Klabin S/A - Climate Change 2022

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

For 123 years, Klabin has been part of the daily lives of millions of people by creating customized sustainable solutions for various industrial sectors. Klabin is the Brazil's largest paper manufacturer and exporter and the country's leading producer of papers and paperboard for packaging, industrial bags and corrugated board packaging. Moreover, we are the only Brazilian company to simultaneously supply hardwood pulp (eucalyptus), softwood pulp (pine) and fluff pulp to the market.

Founded in Brazil in 1899, currently has 23 industrial units, with 22 units distributed in ten Brazilian states and one in Argentina. Klabin also has commercial offices in various Brazilian states, a branch office in the United States, Austria, and sales representatives and agents in many countries. Recently, in 2020, Klabin acquired five units from International Paper.

The paper and paperboard for packaging manufactured, as well as corrugated board packaging and industrial bags offer protection and safety to foods, beverages, hygiene and cleaning products, electronics and consumer appliances, cement, seeds, wheat flour, chemical products and other items.

Klabin's Integrity Program comprises a series of procedures to prevent, detect and remediate conduct that could expose Klabin to undesirable situations, while also implementing best global practices related to the matter. In this way, Klabin demonstrates its commitment to building ethical relationships, contributing to a more transparent business environment, strengthening its image, reputation and business strategy and helping to build a more just and sustainable society. The program, which is aligned with the UN Sustainable Development Goals (SDG), targets anyone who works or interacts with Klabin in the public or private sectors.

We are a global reference in sustainable development. Our forestry and industrial operations are based on this concept to help preserve biodiversity and the ecological balance of the ecosystems surrounding our operations. Klabin's sustainability policy integrates the entire production chain to offer the market environmentally responsible products.

To Klabin, sustainability is the continuous creation of value that prioritizes balance among the economic, social and environmental dimensions. We are a unique forestry company with a responsible management that is committed to biodiversity. We work in collaboration with our clients and suppliers, always guided by innovation and the constant improvement of our products and processes. We together to foster the engagement and development of our people and local communities to achieve increasingly better and sustainable results for the entire value chain.

We directly and indirectly influence the social and economic dynamics of the communities living in the cities where we operate. More than just offering good job opportunities, Klabin invests in the region so that the entire population benefits from initiatives in the areas of local development, education, culture and environmental education. Klabin also offers its employees programs to promote their personal development and volunteer initiatives.

All of Klabin's operations incorporate into their strategy environmental management aspects, such as water, energy, climate change and biodiversity. In this way, the company strengthens its commitment to preserve natural resources, such as by working to reduce the use of non-renewable resources, controlling environmental impacts, monitoring biodiversity and preserving fauna and flora in the forests where it operates.

To guarantee quality, attest to the credibility of our products and reinforce our commitment to continuous improvement, our processes are certified by a number of systems and methodologies that are widely recognized in the global market. The certifications that Klabin holds attest to its pioneering efforts in meeting the needs of its clients and anticipating market trends.

Klabin has a research team working at two research facilities focused on improving its production chain. The first – the Forestry Research Center in Lagoa, Telêmaco Borba (PR) – is dedicated to studying everything related to the forestry chain, such as genetic enhancement, wood quality, soil and climate studies, genetic adaptation, pest control and biotechnology, among others. The mission of the other Technology Center, also located in Telêmaco, is to improve the quality of products, while anticipating trends and developing new technologies and sustainable applications. The professionals seek solutions for an increasingly more efficient consumption of inputs in order to minimize environmental impacts.

The company creates 21,000 jobs (direct and indirect) and invests regularly in people development to promote competencies specific to its business, well-being and safety.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2021	December 31 2021	Yes	1 year

C0.3

(C0.3) Select the countries/areas in which you operate.

Argentina
Brazil

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

BRL

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C-AC0.6/C-FB0.6/C-PF0.6

(C-AC0.6/C-FB0.6/C-PF0.6) Are emissions from agricultural/forestry, processing/manufacturing, distribution activities or emissions from the consumption of your products – whether in your direct operations or in other parts of your value chain – relevant to your current CDP climate change disclosure?

	Relevance
Agriculture/Forestry	Both own land and elsewhere in the value chain [Agriculture/Forestry only]
Processing/Manufacturing	Both direct operations and elsewhere in the value chain [Processing/manufacturing/Distribution only]
Distribution	Both direct operations and elsewhere in the value chain [Processing/manufacturing/Distribution only]
Consumption	Both direct operations and elsewhere in the value chain [Processing/manufacturing/Distribution only]

C-AC0.7/C-FB0.7/C-PF0.7

(C-AC0.7/C-FB0.7/C-PF0.7) Which agricultural commodity(ies) that your organization produces and/or sources are the most significant to your business by revenue? Select up to five.

Agricultural commodity

Timber

% of revenue dependent on this agricultural commodity

More than 80%

Produced or sourced

Both

Please explain

56% of the wood that goes into the production process comes from Klabin's own forests, the other 44% comes from partnerships and producers in the regions where Klabin has forestry operations. According to society's conception, Klabin has preemptive right to purchase wood.

Klabin is recognized for its sustainable management adopted. It was the first pulp and paper company in the Southern Hemisphere to obtain, in 1998, the Forest Stewardship Council®-FSC® certification. In 2017, Paraná Forest unit also earned the Cerflor certificate. These certifications attest to forest management practices that conserve natural resources, provide fair working conditions and encourage healthy relations with local communities.
Forest-issues commitment enlarges through the value chain. To legally safeguard Klabin's business and guarantee products from trusted sources and the traceability of it, Klabin's Wood Purchase Policy is used to decision-making as a standard for wood procurement. Klabin is committed to 100% coverage of FSC® Chains of Custody and controlled wood/due diligence system to ensure the legal and trusted wood sources.

Timber is classified as the main raw material for pulp and paper production. Based on the total amount of inputs consumed in 2021 for total production of Klabin S/A, wood represents 95% of the amount of the inputs.
- Calculation:

% Revenue = Total Quantity of Wood (thousand t / year) / Total Quantity of Input (thousand t / year) * 100

% Revenue = (12,431.55/ 13,079.12)*100 = 95% It is also important to mention that, considering all the inputs consumed by Klabin in 2021, 98% are from renewable origin, the remaining 2% refer to chemicals used in the production process.

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	BRKLBNACNPR9

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Sustainability Officer (CSO)	EXECUTIVE DIRECTOR - INDUSTRIAL TECHNOLOGY, INNOVATION, SUSTAINABILITY OFFICER has the responsibility over Climate Change and its related studies on impacts and opportunities, considering the climate in the company's business strategy. An example of the insertion of the climate in the business strategy is the new industrial complex of the company (Puma I and Puma II) located in Ortigueira, Paraná, which is being built with the adoption of innovative technologies to reduce carbon in the operation, such as example, biomass gasification and tail oil. Example of a decision made by the CSO regarding climate change: approval and supervision of a pipeline of low carbon technologies to be implemented in the company, such as technologies mentioned (biomass gasification and tall oil), approval and supervision of the study of climate risks and opportunities, as well as projects and actions to mitigate risks, related to the company's business. Furthermore, recently the CSO approved three climate targets until 2030: (i) meet the goals agreed with the Science-Based Targets Initiative; (ii) 100% purchase of certified energy from a renewable source; (iii) Reduce fossil fuel usage to have an energy matrix that is 92% renewable It is important to mention that Klabin's CEO and Executive Director of Sustainability joined the global Business Ambition campaign for 1.5oC. With the approval of the Executive Director of Sustainabilitythe company also submitted its science-based goal and received approval in 2021. In addition, Klabin maintains a fixed sustainability committee composed of directors, with the Executive Director of Industrial Technology, Innovation and Sustainability as the sponsor. The directors of the following areas also participate in this committee: (i) Industrial Paper; (ii) Forestry; (iii) Legal, Integrity and Risk Management, (iv) People and Corporate Services. The sustainability manager is the committee's technical advisor. He is also responsible for climate change issues, managing a corporate sustainability team that works daily with this issue.
Board-level committee	Klabin maintains a fixed sustainability committee composed of directors, with the Executive Director of Industrial Technology, Innovation and Sustainability as the sponsor. Also participate of this committee the directors from following areas: (i)Industrial paper; (ii) Forestry; (iii) Legal, Integrity and Risk Management, (iv) People and Corporate Services. The sustainability manager is the technical advisor of the committee. In 2020, the board level committee approved the Klabin's initiative to become TCFD Supporter. Counting on support of the board level committee the company improved the recommendations of the TCFD. A robust study was developed to integrate all the information and data on how the company is meeting the TCFD methodology. A summary of this work is published on the company's ESG website. The prioritization of risks and opportunities, as well as the calculation of the financial impact of risks and opportunities is supervised by the board level committee and other directors.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Setting performance objectives Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	Issues related to climate change are part of the organization's sustainability policy and objectives. Item number 13 of Klabin S/A sustainability policy: "Ensure that the company's operations are constantly seeking to reduce greenhouse gas (GHG) emissions and managing the climate risks and opportunities (adaptation)." Taking into consideration this, the organization's goals and objectives are defined based on the organization's principles. Klabin has a specific corporate area of Sustainability and Environment that has as one of its objectives the day-to-day management of the issue with the responsibility of monitoring global and national climate agendas and mapping their related risks and opportunities. This area shows the importance that the organization sees to deal daily on corporate issues related to the environment and industrial sustainability in the different industrial units and businesses of Klabin. In addition, the issues related to atmospheric emissions integrate the environmental indices of the main units of Klabin S/A. These indicators are monitored and analyzed on a monthly basis. Definitions and main action plans to meet defined goals involve the operational and strategic levels of the organization. Klabin maintains a fixed sustainability committee main composed of directors, with the Executive Director of Industrial Technology, Innovation and Sustainability as the sponsor and Sustainability and Environment Executive Manager as the technical advisor of these committee. Items related to climate change and risks and opportunities are fixed agenda. Items of critical analysis involving senior management (managers and directors). The aligned strategies and actions defined in the committee are guided by financial, legal, social and environmental themes. In general, all these items taken into consideration during these meetings are important issues for the definition of the organization's growth strategy, considering new technologies and new projects for the company in line with the Klabin's Objectives for Sustainable Development – based on UN Sustainable Development Goals. Recently, Klabin approved three climate targets until 2030: (i) meet the goals agreed with the Science-Based Targets Initiative; (ii) 100% purchase of certified energy from a renewable source; (iii) reduce fossil fuel usage to have an energy matrix that is 92% renewable. A specific webpage was created for disclosure and transparency on the company's progress towards achieving the climate and other sustainability goals/targets.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	Company's management is accomplished by Executive Board and Board of Directors. Company's Board of Directors is composed of a minimum of 13 and a maximum of 18 members, elected and dismissed by the General Meeting, in accordance with the legislation in force, with a unified term of office of one year, reelection being permitted. Among the board members elected, at least 20% must be independent members, as defined in the Level 2 Regulation. The Board of Directors has an Internal Regulation approved in May 2021, which regulates the functioning and competence of the body: establishing the Company's business objectives; oversee the management of directors, elect and dismiss the company's directors, establishing their attributions; observing the provisions of the Bylaws; etc. Klabin has three non-statutory advisory committees to Board of Directors, created in October 2020, which are permanently linked to it: Audit and Related Parties Committee, People Committee and Sustainability Committee. Such committees are formed, individually, by three members, elected by the Company's Board of Directors for a term of office of one year; reelection being permitted. The attributions and operating rules of Klabin's Committees are provided for their respective Internal Regulations, which are available for consultation on Company's IR website (https://ri.klabin.com.br/governanca-corporativa/estatuto-codigos-e-politicas/). Composed of three members with competence on climate-related issues, elected by the Company's Board of Directors, the Sustainability Committee is the competent body to analyze the following matters, among other attributions that may be established by the Board of Directors: recommend and monitor adoption of best standards for sustainable development; recommend guidelines for the creation and/or adherence by the Company to institutional campaigns related to environmental or social issues; examine market opportunities or new business formats to strengthen the Company's sustainable growth strategy and recommend to the Board of Directors; among others. Klabin considers the water-related issues experience like a main criteria used to assess the board member(s). The ESG issues experience is also important but it is not enough. Klabin's criterias are looking for real water-related issues experience like a participation on real water-related cases or projects and/or participation on water-related risk assessment.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly
Chief Sustainability Officer (CSO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly
Sustainability committee	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly
Environment/ Sustainability manager	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

1) Where in the organizational structure these position (s) and / or committee (s) meet:

- Chief Sustainability Officer (CSO): Highest level of the organization, responsible for the execution of the Board of Directors' deliberations and the day-to-day management of the business. Has the responsibility over Climate Change and its related studies on impacts and opportunities

- Sustainability committee: Composed of directors, with the Executive Director of Industrial Technology and Sustainability as the sponsor. Participate of this committee the directors from following areas:

(i)Industrial paper; (ii) Forestry; (iii) Legal, Integrity and Risk Management, (iv) People and Corporate Services.

The sustainability manager is the technical advisor of the committee.

- Environment / Sustainability Executive Manager: positioned in the organizational structure below the director, responsible for consolidating and leveraging sustainability practices and environment.

2) Why responsibilities for climate issues have been assigned to this position (s) or committee (s):

- Chief Sustainability Officer (CSO) and Environment / Sustainability Executive Manager: Due to the importance of the theme when related to the organization's policy, goals and objectives.

- Sustainability committee: The objective of centralizing the information in this committee is with the presence of the directors in this group and, in addition, it is done with the objective of giving strength to the subject in the update of the information and in the decision making for the strategy of the organization.

3) How climate issues are monitored by the position (s) and / or committee (s):

Klabin has a specific corporate area of Sustainability and Environment that has as one of its objectives the day-to-day management of the issue with the responsibility of monitoring global and national climate agendas and mapping their related risks and opportunities. The area is also responsible for inserting and monitoring the guidelines and results of environmental and climate management in the company's operating units and facilities. The management of these items is carried out by the area along with coordinators and manager of the units that periodically critically examines the items related to this subject so that they are brought to the Sustainability Committee for discussion and strategic decision making for the organization.

Climate risks and opportunities are monitored and evaluated by the Sustainability Committee and by the company's Risk Committee so that they are incorporated into the company's strategic and financial planning.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Since 2021, all company managers have the possibility of tying their variable remuneration to the company's performance for Klabin's Sustainable Development Goals. In 2021, 18 sponsoring managers and 50% of executive directors linked their remuneration to the emissions reduction target, approved by SBTi. In 2022, all executive directors started to consider a Sustainability Index in their variable remuneration, created to prioritize the company's annual targets. Additionally, up to 10% of the variable remuneration can be converted into units, and is doubled by the company, conferring a character of long-term commitment to the achievement of targets which, in turn, are tied to the performance of Klabin's KODS targets. In 2022, this benefit will be extended to all employees, providing 100% coverage of a long-term incentive linked to the company's ESG performance.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Director on board	Monetary reward	Emissions reduction target	Sustainability Director is response for Environmental, Climate and Social issues and has specific goals related: Klabin is continually investing to raise the use of renewable sources in our energy matrix and consequently develop products with lower carbon footprint. In recent years, it have progressively replaced fuel oil by biomass (vegetable matter from forestry operations) as fuel in our boilers, reaching, in 2014, 86.5% of renewable sources for energy generation – in 2021 we reached 89.5% of renewable sources for energy generation, with the forecast of reaching 90.6% in 2022 with the start of biomass gasification at the Puma unit. With the creation of the company's 2030 Agenda, in 2020 the goal of achieving a 92% energy matrix from renewable sources by 2030 was announced. The result achieved in 2021 shows the company's commitment to meeting the target. This percentage includes, as well as biomass, burning of black liquor (by-product generated in the industrial process) and our own hydraulic power. In addition, Klabin is looking for electricity from clean sources, such as the wind and sun.
Energy manager	Monetary reward	Efficiency target	Energy controllers/ managers have targets related to efficiency on energy consumption. Klabin is continually investing to raise the use of renewable sources in our energy matrix. In recent years, it have progressively replaced fuel oil by biomass (vegetable matter from forestry operations) as fuel in our boilers, reaching, in 2014, 86.5% of renewable sources for energy generation – in 2021 we reached 89.5% of renewable sources for energy generation, with the forecast of reaching 90.6% in 2022 with the start of biomass gasification at the Puma unit. With the creation of the company's 2030 Agenda, in 2020 the goal of achieving a 92% energy matrix from renewable sources by 2030 was announced. The result achieved in 2021 shows the company's commitment to meeting the target. This percentage includes, as well as biomass, burning of black liquor (by-product generated in the industrial process) and our own hydraulic power. In addition, Klabin is looking for electricity from clean sources, such as the wind and sun.
Environment/Sustainability manager	Monetary reward	Efficiency target	Klabin has developed guidelines for climate management. Based on those guidelines, managers establish goals in accordance with its own projects. To monitor and quantify emissions through inventories which have complied with the methodology of the GHG Protocol since 2004; To establish targets for the reduction of GHG emissions, publicly published on company's website, Sustainability report and to CDP; To assesses the vulnerabilities of the business faced with Climate Change, mapping potential risks; Participates in forums and voluntary initiatives associated with the issue; Promotes and encourages energy efficiency; Considers the reduction of GHG emissions to combat the effects of Climate Change in the conception of new projects and processes; Promotes and incentivizes the use of renewable fuels, in an effort to reduce consumption of fossil fuels; Endeavors to reduce GHG emissions related to transportation of its products; Fosters technological innovation and research to reduce GHG in its activities; Discloses the guidelines of Climate Change to stakeholders.
Chief Procurement Officer (CPO)	Monetary reward	Environmental criteria included in purchases Supply chain engagement	The procurement area, in line with the sustainability area, have related goals for the sustainability of the business, where criteria related to environment, climate change, social responsibility and labor are linked to the process of evaluation of Klabin's supply chain. These assessment criteria include items related to business climate change. These goals directly influence the results of direct and indirect greenhouse gas emissions from Klabin SA, in addition to the correlation between the development of sustainable products with lowest carbon footprints.
Chief Procurement Officer (CPO)	Non-monetary reward	Please select	The procurement area, in line with the sustainability area, have related goals for the sustainability of the business, where criteria related to environment, climate change, social responsibility and labor are linked to the process of evaluation of Klabin's supply chain. These assessment criteria include items related to business climate change. These goals directly influence the results of direct and indirect greenhouse gas emissions from Klabin SA, in addition to the correlation between the development of sustainable products with lowest carbon footprints.
All employees	Monetary reward	Efficiency target	All professionals participate in an awards program for the results of the organization, one of the items that compose this index are the environmental indicators of the specific unit. these indicators include environmental aspects that are directly linked to climate change, such as reducing energy consumption, reducing water consumption, and so on.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	1	10	Short-term: Actions and goals in strategic planning of the organization for the current and following year (1 to 10 years horizon, it is considered short term)
Medium-term	10	20	Medium-term: Medium-term actions and targets are those that have goals of 11 to at most 20 years horizon.
Long-term	20	30	Long-term: Long-term actions and goals are those that present longer periods than those described in the medium term, following long-term thoughts that may be longer than 20 years.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

The definition of substantive financial or strategic impact on business is based on Klabin's risk management. Klabin has a specific area for risk management and controls of the wide organization and supply chain. This management considers the entire organization as part of the scenario analysis. In this matrix we consider, for example, the categories of commodities, economic scenario, international policies, government changes, research and development, climate change, environmental accidents, environmental regulations, business continuity plan, etc. The risks listed in Klabin's risk matrix take into account strategic, financial, operational, regulatory and environmental aspects. Four criterias are used to assess the risk:

1. Financial impact :

R$: > 700 – critical impact, > 400 < 700 MM- high impact, > 150 MM < 400 – medium impact. It is important to inform that the ranges of values are being updated by the company's risk management. Critic financial impact, per example, represent around 14% Ebitda of the company in 2020 (R$ 4,9 millions).

