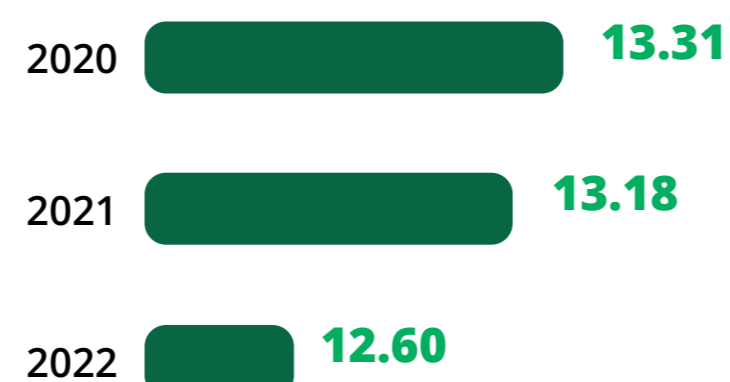
### Energy consumption within the organization (GJ)<sup>1,2</sup>

[GRI 302-1]



### Energy intensity (GJ/t produced)

[GRI 302-3]



Our units in Betim (Brazil) and Aveiro (Portugal) are already ISO 50001 certified, which refers to the application of energy management systems.

All of our units are committed to reducing the intensity of energy consumption in their processes. In order to achieve this goal, specific work roadmaps were established in the main energy sources used in the production process: coke, electricity and natural gas. Our multi-year investment plan also provides for a significant increase in the amounts earmarked for the Energy Efficiency Program as of 2023.

The definition and prioritization of projects to be carried out considers criteria such as the local energy matrix, the criticality of equipment and machines and their classification by consumption. This program addresses the reduction of electricity consumption; the replacement of fossil fuels, renewable energy sources; the optimization of machinery and equipment; the reduction of compressed air losses; the thermal conservation of fuels and the prevention of waste and rework.

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### Energy contracts

Several awareness actions for the efficient use of energy in our facilities are promoted with our direct and outsourced employees. In Joinville (SC) and Saltillo (MX), work to eliminate compressed air losses in the core and finishing areas showed progress in 2022, considering that this equipment represents approximately 12% of electric power consumption for motive power. With the installation of more meters, starting in 2023, Manufacturing management will include this indicator in monthly performance reports, as well as consider it in the deployment of goals for all leadership levels.

### Energy Efficiency Roadmap

PROJECTS PLANNED FOR 2023:

**Electric power:** Replacement of compressors, installation of frequency inverters in high-performance engines, replacement of light bulbs with LED systems and installation of compressed air meters;

**Coke:** Improvements in fuel burning efficiency;

**Natural gas:** Acquisition of more efficient burners and installation of gas consumption meters.

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## Air emissions

Every year, we work towards the continuous improvement of our processes and procedures to mitigate and monitor atmospheric emissions. This is a topic of great importance for us, not only from an environmental point of view, but also from a social point of view, since we are concerned with enhancing the positive impact of communities in the surrounding area. For this purpose, during 2022, we prioritized the implementation of more modern and efficient technologies, including the installation of new equipment.

In 2022, there was a 38% reduction in the Particulate Matter (PM) emission rate compared to 2021, when comparing existing operations in the two years (Joinville, Mauá, Ramos Arizpe and Saltillo); and obtaining a 43% reduction compared to the inclusion of new operations (Aveiro and Betim). This reduction was the result of improvements related to investments of approximately R\$ 23 million related to the acquisition of more efficient equipment, maintenance of emission control systems, online monitoring of exhaust systems and continuous monitoring of air quality.

### Other significant atmospheric emissions

[ GRI 305-7 ] SASB EM-MM-120a.1	2020		2021 <sup>2</sup>		2022 <sup>3</sup>	
	t/year	t/t produced	t/year	t/t produced	t/year	t/t produced
Volatile Organic Compounds (VOC) <sup>1</sup>	217.00	0.00092	199.00	0.00061	254.47	0.00050
Particulate matter (PM)	530.00	0.00132	1,069.00	0.00199	790.51	0.00114

1. Considers only the Joinville and Mauá units.

2. Considers the Joinville and Mauá units, in Brazil, in the Particulate Material indicator; and Saltillo and Ramos Arizpe in Mexico.

3. Considers the units in Joinville, Mauá and Betim, in Brazil; of Saltillo and Ramos Arizpe, in Mexico; and Aveiro, in Portugal.



Reduction of

# 38%

In the index of emissions of particulate matter

# R\$ 23 million

Invested in the acquisition of equipment, support and online monitoring of fixed sources and air quality.

**With the aim of enhancing the positive impact on our communities and guaranteeing improvements in air quality beyond the limits established by law, we intend to reduce emissions of particulate matter per ton produced by 35% until 2026.**

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## Controls and processes

We monitor emissions through periodic measurements, in accordance with the monitoring plan for each unit, at the generation points and carry out daily monitoring through installed cameras and visual inspection routines at units that do not have a camera monitoring system. Air quality is controlled daily by measuring equipment (Hi-vol). The results obtained from these monitoring procedures are evaluated by the Environment team and periodically reported to the Board of Directors.

Initiatives adopted to improve monitoring of stationary sources and air quality:

- Daily monitoring of air quality at the Joinville (BR) and Saltillo (MX) units, with expansion to Ramos Arizpe (MX) and Betim (BR) in 2023;
- Internal and continuous monitoring of fixed priority sources;
- Periodic chimney monitoring routines, according to the frequency defined by local authorities.
- Daily monitoring of sources, through cameras installed at the Joinville (BR) and Saltillo (MX) units and inspections at other units;
- Carrying out inspection routines and audits related to atmospheric emissions;
- Periodic results reports, in addition to regular meetings to prioritize improvement actions.

### Investments in equipment and monitoring:

- Replacement of **emission control systems** for molding and melting processes in Joinville (BR) and Saltillo (MX) by control units with greater capacity;
- Retrofitting of an emission control system in Joinville (BR), expanding its **collection capacity**;
- Expansion of the **online monitoring** network for stationary sources in Joinville (BR), which enables forecasting and preventive action in emission control equipment;
- Implementation of an air quality monitoring network in **Ramos Arizpe (MX)**, and expansion of the existing network in Joinville (BR) and Saltillo (MX), a project that helps measure concentrations and generates data on current conditions, builds history and enables the planning of actions focused on improving air quality;
- Installation of equipment to retain particulates at waste discharge points, achieving an approximate **70% reduction** in local air quality concentrations.

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# CO<sub>2</sub> Emissions [GRI 3-3]

## Decarbonization [GRI 3-3]

The decarbonization process is part of our business strategy and vision. Throughout 2022, the Strategy and Innovation Committee meetings included the presentation, discussion and evaluation of proposals related to action plans that included the prioritization of competitive initiatives.

We have adopted a series of actions for the decarbonization of the process, among which 3 routes help us in the management of the strategy:

### Energy efficiency:

continue to reduce energy consumption in our operations, through more efficient equipment, reuse of heat and thermal conservation.

Learn more about the projects by clicking here.

### Fuels alternatives:

expand the use of alternative fuels based on studies and investigations;

### Innovation:

evaluate and develop low-carbon processes with better economic results.

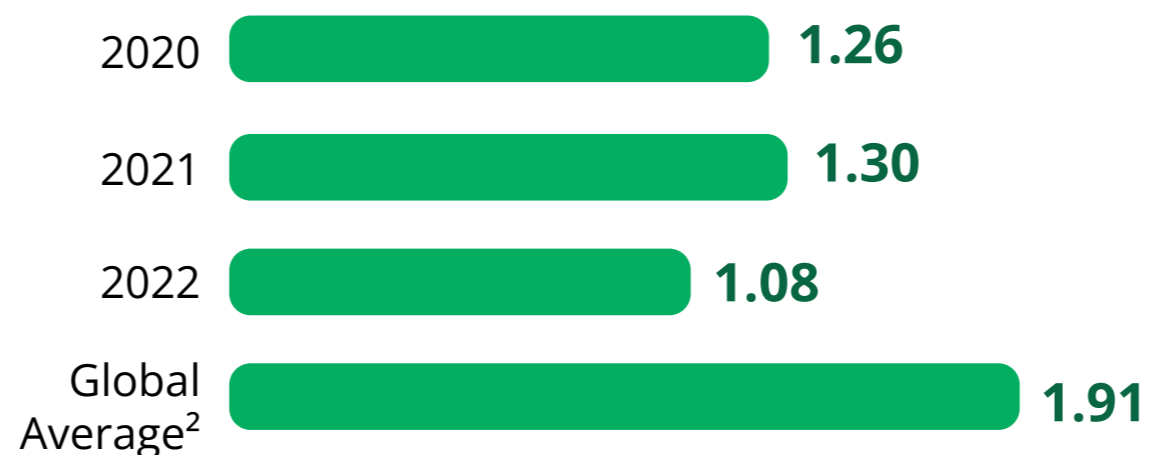
## Inventory

In line with the commitment to monitor our Greenhouse Gas (GHG) emissions, in 2022, we included the Betim and Aveiro units in our inventory, which is prepared with the support of a specialized consultancy and, audited by an independent third party, which ensures the accuracy of the numbers that guide our decision-making. With a view to complete information, the document includes Scope 1 emissions, direct GHG emissions; Scope 2, indirect GHG emissions (purchase of electricity); and Scope 3, other indirect emissions. In 2022, we recorded the lowest GHG emission intensity per ton of equivalent production, as a result of scopes 1 and 2, representing a 17% reduction compared to 2021. This value represents approximately half of the global average published by the World Steel Association (WSA) and makes us stand out in the transformation industry sector.

