Sustainability Report 2021

TUPY

Contents

MESSAGE FROM THE CEO GRI 102-14

Innovation, sustainability, continuous improvement. These three things all play a role in the longevity, preservation and future of businesses, people and our planet. For our future to be successful, there are many decisions that need to be made today, in the present.

Throughout our history as a Company, the future of the business has been guided by insights into current trends and data. This has been our approach in developing solutions and tackling challenges.

As we continue on our journey to sustainable development, we will require more than just engagement and purpose. We will need to explore all available options—for a common challenge, the potential solutions will be manifold. But viable solutions can be complex, and require a highly capable and resourceful team, one which I am proud and grateful to be part of.

Our continued journey to sustainable development will require more than just engagement and purpose

During 2021 we made several strategic moves that will be important to Tupy's continued growth. Our acquisition of Teksid's cast iron operations in Brazil and Portugal further cemented our global leadership in structural components for capital goods. And at the time of writing this Report, Tupy announced the acquisition of engine maker MWM, in a transformational deal that aligns both with our growth strategy for current businesses—by adding value to our product offering and launching us into the aftermarket segment—and with our efforts to develop viable solutions in support of decarbonization, one of the current challenges facing our customers.

Like Tupy, MWM is engaged in research and development toward a multi-fuel future. It currently offers engine retrofits to biogas, biomethane, biodiesel, natural gas and hydrogen, in applications that include trucks, city buses, farm machinery and generator sets. The acquisition will add to our service offering in areas such as renewable fuels and emissions reduction in important sectors of the economy, such as agribusiness.

In this report, we describe these and other important achievements and initiatives which have helped to ensure that both our own operations and the applications in which our products are used are economical, efficient and have minimal environmental impact.

To achieve these goals, we have built partnerships with customers, suppliers, universities, startups and trade associations to expand our engagement with and impact on the innovation ecosystem and on the development of our employees and the communities where we operate.

We would like to thank all those who have supported our journey and enabled us to explore opportunities from the new economy, while leveraging our knowledge to help people live more dignified, prosperous and longer lives.

Fernando Cestari de Rizzo
CEO

**Announced April 18, 2022, subject to approval from the Brazilian anti-trust authority, CADE.*

ABOUT THIS REPORT

Our 2021 Sustainability Report is the second we have published so far. The report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards—Core option, and has been approved for issuance by the Board of Directors. The report is for the period from January 1 to December 31, 2021 and covers our operations in Brazil (Joinville and Mauá) and Mexico (Saltillo and Ramos Arizpe) and our offices in Brazil (São Paulo), the US (Detroit and Indianapolis) and Europe (Munich, Germany). **GRI 102-45, 102-46, 102-50, 102-52, 102-54**

Information about our cast iron operations in Betim (MG/Brazil) and Aveiro (Portugal), which were acquired in October 2021, and our new offices in Italy and the Netherlands, has not been included in this report unless otherwise specified. This is to ensure comparability, as these assets were acquired in the last quarter of the year.

This information will be included in the following editions of the Report.

The sections on financial performance, our business, our global presence and taxes—which are published on a quarterly basis—are inclusive of all our operations.

In line with our commitment to transparency, in this Report we provide an account of our activities to our different stakeholders—including customers, investors, employees, suppliers, communities and society in general, with each disclosure mapped to the relevant United Nations (UN) Sustainable Development Goals (SDGs) and our material topics (*read more in Materiality*).

For further information about the contents of this report, please write to: dri@tupy.com.br
GRI 102-53

How to navigate this report

For ease of navigation, this report has been signposted with icons representing the relevant SDGs and material topics, and contains links to the relevant websites. Learn more about the SDGs here.

Indication of the material topic being addressed

SDGs related to the topic

In addition, you will find icons showing whether a given chart or table has an animation, additional data or a link to supplementary material not included in the Report.

External links

2021 HIGHLIGHTS

FINANCIAL

Our highest net revenue and EBITDA ever

R$ 7.1 billion
in net revenue
(up 66% on 2020)

R$ 878 million
in Adjusted EBITDA
(up 45% on 2020)

10.6%
Return On Invested Capital (ROIC)

ENVIRONMENTAL

9% reduction
in direct GHG emissions (vs 2019)

73% reuse
of total water withdrawals across sites

Around 600,000 metric tons
of waste recycled

57% reduction
in hazardous waste sent to landfills

INNOVATION

70% of R&D investment linked to sustainability

New organizations
Tupy Tech
Tupy Up

Launched ShiftT

SOCIAL

460,000 hours
of training

900+ hours
of volunteering

3,500
suppliers

Around 15,000
people reached by social investments

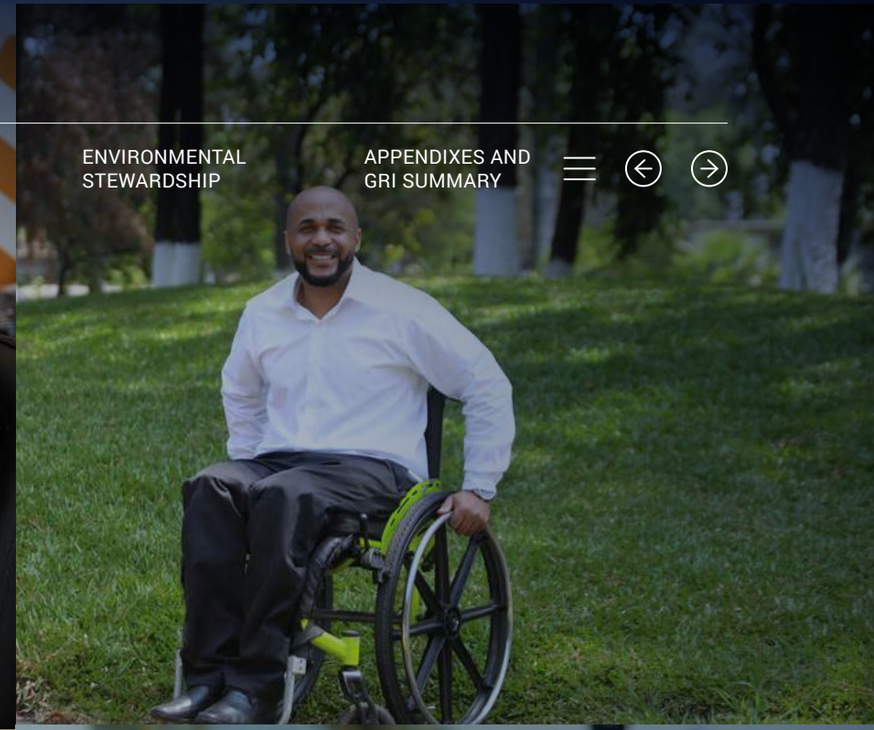
WOB
certified

GOVERNANCE

New structures
- ESG Working Group
- *Compliance*
- People and Compensation, Corporate Governance and Finances and Transactions

Sustainalytics & MSCI ESG rating upgrade

About Us



OUR BUSINESS

Tupy is positioned to meet growing global demand for capital goods by delivering solutions across transportation, infrastructure, agribusiness and power generation

A Brazilian-based multinational, Tupy S.A. is a global leader in the development and manufacture of cast iron structural components engineered to a high level of geometric and metallurgical complexity. Tupy has operations in South America, North America and Europe—including our headquarters and manufacturing plant in Joinville (SC) and manufacturing sites in Mauá (SP) and Betim (MG), Brazil; Saltillo and Ramos Arizpe, Mexico; and Aveiro, Portugal. We employ over 19,000 people. **GRI 102-1, 102-3, 102-4**

With our acquisition of Teksid's cast iron operations in Brazil and Portugal, we have strengthened our position as one of the leading players in our industry in the West. The transaction came as part of our strategy for growth and expansion of our product and services portfolio. The integration will create synergies both from the combination of assets and from knowledge sharing between teams at each site. **GRI 102-10**

With a diversified and well segmented market, our products are exported to around 40 countries—with exports accounting for 77% of our revenues. We serve our customers and partners from offices in Germany, Brazil, the US, the Netherlands and Italy. **GRI 102-6**

Tupy supplies high value-added products and services to the capital goods industry, developed in a robust process supported by cutting-edge technology.

40

countries (approximately) supplied with Tupy products

We offer solutions for transportation and cargo handling (across all modes), agribusiness and construction. The markets we serve, including infrastructure and power generation, are essential for society and sustainable development. **GRI 102-2**

We manufacture essential components for machinery, vehicles and equipment that help to improve quality of life by increasing access to healthcare, basic sanitation, clean water, food production and supply, and global trade (see our infographic: Tupy is everywhere). **GRI 102-2**

Research and development (R&D) is an integral part of our history and our future. We research new materials, geometries and machining techniques, and use our expertise to assist our customers in their decarbonization journeys.

Our history

Fundição Tupy S.A, was founded in 1938 by three partners: Albano Schmidt, Hermann Metz and Arno Schwartz. The Company has since grown and expanded across geographies, becoming a global leader in research, development and manufacture of highly engineered cast iron structural components.

Learn more about our company's history on our website.

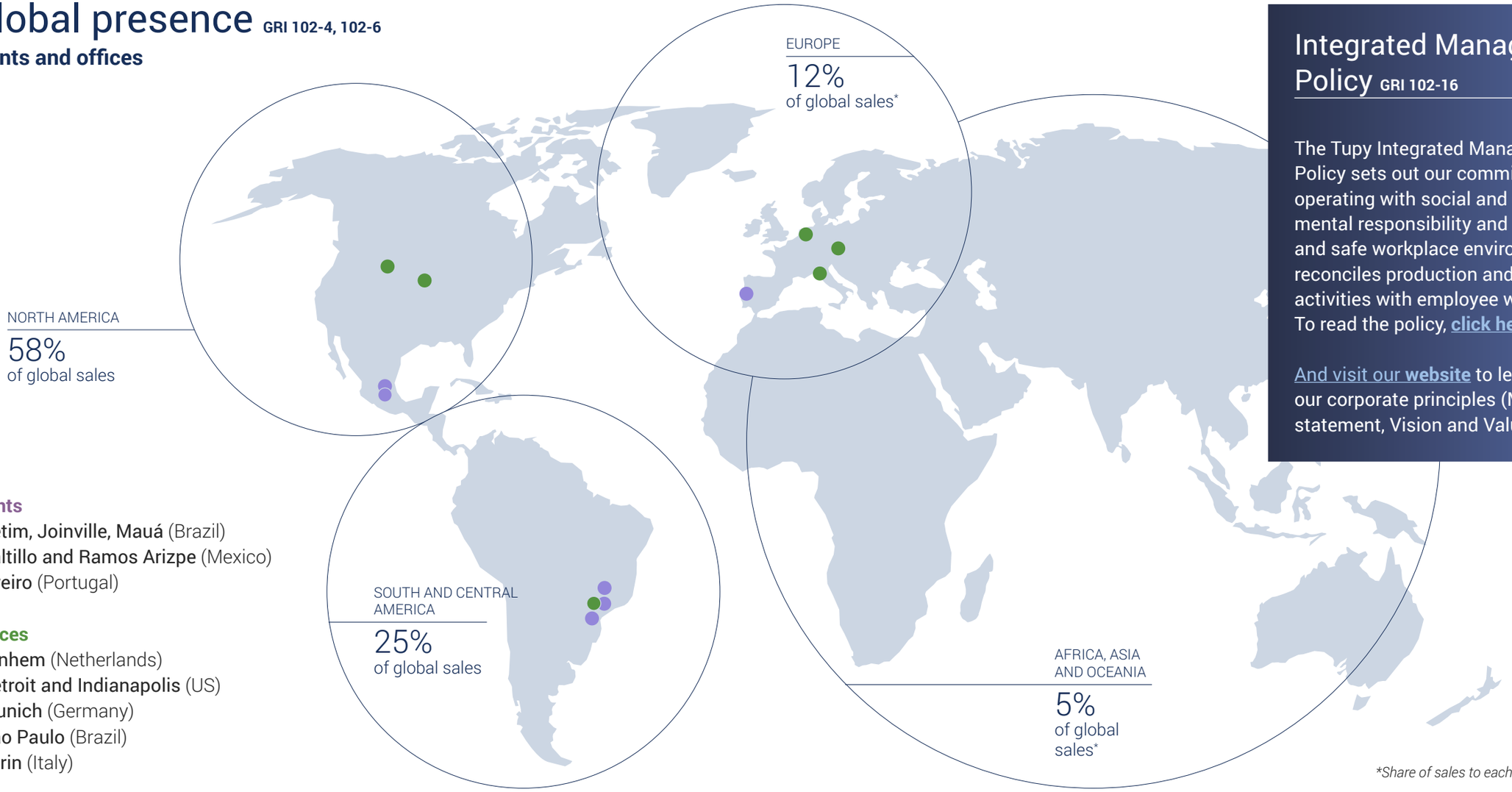
LEARN MORE

Learn more about our products on our *website*

The markets we serve, including infrastructure and power generation, are essential for society and sustainable development

Global presence GRI 102-4, 102-6

Plants and offices



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

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

Share of sales to each continent

Integrated Management Policy GRI 102-16

The Tupy Integrated Management Policy sets out our commitment to operating with social and environmental responsibility and in an ethical and safe workplace environment that reconciles production and business activities with employee well-being. To read the policy, click here

And visit our **website** to learn about our corporate principles (Mission statement, Vision and Values).

OPERATIONAL EXCELLENCE

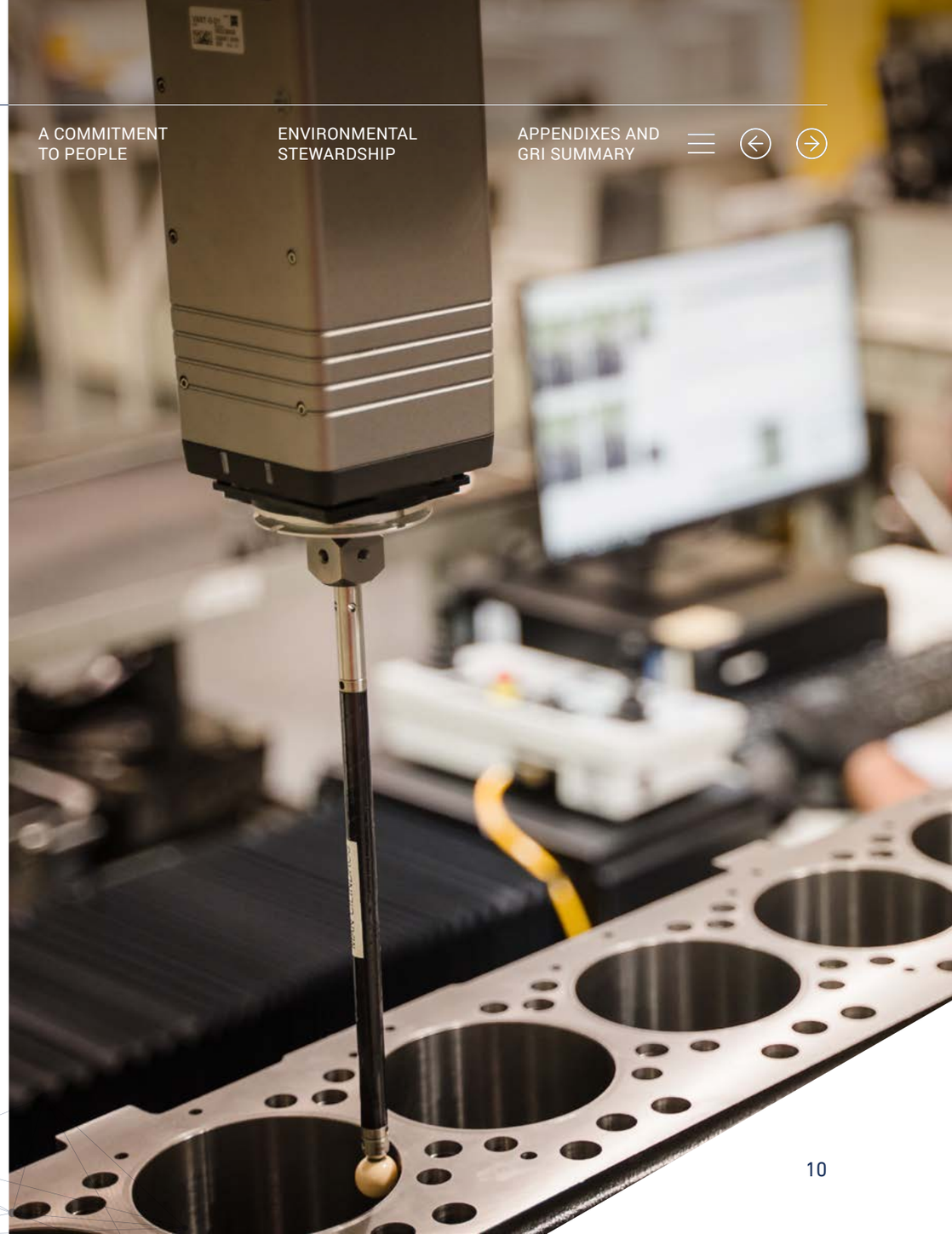
Our production process revolves around metallurgy and machining. In developing new products, we apply our research and know-how about metal alloys to improve efficiency and quality.

Tupy's expertise in metal alloy properties, combinations with other materials and applications in the market allows us to serve a wide range of segments. It also equips us to solve industry challenges in materials efficiency, design and product development.

Co-development—or product development in collaboration between customers and our team of engineers—begins at an early stage and helps to optimize the R&D and production process to deliver high-quality outcomes. This involves a complex set of steps including: product geometry, failure analysis, casting process simulation, approval and start of production. Our process also includes a careful assessment of the raw materials to be used (scrap, pig iron and ferrous alloys) – *learn more in the Our Business infographic*.

TUPY CERTIFICATIONS

To learn more about our certifications, go to our *website*



CONTINUAL IMPROVEMENT

Tupy works to continuously improve its processes, leveraging technology to enhance operational, environmental and economic performance.

Our production process is managed within the Tupy Production System (SPT), a program launched in 2014 that uses concepts borrowed from Lean Manufacturing and Theory of Constraints principles to build internal competencies that can drive excellence in delivery. The SPT system engages employees in solving problems and pursuing continuous improvement, delivering positive outcomes across processes.

Efficient and robust management within the SPT system is enabling successful deployment of Industry 4.0 (*read more in Digital transformation on the ground*).

2021 Highlights

Significant SPT outcomes in 2021 included process redesigns to improve productivity; increased molding and machining line efficiency; and improved safety and environmental performance in core making processes. These outcomes were achieved through initiatives such as:

- Deburring cell automation: reducing process waste and improving ergonomics;
- Tooling pressure washing to reduce scrap rates, improve quality and reduce consumption of materials in the sand core-making process.

SPT HIGHLIGHTS 2021

76% of process improvements implemented
139 kaizen events
5 Senses audit updates
3,000+ hours of training
250+ projects completed

OUR **BUSINESS**

Tupy combines people and knowledge to deliver value-added solutions and technology to customers in more than 40 countries.

Product development

1. Co-development: product designs—geometries, materials and processing equipment—are co-developed with customers.
2. Raw materials: different mechanical, physical, chemical and thermal properties are specified depending on the end product.
3. Analytics and modeling: software, data and 3D modeling are used to validate the geometry and ensure a high-quality product.
4. Process design: the tooling, machinery and equipment needed to manufacture the product.
5. Testing: quality validation, material specifications, dimensional analysis and functional testing

By the numbers

- 30 LABORATORIES in Brazil and Mexico
- 19 ALLOY COMBINATIONS used
- 50+ CONTROL steps
- 2,000 technicians and engineers
- 400,000+ ANALYSES performed each month

Click here to learn more

Production Process

1. Melting: raw materials are made into molten iron alloys.
2. Core making: sand cores to produce internal cavities and reentrant angles in the castings.
3. Mold making: sand molds to create a hollow "negative" that will give the casting its outer shape.
4. Casting: the molten iron is poured into the mold, filing its cavities to produce the casting.
5. Finishing: the casting is cleaned, painted and quality inspected.
6. Machining: castings are machined to precise dimensions and geometries to ensure a perfect fit with other parts and assemblies.

By the numbers

- Present in more than 40 COUNTRIES
- 19,000 EMPLOYEES
- 84 YEARS of history

Click here to learn more

Tupy Tech

Focused on disruptive R&D to develop marketable and scalable technologies.

Research areas
New fuels, circular economy, decarbonization and emerging demand in the new economy.

Collaborations
With universities, science & technology institutes and customers.

