



Sustainability Report

Highlights of the Company's performance
and challenges in 2022 towards KSDGs

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ESG highlights



Klabin in numbers

23 PLANTS,

22

in Brazil and one in Argentina.

MORE THAN

25,000

direct and indirect employees.

2.6

million tons of annual paper production capacity, which will reach 3.1 million when MP28 comes online, scheduled for the second quarter of 2023.

1.6

million tons of market pulp production capacity per year.

719,000

hectares of total area, 42% of which are conservation areas and 356,000 hectares of productive areas*

90

trees planted per minute.

*The production areas are made up of areas planted with pine or eucalyptus forests and also those that are being harvested, transported and planted.

Financial highlights in 2022

- BRL 7.8 billion in Adjusted EBITDA, excluding non-recurring effects, up 13% from 2021.

- 19.2% ROIC, signaling consistent performance across multiple quarters and assertive capital allocation.

- Net revenue reached BRL 20.033 billion, a 22% increase from 2021, with growth across business segments: pulp, paper, and packaging.

- 30% of its debts linked to sustainability performance, integrating its financial strategy with the 2030 Agenda and the Company's growth.

Recognition

The long-standing commitment to a management approach that focuses on sustainable development, good governance practices, and transparency has earned Klabin a place on international lists and rankings that set it apart in the market.



<p>FOR THE</p> <p>3rd</p> <p>consecutive year entered on the Dow Jones Sustainability Index.</p>	<p>FOR THE</p> <p>10th</p> <p>consecutive year, Klabin is part of the B3's Corporate Sustainability Index (ISE) portfolio.</p>	<p>FOR THE</p> <p>3th</p> <p>year in a row, Klabin has been included in the CDP Brazil Climate Resilience Index (ICDPR70) with an A rating.</p>	<p>UNIQUE IN LATIN AMERICA IN THE TOP</p> <p>1%</p> <p>of The Sustainability Yearbook, by S&P Global.</p>
<p>KLABIN CAME OUT ON TOP IN THE</p> <p>Golden Tombstone Award, in the "Debt" category, with the Sustainability-Linked Bond (SLB).</p>		<p>RECOGNIZED WITH</p> <p>Expressão de Ecologia Award in the "Water Conservation" category.</p>	

Climate changes and emissions management

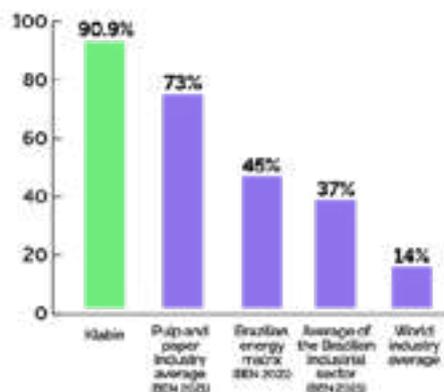
As a TCFD Supporter, Klabin publicly backs the recommendations of the Financial Stability Board (FSB) on the management of climate risks and opportunities and, in 2022, the Company began to meet 100% of the initiative's recommendations.

Investments in low-carbon technologies have contributed to a 68% reduction in specific CO₂ equivalent emissions per ton of product generated since 2003.

In 2022, the Company recorded a 1.3% reduction in scope 1 emissions compared to 2021, mainly due to the decrease in fuel oil consumption in the lime kilns at the Puma (PR) and Correia Pinto (SC) units, with the start-up of the biomass gasification plant at the Puma II Project and the use of bio-oil in the lime kilns of Correia Pinto.

Use of energy

% of Renewable energy matrix

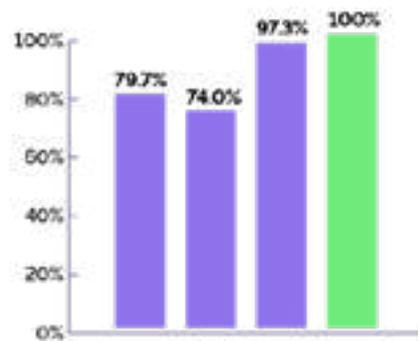




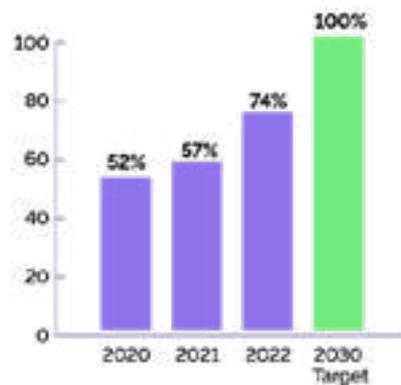
Use of water

All of Klabin's own forestry operation in Paraná and Santa Catarina use the hydrosolidarity management, a strategy based on achieving a balance between forest production and water production. Thus, it is able to integrate the various needs of the input for production, neighboring communities, and ecological processes. The Company is currently working to ensure that, by 2024, its forests located in São Paulo will also operate under this strategy.

Percentage of forest harvesting operations under own management with hydrosolidarity management



Percentage of locations that work with initiatives to increase water security



Waste management

Waste management is a priority item on Klabin's sustainability agenda. The Company's 2030 target is to zero the disposal of industrial waste to landfills. By leveraging intelligent use of natural resources, Klabin employs technology to enhance circularity in processes, thereby creating value across the entire supply chain.



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98.5%

was the rate of waste reuse achieved by the Puma Unit in 2022, a result driven by the performance of the Waste Processing Center, which had been in operation since the start.

99.8%

was the rate of waste reuse achieved by the Puma Unit in 2022, a result driven by the performance of the Waste Processing Center, which had been in operation since the start.

Biodiversity monitoring

- 855 fauna species identified. Of this total, 708 have conservation status recognized by the IUCN.

- Of these, 29 are endangered species.

- 1,968 plant species identified. Of this total, 526 have conservation status recognized by the IUCN.

- Of these, 39 are endangered species.

Commitment to local development

Klabin has an economic, social, and environmental agenda with the communities where it operates, which includes projects for education and job training, family farming, regional solid waste management, and a program to support public management planning.

ACEITAÇÃO

Average approval rating of 83.6% in the municipalities where Klabin operates. The 2030 Agenda (KSDG) target is 80% in four out of the six territories surveyed.

EDUCAÇÃO E CAPACITAÇÃO

By 2022, 106 students have graduated from the Ortigueira Forestry and Agricultural Technical School, Klabin's project in partnership with the State Government of Paraná. Among the graduates, 41.5% have already been hired by Klabin.



People management

At the end of 2022, Klabin's workforce was made up of 18,482 professionals. The majority of employees are between the ages of 30 and 50, followed by those under 30.

DIVERSITY

Klabin has been steadily increasing the representation of women in its workforce since 2019, when 15% of the total were female professionals. In 2022, women accounted for 24% of the total.

CLIMATE SURVEY

With 87% favorability in the Climate Survey conducted in 2022, Klabin was among the top 25% of companies in the Korn Ferry consulting firm's ranking.

Corporate Governance

Klabin is listed on B3's Level 2 of Corporate Governance, is signatory to the Abrasca Code of Self-Regulation and Good Practices for Listed Companies since 2011, and is on the world list of the Dow Jones Sustainability Index for the third consecutive year.

- Units: a share package consisting of 1 common share and 4 preferred shares provides greater liquidity.

- Equal economic rights: Tag Along of 100% of the share amount paid to the controlling shareholder, in the case of sale of the company, and equal dividends for common and preferred shares.



Message from the Chief Executive Officer



The year 2022 was yet another period of growth for Klabin, despite the uncertainties that required caution and vigilance in both foreign and domestic contexts. Our integrated and flexible business model, coupled with our diversified product portfolio, has enabled us to sustain the Company's expansion process. Klabin's growth strategy is founded on pillars that are linked to sustainable development, competitiveness, and value creation: a high-yield forestry asset, outstanding operational efficiency of its mills, and continuous development of technologies, solutions, and products that support the Company's ability to generate lasting results.

Financial highlights include the 13th consecutive year of growth in Adjusted EBITDA, which, along with a disciplined allocation of capital, has benefited cash generation in the period and, consequently, the creation of value for shareholders. This is evidenced by the return on capital employed, measured by ROIC (Return on Invested Capital), of 19.2% in 2022, demonstrating Klabin's ability to balance growth and value creation in a variety of circumstances.

Milestones such as the operation of Paper Machine 27 (MP27) at the Puma II Project, which has seen an impressive learning curve in the year since it came online, and the investment in MP28 for the production of white paperboard made from virgin fibers, help Klabin pave the way for other innovative initiatives and create opportunities for the Company, focused on sustainable products.

We continue to make strides in offering innovative solutions with products from renewable sources that are recyclable and biodegradable. EkoFlex, Klabin's first paper designed for flexible packaging, is one of these initiatives, as is PineFluff eXcel, a fluff pulp made from a blend of hardwood and softwood.

In addition to the projects that will increase our production capacity for corrugated board packaging – the expansion of the Horizonte Unit (CE), with the first phase completed in early 2023, and the Figueira Project in Piracicaba (SP), scheduled for 2024 – we opened a terminal at the Port of Paranaguá (PR). The new structure enables us to operate more productively and efficiently, by connecting the railway to the port area, and contribute to the reduction of impacts on the environment and the reduction of CO₂ emissions.

We have a consistent strategy for decarbonization, which has been steadily evolving, as well as the incorporation of renewable sources into the Company's energy matrix: 90.9% against the target of 92% by 2030. The Brazilian energy matrix is composed of 45% renewable sources, and the pulp and paper industry has an average of 70%.

The Company's long-standing commitment to sustainable development is reflected in public initiatives it subscribes to, such as the Brazil Network of the UN Global Compact, which it has been a part of since 2003, and the National Pact for the Eradication of Slave Labor, since 2013. This positions Klabin on international lists that set it apart from the competition in the market. In 2022, we once again achieved significant recognition: for the second year in a row, we were part of the Triple A-List, the highest score given by CDP in the programs: Climate Change, Water and Forests. For the third year in a row, we have been included in the prestigious Dow Jones Sustainability Index portfolio in the global category, and for the tenth consecutive year, we have been featured in B3's Corporate Sustainability Index (ISE).

The objectives of our 2030 Agenda for Sustainable Development, the KSDGs, are represented mainly in the initiatives mentioned here, with progress towards the targets set for 2030. The acceptance rate of communities and transparency in their relationship with public management are also fronts whose evolutions are the result of this impacts management. We still have big challenges in other pillars and we continue to do intense work to improve our indicators.



The diversity aspects, for instance, have mobilized the Company to pursue an increasingly inclusive work environment. Regarding to gender, one of the five pillars of diversity considered by Klabin, we advanced by more than two percentage points in the number of women in leadership roles and by three percentage points in the total number of employees. These are concrete results of our efforts not only to have more female employees in leadership, but also in the entire workforce, to sustain Klabin's growth without losing sight of the commitment to diversity. And this is a journey that is sponsored by senior leadership: All of Klabin's directors have tied their compensation to targets related to diversity and other sustainability aspects in 2022.

We know that the foreign and domestic economic contexts continue to demand close attention. Therefore, we are faced with the budgetary challenge of optimizing cost management and focusing on efficiency gains in 2023.

Once again, I thank the Board of Directors, our employees, the investors the customers, the suppliers, the communities, and all those who are part of our business environment for the trust deposited in our work, which allows us to continue firmly on our path of growth, sustainable development, and value creation for society as a whole.

Cristiano Teixeira

Klabin's Chief Executive Officer



KLABIN

KSDGS

CORPORATE
GOVERNANCE

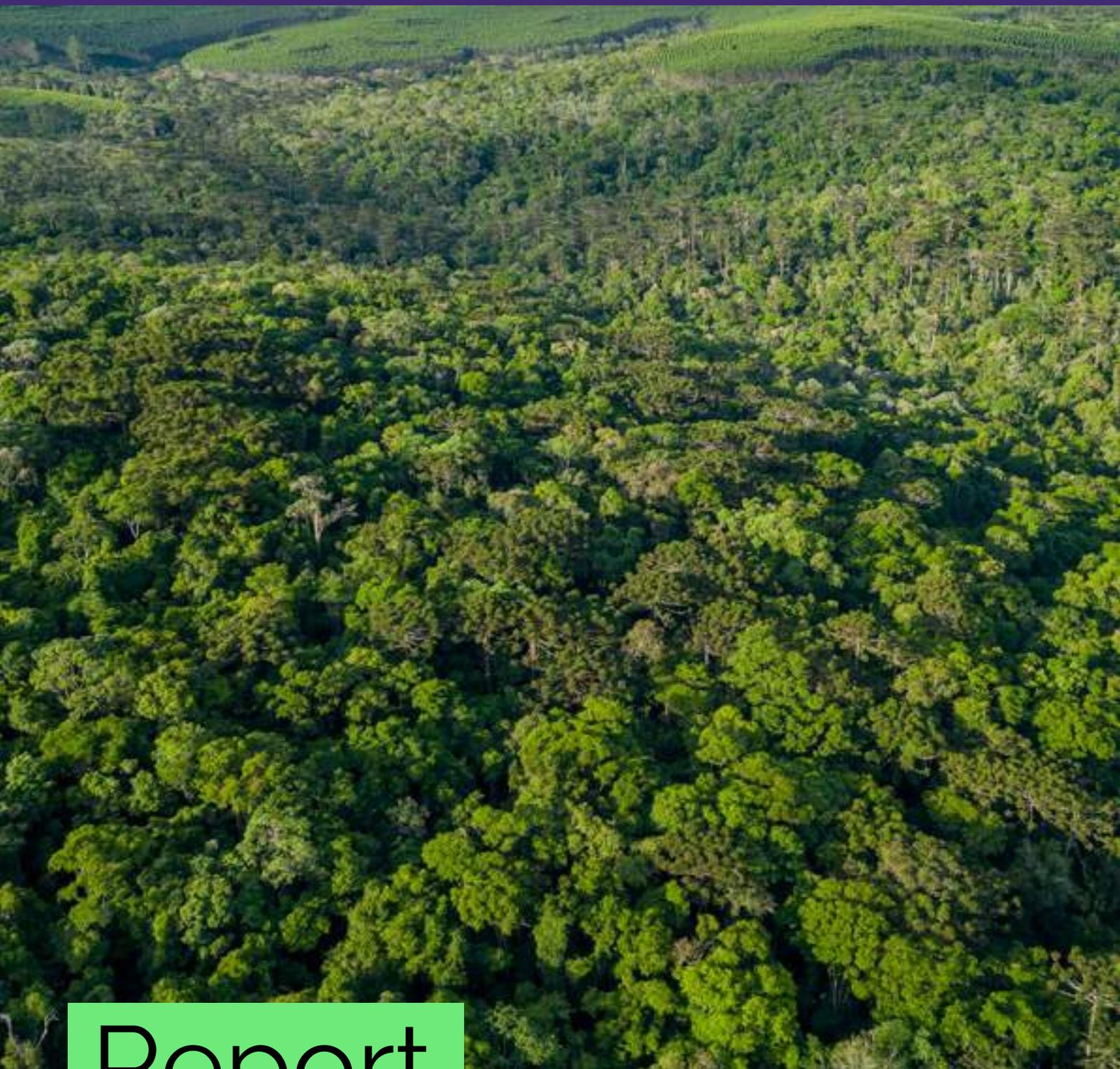
RENEWABLE
FUTURE

SUSTAINABLE
ECONOMY

PROSPERITY FOR
PEOPLE

R&D AND
INNOVATION

ESG
HIGHLIGHTS



Report



What this Report provides

In its 24th Sustainability Report, Klabin highlights its performance and challenges in 2022, aiming to promote the Company's growth and fulfill the Klabin Sustainable Development Goals (KSDG) agenda.

<p>REPORTING PERIOD</p> <p>January 1 to December 31, 2022, with relevant information from early 2023, where relevant.</p>	<p>WHAT GUIDED THE CONTENT</p> <p>material topics for Klabin and its stakeholders and ESG practices that are part of the Klabin Sustainable Development Goals (KSDGs).</p>	<p>INDICATORS</p> <p>linked to the management of these material topics are concentrated in the ESG Dashboard, which also contains data from the historical series and the Company's current position in relation to the targets set for the coming years.</p>	<p>REFERENCES</p> <p>GRI Standards 2021, Klabin Sustainable Development Goals (KSDGs), UN Sustainable Development Goals (SDGs), Principles of the Global Compact.</p>
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Learn more about the material topics:

[ESG DASHBOARD →](#)

How the content is organized

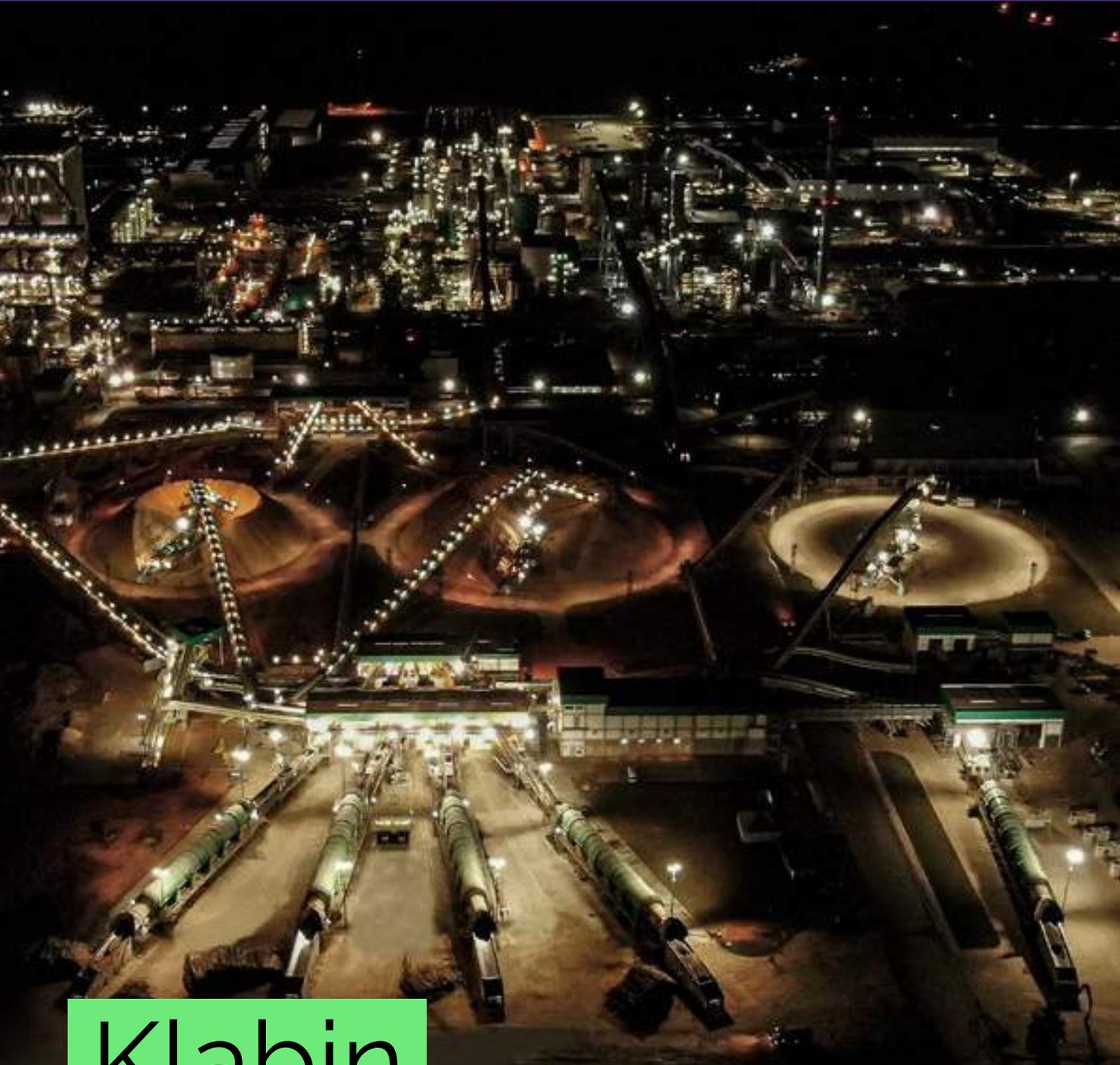
<p>Klabin</p> <ul style="list-style-type: none"> • Overview of Klabin and the essential information to comprehend the context in which the Company operates, • Klabin's production and logistics structure, 	<p>KSDGs</p> <ul style="list-style-type: none"> • Overview of the Klabin Sustainable Development Goals, their relationship with the company's materiality and performance in relation to the established targets,
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Material topics

<p> Corporate governance</p> <ul style="list-style-type: none"> • Aspects, practices and challenges of corporate governance • Ethical conduct and integrity • Risk management • Information security 	<p> Renewable future</p> <ul style="list-style-type: none"> • Climate change • Emissions management • Water use • Waste management 	<p> Sustainable economy</p> <ul style="list-style-type: none"> • 2022 results • Investments • Social and environmental performance of suppliers • Biodiversity
<p> Prosperity for people</p> <ul style="list-style-type: none"> • Local development • Social investment • Employee management and engagement • Diversity • Human capital development • Occupational health and safety 	<p> Technology and innovation</p> <ul style="list-style-type: none"> • Research, development and innovation • Forest development • Multiple uses of wood • Innovation management 	

To clarify doubts or for additional information about Klabin, access:

[CONTACT US. →](#)



Klabin



Sustainable performance for a renewable future

The best path to a renewable future is sustainable operations in the present. This is an agenda with which Klabin, with 124 years of operations, has an intrinsic and historical relationship and which permeates its strategy of full and continuous growth, its focus on efficiency, its constant investments in technology, research, and innovation to pursue the sustainability of its business with consistent, long-term results.

Klabin recognizes that making progress in this direction requires not only its own efforts, but joint construction of shared value, good practices, collaborative discussions, and the implementation of a unified, worldwide agenda to tackle challenges such as the United Nations' Sustainable Development Goals (SDGs).

The Company's forestry and industrial activities adhere to practices that promote the conservation of biodiversity and the maintenance of ecological balance in the regions where it operates. The care extends in the relationship with customers, shareholders, employees, suppliers and partners, and also in the dialogue with the communities, and with society as a whole.

Klabin constantly seeking solutions that drive economic development through new ways of interacting with the planet and its resources.

Company profile

With 22 industrial units spanning all five regions of Brazil and one in Argentina, Klabin's operations range from the production and sale of wood and pulp to the manufacture of paper and packaging for a wide variety of market segments. It is nationally and internationally renowned for its long-standing commitment to sustainable development, combating climate change, and promoting a more circular economy.