## Lower intensity of GHG emissions

**17% reduction**  
the intensity of GHG emissions: (Scope 1 and 2) (vs. 2021)

### Intensity of GHG emissions<sup>1</sup> (tCO<sub>2</sub> equivalent/year) [GRI 305-4]



1. To calculate the intensity, scopes 1 and 2 were considered  
2. Source World Steel Association 2021

### Direct GHG emissions (scope 1) (tCO<sub>2</sub> equivalent/year) [GRI 305-1]

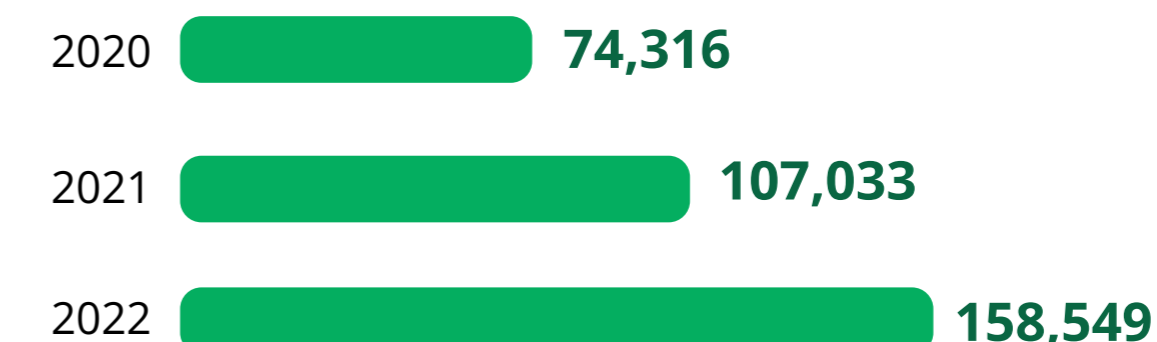


1. The value reported in the previous report ("478,931") was revised for this report due to the correction of the amount of carbon briquettes consumed in Joinville (BR).

### Indirect GHG emissions (scope 2) (tCO<sub>2</sub> equivalent/year) [GRI 305-2]



### Other indirect GHG emissions (scope 3) (tCO<sub>2</sub> equivalent/year) [GRI 305-3]



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Coke from recycle source used in the ovens



As a reflection of our respect for biodiversity and its importance for sustaining life on Earth, we keep more than **5 thousand hectares preserved** in locations close to our headquarters, in Joinville (SC), which results in a stock of

**1.8 million tons of CO<sub>2</sub>**

Part of this area is made up of mangroves – coastal ecosystems of transition between the terrestrial and marine environments, considered nurseries for marine life and capable of capturing carbon. Babitonga Bay is home to 82 km of them, or about 80% of the mangroves in Santa Catarina, according to the Cubatão Cachoeira Joinville Committee.

## Initiatives to reduce greenhouse gas (CO<sub>2</sub>) emission rates

1. **93%** of the metal material used as raw material is from recycled sources.
2. Energy purchased in Mexico has a carbon emission factor **18% lower** than that coming from the national electrical system.
3. Tupy uses coke from recycled and more sustainable sources in all its units to generate energy in the ovens. There was a reduction of **7 thousand tons of CO<sub>2</sub>** by using this material. In other words, around 18% of the coke used in the ovens comes from recycled sources. The initiative was highlighted in the Expression of Ecology Award. [Learn more by clicking here.](#)
4. We signed a contract in Betim (MG) for the generation and provision of **energy from renewable sources** through energy certificates, the I-RECs.
5. The pig iron used in Betim (MG) promotes the reduction of fuel consumption for energy generation in the furnaces. **100%** of the material purchased has ISO 14064 certification, attesting to neutrality in its manufacture.

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# Water and effluents

[ GRI 303-1, 303-2, 303-3, 303-4, 303-5 ]

Water is an important resource for our production processes, being indispensable in many activities, mainly in the cooling of equipment and preparation of industrial inputs. Our units are committed to the conservation and maximum use of water and continuously seek to reduce the consumption of this resource and the generation of effluents, in addition to ensuring quality and safe disposal. In the year 2022, 58% of the abstracted water was purchased from local utilities or tanker trucks, 36% from groundwater and 6% from surface water.

The Saltillo and Ramos Arizpe units, in Mexico, are located in areas with water stress, which represents 36% of our abstraction. In these regions, 54% of the effluents generated are being consumed or reused in the production process, reducing the demand for water

collection. We have been working on the continuous improvement of this indicator in Mexico, following the example of other locations. In Aveiro, Portugal, for example, 98% of the effluents from industrial and sanitary processes are treated and returned to the processes (oven cooling, cooling towers, toilet flushing). In Joinville and Betim, Brazil, this percentage rises to 100%. In total, we reused 93% of industrial and sanitary effluents and stopped collecting 1.3 billion liters of water in 2022.

Regarding consumption, in 2022 we recorded a water footprint of 2.2 m<sup>3</sup>/ton. of equivalent production, which reflects the inclusion of data referring to the acquisitions of Betim (Brazil) and Aveiro (Portugal), which, together, corresponded to more than 70% of the additional volume consumed throughout the year.

We reuse **93% of** Industrial and sanitary effluents

**1 billion liters** of water saved per year

### Water reuse forms

- Cooling tower
- Slag and furnace structure cooling
- Exhaust control systems
- Preparation of machining inputs
- Chemical rinsing processes

### Total water consumption (megaliters) [GRI 303-5]

	2020	2021	2022	
			All units	Disregarding Betim and Aveiro
All Areas	719	904	1,531	1,075
Areas with water stress	299	382	448	448

Regarding the disposal of effluents, the standards adopted for release are in accordance with those established in local licenses and legislation. Each of our units carefully monitors aspects related to water (or soil) quality and its availability.

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# Material recycling

[GRI 3-3]

The use of recyclable raw materials in the production process brings many benefits and reflects our commitment to sustainable development.

Throughout 2022, we accounted for more than 650,000 tons of scrap that were transformed into products and solutions with high added value – a 23% increase compared to the amount recorded in the previous year due to the accounting of the plants in Betim and Aveiro. This material, which represents our main raw material, comes from two sources: items that were discarded by society, such as stoves, refrigerators and old cars; of the metalworking and automobile industries, in addition to parts, machinery and equipment.

The use of recycled material in our processes not only reduces the need to extract new mineral resources from nature, but also reduces the emission of greenhouse gases into the atmosphere, generates jobs and income, less waste is sent to landfills, promotes process innovation and products and increases the efficiency of production processes. Every year, each ton of scrap used in the process reduces CO<sub>2</sub> emissions by 1.2 tons.



## Circular economy in action

**Sand:** More than a third of the sand in our process comes from recycled sources. We maintain nine sand regeneration units at our factories, which in 2022 enabled the transformation of more than 359,000 tons of waste into input for our process. In 2023, we started operating the 10th regeneration unit, in Mexico, with an additional processing capacity of approximately 300 tons per day;

**Iron chip briquette:**

They are better in quality than non-renewable raw materials such as pig iron. Currently, 100% of the cast iron chips are compacted and transformed into raw material;

**Coke:**

Our furnaces operate using 18% recycled coke. In 2022, we recorded a global increase in the consumption of this material, with emphasis on the 25% increase in use at the Joinville (BR) unit. We reduced direct CO<sub>2</sub> emissions by 7 thousand tons and the extraction of approximately 16 thousand tons of non-renewable natural resource;

**Catalyst:**

The units in Ramos Arizpe and Saltillo, in Mexico, adopt the practice of consuming recovered catalyst, which comes from recycling the solution generated in the gas treatment operations in the core mill. In 2022, 20% of the volume of catalyst consumed came from recycling.