2. Reputation: the indicators of periods of damage to the public image are used: > 24 months – critical impact, 12 a 24 months - high impact, < 12 months – medium impact, without damage to the public image– low impact

3. Environmental accidents with difficult remediation and occupational accidents are considered as substantial strategic or financial impact. To determine the significance of the impact an assessment is made regarding the temporality, i.e., the period in which the impact was identified, whether it occurred in the present or in the past but has influence currently or whether it can be predicted to cause some change in the future; incidence – it is considered direct if under the company's control and indirect if the company merely exerts influence on the activity that generated the impact; and condition – normal for routine activities, anormal for non-routine activities and emergency for aspects resulting from unplanned situations.

4 - Identification of scope of the area of impact is also recommended, whether it is local or affects another sector; severity, whether low, medium or high; and if complaints exist.

The applied methodologies are based on ISO 31000. The company determines the evaluation criteria of impact and vulnerability of each listed risk, considering a heat map for the impact classification and vulnerability.

It is important to reaffirm this is applied to all direct operations and supply chain

Follow below one example of a possible financial impact that is assessed and monitored by Klabin:

A stress water and other varieties climate (from climate change) could affect the Klabin's forestry productivity; around 7% productivity (>400 MM and < 700 MM) loss can be expected without adaptation/mitigation measure. It would represent high financial impact, considering the replacement cost of wood (cost of wood purchase in the market). It is relevant to inform that current conditions and projections do not evidence deficit or surplus water in Klabin forestry region (until 2040), but due the relevance of water for productivity it is monitored and there is investment to genetic improvement.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
To identify / map climate risks and opportunities, the company: (i) developed specific studies considering future climate scenarios for the regions in which it has operations; (ii) in addition, studies available in the literature were also used; (iii) and the company's history and records with climatic events already experienced.
The identified risks were assessed according to the company's risk management criteria and metrics - criticality analysis - which crosses the impact analysis (financial, reputational, environment and health and safety) with vulnerability analysis (occurrence, internal controls and perspective of occurrence). Example of the metrics adopted to assess the risk:
(i) Financial impact: R$: > 700 MM – critical impact, > 400 < 700 MM- high impact, > 150 < 400 MM – medium impact. It is important to inform that the ranges of values are being updated by the company's risk management. (ii) Reputation: the indicators of periods of damage to the public image are used: > 24 months – critical impact, 12 a 24 months - high impact, < 12 months – medium impact, without damage to the public image– low impact. (iii) Environmental accidents with difficult remediation and occupational accidents are considered as substantial strategic or financial impact. To determine the significance of the impact an assessment is made regarding the temporality, i.e., the period in which the impact was identified, whether it occurred in the present or in the past but has influence currently or whether it can be predicted to cause some change in the future

Klabin has a Working Group formed by specialists from the company that support the risk area in the development of this work. Specialists from the follow areas: strategic, research, environmental and risk management.
After identification and criticality analysis, the risks are: (i) treaties: how to deal with each risk in order to structure action plans; (ii) monitored: monitoring and reviewing risks and action plans; definition of indicator; (iii) contingency plan: contingency plans and crisis management. Each Business Unit is responsible for embracing its risks (pointed out by the vulnerability matrix) and address it accordingly - following the controls and action plan to mitigate the risk. This plan is registered and monitored by risk management area. For example, forestry business board assumes risk management and mitigation actions of this business unit.
Klabin has a dedicated area for risk management. The area organizes quarterly review meetings to (i) (re) assessment the risks together companies' areas and (ii) defines/monitors controls or actions plans to mitigate the risks.

The company also has Risk Committee composed by Executive Directors, with a quarterly agenda, for discussion and decision-making. This ensures the governance of the businesses risks in the company, and climate risks are included.

The company considers short, medium and long-term risks and opportunities in its assessment. Klabin has been implementing the TCFD (Task Force on Climate Related Financial Disclosure) recommendations to improve the management, integration and disclosure of climate risks with advancement in the financial calculation of the impacts of climate risks.

As results of this work, climate risks are integrated into the company's risk management - below are examples of risks that are part of the risk matrix with a mitigation plan:

Physical risk - water scarcity
Reduction in the availability and quality of water in some regions with industrial operations by the company. Using a specific tool - Aqueduct and other future climate scenarios it was possible to map which units are in regions with potential water scarcity. Considering potential financial and reputation impacts this risk is evaluated as critical. Potential impacts assessed considering the criteria's of risk evaluation of the company interference in industrial production with high financial impact (> R$ 150 MM) and reputation impact due possible paralysation considering lack of water that could affect the image of the company together the community, customers, investors and other stakeholders. For this reasons and high probability of occurrence (due future climate scenario) this risk is assessed and prioritesed in the company's risk matrix.

Mitigation plan: Water monitoring of regions at risk of scarcity; projects to reduce water consumption and increase reuse; study of sustainable alternatives for water supply; monitoring of water quality and disposal of effluents.

Transition risk - carbon pricing
Klabin follows the environmental policy and economy agenda in Brazil and worldwide, including participating in discussion groups on this agenda. The adoption of economic instruments, such as tax or "cap and trade", to regulate carbon emissions is growing around the world, especially in the sectors of industry and power generation. In Brazil, the Ministry of Economy, in partnership with the World Bank, developed a technical study to analyze the impact of adopting such instruments in the countries - the Partnership for Market Readiness (PMR) project. Thus, the possibility of implementing a cap and trade system in the regulated carbon market is considered in Brazil. Potential impacts: two Klabin industrial units have direct emissions above 200 thousand tCO2e / year, which implies the possibility of regulation. In practice, each tCO2e emitted may be priced via the purchase of an emission permit in a (regulated) carbon market. Which can have a financial impact.. The risk assessed with medium financial impact (< R$ 400 MM) for Klabin S.A – however, it is important to clarify that carbon pricing focuses on industrial plants, and for these industrial units the carbon cost can have a high impact on the unit's specific revenue which can then mean a high financial impact. Furthermore, Klabin is a company with a business strategy committed to climate change and carbon management. Due to the relevance of carbon pricing on this agenda, the company assesses and prioritizes this risk in its management.

Mitigation plan: Klabin has a robust carbon reduction target (a science-based target), and a set of technologies that will be implemented in the short and medium term in order to achieve that reduction target. The greater the company's investment in reducing carbon emissions, the lower its exposure to the cost of carbon pricing regulation. In addition, the company develops internal pricing studies to (i) identify the impact cost of possible carbon regulation in the country; (ii) economic and environmental analysis of low carbon technologies through the Marginal Abatement Cost Curve methodology. In the analyzes, a shadow price is adopted based on the average rate in Latin America: US $ 7.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Klabin developed, together with a company specialized in the theme, a study to define its risks related to climate change. The steps of this study were separated into internal mapping (information gathering and temporal alignment), climate modeling study and identification of risks and opportunities. After defining the risks, they were classified according to their probability and magnitude considering the criteria's of risk's assessment of the company, specialy, financial, reputation and environmental impacts. One of the identified risks is regulatory risks, which indicate that the establishment of regulations related to fuel / energy consumption and the establishment of GHG emission limits are considered relevant for Klabin as they may lead to iIncreased costs for operation of the whole organization. Due the with high probability of the establishment GHG regulation in Brazil and the financial impacts due the incresead cost for operation this risk is assessed as relevant for the company and take part of the risk matrix . Mainly in the Monte Alegre and Puma units (located in the state of Paraná), Otacílio Costa and Correia Pinto units (Santa Catarina) and Angatuba unit (São Paulo), which are the largest units and consequently the largest consumers of fuels. As a control, Klabin actively takes part in discussion, forums and workshops related to Climate Changes challenges and its possible impacts on legislation (among others). Klabin is reference of public consults of carbon emissions and climate policies. The legislative proposes are done by APC Group, which represents Klabin and others companies. Klabin also has clear guidelines that orientates its activities planning and operations towards the management of Climate Change and its related regulations. Its pillars basically, relies on making constant improvements to make its operations more efficient in terms of emissions, the establishment of targets for GHG emissions and the assessment of business vulnerabilities in face of climate change.
Emerging regulation	Relevant, always included	Any new regulations related to emissions limits will be relevant for Klabin, mainly in the Monte Alegre and Puma units (located in the state of Paraná), Otacílio Costa and Correia Pinto units (Santa Catarina) and Angatuba unit (São Paulo) which are the units with higher atmospheric emissions. The purchase of allowances or payment of a tax, per example, may represent an increase in operating costs for the company, considering possible regulated market in Brazil. It is a relevant potential financial impact. Therefore, this risk is assessed as relevant for the company. In 2020 Klabin developed, together with a company specialized in the theme, a study to define its risks related to climate change. The steps of this study were separated into internal mapping (information gathering and temporal alignment), climate modeling study and identification of risks and opportunities. After defining the risks, they were classified according to their probability and magnitude – included financial, reputation and environment impacts criterias. One of the identified risks is regulatory risks, which indicate that the establishment of regulations related to fuel / energy consumption and the establishment of GHG emission limits are considered relevant for Klabin as they may lead to increased costs for operation of the whole organization. As a control, Klabin actively takes part in discussion, forums and workshops related to Climate Changes challenges and its possible impacts on legislation (among others). Klabin is reference of public consults of carbon emissions and climate policies in Brazil. Together with the association Brazilian Tree Industry and Coalition of ongs and companies (Coalizão Brasil Floresta, Clima e Agricultura) the company monitors and discusses the Brazilian government's carbon agenda in Brazil (emerging regulation). The pillars of the company basically, relies on making constant improvements to make its operations more efficient in terms of emissions, the establishment of robust targets for GHG emissions (approved by Science Based Target) and the assessment of business vulnerabilities in face of climate change . In addition, the company has been using more efficient technologies and equipment, and it has adopted an increase cleaner matrix (89,5% of renewable energy) to reduce the risks and costs of emerging carbon regulation. The lower the company's carbon emissions, the less exposure to regulations.
Technology	Relevant, always included	Klabin developed, together with a company specialized in the theme, a study to define its risks related to climate change. After defining the risks, they were classified according to their reliability, magnitude and severity. This risk matrix Klabin considers the gap in relation to marketing and technological trends of development of new products and / or processes as a risk to the organization as a whole. A possible technological delay in relation to low-carbon technologies could mean a reputational impact for the company that seeks innovation and forefront on the climate agenda. In addition it represents impact of loss of competitiveness, as the company's markets and customers are increasingly looking for products/packaging with a low carbon footprint, and the adoption of technologies are the basis for meeting this market demand. Therefore, due the potential reputational impact and loss of competitiveness (criteria's used by Klabin risk management to assess the risk) the technology risk is assessed as relevant for the company, The company identified a series of new technologies in the paper and cellulose sector that must be implemented to reduce emissions. Failure to invest in these technologies may bring a risk of technological backwardness, loss of innovation. Thus, to mitigate this and other risks, Klabin, in 2015 concluded the new Technology Center, is taking the company's R & D + I activities to a new level. It is part of the three-year investment plan (2015 to 2017), which provides for the allocation of BRL 70 million in R&D processes. The Technology Center has several lines of research in the areas of forestry, industry, new technologies and reduction of environmental impacts. In 2018, in order to develop initiatives aimed at sustainable management and operational excellence, with a focus on innovation and technology, Klabin announced yet another investment in innovation with the construction of a 'pilot plant park'. The space was built with an investment of BRL 32 million in research and development. In it, studies and tests are carried out on some research fronts. One of them will be with microfibrillated cellulose, a renewable source, which will be incorporated into the company's products to improve quality and resistance. Another line is the multiple use of lignin, a very resistant natural polymer extracted from trees and has the potential to replace raw materials of fossil origin.
Legal	Relevant, always included	The legal requirements are considered relevant for Klabin (specially the risk management of the company) as they may lead to increased costs for operation of the whole organization. Klabin actively takes part in discussion, forums and workshops aimed at Climate Changes challenges and its possible impacts on legislation (among others)..The legislative proposes are done by Brazilian Tree Industry Group, which represents Klabin and others companies of the sector. For example, a Cap &Trade regulation market could affect competitiveness and raise operational costs due to the imposition of a carbon price, mainly in the Monte Alegre and Puma units (located in the state of Paraná), Otacílio Costa and Correia Pinto units (Santa Catarina) and Angatuba unit (São Paulo) which are the units with higher GHG emissions. Thus, the company develops and updates internal carbon pricing studies to understand the impact of regulation on its business / competitiveness, and also to help in making investment decisions to reduce emissions. Klabin also has clear guidelines that orientates its activities planning and operations towards the management of climate change and its related regulations. Its pillars basically, relies on making constant improvements to make its operations more efficient in terms of emissions, the establishment of targets for GHG emissions and the assessment of business vulnerabilities in face of climate change. This is an important risk to Klabin because it has a potential financial impact around 0.5% of total EBITDA.
Market	Relevant, always included	Climate change may induce changes in customer preferences for products and services that emit less greenhouse gases. The company's market and customers are increasingly demanding information and products that have a low carbon footprint. For this reason, the company considers the risks and opportunities related to the market. Klabin, according to the Transition Pathway Initiative, is one of the companies in the pulp and paper sector with the lowest carbon intensity, which possibility the company in making low-carbon products available on the market in response to the growing "carbon and water packaging responsible" movement. Practical example is the researchers in the product development area of the Technology Center work on projects to eliminate, for example, the use of fossil-based barriers in packaging lining. One of Klabin S.A's main research fronts is precisely the development of barriers of renewable origin, which ensures the storage and transport of several products, not requiring materials related to the extraction and oil refining oil. The integrated work of the Sustainability, Commercial and Product Development areas positively explores the competitive advantage of offering low-carbon and biodegradable alternatives to the market, which are renewable and recyclable, given the growing movement towards "carbon and water responsible packaging. We constantly use the relationship with our stakeholders as a source of consultation for new lines of research and market demands in relation to the risks to the business and possible sustainable alternatives to be developed. From the trends, demands and constant updates of the market Klabin directed its new investment cycles. In 2018 we announced another investment in innovation with the construction of a 'pilot plant park'. The space will be built with the contribution of 32 million BRL in research and development of new products. In this park, studies and tests will be carried out on some research fronts. One ofresearch front is the extraction and use of lignin in the products, a very resistant natural polymer extracted from trees. Of renewable origin, lignin and its derivatives can substitute raw materials of fossil origin, among other applications of high added value in industries and several segments which are directly linked to the consumer market and its trends.
Reputation	Relevant, always included	To understand the potential risks and opportunities to which its activities are subject, as well as the adaptive measures required to face such risks and opportunities, Klabin conducts studies on its vulnerabilities and possibilities regarding climate change.. The main risks found are divided into the following categories: physical, regulatory, reputational and financial. Klabin prioritizes adaptive measures related to reputational and financial risks. Klabin has been recognized for 120 years in the market for its commitment to sustainable development and for considering climate change in its business strategy. This allows the company to have in its portfolio green investors who allocate capital to ESG companies. In 2019, the company emitted US$ 1,2 billion of green bonds. Thus, the risk of inconsistent results on the climate agenda can impact the company's image and business, such as loss of investments. This is one of the types of risk that is integrated into the risk management assessment and is constantly updated through meetings with members of the sustainability committee, the Board of Directors, the commercial area and the board of directors, who discuss changes and contribute on this subject. In addition, the reputation is one of the element of the risk management assessment of the company. Periods of damage to the public image: > 24 months - critical impact, 12 to 24 months - high impact, <12 months - medium impact, without damage to the public image - low impact. Klabin constantly monitors its image in the various media, considering the below to evaluate periods of damage to the public image. Thus, the company has an excellent socio-environmental and climate image perception in the market and this is directly associated with the maintaining of its certifications such as FSC and ISO 14000 and results such "A List" in Climate and Water of the CDP Program. Furthermore, the company has relevant public commitments with the climate: TCFD Supporter, Science Based Target, Global Compact (UNP); and public goals related to the climate agenda: i) meet the goals agreed with the Science-Based Targets Initiative; (ii) 100% purchase of certified energy from a renewable source; (iii) reduce fossil fuel usage to have an energy matrix that is 92% renewable. In addition, since 2013 the company has participated in the Corporate Sustainability Index of the Stock Exchange of Brazil (B3).