Click here to learn more

Tupy UP

An organization created to convert, accelerate, and scale opportunities in new segments and revamp existing ones through innovation and digital transformation. Tupy Up's scope of activity includes:

- Open innovation
- LABS
- Digital transformation
- ShiftT - an incubator and accelerator

Click here to learn more

OUR GOVERNANCE

Tupy is aligned with best practices in corporate governance. In 2021 we strengthened our governance structure with the creation of an ESG Working Group within the Board of Directors

As a company listed on the Brazilian stock exchange (B3) since 1966, and as a member of the ***Novo Mercado*** enhanced governance listing segment, Tupy is aligned with best practices in corporate governance. Our Board of Directors (BoD) is composed of nine members, of whom 1/3 are independent (appointed by minority shareholders) and 1/3 are women. Board members are elected every two years. The BoD is our highest governance body, with responsibility for providing general direction, exercising oversight and control of business activities, and recommending and approving amendments to our Bylaws in General Meetings. The Board of Directors also makes decisions on matters such as dividend payments, the creation, mergers, spinoffs and winding up of Group companies, and the disposal of equity interests and assets. **GRI 102-5, 102-18, 102-22, 405-1**

MATERIAL TOPIC

Corporate governance

SDG

5 GENDER EQUALITY

Recognition

In 2021 we were certified by Women on Board (WOB), an independent initiative supported by UN Women that certifies companies which adopt good corporate practices supporting women in leadership. Click here to learn more.

Supporting our governance structure are five committees: Statutory Audit & Risk; Corporate Governance; Strategy & Innovation; Finances & Transactions; and People & Compensation. On these committees, five members are independent (non-members of the Board of Directors). **GRI 102-22**

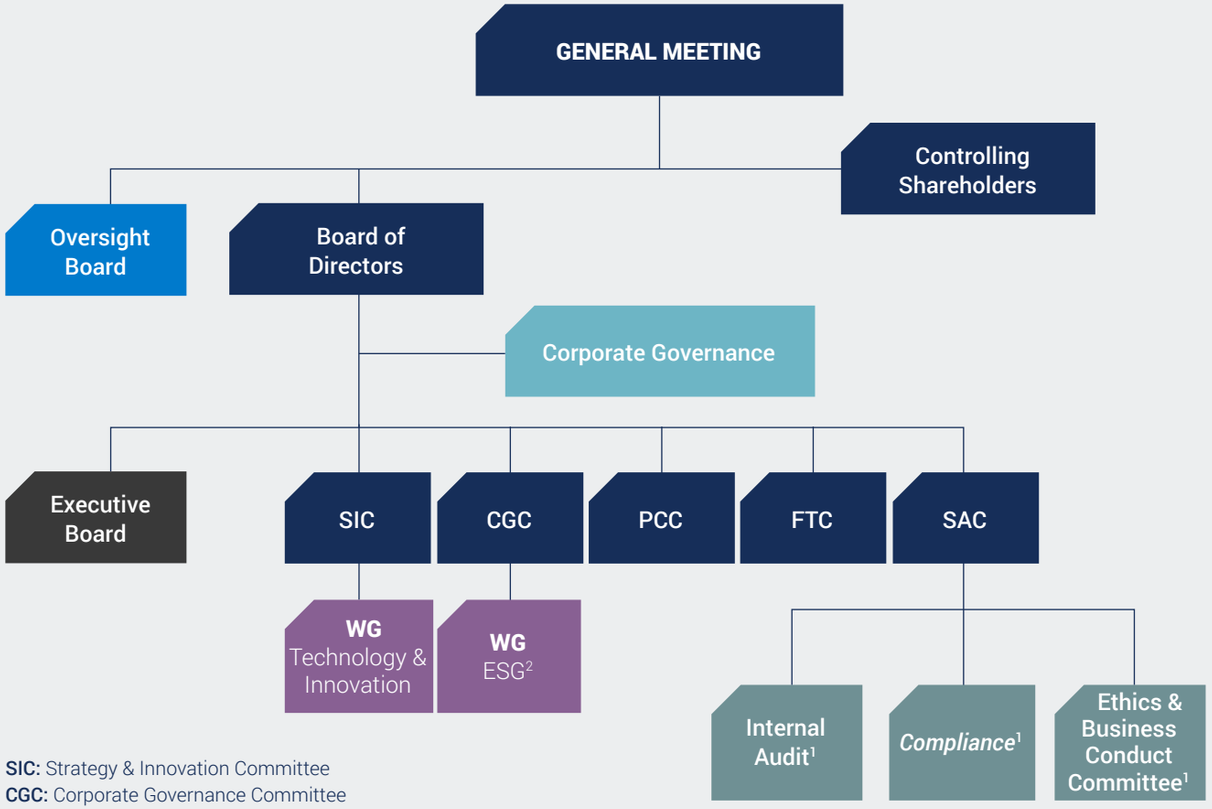
The Executive Board, headed by the CEO, is responsible for ensuring the Company achieves its business objectives. The Executive Board represents the Company and oversees overall business activities. It consists of a CEO; a Chief Operations Officer; a Chief Finance, Controls, Management & Investor Relations Officer; a Chief Commercial Officer; and a Chief Procurement & Logistics Officer. The position of Chief Procurement & Logistics Officer was created in January 2021 to strengthen our governance structure (*click here to read the resumes of our executives*).

Tupy's governance structure also includes a permanent Oversight Board. The duties of the Oversight Board are to review our management's activities and express an opinion on matters submitted to shareholders in general meetings, including our annual Financial Statements and the distribution of net income for the year.

LEARN MORE

Click here **to learn about the composition of our Board of Directors, Executive Board, Committees and Oversight Board GRI 102-22**

Governance Structure



SIC: Strategy & Innovation Committee
CGC: Corporate Governance Committee
PCC: People & Compensation Committee
FTC: Finance & Transactions Committee
SAC: Statutory Audit & Risk Committee
WG: Working Group

1. The Internal Audit, Compliance and Ethics & Business Conduct Committee report to the Board of Directors via the SAC
2. Created in 2021, the ESG WG previously reported to the Board of Directors via the SIC and since January 2022 has reported to the Board via the CGC.

Performance review and remuneration

GRI 102-28, 102-35

The remuneration received by members of management (Board of Directors and Executive Board) and advisory committee members is established in our Remuneration Policy, which we disclose to our shareholders and the market in general. The members of the Board of Directors and its advisory committees receive fixed monthly remuneration, while Executive Officers receive both fixed monthly remuneration as well as variable short- and long-term remuneration. In 2021, fixed monthly remuneration accounted for 49% of the total remuneration received by our Executive Board.

Variable remuneration was 33% long-term and 67% short-term. These percentages vary depending on business results and the remuneration strategy in a given period. In 2021, we incorporated ESG targets underlying the Executive Board's individual short-term variable remuneration. Individual targets for the CEO are set by the Board of Directors, while those for other executive officers are proposed by the CEO and approved by the Board of Directors; all targets are cascaded down the hierarchy to other executives. Each year the Board of Directors conducts a self-review of effectiveness and performance across different dimensions, including ESG, which was incorporated in the review process in 2021.

TAXES GRI 103-2, 103-3 | 207

As part of our governance practices, we ensure compliance with applicable legislation, including tax and other laws and regulations across the different levels of government (local, state and federal), in all jurisdictions where we operate.

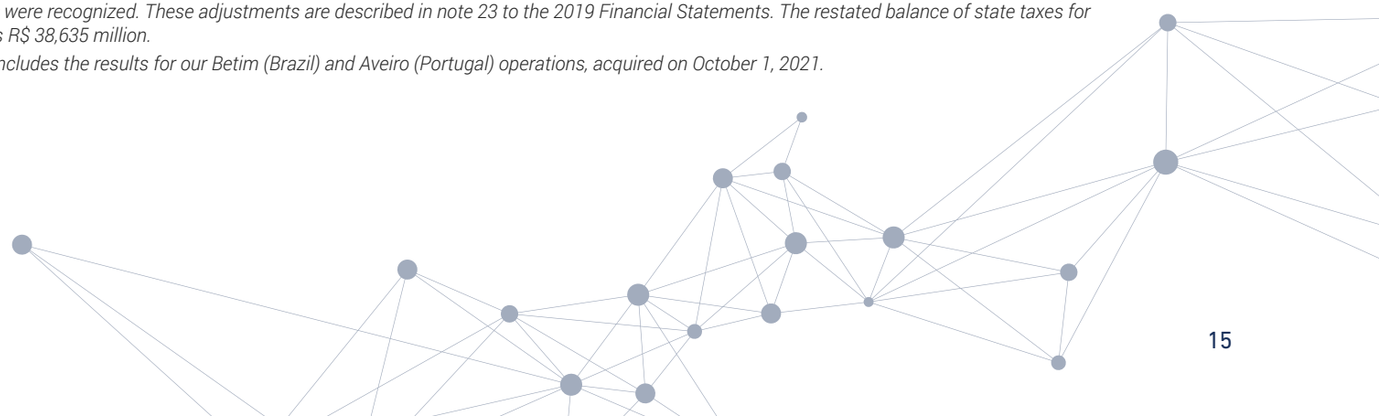
We are always alert to regulatory developments that could affect our operations, and conduct periodic reviews of our tax practices, led by our Tax and Legal departments. These reviews are supported by consultants, independent auditors and opinions prepared by our governance bodies, including the Statutory Audit & Risk Committee and the Oversight Board.

TAX ALLOCATION (R$ THOUSAND) GRI 207-1

Government	2019	2020	2021
Federal taxes, charges and contributions	282,595	50,929	221,217
State taxes and charges	-34,884*	55,466	88,362
Local and other taxes and charges	11,282	10,266	9,253
Total	**258,993**	**116,661**	**318,832**

**At the state level, R$ 45,567 million in provisions for ICMS tax losses recoverable were reversed, and R$ 27,952 million in additional Reintegra credits were recognized. These adjustments are described in note 23 to the 2019 Financial Statements. The restated balance of state taxes for 2019 is R$ 38,635 million.*

Note: includes the results for our Betim (Brazil) and Aveiro (Portugal) operations, acquired on October 1, 2021.



Tupy has joined the Brazilian Hydrogen Association, an initiative aligned with our R&D efforts toward the decarbonization of our product offering over the coming decades

MEMBERSHIP OF ASSOCIATIONS

GRI 102-12, 102-13

We reaffirm our values and positioning through our membership of trade associations and other organizations and initiatives that enhance our ability to drive transformation. In 2021 we joined the Brazilian Hydrogen Association (ABH2), the Brazilian Industrial Internet Association (ABII) and the Brazilian Association for Innovation, Research and Development (ANPEI), strengthening our R&D, innovation and digital transformation capabilities.

In Brazil we are also members of the following trade associations: the Brazilian Automotive Aftermarket Industry Association (SINDIPEÇAS/ABIPEÇAS); the Brazilian Foundry Association (ABIFA); the Joinville Business Association (ACIJ); the Brazilian Industry Confederation (CNI); the Santa Catarina State Industry Federation (FIESC); the São Paulo State Industry Federation (FIESP); and the Brazilian Institute for Corporate Governance (IBGC). In Mexico, we are members of: the Mexican Manufacturing Industry Chamber (CANACINTRA); the Coahuila Automotive Industry Cluster (CIAC); the Employers' Confederation of the Mexican Republic (COPARMEX); and the National Auto Parts Industry Association (INA).

Eureciclo label

In 2021 Tupy pledged to recycle at least 22% of post-consumer packaging in our fittings range in Brazil through a partnership with Eureciclo.

Click here to learn more about this initiative

ETHICS AND INTEGRITY

MATERIAL TOPIC

Compliance, ethics, transparency and integrity

SDG

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

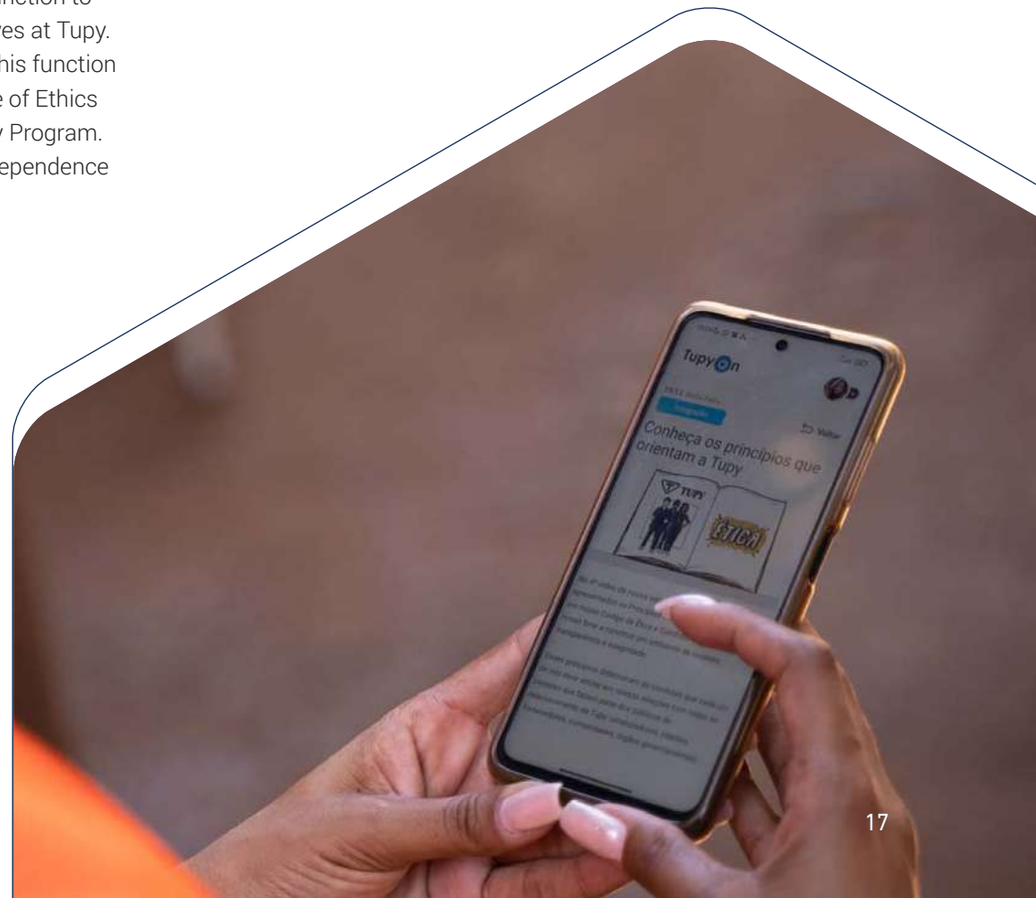
We have a structure in place to ensure we conduct ourselves ethically at all levels of the organization.

At Tupy our business decisions are never influenced by personal interests of any nature, but are based on strictly technical and business criteria. Tupy's Conflict of Interests Policy establishes guidelines to ensure that personal interests do not compromise employees' performance of their obligations or duties.

In 2021 we created a Compliance function to further enhance our existing initiatives at Tupy. Now with a more robust structure, this function manages our Ethics Channels, Code of Ethics and Business Conduct, and Integrity Program. To ensure it conducts itself with independence and impartiality, the Compliance function reports directly to the Board of Directors through the Statutory Audit & Risk Committee.

Our ethical principles

1. **We encourage mutual respect between employees and third parties**
2. **We take a no-tolerance approach to workplace or sexual harassment**
3. **We actively combat child and slave labor**
4. **We embrace diversity**
5. **We comply with applicable regulations, policies, rules and contracts**
6. **Our actions are free of conflicts of interest**
7. **We ensure required confidentiality or transparency around information**
8. **We use intellectual property compliantly**
9. **We protect employee health and safety**
10. **We are committed to the environment and to our communities**



CODE OF ETHICS & BUSINESS CONDUCT

GRI 102-16 | 103 | 206 | 406

Our newly formed Compliance function launched important initiatives throughout 2021, including a review to enhance our Code of Ethics & Business Conduct by incorporating guidance from the *Novo Mercado* listing rules, the Brazilian Corporate Governance Code, the decree regulating the Brazilian Anti-Corruption Act, and Company rules and standards.

Underpinned by the pillars of respect, transparency and integrity, the Tupy Code of Ethics & Business Conduct brings our values as an organization to life. Available in Portuguese, Spanish and English, the Code describes our principles and the conduct expected of employees in their business dealings within and outside the organization, as well as the conduct expected of contractors and other stakeholders that interact with Tupy. The Code also prescribes disciplinary action for any misconduct.

Other issues addressed in the Code include antitrust, conflict of interest in interactions with external stakeholders, as well as discrimination and our commitment to respecting human rights and embracing diversity.

During 2021, we ran a campaign under the theme “Rallying around Respect” to raise employee awareness about the importance of building a respectful environment and combating any and all forms of discrimination. These issues are monitored and assessed via our Ethics Channels.

LEARN MORE

Click here **to view our Code of Ethics**

ANTI-CORRUPTION

GRI 103-2, 103-3 | 205

In 2021 the Compliance function, with support from independent consultants, assessed integrity and anti-corruption risks across our operations. This informed the development of an Integrity Risk Map.

In 2022 the Compliance function plans to develop a dedicated anti-corruption policy, and implement action to mitigate identified risks.

In 2021 we reviewed and updated the Tupy Code of Ethics and Business Conduct. The revised Code has been approved by the Board of Directors and will be communicated and addressed in training in 2022

WHISTLEBLOWING HOTLINE GRI 102-17, 103-2

Our Ethics Channels are managed by an independent, third-party firm and are available to all internal and external stakeholders. Reports can be made anonymously, in confidence and without retaliation against the whistleblower.

COMMUNICATIONS CHANNELS

Form
Available from drop boxes located at all our sites

Website: www.tupy.com.br/etica
Email: etica@tupy.com

Phone
Brazil: 0800 721 7895
Mexico: 800 288 0150
Portugal: 800 180 431

Reports are investigated by the Ethics team and subsequently reviewed and decided upon by the Ethics Committee. Disciplinary or corrective action is taken where a report is deemed substantiated.

The Ethics Committee is an independent body of members appointed by the Board of Directors, who are tasked with championing ethical principles and the conduct expected of employees; ensuring our Code of Ethics and Business Conduct is disseminated, kept up to date and amended as necessary; and acting on reports made via our ethics channels.

Action taken

Where reports are deemed substantiated or partly substantiated, we take action that may include:

- **Disciplinary action;**
- **Contract termination;**
- **Process reviews;**
- **Implementation of controls to mitigate risks.**

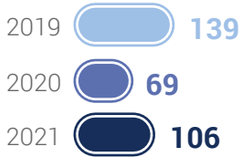
Grievance mechanisms GRI 103-2

Number of grievances filed through grievance mechanisms

Number of grievances addressed

Number of grievances resolved

Number of grievances filed prior to the reporting period that were resolved during the reporting period



RISK MANAGEMENT

The sustainability of our business hinges on stringent risk management ensured by robust policies and initiatives and regular monitoring. Tupy is exposed to strategic, operational, regulatory and supply-chain risks. We identify and monitor potential impacts using Enterprise Risk Management (ERM).

Our Corporate Risk Management and Internal Controls Policy establishes guidelines and roles and responsibilities for identifying, assessing, prioritizing, addressing, monitoring and communicating risks, and for ensuring the proper operation of, and strengthening, our internal controls system. **GRI 102-11**

We have a function responsible for identifying and formalizing internal controls as a way to mitigate risks. For high-consequence risks, we implement action plans and ensure they are communicated to stakeholders. We also carry out annual internal audits to assess whether internal controls processes are effective, and commission external audits on compliance with applicable laws and regulations and environmental commitments. To learn more about our certifications, go to our *website*.

We have measured our progress on environmental risk management over the past three years, and have seen consistent improvement in risk management performance, including a reduction of 30% in high-consequence risks. This reflects measures taken by the Environment team and the increased maturity of our internal controls. We have also seen improved results in our audits for certification to ISO 14001 after incorporating climate-related risks into our assessment and monitoring process. **GRI 102-11**

In 2021 we initiated an assessment of climate risks and opportunities in line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and the Carbon Disclosure Project (CDP)

CLIMATE RISK MATRIX

GRI 103-2, 103-3 | 201, 201-2

To incorporate climate aspects into our integrated risk management system, in 2021 we initiated an assessment of climate risks and opportunities in line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and the Carbon Disclosure Project (CDP). Among the criteria we have assessed are potential financial, social, environmental and regulatory impacts. We will report on climate-related risks and opportunities to the CDP for the first time in the first half of 2022.

A Strategy Connected to Sustainable Innovation

We are helping to build a better and more sustainable world

Tupy's present and future solutions serve a common purpose: applying our technological expertise to meet essential needs, improve quality of life and living standards, and support our customers in their decarbonization journeys (*see our infographic: Tupy is everywhere*).

Environmental, social and governance aspects are embedded in our strategy, which works toward the following key objectives: increasing the share of high value-added services in our offering, such as machining and component assembly; developing new materials and technologies; and identifying new business opportunities where there is a demand for advanced metallurgical solutions.

We pursue these objectives by embedding sustainability in our decision-making and through innovation, two of the core pillars in our strategy. In 2021 we took important steps in this direction with the creation of two new organizations: Tupy Tech and Tupy Up (*read more in this chapter*).