Products

 [Wood](#)

 [Softwood pulp](#)

 [Hardwood pulp](#)

 [Fluff pulp](#)

 [Kraftliner paper](#)

 [Card paper](#)

 [Recycled](#)

 [Corrugated board](#)

 [Industrial bags](#)

Operations



FORESTRY BUSINESS

The wood used in the pulp and paper production process comes from forests cultivated with socially and ecologically appropriate management, and 100% of the forest areas are certified by the FSC. In the supply of wood to the mills, 82% of certified wood was used (51% of certified own wood and 31% of certified third-party wood) and 18% of third-party controlled wood, following the certification regulations. In Paraná, 100% of our forest areas are also certified by the PEFC (Programme for the Endorsement of Forest Certification) and the Company is in the process of extending this Program to other forest areas. In addition to fulfilling its needs, Klabin supplies wood logs to the furniture and construction industries.

Its signature approach to forest cultivation is mosaic planting, which combines both planted and native forests. The technique helps protect natural resources, improves the forests' production potential and collaborates with biodiversity conservation. There are 719,000 hectares of total forest area, 42% of which are conservation areas. Learn more at [challenges of forest planning](#).



PULP BUSINESS

Klabin is the only Brazilian company to produce and supply the market with three types of pulp – hardwood (from eucalyptus), softwood (extracted from pine) and fluff (specially produced from pine softwood) – in a single industrial unit, designed especially for this purpose.



PAPER BUSINESS

Klabin is the largest manufacturer and exporter of packaging paper and paper packaging in Brazil. Produced with its own hard and softwood pulp, the paper and board meet global standards of quality and sustainability.

In 2022, the Company continued the expansion of the industrial park in Ortigueira (PR) with the construction of the MP28 paperboard machine, expected to start operating in the second quarter of 2023. The company's annual paper production capacity, which is currently 2.6 million tons, will increase to 3.1 million tons upon completion of the works and the machine's ramp-up.



PACKAGING BUSINESS

As the leader in the packaging segment in Brazil, Klabin is able to provide solutions for all types of businesses, including e-commerce. Its proposal is to offer customers functional, lightweight, economical, and biodegradable products from renewable sources. The Packaging Business is also responsible for the production of recycled paper, with a processing capacity of more than 450,000 tons a year, which makes Klabin the largest paper recycler in Brazil.



Recognition

International lists and rankings

The long-standing commitment to a management approach that focuses on sustainable development, good governance practices, and transparency has earned Klabin a place on international lists and rankings that set it apart in the market.



Presence in the Dow Jones Index

Klabin is the only Brazilian pulp and paper industry present in the Global and Emerging Markets portfolios of the Dow Jones Sustainability Index (DJSI). It is one of the world's foremost references for best sustainability practices for companies listed on stock exchanges.



B3'S ISE

For the tenth consecutive year, Klabin is part of the B3's Corporate Sustainability Index (ISE) portfolio, which highlights the companies with a high degree of commitment to the sustainability of business and the country.



CLIMATE CHANGE

For the third year in a row, Klabin has been included in the CDP Brazil Climate Resilience Index (ICDPR70) with an A rating, which attests to the success of its operational and management practices in helping to reduce the effects of climate change.



LEADERS GROUP

For the second time, Klabin joined the Business Leaders Group at the 27th United Nations Climate Change Conference (COP27) in Sharm El-Sheikh, Egypt. The leadership group is responsible for spreading the low carbon economy in the private sector.



2X TRIPLE A IN THE CDP

The Company earned a Triple A rating for the second consecutive year from CDP (Disclosure Insight Action) in three programs: Climate Change, Water and Forests.



SUSTAINABLE COMPANY

Klabin was the only Latin American company to be featured in the top 1% of The Sustainability Yearbook, organized by S&P Global, in 2022. Only 67 companies among the 708 in the ranking occupy this position. This is the third time the Company has been included on the list, and the first time with this distinction.



FEATURED IN THE EXAME GUIDE

Recognized as one of the outstanding companies in the Pulp and Paper segment in the Exame Best of ESG 2022 Guide. The placement came based on the plans, goals, and actions implemented to practice conscious capitalism and strengthen the circular economy in Brazil.



BENCHMARK IN AGRIBUSINESS

Klabin obtained the second best placed among the companies in the Reforestation, Pulp and Paper category in the Best of Agribusiness Award, from Globo Rural magazine. A benchmark in the sector, the award is based on Serasa Experian's methodology, which evaluates both financial results and environmental indicators.



TRANSPARENT COMPANY

One of the top companies of the 26th edition of the Transparency Trophy. The ten Financial Statements with the highest quality of information in each category were evaluated. Klabin was ranked in "Companies with net revenues of BRL 5 billion to BRL 20 billion".



Awards

Amcham Eco award

Klabin was one of the winners with the Eukaliner® case. In the 2022 edition, 86 companies registered 108 projects in the Sustainability in Processes and Sustainability in Products and Services categories. Annually, the award selects projects from companies of all sizes that feature sustainability attributes in their strategies.

Golden Tombstone award

Klabin came out on top in the "Debt" category with the Sustainability-Linked Bond (SLB), considered an innovator in financial sustainability. The award publicizes fundraising operations that stand out for their relevance and innovation. The achievement represents the Company's commitment to sustainability and value generation.

ABTCP highlights of the sector award

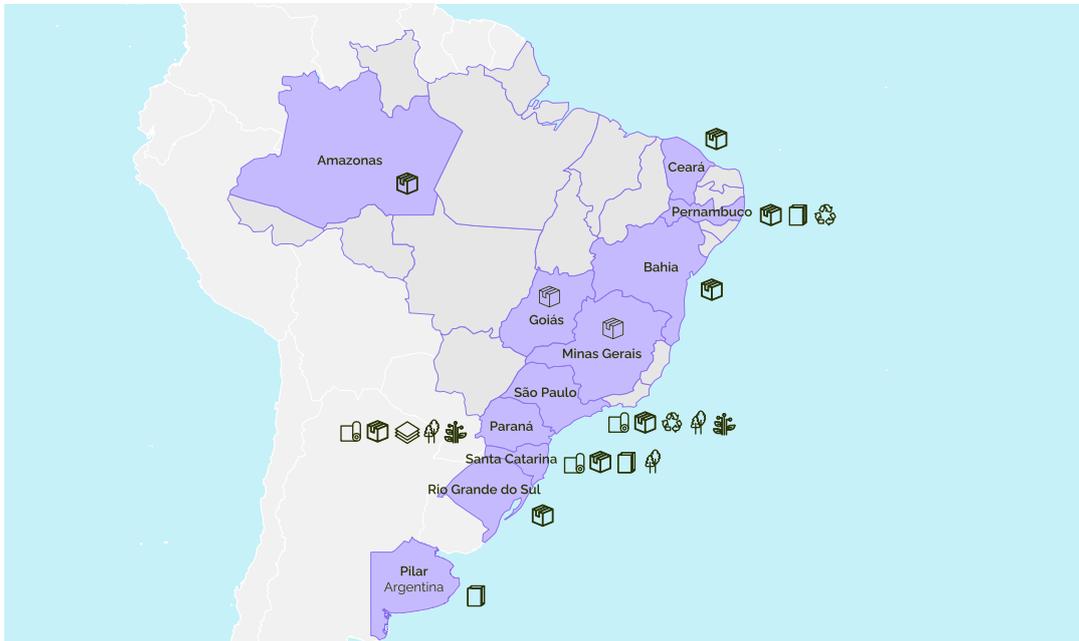
Klabin was chosen in three categories of the award, targeting manufacturers and suppliers in the Brazilian pulp and paper industry. They include: Manufacturer of Packaging Paper, with the product EkoMix; Forest Development, with the Forest Control Tower project; and Social Responsibility, with the Plante com a Klabin program.

Ecology Expression award

Recognized in the "Water Conservation" category for the initiative of producing, conserving, and monitoring water in forest mosaic management. The project maintains experimental micro-watersheds, located in areas of reforestation (pine/eucalyptus) and native forest, generating information about the hydrological functioning of sustainable management of forest plantations.



Location



Hardwood, softwood and fluff pulp

PR Ortigueira



Packaging paper

SP Angatuba
PR Monte Alegre
Ortigueira
SC Correia Pinto
Otaçilio Costa



Recycled paper

PE Goiana
SP Franco da Rocha
Paulínia
Piracicaba



Corrugated board packaging

AM Manaus
PE Goiana
BA Feira de Santana
MG Betim
SP Jundiá
Paulínia
Piracicaba
Suzano
PR Rio Negro
SC Itajaí
RS São Leopoldo
CE Horizonte
GO Rio Verde



Sack kraft packaging

PE Goiana
SC Lages
ARG Pilar



Forestry area

Paraná
Santa Catarina
São Paulo



Technology Center

PR Klabin's Technology Center
SP Packaging Technology Center

Klabin in the world



Argentina
Unit and office



Austria
Office



United States
Office



Responsible development of the forestry base

The start of operations of MP27 in 2021 and the expected debut of MP28 in the second quarter of 2023 resulted in increased demand for wood. In this sense, Klabin's Forestry Unit has reviewed its processes to strengthen its integration of Florestal with the plants, has invested in new technologies and is constantly exploring potential avenues for expansion.

The result of this effort is a significant yet controlled growth of the forest production base, which now encompasses 356,000 hectares of land – more than 100,000 hectares that Klabin had in 2015 prior to the completion of the Puma and investments in the Puma II Project.

Learn more about Klabin's forestry certifications:

[ESG PANEL →](#)

Forest road maintenance

Also in relation to forestry operations, Klabin prepares the roads that will be used in its harvesting processes and in the transportation of wood and replanting. As part of the road preparation, the company mines materials, such as gravel or rock, which are used to coat and maintain the beds of these roads. In addition to facilitating the transportation of inputs for the Company's operations, the upkeep of the roads provides benefits to the local communities as well, making the structures safer.

In 2022, the company used 863,318 m³ of ore to maintain, gravel and level 1,300 kilometers of roads used by Klabin's forestry operations, and donated 2,165 m³ of gravel for municipalities to use on roads in the regions of the cities they are responsible for. The source of the extraction operation is 61.8% owned and 38.2% from third parties.

Forestry Numbers

719,000

hectares of total area.

356,000

hectares of productive areas*.

42%

conservation area.

90

trees planted per minute.

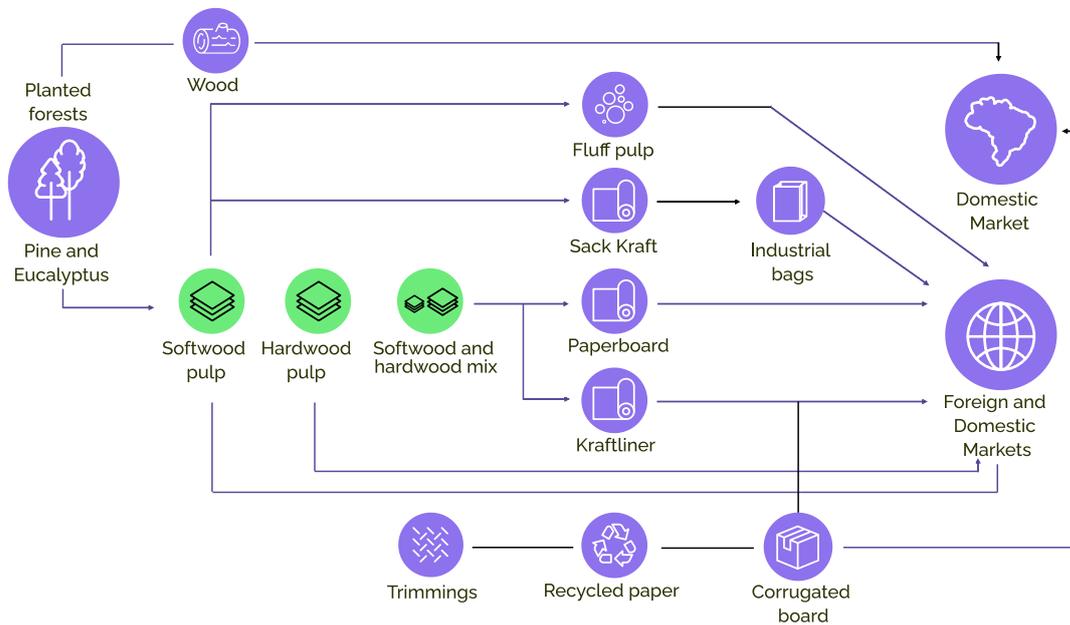
*The production areas are made up of areas planted with pine or eucalyptus forests and also those that are being harvested, transported and planted.



Production destinations

Klabin's products are mainly focused on industries in the segments of processed, frozen, and fresh foods (milk, refrigerated meats, and produce, among others), health and personal hygiene (toilet paper, tissues, diapers, and toothpaste, among others), hygiene and cleaning products (laundry soap and bath soap, for example), beverages (soft drinks, beer, and yogurt, etc.), civil construction, and electronics. In addition to serving the Brazilian market, where it leads the segments in which it operates, the Company exports to 80 countries.

From the forest to the market



Export destinations





A new level in logistics

Puma II expansion project has posed a challenge to Klabin's logistics: accommodate the volume of a new product on the market, Eukaliner®; prepare for the arrival of an additional machine (MP28, whose operation will begin in the second quarter of 2023); while simultaneously increasing the efficiency of processes, offering a higher level of service to customers.

The solution found was to focus efforts on two important investments: Klabin's Container Terminal (KBT) and the Paranaguá Port Terminal (PAR01).

World's largest dedicated container operation

The Container Terminal is responsible for consolidating the outflow of pulp and paper produced at the Puma and Monte Alegre units to the Port of Paranaguá, expediting the export process in containers.

The structure, which has been operational since the end of 2021, coinciding with the launch of MP27, is the result of an investment of BRL 300 million. Its operation is made possible through Klabin's partnership with the Paranaguá Container Terminal (TCP) and Brado Logística. It is a multimodal terminal, despite its focus on railroads, equipped with cutting-edge technologies such as the four electric gantries (lifting machines), whose automation system regulates the operator's maneuvers, providing greater safety for employees.

The KBT in numbers



Multimodal terminal, equipped with cutting-edge technologies. Photo: Farol Drones.



211,000

square meters of area (equivalent to 25 football fields).

16,000

containers were moved in the first year of operation*.

40%

increase in cargo transport by rail in Paraná.

STORAGE CAPACITY OF

2,500

containers and 125,000 tons of pulp and paper.

3 INTERNAL RAILWAY LINES,

3.5 km

long.

REDUCTION IN

GHG

resulting from the replacement of trucks by trains*.

*Data from September 2021 to September 2022.

Key to boosting exports

The Paranaguá Port Terminal (PR) began operations in December 2022 as a pivotal component of Klabin's export logistics. Fully connected to the Ortigueira unit by rail, the terminal facilitates the unloading of cargo in Paranaguá with greater agility. Previously, Klabin's products were first taken to KM5, an external warehouse located 5 kilometers from the port, and then transported by truck to the ship. Now, with the warehouse in the primary zone, the cargo is stored within the port, close to the ship's side.

Paranaguá in numbers

25

years of bid validity (counting from 2019), with the possibility of expansion for another 45 years.

CAPACITY TO LOAD

14,000

tons in 24 hours.

FORECAST OF

1

million tons of pulp and paper handled per year at the Paranaguá Port Terminal.

UP TO

1,200

trips by truck avoided on loading days by breakbulk (loose cargo) as a result of the direct connection of the Ortigueira railway line to the new terminal.

10%

reduction in operating costs.

170

employees responsible for the terminal's operation.



The logistics network

To implement efficient integration between the plants and terminals, Klabin invested in the construction of a railway trench between the cities of Telêmaco Borba and Ortigueira (PR) and an additional 10 kilometers of railroad tracks to enable direct connection between KBT and the port of Paranaguá. In addition to the works of the railway and the terminal, in order to improve the safety of port workers and following a participatory consultation process with the stakeholders, a pedestrian walkway was constructed on the port avenue of Paranaguá (PR).

A closer look at

KBT

Klabin's Container Terminal, located next to the Puma Unit in Ortigueira. It centralizes the export volumes from the Puma and Monte Alegre units, which are transported to the Port of Paranaguá.

TCP

Paranaguá Container Terminal, located in the Port of Paranaguá, managed by the company TCP.

PAR-01

Klabin's Port Terminal, located on the commercial pier of the Port of Paranaguá. It allows the unloading of pulp and paper from the Puma and Monte Alegre units to be done within the Port of Paranaguá and for the shipment to be made by breakbulk (loose cargo).



KSDGS

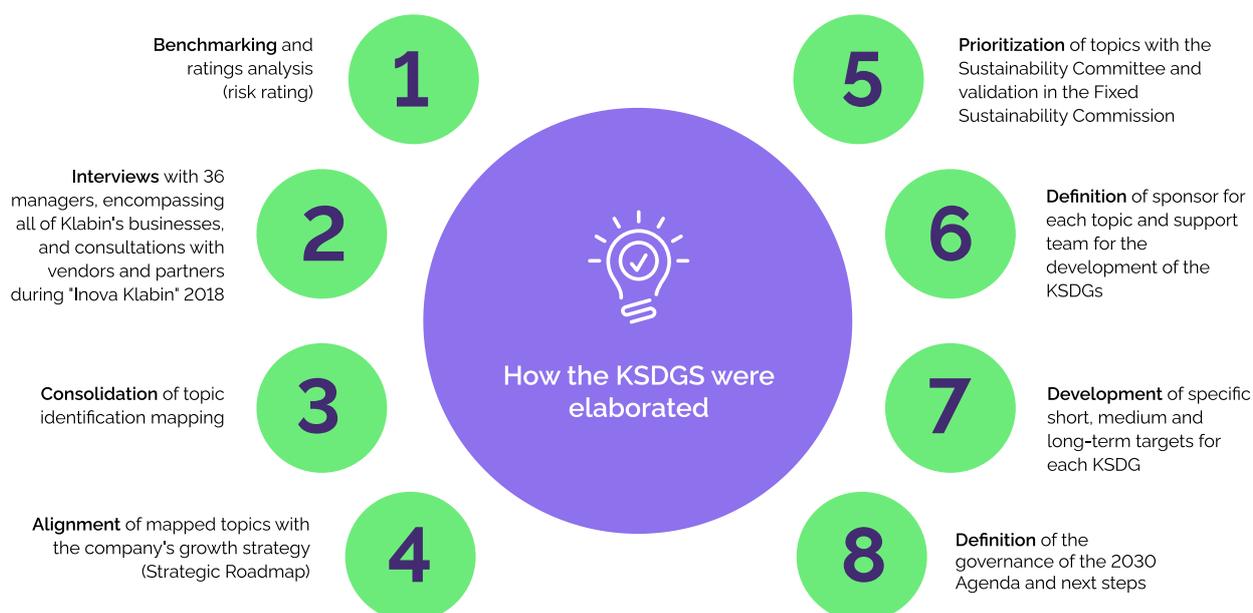
Materiality and commitment

The Klabin 2030 Agenda is inspired by the Klabin Sustainable Development Goals, the KSDGs. They comprise a set of short-term (2021), medium-term (2025) and long-term (2030) targets, which address the environmental, social and governance priorities of the Company and the stakeholders that impact and/or are impacted by its business. The materiality process (infographic below) was conducted in 2019, with subsequent review and analysis for each identified requirement.

This Agenda, in line with the United Nations' Sustainable Development Goals, outlines the essential ESG (Environmental, Social and Governance) aspects for the company and the global needs of society and the planet.

As of 2022, all of Klabin executives' individual targets now encompass a Sustainability Index. The index is a set of KSDG-related targets, chosen at the start of each year, based on the most pressing challenges for advancement during the period. The practice is compulsory for the Company's directors and managers and includes environmental, safety, diversity, and community relations indicators.

Materiality process





Pillars of the Klabin 2030 Agenda and the 23 material topics

PILLARS	MATERIAL TOPICS
Building a renewable future	<ul style="list-style-type: none"> - Wood availability - Increased forest productivity - Energy use - Water use - Waste management - Climate change
Helping build a sustainable economy	<ul style="list-style-type: none"> - Production and logistics - Forest certification - Ethical conduct and integrity - Risk management - Local development - Impact on communities - Supplier social and environmental performance - Customers and products - Biodiversity
Prosperity for people	<ul style="list-style-type: none"> - Human capital development - Management and engagement of professionals - Klabin's culture - Diversity - Occupational health and safety
Technology and innovation	<ul style="list-style-type: none"> - Multiple uses of wood - Innovation management - Information security



Evolution of the Klabin 2030 Agenda



Para saber mais sobre como a Klabin gerencia cada tema, quais são as iniciativas relacionadas aos indicadores e os desafios da Companhia, consulte:

[PAINEL ASG →](#)

To learn more about how Klabin manages each topic, which initiatives are related to the indicators and the Company's challenges, see:

[ESG PANEL →](#)



Corporate governance



Corporate governance practices

The advances made in corporate governance in recent years have placed Klabin in a prominent position on agendas, indexes and public commitments. The Company is listed on B3's Level 2 of Corporate Governance, is signatory to the Abrasca Code of Self-Regulation and Good Practices for Listed Companies since 2011, and is on the world list of the Dow Jones Sustainability Index for the third consecutive year.

Klabin's inclusion in the Dow Jones Sustainability Index reflects its efforts to manage the impacts of its activities. The results achieved continuously challenge the Company to seek improvements to maintain or surpass the levels already achieved.

Indexes and commitments

Level 2 Governance of the São Paulo Stock Exchange (B3)

Klabin is part of the segment of companies that adopt differentiated governance practices and more transparency to shareholders.

Dow Jones Sustainability Index

Klabin is the only Brazilian company in the packaging market to be included in the Dow Jones Sustainability Index (DJSI) in the World Index portfolio. In 2022, the Company was featured in the index for the third year in a row.

Adherence to the ABRASCA Code

In 2011, Klabin adhered to the Abrasca Code of Self-Regulation and Good Practices for Publicly Held Companies, which establishes principles, rules and recommendations for the purpose of contributing to improvements in corporate governance practices.

B3's ISE

For the tenth consecutive year, Klabin is part of the B3's Corporate Sustainability Index (ISE) portfolio, which highlights the actions of companies with a high degree of commitment to the sustainability of business and the country.

Learn more at:

[INTERNATIONAL LISTS AND RANKINGS →](#)

Governance structure

Klabin's main governance bodies are the Annual General Meeting, the Board of Directors, the Executive Board, and the Advisory Committees to the Board of Directors.

The General Shareholders' Meeting is Klabin's highest decision-making body. Klabin is a publicly traded Company listed on B3.

The Board of Directors is responsible for setting the business objectives of Klabin and its subsidiaries, monitoring and evaluating the Company's development and performance, electing and evaluating the members of the Executive Board, among other attributions. The Board of Directors meets ordinarily every two months and extraordinarily whenever there are relevant issues that require consideration outside the ordinary agenda predetermined annually. In 2021, an evaluation process of the Board of Directors was implemented, which verifies, among other aspects, the interaction between the directors, the strategy, the duty of diligence and the human capital.