	Relevance & inclusion	Please explain
Acute physical	Relevant, always included	Klabin developed, together with a company specialized in the theme, a study to define its risks related to climate change. The steps of this study were separated into internal mapping (information gathering and temporal alignment), climate modeling study and identification of risks and opportunities. It is important to reaffirm the adoption of future climate scenarios to identify physical risks. After defining the risks, they were classified according to their reliability, magnitude and severity. These risks can generate several impacts for the company, such as production stoppage, impact on raw material supply, among others. Which can lead to increased operating costs, lost revenue. Therefore, they are relevant and included in the company's risk management matrix. Follow below the most important acute physical identified and the adaptation measures. Changes in precipitation extremes and/or droughts could compromise the development of seedlings. Heavy rainfall can cause runoff entrainment of seedlings, floods, and cause soil drenching. It can affect the logistics of removing wood from forest areas. Strong winds could paralyses ports used by Klabin (for example, Paranaguá Port Region in Paraná State) causing delays in deliveries and dissatisfied clients. The forest department of Klabin constantly monitors the climatic conditions of the regions where Klabin has its forests planted. This monitoring aims to assess trends at the acute and chronic levels of climate variables that may interfere with forest productivity and development. The organization has and efficient operational logistics system, capable of work under adverse rain conditions. Contour lines and containment berms on roads are already being used to prevent the risk of erosion. Also, Klabin works to continuously develop seedlings with higher resistant to cold and frost, focusing on increasing productivity and pulp volume yield.
Chronic physical	Relevant, always included	Klabin developed, together with a company specialized in the theme, a study to define its risks related to climate change. The steps of this study were separated into internal mapping (information gathering and temporal alignment), climate modeling study and identification of risks and opportunities. After defining the risks, they were classified according to their reliability, magnitude and severity. One of the most important chronic risk identified is related water scarcity with impacts such as reduction in the availability and quality of water in some of the regions where the Company has industrial and forestry operations. The Aqueduct tool enabled mapping which units are located in regions with the potential for hydric stress. In addition, the company has developed its own studies on climate change and forestry activity. This risk offers potential impacts due it is included in the risk managemet of the company: interference in industrial production; and interference in the planting of pine and eucalyptus seedlings in the Paraná region. Thus, mitigation measures are adopted such as: water monitoring in regions at risk of scarcity; projects to reduce water consumption and increase reuse; study on sustainable water supply alternatives; monitoring of water quality and the disposal of effluents. And Paraná forestry unit: deployment and increase of irrigated areas in the planting of seedlings; micro-basin forestry planning, which implies the application of best forest management practices to reduce impacts on river basins; and forest conservation, ensuring ecosystem services for water regulation and quality, and local microclimate. In addition, iIncrease in sea level during the years could paralyses ports used by Klabin (for example, Paranaguá Port Region in Paraná State) causing delays in deliveries and dissatisfied clients. Contour lines and containment berms on roads are already being used to prevent the risk of erosion. The forest department of Klabin constantly monitors the climatic conditions of the regions where Klabin has its forests planted. This monitoring aims to assess trends at the acute and chronic levels of climate variables that may interfere with forest productivity and development.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms

Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Klabin has two main industrial units (Puma and Monte Alegre) that have significant carbon emissions and are liable to be regulated by carbon pricing. In 2020, above industrial units emitted around 519,724 tCO2e – Scope 1. The Puma unit produces 3 types of cellulose to the market; and at the Monte Alegre unit packaging paper is produced, such as cardboard and kraft paper.

The Brazilian government, within the scope of the Partnership for Market Readiness - World Bank project, studied in the last years the possibility of implementing a tax or cap and trade in the country. Another possible phase of this project will be able to implement in next years – Partnership for Market Implementation to set up a pilot cap and trade in Brazil. Thus the company's expectation is that in the next 5 ou 6 years the Brazilian government may adopt carbon pricing in the country's climate policy. Klabin participates in different forums that cover/debate this topic in Brazil, closely following this agenda.
Given this scenario of regulatory risk and the financial impact, a series of actions were taken by Klabin:
(i) inclusion of carbon pricing risk in the analysis and, subsequently, the company's risk matrix
(ii) internal carbon pricing studies to identify the cost of the financial impact for the company
(iii) study of a pipeline of low carbon technologies that should be implemented in the medium and long term to reduce carbon emissions. To identify and prioritize technologies, the company developed a Marginal Abatement Cost Curve that makes it possible to evaluate the most cost effective technologies Example of technologies: that turns wood waste into gas. This gas can be used in the industrial process, increasing the use of renewable energy
(iv) development of a robust, science-based carbon reduction target. The lower the emission the less exposed to the impact of carbon pricing the company will be. Klabin S.A commits to reduce scope 1 and 2 GHG emissions 25% per ton of pulp, paper and packaging by 2025 from a 2019 base year; and 49% until 2035.

Considering all the above actions, Klabin results in the internal approval of a series of technologies that will be implemented to reduce emissions and the financial impact of a possible carbon pricing. And the approval of a science-based carbon reduction target.

It is important to mention that these risks are included in the company's risk matrix, with the risk management and financial area accompanying the mitigation actions.

Time horizon

Short-term

Likelihood
Very likely

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
20788960

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact of the creation of the carbon pricing in Brazil (tax or cap and trade) was calculated based on the total scope 1 emissions of the Puma and Monte Alegre units (considered to be the units with industrial production with high emissions, for which it is estimated that there will be taxation). The estimated value for the allowance/tax in Brazil is R$ 40 (BRL 40) - considering studies that demonstrate what an average value of the carbon price should be to induce the adoption of low carbon technologies by the Brazilian industry.The financial impact is measured by the product between the value of the carbon tax/allowance (BRL 40) versus the total scope 1 emissions of the Puma and Monte Alegre units in 2020 – 519,724 tCO2e = BRL 20,788,960. It is annual cost. This calculation aims to demonstrate the financial impact of a possible carbon regulation for the company

Cost of response to risk
186945000

Description of response and explanation of cost calculation
Klabin closely follows the discussions on the establishment of a carbon regulation in Brazil. As mentioned the Brazilian government, within the scope of the Partnership for Market Readiness - World Bank project, studied in the last years the possibility of implementing a tax or cap and trade in the country. Thus, the company's expectation is that in the next 5 ou 6 years the Brazilian government may adopt carbon pricing in the country's climate policy.

To mitigate the risk of carbon costs, the company has been investing in low carbon technologies. The lower the emission - the lower the cost / financial impact. From 2020 to 2030 the company has a pipeline of seven low carbon technologies that will be implemented to reduce emissions.

From this pipeline, until 2021, three technologies were implemented biomass gasification – CAPEX BRL 141,486,000; tail oil – BRL 21,500,000; and boiler fuel exchange (oil for biomass) – CAPEX BRL 23,959,000. The other technologies and its CAPEX are treated as confidential by the company. These technologies have enabled the company to achieve its emission reduction target, approved by Science Based Target, and also to reduce exposure to the cost of carbon regulation. An example we can mention the tail oil technology, installed in the Puma II Project will have a process of extraction and use of Tall Oil as a source of energy for the unit. Tall Oil is a by-product of the pulp production process, originating from wood resins, which can be recovered and used as another source of renewable energy at Klabin. Its use allows for the replacement of fossil fuel and the reduction of greenhouse gas emissions CO2 into the atmosphere.

As a result the company has robust strategies and technologies pipeline to reduce emissions and consequently reduce the operating cost by paying a fee or purchasing an allowance. Klabin has a MACC for medium and long-term assessment of other technologies to reduce carbon emissions. A MAAC permits an easy to read visualization of various mitigation options or measures organized by a single, understandable metric: economic cost of emissions abatement. It is possible to assess/compare the (i) cost of regulation x (ii) the cost of investing in low carbon technology – BRL/tCO2 both. From this analyse it is possible to understand that for Klabin it is more economically attractive to invest in low carbon technologies than to pay a carbon price considering the company's reference value - BRL 40.

Comment
Klabin has been adopting carbon pricing methodologies in order to prepare for and reduce the possible impacts of carbon regulation in Brazil. In addition (to the analysis of the financial impact of a possible cap and trade or carbon tax in Brazil - as shown), the company evaluates a series of low carbon technologies for the medium and long term.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Temperature variability

Primary potential financial impact
Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Climate change can have an impact on the company's planted forests – pines and eucalyptus, generating loss of productivity. Therefore, Klabin has a complete study on current and future climate conditions and the impact of climate change in forestry operation regions – Paraná, Santa Catarina and São Paulo (Brazilian states). Klabin's owned and managed planted forest areas were approximately 273 thousand hectares, distributed in 200 thousand ha in Paraná, 66 thousand ha in Santa Catarina and 6,7 thousand ha in São Paulo.

The analysis of climatic variables was based on (i) the climatic history of the region (1981-2010), (ii) and reference scenarios on emissions (RCP 8.5) of greenhouse gases for climate models - HadGEN2-ES. Therefore, the climatology studies for the reference period 1981 to 2010 were generated for the scenarios HadGEN2 of 2011-2020, 2021-2030 and 2031-2040.
The main climatic risks for eucalyptus and pinus growth evaluated were quantity and frequency of intense drought, minimum temperature, average temperature, potential evapotranspiration and water deficit in the planted forest areas.
Some of the results of this study show a general tendency of temperature increase in the regions considered with a mean increase of 0.32 °C per decade. Thus, temperature increase with low change in the rain distribution regime, which may imply an increase in evapotranspiration, in other words, risk of water deficit.

The water deficiency is directly related to the decrease in wood production, and this is explained by the SPPA (System soil-plant-atmosphere). When under water stress, the plant reduces the opening of the stoma to reduce the loss of water through the leaves (transpiration), however, when the stoma is closed, photosynthesis is interrupted and impacts in the tree growth.
The set of climate changes, especially considering water availability and temperature, indicates scenarios of impact on forest productivity, especially for the growth of planted forests. In the period (2020 and 2035), the annual average loss of productivity (ton of wood) will be 3% for eucalyptus and 5% for pine - if no measures are taken.

Time horizon
Short-term

Likelihood
Likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
39187356

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Climate change could have an impact on the company's forestry productivity. Around 70% of the wood consumed by the company comes from the company's own pine and eucalyptus forests and planted forest with partnership contract.
The company has a study that indicates in the period from 2020 to 2050, what will be the impact on productivity, that is, on the loss of wood. In this period, the annual average loss of productivity (ton of wood) will be 3% for eucalyptus and 5% for pine - if no measures are taken.
3% of Klabin's average annual wood production represents around 179,035 tonnes of eucalyptus; and 5% of Klabin's average annual wood production represents around 192,601 tonnes of pine.
In order to understand the financial impact, the company adopted the scenario of buying wood in the market/suppliers to replace the wood that can stop being produced due the impact of climate change. In this context was considered the price of buy wood in the last six month - YTD: BRL 92.80 per eucalyptus tonne and BRL 117.20 per pine tonne. It is a replacement cost approach.
179,035 tonnes of eucalyptus versus BRL 92.80 = BRL 16,614,519
192,601 tonnes of pines versus BRL 117.20 = BRL 22,572,837
Thus it is potential that climate change may impact Klabin's forest productivity with an annual average cost of wood loss of about BRL 39,245,218 - if no measures are taken.

Cost of response to risk
3669666

Description of response and explanation of cost calculation
Studies of the company shows general tendency of temperature increase in the regions considered with a mean increase of 0.32 °C per decade. Thus, temperature increase with low change in the rain distribution regime, which may imply an increase in evapotranspiration, in other words, risk of water deficit. In the period of 2020 and 2035, the annual average loss of productivity (ton of wood) will be 3% for eucalyptus and 5% for pine - if no measures are taken.
Klabin has Forest Research Department responsible for developing research and solutions to mitigate the impacts of climate change on the company's forest production and develop activities in Ecophysiology, Soils, Forest Nutrition, Pest Control. It is also responsible for the Climate Scenarios. For this, it works with a data model related to exposure to climatic parameters, evaluating the impact of changes in planted forests, and recommending the necessary measures in case of adverse effects.
In 2020, Klabin made an investment of approximately BRL 2,445,164 in forestry research linked with climate change and forest impact. In 2021, Klabin made an investment of approximately BRL 3,669,666 in forestry research linked with climate change and forest impact. All lines of forestry research work directly or indirectly to develop solutions to mitigate the impacts of climate change on forest production. For more details, it is possible to mention the example of the phytosanitary line, with an investment of BRL 627,190, which investigates the plant protection against pests and diseases. In this development, for example, it is considered that pests and diseases will be intensified due to climate change. Another line that can be used as an example is biotechnology and genetic improvement, with investments around BRL 2,395,660 develops clones of pine and eucalyptus aiming at greater forest production, but also materials that are more resistant to the impacts of climate change.
As a result of this work studies and considering the climate change projections for the region, the research team are working to develop new pine species to plant in warmer conditions. Using tree breeding techniques the species Pinus maximinoi, a species from Central America, was genetic improved and now we start operational plantation in North of Paraná State. The wood production with this new species is showing up to 20% increase comparing with Pinus taeda plantation in some regions.

Comment
The study of how climate change affects the productivity of pine and eucalyptus is extremely important for the company's planning and decision making.

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Water scarcity

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Goiana unit is located in water stressed area classified by WRI Aqueduct tool. Klabin has found the increased water stress in the Capibaribe-Mirim river to be a risk to meet the water demand to production of the recycled paper, corrugated board and paper bags. Goiana unit represents around 7% of Klabin's global production and 8% of total revenue at 2021. Goiana unit intake water from two sources: groundwater and surface water. Together, the water sources intake represents 1% of total water intake of

Klabin.
Considering that the water stress is measured for the ratio of total water withdrawals to available renewable surface and groundwater supplies, the water stress risk can affect the available water to Goiana's use what it will impact directly in Klabin's production capacity. This scenario is more impacted in the months of October, November and December, when there is a drought period.
Further, a study conducted by Klabin has realized that the interruption by 20% of total water withdrawals per day during one month is the maximum period can be impacted for this risk.
So, we use this information to calculate the potential financial impact. In additional, the magnitude of potential impact has considered that Goiana unit is the only Klabin unit that produces recycled paper, corrugated board and paper bags. The worst scenario considers the total interruption on production during one month.
Today, the unit has a contingency plan for emergency cases like this, but as a worst-case scenario we are considering the interruption by 20% of total water withdrawals per day during one month.

Time horizon
Short-term

Likelihood
Likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
19689863

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact was estimated considering the reduction of production capacity during the interruption by 20% of total water withdrawals per day during one month. Further, we consider that the interruption by 20% of total water withdrawals impact by 20% of total production capacity.
In 2021, the total revenue of Goiana unit was BRL 1,197,800,000.00. The financial impact of reduction of production capacity during this period is BRL 19,689,863 (1,197.8 million of total revenue per year / 365 working days per year * interruption by 20% of total water withdrawals * 30 days/month).

Cost of response to risk
750000

Description of response and explanation of cost calculation
Surface fresh water is very important to recycled paper production on Goiana unit, even representing only 1% of Klabin's total water withdrawals. Goiana is located in the water stressed area. Between 2019 and 2020, this unit has increased the water withdrawals by 2% even with an increase by 6% of total production in the same period. It is an excellent result but even so the unit is developing a drought emergency plan. This plan considers the drilling of 3 renewable deep wells (200 - 250 meters) in the region to supply the unit's necessary water demand. Today, the average fresh water intake per day is around 100 m3/h, with more than 95% of this value coming from surface water. In addition, the plan envisages reducing the unit's specific water use from 3.8 m3/t to less than 2.0 m3/t. Currently, more than 60% of the wastewater treated at the unit are returned to recycled paper production machines, which further reduce the need to fresh water withdrawals. The cost involved for this plan is BRL 750,000 to drilling of 3 renewable deep wells. The actions to implement the plan will start in the end of the year of 2021 considering the company is assessing the technical information of the project. It is important to mention that Goiana unit already has back up water lagoon that could be offer water for around 10 days of lack of water in case of drought.
This cost of response considers the drilling of 3 renewable deep wells on Brazilian northeast. Each deep wells cost around BRL 250,000. So, three renewable deep wells costs BRL 750,000. The investments to improve wastewater treatment system and new investments consider the change of equipment on primary treatment like floater that is very small to our process. So, with these investments, Goiana unit will be more potential to reuse of water and will have other possible to supply our demand of water in case of increase water stress in this location.

Comment
Goiana unit is located in water stressed area classified by WRI Aqueduct tool. Klabin has found the increased water stress in the Capibaribe-Mirim river to be a risk to meet the water demand to production of the recycled paper, corrugated board and paper bags. Goiana unit represents around 7% of Klabin's global production and 8% of total revenue at 2021. Goiana unit intake water from two sources: groundwater and surface water. Together, the water sources intake represents 1% of total water intake of Klabin.

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Opp1

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Energy source

Primary climate-related opportunity driver
Use of lower-emission sources of energy

Primary potential financial impact
Returns on investment in low-emission technology

Company-specific description
Klabin has important market recognition for its commitment to sustainable development and also for the company's actions in minimizing the impacts of its operations. Since 2003, Klabin has been investing in a cleaner and more sustainable energy matrix. To this end, within its history of operations, it has constantly promoted actions to reduce its greenhouse gas emissions as indicated in the previous items.

Several actions over the years have resulted in the reduction of emissions of more than 205 thousand tons of CO2eq. Over the years, Klabin has constantly invested in reducing consumption of fossil fuels and also in increasing the energy efficiency of the industrial plants. These investments have made Klabin's energy matrix cleaner and based predominantly on the use of renewable fuels - such as bark, wood chips and black liquor, for use in the boilers.

Actions like these are important for the company, because besides reducing operational costs, they contribute to a more renewable national energy matrix, aligning these actions with the UN Sustainable Development Goals.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
224586016.2

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Estimated value referring to the quantity of fuel oil that the organization would stop consuming (replacing with fossil fuels) if there were regulations that demand the reduction of atmospheric emissions and increase of the clean matrix of fuels for generation of energy. This value only estimates the replacement of the fuel by another renewable source (biomass residues).
This impact is considered medium-high, since the estimated specific cost difference for fuel use is different (specific cost of estimated fuel oil is more expensive than cost with biomass).
It is important to mention that this estimated value does not consider the costs necessary to change technologies for fuel substitution.
This calculation considers the replacement of the total consumption of fuel oil by the organization (114,995.4 tonnes in 2021) for biomass waste to produce the same amount of energy (GJ), considering the specific cost of the oil in approximately BRL 1,953 per ton.

114,995.4 * BRL 1,953 = BRL 224,586,016.2

Cost to realize opportunity
71733332.88

Strategy to realize opportunity and explanation of cost calculation
Situation: Klabin purchase energy from renewable resources. Its energy matrix includes natural renewable sources. At the end of 2013, 80% of the energy used by the company was generated by these sources. Every year, strategies, targets and effective actions are defined in all the industrial plants for gains in energy efficiency.

Task: Over the years, Klabin has constantly invested in reducing consumption of fossil fuels and also in increasing the energy efficiency of its industrial plants. These investments have made Klabin's energy matrix cleaner and based predominantly on the use of renewable fuels - such as bark, wood chips and black liquor, for use in the boilers. All these activities in favor of sustainability are evidence of Klabin's commitment to reduce emissions of greenhouse gases generated by the company.