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# 93%

of the metal materials used in our production process were from recycling.

# 59%

of the main inputs and raw materials were from recycling sources.

# + 359 thousand

tons of regenerated sand.

# 7 thousand tons of CO<sub>2</sub>

avoided by the use of coke from recycled sources.

## Every year, each ton of scrap used in the process reduces CO<sub>2</sub> emissions by 1.2 tons.

Circular economy is also continuous improvement: in 2022, we launched the challenge on our **Open Innovation Portal** to further expand our circular economy practices and seek partners and solutions that connect us to different links in the value chain.

Check out this and other challenges [here](#).

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### Materials used in 2022 by all our units, broken down by weight (tons)<sup>1</sup>

[GRI 301-1]

Metal (various scrap, return, briquettes and pig iron)	1,187,006
Sand	1,016,916
Coke	88,474
Catalyst	1,458
Coal powder	20,903
Bentonite	74,287
Limestone	45,091
Resin	12,762
Iron Alloys	51,472
<b>TOTAL</b>	<b>2,498,369</b>

The use of recycled metal material continues to be a positive highlight, representing more than 90% of the volume used. Last year's drop is mainly due to the integration of data and processes at the acquired units and the unavailability of scrap metal in the domestic market, which led to greater purchases of pig iron. This material, although not recycled, can have a neutral carbon footprint, due to the use of charcoal as a bio-reducer. Today, 68% of the volume of pig iron we acquire has ISO 14064 certification, attesting to its neutrality.

### Raw materials and materials of recycled origin used (tons)

[GRI 301-2]

	2020	2021	2022	
			All units	Disregarding Betim and Aveiro
Metal material	99%	97%	93%	96%
Sand	49%	36%	35%	34%
Coke	13%	12% <sup>1</sup>	18%	15%
Catalyst	31%	28%	20%	24%

1. The value reported in the previous report ("25%") was revised for this report due to the correction of the amount of carbon briquettes consumed in Joinville (BR).

Through a partnership with the Eureciclo seal, we reaffirm our commitment to the recycling of post-consumer packaging from our line of pipe fittings distributed in Brazil. In addition, we benefited 39 recycling operators over the last year, with transfers that reached recyclable sorting centers in 22 Brazilian states. In 2022, 22% of our packaging was reused, equivalent to 660.71 tons of plastic and cardboard.

[GRI 301-3]



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# Waste and byproducts

[GRI 306-1, 306-2]

Like any manufacturing industry, we generate a large amount of waste. For this reason, we have management plans in place, in line with local regulations in each country where we operate. All waste destined outside our units is duly sent to suppliers licensed by the competent environmental bodies and previously audited and approved by the Environment area.

The processes established for waste management prioritize factors such as reducing consumption and efficient use of materials.

Annually our waste management plans are evaluated in internal and external audits. In addition, inspections are carried out in operational areas in order to assess their correct execution. Governance of the subject is also monitored through indicators (related to aspects such as waste generation, disposal and compliance with legal requirements) that are periodically evaluated by the Environment area and in specific committees of our units.

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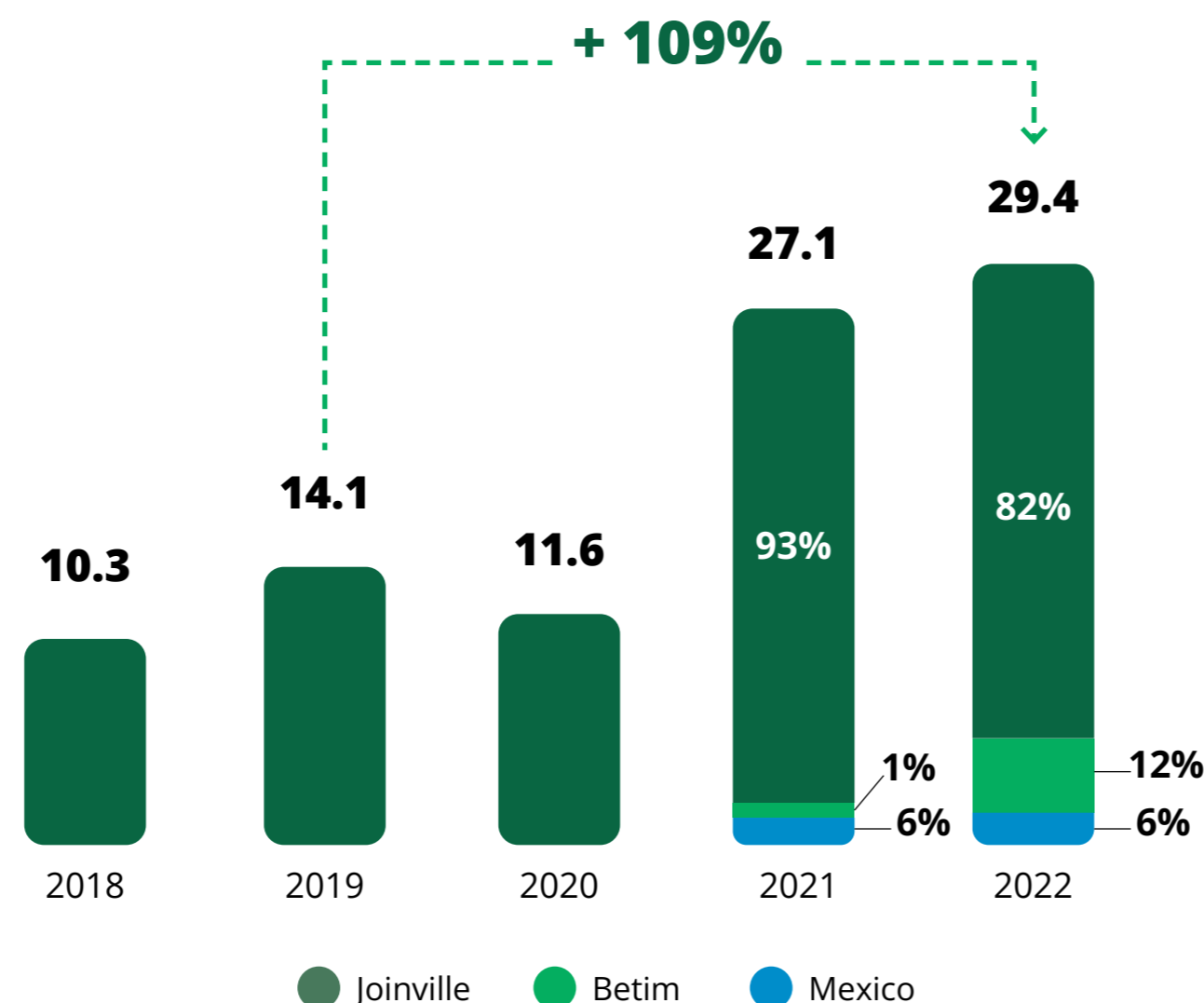
## Waste reuse

Our constant search for alternatives for waste disposal, based on the circular economy, continues to show very positive results. Important advances in 2022 were the increase of approximately 21% in the ton of waste recycled per ton produced, due to the increase in recycling/reuse in processes in Joinville (SC) and in Mexico, associated with existing recycling practices in the new units ( Aveiro and Betim); and the improvement in the waste segregation process at the Betim (MG) unit, with an increase in the value of waste.

**With the aim of increasing reuse and recycling, we intend to reduce by 25% the disposal of waste to landfill per ton produced by 2026.**

Tupy maintains a team capable of working in the search for alternatives for the disposal of waste from its process, based on the principles of the circular economy. The results of this work – the so-called byproduct – helps to reduce the amount of waste in landfills and minimize the extraction of natural resources, since they are used as raw materials in other production chains. These developments guarantee not only environmental but also economic benefits, in 2022, we reached a turnover value 109% higher compared to 2019, when the area was newly created.

### Byproduct Billing History [MM R\$]



**R\$ 29 million**

of revenue from byproduct (8% increase vs. 2021)

**25 thousand**

tons of residual sand reused in structural reinforcement works

**+1 million**

tons of recycled waste

**Over the year, more than 190,000 tons of byproduct were sent for external recycling, the main ones being:**

#### Furnace dust

Generated during the melting process and sold for the use of zinc in chemical industries;

#### Used lubricating oil

Destined for re-refining, a process that, in addition to generating a new product, emits seven times less CO<sub>2</sub>;

#### Iron chips

Originated from the machining of pipe fittings, it is sold to the automotive and steel sectors, adding value in a new production chain;

#### Granulated slag

Originating from the production process, it becomes an important mineral additive to cement;

#### Sludge and zinc ash

Destined for recycling, they return to the process as raw material;

#### Wood waste

After exhausting the possibility of internal use, mainly wooden *pallets*, they are sent to companies that crush this material and generate chips to be used as fuel in other processes.