The Board of Directors has three permanent advisory committees: the People Committee, the Audit and Related Parties Committee and the Sustainability Committee.

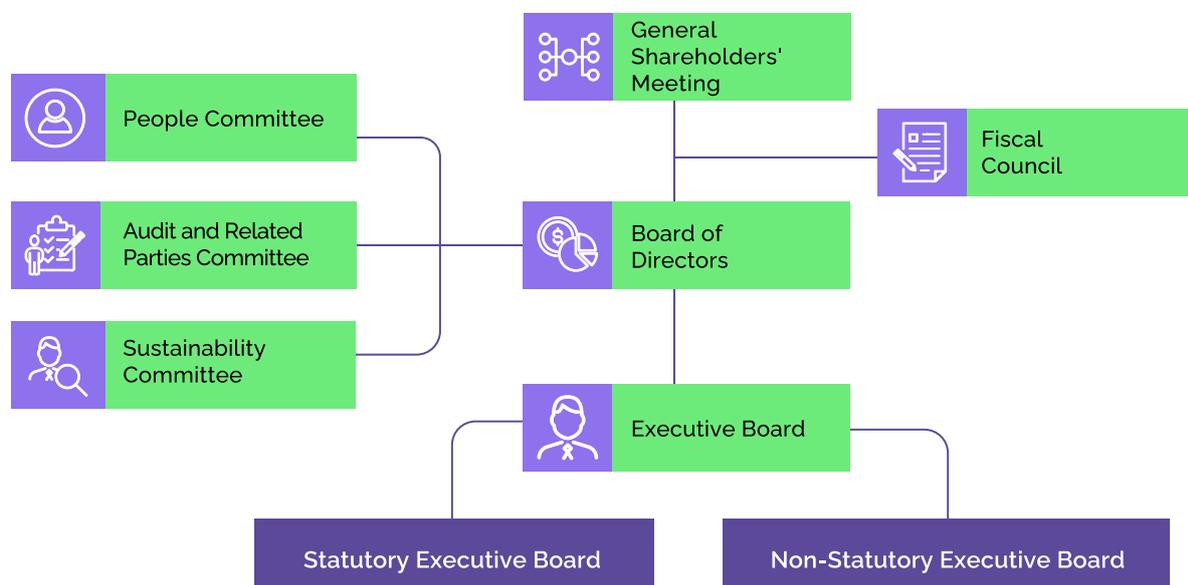
Finally, the Executive Board has fixed or temporary commissions, which are divided by topics (Strategy and Market, People, Investments, Innovation, Integrity, Risks, Sustainability and Communication, Image and Reputation).

Who are Klabin's board members?

The Board of Directors is made up of people with academic and professional backgrounds diverse and complementary (People Management, Risk Management, Accounting, Finance, Audit, Legal and Governance, including knowledge of the industry (packaging, pulp and paper industry) and alignment with the Company's values.

Access the resumes for all members of Klabin's Governance bodies:

[INVESTOR RELATIONS WEBSITE →](#)





Composition of Boards and Committees

*Updated May/2023

Board of Directors (full members 2023)

Amanda Klabin Tkacz (chairman), Alberto Klabin, Amaury Guilherme Bier*, Celso Lafer*, Francisco Lafer Pati, Horacio Lafer Piva, Isabella Saboya*, Lilia Klabin Levine, Marcelo Mesquita de Siqueira Filho*, Mauro Rodrigues da Cunha*, Paulo Sérgio Coutinho Galvão Filho, Roberto Luiz Leme Klabin*, Vera Lafer and Wolff Klabin.

* Independent board member according to the ABRASCA Code of Self-Regulation and Good Practices for Publicly Held Companies and B3 Corporate Governance Level 2 Regulation.

Fiscal Council (full members 2023)

Célio de Melo Almada Neto, Louise Barsi, Pedro Guilherme Zan, Reinoldo Poernbacher and Sergio Ladeira Furquim Werneck Filho.

Advisory Committees to the Board of Directors (2023)

Audit and Related Parties Committee

Amaury Guilherme Bier, João Adamo Junior e Luis Eduardo Pereira de Carvalho.

People Committee

Francisco Amaury Olsen, Marcelo Bertini de Rezende Barbosa e Wolff Klabin.

Sustainability Committee

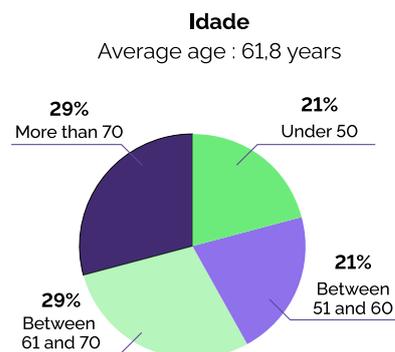
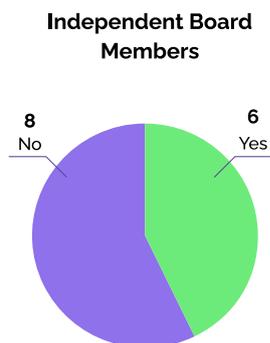
Maria Eugênia Lafer Galvão, Pedro Oliva Marcilio de Sousa e Roberto Luiz Leme Klabin.

Profile of the Board of Directors (full members)

14 members

10 men, 4 woman





*Updated May/2023

Statutory Executive Board

Cristiano Teixeira – Chief Executive Officer

Alexandre Nicolini – Pulp Business Director

Douglas Dalmasi – Packaging Business Director

Flávio Deganutti – Paper Business Director

Francisco César Razzolini – Director of Industrial Technology, Innovation, Sustainability and Projects

Marcos Paulo Conde Ivo – Chief Financial and Investor Relations Officer

Sandro Fabiano Ávila – Forestry Director

Non-Statutory Executive Board

Ana Cristina Barcellos – People & Corporate Services Director

Mariangela Daniele Maruishi Bartz – Legal, Integrity, Risks and Internal Controls Director

Roberto de Camargo Bisogni – Director of Operational Planning, Logistics, Supplies and IT

Main deliberations related to the theme of Governance of the Board of Directors in 2022

- Creation of the Related-Party Transactions Policy.

- Review of the Sustainability Policy and the Securities Trading and Disclosure Policy.

- Amendment to the Internal Regulations of the Board of Directors and creation of the Internal Regulations for the Executive Board.

- Review of the Privacy and Data Protection Policy.



Committees allow deepening in the subjects

Klabın's governance process benefits from the specialization and knowledge of the members of the Advisory Committees and their actions have been speeding up deliberations at the Company, with recommendations based on in-depth analyses.

Their duties and rules of operation are foreseen in the respective Internal Regulations, approved by the Board of Directors and available for consultation on the CVM website as well as [Klabın's Investor Relations website](#).

Each of the committees is made up of three members elected by Klabın's Board of Directors for a term of one year, coinciding with the term of the members of the Board of Directors itself, and re-election is allowed.

Meetings in 2022

- 15 meetings held by the Audit and Related Parties Committee.
- 9 meetings held by the Sustainability Committee.
- 7 meetings held by the People Committee.



Transparency and consistency

Disclosing information in a consistent and transparent way is a top priority for Klabin. The Company presents its performance through the disclosure of quarterly results, Financial Statements – according to the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB) –, ESG Panel, and the Sustainability Report, published annually since 1999.

Right to shareholders

- Units: a share package consisting of 1 common share and 4 preferred shares provides greater liquidity.

- Equal economic rights: Tag Along of 100% of the share amount paid to the controlling shareholder, in the case of sale of the company, and equal dividends for common and preferred shares.

Investor Relations

In December 2022, Klabin had more than 400,000 individual shareholders in its shareholder base, up from 215,000 at the end of 2021. The expansion of investors with this profile, which follows the growth rate of B3's individual investors (over 6 million in February 2023), reflects the company's positive momentum, with increased results and substantial investments in business expansion, and reflects the communication efforts directed towards this audience.

Practices

- Klabin Invest: exclusive content platform featuring videos and podcasts, with information on the Company's performance, innovation, sustainability and topics of interest to the financial market.

- Investor Relations Website: gathers the company's key information, such as its corporate structure, studies, codes, policies, financial and dividend reports, ratings and analyst coverage, in addition to its own content tailored to investors through Klabin Invest.

- ESG Panel: focused on investors and other financial market players.

Learn more at:

[INVESTOR RELATIONS WEBSITE →](#)



MORE THAN 46.9

million views on YouTube, Instagram and LinkedIn.

MORE THAN 40,000

interactions with content, between likes, comments and shares.

MORE THAN 15,000

hours of videos about Klabin watched by the public.

MORE THAN 260,000

subscribers to the LinkedIn newsletter (200,000 subscribers in the first 48 hours).



Risk management underpins decisions

In order to fulfill its value proposition for risk management, one of the targets of the Klabin 2030 Agenda, the Company is constantly challenged to keep its team committed to act responsively and participatively in the processes that involve the risks management. In 2022, several initiatives were developed to advance this culture of risks, among which the following stand out:

- Development and delivery of a risk management manual for senior management and managers.
- Risk management workshop for managers and coordinators from all areas, in all Business Units.
- Risk management training on the Klabin Business School portal (ENK Portal).

300+

managers and coordinators participated in the Risk Management Workshop.

200+

employees completed the risk management training on the ENK Portal.

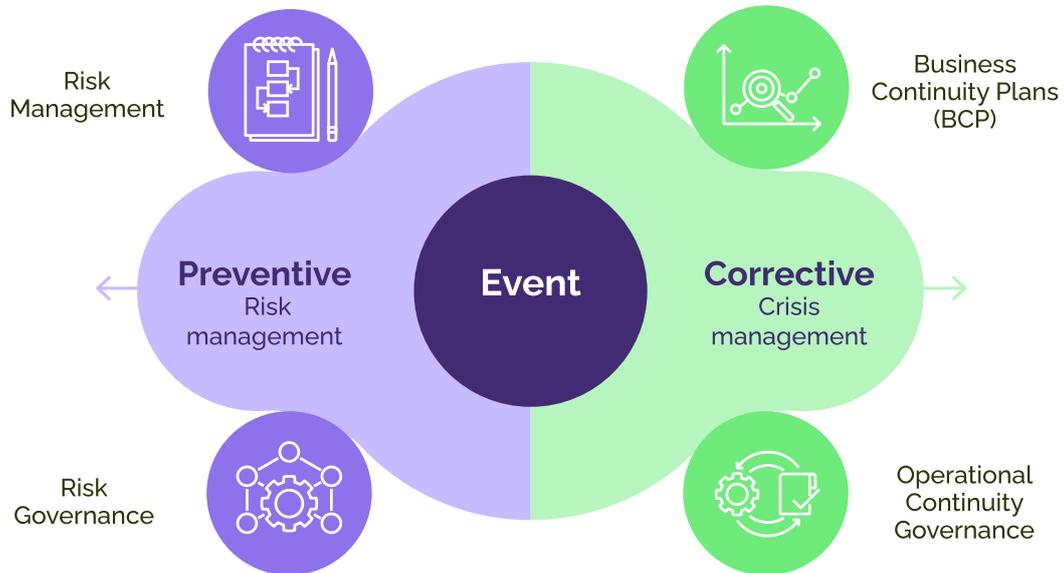
How risks are managed

Klabin's Risk Management Policy is based on the principle of aligning the Company's strategic objectives with a structure referenced to the highest industry standards.

The governance structure assigns risk management responsibilities to the following entities: Board of Directors, Audit and Related Parties Committee, Executive Board, Risk Committee, Risk Management and Internal Controls Department, Business Areas.

According to internal methodology, Klabin's risks are classified as strategic; financial; operational; regulatory and legal; and social and environmental. The risks are assessed according to their level of criticality, defined based on two aspects: impact and vulnerability. The levels of each risk are established according to predefined criteria, standardized and validated internally. The approaches may be: reduce, transfer and/or share, retain or accept.

The steps described ahead are followed with the objective that the main risks inherent to Klabin's activities can be identified, assessed, addressed, monitored and communicated, both at the strategic and operational levels.



Internal Controls

Klabın's primary internal control practices include the establishment of procedures, formal policies, authorization of approval levels, audit assessments, process mapping of departments, integrity assessments, including cybersecurity analysis.

In 2022, procedures for managing legal documents, such as licenses and permits. This action front has seeks continuous improvement in the process of impact on mitigating legal compliance risks.

An important part of the project was also completed, which included mapping processes, identifying and training those responsible for the processes in each area. The project, initiated in 2020, seeks to enhancing knowledge of internal controls within the Company, providing greater agility to the system's updates whenever a process needs to be altered.

60 processes mapped.

750 controls identified.

250 controls identified.



Privacy and Data Protection

Klabin's Privacy and Data Protection Policy establishes the attributions of the various areas involved and regulations applicable to the protection, treatment and eventual sharing of data. Based on this policy, materials have been created for use in training and awareness activities, and is also available on Klabin's portals through the link [Privacy Policy | Klabin](#).

In order to comply with the General Data Protection Law (LGPD), the main challenges in implementing projects are mapping and maintaining the flow of personal data within the Company; training and raising awareness among employees and departments that handle personal data; involving the entire supply chain; and meeting the deadline for responding to any requests from data subjects.

Learn more about data protection and cybersecurity at:

[INFORMATION TECHNOLOGY →](#)

Evolution of the integrity program

Operating pillars to prevent, detect, and address behaviors that could put Klabin and its employees in situations that conflict with the Company's principles and values are outlined in the Integrity Program.



Employee at MP27, Puma Unit, in Ortigueira (PR). Photo: André Valentim.

Among the actions to improve the Integrity Program in 2022, the following stand out: The campaign "Let's talk about harassment? #Speak up" was held in 2021 with the purpose of tackling the issue and pursuing a sexual harassment-free workplace. It resulted in Klabin winning the Ethics, Integrity and Compliance category during the National Stage of the 47th Edition of the Brazilian Association of Business Communication (Aberje) awards in 2022.



To seek greater adherence to integrity-related initiatives at Klabin, especially in the prevention pillar, training is essential. By 2022, more than 11,000 employees had been trained in the Code of Conduct. In 2022, 100% of the public in the commercial area had competition training and the achievement of this same percentage will continue as Klabin's goal. Employees were also trained in 2022 to investigate grievances at Klabin in order to enhance the process.

Klabin's Integrity Program also includes prevention and detection actions related to the anti-corruption theme, consolidated in the Code of Conduct, the Anti-Corruption Manual and contractual clauses. Every year, the Company conducts anti-corruption training for its employees, has Internal Audit work and has an Integrity Channel and Ombudsman for the reception and treatment of complaints of this nature.

100%

of own employees and suppliers were notified about the Code of Conduct in 2022.

64.1%

of own employees were trained on the subject.



Cybersecurity

Klabin's value proposition for cybersecurity is to seek strengthened technological capabilities to protect both its assets and individuals, as well the institutions it interacts with, considering the constant risks inherent in advances in digital culture.

The Cybersecurity Policy outlines the posture, best practices, and responsibilities necessary to mitigate risks in Klabin's environment against cyberattacks. Its entire content was developed according to the framework of the ISO 27001 and IEC 62443 standards.

Awareness and digital inclusion

To ensure that direct and indirect employees are up to date in relation to digital language in order to act consciously and proactively on the subject of cybersecurity, a plan to raise awareness was developed, with training activities at the Klabin Business School, lectures and workshops, security videos and an internal podcast on the subject, among other initiatives. The KSDGs target associated with the topic is to have 100% of direct and indirect employees included in the digital language.

My Klabin, the company's intranet, is one of the most important channels for promoting and disseminating the Cybersecurity Policy. The portal has undergone a technological upgrade to broaden its reach and accessibility to all internal stakeholders. The update also enabled former employees to access specific content, such as pension matters, for example, facilitating communication between this group and the company.

98%

of the company's own employees are active on the My Klabin platform.

58%

of direct employees and 33% of indirect employees were trained on Cybersecurity and digital language.

MORE THAN

3,500

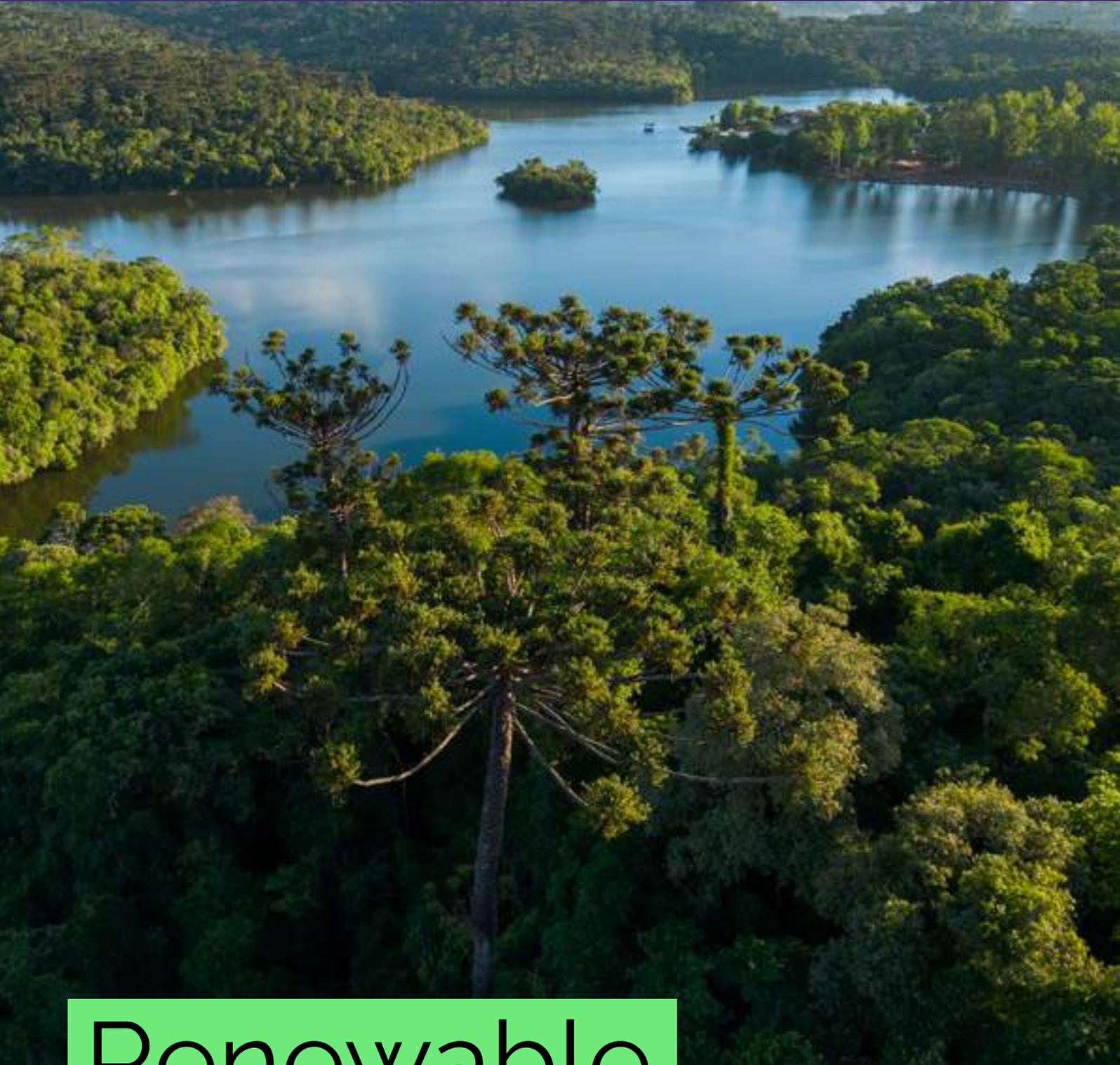
third parties were impacted with the video on Cybersecurity.

Information management

Based on the need to automate some processes at Klabin, information security at the Company was also improved. An example of this effort was the implementation of a technological identity management solution, a tool that organizes and manages the relationships between people and Klabin's information assets throughout the employee's entire relationship cycle with the company.

In addition to streamlining the process, this increases security through access that is exclusively authorized, from the moment the employee is hired, when the business area requests their access, through any changes in position until their departure, when access is revoked.

Regarding the management of managerial information, in line with an update made to the SAP system to make it more adherent to Klabin's own evolution, the cost centers of the Forestry Unit were restructured, with the main objective of simplifying processes.



Renewable future



Responsible performance

The public recognition achieved by Klabin's presence on lists such as the **Dow Jones Sustainability Index** (DJSI) and the B3 Corporate Sustainability Index (ISE) validates its responsible performance strategy. The challenge of sustaining high performance pushes the company to constantly pursue new opportunities.

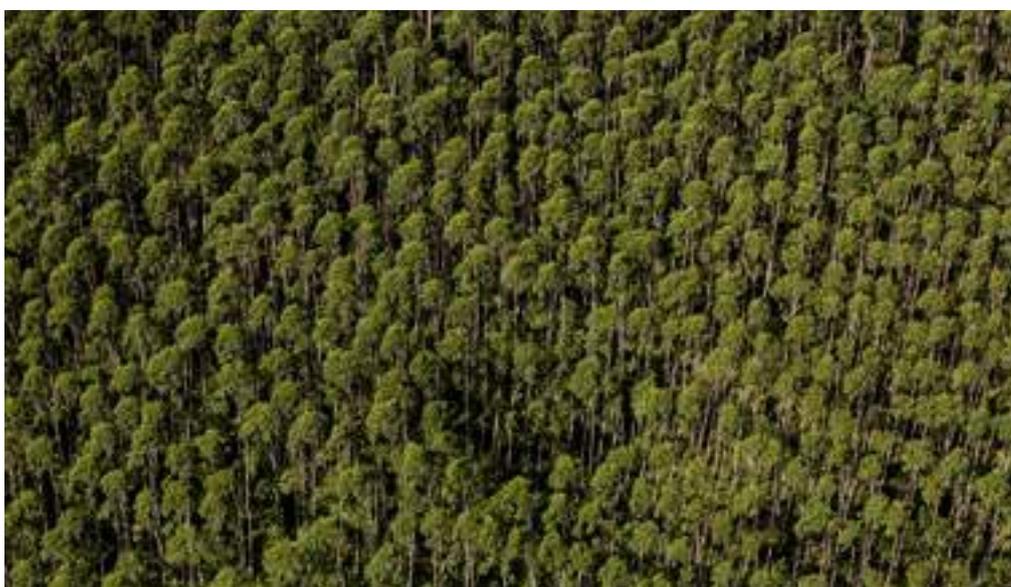
In its operations, Klabin seeks responsible and sustainable management of forests, which form the foundation of its business model. The Company uses benchmarking to stay abreast of the best practices in the market, continually assessing opportunities for improvement through innovation and technology, which set it apart from its competitors.