Action: In recent years, some actions have been taken by the company in order to reduce the consumption of heavy fuel oil and consequently the direct emissions. In 2008 we changed 2 Heavy oil Boilers for a Biomass boiler in Monte Alegre Mill and did the same action in Otacilio Costa mill (2014), Correia Pinto mill (2012) and Angatuba mill (2015). In 2020 the Puma Tall Oil plant went into operation to replace the burning of fuel oil in the lime kilns, at the Piracicaba unit, the new biomass boiler, started in 2021, replaces one fuel oil boiler and three natural gas boilers that will be kept on standby for situations when the biomass boiler stops.

Cost to realize opportunity: BRL 71,733,332.88
Estimated value representing the cost for the use of renewable fuel (biomass residue) in the replacement of fuel oil, not considering the need for replacement of new technology equipment

Result: These actions have resulted in the reduction of more than 205 thousand tons of CO2eq over the years, reinforcing Klabin's commitment to minimize the impacts of its operations.

Explanation of cost calculation:

Fuel oil consumed * PCI = GJ
114,995.4 tonnes * 40.2 GJ/t = 4,622,814.9 GJ

GJ / Biomass PCI = Biomass that would be consumed
4,622,814.9 GJ / 11.6 GJ/t = 398,518.52 tonnes

Humid volume of biomass consumed
398,518.52 tonnes / 0.55 = 724,579. 12 tonnes

Cost to realize this opportunite = biomass * cost of biomass fuel
724,579. 12 tonnes * BRL 99.00 = BRL 71,733,332.88

Comment
BRL 71,733,332.88. Estimated value representing the cost for the use of renewable fuel (biomass residue) in the replacement of fuel oil, not considering the need for replacement of new technology equipment.

Identifier
Opp2

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Ability to diversify business activities

Primary potential financial impact
Other, please specify (Increased revenue through demand for lower emissions products and services)

Company-specific description
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,489.6 MWh)
To maintain this opportunity, in 2018 the PUMA unit was the first unit in the country's pulp sector to achieve ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency.
The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1230734.4

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Approximately BRL 1,230,734.4 related to the sale of International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,489.6 MWh) by PUMA unit.
Calculation is equal to the amount of renewable energy distributed to the national grid multiplied by the IREC average sales value in the year (BRL 1.50).
This impact is considered medium, since the sale of renewable energy certificates are considered as an additional revenue the main revenue obtained with the product "renewable energy" that is its sale and distribution with the national system.

820,489.6 MWh * BRL 1.50 = BRL 1,230,734.4

Cost to realize opportunity
340667.28

Strategy to realize opportunity and explanation of cost calculation
Situation: The year of 2014 made a progress in the works of the Puma Project, the most ambitious in our history, which made Klabin nearly double its size in a period of three years. The construction of this new pulp mill in Ortigueira (PR), has the production capacity of 1.5 million tons of pulp per year. It is worth to metion that the Ortigueira Plant, is able to generate more energy than it needs and the surplus is sold to the interconnected national energy system.

Task: The surplus production of energys allowed Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system.

Action: To manage this opportunity Klabin energy matrix includes natural renewable sources such as black liquor, biofuel, and hydro (own electrical power). In order to maintain this opportunity, in 2018 the PUMA unit was the first unit in the country's pulp sector to achieve ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency.

Cost to realize opportunity: This value (BRL 340,667.28) refers to the total rate of emission of the renewable energy certificate per MWh sold (BRL 0.4152 / MWh) multiplied by the total renewable energy sold by the PUMA unit in 2021 (820,489.6 MWh)

Explanation of the cost calculation:

820,489.6 MWh * BRL 0.4152 / MWh = BRL 340,667.28

In 2021, Klabin issued 482,059 IRECS from the surplus energy generated at the Puma unit. which makes it possible to increase the share of renewable energy in the Brazilian energy matrix. It is important to mention that the company has the potential to emit the total amount of MWh sold in iRECS.

Comment
This value (BRL 340,667.28) refers to the total rate of emission of the renewable energy certificate per MWh sold (BRL 0.4152 / MWh) multiplied by the total renewable energy sold by the PUMA unit in 2021 (820,489.6 MWh).

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan
Yes, we have a transition plan which aligns with a 1.5°C world

Publicly available transition plan
Yes

Mechanism by which feedback is collected from shareholders on your transition plan
We do not have a feedback mechanism in place, but we plan to introduce one within the next two years

Description of feedback mechanism
<Not Applicable>

Frequency of feedback collection
<Not Applicable>

Attach any relevant documents which detail your transition plan (optional)
Klabin commits with the Business Ambition for 1.5ºC and we develop a Marginal Abatement Cost Curve to priorize its GHG reduction projects.

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future
<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	Klabin adopts future climate scenarios to understand the change in the pattern of climate variables (precipitation, temperature, wind, and others) that most interfere with its forestry and industrial production. A series of studies have been developed by experts on the subject so that the scenarios are understood from an operational, tactical and strategic point of view. Klabin has a complete study on climate conditions and the impact of climate change in forestry operation regions – Paraná, Santa Catarina and São Paulo (Brazilian states), and the most important industrial units – Puma and Monte Alegre – that are also located in these regions. The study of future climate scenarios was developed by a renowned researcher on the topic in Brazil and linked to the main technical institution - Embrapa (Brazilian Agriculture Research Corporation). The analysis of climatic variables was based on (i) the climatic history of the region (1981-2010), (ii) and reference scenarios on emissions (RCP 8.5) of greenhouse gases for climate models - HadGEN2-ES. Therefore, the climatology studies for the reference period 1981 to 2010 were generated for the scenarios HadGEN2 of 2011-2020, 2021-2030 and 2031-2040. Some of the results of this study show a general tendency of temperature increase in the regions considered, with a mean increase of 0.32 °C per decade. Thus, temperature increase with low change in the rain distribution regime, which may imply an increase in evapotranspiration, in other words, risk of water deficit. For industrial units, localized in different Brazilian regions, Klabin developed, with a company specialized in the theme, a study to define its risks related to climate change. The CMIP5 climate models were the main information base used in this study, with the description of the approximate horizontal resolutions and number of rounds of the future simulations (RCPs 2.6, 4.5, 6.0 and 8.5). These studies carried out simulations of climatic scenarios for the different regions of Brazil where there are Klabin units (all the facilities were included in this study), pointing out the climatic risks specific to each state from the present data to 2040 simulations.
Transition scenarios: IEA SDS	Company-wide	<Not Applicable>	We were one of the first Brazilian companies to have science-based targets approved by Science Based Targets Initiative (SBTI), aligned to well below 2ºC scenario. In this front, we commit to reducing greenhouse gas emissions (GHG), scope 1 and 2, per ton of pulp, papers and packaging by 25% by 2025 and, by 49%, until 2035, having 2019 as an year- base. Our efforts are guided by the guidelines for climate change management - mitigation and adaptation. The main guidelines of the management of the theme include Business Ambition for 1.5ºC, UN global campaign, and the commitment to reduce emissions considering the science and neutralization of emissions by 2050. The company has implemented the Task Force on Climate-Related Financial Disclosure methodology. Therefore, scenarios for the main drivers of change in the economy contemplated by the TFCD. The use of scenario analysis in TCFD are also studied and considered. Due to the nature of the business, three drivers are considered to be the main drivers: energy price, technological advancement and regulation (local and global). Thus, the company's scenarios are designed considering (i) physical scenarios, related to physical climate changes; (ii) macroeconomic scenarios with a focus on energy, technology and regulation drivers. The company's operations (forestry and industrial) and wood supplier operations are directly related to the physics of the climate. The climatic risks identified by the scenarios are assessed and prioritized by the company's risk management criteria and metrics and mitigation plans are defined. Water scarcity and average temperature rise are the two main risks identified with a significant impact on operations. From water scarcity the following future potential impacts are identified, e.g., (partial) industrial shutdown due to lack of water. The increase in temperature can intensify the risk of a forest fire. The identification of physical risks with mitigation plans helps the company to prepare itself to support, without prejudice, the intensification of the impacts of climate change.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

Klabin has two main focal questions:
What is the forecast for the increase of planet's temperature?
What is the year to achieve carbon neutrality?

Results of the climate-related scenario analysis with respect to the focal questions

In the Sustainable Development Scenario, CO2 emissions drop to zero around 2070 and there are rapid reductions in non-CO2 emissions. The 1.5 °C level is exceeded in the early 2030s and the rise in temperature peaks at just under 1.7 °C around 2050. The SDS is in line with the Paris Agreement objective of "holding the increase in the global average temperature to well below 2 °C", while the NZE goes further to be in line with the Paris Agreement objective of "pursuing efforts to limit the temperature increase to 1.5 °C". Klabin consider the Sustainable Development Scenario because we evaluate this scenario during its science-based target process. Nowadays, Klabin considers the maximum increase in temperature should be well below 2 ºC, aligned with the Paris Agreement objective. In this scenario, the carbon neutrality should be until 2070. However, Klabin is committed with Business Ambition for 1.5ºC and we are developing a NetZero target considering the NetZero Emissions by 2050 scenario (NZE), based on International Energy Agency (IEA) scenarios.

Further, considering that Klabin has two GHG emissions reduction targets and a committed with SBTi NetZero Standard, we have a sustainability and environmental team working with the new projects team to elaborate and evaluate new requirements considering the renewable fuels like main energy and electricity sources.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Klabin offers to the market renewable products with low carbon footprint – paper for packaging and its own packaging (sacks and cardboard boxes). The raw material is wood from planted forest with sustainable management. The trend is the market increases even more the demand for these materials replacing fossil packaging (ex. plastic). Thus, the company is increasingly developing commercial strategies linked to carbon. In addition to the commercial strategy of adding value through the products' carbon footprint performance, the company also invests in research and development to replace carbon intensive products. Klabin is conducting carbon footprint studies with results that are being shared with customers, and which can be incorporated into the packaging produced with Klabin's paper. The company included in its planning for 2020 and 2030, in Klabin Sustainable Development Goals, the expansion of the carbon footprint studies of its products to demonstrate to the market its competitive advantage: low-carbon products. Around three projects for labeling the carbon footprint of packaging made from Klabin's paper are being studied together with customers. We have a real case study that it considers the research and development area advances in the portfolio of the other biobased materials replacing fossil-based raw materials such as microfibrillated cellulose (MFC). MFC is an example of the oppportunity to replacing fossil based material in a variety of applications in the packaging. The strategic planning of the company that considers the period of 2020 and 2030 includes expansion of the production and negotiation of products to replacing fossil based material, being a differential for the company's growth. As a result of this work, the company implemented in 2019 a pilot plant that simulates a plant to carry out studies and industrial tests in research fronts related to lignin and microfibrillated cellulose (MFC), enabling the production of these materials that may guide future opportunities of business for the company.
Supply chain and/or value chain	Yes	Supplier management is part of the strategy of the company's sustainability and supply areas. In recent years, the company has evolved in this agenda in order to mitigate risks related to the supply chain and also due to its socio-environmental responsibility. The company adopts the Ecovadis platform to assess suppliers as well as their demand. In addition, Klabin is preparing to incorporate elements related to climate management in its supplier assessment - emission reduction and adaptation - considering the Klabin Sustainable Development Goals with targets and actions for 2020-2030. As a real result of this Program, 15% of evaluated suppliers already set a science based target and more than 30% has actions to reduce their GHG emissions. Further, Klabin has a technical assistance and technology transfer partnership for the wood suppliers. Result of the forestry research is the development of pine and eucalyptus seedlings that are more resistant to changes in the local climate, such as, for example, temperature increase. These seedlings and management are shared with suppliers, maintaining the supply of wood, and can also increase productivity.
Investment in R&D	Yes	In addition to the production of cellulose, packaging paper and packaging, such as bags and cardboard boxes, the company operates in the development of materials for the bioeconomy. The company believes in a "renewable future", which is why, in recent years, it has expanded its focus on innovation and high technology to respond to market demands and seek new growth cycles, aiming to develop initiatives aimed at sustainable management and operational excellence. Investments in the bioeconomy is one of the elements of the Klabin Sustainable Development Goals with targets and actions for 2020 -2030. In 2019, Klabin issued US $ 500 million of green bonds to the market, part of this money raised will be used to invest in the development of projects within the scope of the bioeconomy and in low carbon technologies. This is described in the green bond issuance framework. The company has a technology center for the development and testing of new products from wood, which are renewable and low carbon products. These producers are important options for consumers in a low carbon economy. Lignin is an example. It is a polymer found in tree/wood. This material has variety applications can replace fossil based phenols. In addition, the company is researching other derivatives such as carbon fiber. Another example/result is MFC to replacing fossil based material in a variety of applications in the packaging. The strategic planning of the company that considers the period of 2020 and 2030 includes expansion of the production and negotiation of products to replacing fossil based material, being a differential for the company's growth. As a result of this work, the company implemented in 2019 a pilot plant that simulates a plant to carry out studies and industrial tests in research fronts related to lignin and microfibrillated cellulose (MFC), enabling the production of these materials that may guide future opportunities of business for the company.
Operations	Yes	The strategy of implementing low carbon technologies are fundamental for the company to consolidate its business strategy of being part of the low carbon economy. Klabin has a strong history of developing actions and implementing technologies that allow for the reduction of emissions. Reducing emissions allows the company to continue to be recognized by the market as a company that delivers sustainable products, with a low carbon footprint, for example. In addition, it is resource efficient, as it allows greater use of forest biomass from its own operation in detriment of fossil fuel. In recent years, Klabin has incorporated new low carbon technologies into its operations. These technologies bring financial returns to the company, with a reduction in operating costs, in addition to reducing carbon. The company prepared a marginal abatment cost curve (MACC) to identify the cost or avoided cost x potential for carbon reduction per technology. All the projects evaluated so far have brought economic benefits. Example, the technology of tail oil (originated from the production of cellulose can be used as biofuel) which for each ton of reduced carbon brings an avoided cost of BRL 217. Therefore, the operations (with low carbon technologies) is an important opportunity . On the company's sustainable development agenda, Klabin Sustainable Development Goals, with targets and actions for 2020 -2030 includes the expansion of technologies that reduce emissions for the company and avoid costs, such as the implementation of biomass gasification in other units. This technology expands the company's renewable energy generation with a reduction in fossil fuel consumption. Thus, as a result of this work three technologies were implemented: tail and biomass gasification in Puma Unit, and boiler exchange in Piracicaba unit.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues	Possible benefits of the 100% clean energy matrix, carbon credits (high magnitude) and sale of renewable energy certificates. The recovery in the carbon market after COP21 (Paris, December 2015) and a recently approved Brazilian Environmental Payment Law may bring benefits and financial opportunities due to Klabin's native and preserved forests. Currently, the company has 248 thousand hectares of native forests preserved in the Atlantic Forest. In order to maintain these "medium-high" magnitudes as defined, in 2018 the PUMA unit was the first unit in the country's pulp sector to achieve ISO 50001 certification, attesting the unit's efforts to improve its performance and energy efficiency . For the sale of energy certificates, this impact is considered medium, since the sale of renewable energy certificates is considered as an additional revenue the main revenue obtained with the product "renewable energy" that is its sale and distribution with the national system. This sale has a magnitude of average to high, since it represents a financial impact of BRL 169,560,000.00 (2021). Thanks to the surplus production of energy from the Puma unit, derived from biomass and black liquor, Klabin was able to become an issuer of IRECs, which are renewable energy certificates that allow all electricity users to make a conscious, evidence-based choice renewable energy generation in any country in the world. Some steps were taken so that the company could start the process of issuing and selling IRECs. Starting by joining the I-REC platform, followed by the registration of the generator project, in this case, the Puma unit. Then, proof of energy generation is required, using evidence to confirm the emission, finally, the company can start proving the energy generated and issuing IRECs. Klabin aims, until 2030, is to zero its Scope 2 emissions, with the use of part of the IRECs as one of the scenarios considered, the remaining part would be sold, generating revenue for the company.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's transition to a 1.5°C world?
Yes

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's transition to a 1.5°C world.

Financial Metric
Revenue

Percentage share of selected financial metric aligned with a 1.5°C world in the reporting year (%)
7

Percentage share of selected financial metric planned to align with a 1.5°C world in 2025 (%)
10

Percentage share of selected financial metric planned to align with a 1.5°C world in 2030 (%)
12

Describe the methodology used to identify spending/revenue that is aligned with a 1.5°C world
Klabin defines the methodology to identify the percentage of total revenue being all MACC curve investments contributing with GHG emissions reduction and with the increase our energy matrix.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Absolute target
Intensity target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number
Abs 1

Year target was set
2017

Target coverage
Company-wide

Scope(s)
Scope 1

Scope 2 accounting method
<Not Applicable>

Scope 3 category(ies)
<Not Applicable>

Base year
2004

Base year Scope 1 emissions covered by target (metric tons CO2e)
995985.91

Base year Scope 2 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
995985.91

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
<Not Applicable>

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes

100

Target year
2022

Targeted reduction from base year (%)
19.32

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
803561.432188

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
783791.71

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
783791.71

% of target achieved relative to base year [auto-calculated]
110.274016285659

Target status in reporting year
Achieved

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
2°C aligned

Please explain target coverage and identify any exclusions
The reduction target is based on 2004 emissions, whose value for Scope 1 was 995,985.91 tCO2eq, with the operation of a new production Puma I unit producing around 1,500,000 tons of pulp per year, the inclusion of five newly acquired units and the start of the Puma 2 project, a recalculation of the base year was carried out, the year 2004 was chosen because it was the first year of the company's greenhouse gas inventory.

In 2022, the company's goal is to issue 803,561.43 tCO2e of Scope 1, which represents a reduction of about 19.32%. In 2021, the result of Scope 1 was 110%. It is important to mention that over the years several initiatives and exchanges of technologies were implemented aiming at the reduction of emissions.
To reaffirm our commitment to implementing actions to combat climate change, Klabin is the first Brazilian company in the sector of forests, pulp and paper to be part of the "Companies Taking Action" initiative of the validation of our goals based on Science Based Targets.
Science-based targets provide companies with a clearly defined pathway to future-proof growth by specifying how much and how quickly they need to reduce their greenhouse gas emissions.

Plan for achieving target, and progress made to the end of the reporting year
<Not Applicable>

List the emissions reduction initiatives which contributed most to achieving this target
Since 2006, the company has had a number of initiatives, and below are some outstanding projects that have contributed to this significant reduction in Klabin SA's greenhouse gas emissions.