### Expansion of byproduct


In 2022, we expanded the Byproducts area to the Betim (MG) unit. Improvements in the segregation processes for dedusting the ovens resulted in a 90% increase in revenue from the sale of waste.

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# 10 Annexes

In this chapter, access: 

## Human and Intellectual Capital

Employees by job type

Workers who are not employed

Workers who are not employed by type of activity performed

Ratio between the lowest wage and the local minimum wage, broken down by gender

## Corporate governance

Communication and training on anti-corruption policies and procedures

Diversity in governance bodies and employees (%)

People with Disabilities (PcDs) by functional category (%)

## Financial Capital

Demonstration of added value  
For the year ended December 31,  
2022 and 2021

## Human capital

New hires and employee turnover

Maternity/paternity leave

Ratio between base salary and remuneration received by women and those received by men

Number of cases of occupational diseases

Percentage of employees receiving regular performance and career development reviews

## Natural Capital

Water collection per source (megaliters)

Discharge of water per source (megaliters)

Waste generated by composition (tons)

Waste not intended for final disposal (tons)

Waste destined for final disposal (tons)

Reduction of GHG emissions (tCO<sub>2</sub> equivalent)

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# Human and Intellectual Capital

## Employees by job type<sup>1</sup>

[GRI 2-7]

	2020		2021		2022	
	PERMANENT	TEMPORARY	PERMANENT	TEMPORARY	PERMANENT	TEMPORARY
<b>Broken down by gender</b>						
Men	12,433	0	14,292	0	17,480	35
Women	1,041	0	1,184	0	1,420	12
<b>Broken down by region</b>						
Brazil	9,152	0	10,272	0	13,842	0
Mexico	4,322	0	5,183	0	4,694	0
United States	0	0	12	0	10	0
Europe	0	0	9	0	354	47
<b>TOTAL</b>	<b>13,474</b>		<b>15,476</b>		<b>18,947</b>	

1. Does not include trainees, interns and apprentices. Accounts for statutory directors as well as non-statutory directors. All employees work full time.

## Workers who are not employed by type of activity performed

[GRI 2-8]

	2022 <sup>1</sup>
End activities	453
Support activities	533
Maintenance, cleaning, security and conservation	606
<b>TOTAL</b>	<b>1,592</b>

1. Does not include trainees, interns and apprentices. Accounts for statutory directors as well as non-statutory directors. All employees work full time.

## Workers who are not employed

[GRI 2-8]

	2022 <sup>1</sup>	
	Direct hiring	Indirect contracting (through a third party)
<b>By gender</b>		
Men	110	1,121
Women	118	243
<b>By contract type</b>		
Apprentices	153	22
Trainees	55	21
Hired	0	1,047
Temporary	0	139
Subcontractors	0	155
<b>TOTAL</b>		<b>1,592</b>

1. We now present this indicator in this reporting cycle, therefore, there is no historical basis.

## Ratio between the lowest wage and the local minimum wage, broken down by gender<sup>1</sup>

[GRI 202-1]

	2022			
	Employees		Workers who are not employed	
	Men	Women	Men	Women
<b>BRAZIL</b>				
Joinville	1.31	1.33	1.28	0.92
Betim	1.55	1.55	0.69	0.69
Mauá	0.00	0.00	0.00	0.00
<b>Mexico</b>				
Saltillo	1.30	1.30	0.75	0.75
Branches	1.23	1.23	1.05	1.05
<b>Portugal</b>				
Aveiro	1.00	1.00	1.00	1.00

1. This indicator only considers the manufacturing units. Only interns and apprentices earn less than the minimum wage.

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# Human capital

## New hires and employee turnover

[GRI 401-1]

### New employee hires

	2020		2021		2022	
	Number	Fee	Number	Fee	Number	Fee
<b>By gender</b>						
Men	1,756	0.14	7,183	0.50	5,351	0.31
Women	174	0.17	371	0.31	470	0.33
<b>By region</b>						
Brazil	1,200	0.13	4,286	0.42	3,966	0.29
Mexico	730	0.17	3,267	0.63	1,787	0.38
United States	-	-	1	0.08	1	0.10
Europe	-	-	0	0	67	0.17
<b>By age group</b>						
Under the age of 30	1,103	0.28	4,468	0.89	3,179	0.58
Between 30 and 50 years	812	0.10	3,000	0.33	2,491	0.23
Over the age of 50	15	0.01	86	0.06	151	0.06
<b>TOTAL</b>	<b>1,930</b>	<b>0.14</b>	<b>7,554</b>	<b>0.49</b>	<b>5,821</b>	<b>0.31</b>

### Employee turnover

	2020		2021		2022	
	Number <sup>1</sup>	Rate <sup>2</sup>	Number <sup>1</sup>	Rate <sup>2</sup>	Number <sup>1</sup>	Rate <sup>2</sup>
<b>By gender</b>						
Men	2,550	0.21	5,325	0.37	5,322	0.30
Women	184	0.18	249	0.21	444	0.31
<b>By region</b>						
Brazil	1,157	0.13	3,195	0.31	3,674	0.27
Mexico	1,577	0.36	2,378	0.45	2,053	0.44
United States	-	-	1	0.08	3	0.30
Europe	-	-	0	0	36	0.09
<b>By age group</b>						
Under the age of 30	1,442	0.36	3,020	0.60	2,866	0.52
Between 30 and 50 years	1,168	0.14	2,338	0.26	2,785	0.25
Over the age of 50	124	0.09	216	0.14	115	0.05
<b>TOTAL</b>	<b>2,734</b>	<b>0.20</b>	<b>5,574</b>	<b>0.36</b>	<b>5,766</b>	<b>0.30</b>

1. Employees who have left the company.

2. Calculation methodology: total employee terminations in the year, divided by the total number of employees at the end of the year.

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## Maternity/paternity leave

[GRI 401-3]

	2022 <sup>1</sup>		
	Men	Women	TOTAL
Employees entitled to take leave	17,515	1,432	<b>18,947</b>
Employees who took leave	671	56	<b>727</b>
Employees who returned to work after leave ended	671	54	<b>725</b>
Rate of return to work <sup>2</sup>	100%	96%	<b>99.72%</b>

1. We now present this indicator in this reporting cycle, therefore, there is no historical basis and the retention rate has not yet been calculated.

2. Total number of employees who returned to work after maternity/paternity leave / Total number of employees who took maternity/paternity leave x 100.

## Number of cases of occupational diseases<sup>1</sup>

[GRI 403-10]

2020	10
2021	6
2022	29

1. These diseases are directly related to repetitive movements, inadequate ergonomic positions and exertions, low work turnover, mineral dust (silica), noise and aromatic solvents (toluene and xylene). These hazards are identified through risk assessment, Technical Report on Environmental Working Conditions (LTCAT) and ergonomic reports. All workers who complain of pain undergo a medical evaluation at the unit and undergo complementary tests. If necessary, visits to the workplace can be carried out in order to identify any relationship between the injury and the workplace and, if any inadequacy is confirmed, corrective measures are applied - such as replacement of materials and tools, rotation of activities, enclosure of machines, improvements in Collective Protection Equipment (EPCs) and Individual Protection Equipment (PPE), among other actions -, with communications to the appropriate responsible government bodies, according to each location.

## Ratio between base salary and remuneration received by women and those received by men

[GRI 405-2]

	2020		2021		2022 <sup>1</sup>	
	Base salary	Remuneration <sup>2</sup>	Base salary	Remuneration <sup>2</sup>	Base salary	Remuneration <sup>2</sup>
Management	80%	90%	74%	73%	110%	110%
Leadership/Coordination	87%	100%	86%	89%	100%	100%
Technical/Supervision	90%	101%	91%	90%	96%	96%
Administrative	86%	83%	85%	85%	96%	97%
Operational	83%	81%	87%	86%	98%	98%

1. As of 2022, the method of calculation started to also compare existing levels within the same position, which, in previous years, only considered the position.