The commitment of executive senior management to sustainability, including targets tied to variable compensation, and the governance of the issue within the Company underscore the importance of taking action towards a sustainable future.

Learn more in the

[GOVERNANCE CHAPTER →](#)

Klabin's forests are important environmental assets, providing ecosystem services such as water, carbon, biodiversity and fertile soil, among others.



Eucalyptus forest in the state of São Paulo. Photo: Kako Photographs.



Climate resilience

At Klabin, the management of the issue related to climate change is focused on building a climate resilient society. Since 2020, the Company has been following the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), not only disclosing the current and potential risks arising from ongoing climate change, but also incorporating into its strategy and financial planning the business opportunities that present themselves in this scenario.

After identifying the potential risks that the Company faces based on different climate-related scenarios, a qualitative evaluation of the potential vulnerability and potential impact on the company is conducted to assign each risk a criticality rating. A multidisciplinary internal team is responsible for contributing to this risk assessment process, leveraging its broad experience in various areas such as business strategy, forestry research, climate change, and risk management.

Water scarcity caused by climate change, the regulatory changes such as carbon pricing and temperature increases have been considered as priority risks for the Company. Based on this identification, the potential financial impact of each of these risks is calculated using methodologies appropriate to each type of risk. The calculation assumptions are developed based on research and external studies, such as a study on carbon pricing projected in Brazil. Finally, the potential financial impact is calculated as a percentage of earnings before interest, taxes, depreciation and amortization (EBITDA), with the disclosure of the investments necessary for the resilience strategy of each identified risk. All data on the methodologies for calculating potential financial impact are disclosed on the ESG Dashboard.

One of the objectives of the Klabin 2030 Agenda is to achieve targets for reducing greenhouse gas (GHG) emissions, approved by the Science Based Targets initiative (SBTi). This means having targets that are compliant with climate science and aligned with the global challenge of limiting the average temperature in the coming decades.

Transparency in risk management

The TCFD contains recommendations for addressing the financial impacts of climate change, increasing transparency about climate-related risks and opportunities for informed financial decision-making. As a TCFD Supporter, Klabin publicly backs the recommendations of the **Financial Stability Board (FSB)** on the management of climate risks and opportunities and, in 2022, began to meet 100% of the initiative's recommendations.

Even with its history of action in relation to the theme of climate change, the Company still faces challenges linked to a market that is not very mature for the implementation of the Task Force's recommendations, either due to the lack of standardized data and specific methodologies for adherence to the guidelines, or due to the expectation of financial players in the sector for a more in-depth analysis of the information.

Even with its history of action in relation to the theme of climate change,

The hiring of a specialized consulting firm to support the company in implementing the TCFD recommendations was essential for Klabin to enhance the dissemination of the Task Force's framework, paving the way to become a benchmark in the Brazilian industrial market on the topic.

Learn more:

[TCFD REPORT →](#)



SBTi

The initiative establishes methodologies to help companies design emission reduction targets based on climate science and sustainable economic development.



NetZero Impact Movement

The result of a partnership between Klabin and the Brazil Network of the UN Global Compact, which aims to invite companies to evaluate the adoption of GHG reduction targets based on science and encourage society to engage in the sustainability cause. Learn more at: <https://www.impactonetzero.com>



Business Ambition for 1.5C

UN campaign that gathers about 200 companies around the world in the effort to restrict the temperature increase on the planet to a maximum of 1.50C until 2030. Klabin is among the 11 participants of the initiative in Brazil.



We Mean Business

Since 2021, the Company has been participating in a global coalition that gathers the business sector around controlling the effects of global warming. The initiative, which includes companies from all over the world, proposes the establishment of a low-carbon economy.

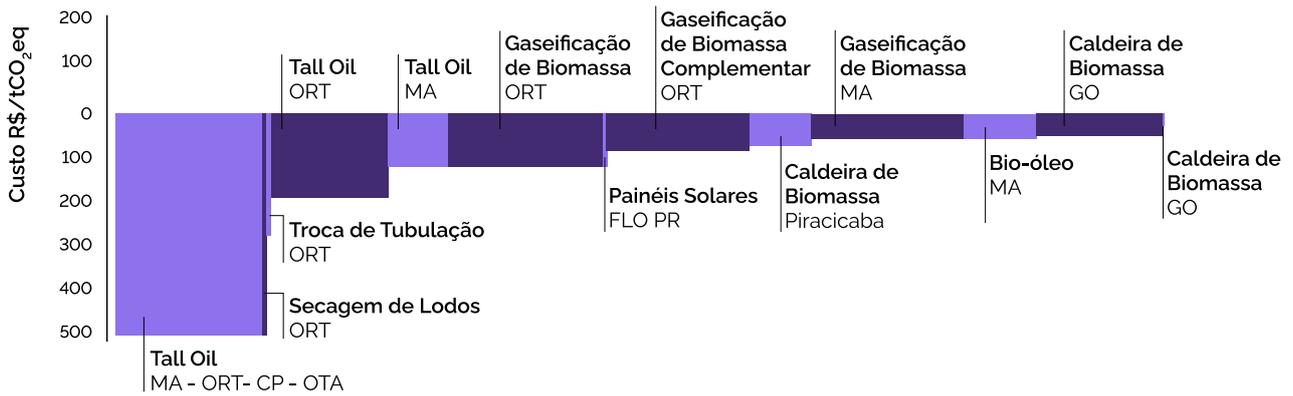
Technologies applied to emissions reduction

The start of operations of the **biomass** gasification plant, the first of its kind in the Brazilian pulp and paper sector, at the Puma Unit in Ortigueira (PR), marked a significant milestone in 2022. By replacing the use of fossil fuels with Syngas, a gas produced from wood biomass, Klabin has ceased to emit approximately 67,000 tons of CO₂ equivalent annually, increasing the share of renewable fuels in its energy matrix.

The adoption of **low-carbon technologies** is one of the action fronts for reducing GHG emissions. Investments such as this have yielded significant results when observing the historical series: a 68% reduction in specific CO₂ equivalent emissions per ton of product generated since 2003.



The Marginal Abatement Cost Curve (MACC) tool practically identifies the technological being studied by Klabin, their costs, and their potential for reducing GHG emissions.



Klabin Ecological Park, in Paraná. Photo: Zig Koch.

Participation in discussions of global reach

Throughout its history, Klabin has continually reinforced its commitment to combat climate change, actively engaging in discussions on the topic since Brazil hosted Eco-92. In 2022, the Company participated in the 27th United Nations Conference on Climate Change (COP27) in Egypt. For the second year in a row, it participated in the Business Leaders Group, which is responsible for presenting the corporate stance on climate ambition and discussing solutions that will drive sustainable economic growth to reach the objectives of the Paris Agreement.

Engaged in the agenda of implementing a regulated international carbon market, Klabin understands that COP27 did not achieve any significant advances on the issue and hopes that this will be one of the main topics at COP28, with Brazil's participation.



Decarbonization strategy

Action focused on climate resilience is directly linked to building a low-carbon society. Klabin has a consistent strategy for reducing carbon emissions, which includes initiatives focused on energy efficiency and replacing the use of fossil fuels with renewable sources.

The biomass gasification plant is an example of low carbon technology that increases the Company's energy matrix with fuel generated from wood biomass.

Learn more at:

[ESG PANEL →](#)

Emissions inventory

Since 2003, Klabin has accounted for its inventory of greenhouse gas emissions according to the specifications of the **Brazilian GHG Protocol Program**, considering direct and indirect emissions from industrial and forestry operations in Brazil, based on scopes 1, 2 and 3.

SCOPE 1	SCOPE 2	SCOPE 3
Direct GHG emissions from sources that belong to or are controlled by the organization.	Indirect GHG emissions, by the acquisition of electric and thermal energy consumed by the company. Since 2019, Klabin considers the methodology based on the choice of purchase in its results.	Other indirect GHG emissions, which are a consequence of the company's activities, but occur in sources that do not belong to or are not controlled by the Company.

Within scope 3, the Company conducted a new study to identify and calculate GHG emissions for all categories relevant to its business. As a result, Klabin is expanding its Scope 3 emissions by adding two new categories – processing of products sold and end-of-life treatment – and is in the process of updating the accounting for the categories of goods and services purchased and activities related to fuels and energy not included in Scopes 1 and 2. The new results will be updated in the Company's reports throughout 2023.

Partners in reducing CO2 emissions

Klabin is striving to reduce its carbon footprint through projects that generate carbon credits. One of the projects underway is linked to the Plante com a Klabin program, a partnership with rural producers that will increase the supply of wood for the Company's expansion plans.



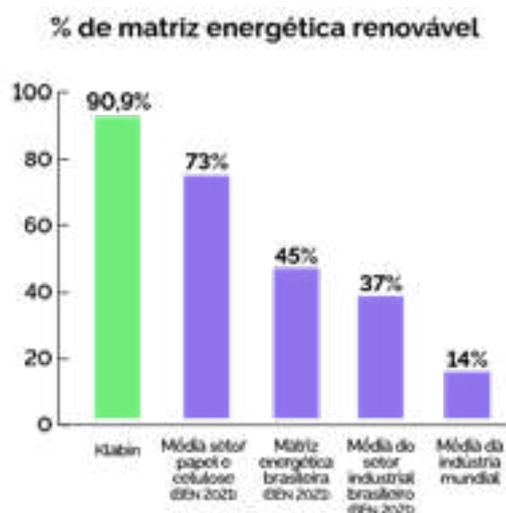
In this partnership with rural producers, carbon credits will be generated upon proof of positive conversion of land use change. For partners who wish to participate, Klabin identifies potential areas for reforestation of commercial forests or degraded areas on their properties that need to be restored, supports land use changes such as pastures, facilitates reforestation or restoration of native forests, and assisting producers in the verification process of actions. The carbon credits generated and certified, when traded, will have their revenue shared equally between the Company and the producer, the latter being entitled to a guaranteed minimum amount.

Learn more at:

[PLANTE COM A KLABIN →](#)

Evolution of the renewable energy matrix

Klabin ended 2022 with a greater contribution of renewable sources to its energy matrix: 90.9%. The 2030 target is to have 92% of the energy matrix from renewable fuels.



The production of **tall oil** from soap (a by-product of paper manufacturing) and tests with **bio-oil**, derived from wood waste, branches, and post-harvest foliage, are examples of low-carbon technologies. Other renewable fuels obtained and used in production processes include methanol, turpentine, hydrogen, and tall oil tar.

In 2022, Klabin produced a total of 2.9 million MWh of electricity in its operations. Of this total, 729,000 MWh, generated from the use of renewable fuels, were made available to the SIN by the Puma Unit, contributing to a more renewable national energy matrix.



Considering all of the Company's units, 82% of the electricity consumed comes from own generation. In 2022, 100% of the electricity purchased by the Company came from renewable sources, verified through the acquisition of renewable energy certificates (IRECs) and self-declarations, surpassing the KSDG target set for 2030 to purchase certified energy from renewable sources.

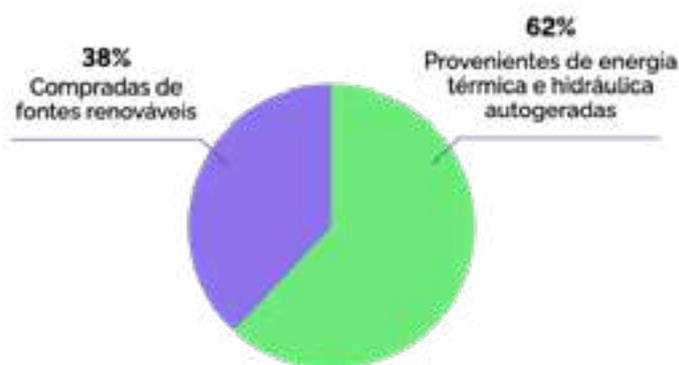
Own generation of electricity

At Klabin, the pulp and paper mills are energy generators. The Puma Unit in Paraná is self-sufficient and any excess is sold and made available to the National Interconnected System (SIN), which manages the production and distribution of electricity throughout the country.

In 2022, 729,784 MWh were delivered to the SIN by the Puma Unit, accounting for 25% of the total electricity produced by Klabin.

The Monte Alegre Unit, in Paraná, is the second largest producer of electricity for Klabin, providing approximately 50% of the energy that the factory requires. Considering all of the company's units, 82% of the energy consumed comes from own generation.

3.5 million Mh - total electricity consumed in 2022





Operation with electric trucks began as a pilot at the Jundiá Tijuco Preto Unit (SP).

Electric trucks

To engage the supply chain in promoting a low-carbon economy, Klabin launched a pilot project in December 2022 to operate electric trucks at the Jundiá Tijuco Preto Unit in the interior of São Paulo. In this first stage, four trucks are in the testing phase to make deliveries in the state of São Paulo. They are recharged at the charging stations installed in the unit. The project, implemented in partnership with LOG Group, Klabin's logistics solutions provider, is part of the Company's efforts to reduce Scope 3 greenhouse gas (GHG) emissions, which cover, among others, the transportation and distribution of products and are one of the greatest challenges of decarbonization.



Monitor to manage impacts

One of the key tools for water management at Klabin is monitoring, which enables periodically critical assessments to be conducted across all units and actions to be taken on any deviations that could affect the progress of indicators. In 2022, more than launching new projects, operational adjustments were made with a focus on continuously improving processes to reduce water consumption.

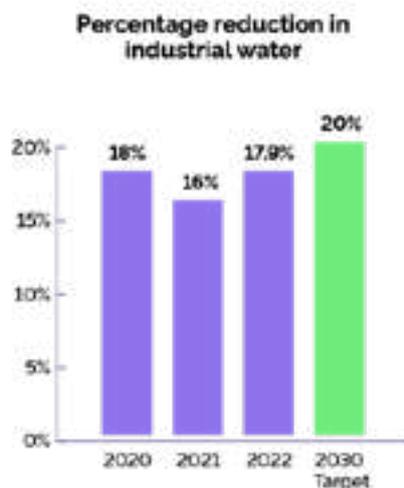
One of the KSDG targets is to reduce specific water consumption by 20% by 2030, based on 2018. Specific consumption is the result of subtracting the amount of effluent treated and returned to the source from the amount of water withdrawn from the source. The indicator that contributes to the target performed well in 2022: 3,63m³ per ton of product, leading to a 17,9% reduction in specific water consumption in the period, compared to the target's base year (2018).

Hydrosolidarity in water management

Klabin adopts **hydrosolidarity management** in its forestry operations. The method consists of the creation of operational routines to guide the planning and execution of the company's forest management, taking into account the harvest plan, the identification and monitoring of watersheds under the influence of forest management, the water catchment points by the communities, in addition to the ecological processes. Thus, the cultivation is done seeking to observe that forest activities preserve water production to mitigate any impacts, through a flow of analysis for decision-making of the management to be considered, incorporating the hydrological model and existing local communities.

For the application of the methodology, several parameters are considered, especially the size of the forest blocks to be managed and their composition (with regard to gender and age). With this, Klabin seeks the continuity of the forest mosaic, which has been practiced for many years.

Klabin's own forestry operation in Paraná is already utilizing the hydrosolidarity management flow. In 2022, 100% of the operation in Santa Catarina also began to use it. As a result, the Company saw a significant improvement in the indicator, nearing the KSDG goal of having 100% of forestry operations under its own management with hydrosolidarity management by 2030. Klabin is currently working to ensure that, by 2024, its forests located in São Paulo will also operate under this strategy.





Water stress

An area is called water stress when it reaches rates greater than 20% of the proportion between the total water withdrawn annually and the annual renewable supply available. For this control, Klabin monitors all its units through the WRI Aqueduct tool, which allows prioritizing actions in the most vulnerable territories. In 2022, Klabin's units classified as areas of water stress were: Franco da Rocha, Jundiá-DI, Jundiá-TP and Suzano, in São Paulo; Goiana (PE), Horizonte (CE) and Rio Verde (GO).

An area is called water stress when it reaches rates higher than 20% of the ratio between the total water withdrawn annually and the annual renewable supply available. For this control, Klabin monitors all its units through the WRI Aqueduct tool, which allows prioritizing actions in the most vulnerable territories.

Taking initiatives to increase territorial water security in all locations where the Company operates is one of the targets of the Klabin 2030 Agenda.

The results of the indicator have been steadily improving year after year (see Indicator Overview below), due to initiatives such as the installation of more efficient Effluent Treatment Plants (Betim, Itajaí, Manaus, Rio Negro, Goiana and São Leopoldo), participation in Watershed Committees and the environmental education actions of the Klabin Caiubi Program, involving the Monte Alegre and Puma units in Paraná; Otacilio Costa, Lages and Correia Pinto in Santa Catarina; Feira de Santana in Bahia, and Angatuba, Jundiá DI and Jundiá TP in São Paulo. The strategic performance of the Water Management Working Group, a team comprised of representatives from all of Klabin's businesses, has made a significant contribution to the results.

Learn more about the Klabin Caiubi Program at:

[SOCIAL INVESTMENT →](#)

Indicator Overview

18%

reduction in specific industrial water consumption

18% (2020)

16% (2021)

18% (2022)

74%

of locations with initiatives to increase water security

52% (2020)

57% (2021)

74% (2022)

97,3%

of forest harvest operations under own administration with hydrosolidarity management

79,7% (2020)

74,0% (2021)

97,3% (2022)



Management of effluent disposal

Klabin adheres to the limits set forth by current legislation for the reference and monitoring of effluents in each locality where its factories are located. The efficiency of **BOD5** (biochemical oxygen demand) and COD (chemical oxygen demand) removal, as well as phosphorus concentrations are monitored parameters. The indices are compared with global benchmarks, established by the **IFC/IPCC** (Intergovernmental Panel on Climate Change).

Treated effluents

Before being released into water bodies, 100% of effluents are treated in Effluent Treatment Plants (ETPs), monitored internally and verified by external auditors to ensure compliance with all legal requirements. In several of the Company's units, water-related targets impact the Profit Sharing Program (PPR).



The Otacilio Costa Unit (SC) has the highest quality effluent of any Klabin facility, the result of technological upgrade projects.



The Puma II project already has 100% of the effluents treated by the tertiary level of the Puma Unit (PR), observed the standards set by the International Finance Corporation (IFC).

Circularity and value creation

Waste management is a priority item on Klabin's sustainability agenda. The Company's 2030 target is to zero the disposal of industrial waste to landfills. In addition to human activities, the company's operations generate solid waste as a result of the byproducts of the production processes. Therefore, by leveraging intelligent use of natural resources, Klabin employs technology to enhance circularity in processes, thereby creating value across the entire supply chain.

Refuse, reduce, reuse, repurpose, recycle – the concept of the "5 Rs" of sustainability – are daily practices in the company's activities. Once sorted, all packaging materials received from suppliers are disposed of in an environmentally appropriate manner. The same is true for sludge from the Water Treatment Plants (ETAs) and Effluent Treatment Plants (ETPs), ash and bark, solid waste generated in operations, as well as other recyclable material.

The Company's waste management is governed by internal policies and guidelines, as well as federal, state, and municipal legislation (such as Law No. 12.305/2010 – National Policy on Solid Waste). These regulations are constantly monitored and accompanied by actions that demonstrate compliance with standards.



98.5%

was Klabin's industrial waste reuse rate in 2022, up 0.4 percentage points compared to 2021.

99.8

was the rate of waste reuse achieved by the Puma Unit in 2022, a result driven by the performance of the Waste Processing Center, which had been in operation since the start.

What is already done in the Company

- Disposal of dregs and grits (waste from chemical recovery) for co-processing and use in agriculture as a soil corrector, and in the production of materials for civil construction, such as pavers and bricks.
- Production of tall oil from the soap generated in wood cooking processes, to be used as a clean energy source, thereby reducing the consumption of oil as fuel.
- Working with customers to recover post-consumer materials, such as the reverse logistics and paper waste recycling project, where the materials return to the consumer chain as new packaging for different segments and sectors of the economy.
- Representativeness in the sector through participation in institutions such as the Brazilian Tree Industry (Ibà) and the Corporate Commitment to Recycling (Cempre), which foster discussions on trends and legislation.
- Initiatives to support the Public Authority for the improvement of selective collection in municipalities where Klabin operates, such as the Solid Waste Program in Paraná.
- Use of by-products of wood processing, such as bark and residual biomass, in energy production.

Learn more about the Solid Waste Program in Paraná at:

[LOCAL DEVELOPMENT →](#)

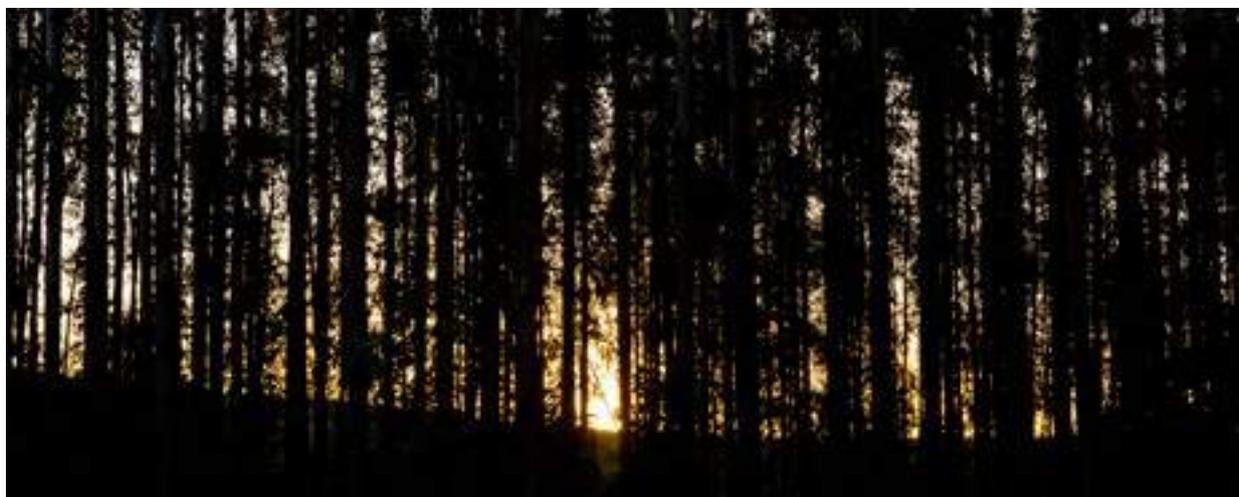


Waste is used to manufacture bricks

In a project developed by Klabin's Technology Center in collaboration with the Ceramic Technology Center (NTC), dregs and grits (byproducts from Klabin's chemical recovery operations) are used as raw materials to produce ceramic bricks. In the pilot phase, the initiative was developed in the Paraná cities of Sapopema, Curiúva and Arapoti, and in Goiana (PE). A total of 95,000 bricks were produced, benefiting public works and local institutions of these municipalities.