With the stabilization of the industrial operations of the Puma Unit, inaugurated in 2016, Klabin registered evolution in the indicators related to energy. The unit was planned to be self-sufficient by generating energy from process waste, such as black liquor and biomass.
In 2017, with the operations of the Puma Unit, the burning of Hydrogen in the lime kilns was made possible as a substitute for heavy oil.
In 2018, with the implementation of projects to reduce the consumption of non-renewable fuels, the Puma unit achieved a 7% reduction in absolute Scope 1 CO2eq emissions.

In April 2019, the Feira de Santana unit finalized the replacement of the boiler heavy oil burner with a natural gas burner and also the installation of new natural gas piping.
To further contribute to the reductions in greenhouse gas emissions, in December 2019, the Puma unit finalized the installation of a Tall Oil extraction plant (renewable fuel - byproduct of the pulp industry) from soap (byproduct of the pulp industry) to replace part of the heavy oil consumed in the Lime Kilns at the PUMA Plant.

At the end of 2020, the Piracicaba/SP unit finished the construction of the new biomass boiler at the unit. The new boiler started operating in 2021. In 2021, the Puma unit finalized the biomass gasification project. This project is based on the use of biomass (leftover branches and bark from the forest areas) to generate gases that can be used as a source of thermal energy. These gases will be used in lime kilns to replace the consumption of heavy oil.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Year target was set
2020

Target coverage
Company-wide

Scope(s)
Scope 1

Scope 2

Scope 2 accounting method
Market-based

Scope 3 category(ies)
<Not Applicable>

Intensity metric
Metric tons CO2e per metric ton of product

Base year
2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
163.429

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)
8.976

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
172.4

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
100

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure
100

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure
<Not Applicable>

% of total base year emissions in all selected Scopes covered by this intensity figure
100

Target year
2025

Targeted reduction from base year (%)
25

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]
129.3

% change anticipated in absolute Scope 1+2 emissions
-3.31

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)
150.879

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
3.831

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)
154.71

% of target achieved relative to base year [auto-calculated]
41.0440835266821

Target status in reporting year
Underway

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
In December 2020, Klabin submitted two targets to the Science Based Target Initiative. In April 2021, SBT approved Klabin's science-based targets:
- Klabin S.A commits to reduce scope 1 and 2 GHG emissions 25% per ton of pulp, paper and packaging by 2025 from a 2019 base year*.
- Klabin S.A commits to reduce scope 1 and 2 GHG emissions 49% per ton of pulp, paper and packaging by 2035 from a 2019 base year*.
*The target boundary includes biogenic emissions and removals from bioenergy feedstocks.
The targets coverage is company-wide.
Scopes 1 and 2 are considered in the approved targets.
The sectoral methodology (SDA) was used to calculate the targets.
The ambition of the approved targets is well-below 2ºC aligned.

With the linear advancement of the target, in 2021 the company should have reached a 33% reduction in greenhouse gas emissions and thanks to the initiatives implemented in recent years, such as the Tall Oil plant in the Puma unit and the replacement of the biomass boiler in the Piracicaba unit, in addition to active efforts to reduce fuel oil consumption in the units, the company reached 41% of the target.

Plan for achieving target, and progress made to the end of the reporting year
Klabin prepares a MACC to identify and prioritize mitigation measures / low carbon technologies, as well as to stimulate business opportunities / cost reduction. A MAAC permits an easy to read visualization of various mitigation options or measures organized by a single, understandable metric: economic cost of emissions abatement. It is possible to assess/compare the (i) cost of regulation x (ii) the cost of investing in low carbon technology – BRL/tCO2 both. As the MACC presents the marginal cost of carbon, which facilitates the company in decisions such as investing in low carbon technologies or paying the fee or allowance. Serving as a basis for comparing the price of carbon when it is regulated in Brazil.
Thus, by prioritizing technologies, Klabin has a pipeline of technologies that will be implemented in the short and medium term to achieve its carbon reduction target and take advantage of opportunities to increase resource efficiency.
To improve internal carbon pricing analyzes, Klabin extended the study considering the impact of carbon pricing on the chain, especially in the purchase of inputs that may pass on the cost of carbon pricing.
In 2019 the fuel oil boiler at the Feira de Santana unit was replaced by a natural gas boiler, in 2020 the Puma Tall Oil plant went into operation to replace the burning of fuel oil in the lime kilns, also in 2020, the Piracicaba/SP unit completed the construction of the new biomass boiler at the unit. This project began in 2019 and provides for a reduction of more than 26,500 tCO2eq/year in addition to an improvement in the use of the company's energy matrix (increase of more than 0.8%). The new boiler began operating in 2021. In 2021, the Puma unit completed the biomass gasification project. This energy project is based on the use of biomass (leftovers of branches and bark that have forested areas) to generate gases that can be used as a source of temperature. These gases will be used in the lime kilns to replace the consumption of fuel oil. With this project, we will have a 67.45% reduction in GHG sources and more than a 2% increase in Klabin's energy matrix from renewable sources.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Int 2

Year target was set
2020

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Please select

Scope 3 category(ies)
<Not Applicable>

Intensity metric
Metric tons CO2e per metric ton of product

Base year
2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
163.429

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)
8.976

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
172.4

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
100

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure
100

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure
<Not Applicable>

% of total base year emissions in all selected Scopes covered by this intensity figure
100

Target year
2035

Targeted reduction from base year (%)
49

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]
87.924

% change anticipated in absolute Scope 1+2 emissions
-3.31

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)

150.879

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
3.831

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)
154.71

% of target achieved relative to base year [auto-calculated]
20.9408589421848

Target status in reporting year
Underway

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
In December 2020, Klabin submitted two targets to the Science Based Target Initiative. In April 2021, SBT approved Klabin's science-based targets:
- Klabin S.A commits to reduce scope 1 and 2 GHG emissions 25% per ton of pulp, paper and packaging by 2025 from a 2019 base year*.
- Klabin S.A commits to reduce scope 1 and 2 GHG emissions 49% per ton of pulp, paper and packaging by 2035 from a 2019 base year*.
*The target boundary includes biogenic emissions and removals from bioenergy feedstocks.
The targets coverage is company-wide.
Scopes 1 and 2 are considered in the approved targets.
The sectoral methodology (SDA) was used to calculate the targets.
The ambition of the approved targets is well-below 2ºC aligned.

Plan for achieving target, and progress made to the end of the reporting year
Klabin prepares a MACC to identify and prioritize mitigation measures / low carbon technologies, as well as to stimulate business opportunities / cost reduction. A MAAC permits an easy to read visualization of various mitigation options or measures organized by a single, understandable metric: economic cost of emissions abatement. It is possible to assess/compare the (i) cost of regulation x (ii) the cost of investing in low carbon technology – BRL/tCO2 both. As the MACC presents the marginal cost of carbon, which facilitates the company in decisions such as investing in low carbon technologies or paying the fee or allowance. Serving as a basis for comparing the price of carbon when it is regulated in Brazil.
Thus, by prioritizing technologies, Klabin has a pipeline of technologies that will be implemented in the short and medium term to achieve its carbon reduction target and take advantage of opportunities to increase resource efficiency.
To improve internal carbon pricing analyzes, Klabin extended the study considering the impact of carbon pricing on the chain, especially in the purchase of inputs that may pass on the cost of carbon pricing.
In 2019 the fuel oil boiler at the Feira de Santana unit was replaced by a natural gas boiler, in 2020 the Puma Tall Oil plant went into operation to replace the burning of fuel oil in the lime kilns, also in 2020, the Piracicaba/SP unit completed the construction of the new biomass boiler at the unit. This project began in 2019 and provides for a reduction of more than 26,500 tCO2eq/year in addition to an improvement in the use of the company's energy matrix (increase of more than 0.8%). The new boiler began operating in 2021. In 2021, the Puma unit completed the biomass gasification project. This energy project is based on the use of biomass (leftovers of branches and bark that have forested areas) to generate gases that can be used as a source of temperature. These gases will be used in the lime kilns to replace the consumption of fuel oil. With this project, we will have a 67.45% reduction in GHG sources and more than a 2% increase in Klabin's energy matrix from renewable sources.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Other climate-related target(s)

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number
Oth 1

Year target was set
2014

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Renewable fuel consumption	Percentage of total fuel consumption that is from renewable sources

Target denominator (intensity targets only)
<Not Applicable>

Base year
2019

Figure or percentage in base year
89.5

Target year
2030

Figure or percentage in target year
92

Figure or percentage in reporting year
89.5

% of target achieved relative to base year [auto-calculated]
0

Target status in reporting year
Underway

Is this target part of an emissions target?
Reduce GHG emissions (scope 1 and 2) by 25% per ton of pulp, paperboard, and packaging by 2025, and by 49% by 2035, starting from base year 2019.

Is this target part of an overarching initiative?
Science Based targets initiative - other

Please explain target coverage and identify any exclusions
Klabin is continuously investing to increase the use of renewable sources in our energy matrix. In recent years, it has progressively replaced fuel oil with renewable fuels in its boilers and lime kilns, such as biomass, tall oil and bio-oil.
In 2021, Klabin's energy matrix was 89.5%, with black liquor and biomass making the biggest contributions to the result, and it is forecasted to reach 90.6% in 2022 with the start of biomass gasification at Puma 2.

Plan for achieving target, and progress made to the end of the reporting year
Klabin started projects to reduce diesel and heavy oil consumption in the pulp and paper mills. These projects started in 2004, when we changed the oil for natural gas at the Piracibaba mill. In 2008 we changed two heavy oil boilers for a biomass boiler at Monte Alegre mill, doing the same at Otacilio Costa mill (2014), Correia Pinto mill (2012) and Angatuba mill (2015).

In 2019, the fuel oil boiler at Feira de Santana unit was replaced by a natural gas boiler. In 2020, the Puma Tall Oil plant went into operation to replace the burning of fuel oil in the lime kilns. At the Piracicaba unit, the new biomass boiler, which started in 2021, replaces a fuel oil boiler and three natural gas boilers that will be kept on standby for situations when the biomass boiler stops. Also in 2021, the Puma unit finalized the biomass gasification project. This project is based on the use of biomass (leftover branches and bark that remain in the forest areas) to generate gases that can be used as a source of thermal energy. These gases will be used in lime kilns to replace the consumption of heavy oil. With this project we will have a reduction of 67,454 tCO2eq/year in GHG emissions and more than 2% increase in Klabin's energy matrix from renewable sources.

In parallel with the reduction target approved by the SBTi, Klabin has a roadmap to implement low carbon technologies. All the projects elaborated undergo a flow of analysis and prioritization based on the Marginal Abatement Cost Curve (MACCs), which provide a method of evaluating potential emissions reduction activities. MACC provides individual access to measures, so that the costs and mitigation potential of emissions can be examined in isolation, and ranked according to their costs from lowest to highest, and thus assists in prioritizing projects.

List the actions which contributed most to achieving this target
<Not Applicable>

Target reference number
Oth 2

Year target was set
2016

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Energy productivity	Other, please specify (Percentage of energy purchased in relation to energy generated)

Target denominator (intensity targets only)
<Not Applicable>

Base year
2016

Figure or percentage in base year
70

Target year
2022

Figure or percentage in target year
76

Figure or percentage in reporting year
88

% of target achieved relative to base year [auto-calculated]
300

Target status in reporting year
Achieved

Is this target part of an emissions target?
Reduce GHG emissions (scope 1 and 2) by 25% per ton of pulp, paperboard, and packaging by 2025, and by 49% by 2035, starting from base year 2019.

Is this target part of an overarching initiative?
Science Based targets initiative - other

Please explain target coverage and identify any exclusions
Klabin has thermo and hydroelectric energy generated in the company, which is distributed among the units, in addition, the Puma unit has energy generation capacity in addition to its consumption, making the surplus available in the National Interconnected System. The energy self-sufficiency target takes into account the amount of energy that is sold and the amount that is purchased.

Plan for achieving target, and progress made to the end of the reporting year
<Not Applicable>

List the actions which contributed most to achieving this target
With the stabilization of the industrial operations of the Puma Unit, inaugurated in 2016, Klabin registered evolution in the indicators related to energy. The unit was designed to be self-sufficient through the generation of energy from process residues, such as black liquor and biomass. As it produces more energy than it consumes, the company can make available the surplus for sale in the Brazilian Electric System, which contributes to the generation of revenue, while contributing to a cleaner energy matrix. In 2020, the goal was revised considering the percentage of energy generated in relation to the total energy consumed in the company. Klabin reached values of 88% of energy self-sufficiency, this target is related to SDG 7 - Affordable and Clean Energy and SDG 13 - Climate Action. Part of this result is the generation of energy from biomass, black liquor and hydraulic energy.

Target reference number
Oth 3

Year target was set
2017

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Energy consumption or efficiency	MWh

Target denominator (intensity targets only)
<Not Applicable>

Base year
2017

Figure or percentage in base year
1232797.95

Target year
2022

Figure or percentage in target year
1171158.052

Figure or percentage in reporting year
1209332.015

% of target achieved relative to base year [auto-calculated]
38.0693929766075

Target status in reporting year
Underway

Is this target part of an emissions target?
Reduce GHG emissions (scope 1 and 2) by 25% per ton of pulp, paperboard, and packaging by 2025, and by 49% by 2035, starting from base year 2019.

Is this target part of an overarching initiative?
No, it's not part of an overarching initiative

Please explain target coverage and identify any exclusions
Based on the results obtained in 2017, Klabin has established a target of a reduction of up to 5% between 2018 and 2022, aiming to reach 1,171,158.052 MWh in the company's energy purchases. With the acquisition of five new units, the base year was recalculated, resulting in the consumption of 1,232,797.95 MWh. This year 2021, the amount of energy purchased was 1,209,332.015 MWh, reaching 38% of the target, which is still in progress. Of this amount of purchased energy, 96.6% comes from certified renewable sources, hydroelectric and thermal from biomass and black liquor.

Plan for achieving target, and progress made to the end of the reporting year
In 2020, Klabin has assumed the goal of having 100% of its energy purchased from renewable sources, this target is related to SDG 7 - Affordable and Clean Energy and

SDG 13 - Climate Action. In 2021, we issued 482,059 I-RECS, from the surplus energy produced at the Puma unit, bringing us very close to our 2030 Agenda goal.

List the actions which contributed most to achieving this target
<Not Applicable>

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.
Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	63663
To be implemented*	1	932.78
Implementation commenced*	1	67454
Implemented*	3	165506
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Low-carbon energy generation	Solid biofuels

Estimated annual CO2e savings (metric tonnes CO2e)
26675

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
1945000

Investment required (unit currency – as specified in C0.4)
23959000

Payback period
1-3 years

Estimated lifetime of the initiative
16-20 years

Comment
The biomass boiler at the Piracicaba unit started operating in 2021, replacing one oil boiler and three natural gas boilers that will be kept on stand-by, maintained for situations when the biomass boiler stops. Thus, reducing the consumption of non-renewable fuels in the unit, reinforcing the company's commitment to maintain its energy matrix from renewable sources.

Initiative category & Initiative type

Low-carbon energy consumption	Hydropower (capacity unknown)

Estimated annual CO2e savings (metric tonnes CO2e)
87291

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
0

Payback period
No payback

Estimated lifetime of the initiative
Ongoing

Comment
On Indirect GHG emissions from energy acquisition - Scope 2, in 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193 MWh, from hydroelectric generation, with the proper declaration of the generator. This results in a reduction of Scope 2 emissions in 87, 291 tCO2e when compared to location-based, which uses the average emission factor of the SIN (National Interconnected System). This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

Initiative category & Initiative type

Low-carbon energy consumption	Liquid biofuels

Estimated annual CO2e savings (metric tonnes CO2e)
51540

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
723089

Payback period
No payback

Estimated lifetime of the initiative
Ongoing

Comment
Starting in 2020, we opted to use the purchase choice methodology as the main one for measuring indirect emissions (scope 2), unlike previous years that prioritized the location method. In 2021 482,059 IRECS were emitted by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably; without the emission of IRECS, our Scope 2 emission by purchase choice would be 70,898 tCO2eq.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Internal finance mechanisms	All the projects elaborated undergo a flow of analysis and prioritization based on the Marginal Abatement Cost Curve (MACCs), which provide a method of evaluating potential emissions reduction activities. Providing a visual comparison of the marginal abatement costs for different projects. The starting point is to estimate how much it costs to control carbon emissions. MACC allows the identification of where the main opportunities for mitigating emissions lie, thus considering the relationship between the cost per ton of carbon avoided and the amount of tons that a reduction measure, if undertaken, will be able to avoid. MACC provides individual access to measures, so that the costs and mitigation potential of emissions can be examined in isolation, and ranked according to their costs from lowest to highest, and thus assists in prioritizing projects.

C-AC4.4/C-FB4.4/C-PF4.4

(C-AC4.4/C-FB4.4/C-PF4.4) Do you implement agriculture or forest management practices on your own land with a climate change mitigation and/or adaption benefit?
Yes

C-AC4.4a/C-FB4.4a/C-PF4.4a

(C-AC4.4a/C-FB4.4a/C-PF4.4a) Specify the agricultural or forest management practice(s) implemented on your own land with climate change mitigation and/or adaptation benefits and provide a corresponding emissions figure, if known.

Management practice reference number
MP1

Management practice
Reforestation

Description of management practice
Practices of adequacy, conservation and environmental preservation in rural properties and planted forests of Klabin. Klabin is pioneer on mosaic management based on “hidrosolidarity”, ensuring the operational efficiency while preserves the water resources and biodiversity present in almost 264,000 hectares of native area (Atlantic Forest, predominantly). Hence, Klabin has created flows to guide forest management planning in order to comply with correct proportion of forestry activities and take in consideration each point of neighbour’s water catchment. This management strategy are in accordance with the ecological services of water provisioning and regulating. First flow happens in the medium term of supply (5 year's harvest plan). In this horizon, the main point observed is the maintenance of mosaic on basins of third order. Micro-basin area must always have 40% of standing forest (both, native and planted), while 60% is available for forestry operations.

In 2020, the company included this subject in the Klabin’s sustainable development goals for 2030, which has the objective to expand this strategic/analyzis flow to the SC and SP Klabin's forest units, in the Paraná unit this process had already been taking place since 2019 . In 2021, the flow was applied in the Paraná forestry unit.