2. It considers fixed and variable remuneration, as well as bonuses.

## Percentage of employees receiving regular performance and career development reviews

[GRI 404-3]

	2020			2021			2022		
	Men	Women	TOTAL	Men	Women	TOTAL	Men	Women	TOTAL
Directorship	100%	-	100%	100%	-	100%	100%	-	100%
Management	98.41%	80%	97.06%	100%	100%	100%	100%	100%	100%
Leadership/Coordination	100%	100%	100%	100%	100%	100%	100%	100%	100%
Technical/Supervision	99.91%	100%	99.62%	100%	100%	100%	100%	100%	100%
Administrative	89.53%	97.96%	91.87%	100%	100%	100%	100%	100%	100%
<b>TOTAL</b>	<b>93.26%</b>	<b>97.85%</b>	<b>94.23</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

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# Corporate governance

## Communication and training on anti-corruption policies and procedures<sup>1</sup>

[GRI 205-2]

	2022 <sup>2</sup>			
	Received communication on anti-corruption procedures and policies		Received training in combating corruption	
	Number	Percentage	Number	Percentage
<b>By functional category</b>				
Administration Council <sup>3</sup>	15	100%	15	100%
Board of Directors <sup>4</sup>	27	100%	22	82%
Management	110	100%	90	82%
Leadership/Coordination	179	100%	150	84%
Technical/Supervision	1,493	100%	1,346	92%
Administrative	1,139	100%	1,043	92%
Operational	15,976	100%	13,668	91%
Trainees	75	100%	70	93%
Apprentices	153	100%	78	51%
<b>By region</b>				
Brazil	14,042	100%	11,550	89%
Mexico	4,714	100%	4,714	100%
United States	10	100%	3	30%
Europe	401	100%	215	54%
<b>TOTAL</b>	<b>19,167</b>	<b>100%</b>	<b>16,482</b>	<b>91.1%</b>

1. It considers active employees and workers (interns and underage apprentices with a direct contract), i.e. those on leave during the period were excluded from the calculation. No trainees were hired in 2022.  
 2. We now present this indicator in this reporting cycle, therefore, there is no historical basis.  
 3. Accounts for members of the Board of Directors, Fiscal Council and committee members.  
 4. Accounts for statutory directors as well as non-statutory directors.

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## Diversity in governance bodies and employees (%)

[GRI 405-1]

	2020			2021			2022					
	Under the age of 30	Between 30 and 50 years	Over the age of 50	Under the age of 30	Between 30 and 50 years	Over the age of 50	Under the age of 30		Between 30 and 50 years		Over 50 years old	
							Men	Women	Men	Women	Men	Women
Council <sup>1</sup>	0	22.22	77.78	0	22.22	77.78	0	0	0	100	78.57	21.43
Board of Directors <sup>2</sup>	0	45.45	54.55	0	53.85	46.15	0	0	100	0	100	0
Management	0	83.82	16.18	1.23	77.78	20.99	100	0	86.67	13.33	94.12	5.88
Leadership/Coordination	0.70	78.87	20.42	1.36	77.55	21.09	100	0	84.68	15.32	98.08	1.92
Technical/Supervision	6.49	80.92	12.6	10.19	79.62	10.19	78.89	21.11	96.57	3.34	99.37	0.63
Administrative	26.28	65.12	8.6	22.95	69.24	7.81	61.29	38.71	71.31	28.69	84.25	15.75
Operational	31.00	58.68	10.32	34.06	56.34	9.60	94.31		93.11	6.89	96.08	3.92

1. Accounts for members of the Board of Directors, Fiscal Council and committee members.

2. Accounts for statutory directors as well as non-statutory directors.

## People with Disabilities (PWD) by functional category (%)

[GRI 405-1]

	2020		2021		2022	
	Number	Percentage	Number	Percentage	Number	Percentage
Council <sup>1</sup>	0	0%	0	0%	0	0%
Board of Directors <sup>2</sup>	0	0%	0	0%	0	0%
Management	0	0%	0	0%	0	0%
Leadership/Coordination	0	0%	1	0.68%	0	0%
Technical/Supervision	5	1.94%	4	1.51%	8	0.54%
Administrative	8	1.05%	9	0.87%	5	0.44%
Operational	131	1.17%	134	0.96%	129	0.81%

1. Accounts for members of the Board of Directors, Fiscal Council and committee members.

2. Accounts for statutory directors as well as non-statutory directors.

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# Natural Capital

## Water collection per source (megaliters) [GRI 303-3]

	2022	
	All Areas	Water stress areas
Surface water (total)	101	0
Underground water (total)	624	181
Third-party water (total)	992	441
<b>Total water withdrawal = Surface water (total) + groundwater (total) + water from third parties (total)</b>	<b>1,716</b>	<b>622</b>

## Discharge of water per source (megaliters) [GRI 303-4]

	2022	
	All Areas	Water stress areas
Surface water	119.37	119.37
Third-party water (total)	65.30	54.01
<b>Total water discharge = Surface water + groundwater + third-party water (total)</b>	<b>184.67</b>	<b>173.38</b>

## Waste generated by composition (tons)

[ GRI 306-3; SASB EM-MM-150a.7 ]

	2020	2021	2022	
			Disregarding the units of Betim and Aveiro <sup>1</sup>	All units
Non-hazardous waste reused internally (grit)	2,092	2,558	2,085	3,103
Internally recycled/regenerated non-hazardous waste (sand, refuse, scrap, iron chips)	452,319	578,679 <sup>2</sup>	591,050	835,777
Non-hazardous waste sent for external recycling (recycling/reuse)	64,558	75,090	114,216	193,291
Hazardous waste sent for external recycling (recycling/reuse/co-processing)	7,447	10,342	8,714	9,398
Non-hazardous waste sent to landfill	452,189	692,156	626,719	802,550
Non-hazardous waste incinerated	-	0	0	0
Hazardous waste sent to landfill	3,005	2,042	1,904	1,904
Hazardous waste incinerated	-	0	0	0
Non-hazardous waste temporarily stored inside plants	30,800 <sup>3</sup>	22,600 <sup>3</sup>	31,100	54,469
<b>TOTAL</b>	<b>1,012,411<sup>3</sup></b>	<b>1,383,467<sup>3</sup></b>	<b>1,375,786</b>	<b>1,900,492</b>
Ton produced		536,801	527,996	696,265
Total waste generated per ton of equivalent production [t/t produced]	2.52	2.58 <sup>4</sup>	2.61	2.73

1. The information for 2022 is being presented in this format so that we can maintain the transparency of our performance in comparison with the historical base.

2. Number corrected in this report because, in 2021, the amount of return + metal waste generated in the units in Mexico had not been accounted for, therefore, the change is justified by the incorporation of the quantitative data of the waste generated in the process in the sum.

3. Number corrected in this report due to access to new waste inventory controls stored by the responsible area that report this amount of waste generated and stored on site.

4. Number corrected in this report due to the change of two previous items: non-hazardous waste recycled regenerated and non-hazardous waste temporarily stored inside the plants.

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## Waste not intended for final disposal (tons)

[GRI 306-4]

	2020	2021	2022
<b>Within the Organization</b>	<b>454,411.00</b>	<b>581,237.00</b>	<b>838,879.32</b>
<b>Non-hazardous waste</b>	<b>454,411.00</b>	<b>581,237.00</b>	<b>838,879.32</b>
Preparation for reuse	2,092.00	2,558.00 <sup>1</sup>	3,102.74
Recycling	452,319.00	578,679 <sup>2</sup>	835,777
<b>Outside the Organization</b>	<b>72,005.00</b>	<b>85,432.00</b>	<b>202,689.63</b>
<b>Hazardous Waste</b>	<b>7,447.00</b>	<b>10,342.00</b>	<b>9,398.25</b>
Recycling	7,447	10,342	9,398.25
<b>Non-hazardous waste</b>	<b>64,558.00</b>	<b>75,090.00</b>	<b>193,291.38</b>
Recycling	64,558	75,090	193,291.38
<b>TOTAL</b>	<b>526,416.00</b>	<b>666,669.00</b>	<b>1,041,568.95</b>
<b>Hazardous Waste</b>	<b>7,447.00</b>	<b>10,342.00</b>	<b>9,398.25</b>
Recycling	7,447.00	10,342.00	9,398.25
<b>Non-hazardous waste</b>	<b>518,969.00</b>	<b>656,327.00</b>	<b>1,032,170.70</b>
Preparation for reuse	-	2,558.00	3,102.74
Recycling	452,319.00	653,769.00	1,029,067.96

1. The value reported in the previous report was adjusted due to the additional amount related to waste reused internally in Joinville 2021 (reuse of landfill sand, grit, refuse and channels).

2. The amount reported in the previous report was adjusted due to the addition of scrap and metal returns that had not been accounted for in 2021.