Ceramic bricks made in Paraná, from residues from the chemical recovery of the operation.

Initiatives that promise to make a difference



Potassium sulfate production: one of the key components used in fertilizer formulation, potassium, imported until then, began production at the Puma Unit in September 2022, making Klabin the first pulp and paper industry in the world to produce the input. Potassium is extracted from the treatment of the ashes produced in the Recovery Boiler and recovered in the form of crystallized potassium sulfate, which can be used in the composition of fertilizers and soil amendments for forests and also for commercial sale.



Sludge drying: installation of a drying plant for sludge from effluent treatment, currently in progress at the Puma Unit. In addition to reducing the amount of biological and tertiary sludge to be treated, this presents the opportunity to use the dry sludge as fuel for burning biomass in the biomass boiler.



Life cycle analysis: Klabin has made strides in this area, with the goal of understanding the entire production chain in order to enhance the management of environmental impacts from the production of its products. Currently, 100% of the pulp and paper production cycle has been mapped and simulations have already been conducted for the production of Paper Machine 28 (MP28), which is set to come online in 2023.



Sulfuric acid production: in May 2022, the first concentrated sulfuric acid plant integrated with a pulp mill in the Americas came online, located at the Puma Unit. The acid is produced by utilizing the residual gases from the wood cooking process, which contains Sulphur, powered by 100% renewable energy derived from the combustion of biomass and black liquor. The chemical is one of the main inputs of pulp and paper production. The production of 150 tons of concentrated acid daily will make the Puma Unit self-sufficient. The unit can also use solid sulfur to increase its capacity. In addition to reusing gases containing sulfur, the integrated unit enables a significant reduction in emissions from transporting acid, which was previously imported or produced in third-party units located far from the unit. The surplus of the input can be used in the nearby Monte Alegre unit or sold.



Klabin at the Bienal do Lixo

In May 2022, Klabin took part in the inaugural edition of the São Paulo Bienal do Lixo (Trash Biennial), held at Villa Lobos Park. Visitors had the chance to experience the "Sustainable Journey", an interactive action that sought to promote reflection on each citizen's environmental responsibility. The public was also introduced to the KlaCup Bio, a biodegradable solution for paper cups. The Company's executives also participated in panels throughout the event.

Klabin provided "Sustainable Journey" to event visitors.



About 10,000 people participated in the Sustainable Journey.



1,400+ messages were sent from the public about what sustainable commitment they intend to make.

What still challenges Klabin

Even with a 98.5% rate of industrial waste reuse, Klabin is not content and continually assesses potential opportunities. Finding a technically sound and economically feasible solution for waste generated from paper recycling, grits, dregs and tertiary sludge remains a challenge for the Company, which maintains a research line dedicated to finding alternatives to landfills for the disposal of industrial waste.



Sustainable economy



Growth and value creation

The 2022 results demonstrate Klabin's capacity to expand and create value in a variety of contexts. The integrated and flexible business model, with a wide range of products, has enabled the Company to pursue its investment strategy and its growth trajectory.

The 13th consecutive year of growth in Adjusted EBITDA, reaching a level of BRL 7.8 billion, excluding non-recurring effects, and the prudent allocation of capital enabled the generation of cash in the period and, consequently, the creation of value for shareholders. The Return on Invested Capital (ROIC) was 19.2% in 2022, a level that has been sustained for multiple quarters.

Financial result

BRL 7.8

billion in Adjusted EBITDA, excluding non-recurring effects, up 13% from 2021.

19.2%

ROIC, signaling consistent performance across multiple quarters and assertive capital allocation.

2.6X

was the net debt/adjusted EBITDA ratio measured in dollars, demonstrating the Company's deleveraging, even during the Puma II investment cycle.

Operating results

- Sales volume (excluding wood) was 3,852 thousand tons, 1% higher than the amount seen in 2021.

- Eukaliner's® incremental volume from MP27 contributed to the result, offsetting the volume downturn observed in other segments.

- Net revenue reached BRL 20.033 billion, a 22% increase from 2021, with growth across all business segments: pulp, paper, and packaging.

What challenged Klabin

The unit cash cost, which encompasses the sale of all the Company's products and includes selling, general and administrative expenses, excluding the effects of scheduled stoppages, was BRL 3,111 per ton. This amount represents an increase of 24% compared to 2021. This growth is primarily attributed to the rise in chemical and fuel costs, inflation of services and labor, and the reduced absorption of fixed costs due to the decreased sales volume. There was also an increase in the cost of fibers due to increased purchases of wood from third parties to meet the demands of the first cycle of the Puma II Project, while the company's own forests are being developed for harvesting in the second cycle.

Part of this increase was offset by the decrease in average cost and lower purchase volume of chips resulting from the reduced production of recycled materials, as well as the decreased purchase of paper from external sources, both due to the increased integration of kraftliner in the production of corrugated board boxes.



Business unit contributions



FORESTRY

The Forestry Unit has taken action to address the increased production volumes resulting from the Company's capacity increases. By the end of 2022, approximately 90% of the forest expansion program had been finished. The performance achieved was challenging, with Paper Machine 27 operating at full capacity and necessitating the implementation of the forest area plan that had been devised since the inception of Puma II.

In this scenario, approximately 16 million tons of pine and eucalyptus logs and wood chips were transported. Most of it was used for the production of paper and pulp, and the biomass resulting from the processing of this wood was used for self-generation of energy by the Company. Of this total, the volume of log sales to third parties was 1 million tons, with net revenue of BRL 192 million in 2022.



PULP

The Pulp Business operated beyond its nominal capacity, the result of debottlenecking initiatives combined with increased manufacturing productivity. The production volume reached 1,586 thousand tons, down 4% from the volume of the previous year, as there was no general maintenance stoppage in 2021. Net revenue reached BRL 6.995 billion, up 21% from 2021, and operating cash flow, measured by EBITDA, was BRL 3.964 billion in the year, 8% higher than the previous year, the best result since the Puma Unit in Paraná began operations in 2016.

Fluff pulp showed resilient demand, superior to that of other fibers, solidifying the positive outlook for the Company's future. In the softwood pulp market, Klabin sustained its important regional leadership. Hardwood, on the other hand, accounted for 30% of the financial result in 2022.



PAPER

The accelerated structural changes brought on by the Covid-19 pandemic, the increased demand for more sustainable products, the shift from single-use plastic to paper packaging, and the greater presence of e-commerce in sales were all made more evident in 2022, resulting in strong performance from the Paper business unit.



PAPER

As it already operates at its maximum capacity for card production, sales volume remained steady when comparing the years 2022 and 2021, despite the high demand for this market in 2022. Paperboard sales revenue totaled BRL 3,538 billion, up 15% compared to 2021, due to the implementation of price adjustments throughout the year, which offset the negative impact of foreign exchange during the period. The unit also solidified the sales of Paper Machine 28's card production, formalizing contracts for approximately 60% of its total sales volume. MP28 will come online in the second quarter of 2023.

The kraftliner market started the year 2022 with high price levels, close to all-time highs, after a year of strong growth. In the first six months, new price hikes were driven by cost pressures from producers in the Northern Hemisphere, primarily due to the energy matrix in Europe. In the second half of the year, however, the decrease in demand, the increase in supply, and the higher level of customer inventories due to improved logistics initiated the price correction. In this context, Klabin leveraged its ability to incorporate paper into packaging, reducing the production of recycled paper and increasing the conversion of kraftliner, more competitive, into corrugated board.

The sales volume of containerboard was 568,000 tons, a 35% increase from the 2021 volume, primarily due to the increased volume of Eukaliner® from MP27. Net revenue reached BRL 2,820 billion, a 75% year-on-year increase, due to the combination of increased volume sold and price adjustments that counteracted the negative impact of foreign exchange during the period.



PACKAGING

Due to factors such as the deceleration of consumer goods and the decrease in the tobacco and fruit harvest caused by climate and market-related issues, particularly in Europe, sectors in which Klabin has a significant presence, the Company's corrugated packaging sales volume dropped 8% compared to 2021, totaling 876,000 tons. Net revenue, in turn, was BRL 4,973 billion in the year, an increase of 7% compared to the previous period, reflecting price transfers throughout the year to compensate for cost inflation.

The Industrial Bags business continued to operate at full capacity, propelled by the increasing demand for sustainable packaging, particularly the substitution of single-use plastic.

In 2022, there was a 4% decrease in sales volume compared to 2021, due to the change in the product portfolio, with an increased volume of bags for new applications, such as animal feed, sugar, coffee, and flour. These, being smaller and lighter than bags for civil construction, they take up less volume when measured in tons, but have a higher added value. As a result, net revenue reached BRL 1,217 billion in 2022, a 17% increase due to a better mix of sales and price transfers to offset the cost inflation during the period.



Investments on the road to growth

In 2022, Klabin took another step forward in its Puma II project, which seeks to expand capacity in the packaging paper segment. This was done through the approval of a complementary investment to add the capacity to produce white paperboard made from virgin fibers on MP28.

MP28 will help Klabin meeting the growing demand for sustainable products and paper packaging.

Efforts have also been directed towards the feasibility of projects that will increase the production capacity of corrugated board packaging: the expansion of the Horizonte Unit (CE), increasing the annual installed capacity by 80,000 tons; and the Figueira Project in Piracicaba (SP), to install a high-level factory, with an additional capacity of 100,000 tons of corrugated board per year.

BRL 188 MILLION

were invested to expand the installed capacity of the Horizonte Unit, which is already operational and will increase its annual packaging capacity from 20,000 tons to 100,000 tons.

BRL 1.6 BILLION

is the amount invested to build a corrugated board packaging unit in Piracicaba (SP), slated to begin operations in the second quarter of 2024.

Challenges of forest planning

The imminent start-up of Paper Machine 28 presents a new challenge to the Company, as paperboard has a distinct entry profile in the market, requiring extensive research, experiments, and tests to meet the quality standards demanded by customers for the approval of these products. The impact on the forest area is primarily seen in the maturity and type of forest chosen to obtain the best results in the delivery of the final product.

Klabin has been successful in the planning and integration between the Forestry Unit and the plants, providing a steady supply of high-quality wood and maintaining a competitive edge.

The forest expansion program includes the purchase of wood and the purchase of the expansion base. Klabin has been successful in implementing its expansion program. This program is implemented through land purchase or lease, and rural partnership.



Sustainable finance strategy

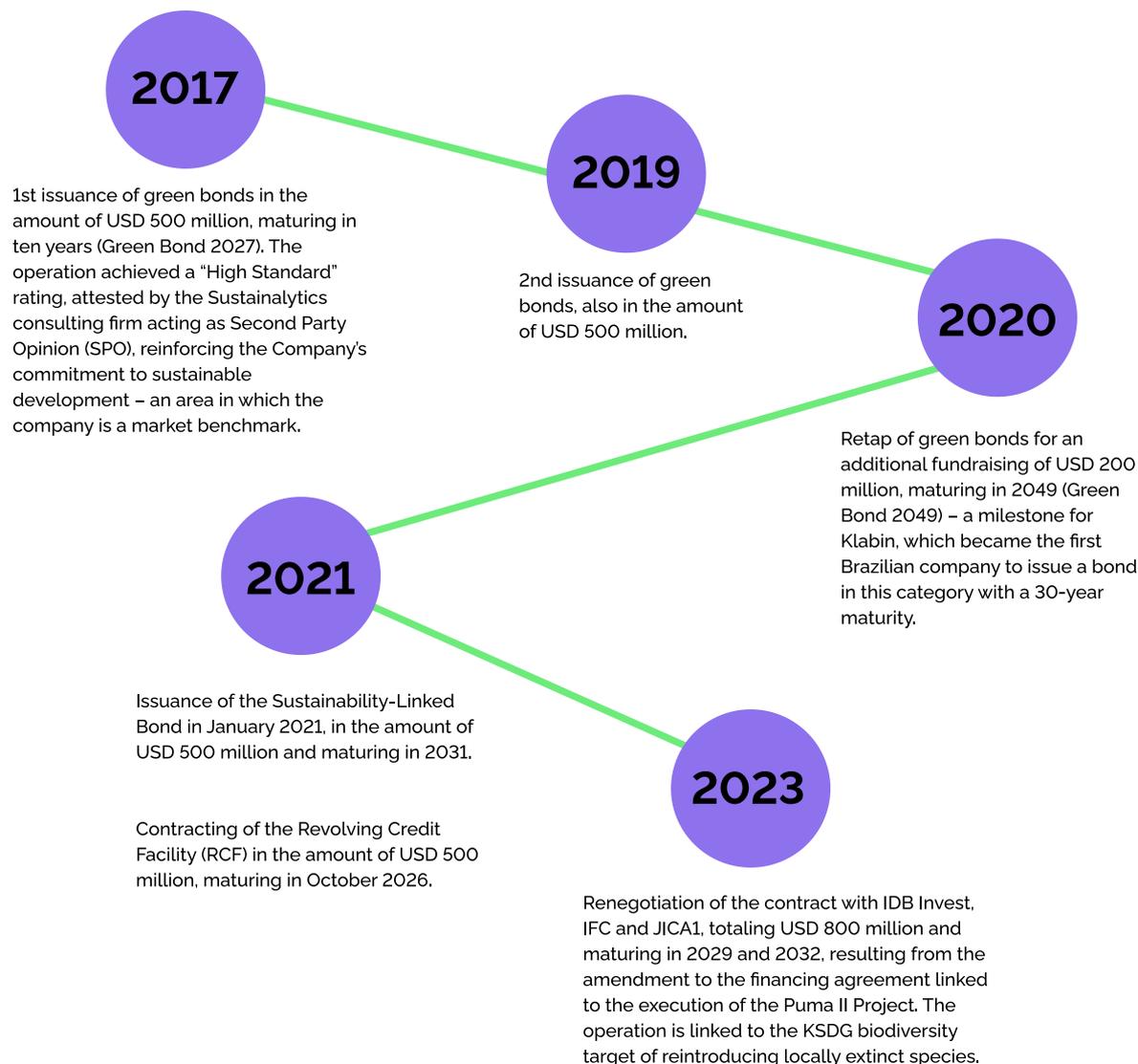
Given Klabin's long-term business model, the sustainability strategy and financial strategy are inextricably linked. The Company's debt profile provides extensive access to the global securities market.

Klabin has 30% of its debts linked to sustainability performance, reaffirming its position as a leader in the segment of debt securities associated with sustainable goals, integrating its financial strategy with the 2030 Agenda and the Company's growth.

In addition to meeting the targets associated with sustainable financial instruments, the actions directed towards sustainability aspects also meets the high international standards required for financing by the International Finance Corporation (IFC), which is part of the World Bank Group and is the largest development institution focused on the private sector in emerging markets.

Participation in the CFO Task Force of the Brazil Network of the UN Global Compact starting in 2022 reinforces Klabin's representation in forums that promote discussions about the role of corporate finance and investments as catalysts for sustainable development.

History of Sustainable bonds



1. Green Bond Transparency Platform developed by the Inter-American Development Bank (IDB) that supports the harmonization and standardization of green bond reporting in Latin America and the Caribbean by providing references to disseminate best practices.

With the Revolving Credit Facility (RCF), the Sustainability-Linked Bond (SLB), and the IDB/IFC/JICA agreement renegotiation, Klabin commits to achieving three ESG goals by 2030, with interim targets in 2025 and 2027. They represent three of the 23 KSDGs, related to reusing industrial solid waste, reducing specific water consumption in the process, and reintroducing threatened or endangered species to the ecosystems where it operates.

Learn more about Sustainable Finance at:

[ESG PANEL →](#)



Klabin has sustainable finance initiatives, of which the Sustainability-Linked Bond (SLB) is part and which earned the Company the 2022 Golden Tombstone Award from the Brazilian Institute of Finance Executives (IBEF).



The case was evaluated as one of the most important financial fundraising operations in Brazil.

Debt management

The increase in operating cash flow measured by Adjusted EBITDA contributed to the Company's debt reduction even during the Puma II investment cycle, resulting in a decrease in the net debt to adjusted EBITDA ratio, measured in US dollars. The ratio stood at 2.6x at the end of 2022, compared to 2.9x in 2021.

The average cost of Klabin's foreign currency debt, the Company's primary source of credit, remained steady at an annual rate of 5.2%. The cost of debt in local currency was reduced to 10.8% annually, due to the adoption of debt dollarization. Currently, about 80% of the company's debt is contracted in dollars.

The pursuit of an extended average debt term is also part of the strategy adopted due to the long-term nature of the business. In 2022, Klabin issued simple debentures that serve as collateral for the issuance of the Agribusiness Receivables Certificate (CRA). With the issuance of BRL 2.5 billion, the largest in the history of CRAs in Brazil, maturing in 2034, Klabin paid off other debts with shorter maturities.

Wood suppliers

The volume of third-party wood to supply the plants has been fundamental in meeting the first cycle of the Puma II Project. Therefore, maintaining solid partnerships with rural producers is an important support to sustaining Klabin's expansion trajectory.

These suppliers are either partners in initiatives such as the Plant with Klabin or are independent producers, subsidized by actions that aim to ensure the quality and traceability of the wood, such as the Madeira Controlada Program or incentives to obtain forestry certifications. In 2022, Klabin used 82% of certified wood (51% of its own wood and 31% of wood from third parties) and 18% of the wood purchased from third parties, with controlled origin, following the FSC® – Forest Stewardship Council® certification regulations (FSC - C007520, FSC - C022516 e C023492).

Due diligence

In addition to adhering to the principles of certification for its own areas (Forest Stewardship Council® (FSC®) Certification (FSC-C020628, FSC-C022516 and FSC-C023492)), Klabin applies strict international wood control standards at all of its wood supply points. Bimonthly audits conducted by an internal team in order to assess compliance with Chain of Custody standards to verify the efficiency of the traceability system.

This bimonthly internal audit process evaluates the documentary issues in 100% of the wood suppliers and is validated with external audit by an accredited and specialized team.

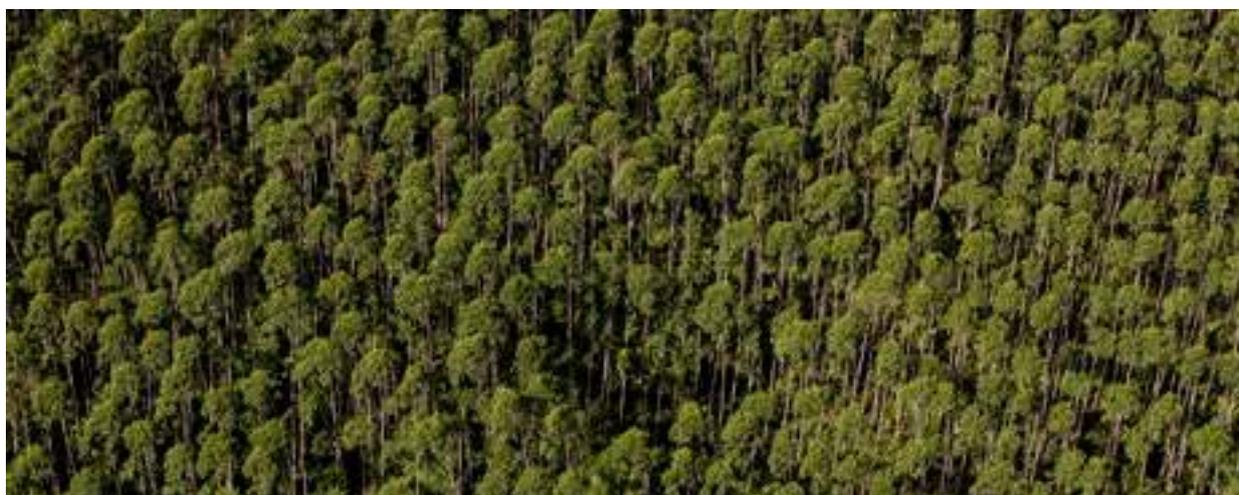
In addition, field checks and technical guidance are carried out on an ongoing basis, strengthening the knowledge of the production chain on aspects of forest sustainability and guiding partners in the certification of their properties.



Madeira Controlada Program: Non-certified timber suppliers are evaluated by Klabin's internal team every two months, according to a specific methodology related to FSC® Chain of Custody Certification (FSC - C007520, FSC - C022516 e C023492). These suppliers are an important part of the supply chain due to the high risks this sector poses.



Klabin invests in the development of rural producers in Paraná and Santa Catarina through the Plante com a Klabin Program. The initiative contributes to promoting income distribution by not concentrating all the available wood under the Company's control, helping to develop forestry and harvesting service providers and bringing economic diversity to the producer within a property.



Certificação Florestal Program: The Certificação Florestal Program for Small and Medium Rural Producers, which considers the FSC® SLIMF standard (created in partnership with Klabin) is promoted in the region of Campos Gerais, Paraná, Santa Catarina and Rio Grande do Sul. The certificate confirms that the timber producer operates with social and environmental responsibility and follows global management standards. In 2022, approximately 111,109 hectares of land owned by small and medium-sized farmers were certified in Paraná and over 7,000 in Santa Catarina and Rio Grande do Sul.

Learn more at:

[PLANTE COM A KLABIN →](#)



Share responsibly

Growth associated with a raw material sourced from planted forested areas is a strategic priority for Klabin and a challenge for the entire industry, which anticipates a scarcity of new land in the future. Land sharing through partnerships, crop diversity and initiatives to reverse the degradation of grazing lands are trends that are already coming to fruition. Klabin not only takes the lead in this agenda, but also works to ensure that the entire sector takes responsibility for driving sustainable development.

Suppliers of products and services

Klabin's size and geographical distribution represent challenges for supplier management. The greatest complexity lies in the relationship with third parties in order to seek qualification and monitoring of these companies in relation to the fulfillment of the Company's ESG requirements.

The value proposition for managing this topic at Klabin is to maintain a strong and resilient value chain based on good practices throughout the entire product lifecycle.

In addition to verification of the origin of the wood used in production, Klabin is committed to maintaining sustainability in its supply process, with evaluation criteria and a focus on ESG indicators, as is already done with its wood suppliers.

The methodology used to evaluate strategic suppliers on criteria of Environment, Labor Practices and Human Rights, Ethics and Sustainable Procurement is EcoVadis, which provides evaluation levels that demonstrate the maturity stage of the suppliers in these requirements. Through the National Pact for the Eradication of Slave Labor, which Klabin subscribes to, the company commits to cross-check data from suppliers that appear on the "Slave Labor Blacklist" created by the Ministry of Labor and Employability, with its own records, seeking to address risks associated with labor practices and human rights.

Sustainable Supply Chain Management

Guidelines in the General Conditions for Supply and Code of Conduct for Suppliers address the adoption of good social and environmental practices that seek the effective management of potential risks associated with Klabin's suppliers activities.