Primary climate change-related benefit
Increase carbon sink (mitigation)

Estimated CO2e savings (metric tons CO2e)
22991.15

Please explain
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology Klabin reserves 42% of its land for preserved native forests and maintains its own areas with planted forests for the manufacture of its products. Klabin was the first pulp and paper company in the Southern Hemisphere to obtain, in 1998, the Forest Stewardship Council®-FSC® certification (FSC-C022516) which attests to management practices that conserve natural resources, provide fair working conditions and encourage healthy relations with local communities. Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Apremavi), it promotes actions of rural property planning, conservation and environmental education in the states of Paraná and Santa Catarina. It guides small and medium-sized owners to perform more efficiently and with greater profitability, in addition to preserving ecosystems. Producers take courses, lectures and exchange visits and receive free seedlings of native plants. The program also encourages forestry with planted pine and eucalyptus forests, organic agriculture and ecotourism.

This program had 2,119 ha of demarcated areas of preservation. Using as base the value of 10.85 tCO2eq / ha calculated according to the CO2 sequestration of the native forests in relation to a total area that a Klabin has (Brazilian GHG Protocol Metodology used). As we have an amount in ha from Matas Legal we have: 2,119 ha * 10.85 tCO2 / ha = 22,991.15 tCO2eq

This amount of CO2 is also contemplated in the CO2 removal calculation for land use management. In 2021, we were able to reach more properties than the previous year, where we had stricter protocols due to COVID-19, so there was a increase in the number of properties.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Pulp and paper	Other, please specify (Hardwood bleached pulp)

Description of product(s) or service(s)
Klabin has produced hardwood bleached pulp that uses more than 92% of renewable fuels on energy matrix. These products can be classified as low-carbon products because manufacturing of them requires very less GHG emissions.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Guidelines for Assessing the Contribution of Products to Avoided Greenhouse Gas Emissions (ILCA)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Cradle-to-gate

Functional unit used
1000 kilograms of hardwood bleached pulp at 2022.

Reference product/service or baseline scenario used
1000 kilograms of hardwood bleached pulp at 2018.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Cradle-to-gate

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
19

Explain your calculation of avoided emissions, including any assumptions
To estimate the emissions avoided with our products, we compared the life cycle analysis done previously (2018) with the analysis using more recent data with the Puma Project 2 operation scenario (2021), in order to show what impact the GHG emission reduction projects have on our products. Thus, we can say that we use the attributional estimation approach.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
23

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Pulp and paper	Other, please specify (LPB -Liquid Packaging Board)

Description of product(s) or service(s)
Klabin has produced liquid packaging board that uses more than 92% of renewable fuels on energy matrix. These products can be classified as low-carbon products because manufacturing of them requires very less GHG emissions.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Guidelines for Assessing the Contribution of Products to Avoided Greenhouse Gas Emissions (ILCA)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Cradle-to-gate

Functional unit used
1000 kilograms of LPB at 2018.

Reference product/service or baseline scenario used
1000 kilograms of LPB at 2008.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Cradle-to-gate

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
114

Explain your calculation of avoided emissions, including any assumptions
To estimate the emissions avoided with our products, we compared the life cycle analysis done previously (2008) with the analysis using more recent data (2018), in order to show what impact GHG emission reduction projects have on our products. Thus, we can say that we use the attributional estimation approach.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
12

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Pulp and paper	Other, please specify (FBB/CB - Folding Box Board / Carrier Board)

Description of product(s) or service(s)
Klabin has produced Folding Box Board and Carrier Board that uses more than 92% of renewable fuels on energy matrix. These products can be classified as low-carbon products because manufacturing of them requires very less GHG emissions.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Guidelines for Assessing the Contribution of Products to Avoided Greenhouse Gas Emissions (ILCA)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Cradle-to-gate

Functional unit used
1000 kilograms of FBB/CB at 2018.

Reference product/service or baseline scenario used

1000 kilograms of FBB/CB at 2008.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Cradle-to-gate

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
119

Explain your calculation of avoided emissions, including any assumptions
To estimate the emissions avoided with our products, we compared the life cycle analysis done previously (2008) with the analysis using more recent data (2018), in order to show what impact GHG emission reduction projects have on our products. Thus, we can say that we use the attributional estimation approach.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
5

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
Yes, an acquisition

Name of organization(s) acquired, divested from, or merged with
International Paper

Details of structural change(s), including completion dates
This reporting year includes the consumption and emissions of 5 units of International Paper acquired in late 2020 by Klabin, in the cities of Franco da Rocha/SP, Manaus/AM, Paulínia/SP, Rio Verde/GO and Suzano/SP.

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in boundary	This reporting year includes the consumption and emissions of 5 units of International Paper acquired in late 2020 by Klabin, in the cities of Franco da Rocha/SP, Manaus/AM, Paulínia/SP, Rio Verde/GO and Suzano/SP.

C5.1c

(C5.1c) Have your organization's base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?

	Base year recalculation	Base year emissions recalculation policy, including significance threshold
Row 1	Yes	For the recalculation of the base year, direct emissions from the production process of five plants recently acquired by Klabin were included. The production of these plants together is about 430 thousand tons of packaging and recycled paper, representing approximately 8% of the company's total production, and the start of the Puma 2 project that counts on the production of one more paper machine.

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start
January 1 2004

Base year end
December 31 2004

Base year emissions (metric tons CO2e)
642219

Comment
The reduction of emissions is one of the items of Klabin's Sustainability Policy. With the increased use of renewable energy source, a company responsible for reducing the emission of greenhouse gases (GHG). The highlighted texts are presented in the Emissions Inventory prepared according to the methodology of the Brazilian GHG Protocol Program (base year 2004), an internationally recognized standard and audited by the Brazilian part.

Scope 2 (location-based)

Base year start
January 1 2004

Base year end
December 31 2004

Base year emissions (metric tons CO2e)
19195

Comment
The reduction of emissions is one of the items of Klabin's Sustainability Policy. With the increased use of renewable energy source, a company responsible for reducing the emission of greenhouse gases (GHG). The highlighted texts are presented in the Emissions Inventory prepared according to the methodology of the Brazilian GHG Protocol Program (base year 2004), an internationally recognized standard and audited by the Brazilian part.

Scope 2 (market-based)

Base year start
January 1 2017

Base year end
December 31 2017

Base year emissions (metric tons CO2e)
43644.22

Comment
The reduction of emissions is one of the items of Klabin's Sustainability Policy. With the increased use of renewable energy source, a company responsible for reducing the emission of greenhouse gases (GHG). The highlighted texts are presented in the Emissions Inventory prepared according to the methodology of the Brazilian GHG Protocol Program (base year 2004), an internationally recognized standard and audited by the Brazilian part.
On Indirect GHG emissions from energy acquisition - Scope 2, in 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
85282.25

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is related to the production of the chemical inputs used in the production process.

Scope 3 category 2: Capital goods

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
2296.17

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is related to the transportation of the fuel used in our vehicles, for the Scope 3 expansion, emissions from the extraction and production of this fuel will also be accounted for.

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
367581.237

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain, starting with the accounting of maritime emissions . We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
443.025

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 6: Business travel

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
413.972

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 7: Employee commuting

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)
893.92

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 8: Upstream leased assets

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is not relevant to Klabin's operations and was therefore not accounted for in the base year.

Scope 3 category 9: Downstream transportation and distribution

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis.

Scope 3 category 10: Processing of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. Klabin would like to work actively with its customers to minimize the impact of its products and reduce emissions when processing them.

Scope 3 category 11: Use of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. Klabin would like to work actively with its customers to minimize the impact of its products and reduce emissions when using them.

Scope 3 category 12: End of life treatment of sold products

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. We will consider 2020 as the base year as it was the first year where the currently assessed categories were measured. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. Klabin would like to work actively with its chain to minimize the impact of its products and reduce emissions at the end of the life cycle.

Scope 3 category 13: Downstream leased assets

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is not relevant to Klabin's operations and was therefore not accounted for in the base year.

Scope 3 category 14: Franchises

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is not relevant to Klabin's operations and was therefore not accounted for in the base year.

Scope 3 category 15: Investments

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. Emissions generated due to investments made by the company are allocated to scopes 1 and 2.

Scope 3: Other (upstream)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is not relevant to Klabin's operations and was therefore not accounted for in the base year.

Scope 3: Other (downstream)

Base year start
January 1 2020

Base year end
December 31 2020

Base year emissions (metric tons CO2e)

Comment
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. This category is not relevant to Klabin's operations and was therefore not accounted for in the base year.

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
Brazil GHG Protocol Programme

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
783791.714

Start date
January 1 2021

End date
December 31 2021

Comment
By 2021 we have an 8% increase in the consumption of renewable fuels, especially biomass and tall oil tar. Regarding to non-renewable fuels, we had an increase of 14%, and it is important to point out that this result is mainly due to the start of the Puma 2 project and the incorporation of the five plants recently acquired by Klabin, whose main energy source is natural gas and heavy oil. Considering the intensity of emissions, we had a 17% increase in the company's gross production, causing us to reduce the intensity from 165 kgCO2e/ton to 155 kgCO2e/ton.

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)
703830.512

Start date
January 1 2020

End date
December 31 2020

Comment
In 2020 there was a 1.4% reduction in Scope 1 emissions. It is possible to relate the result to the increase in the participation of renewable fuels, by 8%, in stationary combustion, making the company's energy matrix reach 89.94% of participation of renewable fuels, besides the reduction in the consumption of mobile combustion fuels and in the use of air conditioning gases. There was a 6% increase in scope 1 biogenic emissions due to the increase in the percentage of biomass and black liquor burning in the boilers. Considering the intensity of the emissions, there was a 3% increase in the company's total production, causing our specific emissions to reduce from 163 to 158 kgCO2e/t.

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment
On Indirect GHG emissions from energy acquisition - Scope 2, in 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin purchased 686,193.11 MWh, from hydroelectric generation, with the appropriate generator declaration. Futhermore, 482,059 IRECS were emitted by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably; without the emission of IRECS, our Scope 2 emission by purchase choice would be 70,898 tCO2eq.
This results in a reduction of Scope 2 emissions in 138,285.935 tCO2eq when compared to location-based, which uses the average emission factor of the SIN (National Interconnected System). This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
158189.496

Scope 2, market-based (if applicable)
19903.561

Start date
January 1 2021

End date
December 31 2021

Comment
Beginning in 2020, we opted to use the purchase choice methodology as the main one for measuring indirect emissions (scope 2), unlike previous years that prioritized the location method. In this year 2021, Klabin purchased 686,193.11 MWh, from hydroelectric generation, with the appropriate generator declaration. Futhermore, 482,059 IRECS were emitted by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably; without the emission of IRECS, our Scope 2 emission by purchase choice would be 70,898 tCO2eq. The sum of hydroelectric power plus the IRECS issued by the company amounts to 96.6% of the energy purchased was from renewable sources.

Past year 1

Scope 2, location-based
77768.603

Scope 2, market-based (if applicable)
30141.952

Start date
January 1 2020

End date
December 31 2020

Comment
Regarding indirect GHG emissions from the acquisition of energy - Scope 2, in 2017 Klabin began to record these emissions through the Market-Based Approach. In this approach, Klabin quantifies Scope 2 GHG emissions using the specific emission factor associated with each source of electricity generation that Klabin chose to purchase. In this year 2020, Klabin purchased 740,637.8 MWh, from hydroelectric generation, with the appropriate generator declaration, this amount indicates that 62% of the energy purchased was from renewable sources. This results in a reduction of Scope 2 emissions by 47,626,651 when compared to the SIN (National Interconnected System), which uses the average SIN emission factor. This demonstrates Klabin's commitment to opting to purchase renewable energy, in accordance with its Sustainability Policy.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?
No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
113102.94

Emissions calculation methodology
Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Klabin report the emissions for purchased goods and services referring to the chemical inputs used in paper production, the emission factors used are from the Ecoinvent database, adapted to the Brazilian reality.

Capital goods

Evaluation status
Relevant, not yet calculated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Klabin seeks to expand the scope of the company's Scope 3 emissions, for this we are mapping the categories with the suppliers and creating a scope expansion roadmap in order to improve the transparency of our emissions.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
2488.18

Emissions calculation methodology
Fuel-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Klabin report the emissions related to fuels that are not previously included in scope 1 and 2, these emissions refer to the transportation of fuel used at Klabin's gas stations, calculated through the distance between the refinery and Klabin's gas stations. This category is included in the scope expansion for the next reporting cycle, where in addition to distance, we want to account for emissions from extraction and production of fuels used in Klabin's transport, in 2022 an estimate of this category was made, being approximately 82,014 tCO2eq. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
374407.86

Emissions calculation methodology
Fuel-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Klabin calculates emissions from third-party fuel consumption, referring to the transportation of inputs and products, in the last year we also started to report maritime emissions referring to the export of our products. The company has been studying alternatives to reduce fuel consumption in the products transportation, some initiatives are related to the substitution of fossil fuel for biofuels, besides the improvement in equipment efficiency. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
595.98

Emissions calculation methodology
Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
This Scope 3 category includes emissions from the treatment and / or final disposal of solid waste arising from the operations of the organization during the year, carried out in facilities owned or controlled by third parties. We achieved 98.1% of reuse of solid waste in 2021. This category accounts for all future emissions (along the treatment and / or final disposal process) that result from the waste generated in the inventory year. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
408.13

Emissions calculation methodology
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
This category includes the calculation of emissions from the transportation of employees to activities related to the inventor's organization's business carried out on vehicles operated by or owned by third parties. Business travel related emissions remained the same when compared to 2020, this result was due to the permanence of some security protocols against COVID-19. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
2929.98

Emissions calculation methodology
Fuel-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
This category includes the calculation of the emissions of the transport of employees in their movement between home and work, carried out in private vehicles of employees or public transportation. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3. The forestry operation on land leased by the company is carried out by its own team and machinery, so the emissions are allocated to Scope 1.

Downstream transportation and distribution

Evaluation status
Relevant, not yet calculated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. The emissions from the final product to the landfill will be calculated, taking into account an average distance and the emission factor of the transport.

Processing of sold products

Evaluation status
Relevant, not yet calculated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. For this category, emissions from Klabin's intermediate product customers will be considered, forecast for inclusion in the next cycle, in 2022 an estimate of this category was made, being approximately 1,233,569 tCO2eq.

Use of sold products

Evaluation status
Not relevant, calculated

Emissions in reporting year (metric tons CO2e)
0

Emissions calculation methodology
Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Emissions in this category are 0, our products do not emit during use.

End of life treatment of sold products

Evaluation status
Relevant, not yet calculated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
As of 2019, Klabin started to expand the scope of its Scope 3 in order to identify action points to reduce its emissions in the chain. The company has a chronogram for its expansion to be able to act more assertively with the chain to combat the climate crisis. For this category, emissions from Klabin's final product customers will be considered, forecast for inclusion in the next cycle, in 2022 an estimate of this category was made, being approximately 2,906,056 tCO2eq

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3. The forestry operation on land leased by the company is carried out by its own team and machinery, so the emissions are allocated to Scope 1.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
The company has no franchises, the emissions that are included in the greenhouse gas inventory come from the units that are under operational control and are allocated in scopes 1, 2, and in the categories mentioned above in scope 3. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3.

Investments

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Emissions from projects developed throughout 2021 are allocated to scopes 1 and 2. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3.

Other (upstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3.

Other (downstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data, as well as the non-relevance of some emission sources for scope 3.

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date
January 1 2020

End date
December 31 2020

Scope 3: Purchased goods and services (metric tons CO2e)
85282.25

Scope 3: Capital goods (metric tons CO2e)
0

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
2296.17

Scope 3: Upstream transportation and distribution (metric tons CO2e)
367581.237

Scope 3: Waste generated in operations (metric tons CO2e)
443.025

Scope 3: Business travel (metric tons CO2e)
413.972

Scope 3: Employee commuting (metric tons CO2e)
893.92

Scope 3: Upstream leased assets (metric tons CO2e)
0

Scope 3: Downstream transportation and distribution (metric tons CO2e)
0

Scope 3: Processing of sold products (metric tons CO2e)
0

Scope 3: Use of sold products (metric tons CO2e)
0

Scope 3: End of life treatment of sold products (metric tons CO2e)
0

Scope 3: Downstream leased assets (metric tons CO2e)
0

Scope 3: Franchises (metric tons CO2e)
0

Scope 3: Investments (metric tons CO2e)
0

Scope 3: Other (upstream) (metric tons CO2e)
0

Scope 3: Other (downstream) (metric tons CO2e)
0

Comment
The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

C-AC6.8/C-FB6.8/C-PF6.8

(C-AC6.8/C-FB6.8/C-PF6.8) Is biogenic carbon pertaining to your direct operations relevant to your current CDP climate change disclosure?
Yes

C-AC6.8a/C-FB6.8a/C-PF6.8a

(C-AC6.8a/C-FB6.8a/C-PF6.8a) Account for biogenic carbon data pertaining to your direct operations and identify any exclusions.

CO2 emissions from land use management

Emissions (metric tons CO2)
6903.25

Methodology
Default emissions factors

Please explain
The emissions in this category refer to the application of nitrogen compounds during the implementation of our forests in the states of Paraná, São Paulo, and Santa Catarina. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

CO2 removals from land use management

Emissions (metric tons CO2)
9323134

Methodology
Default emissions factors

Please explain
Removal of 9,323,134 t CO2e (biogenic) referring to the planting of forests for the supply of wood. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

Sequestration during land use change

Emissions (metric tons CO2)
22991.15

Methodology
Default emissions factors

Please explain
Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Apremavi), it promotes actions of rural property planning, conservation and environmental education in the states of Paraná and Santa Catarina. It guides small and medium-sized owners to perform more efficiently and with greater profitability, in addition to preserving ecosystems. Producers take courses, lectures and exchange visits and receive free seedlings of native plants. The program also encourages forestry with planted pine and eucalyptus forests, organic agriculture and ecotourism. This program had 2,119 ha of demarcated areas of preservation. Using as base the value of 10.85 tCO2eq / ha calculated according to the CO2 sequestration of the native forests in relation to a total area that a Klabin has (Brazilian GHG Protocol Metodology used). As we have an amount in ha from Matas Legal we have: 2,119 ha * 10.85 tCO2 / ha = 22,991.15 tCO2eq This amount of CO2 is also contemplated in the CO2 removal calculation for land use management. In 2021, we were able to reach more properties than the previous year, where we had stricter protocols due to COVID-19, so there was an increase in the number of properties

CO2 emissions from biofuel combustion (land machinery)

Emissions (metric tons CO2)
21588.793

Methodology
Default emissions factors

Please explain
Emissions of 21,588.793 t CO2e (biogenic) for mobile combustion (transport / machinery) The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

CO2 emissions from biofuel combustion (processing/manufacturing machinery)

Emissions (metric tons CO2)
5864208.179

Methodology
Default emissions factors

Please explain
Emissions of 5,864,208.179 tCO2e (biogenic) relative to stationary combustion of biomass fuels (biodiesel, vegetable residues and Black Liquor). The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

CO2 emissions from biofuel combustion (other)

Emissions (metric tons CO2)
268713.435

Methodology
Default emissions factors

Please explain
Emissions of 17,685.31 t CO2e (biogenic) for Scope 3, refering to the combustion of biodiesel in transportation. 251,028.125 t CO2e (biogenic) for Scope 2, these emissions refer to the purchase of thermal energy from biomass at the Angatuba and Piracicaba units.. The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology and was verified by third party, attesting to the veracity of the data.