We are committed to ensuring that both our own operations and the applications in which our products are used are economical, efficient and have minimal environmental impact. We adhere to ethical principles and practice effective governance, and work to create value for society by supporting local development.

SUSTAINABILITY JOURNEY

At Tupy, business and sustainability go hand in hand

We translate our technological expertise into solutions that are used to deliver clean water, sanitation, housing, healthcare, electricity and food supply, all of which help people live more dignified, prosperous and longer lives. We recognize that our role in this journey to sustainable development extends beyond our company walls—it includes both our own operations and the applications in which our products are used.

We also know that building a sustainable Company is a continuous journey, and we have now taken a step further by articulating a set of commitments in line with our strategy, our material topics and the SDGs. In doing so our aim is to continue to create long-term value for our stakeholders.

MATERIALITY

GRI 102-40, 102-42, 102-43, 102-47

Material topics describe an organization's significant economic, environmental and social impacts. In defining our material topics, we drew inputs from our strategic plan, global reporting frameworks and a survey of our key stakeholders.

The materiality assessment, carried out in 2020, comprised the following steps:

1) Review of internal documents and external frameworks: our Strategic Plan 2020-2024; the S&P Sustainability Yearbook 2020; the GRI Sustainability Topics for Sectors: Automobiles and Components and Mining - Iron, Aluminum, Other Metals; the SASB Standards: Auto Parts and Iron & Steel Producers; the MSCI ESG Ratings and Bloomberg ESG.

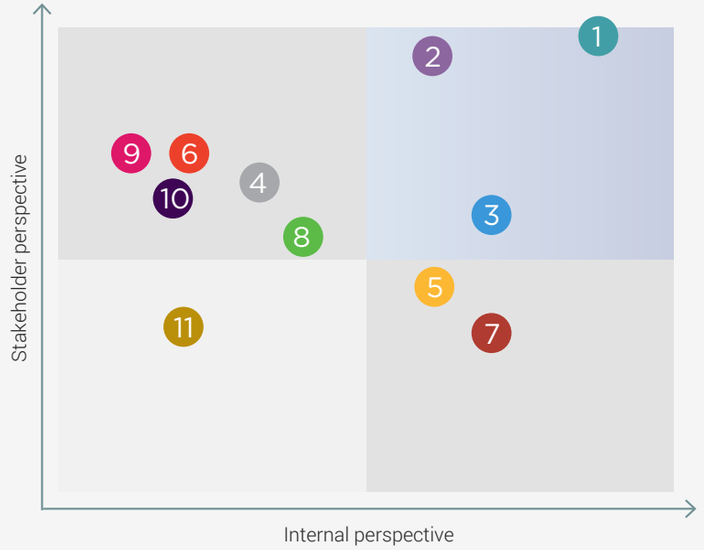
2) Benchmarking: based on a benchmarking assessment, we identified and selected 22 material topics that are relevant to our business.

3) Online survey: we carried out a survey of our internal and external stakeholders, including: the Board of Directors, employees, customers, suppliers, governments, communities, the media, strategic partners, retailers (fittings) and unions, with a total of 735 respondents.

4) Prioritization and interviews: we interviewed our key executives—including our CEO, chief executives and directors—and reviewed their responses.

5) Matrix building: 11 material topics were identified and validated by the Board of Directors and the Executive Board.

OUR MATRIX



OUR MATERIALITY TOPICS

1. Air emissions
2. Employee and contractor health, safety and well-being
3. Decarbonization
4. *Compliance*, ethics, transparency and integrity
5. Corporate governance
6. Operational technologies
7. Supplier social and environmental criteria
8. Impact on local communities
9. Waste management
10. People management and development
11. Diversity and inclusion

Our priorities **GRI 102-44, 102-46, 102-47, 103-1**

Material topics[1]	Context	Approach (what we do)[2]	Extent of impact (within and outside the organization)	GRI Topics	Related disclosures 2020	Related disclosures 2021	SDG[3]
1. Air emissions	Initiatives to reduce air emissions (such as particulate matter) and greenhouse gas emissions from our production process, and to improve the energy efficiency of our machinery and equipment	Environmental stewardship	Within and outside the organization (employees, customers, society, suppliers, governments, strategic partners and the media)	Emissions	305-1, 305-2, 305-7	305-1, 305-2, 305-4, 305-5, 305-7	7, 9, 11, 13
				Energy	302-1		
2. Employee and contractor health, safety and well-being	Initiatives to enhance people's quality of life, safety and health	Occupational health and safety	Within and outside the organization (employees, customers, suppliers and labor unions)	Health, safety and well-being	403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-9	403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-9, 403-10	3
3. Decarbonization	R&D investment to deliver products and services with a lower carbon footprint	Innovation and technology	Within and outside the organization (employees, customers, investors, partners and academia)	Energy	302-5	302-1, 302-3, 302-5	7, 9
				Indirect economic impacts	-	201-2	11
4. Compliance, ethics, transparency and integrity	Ensuring compliance with laws and regulations, and fostering transparency and ethical relationships with all stakeholders	Ethics and integrity	Within and outside the organization (employees, customers, suppliers, investors, strategic partners and resellers (pipe fittings))	Ethics and integrity	102-17	102-17	16
				Anti-corruption	205-3	205-1, 205-3	
				Anti-competitive behavior	206-1	206-1	
				Non-discrimination	406-1	406-1	
5. Corporate governance	Board of Directors composition and activities, and independence of advisory committees	Our governance	Within and outside the organization (employees, investors and strategic partners)	Governance	102-18, 102-22, 102-28, 102-35	102-18, 102-22, 102-28, 102-35	5
6. Operational technologies	Investment in automation and enterprise resource planning (ERP) systems, and deployment of Industry 4.0 technologies	Innovation and technology	Within and outside the organization (employees, customers, investors, strategic partners and academia)				8, 9

Our priorities **GRI 102-44, 102-46, 102-47, 103-1**

Material topics[1]	Context	Approach (what we do)[2]	Extent of impact (within and outside the organization)	GRI Topics	Related disclosures 2020	Related disclosures 2021	SDG[3]
7. Supplier social and environmental criteria	Encouraging and enforcing compliance with labor and environmental laws and regulations and sustainable practices	Suppliers	Within and outside the organization (employees, suppliers, investors and the media)	Freedom of association and collective bargaining	407-1	407-1	8
				Child labor	408-1	408-1	
				Forced or compulsory labor		413-2	
8. Impact on local communities	Supporting jobs and livelihoods for local communities, and contributing to social and economic development through capacity building, social investments, recreation, sports and culture	Communities	Outside the organization (suppliers, communities, the media and academia)	Economic impacts Indirect	203-2	203-2	1, 4, 8, 10
				Taxes	–	207-1	
				Local communities	413-2	413-1, 413-2	
9. Waste management	Reducing waste volumes and increasing waste recycling, reuse and treatment	Environmental stewardship Suppliers	Within and outside the organization (employees, suppliers, governments, academia, investors and resellers (pipe fittings))	Materials	301-2	301-2	11, 12
				Waste	306-1, 306-2, 306-3, 306-4, 306-5	306-1, 306-2, 306-3, 306-4, 306-5	
10. People management and development	Supporting employee development and career planning through training, capacity building and management support	People management	Within and outside the organization (employees, customers, suppliers, resellers (pipe fittings), and labor unions)	Employment	401-1	401-1, 401-2	4
				Training and education	404-1, 404-2, 404-3	404-1, 404-2, 404-3	
				Market presence	-	202-1	
11. Diversity and inclusion	Providing equal opportunity at all levels of the organization, and a more diverse and inclusive workplace environment	People management	Within and outside the organization (employees, suppliers, society and labor unions)	Diversity and equal opportunity	405-1, 405-2	405-1, 405-2	5
				Non-discrimination	406-1	-	

1. There are no specific limitations on the topic boundary.
2. Material topics are addressed in the relevant chapters.
3. Sustainable Development Goals.

INNOVATION & TECHNOLOGY

Our expertise in metallurgy, metal properties and applications has enabled us to design solutions across different segments and identify and connect customer needs to our technical and technological capabilities.

We continue to invest in R&D to develop new products and solutions that combine cutting-edge science with practical know-how about casting and machining. Our R&D is supported by on-site laboratories as well as partnerships with universities around the world. We help to solve industry challenges by effectively meeting demand for new materials and increased resource efficiency.

In 2021 we created two new organizations to accelerate our R&D initiatives: Tupy Tech, an organization focused on disruptive R&D to develop marketable and scalable technologies in current and new businesses; and Tupy Up, an organization created to convert, accelerate, and scale opportunities in new segments and revamp existing ones through innovation and digital transformation.

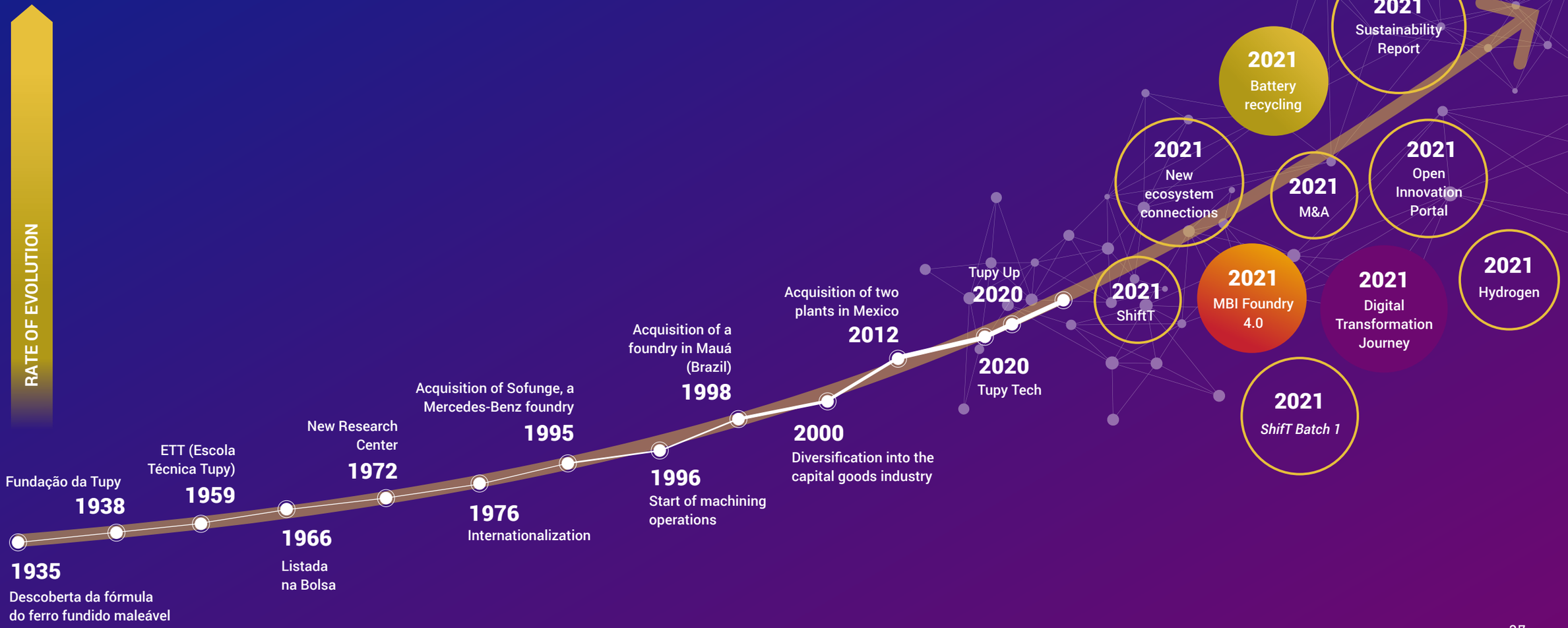
MATERIAL TOPIC

Decarbonization

Operational technologies

SDG

OUR JOURNEY OF EVOLUTION



TUPY TECH

A new R&D organization created with a mission to explore marketable and scalable technologies in current and new businesses, while helping to accelerate decarbonization across our processes and products. The new organization operates on two fronts:

1. Strategic partnerships to develop new technologies using new materials, geometries and machining techniques;
2. Emerging demand in the new economy, including the circular economy, recycling and applications for hydrogen and other alternative fuels.

Tupy Tech is building on long-standing collaborations with universities and research centers in Brazil and around the world.

One of our most important R&D fronts is the decarbonization of our processes and the products that our customers will use in the decades to come, within a multi-fuel strategy. Among these fuels is hydrogen, as part of a movement that in Brazil is being spearheaded by the Brazilian Hydrogen Association (ABH2). In 2021, we joined ABH2 in carrying out studies, research and efforts to strengthen the hydrogen industry in Brazil.

We have also been actively engaged in testing and developing new materials and geometries that support more efficient use of alternative fuels (natural gas, biofuels, and e-fuels (such as hydrogen, ammonia, methanol and methane).

In 2021, 70% of our R&D investment was devoted to sustainability projects

Sustainable Impact GRI 302-5

Our governance process at Tupy involves close interaction with the Board of Directors, and especially the Strategy & Innovation Committee. This committee continuously monitors emerging demands and technology trends in the markets were we operate or plan to operate in the future. Committee assessments inform strategic definitions of technology deployment routes.

As part of this process, Tupy tracks two performance indicators: R&D investment; and how much of this investment is allocated to sustainability projects.

In 2021, 70% of our R&D investment was devoted to sustainability projects.

We expect to see consistent annual growth in R&D investment to maintain a substantial share of sustainable products and services in our offering.

TUPY TECH **PROJECTS IN 2021**

Battery recycling

In 2021 we launched a collaboration with the Polytechnic School of the University of São Paulo (USP) for research into lithium battery recycling. With an initial investment of approximatively R$ 4 million, the project is staffed by 20 researchers, including master's and doctoral researchers, and will have an estimated duration of two years. Other partners in the project include Fundação USP and the Brazilian Industrial Research and Innovation Corporation (EMBRAPII).

We expect that this research will drive new business opportunities for the Company. The new recycling process could reduce CO_2 emissions by as much as 70% compared to the conventional process, while also enhancing recovery of non-renewable natural resources. It will also mark our entry into a new market with high growth potential in Brazil, delivering on our commitment to advancing science and the circular economy.

Hydrogen-fueled engines

In 2021 we launched a collaboration with Westport Fuel Systems, a global leader in alternative fuel and low emission transportation technologies, and AVL, the world's largest independent company for development, simulation and testing in the automotive industry. Tupy's role in the collaboration will be to develop new materials, geometries and machining that can improve the efficiency of the newly developed hydrogen internal combustion engine.

New alloys and materials

Tupy has applied for a patent for a new cast iron engine block concept. The new design is an alternative for application in hybrid vehicles, developed in collaboration with Ricardo PLC, a global leader in engineering and environmental consulting for the transport, energy and scarce resources sectors.

In this project, we developed an engine block that is 5% lighter than an aluminum equivalent, a remarkable feat considering that iron has an almost three times higher density than aluminum. In the validation of the proof of concept, in addition to adequate structural strength, we observed additional benefits such as noise reduction.

TUPY UP

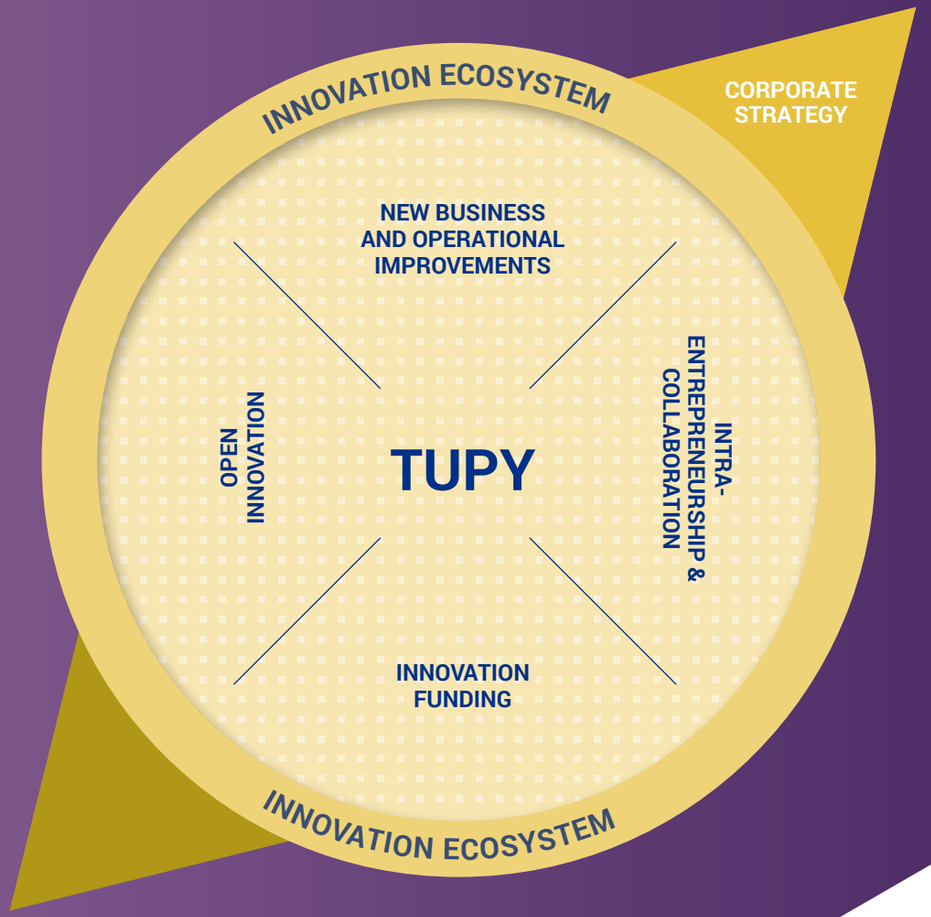
Tupy UP's mission is to capture new opportunities in innovation and digital transformation. Tupy Up operates in coordination with the innovation ecosystem across four dimensions: open innovation, intra-entrepreneurship and collaboration; funding; new business development; and operational improvements.

Among other initiatives, in 2021 Tupy Up launched ShiftT, a startup accelerator that combines Tupy's capabilities and expertise with entrepreneurial talent to drive shared value and sustainable development. Selected entrepreneurs not only tap into Tupy's deep engineering capabilities, but are also offered exclusive mentoring by 30 Tupy engineers with broad-ranging subject-matter experience, and who have been trained on innovation and the new economy.

LEARN MORE

Click here **to learn about SHifT's initiatives**

CORPORATE INNOVATION PROCESS



STARTUPS ACCELERATED

In its first batch, ShiftT selected three businesses to accelerate in 2021 out of more than 100 candidates across Brazil. **Learn about the selected startups below.**

ShiftT by Tupy

Exy

Based in the southern state of Paraná, Exy is a health-tech startup that works to improve safety, productivity and ergonomics in manufacturing environments. Among its products is Exy One, a wearable exoskeleton that can reduce the wearer's physical exertion by up to 30%.

Hedro

A startup in the southeastern state of Minas Gerais that specializes in the development and integration of emerging technologies (hardware, firmware and software) into the manufacturing environment. Using sensors and data analytics, Hedro helps to improve predictive maintenance and machine availability.

Pix Force

Based in the southern state of Rio Grande do Sul, Pix Force develops solutions using computer vision, artificial intelligence and machine learning technology.

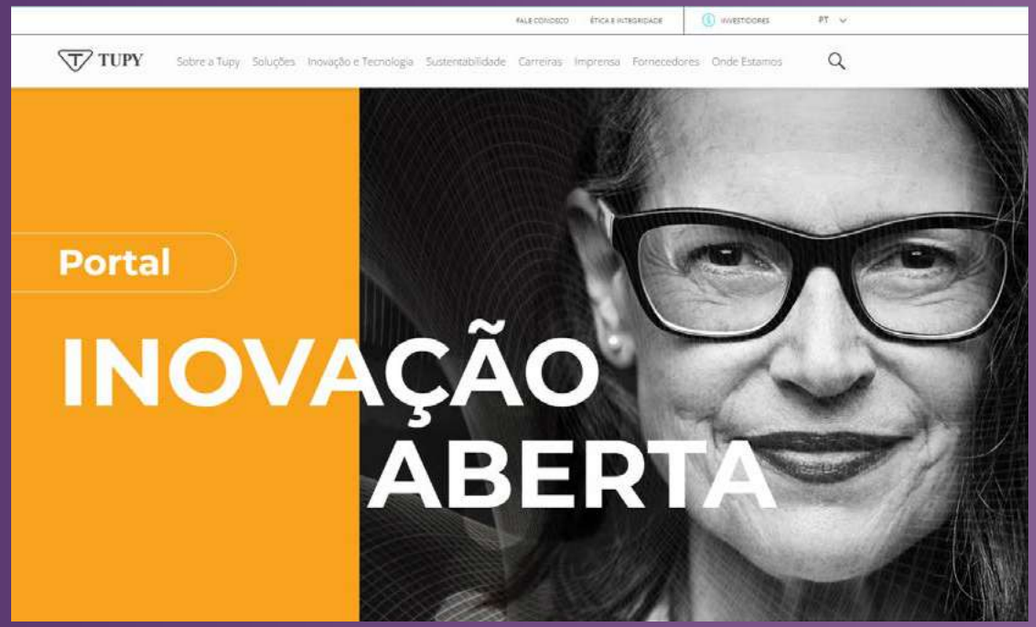
An algorithm developed by Pix Force can identify everything the human eye can see and classify the objects accurately and quickly. The solution has a vast range of applications in manufacturing environments. At Tupy we are using Pix Force for scrap inspections.