7,528

was the total number of active suppliers of products and services to Klabin in 2022, distributed throughout Brazil.

BRL 7.3

billion was the total spent on suppliers in the period, up 44% from 2021.



Recognition

In 2022, Klabin held the first edition of the Suppliers of the Year Award. Its purpose is to recognize the contribution of its partners, with the goal of strengthening the relationship and promoting the best practices to ensure they are increasingly in line with the values of ethics, transparency, and respect for the environment.

In all, 19 partners were recognized for excelling in 2021 and 2022 in their supply categories. The award ceremony took place during the 5th edition of Inova Klabin in September 2022, and was divided into five main categories - Raw Materials, Forestry, Industry, Logistics, and Corporate Services - as well as two special categories - Sustainability and Innovation.

Learn more about Inova Klabin at:

[INNOVATION MANAGEMENT →](#)

“The seal provides benefits to the entire production chain, such as reducing waste and increasing product delivery capacity, not only for Klabin, but also for other stakeholders. An evolution that directly impacts the financial lives of the families involved.” **”**

Francielle Vieira

FOREST ENGINEER AND
FOREST CERTIFICATION
SUPERVISOR OF SUMATRA,
CONSULTANT FOR
PRODUCERS OF KLABIN'S
FOREST CERTIFICATION
PROGRAM FOR WOOD
SUPPLIER IN SC.



Biodiversity as a key factor for business

Forests are the foundation of Klabin's business, which imposes a great responsibility to take care of the primary source of raw materials for its products. As the quality of planted forests also depends on the quality of native forests and their natural resources, biodiversity is a material topic for the Company, and has the largest set of 2030 targets for 2030 in Klabin's Agenda for Sustainable Development (KSDGs). They include:

- Reintroduce two locally extinct species of fauna and reinforce the population of four other endangered species by 2030.

- Provide one million native tree seedlings to recover degraded areas.

- Have at least six researchers/research partnerships per year.

- Maintain and strengthen the number of native fauna species dependent on high environmental quality forests.

- Map 100% of the hotspots* of trampling of fauna and conduct actions to reduce occurrences.

*Areas with a high rate of fauna trampling, identified by means of heat maps (the more red, the higher the trampling rate).

Forest management

Responsible forest management, through mosaic planting, combines conserved native forests with planted pine and eucalyptus forests and is one of the best examples of Klabin's good forestry practices in this area. This form of management helps to protect nature and its resources, contributing to the enhancement of the productive potential of forests and the conservation of biodiversity through ecological corridors that enable the circulation of hundreds of species of wildlife.

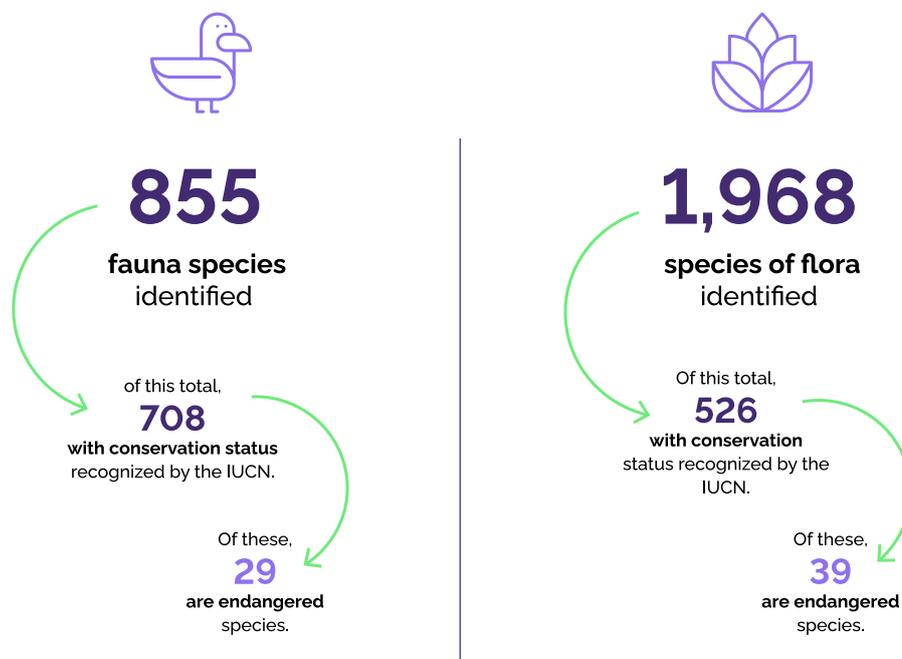
Through the Continuous Biodiversity Monitoring Program, the impacts of forest management on the quantity, distribution, and behavior of fauna are assessed and measures are taken to prevent and mitigate damage to biodiversity, working towards its conservation.

The monitoring, in addition to creating new records, contributes to the preservation and identification of threatened species of fauna and flora in Klabin's areas, enabling the knowledge and continual updating of the biological richness in the monitored areas. As such, it is possible to recognize the permanent species for the farms over time and to identify the maintenance of the conservation of Areas of High Conservation Value (AAVCs).

The Company participates in working groups of the National Action Plans (PAN) for the Conservation of Endangered Species, together with the Chico Mendes Institute for Biodiversity Conservation (ICMbio). The PAN is a participatory management tool for organizing and prioritizing actions to conserve biodiversity and its natural habitats.



Monitoring in 2022



Reintroduction of species

Since 2019, the Klabin Ecological Park in Telêmaco Borba (PR) has been spearheading efforts to reintroduce locally extinct fauna species and reinforce the population of those that are endangered, as listed by the International Union for Conservation of Nature and Natural Resources (IUCN), as well as federal and state lists.

Established in the 1980s, the Park covers an area of nearly 10,000 hectares, of which roughly 91% are composed of native forests. Its activities are focused on the conservation of biodiversity, wildlife rehabilitation, preservation of endangered species, development of scientific research, and support for environmental education projects.

The release of 30 piping guans (*Aburria jacutinga*) in the native forest, since March 2022, has already contributed to the evolution of one of the KSDG targets and which is also a goal linked to the Sustainability-Linked Bond (SLB). The project includes renovations of enclosures in the Ecological Park, obtaining necessary permits and licenses, and other necessary procedures.

In 2023, preparations began for the Vinaceous-breasted Parrot (*Amazona vinacea*) population reinforcement project, a species with a conservation status deemed vulnerable in the region.



Environmental education: Biodiversity Circuit at the Klabin Ecological Park. Photo: Zig Koch.

Natural Heritage Private Reserve (RPPN)

Klabin has two **RPPNs** in its forest areas, which provide numerous **ecosystem services** to the region. The Monte Alegre RPPN is located at the Monte Alegre Farm in Telêmaco Borba, Paraná. The space measures 3,852 hectares and is also an area for scientific research, conservation of local biodiversity and protection of water resources.

The Serra da Farofa Complex RPPN is located in Santa Catarina, measures 4,987.15 hectares and is found in a native environment without interference from forestry operations. With araucaria and high altitude forests, it houses the springs of the Caveiras and Canoas rivers. It is a breeding ground for scientific research, management of natural resources, and upholding of climatic and ecological equilibrium.

Still in the approval phase by the environmental authorities, Klabin has a third area to be recognized as RPPN, Samuel Klabin, located in the municipality of Imbaú, Paraná.



Prosperity for people



Commitment to local development

Klabin has an economic, social, and environmental agenda with the communities where it operates, which includes projects for education and job training, family farming, regional solid waste management, and a program to support public management planning.

The Company seeks to identify impacts of industrial activity, aiming to mitigate them in order to have its operations within the highest standards of sustainability.

Acceptance survey

In the 2022 community acceptance survey, Klabin achieved an average approval rating of 83.6% in the municipalities where it operates, surpassing the 2030 Agenda (KSDG) target of 80% in four out of the six territories surveyed. The survey is conducted annually and its indicator corresponds to the average of eight dimensions: perception of impacts, economic development, environmental preservation, job creation, commitment, image, social stimulation, and business promotion.

The scope of the survey includes the Company's largest operations in the states of Paraná and Santa Catarina, as well as the cities of Paranaguá and Rio Negro (PR), Goiana (PE) and Angatuba (SP), totaling 25 municipalities.

In 2022, Klabin began to take into account the global indicator for managing the topic, calculated by the weighted average of the six territories. Paraná, for example, accounts for 44% of all interviews. Thus, the overall result obtained in 2022, of 83.6%, is four percentage points higher than in 2021, with evolution in all dimensions in the weighted average and greater emphasis on environmental preservation, commitment, social, and business stimulus.

The Company's challenge is to maintain the level of the approval rate already reached, analyzing the responses from each of the territories consulted. One of the issues identified as opportunities for improvement is the need to increase awareness of Klabin's activities in the communities, which can be achieved by reinforcing communication initiatives, for example.

UNIT	TARGET INDICATOR (AVERAGE 8 DIMENSIONS)	BASE (INTERVIEWS)
Paraná	84.5%	1.651
Santa Catarina	85.3%	844
Angatuba	83.2%	393
Goiana	80.8%	501
Rio Negro	79.5%	130
Paranaguá	77.9%	201
Klabin Total	83.6%	3.720



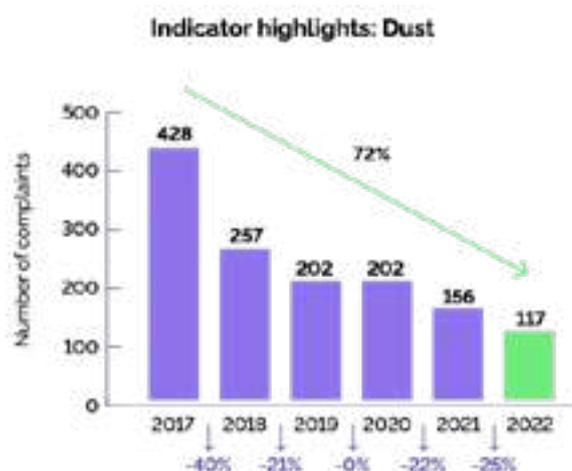
Impact management and engagement

The evolution of the community acceptance index is linked to Klabin's proactive, anticipatory, and ongoing management of the impacts of its operations in the territories. The Company works to prevent or reduce the negative impacts of its forestry and industrial operations, such as dust, unsafe driver behavior, poor road conditions, odors, and factory noise, among others.

The dust created by truck traffic the municipalities where Klabin has a forest operation is one of the primary concerns raised by the communities. The impact is monitored by the rate of complaints per kilometer traveled in communities (total complaints received divided by the total kilometers traveled in communities during the year), which was 0.9 complaints/km in 2022. Klabin's goal is to eliminate dust complaints.

Even with the progress of the results, the Company is challenged by the growth of its operations, which also expands the number of municipalities and communities impacted by its operation. The rate is 25% lower than that recorded in 2021, despite the expansion and increased distance of forestry activities in recent years, as well as the Puma II expansion in full operation.

Year	Municipalities	Communities	Kil. in communities	Dust complaints (annual total)	Goal result (complaints per kilometer traveled)
2016	14	50	-	-	-
2017	17	60	61.14	-	-
2018	16	61	103.4	257	4.2
2019	32	83	116.5	202	2.0
2020	31	132	118.3	202	1.7
2021	39	169	120	156	1.3
2022	55	238	134	117	0.9
2023	58	128	-	-	-





The results indicate the effectiveness of mitigation measures. Examples include the humidification of roads, the use of a coating made up of successive applications of aggregate and bituminous binder, prior analysis for the optimization of transport routes with detours around communities, spot asphaltting, and the installation of individual sprinklers on isolated properties.

The positive impacts of Klabin's actions are amplified through the creation of jobs, support for municipalities in public management programs, and the implementation of social projects, among other initiatives.

Klabin Social Demands

Since 2021, the management of social impacts has been enhanced through the deployment of a system in which all employees can register requests, complaints, questions, and suggestions from stakeholders. Klabin Social Demands (KDS) follows internal guidelines for handling and a review process for the demands, with the timeframe varying depending on the severity of each demand.

KDS was initiated in Klabin's operations in Paraná and was then expanded to units in Angatuba, Rio Negro, Goiana, Otacilio Costa, Correia Pinto and Lages. The Piracicaba, São Leopoldo, and Horizonte Units and the Figueira Project are the Company's next operations in line to receive the tool. In 2022, the system registered 733 demands, of which 515 were complaints. Of these, most referred to traffic violations, dust and poor road condition.

Social risk management

Before launching major projects, Klabin follows a methodology of collecting primary and secondary data from the territory and communities in the area of influence to assess the socioeconomic situation of the region where it has a forest and industrial base and the potential impacts of its operations. The Company has been taking action to strengthen its focus on human rights in assessments and, in turn, enhance the management of risks of this type.

In Parana, where Klabin concentrates significant operations, such as a maritime terminal in the Port of Paranaguá, Puma and the Puma II expansion project, the company, for example, already has a solid knowledge base regarding the territory, which allows for the correct sizing and optimization of the results of active social programs.

Learn more about social risk management at:

[ESG DASHBOARD.](#) →



Puma II Programs

In addition to continuing the corporate social programs already established, such as Klabin Semeando Educação, Support for Public Management, Matas Sociais, and the Solid Waste Program, as of the execution of the Puma II Project, the Company strengthened initiatives to combat violence against women and children in the project's direct area of influence in the Paraná municipalities of Telêmaco Borba, Imbaú, and Ortigueira.

With the support of a specialized consulting firm, structured and high-quality training actions are being promoted to enable service networks to effectively address and combat this violence. The purpose of the initiative is to coordinate, integrate, and standardize actions and procedures between institutions, equipment, services, and programs that comprise the protection network and security and justice systems.



Klabin Semeando Educação Pgram, in the municipality of Congonhinhas, Paraná.

Traditional communities

Klabin identifies and implements measures to seek the protection of the rights of traditional communities (quilombolas, indigenous, and faxinalenses (wood gatherers)) located in a buffer zone of 10 kilometers from the forest management areas. This process is premised on the Free, Prior, and Informed Consent (FPIC) of the communities, and the Company's refusal of prospected areas that border or have an impact on the lifestyles of these communities.

Reports of these activities are regularly audited by certification bodies from banks financing the expansion projects (IFC, IDB), including field visits and interviews with affected communities.

Every two years, the forestry base is reviewed in relation to the mapping and, if necessary, new communities are included in the delimited space of the mapping. The consistency of information and in-depth knowledge of the presence of traditional peoples in the territory enables Klabin to establish closer and more meaningful dialogue with the communities and to include them more effectively in the activities undertaken by the Company.



Within a 10 kilometer buffer of Klabin's management areas in Paraná, Santa Catarina and São Paulo, 170 traditional communities have been mapped, including 101 faxinais (wood gatherers), 52 quilombolas and 17 indigenous lands. These communities were identified through studies conducted over the years and in accordance with the evolution of the Company's forestry base.

Saiba mais em

[PAINEL ASG →](#)

Indigenous Environmental Basic Plan in Ortigueira

Since 2017, the Company has been working with the Kaingang indigenous communities in the Queimadas and Tibagy-Mococa Indigenous Lands in Ortigueira (PR), as part of the Indigenous Environmental Basic Plan (PBAI). This plan was created as a requirement for the environmental license for the operations of the Puma Unit. Highlights of the PBAI initiatives include an audiovisual training program, which began in 2022, with the goal of supporting the Kaingang to strengthen their identities and their territorial and cultural heritage through audiovisual resources and a collaborative production between indigenous people and specialized professionals.

The Kaingang Ecological Corridors Program, however, has a dimension and scope directly related to the scale of the transformations that have taken place in the land ecosystems of the region since the installation of the Puma Unit and that continue during the operation of the venture. Since the program began in 2019, landscapes that are sources of biodiversity have been identified, restoration priorities have been set, and Kaingang ecological corridors have been delineated. In 2023, training will be provided to the indigenous people to facilitate the implementation of these corridors.

The creation and management of scholarships is also part of the PBAI, within the Kaingang Education and Culture Revitalization Program. Since its inception in 2017, the Program has trained 20 professionals in courses such as dentistry, pedagogy, nursing, nursing technician, secretarial, and cashier operations. Another 22 are still enrolled.



Intangible heritage

Klabin takes into account the impacts on intangible heritage when managing social risks, such as the traditional feast of Nossa Senhora do Rocio, which has been celebrated for over 200 years in Paranaguá (PR), where the company's Port Terminal is located.

A research study on the cultural and devotional manifestation and mitigation actions to address the potential impacts of the terminal on the intangible heritage of the festival was recorded in a report at the Institute of National Historical and Artistic Heritage (IPHAN) as a condition of the environmental licensing process for the venture. The initiatives proposed and approved by regional leaders, devotees, and Caiçara communities involved in the celebration include studies for urban planning and revitalization, the creation of an inventory of regional faith festivals, and the training of institutions in the development and management of socio-cultural projects.

The Paranaguá Port Terminal, in Paraná



Social investment platform

Klabin's social investment platform focuses on implementing and supporting social programs that align with four core pillars: local development, citizenship, environmental education, and culture. The following are the main initiatives in 2022.

See all programs supported through the social investment platform at:

[COMMUNITY AND SOCIETY →](#)

Support for Public Administration

Through the Public Management Support Program, Klabin works to ensure that priority municipalities (see criteria below) for the company's operations make significant progress through training and consulting to enhance their planning and the use of public funds (such as the allocation of resources from taxes paid by businesses). The goal is to promote participatory public management in order to foster regional development.

The program is present in 15 municipalities: Telêmaco Borba, Ortigueira, Imbaú, Sapopema, Tibagi, Reserva, Curiúva, Paranaguá, Rio Negro and Ventania, in Paraná; Otacilio Costa, Correia Pinto and Lages, in Santa Catarina; in addition to Angatuba (SP) and Goiana (PE).

In 2022, as part of the program, Klabin provided specialized consulting to develop the Multiannual Plans (PPAs) for the new municipal administrations in 14 cities. Together, they add up to 2,140 actions.

Priority municipalities

By 2030, Klabin has the goal of reaching 100% of priority municipalities through actions to strengthen public management. The criteria used to prioritize municipalities includes: having large or medium-scale operations of Klabin, having high or medium economic dependence on the Company, or having low development indices compared to other municipalities or a GDP lower than the Company's EBITDA. In 2022, 76% of the priority municipalities were contemplated with initiatives to support public management.



Social Progress Index

In 2022, the Social Progress Index (SPI) was launched for 12 municipalities in the mountainous region of Santa Catarina, including Lages, Correia Pinto, Otacílio Costa, and nine surrounding municipalities (Painel, Urupema, Rio Rufino, Palmeira, Ponte Alta do Norte, Bocaina do Sul, Ponte Alta, São Cristóvão do Sul and Bom Retiro). The work is a partnership between Klabin and Fundación Avina, an organization present in 20 countries that promotes the generation of large-scale changes for sustainable development in Latin America.

The SPI has the differential of measuring only social and environmental results with a direct impact on the life of the population, considering three dimensions: Basic Human Needs, Fundamentals of Well-being and Opportunities.

For the SPI of the municipalities in the mountainous region of Santa Catarina, official data from public sources were combined with a perception survey conducted in December 2020 with 1,500 people in 12 municipalities in the region. The results show that the average SPI of the territory's cities was 64.20 in 2021. This means that, on average, the region is over halfway to achieving the Sustainable Development Goals measured by the index.

Klabin has already conducted the SPI for 12 municipalities in the state of Paraná in 2021, as well as the municipality of Goiana, in Pernambuco, in 2019.

Local Development Forums

Since 2018, Klabin has been participating in and supporting the Local Development Forums "Angatuba em Movimento", from Angatuba (SP), and "Goiana em Ação", from Goiana (PE), composed of several representatives from civil society, governments and companies from these territories. The action is linked to the KSDGs for supporting participatory public management, reinforcing the significance of community involvement in enhancing democracy for the development and management of local public policies.

In the 2022 cycle, eight meetings were held with each of the municipalities. In the 2023 cycle, a differential has been the presentation and conceptual detailing of the budget revenues of the two municipalities. Through the meetings, the members gained an understanding of how budgetary logic operates, bolstering initiatives to suggest and propose to the local Public Authority.



Matas Sociais Program – Planning Sustainable Properties

A program that encourages family farming, rural permanence, the sustainable development of the production and consumption chain, and entrepreneurship among farmers in Paraná and Santa Catarina. It is a Klabin initiative developed in partnership with Sebrae and the NGO Association for the Preservation of the Environment and Life (Apremavi). In 2022, we highlight the support for advancing the regularization of the Municipal Inspection Service (SIM) of Products from an Animal Origin in the municipalities of Tibagi, Ventania, Imbaú, and Telêmaco Borba; the support for municipalities to better meet the requirements of the National School Feeding Program (PNAE) and the expansion to the Santa Catarina municipalities of Palmeira and Ponte Alta.

Another highlight of the program is the strategic planning of the Central de Cooperativas da Agricultura Familiar Centro Norte do Paraná, comprised of five cooperatives; and the continuation of the distribution of fruits and vegetables to various markets, including the Feira do Bem, hosted by the Municipality of Telêmaco Borba, which enables the exchange of recyclable waste for vegetables; and the procurement of food for employee meals in the Company's restaurants and for the animals under the care of the PEK - Klabin Ecological Park.



1,000+
properties served since the program began in 2015.



318,000
native seedlings were donated.

BRL 4.9 million

is the total sales that producers in the municipalities of Reserva, Imbaú, Ortigueira, Tibagi, Cândido de Abreu, São Jerônimo da Serra, Sapopema and Telêmaco Borba obtained, after receiving support for the planning and management of fruit and vegetable crops.

5 cooperatives,

with one thousand member families from 40 municipalities, supported by the program through the Central de Cooperativas da Agricultura Familiar Centro Norte do Paraná.

Klabin Semeando Educação

The program provides ongoing professional development for teachers of basic education in Portuguese and mathematics, and also supports the strengthening of school management, benefiting the municipal public school system. Its main objective is to improve the results of official indices, such as the Basic Education Development Index (Ideb). Klabin Semeando Educação is held in 13 municipalities where Klabin operates in Paraná, in five municipalities in Santa Catarina, two in São Paulo and one in Pernambuco. Five cities have already registered an increase in the Ideb. They include: Imbaú and Sapopema, in Paraná; Correia Pinto and Lages, in Santa Catarina; and Goiana, in Pernambuco. In 2022, the program was extended to the municipalities of Itararé (SP), Congonhinhas (PR), Palmeira and Ponte Alta (SC).



291

elementary schools assisted.

1,807

education professionals trained in Portuguese and mathematics.

22,000

education professionals trained in Portuguese and mathematics.