## Waste destined for final disposal (tons)

[GRI 306-5]

	2020	2021	2022
<b>Within the Organization<sup>1</sup></b>	<b>315,510.00</b>	<b>489,171.00</b>	<b>624,626.90</b>
<b>Non-hazardous waste</b>	<b>315,510.00</b>	<b>489,171.00</b>	<b>624,626.90</b>
Landfill confinement	315,510	489,171	624,626.90
<b>Outside the Organization<sup>2</sup></b>	<b>139,684.00</b>	<b>205,026.00</b>	<b>179,829.41</b>
<b>Hazardous Waste</b>	<b>3,005.00</b>	<b>2,042.00</b>	<b>1,903.81</b>
Landfill confinement	3,005	2,042	1,904
<b>Non-hazardous waste</b>	<b>136,679.00</b>	<b>202,984.00</b>	<b>177,923.60</b>
Landfill confinement	136,679	202,984.00	177,923.60
<b>TOTAL</b>	<b>455,194.00</b>	<b>694,197.00</b>	<b>804,454.31</b>
<b>Hazardous Waste</b>	<b>3,005.00</b>	<b>2,042.00</b>	<b>1,903.81</b>
Landfill confinement	3,005.00	2,042.00	1,903.81
<b>Non-hazardous waste</b>	<b>452,189.00</b>	<b>692,155.00</b>	<b>802,550.50</b>
Landfill confinement	452,189.00	692,155.00	802,552.50

1. The increase in the disposal of waste to landfills within the organization is due to the incorporation of data from the plant in Betim, which also has its own landfill, as in Joinville.

## Reduction of GHG emissions (tCO<sub>2</sub> equivalent)<sup>1</sup>

[GRI 305-5]

	2020	2021	2022
Reductions from direct emissions (scope 1)	-154,946	-47,341	-8204
Reductions from indirect emissions from energy acquisition (scope 2)	-60,032	1,353	-50,472
Reductions from other indirect emissions (scope 3)	-51,602	-18,889	- 5,280
<b>Total GHG emission reductions</b>	<b>-266,580</b>	<b>-64,077</b>	<b>- 63,956</b>

1. We did not consider the Betim and Aveiro units in the reduction calculation in order to maintain the comparison with the historical basis. These units will only be included in the next reporting cycle, when comparison will be possible. Base year for comparison: 2019.

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# Financial Capital

## Demonstration of added value For the year ended December 31, 2022 and 2021 (per million of reais) [GRI 201-1]

	CONSOLIDATED	
	12/31/22	12/31/21
<b>Added value generation</b>	<b>10,820,116</b>	<b>7,522,694</b>
Sale of products, net of returns and rebates	10,845,276	7,468,056
Other (Expenses) Income	-14,298	48,804
Provision for doubtful credits	-10,862	5,834
<b>(-) Inputs purchased from third parties</b>	<b>-7,217,678</b>	<b>-5,087,378</b>
Raw materials and process material consumed	-4,872,907	-3,318,759
Materials, energy, third-party service and others	-2,344,771	-1,768,619
<b>GROSS VALUE ADDED</b>	<b>3,602,438</b>	<b>2,435,316</b>
<b>Retentions:</b>	<b>-348,551</b>	<b>-367,668</b>
Depreciation and amortization	-348,551	-367,668
<b>Net added value generated</b>	<b>3,253,887</b>	<b>2,067,648</b>
<b>Added value received in transfer</b>	<b>99,360</b>	<b>47,982</b>
Profit sharing of subsidiaries	-	-
Financial Revenues	99,360	47,982
<b>ADDED VALUE TO DISTRIBUTE</b>	<b>3,353,247</b>	<b>2,115,630</b>
<b>Added value distribution</b>		
<b>From work</b>	<b>1,911,260</b>	<b>1,398,707</b>
Employees	1,539,215	1,181,332
Social charges - FGTS	43,130	36,838

	CONSOLIDATED	
	31/12/22	31/12/21
Profit sharing or results	153,231	65,781
Management fees	29,717	17,200
Health and safety at work	65,648	55,183
Food	14,675	14,124
Education, training and professional development	2,649	2,139
Other amounts	62,995	26,110
<b>From the government</b>	<b>698,552</b>	<b>318,832</b>
Federal taxes, fees and contributions	491,079	221,217
State taxes and fees	197,849	88,362
City and other taxes and fees	9,624	9,253
<b>Third-party capital</b>	<b>241,214</b>	<b>195,179</b>
Financial Expenses	221,484	207,021
Net monetary and exchange variations	19,730	-11,842
<b>Equity</b>	<b>502,221</b>	<b>202,912</b>
Shareholders (interest on own capital)	-	-
Shareholders (dividends)	65,378	-
Retained earnings	436,843	202,912
<b>TOTAL VALUE ADDED</b>	<b>3,353,247</b>	<b>2,115,630</b>

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# 11 GRI Content Summary







# GRI Content Summary

Declaration of use	Tupy S.A. reported in accordance with the GRI Standards for the period from January 1 to December 31, 2022.
GRI 1	GRI 1 Fundamentals 2021
Applicable GRI Sector Standard	There was none

GRI STANDARD	CONTENT	RESPONSE	OMISSION			GRI CONTENT SUMMARY
			REQUIREMENT OMITTED	REASON	EXPLANATION	
<b>GRI 2: General Contents 2021</b>	2-1 Organization details	page 13				
	2-2 Entities included in the organization's sustainability report	page 6				
	2-3 Reporting period, frequency and point of contact	page 6				
	2-4 Restatements of information	page 6				
	2-5 External verification	Only data referring to Greenhouse Gas (GHG) emissions and financial results were audited by an independent third party. The other information was verified internally, with the supervision of the Executive Board and the Board of Directors.				
	2-6 Activities, value chain and other business relationships	page 13				
	2-7 Employees	page 79				
	2-8 Workers who are not employees	page 79				
	2-9 Governance structure and its composition	pages 21 e 23				
	2-10 Nomination and selection for the highest governance body	page 24				
	2-11 Chair of the highest governance body	page 23				
	2-12 Role played by the highest governance body in overseeing the management of impacts	page 25				
	2-13 Delegation of responsibility for managing impacts	page 25				
	2-14 Role played by the highest governance body in sustainability reporting	page 7 The information presented in this report was verified internally under supervision of the Executive Direction and the Board of Directors.				

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GRI STANDARD	CONTENT	RESPONSE	OMISSION			GRI CONTENT SUMMARY
			REQUIREMENT OMITTED	REASON	EXPLANATION	
<b>GRI 2: General Contents 2021</b>	2-15 Conflicts of interest	In September 2015, the Board of Directors approved the Related Party Transactions Policy, which was last revised in October 2018. Among other specific improvements, the treatment given to situations of conflict of interest was established, in line with the recommendations of the Brazilian Code of Corporate Governance and the Novo Mercado Regulation of B3. In addition, with the purpose of ensuring that the person who is not independent in relation to the matter under discussion or deliberation in the management or supervisory bodies timely manifests their eventual conflict of interest or private interest, our corporate governance contemplates additional rules in other corporate documents that must be observed by administrators and managers with decision-making power, such as the Board of Directors' Internal Regulations and the Internal Conflict of Interest Rules.				
	2-16 Communication of critical concerns	page 25				
	2-17 Collective knowledge of the highest governance body	In 2022, a workshop on sustainable development was held for board members, sponsored by the Strategy and Innovation Committee.				
	2-18 Evaluation of the performance of the highest governance body	page 24				-
	2-19 Remuneration policies	page 25				-
	2-20 Process for determining remuneration	page 25				-
	2-21 Annual total compensation ratio			All.	Information on the compensation of the Board of Directors, Statutory Board of Executive Officers and Fiscal Council is available in section 13 (Management Compensation) of the Company's Reference Form.	Topics related to executive compensation are considered strategic and, therefore, are not presented in this report.