C-AC6.9/C-FB6.9/C-PF6.9

(C-AC6.9/C-FB6.9/C-PF6.9) Do you collect or calculate greenhouse gas emissions for each commodity reported as significant to your business in C-AC0.7/FB0.7/PF0.7?

Agricultural commodities
Timber

Do you collect or calculate GHG emissions for this commodity?
Yes

Please explain
Timber is considered to be the main raw material for Klabin's production process. The boundaries used for data collection are related to the company's own operations as a whole and forestry activities in the states of Parana, Santa Catarina, and Sao Paulo. For the calculations of the atmospheric emissions of this commodity, the stationary emissions (plant residues and black liquor) are considered as biomass and liquor for the boilers (GHG emissions equivalent to 64,644.47 t CO2e and 5,864,208.179 tCO2 biogenic in 2021) and, in addition, the emissions of greenhouse gases are calculated for the agricultural emissions processes considering Forest Planting for wood supply (GHG emissions of 6,903.25 tCO2e in 2021). These calculations are performed annually using the methodology of the Brazilian GHG Protocol.

C-AC6.9a/C-FB6.9a/C-PF6.9a

(C-AC6.9a/C-FB6.9a/C-PF6.9a) Report your greenhouse gas emissions figure(s) for your disclosing commodity(ies), explain your methodology, and include any exclusions.

Timber

Reporting emissions by
Unit of production

Emissions (metric tons CO2e)
0.083

Denominator: unit of production
Metric tons

Change from last reporting year
Lower

Please explain
Timber is considered to be the main raw material for Klabin's production process. For the calculations of the atmospheric emissions of this commodity, the stationary emissions (plant residues and black liquor) are considered as biomass and liquor for the boilers (GHG emissions equivalent to 64,561.12 tCO2e and 5,821,838.72 tCO2 biogenic in 2021). Thats a decrease of 8.33% of CO2 biogenic emissions from timber when compared to 2020. It is important to mention that there was a 16% increase in the company's gross production, mainly referring to the five new units acquired and the start-up of the Puma 2 project. These calculations are performed annually using the methodology of the Brazilian GHG Protocol.

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
154.71

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
803695.27

Metric denominator
metric ton of product

Metric denominator: Unit total
5194848.71

Scope 2 figure used
Market-based

% change from previous year
6.1

Direction of change
Decreased

Reason for change
In 2021 we had a 17% increase in the company's gross production, in addition we had the emission of 482,059 IRECS by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably, reaching 96.6%. The significant reduction in scope 2 emissions due to the reporting of renewable energy purchases contributed to the important result for the year.

Intensity figure
0.0000488

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
803695.27

Metric denominator
unit total revenue

Metric denominator: Unit total
16481000000

Scope 2 figure used
Market-based

% change from previous year
20.61

Direction of change
Decreased

Reason for change
In 2021 we had a 17% increase in the company's gross production, in addition we had the emission of 482,059 IRECS by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably, reaching 96.6%. The significant reduction in scope 2 emissions due to the reporting of renewable energy purchases contributed to the important result for the year.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	702549.741	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	22468.124	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	53690.06	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	5083.789	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Brazil	783791.714

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Angatuba	8102.855	-23.565066	-48.359227
Betim	4160.885	-19.964755	-44.120758
Correia Pinto	20565.725	-27.551488	-50.364019
Feira de Santana	4149.076	-12.290827	-38.91198
Goiana	55699.91	-7.556655	-35.035038
Itajaí	5729.558	-26.891305	-48.709733
Jundiaí Distrito Industrial	5722.931	-23.1752	-46.931352
Jundiaí Tijuco Preto	2886.646	-23.266963	-46.865105
Lages 1	1465.739	-27.808633	-50.363555
Manaus	2053.382	-3.0985	-59.943561
Monte Alegre	240104.141	-24.310186	-50.6079
Otacilio Costa	37994.422	-27.513275	-50.116602
Piracicaba	6252.455	-22.687536	-47.674963
Puma	327156.328	-24.258055	-50.746944
São Leopoldo	3771.557	-29.786711	-51.114425
Depósito Paranaguá	631.624	-25.539727	-48.535783
Rio Negro	999.121	-26.083283	-49.77273
Escritório Sede	0	-23.589061	-46.682311
Lages 2	43.228	-27.80863	-50.363555
Horizonte	3.341	-4.09752	-38.4909
Franco da Rocha	15829.491	-23.32167	-46.72694
Manaus 2	2376.941	-3.0985	-59.943561
Paulínia	25866.539	-22.76111	-47.15417
Rio Verde	4756.289	-18.91806	-54.84417
Suzano	7017.755	-23.5425	-46.31083
Pilar	376.177	-34.61315	-58.37723

C-AC7.4/C-FB7.4/C-PF7.4

(C-AC7.4/C-FB7.4/C-PF7.4) Do you include emissions pertaining to your business activity(ies) in your direct operations as part of your global gross Scope 1 figure?

Yes

C-AC7.4a/C-FB7.4a/C-PF7.4a

(C-AC7.4a/C-FB7.4a/C-PF7.4a) Select the form(s) in which you are reporting your agricultural/forestry emissions.

Emissions disaggregated by category (advised by the GHG Protocol)

C-AC7.4b/C-FB7.4b/C-PF7.4b

(C-AC7.4b/C-FB7.4b/C-PF7.4b) Report the Scope 1 emissions pertaining to your business activity(ies) and explain any exclusions. If applicable, disaggregate your agricultural/forestry by GHG emissions category.

Activity
Agriculture/Forestry

Emissions category
Total

Emissions (metric tons CO2e)
6903.25

Methodology
Default emissions factor

Please explain
This emission value is linked to Agricultural emissions (scope 1) column on Brazilian GHG Protocol Metodology. Is related to the application of nitrogen compounds in the implantation of planted forests.

Activity
Processing/Manufacturing

Emissions category
Total

Emissions (metric tons CO2e)
4.11

Methodology
Default emissions factor

Please explain
This emission value is linked to Industrial Process (scope 1) column on Brazilian GHG Protocol Metodology

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Activity
Distribution

Emissions category
Total

Emissions (metric tons CO2e)
187432.656

Methodology
Default emissions factor

Please explain
This emission value is linked to Mobile Combustion emissions (scope 1) column on Brazilian GHG Protocol Metodology

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Activity
Processing/Manufacturing

Emissions category
Total

Emissions (metric tons CO2e)
584359.973

Methodology
Default emissions factor

Please explain
This emission value is linked to Stationary Combustion emissions (scope 1) column on Brazilian GHG Protocol Metodology

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C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Brazil	158189.496	19903.561

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.
By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Angatuba	13417.33	5493.174
Betim	979.537	234.218
Correia Pinto	15317.971	2219.566
Feira de Santana	696.082	94.843
Goiana	13512.367	1963.409
Itajaí	846.744	228.602
Jundiaí Distrito Industrial	1137.464	297.434
Jundiaí Tijuco Preto	775.041	212.509
Lages 1	1410.899	367.747
Manaus	357.178	99.294
Monte Alegre	73919.759	0
Otacílio Costa	9411.084	453.358
Piracicaba	10123.084	4273.56
Puma	3028.2	0
São Leopoldo	790.57	212.184
Despósito Paranaguá	43.646	43.492
Rio Negro	572.31	164.134
Escritório Sede	41.055	40.613
Lages 2	156.349	156.014
Horizonte	156.298	47.142
Franco da Rocha	2472.99	764.681
Manaus 2	470.898	121.196
Paulínia	5718.894	1501.003
Rio Verde	884.524	260.007
Suzano	1440.707	417.699
Pilar	238.517	237.683

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	10238.391	Decreased	33.967	On Indirect GHG emissions from energy acquisition - Scope 2, in 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, 482,059 IRECS were emitted by the surplus of energy generated by the Puma unit, which caused the percentage of renewable energy purchase to increase considerably. (10,238.391/ 30,141.952)*100 = 33.967%
Other emissions reduction activities	13123.81	Decreased	1.788	At the Monte Alegre Plant, a Heavy Oil WG was created to identify and act in areas of the plant where there were opportunities to reduce consumption. With this work, the unit stopped consuming approximately 4,200 tons of heavy oil in 2021, in addition to active work for the substitution of this fuel. (13,123.81/733,972.464)*100 = 1.788%
Divestment	0	No change	0	The reduction in emissions from the investment in the Puma 2 project, mainly referring to the biomass gasification, installed in 2021, began to be noticed in 2022 and will enter the next reporting cycle.
Acquisitions	55847	Increased	7.6	This reporting year includes the consumption and emissions of 5 units of International Paper acquired in late 2020 by Klabin, in the cities of Franco da Rocha/SP, Manaus/AM, Paulínia/SP, Rio Verde/GO and Suzano/SP. (55,847/ 733,972.464)*100 = 7.6%
Mergers	0	No change	0	There were no changes in emissions due to mergers.
Change in output	0	No change	0	There were no changes in emissions due to change in output.
Change in methodology	0	No change	0	There were no changes in emissions due to change in methodology.
Change in boundary	0	No change	0	There were no changes in emissions due to change in boundary.
Change in physical operating conditions	0	No change	0	There were no changes in emissions due to change in physical operating conditions.
Unidentified	0	No change	0	There were no changes in emissions due to undentified reasons.
Other	227.622	Decreased	0.031	There was a reduction in consumption and consequent recharges of air conditioning gases in the company's units due to lower traffic of people, mainly in administrative areas, yet in accordance with the protocols for confronting the COVID-19 pandemic and social distancing measures. Fugitive emissions in 2020: 5,369.347 tCO2e Fugitive emissions in 2021: 5,091.235 tCO2e (227.622/ 733,972.464) * 100 = 0.03%

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 30% but less than or equal to 35%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	No

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	17534506.98	2063228.28	19597735.26
Consumption of purchased or acquired electricity	<Not Applicable>	1168252.11	41079.9	1209332.01
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	18702759.09	2104308.18	20807067.27

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value
LHV

Total fuel MWh consumed by the organization
6546382.75

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
607924.08

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
5938458.67

Comment
In 2021 we had a 12% increase in the biomass consumption in the company, part of this result was due to the stabilization of the new biomass boiler in the Piracicaba unit.

Klabin was the first pulp and paper company in the Southern Hemisphere to earn FSC® Forest Management certification, in 1998. Widely approved in the sector and recognized by stakeholders, the certification brings security and credibility to sustainable forest management. Klabin is pioneer in the adoption of mosaic management concept - planted forests interspersed with native forests for conservation. In 2021, Klabin had 284,000 hectares of planted forests (eucalyptus and pine).

Regardless of wheter the planting spot is intended for biomass production or for processing (cellulose), field operation-procedures follow the same quality (environmental) parameters.

Other biomass

Heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
All biomass consumption is sustainable and reported in the field above.

Other renewable fuels (e.g. renewable hydrogen)

Heating value
LHV

Total fuel MWh consumed by the organization
10988124.23

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
10988124.23

Comment
In this year of 2021 we can highlight the increase in consumption of tar and tall oil, which substitutes heavy oil in the lime kilns. Besides this, we had an increase in the use of other renewable fuels at Klabin, such as black liquor, hydrogen and methanol.

Coal

Heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
Klabin does not use coal in its operations.

Oil

Heating value
LHV

Total fuel MWh consumed by the organization
1284115.25

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
39140.87

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
1244974.36

Comment
With the accounting of the plants acquired by Klabin (Manaus 2 and Rio Verde) that operate with heavy oil boilers and the start of operation of the Puma 2 project, we can see an increase of 12% in consumption over the previous year. This value tends to decrease with the stabilization of the project and initiatives to reduce consumption.

Gas

Heating value

Total fuel MWh consumed by the organization
640537.43

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
640537.43

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
In 2021 we can see an increase in natural gas consumption due to the inclusion of the consumption of the newly acquired units that use this fuel as a source for the boilers.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
LHV

Total fuel MWh consumed by the organization
138575.6

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
6003.61

MWh fuel consumed for self-generation of steam
140.31

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
132431.61

Comment
In 2021 we maintained the consumption of stationary LPG at the same level as the previous year and we can see a reduction in the consumption of stationary diesel in our units.

Total fuel

Heating value
LHV

Total fuel MWh consumed by the organization
19597735.26

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
6003.61

MWh fuel consumed for self-generation of steam
1287742.69

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
18303988.87

Comment
The environmental and climate change management, the promotion and encouragement of energy efficiency are expressed in the document Climate Change Management Guidelines - Adaptation and Mitigation. At the Puma Unit, we count on the involvement of the employees, through the Internal Committee for Energy Conservation (CICE). From this committee, the professionals look for opportunities to reduce consumption of energy, steam, compressed air and eliminate waste.

Klabin is also committed to energy production and to the progressive increase of the renewable energy matrix, produced from biomass and black liquor. Of the total electricity consumed, approximately 63% is self-generated and the rest, energy bought from the system, with 97% of the purchase coming from renewable sources.

When we look at the amount of electricity generated by the company and the amount purchased, we have 88% of energy self-sufficiency, i.e., the company generates almost all the energy it consumes.

Energy efficiency is a constant pursuit in Klabin's environmental management, which is continually concerned with optimizing energy consumption in the industrial plants. The energy generated by Klabin has an energy matrix predominantly formed by renewable sources, corresponding to 89.5% of the total generated.

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method
Green electricity products from an energy supplier (e.g. green tariffs)

Energy carrier
Electricity

Low-carbon technology type
Hydropower (capacity unknown)

Country/area of low-carbon energy consumption
Brazil

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
686193.11

Country/area of origin (generation) of the low-carbon energy or energy attribute
Brazil

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2012

Comment
The Brazilian GHG Protocol Methodology considers hydroelectric energy with emission factor equal to zero. in 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh, from hydroelectric generation, with the proper Declaration of the generator. The value reported here refers to the sum of the self-declarations of renewable energy that Klabin receives from its suppliers, 86% of this energy is supplied by Copel, whose power plant started operating in 2012. This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

Sourcing method
Unbundled energy attribute certificates (EACs) purchase

Energy carrier
Electricity

Low-carbon technology type
Sustainable biomass

Country/area of low-carbon energy consumption
Brazil

Tracking instrument used
I-REC

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
482059

Country/area of origin (generation) of the low-carbon energy or energy attribute
Brazil

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2016

Comment
In 2017 Klabin began to record these emissions through the Market-based Approach. In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin emitted 482,059 IRECS, from surplus energy generated in Puma unit, with the proper Declaration of the generator. This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

Sourcing method
Purchase from an on-site installation owned by a third party

Energy carrier
Steam

Low-carbon technology type
Sustainable biomass

Country/area of low-carbon energy consumption
Brazil

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
557282.99

Country/area of origin (generation) of the low-carbon energy or energy attribute
Brazil

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2021

Comment
Klabin has a contract to buy steam from biomass through direct transfer. The steam is generated in the boilers of a third-party company that supplies it to be consumed at the Angatuba and Piracicaba mills. In the year 2021 the equivalent of 557,282.99 MWh were purchased. This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area
Brazil

Consumption of electricity (MWh)
3322485.62

Consumption of heat, steam, and cooling (MWh)
2049777.1

Total non-fuel energy consumption (MWh) [Auto-calculated]
5372262.72

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Argentina

Consumption of electricity (MWh)
1880.15

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
1880.15

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description
Energy usage

Metric value
13.91

Metric numerator
GJ

Metric denominator (intensity metric only)
ton

% change from previous year
21.27

Direction of change
Decreased

Please explain
Energy efficiency is a constant pursuit in Klabin's environmental management, which is continually concerned with optimizing energy consumption in the industrial plants. Where we have managed to reduce energy consumption per ton of product produced through consumption reduction actions, mainly at the Monte Alegre Plant.

Description
Waste

Metric value
49.12

Metric numerator
ton

Metric denominator (intensity metric only)
-x-

% change from previous year
3.49

Direction of change
Increased

Please explain
In 2021, we reused 98.1% of solid waste, a reduction of 0.2% in relation to the index for 2020. This reduction occurred due to Klabin's acquisition of five new units, these units added a total of 16,008 tons of non-reused waste, mostly waste from the depuration of shavings for the recycling process.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
C3037 VIE Klabin GPV VIE 2019 (DE) Declaração de Verificação - INGLES.pdf

Page/ section reference
Scope 1 emissions are found on page 2, in the Organization Verified Emissions (Operational Control) section, in the attached document. Verification Statement in accordance with the Brazilian GHG Protocol Program and ABNT NBR ISO 14064-3: 2007

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
C3037 VIE Klabin GPV VIE 2019 (DE) Declaração de Verificação - INGLES.pdf

Page/ section reference
Scope 2 location based emissions are found on page 2, in the Organization Verified Emissions (Operational Control) section, in the attached document. Verification Statement in accordance with the Brazilian GHG Protocol Program and ABNT NBR ISO 14064-3: 2007.

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 2 approach
Scope 2 market-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
C3037 VIE Klabin GPV VIE 2019 (DE) Declaração de Verificação - INGLES.pdf

Page/ section reference
Scope 2 market based emissions are found on page 2, in the Organization Verified Emissions (Operational Control) section, in the attached document. Verification Statement in accordance with the Brazilian GHG Protocol Program and ABNT NBR ISO 14064-3: 2007

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Purchased goods and services
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
Scope 3: Upstream transportation and distribution
Scope 3: Waste generated in operations
Scope 3: Business travel
Scope 3: Employee commuting

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
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Page/section reference
Scope 3 emissions are found on page 2, in the Organization Verified Emissions (Operational Control) section, in the attached document. Verification Statement in accordance with the Brazilian GHG Protocol Program and ABNT NBR ISO 14064-3: 2007.