Open Innovation Portal

Launched in 2021, our Open Innovation Portal invites science and technology institutes, universities, startups and other players in the innovation ecosystem to collaborate on solving challenges across different areas at Tupy.

The portal features challenges that are relevant to our industry and require innovative solutions. Potential partners can submit proposals to address outstanding challenges directly on the website. Accepted proposals then progress into initiatives and projects.

Click here to visit the online platform and learn about the challenges



DIGITAL TRANSFORMATION IN PRACTICE

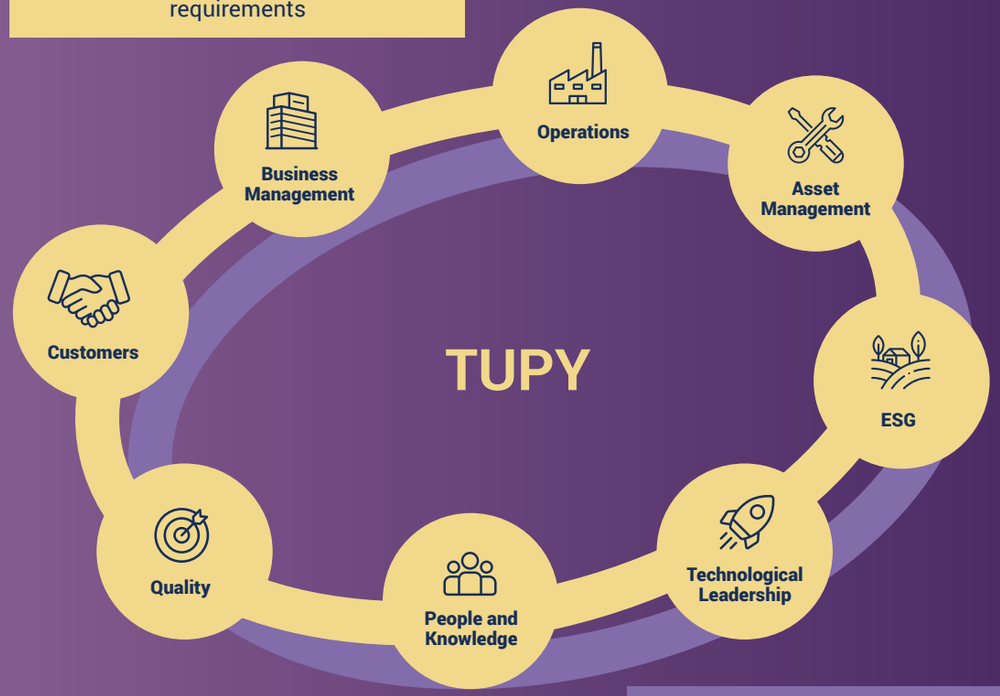
Tupy Up is leading our digital transformation journey at Tupy. Our approach to Digital comprises a set of enabling technologies that support process digitization and Industry 4.0. Transformation is about people and how we are equipping them with the new skill sets needed to adopt these new digital tools.

Our digital levers are seven value creation fronts developing digital solutions connected to our business requirements: Business Management, Operations, Asset Management, Customers, Quality, People & Knowledge, ESG, and Technological Leadership.

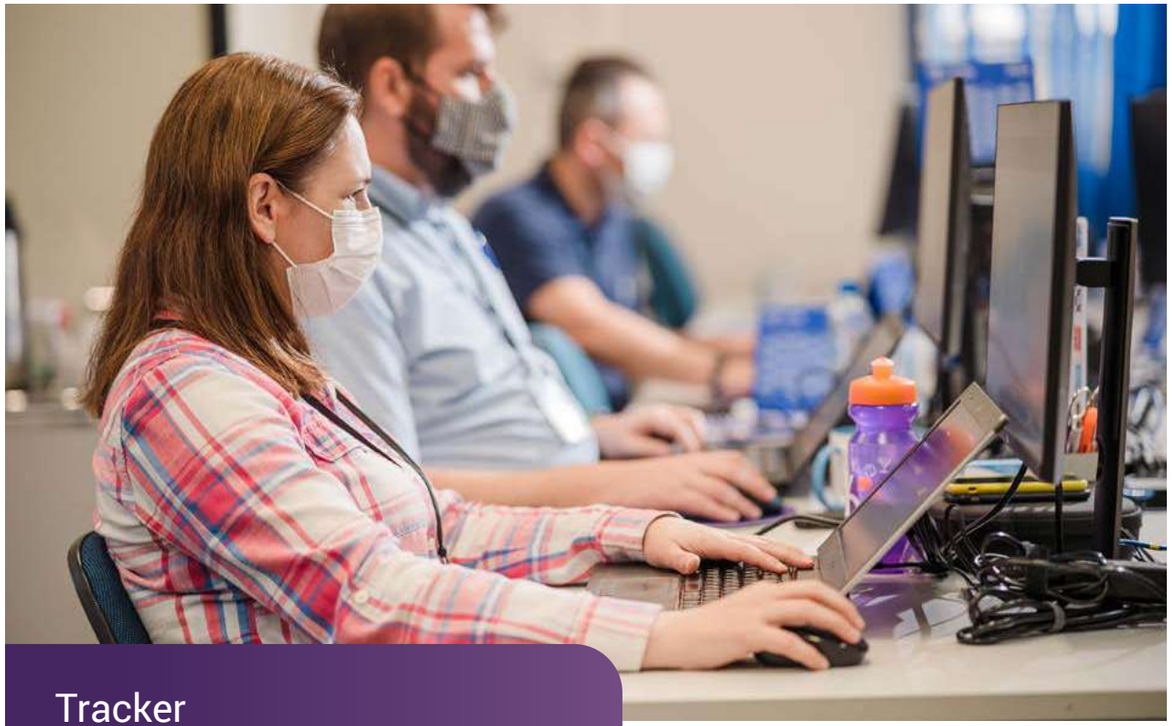
Tupy's Open Innovation Portal catalyzes the science, technology and innovation ecosystem through co-creation and collaboration across the network

DIGITAL TRANSFORMATION LEVERS

DIGITAL LEVERS
Value creation fronts developing digital solutions connected to our business requirements



ENABLING TECHNOLOGIES
The different technologies we use to build solutions that are then applied to the digital levers



Tracker

One of our flagship quality projects in 2021, Tracker allows products to be tracked across each of the process steps they have passed through. The system can be integrated with other digital tools, supporting data analytics and artificial intelligence capabilities that can provide actionable information.

GOVERNANCE
In 2021 we created a multidisciplinary Industry 4.0 Committee to develop methods, guide our selection of technologies, and support the development of more efficient processes in an innovation environment with higher uptake of automation and Industry 4.0 technology.

GROWTH

We continued to pursue our strategy of global growth with our acquisition of Teksid's cast iron operations in Betim, Brazil and Aveiro, Portugal. In October 2021 we initiated the integration of the two new manufacturing sites and our new office in Turin, Italy.

The new sites will expand our offering of value-added services for the capital goods industry, as well as creating important synergies from the combined assets and from sharing best practices. The new team is composed of highly trained professionals who have added to our technical expertise and experience. Both sites are certified to international standards such as ISO 50001 (Energy Management) and ISO 45001 (Occupational Health & Safety Management).

Tupy's journey to become a global player picked up momentum in 1995 with our acquisition of Sofunge, a Mercedes-Benz foundry. In 1998 we acquired Cofap and in 2012 we entered the Mexican market by acquiring two plants in the state of Coahuila.

On April 18, 2022 we announced the acquisition of engine maker MWM, subject to anti-trust approval. The deal aligns both with our growth strategy for current businesses—by adding value to our product offering—and with our efforts to develop viable decarbionization solutions. MWM has an engineering team with capabilities to retrofit generator sets and commercial vehicles to biogas, biomethane, biodiesel, natural gas and hydrogen.

LEARN MORE

Click here for further details about the acquisition.

#TupyUnited

In October we integrated the Aveiro and Betim manufacturing sites and the Turin office into Tupy. Managers from all of our operations came together in an integration ceremony that was livestreamed to our 19,000 employees. Click here to watch a video of the event.


Joinville


Betim


Mauá


Ramos Arizpe


Saltillo


Aveiro Plant

RESULTS OF OPERATIONS GRI 102-7

Strong and consistent financial performance, sustained by a resilient business model

Tupy's financial performance reflected the market landscape in 2021. To cater to the historically high levels of demand for commercial vehicles, machinery and equipment, we expanded our workforce, activated idle equipment and adjusted our production process.

A shortage of components such as semiconductors led to temporary disruptions at some of our customers, consequently reducing our sales volumes. Concurrently, the costs of raw materials rose substantially in the year. These combined factors affected our margins as a result of lower cost dilution.

Although our contracts contain pass-through mechanisms that protect our cash flows and EBITDA, our margins were still affected as the adjustments are made directly to the price and therefore result in higher revenue, the denominator in calculating margins. In addition, the unavailability of certain materials affected our quality indicators and ultimately our margins.

Despite these effects, our resilient business model and our implementation of several efficiency-oriented initiatives helped to deliver strong financial results in the year. We posted our highest net revenue and EBITDA ever, and significantly improved our Return On Invested Capital (ROIC)—from 5.2% in 2020 to 10.6%. Cash and cash equivalents were R$ 1.3 billion at year-end, and our leverage ratio was 1.5x Adjusted EBITDA.

Note: includes the results for our Betim (Brazil) and Aveiro (Portugal) operations, acquires on October 1, 2021.

R$ 7.1 billion
in net revenue

R$ 878 million
in Adjusted EBITDA, with a margin of 12.4% of revenue

10.6%
return on invested capital (ROIC)

R$ 1.3 billion
in cash and cash equivalents

A commitment to people

Among Tupy's values, first come People, not only our own employees, but all those with whom we have a relationship such as our shareholders, the communities where we operate, our suppliers, and customers

It is through them that we contribute to the development of society, which benefits from the machinery, vehicles, and equipment that contain Tupy solutions. These applications are the result of the technical knowledge of our professionals, and our partnerships with the network involved in our value chain.

We seek to develop close relationships with our stakeholders, and use different communication channels for engagement and to strengthen bonds (*see the chart on page 69*).

GRI 102-43, 102-44

PEOPLE MANAGEMENT GRI 103-2, 103-2 | 401

Investing in human capital is one of the values we have embraced from the very start. At Tupy we make sure the work environment is ethical, upstanding, safe, and inclusive

Our policies, codes, and regulations help us value and expand the skills of our employees, contributing to their professional development.

We value the knowledge and background of those employees who have a greater length of service, attract talents from the marketplace, and contribute to the development of young professionals with our trainee, apprenticeship, and internship programs. Our company is diverse not only in terms of age and generation, but also nationality, among others. **In 2021 we had employees of 22 different nationalities.**

Our internal management model monitors our organizational climate and makes sure our HR consultants and leaders are aware of any related issues. We also have an independent whistleblowing channel (*read more in Ethics and Integrity*).

To assess employee performance and potential, and develop a succession plan, we have a talent and leadership channel that discusses and addresses individual development and recognition. We reviewed this process in late 2021 and the new process will be implemented in Brazil and Mexico during the course of 2022.

WORKFORCE PROFILE

GRI 102-8, GRI 401-1

The increase in the number of employees is the result of increased demand by customers in Brazil and foreign markets. Much of this increase was experienced after the acute phase of the pandemic, extending to various markets.

Our headcount **increased 13% between 2020 and 2021. This means that we added almost 2,000 employees, directly benefiting their families, and indirectly benefiting local economies.**

In Brazil, all employees are covered by collective bargaining agreements. In Mexico 90% are covered. Because of Mexico's laws administrative personnel are not covered by this type of agreement. The right to freedom of association and collective bargaining is ensured by Tupy.

GRI 102-41, 407-1

Our workforce[1]

15,681

Employees in our plants and offices

1. These include not only our direct employees, but also trainees, interns and apprentices who receive the same benefits and treatment extended to other employee categories.

MATERIAL TOPIC

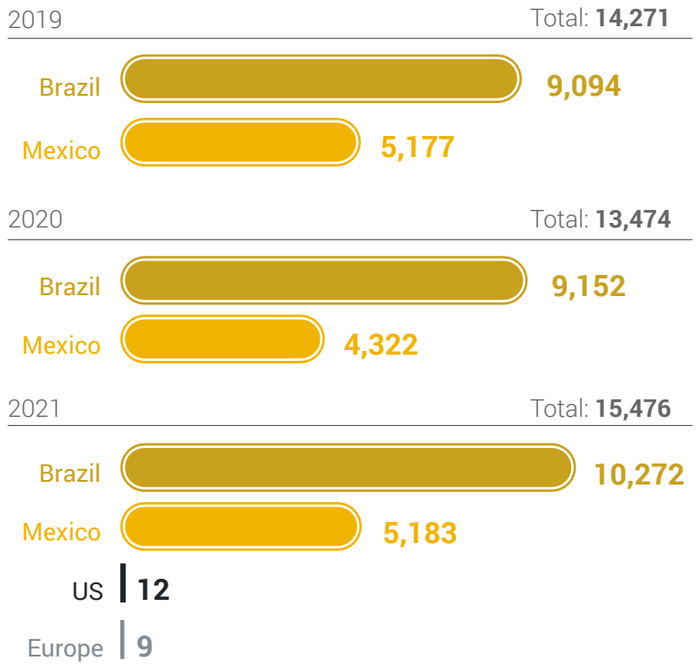
People management and development

Diversity and inclusion

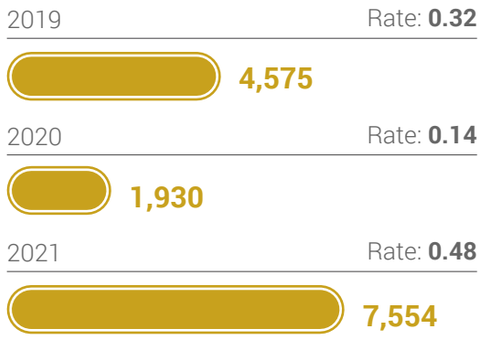
SDG

INFORMATION ON OUR EMPLOYEES GRI 102-8

Permanent contract and region[1,2]



New hires GRI 401-1



Note: includes trainees, interns, and apprentices, as per GRI criteria.
1. We have no temporary employees.
2. Information about our offices in the US and Europe has been included since 2021.

QUALIFICATION AND TRAINING GRI 404-1

Education and training are part of Tupy's history. In 1959 we created the Tupy Technical School out of our concern with the technical qualification of our people, and with an emphasis on "what to teach" and "how to teach", and on-the-job competence.

Sixty years later, we continue to qualify and train our people. We monitor the knowledge required to perform each activity and provide suitable training, be it in specific leadership skills, technical and academic skills, or made-to-order development plans for each area. Our

commitment extends beyond the company gates. One example is our adherence to ***Movimento Santa Catarina pela Educação*** (the Santa Catarina Movement for Education), which promotes literacy and minimum education for all workers, providing spaces and resources where primary and secondary schools can operate. **GRI 404-2**

In 2021 we improved our technical skills program, revitalizing the operational skills matrices. Ninety-two percent of employees in our plants have been trained for their jobs.

We also developed numerous initiatives in specialties and competences that are specific for casting/foundry, metallurgy, and machining.

In 2021 **hours trained/employee increased 60%** compared to 2019. Basically all technical/supervision and operating positions were trained, and we also provided leadership development training and training for operating procedures related to safety, quality, and the environment. **In 2021, about 66% of the training hours were on social and environmental topics**.

QUALIFICATION AND TRAINING PROGRAMS

Master in Business Innovation (MBI)

We advanced in our commitment to innovation by creating the Master in Business Innovation (MBI) in Casting 4.0 program. This is a joint initiative with SENAI, training 47 professionals to become change agents in the Company's digital transformation process (*read more in Tupy Up*). This is an 18-month specialization course that addresses concepts of innovation and technology applied to Industry 4.0.

Machining School

Modeled after our Foundry School, in 2021 we created a Machining School, offering a knowledge pathway focused on operations, and another focused on the technical area.

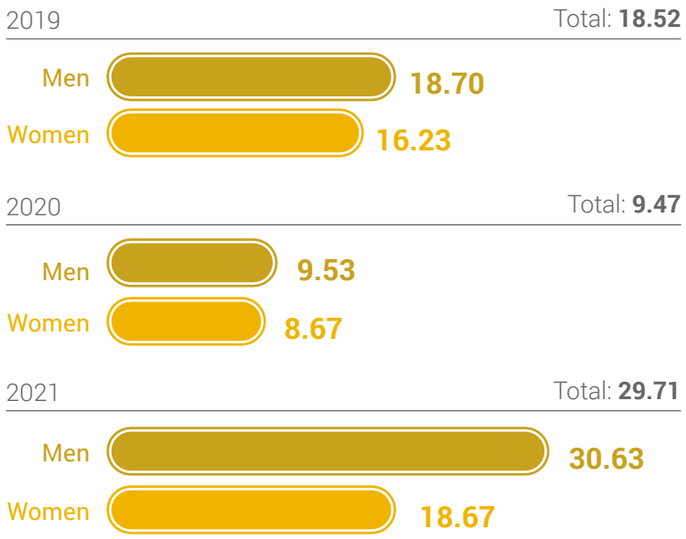
Young talents

Tupy has a much sought-after young talents program. In Brazil we have Trainee Tupy, and in Mexico Impulse T, both lasting 15 months. These initiatives allow professionals to learn more about the Company, work in projects, and lead initiatives in their areas of activity. In the 2021/2022 cycle we had 1,666 applicants, out of whom 12 were chosen in Brazil, and 4 in Mexico.

Leadership

Another important program is our continuous leadership training cycles, which trained 468 employees in Brazil, and 353 in Mexico. This program focuses on plant leaders—technicians, facilitators, and supervisors. In 2022 it will be extended to coordinators.

Average hours of training per year, per employee GRI 404-1



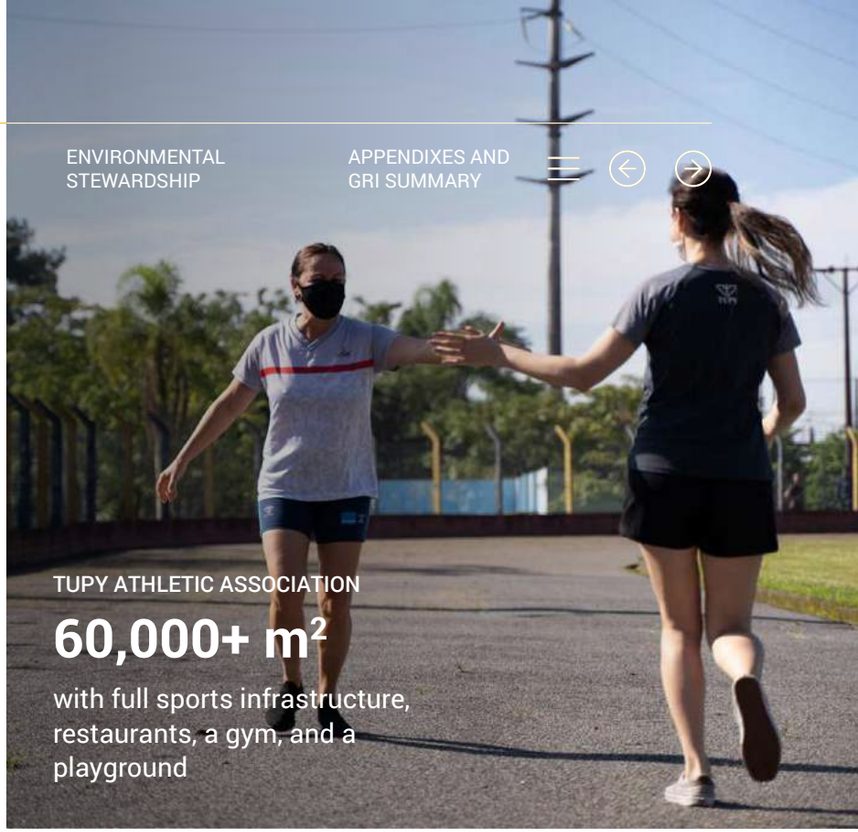
Note: average hours are calculated as total training hours / total headcount.