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<b>GRI 2: General Contents 2021</b>	2-22 Declaration on sustainable development strategy	page 3				-
	2-23 Policy Commitments	pages 27, 30 e 37				-
	2-24 Incorporation of policy commitments	page 27				-
	2-25 Processes for repairing negative impacts	page 28 In September 2015, the Board of Directors approved the Related Party Transactions Policy, which was last revised in October 2018. Among other specific improvements, the treatment given to situations of conflict of interest was established, in line with the recommendations of the Brazilian Code of Corporate Governance and the Novo Mercado Regulation of B3. In addition, with the purpose of ensuring that the person who is not independent in relation to the matter under discussion or deliberation in the management or supervisory bodies timely manifests their eventual conflict of interest or private interest, our corporate governance contemplates additional rules in other corporate documents that must be observed by administrators and managers with decision-making power, such as the Board of Directors' Internal Regulations and the Internal Conflict of Interest Rules.				-
	2-26 Mechanisms for counseling and raising concerns	page 32				
	2-27 Compliance with laws and regulations	Considering our size, there were no significant cases of non-compliance with laws and regulations during the reporting period.				
	2-28 Membership associations	page 26				
	2-29 Approach to stakeholder engagement	page 54				
	2-30 Collective Bargaining Agreements	In Brazil and Portugal, 100% of employees are covered by collective bargaining agreements. In Mexico, this percentage is 88%, and for employees not covered by a collective bargaining agreement, the same terms and conditions are adopted based on the agreement established with other employees. These agreements are reviewed annually.				

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			REQUIREMENT OMITTED	REASON	EXPLANATION	
MATERIAL THEMES						
<b>GRI 3: Material Themes 2021</b>	3-1 Process for defining material topics	page 7				
	3-2 List of material topics	page 7				
MATERIAL THEME: <b>ATMOSPHERIC EMISSIONS</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 66				
<b>GRI 302: Energy 2016</b>	302-1 Energy consumption within the organization	page 66				
	302-2 Energy consumption outside of the organization		All.	Unavailable/incomplete information	Information not verified in the GHG emissions inventory. It will be answered in the next reporting cycles.	
	302-3 Energy intensity	page 66				
	302-4 Reduction of energy consumption	page 66				
<b>GRI 305: Emissions 2016</b>	305-1 Direct (Scope 1) GHG emissions	page 70				
	305-2 Energy indirect (Scope 2) GHG emissions	page 70				
	305-3 Other indirect (Scope 3) GHG emissions	page 70				
	305-4 Intensity of greenhouse gas (GHG) emissions	page 70				-
	305-5 Reduction of GHG emissions	page 85				-

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<b>GRI 305: Emissions 2016</b>	305-6 Emissions of substances that deplete the ozone layer (ODS)		All.	Not applicable.	CFC-11 is not used in any of our units.	-
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	page 68				-
<b>MATERIAL THEME: DECARBONIZATION</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 70				
<b>GRI 201: Economic Performance 2016</b>	201-2 Financial implications and other risks and opportunities due to climate change		All.	Information unavailable.	We do not currently use climate-related scenario analysis, but we have a transition plan that will be developed over the next two years.	
<b>GRI 302: Energy 2016</b>	302-5 Reductions in energy requirements of products and services		All.	Unavailable/incomplete information	Information not verified in the GHG emissions inventory. It will be answered from the next reporting cycles.	
<b>MATERIAL THEME: WASTE MANAGEMENT AND CIRCULAR ECONOMY</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 73				

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<b>GRI 301: Materials 2016</b>	301-1 Materials used, broken down by weight or volume	page 75				
	301-2 Raw materials or recycled materials used	page 75				
	301-3 Products and their packaging reused	page 75				
<b>GRI 303: Water and effluents 2018</b>	303-1 Interactions with water as a shared resource	page 72				
	303-2 Management of water discharge-related impacts	page 72				
	303-3 Water withdrawal	pages 72 e 84				
	303-4 Water discharge	pages 72 e 84				
	303-5 Water consumption	page 72				
<b>GRI 306: Waste 2020</b>	306-1 Waste generation and significant waste-related impacts	page 76				
	306-2 Management of significant waste-related impacts	page 76				
	306-3 Waste generated	page 84				
	306-4 Waste diverted from disposal	page 85				
	306-5 Waste directed to disposal	page 85				
<b>MATERIAL THEME: INNOVATION AND PRODUCT QUALITY</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 46				
<b>MATERIAL THEME: ETHICS AND COMPLIANCE</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 30				

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			REQUIREMENT OMITTED	REASON	EXPLANATION	
<b>GRI 205: Fighting Corruption 2016</b>	205-1 Operations assessed for risks related to corruption	Based on all the practices mentioned on page 26 of this report, we consider that 100% of operations are evaluated.				
	205-2 Communication and training about anti-corruption policies and procedures	page 82				
	205-3 Confirmed incidents of corruption and actions taken	page 32				
<b>GRI 206: Unfair Competition 2016</b>	206-1 Lawsuits for unfair competition, trust and monopoly practices	None.				
<b>GRI 406: Non-Discrimination 2016</b>	406-1 Incidents of discrimination and corrective actions taken	In 2022, there were two cases arising from discrimination. In both, the penalties provided for in our Disciplinary Code were followed.				
<b>MATERIAL THEME: DEVELOPING PEOPLE</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 40				
<b>GRI 201: Economic Performance 2016</b>	201-3 Defined benefit plan obligations and other retirement plans	page 43				
<b>GRI 401: Employment 2016</b>	401-1 New employee hires and employee turnover	page 80				
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	page 43				
	401-3 Parental leave	page 81				

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<b>GRI 404: Training and Education 2016</b>	404-1 Average hours of training per year per employee	page 41				
	404-2 Programs for upgrading employee skills and transition assistance programs	page 42				
	404-3 Percentage of employees receiving regular performance and career development reviews	page 81				
<b>MATERIAL THEME: HEALTH, SAFETY AND WELL-BEING</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 37				
<b>GRI 403: Occupational Health and Safety 2018</b>	403-1 Occupational health and safety management system	page 37				
	403-2 Hazard identification, risk assessment, and incident investigation	page 38				
	403-3 Occupational health services	page 39				
	403-4 Worker participation, consultation, and communication on occupational health and safety	page 39				
	403-5 Training of workers in occupational health and safety	page 38				
	403-6 Promotion of worker health	page 39				
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	page 38				
	403-8 Workers covered by an occupational health and safety management system	page 37				
	403-9 Occupational injuries	page 37				
	403-10 Occupational ill health	page 81				

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			REQUIREMENT OMITTED	REASON	EXPLANATION	
<b>MATERIAL THEME: DIVERSITY AND INCLUSION</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Management of material issues	page 44				
<b>GRI 405: Diversity and Equal Opportunities 2016</b>	405-1 Diversity of governance bodies and employees	pages 45 e 83				
	405-2 Ratio of basic salary and remuneration of women to men	page 81				
<b>MATERIAL THEME: SUSTAINABLE SUPPLY CHAIN</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Material topic management	page 55				
<b>GRI 407: Freedom of Association and Collective Bargaining 2016</b>	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	The right to freedom of association and collective bargaining are covered by the legislation of the country of the absolute majority of our suppliers (99.6%).				
<b>GRI 408: Child Labor 2016</b>	408-1 Operations and suppliers at significant risk for incidents of child labor	page 56				
<b>GRI 409: Forced or Slave Labor 2016</b>	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	page 56				
<b>MATERIAL THEME: IMPACTS ON LOCAL COMMUNITIES</b>						
<b>GRI 3: Material Themes 2021</b>	3-3 Material topic management	page 58				

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			REQUIREMENT OMITTED	REASON	EXPLANATION	
<b>GRI 201: Economic Performance 2016</b>	201-1 Direct economic value generated and distributed	page 86				
	201-4 Financial assistance received from government	R\$ 5,041,945.00 distributed in Reintegra, Worker's Food Program (PAT) and Lei do Bem.				
<b>GRI 202: Market Presence 2016</b>	202-1 Ratio between the lowest wage and the local minimum wage, broken down by gender	page 79				
	202-2 Proportion of board members hired from the local community	Eleven Board members were hired from the local community (41%). For this indicator, we consider both directors and statutory directors.				
<b>GRI 203: Indirect Economic Impacts 2016</b>	203-1 Infrastructure investments and services supported	page 58				
	203-2 Significant indirect economic impacts	page 58				
<b>GRI 413: Local Communities 2016</b>	413-1 Operations with local community engagement, impact assessments, and development programs	page 58				
	413-2 Operations with significant actual or potential negative impacts on local communities	page 61				