“The Klabin Semeando Educação Program was very important for the improvement of education here. We are delighted with the outcome of this partnership and are confident that the educational development of the municipality will continue to improve.” ”

**Fátima Rodrigues
de Almeida,**
SECRETARY OF EDUCATION OF
SAPOPEMA (PR), A
MUNICIPALITY THAT
REGISTERED EVOLUTION IN
IDEB: 6.4 IN 2022 VERSUS 5.9 IN
2019.

Technical School of Forest Machinery Operations and Mechanics

The Ortigueira Forestry and Agricultural Technical School, Klabin's pioneering project in partnership with the State Government of Paraná and the city of Ortigueira, and the only technical school for forest machinery operation and mechanics in Latin America, held its third graduation at the Queimadas Cultural Center in December 2022.

Inaugurated in 2020 with the goal of becoming a benchmark in training forest operators and mechanics, 106 students have graduated so far, with 44 (41.5%) of them already hired by Klabin, demonstrating the company's commitment to promoting education and job opportunities in the areas in which it operates. The school has a capacity for up to 800 students and an exclusive boarding school for students who enter the full-time format courses.



The institution is the only technical school for mechanics and forest machine operations in Latin America.



Klabin Caiubi Program

The program is focused on training teachers to disseminate concepts of the environment and sustainability and to contribute to the formation of citizens aware of their responsibilities to the planet. The initiative is supported by municipal administrations in the cities where it is held, institutions and professional partners.

Klabin has been promoting the program in Paraná since 2001. In 2007, it was expanded to Santa Catarina and, since 2019, it is also being held in Feira de Santana (BA). Even in the face of the pandemic, the program was conducted virtually in 2021 and expanded to the city of São Leopoldo (RS) and, in 2022, to the municipalities of Angatuba and Jundiaí (SP).



Second edition of the Program held in 2022 in São Leopoldo (RS). Photo: Andrea Graiz.

Over the more than 20 years of the program's existence, 6,527 educators were trained, 499,514 students benefited and 1,804 schools were served.

Solid Waste Program

The purpose of the program is to enhance solid waste management, environmental education in communities, and the working and income conditions of environmental recycling agents. It is conducted in partnership with the Intermunicipal Consortium Caminhos do Tibagi in seven municipalities of Paraná, with the support of ViraSer, which provides specialized technical consulting to structure cooperatives and facilitate partnerships between these groups, the public authority, and society.

In 2022, the first class of Environmental Public Managers of the program was established, with representatives from the seven municipalities, when the Action Plans were drafted and the goals for the subsequent two years were established. Also in 2022, Klabin expanded its initiative to Goiana (PE), making progress in diagnosing the municipality's initial situation, creating a Municipal Plan for Selective Collection, and forming the "Recicla Goiana" recycling agent group.



Since 2021, the Solid Waste Program, which has undergone a new cycle of action and investment, has aided in a 63% increase in the average income of recycling agents, and if the period from 2012 to 2022 is taken into account, the increase was 86%.



Encouragement for sports

The Superação Atletismo project, promoted in Reserva (PR) with the support of Klabin, took athletes to ten competitions, winning more than 100 medals in regional, state and national competitions, one of them in gold, won by João Emanuel Domingues in the Brazilian School Games. He became the first athlete from the Regional Center of Telêmaco Borba to be crowned Brazilian school champion.

Paraná's Ariely Miranda also earned a gold medal in the children's division of the 41st National Artistic Gymnastics Tournament. She is a student at the Telêmaco Borba Artistic Gymnastics Training Center, which Klabin has been supporting for over a decade, and has over 100 children participating.

The Superação Atletismo project, promoted in Reserva, in Paraná. Photo: Rafael Chui.



People management

Continuous learning of employees throughout their careers, encouragement for innovation, promotion of diversity, and a culture of valuing life in a safe and healthy environment are essential for Klabin's growth.

People management at the company is geared towards initiatives that integrate the five material topics of the Klabin 2030 Agenda: management and engagement of professionals, organizational culture, diversity, human capital development, and occupational health and safety.

Klabin's employees

At the end of 2022, Klabin's workforce was made up of 18,482 professionals. The majority of employees are between the ages of 30 and 50, followed by those under 30.

The Company has been steadily increasing the representation of women in its workforce since 2019, when 15% of the total were female professionals. In 2022, women accounted for 24% of the total. The percentage of black people, 35.39% in 2022, has also been increasing in recent years, reflecting awareness actions at all levels and operating units. In 2021, this rate was 32.99%, and in 2020, 30.58%. The rates of people with disabilities in the workforce remained stable in 2020 and 2021 (2.67% and 2.66%, respectively), with a slight increase in 2022, when it was 2.82%.

Gender, intergenerational relationships, and race are some of the aspects of diversity that Klabin considers in its people management, for which it maintains active affinity groups and other initiatives to reach its KSDG targets.

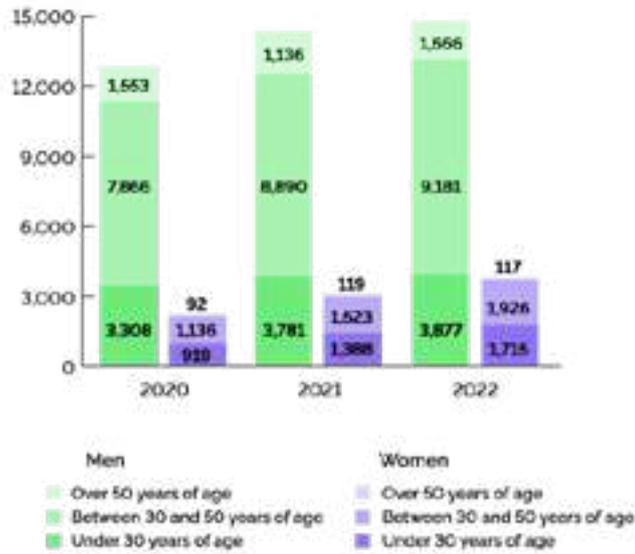
Learn more at:

[DIVERSITY →](#)

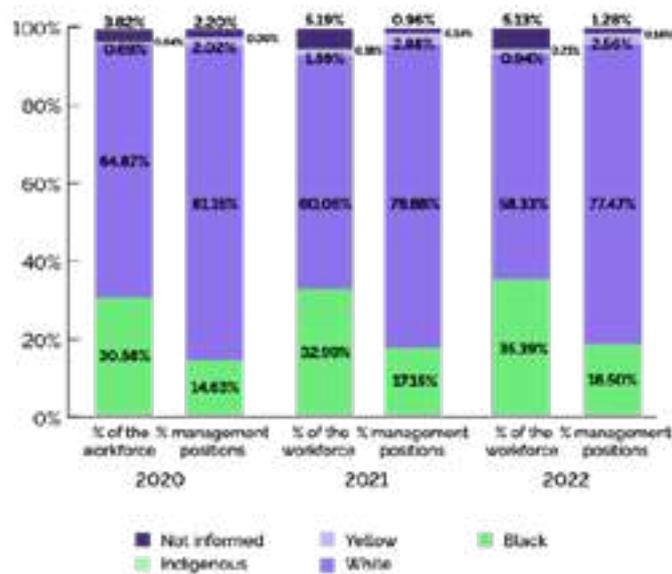




Employees by age group*



Employees by race and ethnicity**



** The numbers of employees consider trainees, apprentices, other employees in the CLT regime and statutory directors.

** Klabın considers the definition of black race as the sum of black and mixed race people, according to the IBGE. Management positions are organized into the levels of Director, Manager, and Coordinator. The ethnic-racial information is made through the employee's self-declaration.



Management and engagement

Klabin's value proposition for this material topic is to ensure that leaders remain dedicated to upholding the Company's strategic direction and values. Taking into account that turnover can lead to changes in an organization's human and intellectual capital, and can have an impact on productivity, turnover rates are important indicators for assessing the organizational climate and the ability to attract diverse and qualified personnel, which can mold Klabin's recruitment and retention practices.

In 2022, Klabin's voluntary turnover rate was 2.53%, compared to 2.16% in 2021. The cumulative rate, which considers voluntary and non-voluntary turnover, was 19.56% in 2022 and 17.81% in 2021.



Employee at Correia Pinto Unit (SC). Photo: Gugu Garcia.

Organizational culture

In its organizational culture model, Klabin strives to balance the appreciation and care for people with economic growth and high levels of productivity and job satisfaction.

One of the key tools for assessing the effectiveness of its human resource management practices is the biennial Climate Survey. In the 2022 edition, the results revealed a solid cultural evolution, capable of sustaining the Company's business and growth. Similarly, highlighted points that continue to challenge the company and for which the management's scrutiny should always be sharpened. See the following infographic.

With 87% favorability in the Climate Survey conducted in 2022, Klabin was among the top 25% of companies in the Korn Ferry consulting firm's ranking.



Climate Survey 2022

KEY FINDINGS		WHAT IT SHOWS
Consolidated strongholds	Focus on the customer, Well-being and respect e Engagement	Engaged employees and respectful and healthy work environment. It needs to be kept.
New highlight	Clarity and alignment	There is a direct correlation with the leader's success in communicating the company's directives to their teams.
Challenges	Meritocracy	Historically sensitive topic for companies. Although Klabin scored above the average of the general market and saw an improvement in the indicator compared to the previous cycle, there is an opportunity to improve communication about the criteria for applying meritocracy in the company, in order to create a more merit-based and humane environment.
	Diversity	Significant evolution, however there are still opportunities for improvement. The theme is very relevant in the Company, with goals for all directors tied to variable compensation.
New challenge	Collaboration	The focus is on the opportunity to improve collaboration between Klabin's businesses.

Challenges and priorities

Klabin's rapid growth rate brings the expectation of increased operational efficiency in the near future. In this context, the people management challenges are numerous and range from increasing comprehension of the company's strategy and the role of each employee to reinforcing safe behavior to prevent workplace accidents, as well as the responsibility to care for and develop the company's succession line. Thus, culture, safety, succession and operational efficiency are the four priorities of people management in 2023.



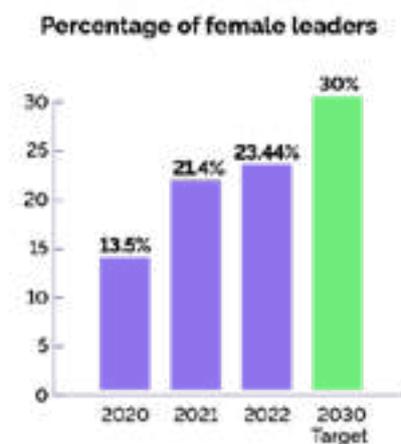
More diverse work environments

By managing diversity as part of the 2030 Agenda, Klabın seeks to create the most value possible to ensure that human diversity is embraced in a secure, inclusive, and open work environment that allows individuals to express themselves freely and creatively.

The initiatives carried out follow the Company's Diversity and Employability Promotion Policy, which has, among its premises, the promotion of practices to value diversity, ensuring that aspects such as race, color, sex, religious or sexual orientation, social origin, appearance, age, physical disability and special needs are not used as a qualification criterion in the composition, development or promotion of the Company's workforce.

The value proposition is challenging and sets public goals of having 30% female leaders and 90% of employees from diverse backgrounds positively evaluating the conditions of respect and equality in the workplace by 2030.

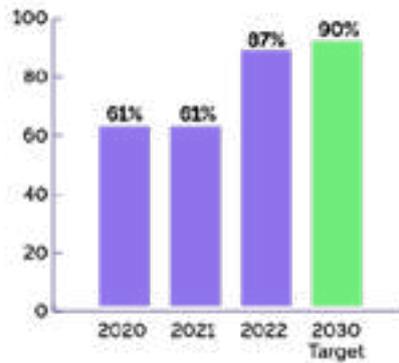
Indicator performance



The growth of more than two percentage points in the number of women in leadership roles, such as coordinators, managers, and directors, is a result of initiatives like ongoing sensitization of leaders, campaigns for gender equality, discussions and actions from affinity groups and the development of internal talents.



Percentage of employees belonging to diversity groups* positively assessing the conditions of respect and equality in the workplace



*The diversity groups considered in this indicator are based on the responses of people who self-identified as members of a minority in terms of gender, race, and sexuality (women, non-binary individuals, trans men and women, black, mixed race, indigenous, and LGBTQIA+) in the 2022 Climate Survey.

Although Klabın achieved 87% in 2022, taking into account the weighted average of all diversity groups, there are still challenges to be addressed when looking at each group individually within the Company. One of the examples is the LGBTQIA+ public, which presented a 75% favorability index. In 2023, Klabın will increase its efforts to include minority groups whose perception of favorability has not yet met the goal, in order to create a more inclusive work environment.

Progress on the topic in 2022

100% OF EXECUTIVE DIRECTORS ASSUMED

diversity targets tied to variable compensation, taking into account gender and racial aspects.

1ST DIVERSITY CENSUS

was conducted at Klabın, with 44% employee participation.

4.1% OF DIVERSITY

survey respondents self-declared LGBTQIA+ or chose not to declare.

AN EXCLUSIVE RESUME BANK

for blacks and people with disabilities was created in the Company, with the goal of increasing the representation of these groups in the workforce.

SIX INTERNAL CAMPAIGNS

were carried out with a focus on diversity, which included sensitization on respect and inclusion within the five pillars established by Klabın: gender, race, LGBTI+, people with disabilities and generations.



Adherence to public initiatives

Klabin is committed to respecting and promoting LGBTQIA+ human rights in the business environment and society by integrating public initiatives such as the Brazilian Forum of Companies and LGBTI+ Rights. It is also part of the Racial Equity Movement (MOVER), a coalition of companies that seeks to be an effective tool in combating racism, with the challenge of reaching 10,000 new leadership positions occupied by blacks by 2030; and Equity is a Priority, a gender equity acceleration program that supports the UN Global Compact and Women Empowerment Principles to set and achieve goals for female leadership.

In 2022, the company joined Rede Mulher Florestal, a non-governmental, non-profit organization with no political affiliations that encourages conversations and the sharing of knowledge between businesses and the public on gender issues, with a focus on including women in the forestry industry.

Employee at Jundiá Unit - Industrial District. Photo: Aparecido Marcondes (HubConteúdo).

Governance of diversity

Klabin's diversity initiatives are the result of a structured governance system that involves the Diversity Committee, comprised of representatives from all units; the People Committee, made up of senior leadership; the Reputation and Brand Committee, responsible for institutional positioning guidelines; and affinity groups.

Diversity has been a recurring theme on the agenda of the Company's senior executive management. Managers in the units are granted levels of autonomy for decision-making related to diversity, with reports to the People Commission every three months.

Reinforcement and continuity of actions

- The Diversity and Employability Promotion Policy outlines the Company's commitment to offering equal opportunities for all in an inclusive work environment.

- Integra Klabin is an internship program aimed at low-income university students. In 2022, 40 young people from this program were hired, which represents 47% of permanent hiring.

- The promotion of campaigns to raise awareness and foster engagement to promote equity and respect for diversity occurs on dates such as International Women's Day, Black Awareness Day, and International LGBTQIA+ Pride Day, as well as throughout the year at events such as Diversity Week, discussion circles, and other communication opportunities.

- The Company is also committed to maintaining affinity groups active to foster welcoming, dialogue, collaboration, and support for corporate initiatives. Five groups are currently active: K entre Nós (actions aimed at gender equity), Black (race and ethnicity issues), Kolors (LGBTQIA+ issues), MultiKlabin (discussion on the intergenerational relationship) and Memoh Klabin (gender, with a proposal to discuss the effects of toxic masculinity).



Strengthening human capital

Qualifying professionals to maintain current, relevant skills helps to strengthen human capital. The effective management of skill development is a critical factor in a evolving work environment, such as Klabin's as it continues to grow.

To define the solutions for human capital development, the Company's strategic alignment, aspects of the organizational culture, results of the Climate Survey, specific business demands and challenges, and Individual Development Plans (IDPs) are all taken into consideration.

The biggest driver for employee development is the Klabin Business School (ENK), which seeks to provide accessible, relevant, and cutting-edge learning experiences.

ENK Portal in 2022

18,600

active users, with 15,500 subscribers to the platform.

194,000+

hours of navigation, which represents an average of more than 5 hours per person.

211,000+

courses have been completed and 253 new pieces of content made available.

Performance and leadership development

Performance Cycle is the platform that brings together the majority of Klabin's people management practices, enabling the connection between targets, results, and feedback, succession and development. The process clearly outlines the desired behaviors and skills of employees, providing a basis for succession decisions in the Company.

The actions focused on leadership development have the primary goal of equipping this audience to meet Klabin's current and future challenges.

- Leadership Journey: one of ENK's tracks. It covers topics related to business, people management, safety, and mental health; these last two were reinforced in 2022 when the Company recognized the need to increase the knowledge and capacity of leaders to address these critical topics with their teams.

- Succession: from the Performance Cycle, successors in the company are mapped out and participate in programs such as those aimed at accelerating development (Fast Track for managers and coordinators) and the Florescer Program to train leaders for coordination positions.



75% of the Board of Directors is made up of professionals who have developed their career within the company itself. The retention of a portion of professionals from the market is considered beneficial.

Targeted learning tracks

In order to strengthen the functional skills of employees in the commercial areas of the business units, enabling them to act in a more entrepreneurial and collaborative manner, Klabin has developed customized learning and training tracks. The project started in 2021, when it was directed towards the Commercial division of the Packaging Business Unit, and was extended to the Paper, Pulp, and Forestry businesses in 2022, as well as the Operational Planning, Logistics and Supplies Directorate.



Expertise and lessons learned

Working groups composed of individuals from various departments at the Puma Unit in Paraná have been actively working since 2022 to prepare employees for the operation of Paper Machine 28, which is scheduled to come online in the second quarter of 2023. The working groups hold regular meetings to discuss technical, quality, safety, continuous improvement, and lessons learned from MP27 to ensure ongoing success. This work model gave rise to structured training actions and has already reduced the time of some training by up to six months.

MP27 Operator. Photo: André Valentim.



Long-Term Incentive (LTI)

In 2022, the Long-Term Incentive (LTI), one of Klabın's variable compensation programs, began to be offered to all employees ("LTI for All"), becoming another important instrument of engagement. Until 2021, the program was only available to specialist, coordinator, and higher-level positions. Membership is voluntary and occurs every year in February. In 2023, 24% of the employees joined the program, while in 2022, the rate was 33%.

How it works: the program grants the employee the right to convert part of their Short-Term Variable Compensation (PPR – Profit Sharing Program) into the acquisition of Klabın Units. In return, for each **Unit** acquired, the employee is entitled to receive an additional Unit from the Company ("Additional Units"), in accordance with the terms and conditions of their respective grant agreements, doubling the value of the investment. After three years, provided that the conditions outlined in the Plan, programs, and grant agreement have been met, the employee will receive the shares and can decide whether to keep them or sell them on the stock exchange.

Since 2022 was the first year of "LTI for All", Klabın provided financial education to its employees and their families. With a social bias, the educational track sought to address the financial organization and teach how the variable income market works, and how there are gains or losses.



Health gains an expanded agenda

In addition to taking precautions against the spread of the coronavirus, efforts to promote the mental health of employees and to maintain a balance between personal and professional life were intensified in 2022. Topics related to mental, physical, and social health, including suicide prevention, were disseminated in lectures and campaigns, and were included on the agendas of various forums in the different Klabin units, as part of the Viver Bem Program's initiatives.

The greatest challenges lie in providing knowledge and support to leadership to recognize potential accident-causing behaviors within their teams. To this end, the Company has been reinforcing training, qualification and engagement actions.

Attention and care

- Mental health mentoring, with the distribution of a handbook for leaders and a case study on the topic on the ENK Portal.

- Roundtable discussions with leaders on the role of management in mental health, featuring the participation of over 650 managers.

- For non-leaders, 20 roundtable discussions were held, encompassing more than 400 employees.

- Joining the Mind in Focus movement of the Brazil Network of the Global Compact, which encourages the development of mental health programs in businesses.

Parental leave

A member of the Federal Government's Citizen Company Program, Klabin offers parental leave to all employees, without discrimination of gender, and sexual orientation, among others, also applicable to cases of adoption, with 20 days of paternity leave and 180 days of maternity leave.

In 2022, 697 employees took advantage of the benefit, totaling 39,380 days of leave. The rates of return to work after the end of the leave were 100% in both cases. The retention rates, which indicate the length of time employees remain with the company after returning to work, were 89% and 79% for men and women, respectively. These indicators are important references for people management at Klabin.

Workplace safety

The guidelines and procedures of Klabin's Occupational Health and Safety Management System (OHSMS) are focused on preventing losses and improving processes on an ongoing basis to protect the lives, health, and physical well-being of people. This system is supported by the dissemination of the health and safety culture.



The Life Protection Policy, launched in 2022 and communicated to the entire Company, serves as an important guide in the pursuit of a mature safety culture. The document highlighted non-negotiable values and expected performance by all in Safety, as well as concepts and their differences, such as error and violation, and their correlation with the environment's vulnerability to potential accidents, providing a basis for secure decisions.

In this regard, Klabin has encouraged managers to recognize the importance of creating a work environment in which employees feel comfortable discussing any issue with leadership, such as unsafe conditions, and to promote an understanding of psychological safety within the Company, a process that presents a challenge.



Employee at Jundiá Unit - Industrial District. Photo: Aparecido Marcondes (HubConteúdo).

Indicators

Managing safety indicators takes into account the relationship between accident rates and the company's capacity to manage risks in its daily routine. The analysis from this perspective provides greater clarity on the effectiveness of the actions and their impact on the results achieved.

In 2022, for the fourth year in a row, there was a decrease in the frequency rate of accidents resulting in time off among direct and indirect employees, reaching 1.34, and in the severity rate for the third consecutive year, which reached a rate of 55. Both reached historical records. The consistency of the indicator demonstrates that efforts to manage safety-related risks have yielded results.

Among direct employees, the frequency rate of accidents resulting in time off was 1.59, a year-over-year reduction of 23% in 2022; among indirect employees, this frequency rate of 1.11 represented a y-o-y reduction of 15%.

However, Klabin regrettably recorded six lives changed (high-consequence work-related injuries, excluding fatalities) in 2022, which highlights that there are still challenges regarding the promotion of safer and more secure work environments and reinforces the need for the Company to remain focused on its purpose of safety and protection of life.



Risk management and safety governance

Continuous improvement is applied daily to established processes, such as risk analysis tools and work permits, which is essential for achieving consistent results.

Recently, processes have been established to enhance the governance of the topic. One of them is the establishment of a dedicated coordination for logistics operations, which has already been able to achieve closer ties with transport companies, which is a major step towards engaging suppliers in safety.

Unlike occupational safety, process safety seeks to enhance risk management capabilities through processes, management of critical elements, and risk mitigation in more sensitive plants. With this, the company has been intensifying its risk assessments and has established a committee to address fire risks, enabling it to make progress in prevention and equipment readiness for emergency response at Klabın.