COMPENSATION AND BENEFITS

GRI 103-2, 103-3 | 202

The aim of our compensation strategy is to attract, motivate, and retain talents. Compensation packages include benefits, and are defined based on the responsibility of each position, and business competitiveness and strategy. They recognize individual and collective performance.

In general, the ratio of the entry-level salary at Tupy to the local minimum wage tends to be higher than required by law or collective bargaining agreements, and reflects Tupy's adherence to the principles of competitiveness and valuing people. **GRI 202-1**



Ratio of basic salary and remuneration of women to men GRI 405-2

	2019		2020		2021	
	Basic salary	Remuneration	Basic salary	Remuneration	Basic salary	Remuneration
Middle Management	81%	84%	80%	90%	74%	73%
Leader/Coordinator	89%	112%	87%	100%	86%	89%
Technical/Supervisor	90%	83%	90%	101%	91%	90%
Administrative	84%	85%	86%	83%	85%	85%
Operational	84%	80%	83%	81%	87%	86%

The wage and compensation differences between men and women at Tupy are primarily the result of the legacy gender gap in the composition of the Company's workforce. Therefore, as men tend to have more seniority, their wage and compensation base is a bit higher than women, who make up less of our workforce.

The benefits offered are based on common practices in the regions where we are present, and the assessment of our employees, as measured against Tupy indicators. **GRI 401-2**

To promote quality of life among employees and communities, Tupy sponsors and supports areas for leisure, social get-togethers, and sports. In Joinville we have the Tupy Athletic Association (AAT) as a venue for sports, recreation, and events. This 60 thousand square-meter location has suitable infrastructure for different sports, restaurants, a gym and playground.

DIVERSITY & INCLUSION

GRI 103-2, 103-3 | 405

At Tupy, inclusion is based on valuing human beings, regardless of ethnicity, nationality, gender, age, sexual orientation, religious beliefs and physical disability, among other factors. We are committed to promoting a culture where diversity and inclusion enhance the company's creative and innovative potential.

We constantly seek to improve the conditions at our workstations, so that they are suited for people of different genders and of different physical abilities. In 2021, the Joinville plant organized numerous activities focused on selecting people with disabilities, including an awareness and training plan for the HR department and people in leadership positions. **GRI 405-1**

Support for cultural diversity

Regarding cultural diversity, we offer Portuguese language courses for employees of different nationalities. This program allows people of different nationalities to communicate and share experiences, using a straightforward, continuous learning approach.

By functional category and gender (%) GRI 405-1

	2019		2020		2021	
	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Executive Board	88.89	11.11	90.91	9.09	100.00	0
Middle Management	92.65	7.35	92.65	7.35	90.12	9.88
Leader/coordinator	86.99	13.01	85.21	14.79	88.44	11.56
Technical/ supervisor	97.83	2.17	98.10	1.90	97.74	2.26
Administrative	72.95	27.05	72.21	27.79	73.87	26.13
Operational	94.30	5.70	94.01	5.99	93.67	6.33
Trainees	60.00	40.00	0	0	66.67	33.33
Interns	64.29	35.71	60.00	40.00	54.17	45.83
Apprentices	47.24	52.76	41.53	58.47	38.62	61.38
Total	92.03	7.97	91.76	8.24	91.72	8.28

Note: We included the employee categories trainees, interns, and apprentices in reporting on diversity by employee category and gender.

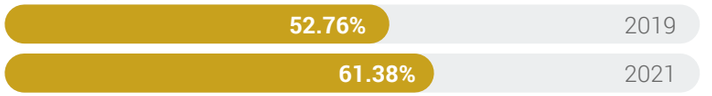
The majority of the workforce in the foundry industry has always been male. Tupy is aware that progress is needed in increasing the number of women in our operations. The number of women in operational positions increased from 5.70% in 2019 to 6.33% in 2021. In technical and supervisor positions, women went from 2.17% to 2.26% in the same period. The balance is much better among our young talents, interns, and apprentices, with 45.83% women and 61.38% men.

Diversity in governance (Board of Directors) (%) GRI 405-1

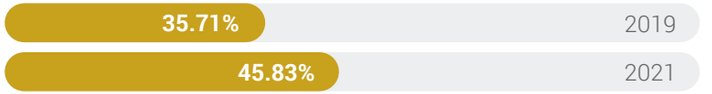
	2019	2020	2021
By gender			
Men	77.78	77.78	66.67
Women	22.22	22.22	33.33
By age group			
30 - 50	22.22	22.22	22.22
> 50	77.78	77.78	77.78

Diversity evolution by employee category and gender (%) GRI 405-1

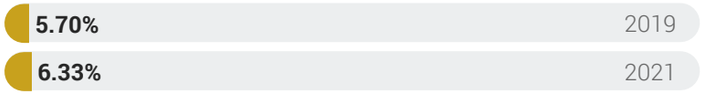
Female apprentices



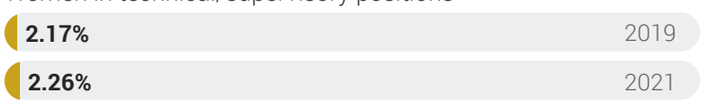
Female interns



Women in operational positions



Women in technical/supervisory positions



WORKPLACE HEALTH AND SAFETY

GRI 103-2, 103-3 |403, 403-1, 403-2

Health and Safety first, ensuring a healthy and safe workplace for all

Health and safety run through Tupy's culture. For us, safety comes first. We use strict protocols to monitor the working conditions of our teams, and invest to ensure a safe and healthy workplace.

Our workplace health and safety system covers our employees and, indirectly, all those who access our facilities—contractors, visitors, and customers, among others.

In January 2022 we created a director-level corporate department of Health, Safety and Environment (HSE), as part of our Organizational People and Human Development (OPD) system, further reinforcing the importance of this theme for the Company.

We budgeted R$ 25 million in 2022 for accident prevention and to improve working conditions, enhancing our commitment to employee health and safety.

MATERIAL TOPIC

Employee and contractor health, safety and well-being

SDG

3 GOOD HEALTH AND WELL-BEING

OCCUPATIONAL SAFETY

We have procedures in place based on applicable legislation, good safety practices, and the characteristics of each activity.

Non-routine activities are only performed after a Special Work Permit is completed, following the requirements established by the Workplace Safety Engineering function for that particular activity. For routine activities, work instructions or procedures go beyond describing how the task should be performed, and also list the controls to follow to avoid workplace accidents or diseases.

We have three safety committees: Injury Investigation and Reporting Committee; Melting Safety Committee, and the RSSA (Weekly Environmental Safety Report) Committee.

At our sites in Brazil, every two weeks we have a "security stop" in which we discuss prevention initiatives and lessons from past incidents. Managers audit workplaces to identify and correct potential risks and behaviors observed.

The Internal Accident Prevention Committee (CIPA) is made up of a mix of participants elected by employees and appointed by the Company, as per applicable legislation. The goal is to discuss and address deviations that may create hazards. In 2021, Tupy's SIPAT (Internal Accident Prevention Week) was completely online, and the content later shared on the TupyOn app.

To supplement onboarding programs for new employees and contractors, in some operating areas we offer Onboarding and Knowledge Sharing Programs, strengthening the conversations surrounding the safe operation of our processes. **GRI 403-5**

We also train our employees in the specific regulations for each country. And we require that contractors train their employees. **GRI 403-5**

Tupy also has an Emergency Brigade of 21 industrial fire-fighters and 612 volunteers who work to prevent and respond to environmental and occupational incidents. The Brigade has a fully equipped truck with instruments, uniforms, and equipment required to respond to incidents.

We believe that life is our most precious asset, and for this reason our safety rules are known as the "Golden Rules". Failure to follow any of them is a serious breach and results in disciplinary action in accordance with our disciplinary code. **GRI 403-4**

Internal COVID-19 response

IN COMMON AREAS

- Enhanced disinfection of work environments and more frequent cleaning of air conditioning filters;
- Maximum 70% occupancy in our cafeterias, which were also fitted with physical barriers on the tables and disposable gloves.

OTHER PRACTICES

- Ensure employees in the risk groups were kept on leave;
- Monitor symptomatic employees and perform COVID 19 testing;
- Make sure positive employees are kept on leave and monitor confirmed and suspected cases of Covid;
- Provide oximeters for serious confirmed cases.

Workplace Health and Safety Actions

Over 100,000 hours
of workplace safety training

Over 2,000 hours
of training and retraining of brigade members

19%
reduction in mandatory reportable workplace accidents

237
emergency drills

Over 520
ambulatory care services

Outpatient clinics

Tupy Golden Rules
> Workplace Safety

1. Safety must be addressed as a priority; no activity is so urgent or so important that it cannot be performed safely.
2. Hazardous and non-routine work will only be performed with written authorization following a Task Safety Assessment (TSA), and/or a Special Work Permit (SWP).
3. Personal or collective protective equipment is mandatory in all operations areas. When performing hazardous tasks (electrical work, work at heights etc.), appropriate equipment must be used and safety rules must be followed.
4. All energy sources must be locked out when handling, servicing or cleaning machinery and equipment (electrical, pneumatic, mechanical, etc). Lock-out/tag-out must always be used.
5. Industrial vehicles and moving equipment may only be driven by qualified, trained, and authorized employees. The speed limit must be observed at all times, and safety belts must be worn.
6. Nobody under the effect of alcohol or illicit drugs, or carrying guns or other weapons will be allowed on the premises.

HEALTH AND WELL-BEING

Our Occupational Health and Medical Control Program (PCMSO) cares for the well-being of our workers. It is planned and implemented based on health hazards, especially those identified in regulatory assessments.

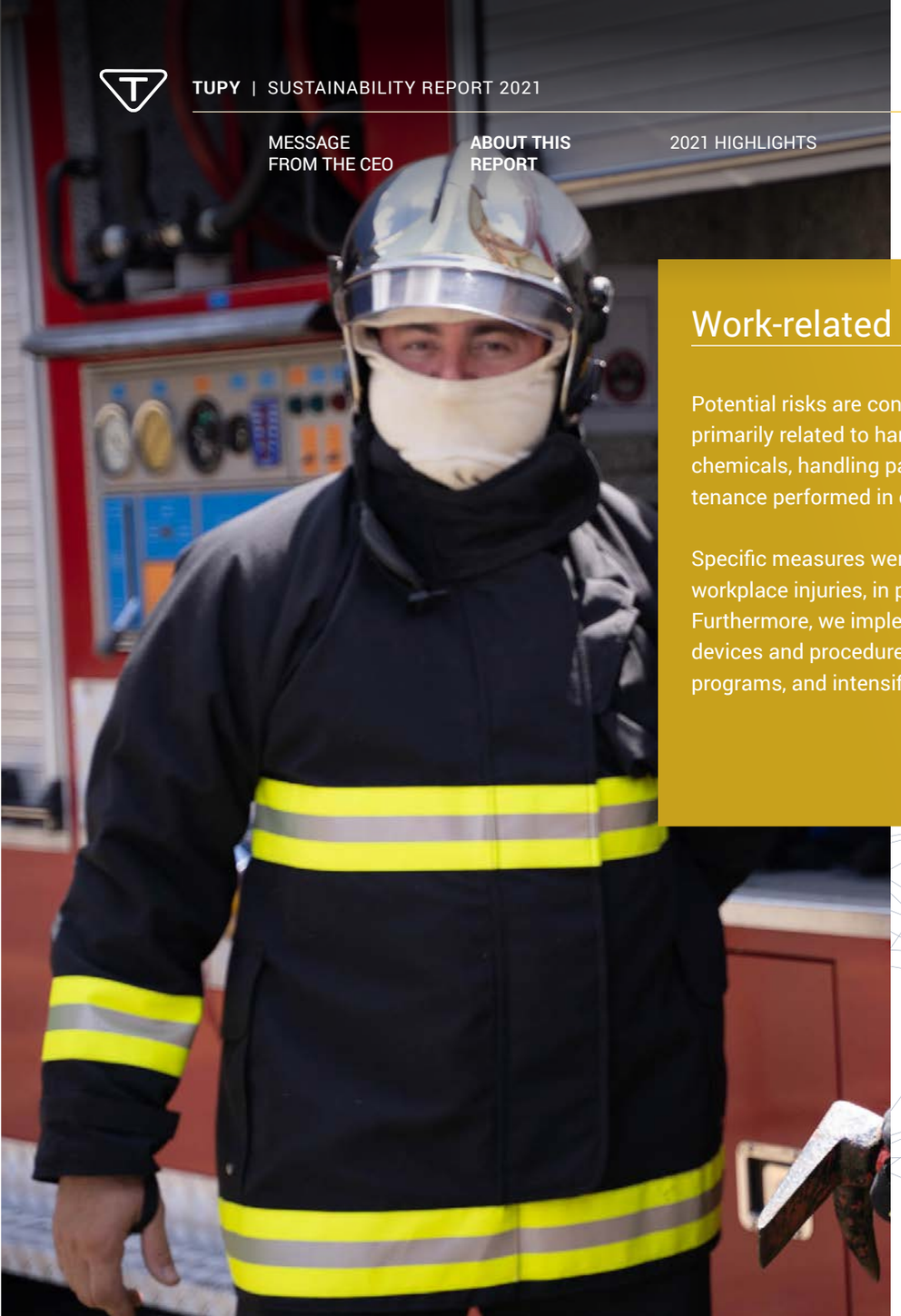
Tupy also has its own outpatient clinic for pre- and post-employment physicals, and to handle workplace accidents and the ill, whether due to professional or other diseases. It is staffed by doctors who specialize in workplace medicine, nurses, and nursing technicians. It is open 24x7 when we are in operation. We also have an ambulance to transport employees, contractors, visitors, and suppliers requiring off-site specialized medical care. **GRI 403-3**

Every year we promote a number of activities and campaigns related to health and disease prevention. Themes such as dengue prevention, adopting healthy habits, bone and muscle diseases, flu vaccine, high blood pressure and obesity prevention, healthy nutrition, eye health, mental health, women's health, and men's health were just some of the campaigns in 2021. We also focus on healthy and safe management. In Joinville, female employees are monitored by our Nursing team during pregnancy and after child-birth. In addition to pre-natal care, pregnant employees also receive information about delivery, nursing, documents for the mother and newborn, and information about HR and the healthcare plan. **GRI 403-6**

In 2021 Tupy had only six cases of reportable professional diseases. In 2020 there were ten, and in 2019, nine. **GRI 403-10**

Even adopting numerous measures to minimize workplace accidents, in 2021 there were two fatal injuries at our Saltillo, Mexico facility. In light of this, we took measures to mitigate risk and unsafe conditions, including a review and training on our operating procedures, new protection devices, emergency system verification, and hazard signage.

At Tupy we recognize that further progress is needed to ensure a safe and healthy environment. In relation to the incidents in Mexico, the Ministry of Labor concluded that we were not at fault in either case.



Work-related injuries

Potential risks are continuously monitored and are primarily related to handling liquid metals, using chemicals, handling parts and materials, and maintenance performed in confined spaces.

Specific measures were implemented to reduce workplace injuries, in particular an investment plan. Furthermore, we implemented and maintained devices and procedures, reviewed procedures and programs, and intensified audits and training.

Workplace injuries[1] GRI 403-9

Employees	2019	2020	2021
Number of hours worked	29,627,612	20,825,972	29,781,718
Number of fatalities as a result of work-related injuries[2]	1	0	2
Rate of fatalities as a result of work-related injuries	0.03	0	0.07
Number of high-consequence work-related injuries (excluding fatalities)	6	4	6
Rate of high-consequence work-related injuries (excluding fatalities)	0.20	0.19	0.20
Number of recordable work-related injuries (including fatalities)	487	277	398
Rate of recordable work-related injuries (including fatalities)	16.44	13.30	13.36

Note: the injury rate is calculated as the number of injuries x 1,000,000/number of hours worked.

1. Workplace injury information does not include workers not employed by the Company.

2. Both deaths in 2021 happened in Saltillo, Mexico.

CUSTOMERS

The Tupy customer base is highly diversified in terms of geography and applications, and over 77% of our revenue comes from exports.

We manufacture custom products for major global capital goods manufacturers, and offer high value-added services such as machining, component assembly, and other engineering services. For this we have over 2,200 technicians and employees working with our customers on co-development processes, as well as commercial teams who prospect and acquire new business and are responsible for relationship management.

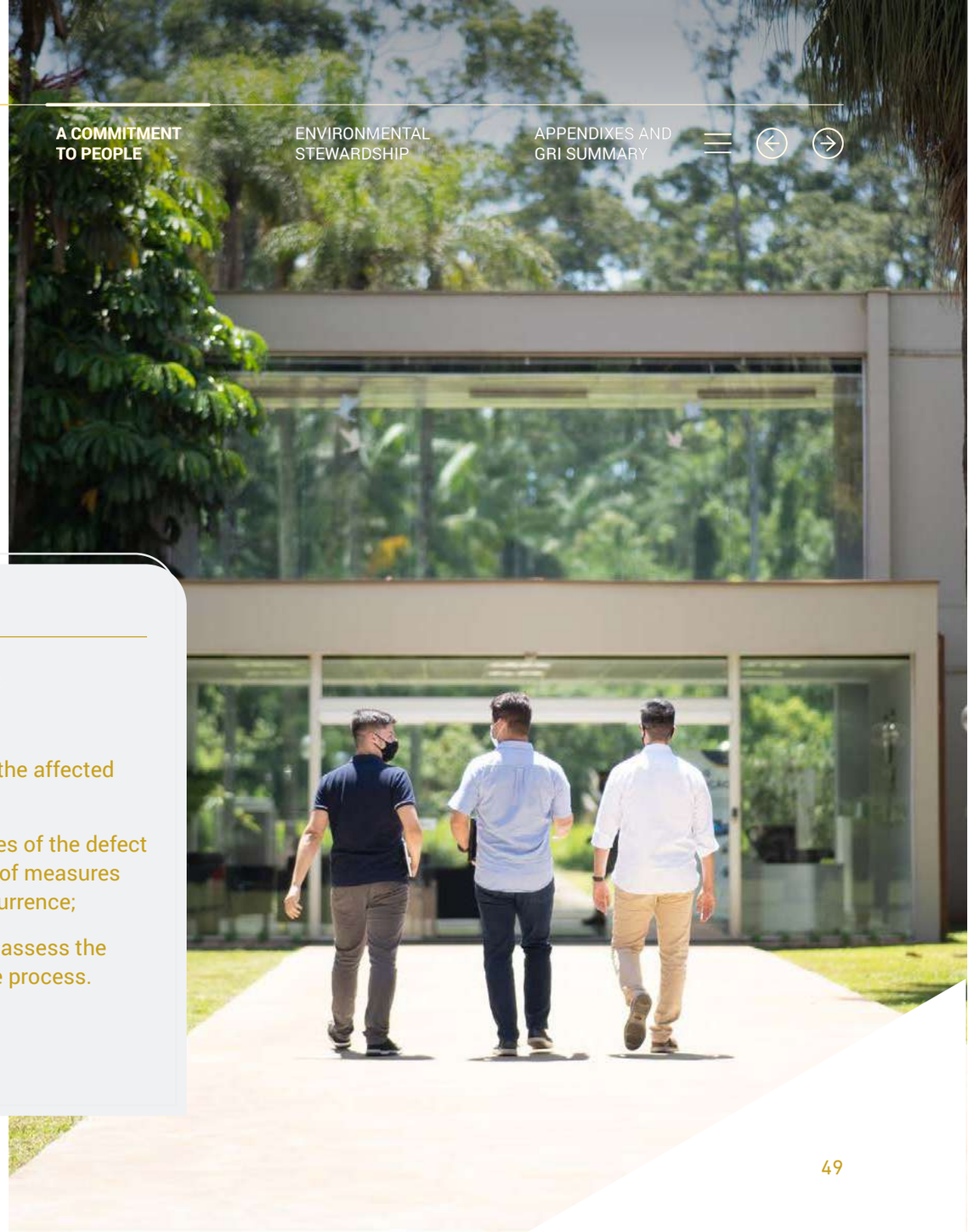
We also measure the satisfaction of our customers with semi-annual surveys, and other ad-hoc surveys for specific purposes, as well as our Fale Conosco (Contact Us) channel (*read more under Engagement Initiatives*).

In 2021 we made intense efforts to overcome the bottlenecks in global supply chains, an effect of the COVID-19 pandemic, to ensure the quality and availability of our products, despite higher costs and volatile volumes.

Product quality and safety

Our Recall policy defines quality and safety guidelines for goods supplied by Tupy. The criteria are:

- Suitable communication with all stakeholders, including customers, suppliers, and regulators;
- Halt the product manufacturing, distribution, and sales processes involved;
- Recall the affected product from the market, inventories, and distribution centers;
- Suitable disposal of the affected products;
- Analysis of the causes of the defect and implementation of measures required to avoid recurrence;
- Post-recall review to assess the efficacy of this entire process.