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# SASB Content Summary

SASB THEME	CODE	ACCOUNTING METRICS	RESPONSE
Topics and accounting metrics for sustainability disclosure   Sector: Mineral extraction and processing   Industry: Metals and Mining			
<b>Air quality</b>	EM-MM-120a.1	Atmospheric emissions of the following pollutants: (1) CO, (2) NOx (excluding N2O), (3) SOx, (4) particulate matter (PM10), (5) mercury (Hg), (6) lead (Pb) and (7) volatile organic compounds (VOCs)	pages 68 e 70
<b>Power management</b>	EM-MM-130a.1	(1) Total energy consumed, (2) percentage of grid electricity, (3) percentage renewable	page 66
<b>Waste &amp; hazardous material management</b>	EM-MM-150a.7	Total weight of hazardous waste generated	page 84
	EM-MM-150a.9	Number of significant incidents associated with the management of hazardous materials and waste	None.
<b>Water management</b>	EM-MM-140a.2	Number of cases of non-compliance associated with water quality licenses, standards and regulations	None.
<b>Work relationships</b>	EM-MM-310a.1	Percentage of active workforce covered by collective bargaining agreements	In Brazil and Portugal, 100% of employees are covered by collective bargaining agreements. In Mexico, this percentage is 88%, and for employees not covered by a collective bargaining agreement, the same terms and conditions are adopted based on the agreement established with other employees. These agreements are reviewed annually.
	EM-MM-310a.2	Number and duration of strikes and lockouts	None.
<b>Business Ethics &amp; Transparency</b>	EM-MM-510a.1	Description of the management system for preventing corruption and bribery throughout the value chain	page 32

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# TCFD report

THEMES	TCFD RECOMMENDATIONS	REFERENCE (PAGE/DIRECT ANSWER)
<b>Governance</b>	a. Describe how the Board oversees risks and opportunities related to climate change.	<p>Climate risks are supervised within the scope of periodic monitoring of strategic risks. This activity is conducted by the Executive Board and reported to the Board of Directors and its Advisory Committees (Strategy and Innovation Committee and Statutory Audit and Risks Committee).</p> <p>The governance that deals with the topic includes:</p> <ol style="list-style-type: none"> <li>1. Statutory Audit and Risk Committee: linked to the Board of Directors and is responsible for evaluating the risk management process and structure and the effectiveness of existing controls for monitoring it, including the adequacy of human and financial resources;</li> <li>2. Vice-presidency of Finance, Controls and Administration: linked to the Presidency, it is responsible for validating climate risks and opportunities on long-term strategic guidelines;</li> <li>3. Investor Relations Manager: linked to the Vice-Presidency of Finance, Controls and Administration, and is responsible for identifying, assessing and managing climate risks and opportunities regarding long-term strategic guidelines;</li> <li>4. Risk Manager: linked to the Finance, Controls and Administration Vice-Presidency, and is responsible for defining the risk management methodology and reporting the main risks to the Company's Governance bodies.</li> </ol>
<b>Governance</b>	b. Describe the Board's role in assessing and managing risks and opportunities related to climate change.	The Statutory Audit and Risks Committee, which reports to the Board of Directors, is responsible for monitoring risks and ensuring that controls and mitigation measures are being implemented in accordance with the procedure. Critical risks are taken for direct treatment by the Board, in follow-up meetings.
<b>Strategy</b>	a. Risks and opportunities related to climate change that the organization has identified in the short, medium and long term.	<p>We have an internal Risk Management and Internal Controls policy. This policy aims to disseminate the risk management culture and control environment at all levels of the organization, incorporating it into the Company's decision-making process. It establishes guidelines and responsibilities in the risk management process in order to allow the identification, evaluation, prioritization, treatment, monitoring, communication of risks and ensure the functioning of the Company's internal control system.</p> <p>The risks and opportunities related to climate change mapped in this process are medium term (1 to 5 years):</p> <ul style="list-style-type: none"> <li>• Risks: (i) Changes in precipitation patterns: prolonged droughts; (ii) New regulations: establishment of CO2 equivalent emission limits in the operation; (iii) Regulations that limit the amount of CO2 equivalent of products.</li> <li>• Opportunities: (i) Replacement of mineral coke by biomass briquette; (ii) Forest conservation in Tupy's assets; (iii) Development of new low carbon products adding value to the product.</li> </ul>
<b>Strategy</b>	b. impacts of risks and opportunities related to climate change on the organization's business, strategy and financial planning.	<ul style="list-style-type: none"> <li>• Impacts related to mapped risks: increase in direct and indirect costs.</li> <li>• Impacts related to identified opportunities: (i) generation of carbon credits from the conservation of our forestry assets and (ii) gains from generating additional volume and blocking competitors and intangible gains in communication and image.</li> </ul>

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THEMES	TCFD RECOMMENDATIONS	REFERENCE (PAGE/DIRECT ANSWER)
<b>Strategy</b>	c. Resilience of the organization's strategy, considering different climate change scenarios, including a scenario of 2°C or less.	We do not currently use climate-related scenario analysis, but we have a transition plan that will be developed over the next two years.
<b>Risk Management</b>	a. Processes used by the organization to identify and assess risks related to climate change.	<p>Our internal Risk Management and Internal Controls policy establishes guidelines and responsibilities that allow the identification and assessment of these risks.</p> <p>To assess the likelihood of occurrence of climate risks, we use the following criteria: (i) occurrence of physical or transitional phenomena in previous years; (ii) indications that the assessed events may occur; (iii) temperature influence and variation.</p> <p>To assess the potential impact of identified risks, we use the following criteria: (i) potential financial impacts in case of materialization of the risk; (ii) consequences on our production system in case of occurrence of the event; (iii) potential impacts on the Company's image or the sector where the Company operates; and (iv) consequences on our strategies in case of risk materialization.</p>
<b>Risk Management</b>	b. processes used by the organization to manage risks related to climate change.	<p>Risk management activities are based on good corporate governance practices established by the following references: <i>Committee of Sponsoring Organization of the Treadway Commission (COSO) ERM: 2017 – Corporate Risk Management Integrated with Strategy and Performance</i> and <i>ISO 31000:2018 – Risk Management Guidelines</i>. They also follow the <i>Control Objectives for Information and related Technology (CobIT) standards and methodology</i>.</p> <p>The management of internal controls uses the following concepts and structures:</p> <ul style="list-style-type: none"> <li>• Control Self-Assessment (CSA): Self-assessment process carried out by the business areas to assess the design and implementation of internal controls, and ensure that they are being carried out in accordance with their objectives;</li> <li>• Test of Effectiveness (ToE): Internal control effectiveness testing process used to attest that the controls are properly executed by the business areas, allowing to identify any deficiencies;</li> <li>• Sign Off: Process used by the company's management to approve the results of internal control evaluations.</li> </ul> <p>Tupy assesses risks considering their inherent and residual effects, as well as their probability and impact, in order to allow risk prioritization.</p>
<b>Risk Management</b>	c. How the processes used by the organization to identify, assess and manage risks related to climate change are integrated into the organization's overall risk management.	<p>Climate aspects are incorporated into integrated risk management. In 2021, we began assessing climate risks and opportunities in line with the recommendations of the Task Force for Climate Disclosure (TCFD) and the Carbon Disclosure Project (CDP). Among the evaluated criteria are the possible financial, social, environmental and regulatory impacts.</p> <p>We have an integrated structure of Governance, Risk and Compliance (GRC), distributed in the areas of Risk Management and Internal Controls; Internal Audit; Compliance; and Corporate Governance – the last three of which are linked to the Board of Directors. This assesses the Company's exposure to negative impacts by discussing the priority risk matrix and the respective action plans, which are updated quarterly, based on the best governance practices.</p> <p>Our internal controls are regularly evaluated by the business areas in a Control Self Assessment (CSA) process organized by the Risk Management and Internal Controls area; their effectiveness is tested by the Internal Audit area, considering maturity criteria of the adopted controls. Topics with the potential to negatively impact our stakeholders are forwarded monthly to the respective committees of the Board of Directors.</p>

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THEMES	TCFD RECOMMENDATIONS	REFERENCE (PAGE/DIRECT ANSWER)
<b>Metrics and goals</b>	a. Metrics used by the organization to assess risks and opportunities related to climate change in accordance with its strategy and risk management process.	Absolute GHG emissions (tCO <sub>2</sub> e); Intensity of GHG emissions: Scope 01 and 02 (tCO <sub>2</sub> /t iron) Intensity of GHG emissions: Scope 01 and 02 by billing (tCO <sub>2</sub> /R\$) Energy Consumption (GJ) Energy intensity: energy consumption in GJ/t produced
<b>Metrics and goals</b>	b. transparency regarding scope 1, 2 and 3 emissions	Scope 01: Brazil: 560,102 tCO <sub>2</sub> Scope 02: Brazil: 196,159 tCO <sub>2</sub> Scope 03: 158,549 tCO <sub>2</sub>
<b>Metrics and goals</b>	c. Targets used to manage climate change-related risks and opportunities, and performance against targets.	We haven't set goals yet.

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COORDINATION  
**Diretoria de Relação com Investidores**

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**Walk4Good**

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## Tupy on social media

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[\\_company/shifftaceleradora/](#)

 [\\_MWM Motores](#)  
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