An audit process conducted on 100% of operations revealed that adherence to critical operational requirements had increased by more than 12 percentage points, demonstrating the Company's growth in its ability to manage these risks.



R&D and Innovation



Research, development and innovation

Work in the present to build the future. With this vision, the Research, Development, and Innovation team's performance is directly connected to Klabin's growth strategy and sustainable outlook, helping to increase the Company's competitiveness.

Whether it be in increasing forest productivity, enhancing industrial processes, developing multi-purpose products that are renewable, recyclable, and biodegradable, or managing impacts on the value chain, investments in R&D+I, which totaled BRL 63.9 million in 2022, have been essential.

Managing the impacts of its operations continually challenges Klabin and its R&D+I area to focus on creating value in the circular economy chain.

Performance focused on new opportunities in:

- Improvement or creation of processes.

- Product development.

- New applications for the products that the company manufactures.

- Development to meet customer needs.

- Contribution to the circular economy.

Technology Center

The Klabin Technology Center (CTK) in Telêmaco Borba (PR) completed five years of operation in 2022, transforming the relationship between the Company's industrial and forestry areas. CTK provided the company with a robust structure to replicate processes, simulate manufacturing, and expedite product development.

INDUSTRIAL DEVELOPMENT

focused on incrementally improving Klabin's portfolio products and refining processes.

FOREST DEVELOPMENT

focused on incrementally improving Klabin's portfolio products and refining processes.

RESEARCH

to add barrier properties to paper, always focused on protecting human health and consumption.

Innovative solutions that were born at CTK

In 2022, a partnership with the Chemical and Textile Industry Technology Center (SENAI CETIQT) resulted in a project to develop an antiviral coating for application on kraft paper, composed entirely of organic components and free of any metals. The coating is primarily designed for e-commerce packaging and has already undergone research and efficacy tests to deactivate the coronavirus (SARS-CoV2) conducted by Bio-Manguinhos/Fiocruz, one of the most highly regarded organizations in the country in the development of immunobiologics. See below other innovations developed at the Klabin Technology Center.



Eukaliner®: the first kraftliner in the world made entirely from eucalyptus fiber, which began to be produced on a large scale last year at the Puma II Project on Paper Machine 27, was also developed at CTK. The product offers a range of advantages that make it stand out in the market, including a reduction in weight of more than 10%, keeping strength and lightness to the packaging, lower energy consumption during conversion, and improved printing surface, among other features.



Klamulti Premium: a lightweight and durable paperboard designed for the beverage packaging market (multipack) that contains microfibrillated cellulose (MFC), resulting in a significant improvement in properties and performance.



EkoMix: packaging for cement made with 100% dispersible paper can be seamlessly integrated into the concrete mixing process during preparation. One of the primary advantages of this solution is the decreased disposal of waste at the construction site, providing even more efficiency to production.



PineFluff eXcel: fluff pulp made from a blend of eucalyptus hardwood and pine softwood, with a focus on the hygiene products market (including infant and adult diapers, feminine pads, and hygienic carpets for pets).



Hand sanitizer: In 2020, at the start of the Covid-19 pandemic, researchers from Klabin's Technology Center, in collaboration with the Senai Institute of Innovation in Biosynthetics and Fibers and the cosmetics company Apoteka, developed a novel formulation of hand sanitizer made from microfibrillated cellulose (MFC). At the time, over four tons of the product were donated to various organizations and hospitals in the areas where the company operates.



The customer experience at Klabin

With the opening of the Packaging Technology Center (CTE) in 2022, Klabin will strengthen the customer's experience of being immersed in the Company's culture of innovation and enhance the product co-creation processes. With the goal of becoming an experiential center, the new structure is in the Jundiaí Tijuco Preto Unit, in the interior of São Paulo.

CTE aggregates a portfolio of projects in collaboration with customers from multiple industries, to address a variety of challenges. Some examples include: packaging for transporting and protecting furniture, adding new functionality for reuse; the sack kraft paper bag model laundry bag for packaging uniforms in factory operations; and the development of a new concept in packaging for paints and optimization of the production process.

The latter is already being produced by Klabin at the Suzano Unit (SP). The packaging, made of corrugated cardboard, is designed for Suvinil's line of water-based varnishes and replaces the tin packaging. The product is packaged in a plastic bag made of 100% virgin material, and enclosed in a cardboard box. Easy to handle, 100% recyclable, and with a lower environmental impact than metal gallons, emitting less CO₂, the product meets the customer's demand for a more practical and sustainable packaging than the previous one.



Forest development

Klabin's growth strategy is directly connected to research and development initiatives to enhance the productivity of its forests. Interactions between the factors that exist in the environment (such as soil, water, animal and plant species, and temperature) are always evaluated for the management of pine and eucalyptus forests, aiming to maximize the productive gains of each species in the regions where Klabin operates and in all ongoing forest expansion projects.

To that end, the Company has specialists in the areas of genetic improvement for eucalyptus and pine, biotechnology and cloning, nutrition and forestry, **ecophysiology**, forest protection and wood quality.

The assessment of the wood to be purchased and its effect on the final quality of the pulp are also within the purview of Klabin's R&D department.

Technology for monitoring anthills

The pilot project for monitoring ant hills using embedded radars on drones has the unique ability to accurately identify underground colonies, expanding and strengthening monitoring and control efforts of leaf-cutting ants in planted forests. The monitoring of leafcutter ants is an ongoing activity in planted forests, as the insect has a high potential to cause damage, potentially reducing crop yields productivity by over 15% if not managed. The project was developed in collaboration with Radaz, an expert in Remote Sensing Radar, and Universidade Estadual de Campinas (Unicamp).

“ The information obtained from the SAR (Synthetic Aperture Radar) system was processed using an image-oriented deep learning technique, resulting in an anthill detection rate of 80% with no false alarms. ”

**Gian Carlos Oré
Huacles,**

PHD STUDENT IN ELECTRICAL
ENGINEERING AT UNICAMP.
RESPONSIBLE FOR THE
PROJECT.



Eucalyptus seedlings, in Santa Catarina. Photo: Anna Carolina Negri.



From the forest to the forest

The use of potassium sulfate in forest fertilization is another example of Klabin's extensive research. The installation of a plant for the production of this chemical compound at the Puma Unit (PR), from the recovery of potassium (an element present in wood and not used in the industrial process) extracted from the ashes generated in the recovery boiler and was preceded by a research effort that included chemical analysis, technical review, tests, definition of an operational model, and other processes, leading to the recommendation of its use in the forestry sector as a substitute for potassium chloride.

The project provides financial benefits by reducing the need to purchase fertilizers from the market and allowing for the recovery of a component of eucalyptus wood, returning it to the soil as fertilizer. By doing so, Klabin takes another step towards a **circular economy**.

Learn more at:

[WASTE MANAGEMENT →](#)

Precision forestry

Although Klabin adheres to the highest standards in its operations, it recognizes that this is an ever-evolving process. Soil mapping is an activity with high potential for improvement. Therefore, the Company has developed precision forestry, driven by the increasingly detailed knowledge of the soil – similar to the well-known concept of **precision agriculture**. With this, soil preparation recommendations, for example, can be customized for each type of soil, resulting in increased productivity and reduced cost.

The primary challenge for the Forestry Unit is to utilize applied science – such as precision forestry – to gain both in terms of forest growth and cost savings when expanding the forest base.

Productivity that comes from research

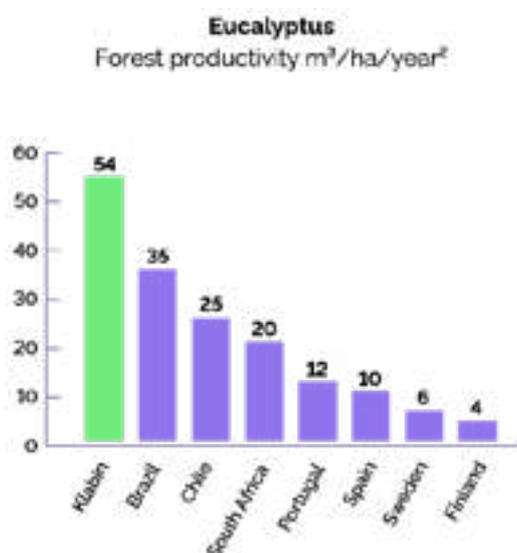
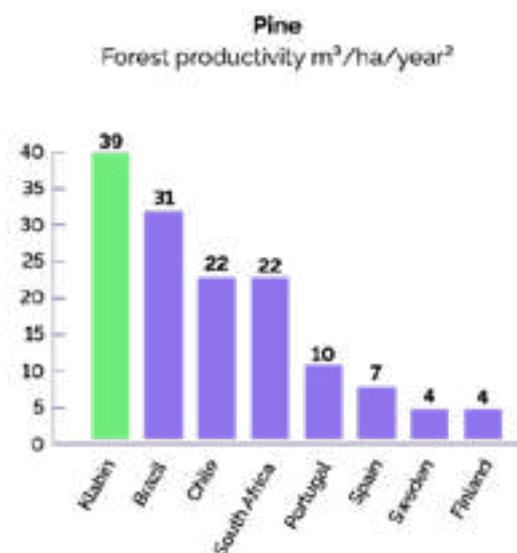
Since it began planting eucalyptus forests with market clones in its operations, Klabin has been continuously improving the development of clonal materials. Every two years, the Company releases new clones to be incorporated into its planting program, which has had a significant impact on boosting the productivity of the company's forests. The developed clones show 20% more productivity, when compared to the operational market clones planted previously.

A similar evolution is seen in the plantations of the mountainous region of Santa Catarina, where the company's R&D has had a strong impact on the development of frost-tolerant clones, which now have yields above the national average for eucalyptus. The productivity evolution in this case was 19% since the beginning of the project in 2007. In addition to being more productive, these clones have greater resistance to pests and diseases, as well as higher fiber yields at Klabin's factories.

Currently, Klabin has eight clones protected in Paraná and six in Santa Catarina. Another eight clones, which are in the semi-operational phase, will be registered and protected by the Ministry of Agriculture, Livestock and Supply soon.

It is no different for the pine genus. By selecting new sources and utilizing genetic improvement through the selection of superior families, it is possible to increase productivity in pine forests by up to 12%. In order to achieve this gain, Klabin began commercially planting the new materials, produced through vegetative propagation, on 1,000 hectares in 2022.

The development of genetic materials of pine through vegetative propagation has also been gaining prominence. In 2022, seedlings with new genetic materials, which increase forest productivity by 10-12%, were planted across one thousand hectares of forest areas, the largest area planted with these materials to date by Klabin.



Ingredients for sustainable applications

Through Research, Development, and Innovation, it is possible to draw components from forests for a variety of applications. Klabin has made strides in developing more sustainable applications for its products, seeking out renewable and biodegradable barriers (such as oxygen, water vapor, and fat) to meet the needs of conscious consumers. The Company's R&D+I work in this area is increasingly directed towards these applications. One example of the area's vitality and the increased demand is that, in 2022, Klabin's laboratories and Technology Center began operating in shifts.



Solution in corrugated cardboard packaging for frozen foods.

From development to application

The Research & Development team, which started with four people, currently has 66 professionals who work in two shifts, a differentiated structure for an R&D team around the world. The Pilot Plant Park, which began operations in 2019, is responsible for delivering a variety of MFC products to the market.

R&D Development

INGREDIENTS DEVELOPED	APPLICATION
Microfibrillated cellulose (MFC) is a microparticle of cellulose that provides properties such as increased mechanical strength of paper due to the ease of intertwining of microscopic-sized fibers, as well as other properties.	Beverage packaging, cosmetic products, water-based paints, hand sanitizer, cleaning products.
Lignin: a natural polymer and component of wood used in pulp manufacturing, separated after the cooking process, being a renewable alternative to petroleum-based products.	Resins and plastics, facilitating the biodegradation process.
Turpentine: a chemical extracted from pine, either in the cooking of wood in the production of paper or directly from it.	Pharmaceutical industry, food industry, cosmetic products.
Crude tall oil – unrefined – produced after acidulation of black liquor soap (extracted from pine) present in the chemical recovery process of pulp production.	Resins, cosmetics, fuels and hot glue.



Partners in Brazil and abroad

Investing in R&D+I for the development of new products and partnerships with other organizations is a target that is included in the Klabin 2030 Agenda. In 2022, BRL 43.6 million was invested in research, development, and industrial innovation, and BRL 20.2 million in the forestry R&D+I sector, representing increases of 70% and 29%, respectively, compared to the amounts invested in 2021. The organizations Klabin partnered with in 2023 are listed below.

- Associação Brasileira Técnica de Celulose e Papel (ABTCP) [Brazilian Pulp and Paper Technical Association]
- Comitê de Produtores – Tappi Nano [Producers Committee – Tappi Nano]
- Embrapa Florestas
- Escola Superior de Agricultura Luiz de Queiroz (Esalq)
- Melodea
- Pine Chemicals Association International
- Research Institutes of Sweden (RISE)
- National Industrial Training Service (Senai)
- Unicamp
- University of Karlstad (Sweden)
- University of Leuven (Belgium)
- University of Toronto
- North Carolina State University (NCSU)
- Universidade do Estado de Santa Catarina
- Universidade Estadual de Ponta Grossa
- Universidade Federal de Lavras
- Universidade Federal de Uberlândia
- Universidade Federal de Viçosa
- Universidade Federal do Espírito Santo
- Universidade Federal do Paraná
- Universidade Federal do Rio de Janeiro
- VTT Technical Research Centre of Finland



Innovation management

Innovation is an important driver for Klabin's business. It can integrate the development of new products in the Technology Centers, but can also initiate an open innovation process, involving multiple areas of the Company or external partners.

The Company's strategy for innovation is to access a global network of contacts, facilitate the combination of projects and available opportunities in the market through innovation programs and incentivized projects, share knowledge, and create value for the company and society.

The main figures of the 2022 initiatives are: databases with over 2,200 startups, 40 proofs-of-concept (PoCs) conducted in various areas of the organization, more than 10 collaborations with universities, 12 pitches conducted, and 4 intrapreneurship projects with employees.

The Innovation Committee is responsible for the governance of innovation projects at each of Klabin's business units. Every two months, the project pipeline is prioritized, roles and responsibilities are defined, and performance indicators and goals are tied to the compensation of the Company's executives. Above the Innovation Committees of the business units lies the Innovation Commission, comprised of the directors of each unit, as well as other members, with the purpose of deliberating on the progress, implementation, and prioritization of projects on a corporate scale.

Learn more about Klabin's open innovation programs on the:

[INOVA KLABIN →](#)

Examples and experiences at Inova Klabin

Inova Klabin, held since 2017, was born with the challenge of promoting dialogue with employees, customers, suppliers and partners about the challenges of the future, in addition to providing visibility to the innovative solutions already adopted by the Company. It was the way found to make the work done in the company tangible, by sharing examples and experiences. The experiences offered to the public go beyond simply demonstrating the production or application of a product and involve practical demonstrations of innovation focused on sustainability in everyday life and in the event's very conception.



Public had contact with practical experiments and collective constructions.

Sustainability as a principle

The fifth edition of Inova Klabin, held in September 2022 at Ibirapuera Park in São Paulo, featured immersive activities in journeys related to five pillars – Biodiversity, Climate Change, Circularity, Klabin Initiatives, and New Business –, bringing together employees, customers, and suppliers for an entire day.

Each of the pillars enabled the public to engage with topics of extreme relevance from the perspective of innovation and sustainability, through practical experimentation and collective building. The days were envisioned by Klabin and constructed collaboratively in partnership with renowned institutions and individuals in each of the topics.

To minimize environmental impact, Klabin conducted a study to calculate the emissions resulting from the event, which were offset by planting six trees for each ton of CO₂eq in an area where the company operates and in partnership with SOS Mata Atlântica. It also had the premise of being zero-waste and employed processes such as composting the organic material generated throughout the day, as well as donating the remaining waste to partner communities and organizations to facilitate recycling and reuse in line with the concept of circularity.

Learn more at:

WASTE MANAGEMENT →



NEUTRALIZED EMISSIONS:

the event's emissions, including participant travel, totaled approximately 70 tons of CO₂eq, which were fully offset by the planting of 422 trees in partnership with Fundação SOS Mata Atlântica.

100%

of the organic material generated at Inova Klabin was composted, and the remaining waste was sent to partner communities and organizations for recycling and reuse.

MAIS DE

2,600+

pieces of corrugated board furniture produced for the event's decor.

885

pieces of corrugated board furniture produced for the event's decor.

"It is not just about incremental changes over time, but disruptive changes, changing the system in which we all operate."

John Elkington,

global leader in corporate responsibility and sustainable capitalism, guest speaker at Inova Klabin in 2022





Glossary



Bio-oil: a black liquid obtained through the pyrolysis process, in which biomass is subjected to high temperatures in an isolated environment with little or no oxygen. It is mainly used as a fuel for heating and the generation of electrical energy.

Biomass: all organic matter of plant or animal origin used for the purpose of producing energy.

BOD₅: biochemical oxygen demand. This is a standard test, performed at a constant temperature and during a five-day incubation period, to measure the oxygen consumption in water. It is measured by the difference of the amount of dissolved oxygen (DO) found before and after the incubation period.

Brazilian Association of Business Communication (Aberje): the main national reference center in the production and dissemination of knowledge and business communication practices.

Brazilian GHG Protocol Program: created in 2008, it is responsible for adapting the GHG Protocol method to the Brazilian context and for developing calculation tools for greenhouse gas emission estimates.

CDP: international non-profit organization that analyzes and recognizes the efforts of companies worldwide to manage the environmental impacts of their activities.

CFO Task Force: group of chief financial officers from 60 companies that are part of the UN Global Compact movement. The group committed to investing, over the next five years, more than USD 500 billion in the SDGs (Sustainable Development Goals) to promote a collective work of greater integration of these SDGs both within their own organizations and outside of them, seeking to attract new partners to the initiative.

Circular economy: an economy that keeps materials and products in circulation for as long as possible. The goal of the circular economy is to reduce waste by optimizing the design of materials, products, processes, and business models, utilizing materials that are recyclable, recycled, compostable, and/or biodegradable.

Climatology: the scientific study of climate, defined as weather conditions calculated over a period of time.

CO₂eq: carbon dioxide equivalent is the unit for converting all greenhouse gases (GHGs) in terms equivalent to the amount of as if they were CO₂, considering their planet-warming potential. It is the result of multiplying the tons of GHG emissions by their global warming potential.

COD: chemical oxygen demand. This is an indispensable parameter for studies on sanitary sewage and industrial effluents. It assesses the amount of dissolved oxygen (DO) consumed in an acid medium that leads to the degradation of organic matter.

COP27: The Conference of the Parties or COP is within the scope of an international treaty established by the United Nations Framework Convention on Climate Change (UNFCCC). It is the ultimate decision-making authority governing efforts to control greenhouse gas emissions. COP27 was held from November 6 to 18 in Sharm El-Sheikh, Egypt.

Crude Tall Oil (CTO)/ Tall oil: raw vegetable oil (crude) – unrefined – produced after the acidulation of the black liquor soap (extracted from pine) present in the chemical recovery process of the pulp and paper industries. Because it is a renewable forest-based oil, this ingredient can replace other petroleum bases, making its applications more sustainable.



Debottlenecking: the elimination of points (bottlenecks), within an industrial system, that limit the final production capacity, reducing productivity rates.

Dow Jones Index Score: companies participating in the Dow Jones Sustainability Index selection answer an extensive questionnaire, which is sector-specific. The questions, based on pre-established criteria, have different weights, thus resulting in an overall score for the company, which is a determining factor in its inclusion in the DJSI.

Dow Jones Sustainability Index (DJSI): a global indicator of financial performance. It was launched in 1999 as the first indicator of the financial performance of leading companies in sustainability at a global level.

Ecophysiology: the branch of comparative physiology that studies the physiological diversity in relation to the environment and its impact on the ecology of organisms.

Ecosystem services: the services that nature provides to mankind and that are indispensable for its survival, associated with the quality of life and well-being of society.

Financial Stability Board: an international body that monitors the global financial system and makes recommendations about it. It was established after the G20 summit in London, in April 2009, as a successor to the Financial Stability Forum.

GHG: greenhouse gases. These gases are those that absorb part of the sun's rays and redistribute them in the form of radiation in the atmosphere, heating the planet in a phenomenon called the greenhouse effect. Carbon dioxide (CO₂); methane (CH₄); hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) used in aerosols and refrigerators are examples.

Hydrosolidarity management: set of practices that enables proper guidance on the use of land and other natural resources in order to produce environmental goods and services, without affecting the soil and water.

IFC/IPCC: Intergovernmental Panel on Climate Change. Created by the United Nations Environment Program (UN Environment) and the World Meteorological Organization (WMO), it aims to provide policy makers with regular scientific assessments of climate change, its implications and possible future risks, as well as propose adaptation alternatives and damage mitigation policies.

International Accounting Standards Board (IASB): the international non-profit organization that publishes and updates the International Financial Reporting Standards – IFRS.

International Financial Reporting Standards (IFRS): accounting standards issued by the IFRS Foundation and the International Accounting Standards Board.

Low-carbon technologies: processes, equipment, systems, and resources that aim to reduce the emission of greenhouse gases, such as carbon dioxide (CO₂).

Precision agriculture: set of practices that use data collected in the field to promote the management of the plantation in a more efficient and assertive manner. The technologies provide a more comprehensive view of the production system, enabling the optimization of inputs, which in turn contributes to increased productivity and reduced environmental impacts.

Racial Equity Movement (MOVER): movement formed by 47 Brazilian companies that intend to work on the structures that perpetuate inequality in the country, breaking patterns and providing equally possible achievements for all.



RPPN: acronym for Natural Heritage Private Reserve. It is a private domain conservation unit (UC) category, whose objective is to conserve biological diversity. The creation of a UC does not affect the ownership of the property. In addition to contributing to the expansion of protected areas in the country, private reserves help to protect the biodiversity in Brazilian biomes.

Sexual harassment: a single act or repeated action in which a person, who may be a woman or a man, is embarrassed by a hierarchical superior, or by another person who has some type of ascendancy inherent to the exercise of the position, with the intention of obtaining sexual advantage or favor.

Tag along: a mechanism for protecting a company's minority shareholders, which guarantees them the right to leave a company if the company's control is acquired by an investor that was not previously part of the company.

UN's Global Compact: initiative promoted by the United Nations (UN) to engage companies and organizations in the adoption of ten universal principles in the fields of Human Rights, Labor, Environment and Anticorruption Practices, to develop actions aimed at addressing society's challenges.

Unit: also known as a Stock Certificate, is a package of shares traded on the Stock Exchange, composed of 1 common share and 4 preferred shares.

Water body: generic designation for any water source: watercourse, river stretch, artificial or natural reservoir, lake, pond or underground aquifer.



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