SUPPLIERS GRI 102-9

We look for suppliers who follow strict quality standards, are innovative, and continuously improve their products and services.

Because of the complexity of the products we supply, our supply chain is diversified and includes small, mid-sized, and large consumer goods, services, consulting, and other companies. The main supplier categories are scrap, power, and logistics.

In a first step potential suppliers undergo a technical and commercial assessment. In some cases, an environmental and quality audit is conducted at the supplier's facility. Companies that transport hazardous goods (waste, chemicals, and flammables) must have an internal self-inspection program and properly maintain their fleets. They must also have a plan to handle external emergencies.

Once selected, suppliers must monitor the performance of their manufacturing processes, use and improve failure prevention methods, and have contingency plans to ensure the continued supply of the service/product.

In 2021 we had a total of 3,543 active suppliers, out of a total of 11,727 suppliers in our database. Ninety percent of Tupy's active suppliers are domestic (Brazil and Mexico), and the remainder are in the US and Europe. Our spending along the entire supply chain in 2021 added up to R$ 4.2 billion.

SOCIAL AND ENVIRONMENTAL CRITERIA

GRI 103-2, 103-3 | 407, 408, 409

We expect our suppliers to adopt minimum social responsibility standards as per applicable legislation.

Child, forced, or slave-like labor are covered by our Supplier Management Policy and Code of Ethics. Our agreements include a clause that covers these themes, as well as self-assessment using NIMBI, a supply-chain management platform to monitor supplier onboarding, and bids organized by Procurement. At Tupy we found no suppliers with significant risk of child, forced, or slave-like labor. **GRI 408-1, 409-1**

In environmental matters, suppliers are expected to perform their activities according to applicable environmental laws and regulations, avoiding waste, avoiding pollution, and conserving energy. We encourage suppliers to seek independent certification such as ISO 14001.

Upon registration, all suppliers commit to our Master Supply Terms and Policies Agreement, which is renewed annually and available on the procurement management portal. In 2021 Tupy added sustainability criteria to its supplier management strategic plan. Questionnaires and audits covering social and environmental issues are currently being implemented that will inform our risk matrix.

MATERIAL TOPIC

Social and environmental criteria for suppliers

Waste management

SDG

OUR SUPPLIERS – 2021

Over 3,500
active suppliers

90% local
(Brazil and Mexico)

R$ 4.2 billion
injected into the Brazilian and Mexican economies

All our procurement agreements
include social and environmental clauses

COMMUNITIES

GRI 103-2, 103-3 | 203, 413

Social and environmental values are part of Tupy's trajectory and culture. Based on our Social Investment Policy (SIP) created in 2011 we drive community actions that focus on transforming the social reality.

We use our own funds as well as tax incentive laws, corporate volunteering, and donations of our goods and materials with transparency, and also systematically assess the projects we are involved in. **GRI 103**

In corporate volunteering we have a program, called Tupy Transformers, to incentivize and engage employees in social activities in the community. Currently, 211 employees in Brazil and Mexico volunteer in projects and activities supported by the Company.

We believe, however, that there is room for more. The changes in the world are dynamic and require a careful look on the challenges they present. In light of this, our Private Social Investment Policy (SIP) is being reviewed for issuance in 2022.

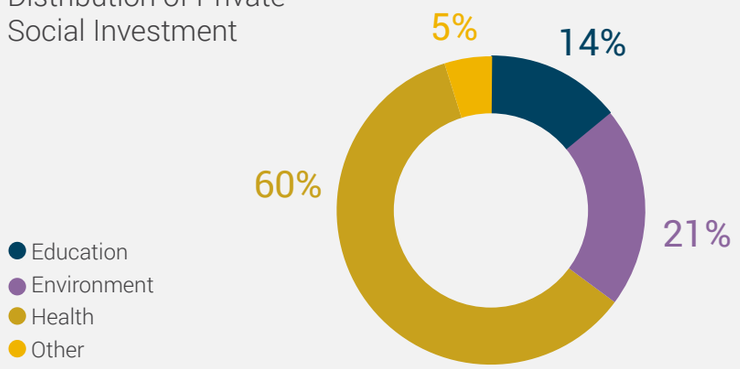
We organize community initiatives with a focus on transforming their social reality

MATERIAL TOPIC

Impact on local communities

SDG

Distribution of Private Social Investment



SOCIAL INITIATIVES

The numbers reflect Tupy's commitment to people, communities, and society

14,800 people
impacted

28
organizations supported

211
total volunteers

940
total hours volunteered

Tupy Transformers

Our initiatives in communities

EDUCATION

Youth and Adult Education

Since 2006 we have worked with the Santa Catarina SESI-SENAI system to provide Youth and Adult Education (EJA), helping over 1,200 people to complete primary and secondary school. Currently, 308 students are enrolled, 190 company employees and 118 from the community. **GRI 203-2**

Technicians in Development Program

In Mexico we signed an agreement with the Coahulla Technology University to create the Technicians in Development (TID) program. Participant students are able to implement and strengthen the skills and knowledge acquired in our maintenance department.

School Renovation

Renovations at the Maria Del Socorro Reyes Cepeda Primary School, located in Colônia Lomas Verdes, in Saltillo, Coahuila de Zaragoza, Mexico, included cleaning, painting, adjusting the spaces, repairing doors, windows, and window-panes, and replacing broken light fixtures, benefiting 168 children.

Draw a Smile Project

The goal of this project is to promote inclusion of Mexican children. Among the activities in 2021 was an educational trip to the Desert Museum and Christmas gifts for 120 children.

ENVIRONMENT

Zero Trash Week

In 2021 we participated in the 8th Zero Trash Week in Joinville, an event organized by Instituto Lixo Zero Brasil. In addition to our in-house activities in this area, Tupy contributed to other community initiatives, with a zero-trash effort in 75 homes organized by the city Department of health, and construction of a composting facility at Instituto Priscilla Zanette, in partnership with the Joinville Zero Trash Collective and Engineers Without Borders.

Our club, Associação Atlética Tupy, became a collection center for electronic waste for the community. The company provided this and another two collection points, which collected 257 kg of discarded waste.

Mangrove SOS Project

This project was carried out by Instituto Cocmar with the support of Tupy, and promoted environmental education in Joinville (SC) schools. These activities encouraged students to observe the reality of their neighborhoods and experience the dynamics of local ecology.

On July 26, World Mangrove Protection Day, we launched Plataforma Troca Verde (Green Exchange Program), a free tool to help teachers, educators, and students address the theme of mangrove ecosystems remotely, dynamically, and actively. This platform includes digital games with educational models, comics, games, and a 360º virtual pathway. click here

Cleaning Task Force

In 2021, as part of the Mangrove SOS Project, Tupy Transformers collected 250 kg of waste such as plastic bottles, glass, tires, and cans from a mangrove located close to the Company's headquarters. In three hours they also symbolically planted native plants to celebrate World Tree Day.

Learn more about the initiative here.

Sustainable School

In Joinvile, Tupy Transformers helped the Castello Branco Municipal School, combining saving natural resources and environmental education. In addition to building compost heaps and vegetable gardens, to be kept by the 859 students at the school, volunteers created a system to capture water from the air conditioner for use in cleaning.

Sierra de Artega

In Mexico, Tupy Transformers planted 150 trees to help recover Sierra de Artega, an area devastated by fire.

HEALTH

Joinville Volunteer Fire Fighters

Since 2012 we have contributed funds to the Joinville Volunteer Fire Fighters (CBVJ). This is the oldest unit of its kind in Brazil, and was created in 1892. In 2021 it responded to 10,588 incidents and helped 7,052 victims.

World Health Day

On world health day we honored Brazilian healthcare professionals by distributing 1,500 roses. This initiative was carried out by Tupy Transformers at the Hans Dieter Schmidt Hospital, a COVID-19 screening center, Hospital São José, and at Tupy's own outpatient clinic.

Pink October

Pink October was celebrated across the company. In Mexico, enough hair was donated to make 22 wigs for patients in chemotherapy.

Natal Luz (Christmas Lights)

This annual project allows socially and economically vulnerable children to celebrate Christmas.

In 2021 we donated funds to purchase video-surgery equipment for the Dr. Jeser Amarante Faria Children's Hospital in Joinville, which serves 100% SUS (Unified Healthcare System) patients.

OTHER INITIATIVES

Revitalizing the city park (*Parque da Cidade*)

Parque da Cidade is an important location of free leisure for the population. Thinking of the community's well-being, Tupy helped revitalize the location, making it safer and enabling all of its infrastructure to be used. Adding to the attractions, a group of Tupy Transformers built a small literary house to encourage and democratize reading.

Solidarity campaigns and donations

This year the Joinville plant collected 1,100 sweaters that were donated to institutions hat help the homeless and socially vulnerable people. In Mexico we collected food for fire fighters in the Sierra de Artega fire, benefiting 200. Every year Tupy Christmas Baskets left over from employee distribution are donated to socially vulnerable individuals. In 2021, about 500 families benefited from this initiative.

SOCIAL INITIATIVES WITHIN OUR COVID-19 RESPONSE

Tupy has led efforts in support of people's health from the very start of the Pandemic.

In Brazil, one of our initiatives was a COVID-19 Screening and Testing Center at the Company's sports facility. Between April 2020, when it opened, and May 2021, it administered over 90,000 Covid tests.

In 2021, with the vaccination rollout, this site became the second largest Immunization Center in Joinville, where over 150,000 doses of the vaccine were applied. To support the healthcare system infrastructure, Tupy loaned 50 oxygen cylinders.

To contribute with the state healthcare system in Mexico, we encouraged people to donate blood and platelets. In 2021, 834 employees contributed. Blood and platelets were sent to Coahulla community medical centers.

COVID-19 pandemic response

Over 90,000
served at our Screening and Testing Center between 2020 and 2021

50
oxygen cylinders loaned to the municipal healthcare center

Over 150,000
doses of vaccine applied at the Immunization Center

834
blood and platelet donations

Environmental Stewardship

ENVIRONMENTAL STRATEGY AND POLICY

We actively work to minimize environmental impacts from our operations and to conserve natural resources

Tupy has an Integrated Management System (IMS) that has been certified to ISO 14001 since 2001. The IMS helps us to reconcile our production activities with environmental protection by mitigating and controlling aspects related to our business, and continuously improving our production processes in order to minimize environmental impacts. As part of the EMS routine, monthly meetings are held to review all environmental indicators with the Executive Board.

Throughout 2021, we conducted enhanced studies and analyses to update our environmental assessments and prioritize initiatives.

Most of our environmental investments in the year—which included construction work, new equipment and improvements to wastewater treatment stations and waste management centers—were allocated to air quality, including monitoring stations, replacing equipment with more efficient models, and retrofitting exhaust systems.

For 2022, approximately R$ 25 million has been budgeted toward investments in environmental controls, plant water and air emissions.

In 2021 we redefined the global role of our Occupational Health, Safety and Environment (OHSE) department. In January 2022 we appointed a corporate director for this department and, in Brazil, a specialist in air emissions.

As with Safety, we also have a set of Golden Rules for the Environment. Failure to follow any of these rules is a serious breach and results in disciplinary action in accordance with our disciplinary code. **GRI 403-4**

MATERIAL TOPIC

Air emissions

Waste management

SDG

Tupy Golden Rules > Environment

1. No tree felling or trimming should be carried out without an environmental permit.
2. All liquid effluents must be sent for treatment at wastewater treatment plants.
3. In the event of a spill, responders should:
   (a) contain the spill until a final solution is implemented, and
   (b) create and issue a work order to the maintenance team in the affected area.
4. All solid waste must be stored properly.
5. All newbuild facilities or modifications to the production process must be preceded by an environmental impact assessment.

WASTE MANAGEMENT GRI 103-2, 103-3 | 306, 306-1

Each site has a Waste Management Plan that conforms to the local laws and regulations of each country, outlining controls and requirements for managing all types of waste.

We have made significant progress in waste management, including a 15% reduction in landfilled non-hazardous waste and a 57% reduction in landfilled hazardous waste from a 2019 baseline. These reductions were achieved through environmental campaigns and alerts, and production process improvements. GRI 306-5

In Saltillo, Mexico, we have joined a voluntary government program for managing and minimizing waste materials, and received a Green Shop Certificate as part of the program. GRI 306-2, 306-5

All waste materials disposed of off-site are sent to suppliers that are licensed by the appropriate environmental authorities and have been previously screened by the Environment department. GRI 306-2

WASTE RECYCLING

We generate an average of 1 million metric tons of waste per year, and recycle around 50% of this volume. 87% of recycled waste materials are reused within our own process.

In 2019, Tupy trained a team to identify options for waste recycling within the process, based on circular economy principles. The co-products generated in this process help to conserve natural resources, generate energy savings and minimize material disposal, as they can be used in other value chains. In 2021, more than 60 alternative applications for waste materials were approved, and approximately 75,000 metric tons of waste materials were recycled, including:

- **Melting exhaust dust –** sold to recover zinc in metal recovery processes;
- **Used lubricants –** sent for re-refining, a process that generates a new product and emits seven times less CO_2;
- **Swarf –** swarf from machining galvanized cast-iron pipe fittings is sold to the automotive and steelmaking industry, creating value in separate value chains;
- **Granulated slag –** slag from the production process is used as an important mineral additive in cement production;
- **Zinc ash and sludge –** recycled and returned to the process as a raw material.

87% of recycled waste materials are reused within our own process

RECYCLING GRI 103-2, 103-3 |301, 301-2

In 2021, 97% of the metal materials used in our production process were from recycling. We process more than 500,000 metric tons per year into high value-added products. (learn more in the Circular Economy infographic)

We use two different sources of scrap materials: end-of-life scrap, our primary source, is scrap from discarded consumer products such as stoves, refrigerators and old cars, which we collect from small recycling companies. The second source is industrial scrap, from industries such as the metalworking, infrastructure, automotive, auto parts, machinery and equipment industries.

Using recycled materials reduces demand for natural resources and energy, and minimizes greenhouse gas (GHG) emissions.

In addition to scrap metal, we source recycled raw materials from other sources, such as:

- **Sand –** More than 1/3 of the sand used in our process is from recycling. We have six sand regeneration units at our sites, where waste materials are transformed into inputs and recycled back into the production process—more than 275,000 metric tons are regenerated and used every year.
- **Iron briquettes –** 100% of the cast iron swarf we produce is compacted into briquettes as a raw material. The iron briquettes produced have better quality than virgin raw materials, such as pig iron.
- **Coke –** our furnaces are fed with 25% recycled coke, helping to minimize GHG emissions.
- **Catalyst –** Our Saltillo plant in Mexico chemically treats the catalyst gas from the recycling process in its core-making operations. The material is then recycled back into the process, reducing the amount that needs to be purchased.

RESULTS 2021

97%
of the metal materials used in our production process are recycled

275,000+
metric tons of sand regenerated

R$ 25 million
in revenue from co-products, double the figure in the previous year

15%
reduction in landfilled non-hazardous waste

We process more than 500,000 metric tons of scrap per year into high value-added products

As a manufacturing company, we have the ability to transform waste into value

Company of the Year

The Joinville Zero Trash Collective named Tupy Company of the Year in 2021. The award program, organized by Instituto Lixo Zero Brasil, encourages businesses to find innovative solutions to achieve Zero Waste.

See here for a summary of initiatives

INTERNAL RECYCLING INITIATIVES

In Joinville we organized workshops, livestreamed sessions and exhibitions about composting and the circular economy.

Home composting system tutorial: see here

A game event themed around the Circular Economy, and an exhibition of recycled materials

Zero Trash Effort in partnership with the Health Department *– (learn more in Communities)*

Three electronic waste collection stations—a total of 257 kg of electronic waste were collected

A live-streamed presentation about composting for employees, who participated in a prize draw for composting systems.

Composting workshop

CIRCULAR ECONOMY

Using recyclable materials in the production process creates a range of benefits and reflects Tupy's commitment to sustainable development

CO_2

Every metric ton produced from scrap avoids **1.2 metric tons of greenhouse gas emissions.**

500,000

metric tons of scrap are processed into **value-added, high-tech products** every year.

1 Everything has its beginning!

Scrap, our primary raw material, comes from two different sources:

End-of-life consumer products
Items such as stoves, refrigerators and old cars

Industrial scrap
Scrap materials from the metalworking, automotive, parts, and machinery and equipment industries.

97% of the metal materials used in our production process were from recycling in 2021.

2 Processing

Our production process turns raw materials and inputs into products. But it also generates waste materials, that are then recycled and reuse.

Recycling
Here are three examples:

- Sand: more than 1/3 of the sand used in our process is from recycling.
- Briquettes: 100% of cast iron swarf is compacted and reutilized.
- Water: around 1 million cubic meters of wastewater are recycled back into the production process each year.

Reuse

Materials that are not recycled on-site are supplied to other industries. Approximately 75,000 metric tons per year are processed into **60 types of co-products:**

- Exhaust dust, sludge and zinc ash are turned into metallic zinc.
- Lubricants are refined and reused as lubricants.
- Iron swarf is sold to the automotive and steelmaking industries.
- Granulated slag is used as an important mineral additive in cement production.

3 Use – practical applications

Tupy products are present in a wide range of industries, such as freight transportation (all modes), infrastructure, agriculture and power generation. Our products can be found in machinery, vehicles and equipment—and have a long lifecycle.

4 Disposal – the cycle re-begins

Our products are fully recyclable and, on reaching the end of their useful life, are returned as scrap and processed into new products.

Whatever is not reused is sent to suppliers that are licensed by the appropriate **environmental authorities.**

BENEFITS OF A CIRCULAR ECONOMY

- Minimizes greenhouse gas emissions
- Reduces extraction of nonrenewable natural resources
- Creates employment and income opportunities
- Minimizes landfilling
- Drives innovation in processes and products
- Enhances process efficiency

ENERGY AND EMISSIONS

ENERGY EFFICIENCY

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

Because our manufacturing process is energy-intensive, we work to ensure energy is used efficiently by identifying and mapping out energy consumption in our processes.

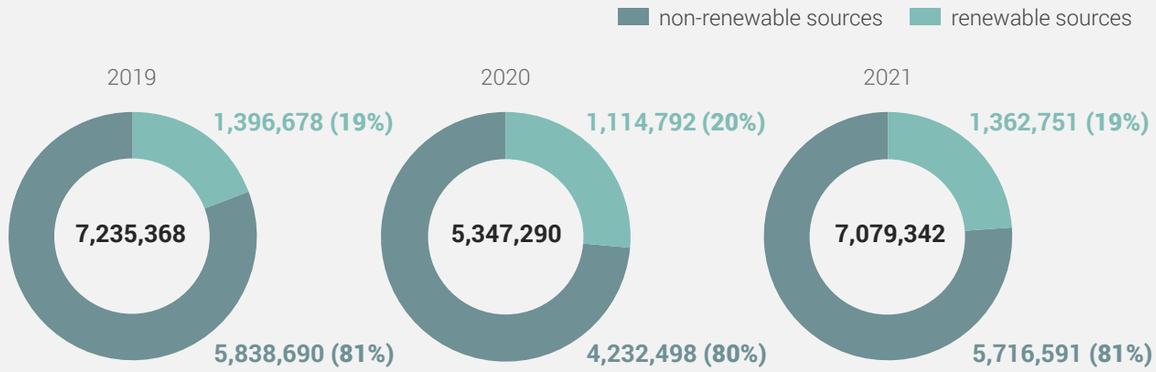
Efforts as part of our Energy Efficiency Program, implemented in 2021, are designed to disseminate good practices in energy management. Source-specific working groups (electricity, natural gas and coke) work to improve energy performance across each link in Tupy's value chain. Energy efficiency is an imperative for improving competitiveness by reducing operational costs and greenhouse gas emissions in our operations. **GRI 302-3**

More efficient GRI 302-1

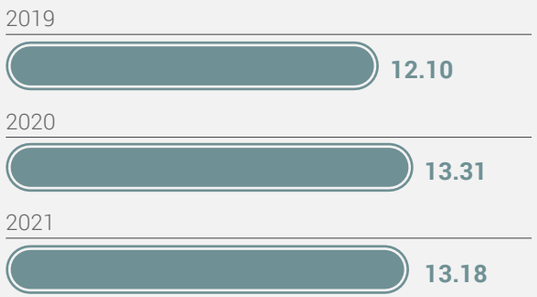
In 2022 our Brazil sites will implement the following projects:

- Lighting system retrofits with LED light bulbs;
- Installation of natural gas meters.

Energy consumption and intensity within the organization (GJ)[1,2] **GRI 302-1, 302-3**



Energy intensity (GJ/t produced)



Note: beginning in 2021, Tupy is using equivalent production as the denominator in the intensity calculation.
1. The energy intensity calculation is based on consumption of fuel and electricity.
2. Source of the conversion factors used – Brazil: National Energy Balance 2021: year 2020.

AIR EMISSIONS

GRI 103-2, 103-3 | 305, 305-7

Emissions are monitored through annual measurements at emissions points and through daily monitoring using cameras. Air quality is monitored based on daily readings from monitoring equipment (Hi-vol). The air-quality readings are regularly reviewed by the Environment team.

The Environment department, which is a part of our governance structure, reports to the Executive Board on environmental performance indicators, including air quality indicators. Also on a weekly basis, Manufacturing managers review performance indicators and agree on initiatives to improve performance and address any deviations.

In 2021 our stack particulate emissions decreased by 4% from a 2019 baseline. This reduction was the result of emissions monitoring improvements, exhaust system preventive maintenance, and modifications to painting processes to optimize the consumption of paints and solvents. **GRI 305-7**

We reduced our particulate emissions by 4% from a 2019 baseline. This reduction reflects improvements in emissions management processes

Daily emissions monitoring (Joinville, Brazil)

Other significant air emissions[1] GRI 305-7

	2019		2020		2021	
	mt/year	t /t produced	mt/year	t /t produced	mt/year	t /t produced
Volatile Organic Compounds (VOCs)	22	0.00007	217	0.00092	199	0.00061
Particulate Matter (PM)	1244	0.00208	530	0.00132	1,069	0.00199

Note: beginning in 2021, Tupy is using equivalent production as the denominator in the intensity calculation.
1. VOC figures (2019, 2020 and 2021) are for Brazil only.

CO_2 EMISSIONS

GRI 103-2, 103-3 | 305, 305-7

Like the broader manufacturing industry, our production process is energy- and therefore emissions-intensive. Tupy is committed to continuously developing solutions to reduce emissions at each stage in the value chain. Currently, for example, every metric ton we produce from scrap avoids 1.2 metric tons of greenhouse gas emissions.

Our scope 1 and 2 emissions intensity was 1.3 metric tons of CO_2e per metric ton of iron produced. This is less than the global average as published by the World Steel Association (WSA): 1.85 metric tons of CO_2e per metric ton produced.

Tupy has set up a program to identify potential energy efficiency and emissions reduction projects. In 2021 we reduced or absolute scope 1 emissions by 9% from a 2019 baseline. **This reduction was achieved by replacing mineral coke with recycled coke, which has a lower emission factor. We also adjusted the emissions factors for sand, and reduced consumption of inputs, such as resin and coal dust, in the molding and core-making departments.**

GRI 305-1, 305-5

The slight increase in absolute indirect (scope 2) emissions from 2019 is primarily explained by the higher share of non-renewable sources in Brazil's electricity matrix as a result of the water crisis in 2021, which made the national grid more carbon-intensive. Offsetting this, **in mid-2021 we concluded a new power purchase agreement at our Mexican sites, and have since purchased electricity with an 18% lower carbon-emission factor than for the country's fossil-intensive national grid.**

GRI 305-2

Every metric ton produced from scrap avoids 1.2 metric tons of greenhouse gas emissions

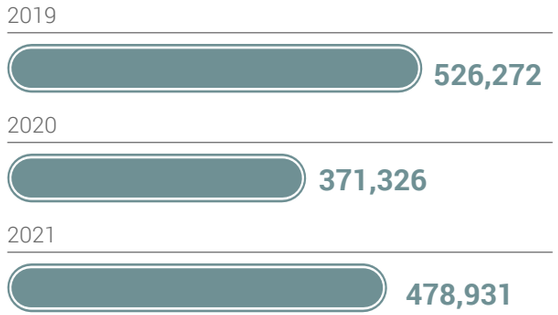
Conservation of biodiversity

We maintain approximately 5,200 hectares of protected forests at and around our sites, with a carbon stock of 1.8 million metric tons of CO_2.

Some of these protected areas are mangroves—transition ecosystems between marine and terrestrial habitats that serve as nurseries for marine life and can sequester and store carbon. Babitonga Bay, near our headquarters, harbors a total of 82 square kilometers of mangroves, accounting for 80% of the total mangrove area in the state of Santa Catarina, according to the Cubatão Cachoeira Joinville Committee. To help protect this biome, Tupy has partnered with the "Mangrove SOS Project" (*read more in Communities*) to implement preservation and environmental education initiatives in communities.

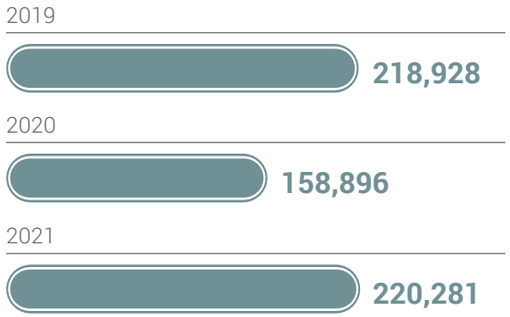
Direct (scope 1) GHG emissions (tCO_2 equivalent) GRI 305-1

tCO_2eq/year



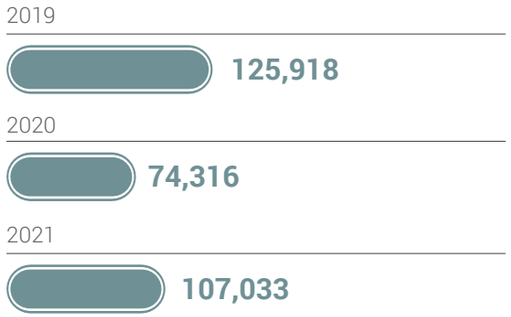
Indirect (scope 2) GHG emissions (tCO_2 equivalent) GRI 305-2

tCO_2eq/year



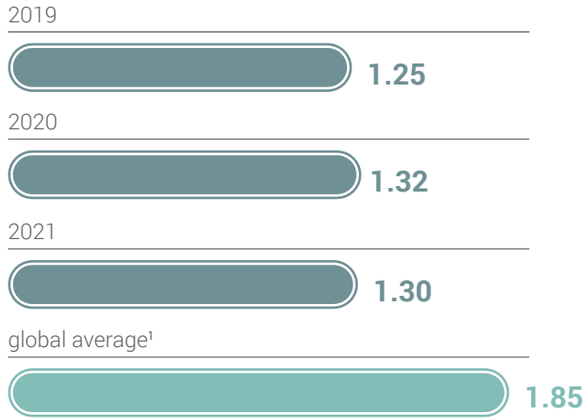
Other indirect (scope 3) GHG emissions

tCO_2eq/year



GHG emissions intensity[2] GRI 305-4

tCO_2eq/year



Note: beginning in 2021, Tupy is using equivalent production as the denominator in the intensity calculation.

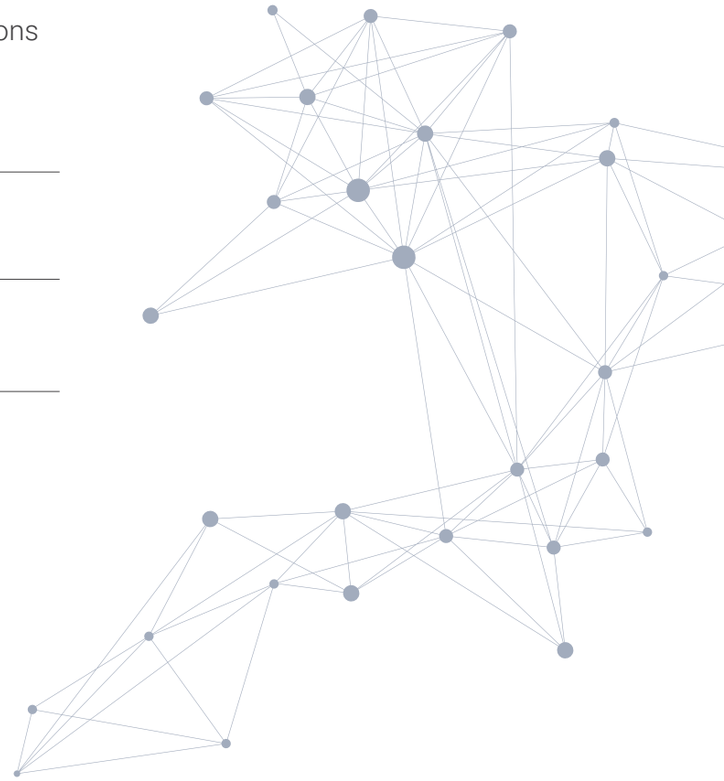
1. Source: World Steel Association

2. The emissions intensity calculation includes scope 1 and 2 emissions

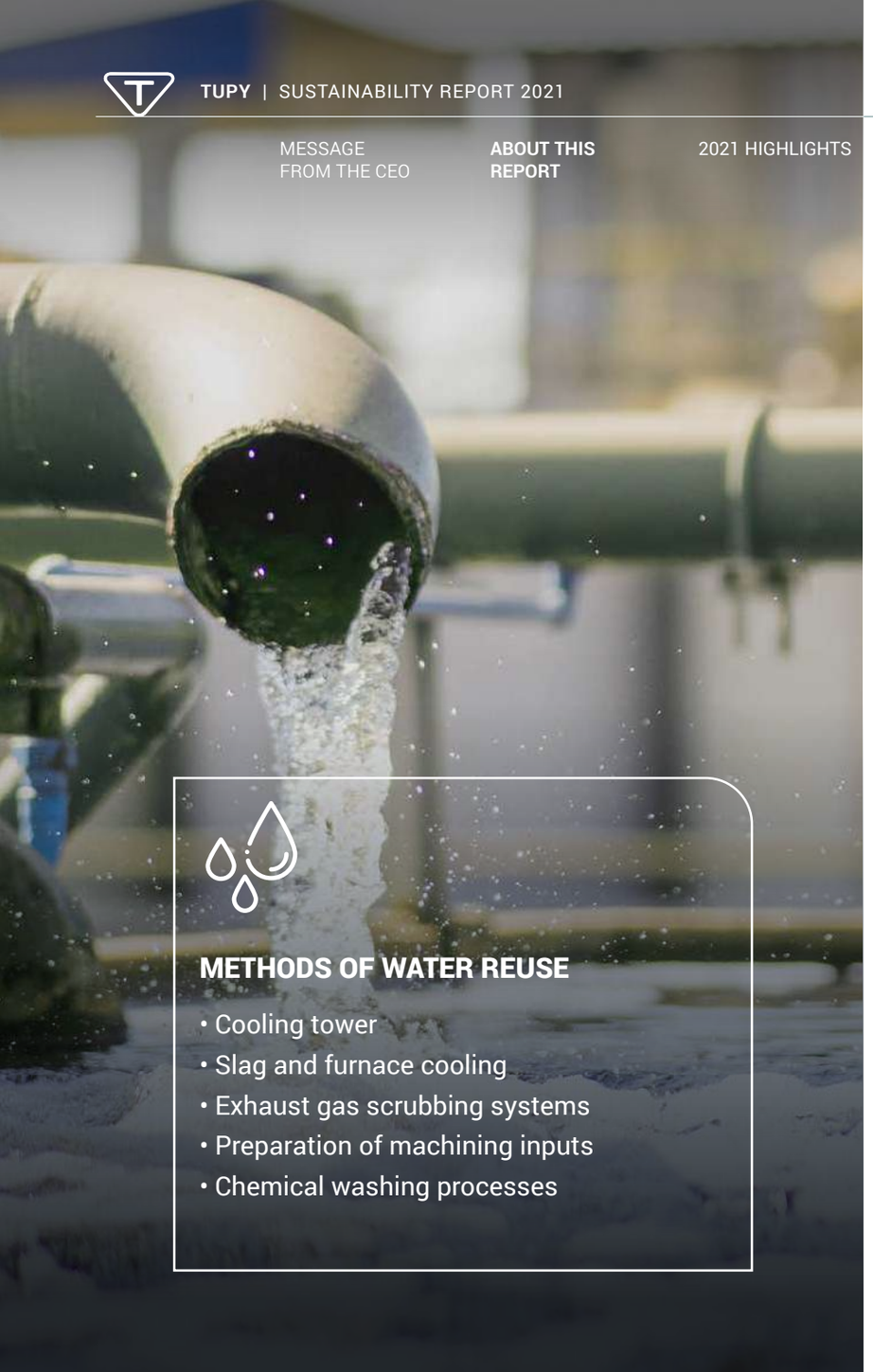
Reduction of GHG emissions (t CO_2 equivalent) GRI 305-5

	2020	2021
Reductions of direct emissions (scope 1)	-154,946	-47,341
Reductions of energy indirect (scope 2) GHG emissions	-60,032	1,353
Reductions of other indirect (Scope 3) GHG emissions	-51,602	-18,889
Total reduction of GHG emissions	**-266,580**	**-64,077**
Reductions from offsets	0	0

Note: from a 2019 baseline.



We reduced or absolute scope 1 emissions by 9% from a 2019 baseline



METHODS OF WATER REUSE

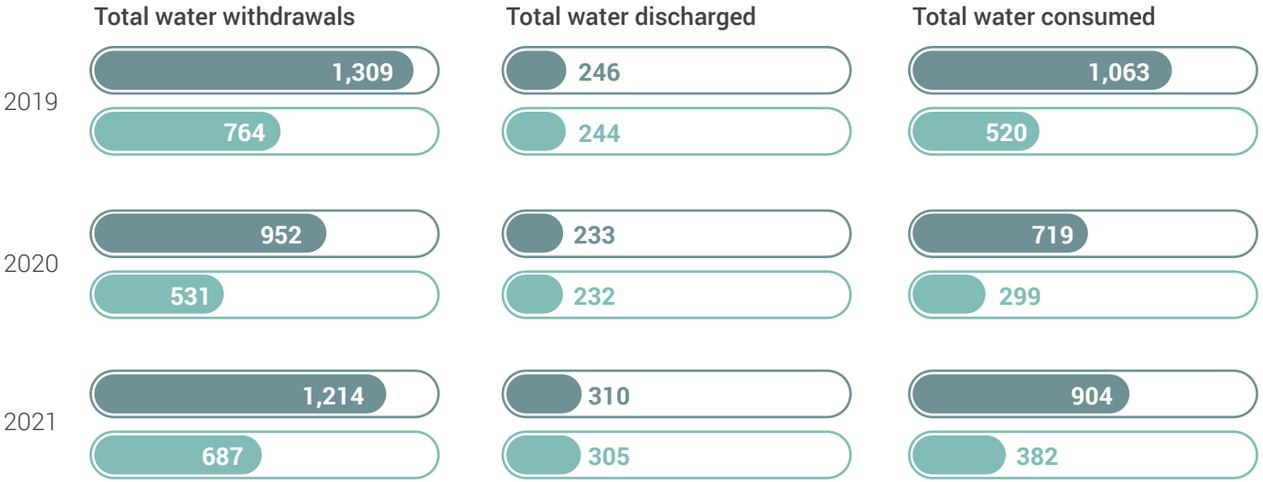
- Cooling tower
- Slag and furnace cooling
- Exhaust gas scrubbing systems
- Preparation of machining inputs
- Chemical washing processes

WATER AND EFFLUENTS

GRI 103-2, 103-3 | 303, 303-1, 303-5

We invest continuously in water recycling programs that help to reduce both water withdrawal and wastewater volumes. Our average water intensity in 2021 was 1.68 m³ per metric ton of production equivalent. From a 2007 baseline, we have reduced our water withdrawals by approximately 50%. In the last three years, we have implemented more than 60 water-related projects, including filter system improvements and new tanks, mixers, pumps, flowmeters and other equipment.

Total water withdrawal and discharge – 2021 (ML) **GRI 303-5**



We monitor our water usage and have water reuse and recycling systems at each of our sites. In 2021, approximately 73% of our plant and sanitary wastewater was recycled back into the process, and water withdrawals were reduced by 7% from a 2019 baseline, further reducing water consumption.

Wastewater treatment plants

Tupy has seven wastewater treatment plants (five in Brazil and two in Mexico) where we treat wastewater for reuse in our manufacturing processes.

In 2021 we completed an overhaul of the treatment plant in Joinville (Brazil) that will allow us to treat and reuse approximately 6,000 cubic meters per year.

Tupy avoids approximately 1 million cubic meters in water withdrawals per year. This is thanks to water recycling rates as high as 100% at some sites

Response to the water crisis

We created an internal committee at Tupy to monitor the water crisis in Brazil and identify alternative energy sources. We regularly monitor power supply dynamics and costs to inform strategies such as migrating products between production lines (Brazil and Mexico), modifying our production processes and prioritizing higher value-added products.

Appendixes

IN THIS CHAPTER

ENGAGEMENT INITIATIVES GRI 102-43, 102-44

Stakeholder group	Communication channel	Topics addressed
Employees	• The TupyOn app, launched in 2021 with a range of internal communication content • Direct communication – we encourage managers to discuss business-relevant topics with their teams • Toolbox Talks • Weekly environment discussions	• Health and safety, benefits, careers, ethics, environment, innovation and technology, quality, brands and products, and sustainability
Customers	• Direct contact with the sales team • Two-yearly customer satisfaction survey • One-off, targeted surveys • *Website* (Contact Us) • Emails and meetings – account managers regularly meet with customers	• Global consumption outlook • Quality specifications • Sales planning • Value chain partnerships
Suppliers	• Supplier portal	• Prices of raw materials and services – continuous monitoring of inflation and foreign-exchange rates • Mitigation – Tupy implements and monitors risk mitigation actions to ensure adequate volumes are available and to minimize impacts on costs
Communities	• Phone • *Email* • Private and/or public meetings • Legal department involvement on demand • *Email*	• Impacts from our operations • Requests for support, sponsorship, donations and other social partnerships
Government	• Meetings • Official visits and letters	• Common agendas that support the development of the regions where we operate, guided by our Code of Ethics and Business Conduct, which sets out guidelines on dealings with government officials
Shareholders	• Phone • Conferences • *Email* • *Website*	• Economic performance • Business strategy • Outlook • ESG agenda

Waste diverted from disposal (t) GRI 306-4

	2019	2020	2021
Non-hazardous waste materials sent for off-site recycling/reuse	76,878	64,558	75,090
Hazardous waste materials sent for off-site recycling/reuse/co-processing	8,962	7,447	10,342
Waste materials reused on site (steel abrasives)	2,107	2,092	2,558
Waste materials recycled/regenerated on site (sand, rejects, scrap, iron swarf)	536,157	452,319	576,147
Total	624,104	526,416	664,137

SOLID WASTE

Waste generated by composition (t) GRI 306-3

Category	2019	2020	2021
Waste materials reused on site (steel abrasives)*	2,107	2,092	2,558
Waste materials recycled/regenerated on site (sand, rejects, scrap, iron swarf)*	536,157	452,319	576,147
Waste materials sent for off-site recycling/reuse*	76,878	64,558	75,090
Waste materials sent for off-site recycling/reuse/co-processing	8,962	7,447	10,342
Waste materials sent to landfills*	816,545	452,189	692,156
Waste materials sent to landfills**	4,714	3,005	2,042
Waste materials kept in temporary storage on site*	0	30,000	13,000
Total	1,445,363	1,011,610	1,371,335
Total waste materials generated per metric ton of production equivalent	2.42	2.52	2.55

Note: the categories used reflect previously established controls based on the method of disposal and waste classification. Waste materials sent for treatment at effluent treatment plants were not included in the calculations as they are deemed to be effluents.

**Nonhazardous waste.*

***Hazardous waste.*

SOLID WASTE

Waste directed to disposal (t) GRI 306-5

Material	2019	2020	2021
Non-hazardous waste directed to disposal	816,545	452,189	692,156
Hazardous waste directed to disposal	4,714	3,005	2,041
Total	821,259	455,194	694,197

SOLID WASTE

Waste generated by composition (t) GRI 306-3

	2019			2020			2021		
	Within the organization	Outside the organization	Total	Within the organization	Outside the organization	Total	Within the organization	Outside the organization	Total
NONHAZARDOUS WASTE									
Preparation for reuse	2,107	0	2,107	2,092	0	2,092	2,558	0	2,558
Recycling	536,157	76,878	613,035	452,319	64,558	516,877	576,147	75,090	651,238
Total	**538,264**	**76,878**	**615,142**	**454,411**	**64,558**	**518,969**	**578,705**	**75,090**	**653,796**
HAZARDOUS WASTE									
Recycling	0	8,962	8,962	0	7,447	7,447	0	10,342	10,342
Total	**0**	**8,962**	**8,962**	**0**	**7,447**	**7,447**	**0**	**10,342**	**10,342**
Total waste diverted from disposal	**538,264**	**85,840**	**624,104**	**454,411**	**72,005**	**526,417**	**578,706**	**85,432**	**664,138**

Total waste directed to disposal by recovery operation (t) GRI 306-5

	2019			2020			2021		
	Within the organization	Outside the organization	Total	Within the organization	Outside the organization	Total	Within the organization	Outside the organization	Total
NONHAZARDOUS WASTE									
Landfilling	448,001	368,544	816,545	315,510	136,679	452,189	489,171	202,984	692,156
Total	**448,001**	**368,544**	**816,545**	**315,510**	**136,679**	**452,189**	**489,171**	**202,984**	**692,156**
HAZARDOUS WASTE									
Landfilling	0	4,714	4,714	0	3,005	3,005	0	2,042	2,042
Total	**0**	**4,714**	**4,714**	**0**	**3,005**	**3,005**	**0**	**2,042**	**2,042**
Grand total	**448,001**	**373,258**	**821,259**	**315,510**	**139,684**	**455,194**	**489,171**	**205,026**	**694,198**

Note: the data includes all waste materials sent for reuse, recovery or recycling. The recycling category includes waste materials recycled on site (regenerated). Data were compiled from the waste management system and waste transportation manifests.

**Nonhazardous waste.*

***Hazardous waste.*

EMISSIONS

Direct (scope 1) greenhouse gas (GHG) emissions[1] – (tCO_2 equivalent) GRI 305-1

	2019	2020	2021
Production of electricity, heat or steam	396,950	267,727	381,694
Physical-chemical processing	112,920	91,715	82,931
Transportation of materials, products, waste, employees and passengers	13,487	10,373	13,020
Fugitive emissions (refrigerant and fire extinguisher gases)	2,915	1,511	1,285
Total CO_2 emissions per total production equivalent	0.88	0.92	0.89
Total gross CO_2 emissions	526,272	371,326	478,930

1. The following gases have been included in the calculations: CO_2 (carbon dioxide); CH_4 (methane); N_2O (nitrous oxide); and HFCs (hydrofluorocarbons). Data in Brazil is for the Joinville operation only, and data in Mexico is for the Ramos and Saltillo operations. The plant in Mauá accounted for less than 1% percent of emissions and has therefore been excluded.

Other indirect (scope 3) GHG emissions[1] (tCO_2 equivalent) GRI 305-3

	2019	2020	2021
UPSTREAM			
Transportation and distribution (upstream)	23,610	17,794	13,048
Waste generated in operations	17,284	6,444	23,087
Business travel	498	254	647
Commuting	2,225	1,937	3,365
Subtotal	**43,617**	**26,429**	**40,147**
DOWNSTREAM			
Transportation and distribution (downstream)	82,302	47,887	66,887
Subtotal	82,302	47,887	66,887
Total other indirect (Scope 3) GHG emissions	**125,919**	**74,316**	**107,034**
BIOGENIC CO_2 EMISSIONS	**5,430**	**4,731**	**5,809**

Note: the lower emissions are explained primarily by a reduction in product and raw material transportation volumes.
1. The following gases have been included in the calculations: CO_2 (carbon dioxide); CH_4 (methane); and N_2O (nitrous oxide).

ENERGY

Energy consumption within the organization (GJ) GRI 302-1

Consumption of nonrenewable fuels

	2019	2020	2021
Coke	2,413,037	1,576,094	2,277,976
Electric power	1,756,652	1,324,543	1,734,434
Natural gas	1,497,438	1,168,486	1,537,144
LPG	26,192	19,601	25,497
Diesel	145,371	143,774	141,540
Total	5,838,690	4,232,498	5,716,591

Note: in our databases, energy data was recorded by source using the following units: coke (kg), natural gas (m³), LPG (kg), diesel (l), electricity (kWh). These units of measure were converted into GJ based on the Brazilian Energy Balance 2019.

TOPICS

Percentage of raw materials or recycled materials used in the production of products and services GRI 301-2

Material	2019	2020	2021
Metals (scrap, returns and briquettes)	99%	99%	97%
Sand	31%	49%	36%
Catalyst	44%	31%	28%
Coke	5%	13%	25%

WORKFORCE PROFILE

By age group GRI 102-8

	2019	2020	2021
< 30	4,515	3,995	5,013
30 - 50	8,315	8,078	8,963
> 50	1,441	1,401	1,500
Total	14,271	13,474	15,476

New hires GRI 401-1

	2019		2020		2021	
	no.	rate	no.	rate	no.	rate
By gender						
Men	4,236	0.32	1,756	0.14	7,183	0.50
Women	339	0.32	174	0.17	371	0.31
Total	4,575	0.32	1,930	0.14	7,554	0.49
By region						
Brazil	1,466	0.16	1,200	0.13	4,286	0.42
Mexico	3,109	0.60	730	0.17	3,267	0.63
United States	-	-	-	-	1	0.08
Europe	-	-	-	-	0	0
Total	4,575	0.32	1,930	0.14	7,554	0.49
By age group						
< 30	2,928	0.65	1,103	0.28	4,468	0.89
30 - 50	1,616	0.19	812	0.10	3,000	0.33
> 50	31	0.02	15	0.01	86	0.06
Total	4,575	0.32	1,930	0.14	7,554	0.49

Turnover[1,2] GRI 401-1

By gender	2019		2020		2021	
	no.	rate	no.	rate	no.	rate
Men	4,491	0.34	2,550	0.21	5,325	0.37
Women	298	0.28	184	0.18	249	0.21
Total	4,789	0.34	2,734	0.20	5,574	0.36

By region	2019		2020		2021	
	no.	rate	no.	rate	no.	rate
Brazil	1,488	0.16	1,157	0.13	3,195	0.31
Mexico	3,301	0.64	1,577	0.36	2,378	0.45
United States	-	-	-	-	1	0.08
Europe	-	-	-	-	0	-
Total	4,789	0.34	2,734	0.20	5,574	0.36

By age group	2019		2020		2021	
	no.	rate	no.	rate	no.	rate
< 30	2,953	0.65	1,442	0.36	3,020	0.60
30 - 50	1,687	0.20	1,168	0.14	2,338	0.26
> 50	149	0.10	124	0.09	216	0.14
Total	4,789	0.34	2,734	0.20	5,574	0.36

Note: In 2021 the Human Resources department identified a turnover pattern in which many employees began to seek job opportunities involving less exposure to COVID-19 (often returning to their home towns or migrating to smaller cities), or elected to telecommute in other cities, which was not possible in their roles with the company.

1. Terminations.

2. Calculation method: total terminations in the year divided by total headcount at year-end.

By employee category and gender[1] GRI 102-8

	2019		2020		2021	
	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
Executive Board	8	1	10	1	13	0
Middle Management	63	5	63	5	73	8
Head/coordinator	127	19	121	21	130	17
Technical/supervisor	270	6	258	5	259	6
Administrative	801	297	764	294	766	271
Operational	11,951	723	11,217	715	13,051	882
Total by gender	13,220	1,051	12,433	1,041	14,292	1,184
Grand total	**14,271**		**13,474**		**15,476**	

1. Trainees, interns, and apprentices who are classified as workers and not employees have not been included.

TRAINING AND DEVELOPMENT

Average hours of training per year per employee GRI 404-1

By gender	2019	2020	2021
Men	18.70	9.53	30.63
Women	16.23	8.67	18.67
Total	18.52	9.47	29.71

By employee category	2019	2020	2021
Middle Management	21.47	11.38	10.29
Head/coordinator	17.46	12.06	8.83
Technical/supervisor	13.63	11.29	20.34
Administrative	14.87	10.33	13.58
Operational	18.95	9.31	31.45
Total	18.52	9.47	29.71

1. The impacts from the COVID-19 pandemic on production operations, the initial limitations on on-site activities, and the required adaptations in practical training affected overall training hours. However, all training programs were maintained.

TRAINING AND DEVELOPMENT

Employees receiving regular performance and career development reviews, by employee category (%) GRI 404-3

	2019			2020			2021		
	men	women	total	men	women	total	men	women	total
Executive Board	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00	100.00
Middle Management	98.41	100.00	98.53	98.41	80.00	97.06	100.00	100.00	100.00
Head/coordinator	96.06	100.00	96.58	100.00	100.00	100.00	100.00	100.00	100.00
Technical/ supervisor	99.63	100.00	99.64	99.61	100.00	99.62	100.00	100.00	100.00
Administrative	99.64	100.00	99.46	89.53	97.96	91.87	100.00	100.00	100.00
Total	**98.98**	**100.00**	**99.19**	**93.26**	**97.85**	**94.23**	**100.00**	**100.00**	**100.00**

Note: the Company currently does not have a formal program of regular performance reviews for the operational category.

DIVERSITY

Diversity by employee category and age group (%) GRI 405-1

	2019			2020			2021		
	< 30	30 - 50	> 50	< 30	30 - 50	> 50	< 30	30 - 50	> 50
Executive Board	0	50.00	50.00	0	45.45	54.55	0	53.85	46.15
Middle Management	0	85.29	14.71	0	83.82	16.18	1.23	77.78	20.99
Head/coordinator	2.05	79.45	18.49	0.70	78.87	20.42	1.36	77.55	21.09
Technical/supervisor	7.25	81.16	11.59	6.49	80.92	12.6	10.19	79.62	10.19
Administrative	27.53	64.26	8.21	26.28	65.12	8.6	22.95	69.24	7.81
Operational	33.06	56.86	10.08	31.00	58.68	10.32	34.06	56.34	9.60
Trainees	100.00	0	0	0	0	0	91.67	8.33	0
Interns	97.62	2.38	0	96.67	3.33	0	100.00	0	0
Apprentices	100.00	0	0	100.00	0	0	100.00	0	0

People with Disabilities (PwDs) by employee category GRI 405-1

	2019		2020		2021	
	%	No.	%	No.	%	No.
Head/coordinator	0	0	0	0	0.68	1
Technical/supervisor	1.45	4	1.94	5	1.51	4
Administrative	0.91	10	1.05	8	0.87	9
Operational	1.11	141	1.17	131	0.96	134

GRI CONTENT INDEX GRI 102-55

GRI Standards	Disclosure	Page/URL/Information	Omission	SDG*
GENERAL DISCLOSURES				
GRI 101: Foundation 2016				
GRI 101 contains no disclosures				
ORGANIZATIONAL PROFILE				
GRI 102: General disclosures 2016	102-1 Name of the organization	7	-	-
	102-2 Activities, brands, products, and services	8	-	-
	102-3 Location of headquarters	7	-	-
	102-4 Location of operations	7, 9	-	-
	102-5 Ownership and legal form	13	-	-
	102-6 Markets served	7, 9	-	-
	102-7 Scale of the organization	35	-	-
	102-8 Information on employees and other workers	38, 39, 74	-	8, 10
	102-9 Supply chain	50	-	-
	102-10 Significant changes to the organization and its supply chain	7	-	-
	102-11 Precautionary principle or approach	20	-	-
	102-12 External initiatives	16	-	-
	102-13 Membership of associations	16	-	-

GRI Standards	Disclosure	Page/URL/Information	Omission	SDG*
STRATEGY				
GRI 102: General disclosures 2016	102-14 Statement from senior decision-maker	3	-	-
ETHICS AND INTEGRITY				
GRI 102: General disclosures 2016	102-16 Values, principles, standards, and norms of behavior	9, 18	-	16
GOVERNANCE				
GRI 102: General disclosures 2016	102-18 Governance structure	13	-	-
STAKEHOLDER ENGAGEMENT				
GRI 102: General disclosures 2016	102-40 List of stakeholder groups	23	-	-
	102-41 Collective bargaining agreements	38	-	8
	102-42 Identifying and selecting stakeholders	23	-	-
	102-43 Approach to stakeholder engagement	23, 37, 69	-	-
	102-44 Key topics and concerns raised	24, 37, 69	-	-

GRI Standards	Disclosure	Page/URL/Information	Omission	SDG*
REPORTING PRACTICES				
GRI 102: General disclosures 2016	102-45 Entities included in the consolidated financial statements	4	-	-
	102-46 Defining report content and topic Boundaries	4, 24	-	-
	102-47 List of material topics	23, 24	-	-
	102-48 Restatements of information	There were no significant restatements of information. Any restatements are clearly flagged.	-	-
	102-49 Changes in reporting	None.	-	-
	102-50 Reporting period	4	-	-
	102-51 Date of most recent report	2020	-	-
	102-52 Reporting cycle	Annual	-	-
	102-53 Contact point for questions regarding the report	4	-	-
	102-54 Claims of reporting in accordance with the GRI Standards	This report has been prepared in accordance with the GRI Standards—"Core" option	-	-
	102-55 GRI content index	77	-	-
	102-56 External assurance	This report has not been independently assured.	-	-

GRI Standards	Disclosure	Page/URL	Omission	SDG*
MATERIAL TOPICS				
ECONOMIC PERFORMANCE				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	20	-	-
	103-3 Evaluation of the management approach	20	-	-
GRI 201: Economic performance 2016	201-2 Financial implications and other risks and opportunities due to climate change	20	-	13
MARKET PRESENCE				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	41	-	-
	103-3 Evaluation of the management approach	41	-	-
GRI 202: Market presence 2016	202-1 Ratio of standard entry level wage by gender compared to local minimum wage	The figures used in the calculation were those for Joinville, our most representative site. There is no gender-based difference in entry-level wage. For interns and trainees, we conduct market research to ensure the program is competitive. Wages for apprentices are in accordance with applicable regulations (*read more in Compensation and benefits*).	-	1, 5, 8
INDIRECT ECONOMIC IMPACTS				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	51	-	-
	103-3 Evaluation of the management approach	51	-	-

GRI Standards	Disclosure	Page/URL	Omission	SDG*
GRI 203: Indirect economic impacts 2016	203-2 Significant indirect economic impacts	52	-	1, 3, 8
ANTI-CORRUPTION				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	18	-	-
	103-3 Evaluation of the management approach	18	-	-
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	Identified risks: violations of the Brazilian Anti-Corruption Act committed by employees, representatives or third parties; and undue advantages (gifts, entertainment, donations, sponsorship, partnerships, etc.). None of these risks are deemed significant at Tupy.	-	16
	205-3 Confirmed incidents of corruption and actions taken	In 2021 there were no reports of corrupt practices constituting offenses under the Anti-Corruption Act. In our 2020 Sustainability Report, we reported 18 incidents of corruption, fraud, undue payments, conflicts of interest, and noncompliance with company policies and procedures. This was reported based on the methodology being used at the time. However, none of these cases constituted a violation of Law no. 12 846/2013.	-	16
ANTI-COMPETITIVE BEHAVIOR				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	18	-	-
	103-3 Evaluation of the management approach	18	-	-

GRI Standards	Disclosure	Page/URL	Omission	SDG*
GRI 206: Anti-competitive behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	We identified no legal actions pending or completed during the reporting period regarding anti-competitive behavior and violations of anti-trust and monopoly legislation.	-	16
TAXES				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	15	-	-
	103-3 Evaluation of the management approach	15	-	-
GRI 207: Taxes 2020	207-1 Approach to tax	15	=	1, 10, 17
MATERIALS				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	59	-	-
	103-3 Evaluation of the management approach	59	-	-
GRI 301: Materials 2016	301-2 Recycled input materials used	59, 73	-	8, 12
ENERGY				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	62	-	-
	103-3 Evaluation of the management approach	62	-	-
GRI 302: Energy 2016	302-1 Energy consumption within the organization	62, 73	-	7, 8, 12, 13
	302-3 Energy intensity	62	-	7, 8, 12, 13
	302-5 Reductions in energy requirements of products and services	28	-	7, 8, 12, 13

GRI Standards	Disclosure	Page/URL	Omission	SDG*
WATER & EFFLUENTS				
	103-2 The management approach and its components	66	-	-
	103-3 Evaluation of the management approach	66	-	-
GRI 303: Water and effluents 2019	303-1 Interactions with water as a shared resource	66	-	6, 12
	303-5 Water consumption	66	-	6
EMISSIONS				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	64	-	-
	103-3 Evaluation of the management approach	64	-	-
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	64, 65, 72	-	3, 12, 13, 14, 15
	305-2 Energy indirect (Scope 2) GHG emissions	64, 65	-	3, 12, 13, 14, 15
	305-4 GHG emissions intensity	64, 65	-	13, 14, 15
	305-5 Reduction of GHG emissions	64, 65	-	13, 14, 15
	305-7 Nitrogen oxides (NO_X), sulfur oxides (SO_X), and other significant air emissions	63, 64	-	3, 12, 14, 15
WASTE				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	25	-	-
	103-2 The management approach and its components	58	-	-
	103-3 Evaluation of the management approach	58	-	-

GRI Standards	Disclosure	Page/URL	Omission	SDG*
GRI 306: Waste 2021	306-1 Waste generation and significant waste-related impacts	58	-	3, 6, 11, 12
	306-2 Management of significant waste-related impacts	58	-	3, 6, 11, 12
	306-3 Waste generated	70, 71	-	3, 6, 12, 14, 15
	306-4 Waste diverted from disposal	70	-	3, 11, 12
	306-5 Waste directed to disposal	58, 70, 71		3, 6, 11, 12, 14, 15
EMPLOYMENT				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	38	-	-
	103-3 Evaluation of the management approach	38	-	-
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	38, 39, 74	-	5, 8, 10
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Both full- and part-time and temporary employees are provided with benefits such as: life insurance, health insurance, disability and invalidity pension, parental leave, pension and benefit plans, stock option plans, and transportation.	-	3, 5, 8
LABOR/MANAGEMENT RELATIONS				
Occupational health and safety				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	44	-	-
	103-3 Evaluation of the management approach	44	-	-

GRI Standards	Disclosure	Page/URL	Omission	SDG*
GRI 403: Occupational health and safety 2019	403-1 Occupational health and safety management system	44	-	8
	403-2 Hazard identification, risk assessment, and incident investigation	44	-	3, 8
	403-3 Occupational health services	47	-	3, 8
	403-4 Worker participation, consultation, and communication on occupational health and safety	45, 57	-	8, 16
	403-5 Worker training on occupational health and safety	45	-	8
	403-6 Promotion of worker health	47	-	3
	403-9 Work-related injuries	48	-	3, 8, 16
	403-10 Work-related ill health	47	-	3, 8, 16
TRAINING AND EDUCATION				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	39	-	-
	103-3 Evaluation of the management approach	39	-	-
GRI 404: Training and education 2016	404-1 Average hours of training per year per employee	39, 41, 75	-	4, 5, 8, 10
	404-2 Programs for upgrading employee skills and transition assistance programs	40	-	8
	404-3 Percentage of employees receiving regular performance and career development reviews	75	-	5, 8, 10

GRI Standards	Disclosure	Page/URL	Omission	SDG*
DIVERSITY AND EQUAL OPPORTUNITY				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	42	-	-
	103-3 Evaluation of the management approach	42	-	-
GRI 405: Diversity and equal opportunity 2016	405-1 Diversity of governance bodies and employees	13, 42, 43, 76	-	5, 8
	405-2 Ratio of basic salary and remuneration of women to men	41	-	5, 8, 10
NON-DISCRIMINATION				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	18	-	-
	103-3 Evaluation of the management approach	18	-	-
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	Tupy recorded one incident of discrimination during the reporting period, which was duly investigated and referred to the Ethics Committee. The disciplinary action and instruction recommended by the Committee were then implemented. In 2020 there were eight incidents of discrimination. According to the Company, the reduction is likely the result of awareness initiatives in 2021.	-	5, 8

GRI Standards	Disclosure	Page/URL	Omission	SDG*
FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	50	-	-
	103-3 Evaluation of the management approach	50	-	-
GRI 407: Freedom of association and collective bargaining 2016	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	The right to freedom of association and collective bargaining, as required by Brazilian legislation, is guaranteed by 99.73% of suppliers.	-	8
CHILD LABOR				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	50	-	-
	103-3 Evaluation of the management approach	50	-	-
GRI 408: Child labor 2016	408-1 Operations and suppliers at significant risk for incidents of child labor	50	-	8, 16
FORCED OR COMPULSORY LABOR				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	50	-	-
	103-3 Evaluation of the management approach	50	-	-
GRI 409: Forced or compulsory labor 2016	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	50	-	8

GRI Standards	Disclosure	Page/URL	Omission	SDG*
LOCAL COMMUNITIES				
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its Boundary	24	-	-
	103-2 The management approach and its components	In 2021, our operations in Brazil (Joinville and Mauá) and Mexico (Saltillo and Ramos Arizpe) underwent assessments and continuous monitoring for environmental impacts. The results from these assessments were publicly disclosed. Most of our operations (75%) have development programs based on local community needs, as well as formal grievance mechanisms.	-	-
	103-3 Evaluation of the management approach		-	-
GRI 413: Local communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	The primary significant actual or potential negative impact from our operations is changes in air quality (particulate emissions). In 2021, Tupy received six complaints from communities in Joinville regarding air emissions, a reduction of 60% from the previous year and 25% from 2019. In Mexico, we received three complaints at the Ramos Arizpe operation regarding particulate emissions.	-	-
	413-2 Operations with significant actual or potential negative impacts on local communities		-	1, 2

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