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Product footprint verification	The product life cycle study was evaluated within the general guidelines for conducting Life Cycle Assessment studies established by ISO 14040 - Environmental Management - Life Cycle assessment - Principles and Framework and ISO 14044 - Environmental Management - Life Cycle Assessment - Requirements and Guidelines - (ISO, 2006a and ISO, 2006b).	Klabin's main products (78% of the portfolio) are evaluated using the ISO 14040 methodology. Through this methodology, we were able to identify the carbon footprint and the main points of carbon emission along the chain. What enables better targeting of actions and investments to reduce carbon. In 2021, some Life Cycle Assessment, Carbon Footprint and Water Footprint studies were finalized and verified by a third party for the following products: hardwood pulp, softwood pulp, eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the kraftliner from Otacilio Costa. In 2021, Klabin invested about BRL 201,400 to evaluate the life cycle of products, and the results are shared with some customers, which also allows joint actions to reduce carbon in the chain.
C5. Emissions performance	Change in Scope 1 emissions against a base year (not target related)	The company's greenhouse gas inventories are calculated according to the methodology of the Brazilian GHG Protocol Program. Since 2010, the company has been reporting its inventories on the Public Emissions Registry platform and since 2011 they have been verified by a third party, according to Verification Specifications of the Brazilian GHG Protocol Program and the ABNT NBR ISO 14064-3: 2007 standard.	Klabin's greenhouse gas inventory is assessed using the Brazilian GHG Protocol methodology and the ABNT NBR ISO 14064-3: 2007 standard. With this methodology, we were able to map the main sources of carbon emissions in the company. Klabin's inventory is audited by a third party and made available at the Public Emissions Registry.

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

In 2022, the Brazilian Government launched Decree 11075, which establishes the procedures for the elaboration of Sectorial Plans for Mitigation of Climate Change and institutes the National System for the Reduction of Greenhouse Gas Emissions. Klabin considers this action as a first step towards regulating the carbon market in Brazil. Klabin is considering the beginning of the regulated carbon market in Brazil from 2023.

Since 2018, Klabin has been adopting methodologies for internal carbon pricing. To assess the impact and strategic investments in the face of possible regulation in Brazil, (ETS and / or tax) a shadow price (BRL 40) is adopted. This value was defined based on studies by the Ministry of Economy of Brazil that analyzes the ways to price carbon in the country. BRL 40 would be the average amount needed to induce investment in low carbon technologies. This value also reflects (in reais) the average carbon price in Latin American countries, which have mandatory carbon pricing schemes.

Sensitivity analyzes are performed to better understand the impacts of the carbon cost. Klabin has two industrial units, Puma and Monte Alegre, with emissions scope 1 above 200,000 tCO2e, being liable to be regulated if the Brazilian government in the future adopt a cap and trade scheme or taxation. Thus, analyzes are made to identify the financial impact of carbon pricing. The financial impact is measured by the product between the value of the carbon tax/allowance (US$ 7 = R$ 40) versus the total scope 1 emissions of the Puma and Monte Alegre units in 2019 - 532.101 t CO2e = BRL 14,9 million. It is annual cost.

In addition, Klabin prepares a MACC to identify and prioritize mitigation measures / low carbon technologies, as well as to stimulate business opportunities / cost reduction. A MAAC permits an easy to read visualization of various mitigation options or measures organized by a single, understandable metric: economic cost of emissions abatement. It is possible to assess/compare the (i) cost of regulation x (ii) the cost of investing in low carbon technology – BRL/tCO2 both. As the MACC presents the marginal cost of carbon, which facilitates the company in decisions such as investing in low carbon technologies or paying the fee or allowance. Serving as a basis for comparing the price of carbon when it is regulated in Brazil.

Thus, by prioritizing technologies, Klabin has a pipeline of technologies that will be implemented in the short and medium term to achieve its carbon reduction target and take advantage of opportunities to increase resource efficiency.

In 2020, to improve internal carbon pricing analyzes, Klabin extended the study considering the impact of carbon pricing on the chain, especially in the purchase of inputs that may pass on the cost of carbon pricing. Thus, the financial impact was calculated based on the projected increase in the purchase price of energy and fuels consumed by the company.

Based on a study and literary review, it was considered, in the scenario of the establishment of the national carbon pricing market, an increase in the price of energy by 3% (CNI, 2020) and an increase of 8% in the price of fossil fuels (CNI, 2020). CNI – Brazilian National Confederation of Industry

Klabin is member of IBÁ's technical committee on climate change, in order to be aware of updates on the topic.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price
Navigate GHG regulations
Drive energy efficiency
Drive low-carbon investment
Stress test investments
Identify and seize low-carbon opportunities

GHG Scope
Scope 1
Scope 2

Application
We simulate that emissions from stationary sources (of our industrial units with annual emissions more higher than 200,000 tonneCO2e) are regulated and needs to pay a carbon tax (BRL 40/tonneCO2e).
In this case, the Klabin units apply the carbon pricing for the Monte Alegre and PUMA units, both located in the state of Parana.

Actual price(s) used (Currency /metric ton)
40

Variance of price(s) used
Klabin considers an uniform pricing that it represents a single price that is applied throughout the company independent of geography or business unit. Further, Klabin considers a static pricing that it represents a price that is constant over time. We consider that because in Brazil there is not carbon regulation yet and it is extremally hard to define the potential variations about carbon pricing.

Type of internal carbon price
Shadow price
Implicit price
Offsets

Impact & implication
1 - Shadow price: Due the possible impacts of the carbon regulation, for example tax or ETS, Klabin use a shadow price to understand the financial impact on the business revenue and EBITDA.
We simulate that emissions from stationary sources (of our industrial units with annual emissions > 200,000 tonCO2e) are regulated.

Impact & implication
We conducted 'sensitivity analysis' based on: average carbon tax in Latin America – U$ 7.0. The carbon price is converted to Real.

Our stationary emissions (584,359 tCO2e) X medium carbon tax (BRL 40.00) = around BRL 23,374,360. Less than 1% of the 2021 Adjusted Ebitda (R$ 6,885 millions).

2 - MACC - Klabin has been structuring a Marginal Abatement Cost Curves to identify the cost of the technologies and reduction emission potential.

Impact & implication
The MACC contributes to understand better the cost effective emission abatement of the company, contributing to identify and prioritize the emission reduction measures.

A MAAC permits an easy to read visualization of various mitigation options or measures organized by a single, understandable metric: economic cost of emissions abatement. It is possible to assess/compare the (i) cost of regulation x (ii) the cost of investing in low carbon technology – BRL/tCO2 both

In some cases, the cost of possible carbon regulation (in Brazil) will enable some investments. In additional, some technologies measures offers economic gains.

3 - Offsets – the company has an offset project base on restoration areas with planted forest. This project was submitted to UNFCCC and Brazilian government. It is expected the negotiation these offsets in future carbon market in Brazil. A percentage of the offsets can be used as a flexible mechanism in the regulated market.

Impact & implication
An expected economic gain from sales of offsets, to identify this opportunity we use the currently offset price ($ 3 = BRL 11.58) X 4,645,40 tCO2e expected offsets (it will be generated) = around BRL 53 million.
In December 31th, the offset price was $14 = BRL 80

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our suppliers
Yes, our customers/clients
Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement
Engagement & incentivization (changing supplier behavior)

Details of engagement

Run an engagement campaign to educate suppliers about climate change

% of suppliers by number
51

% total procurement spend (direct and indirect)
27

% of supplier-related Scope 3 emissions as reported in C6.5
100

Rationale for the coverage of your engagement
The Klabin forestry units have a Controlled Wood Program where the wood suppliers are evaluated by specific forestry team, based on specific methodology related to the FSC® chain of custody certification. These suppliers were selected because they represent an important part of our supply chain due to high risks this sector represents.
In 2021, Klabin purchased 5.4 million of tonnes with 71% from certified sources representing 73% of total spend. All these certified suppliers were evaluated in water-related issues by FSC® certification.
Further, 709 audits have evaluated in 168 non-certified wood suppliers and 40 certified wood suppliers in Paraná and Santa Catarina states. These suppliers represented 51% of Klabin's wood suppliers by number. In total procurement spend, these suppliers represented 27% of total wood suppliers.
All suppliers of the forestry units are audited by Klabin on a quarterly basis. In case of non-compliance with the water-related targets or guidelines, Klabin stops supplying immediately and sends a recommendation of adequacy. After fulfilling the recommendations, the supplier is audited again and, in the event of no pending issues, the supply contract is resumed.

Impact of engagement, including measures of success
Klabin measures the success by compliance percentage of all sustainability parameters on properties involved in the Program. This checklist has labor and human rights, environmental (water, solid wastes, emissions) and social aspects and it is used to measure of success of the engagement.

Forest Environmental Responsibility coordination is responsible for apply internal audits in own and value chain operations.
In 2021, 709 audits were realized in Paraná and Santa Catarina suppliers; approximately 202 suppliers were evaluated. Klabin audits all wood suppliers monthly. Audit checklist contemplates ESG issues. Operational deviations are classified according to severity:

(I) Observations - minor severity: supplier has 7 days to regularize the operation and send evidence of it. An example of what is considered a minor severety deviation is incorrect waste disposal (recyclable and non-recyclable).
(II) Non-conformities - major severity: supplier is suspended to delivery wood for Klabin immediately. After fulfilling the recommendations od adequacy, supplier undergoes a new audit and if no pendind issues, supply contract is resumed. An example of what is considered a major severety deviation is irregular accommodation for workers (occupational health and safety).

In 2021, 100% of the suppliers that delivered wood to the factory were suitable or have been adapted as recommended by Klabin for this purpose.

Comment
In Parana, the percentage of audits identified in 2021 as causing significant and negative impacts which improvements were verified and resolved: 0.4% (2 audits). 99% of the evaluated items involved were attended; the 1% refers to update documents and adequacy of accommodation for employees.
In 2021, Klabin purchased 5,4M ton from suppliers; 331 suppliers – 51% of them are controlled wood suppliers by number; 27% was the total procurement spend in this kind of sourcing. At general, controlled wood suppliers are smallholders producers.

Type of engagement
Engagement & incentivization (changing supplier behavior)

Details of engagement
Climate change performance is featured in supplier awards scheme

% of suppliers by number
4

% total procurement spend (direct and indirect)
54

% of supplier-related Scope 3 emissions as reported in C6.5
100

Rationale for the coverage of your engagement
Klabin took an important step in improving supply chain management in 2019 with the adoption of the EcoVadis methodology for supplier assessment, aimed at classifying sustainability in several aspects: financial, labor & human rights, environment and social issues. Klabin has selected 453 strategic suppliers from our portfolio (around 7,000 suppliers), representing 4% by number and 54% of total procurement spend of supply chain, to participate in the assessment, which considers questions grouped into four major themes: environment (climate and water management, for example), labor and human rights, ethics and sustainable procurement. The strategic suppliers were selected according to criticality matrix of supply chain team that assesses aspects-related to total spend, recurrence greater than 6 months a year and potential impacts on business. Further, this strategy also considers our social and environmental responsibility matrix that it includes environmental potential impacts, issues of diversity, ethic and human rights and health and safety impacts. Our suppliers are incentivized to participate the Ecovadis assessment through our supply contracts which request that they comply with the sustainability standards as defined in our Supplier Code.

Impact of engagement, including measures of success
Considering the three phases of our Corporate Social Responsibility Program, Klabin already evaluated and rated 264 strategic suppliers which it represents more than 58% of way that we get to reach our target until 2030 (100% of strategic suppliers evaluated by CSR Program). The consolidated engagement rate of this Program was 85% what it represents a very good result because it is much higher than EcoVadis' engagement rate (56%). The average score from Klabin's suppliers was 42.5 of 100.
To suppliers maintain within our procurement strategy, Klabin requires all selected suppliers to report their informations and results related the last year including direct use of energy, climate-related actions and climate-related risks and opportunities. In situations where the result of this reporting is lower than minimum score required by Klabin (score <35), suppliers are requested to elaborate an action plans to improve your score. In case of this score be critical (score <25), Klabin realizes a follow-up audits in suppliers. We have found this assessment has helped us to identify on our supply chain the major climate-related risks who we are exposed. The climate-related success of this Program is measured by number of suppliers with any energy or climate actions every year.

In 2019, 49% of 86 evaluated suppliers report that they had any specific energy or climate-related actions in their climate management.
In 2020, 39% of 84 evaluated suppliers report that they had any specific energy or climate-related actions in their climate management.
In 2021, 34% of 94 evaluated suppliers report that they had any specific energy or climate-related actions in their climate management.

Comment
EcoVadis is a collaborative platform that allows measuring the quality of a company's Corporate Social Responsibility management system through its policies, actions and

results. More than 90 thousand companies in the world were rated until 2021. In 2021, the participation is voluntary and requires an investment by suppliers. For this reason, Klabin financed the participation of smaller companies.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number
100

% of customer - related Scope 3 emissions as reported in C6.5
100

Please explain the rationale for selecting this group of customers and scope of engagement
Klabin shares information with all its customers regarding information related to the organization's atmospheric emissions and certifications. There are some specific customers where Klabin periodically responds to information on air emissions, sustainability and the environment. It is important to mention that over the years more customers are requesting the supply engagment questionnaire in the CDP. This demonstrates the company's commitment to stakeholder engagement and transparency in information sharing. In addition, for all customers (and for this reason it is considered 100%), Klabin publicly announces its results and actions related to climate change. Some of the shared documents are: Public record of atmospheric emissions, disclosure of results on the Klabin website, Corporate Sustainability Index Report (ISE), Klabin Sustainability Report, Dow Jones Report, among others.

Impact of engagement, including measures of success
Klabin's customers are one of the stakeholder groups which have most driven and challenged the Company on its path to a low carbon economy. This is reinforced by Klabin's Policy of Stakeholder Engagement, which states that the Company should seek to meet the needs of its customers, considering their growing demand for gains in innovation and sustainability of its products. The theme Customers and Products is increasingly linked to innovation and sustainability and is considered one of Klabin's Objectives for Sustainable Development (KODS). In 2020, the company established a goal of having 10 benchmarking cases of circular economy in partnership with customers by 2030, this goal is part of Klabin's Agenda 2030 and the KODS. Klabin is sharing its Sustainability performance with 78 customers through EcoVadis platform. In 2021, Klabin performed 80 from 100 points, reaching the platinum medal which it represents that Klabin is within 1% the best performance of sector in the world.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Klabin has always valued maintaining a close relationship with the communities surrounding its facilities, since these are affected directly or indirectly by our operations. With this in mind, in 2001 the Caiubi Project was created at a meeting in the Casa de Cultura of Telemaco Borba, in Parana, with the objective of training teachers in environmental education. The schools of the towns where Klabin operates are invited to participate through the Education Departments.

The editions are guided by a main theme, chosen after an analysis of local needs and potential. We also seek to align the themes with Klabin's Sustainability Policy and with the KODS - Klabin Goals for Sustainable Development, linked to Agenda 2030 of the United Nations. The journey is developed in three stages:

- Training: specialists share their knowledge with educators, take questions and provide guidance as to the best way to work the theme with students, in theory and practice. There is always a workshop that encourages the teacher to experience the themes.
- Development: teachers approach the theme in special classes and put the projects into practice with their classes. The actions are planned in advance, in joint meetings between the coordinators of the Program and the school professionals.
- Environmental exhibition: this is one of the most important moments of the journey. At this stage, the students share what they have learned with their classmates, their families, and the entire community. The presentations encourage teamwork and are also an opportunity for students to exercise their autonomy. Children and young people become true multipliers of good environmental practices.

This program was chosen because of its importance for the company and for the community. Over 20 years, the Klabin Caiubi Program has been present in 1,588 schools in more than 50 municipalities in Parana and Santa Catarina. As of 2019, the initiative was extended to the municipality of Feira de Santa, in Bahia. In 2021, the program started in São Leopoldo, in Rio Grande do Sul. The expectation is that, adapted to local needs, Caiubi will produce good results for teachers, students and their families and will be taken to the other cities where Klabin has operations.

In the four states where the program operates (Paraná, Santa Catarina, Rio Grande do Sul, and Bahia), more than 6,000 educators have been trained, more than 1,600 schools have participated, and more than 480,000 students have been reached. For the company, the program has a positive impact on its image and reputation, as it is a way to get closer to the community.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?
Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement
Setting a science-based emissions reduction target

Description of this climate related requirement
Klabin adopted EcoVadis methodology for supplier assessment, aimed at classifying sustainability in several aspects. The strategic suppliers were selected according to criticality matrix of supply chain team that assesses aspects-related to total spend, recurrence greater than 6 months a year and potential impacts on business. Our suppliers are incentivized to participate the Ecovadis assessment through our supply contracts which request that they comply with the sustainability standards as defined in our Supplier Code.
To suppliers maintain within our procurement strategy, Klabin requires all selected suppliers to report their informations and results related the last year including direct use of energy, climate-related actions and climate-related risks and opportunities. This assessment helped us to identify on our supply chain the major climate-related risks who we are exposed. The climate-related success of this Program is measured by number of suppliers publicy reporting science based emissions reduction target.
Klabin's target is that by 2030, 100% of critical suppliers will be evaluated on the Ecovadis platform, and these will represent more than 85% of the company's spend. It is important to emphasize that all suppliers that participate in this evaluation are questioned about the definition of emission reduction targets based on science, in the first 3 waves of the evaluation, 6% of the suppliers are committed to SBTi.

% suppliers by procurement spend that have to comply with this climate-related requirement
100

% suppliers by procurement spend in compliance with this climate-related requirement
4

Mechanisms for monitoring compliance with this climate-related requirement
Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement
Retain and engage

C-AC12.2/C-FB12.2/C-PF12.2

(C-AC12.2/C-FB12.2/C-PF12.2) Do you encourage your suppliers to undertake any agricultural or forest management practices with climate change mitigation and/or adaptation benefits?
Yes

C-AC12.2a/C-FB12.2a/C-PF12.2a

(C-AC12.2a/C-FB12.2a/C-PF12.2a) Specify which agricultural or forest management practices with climate change mitigation and/or adaptation benefits you encourage your suppliers to undertake and describe your role in the implementation of each practice.

Management practice reference number
MP1

Management practice
Reforestation

Description of management practice
We develop practices of adequacy, conservation and environmental preservation in rural properties.

Your role in the implementation
Financial
Knowledge sharing
Operational
Procurement

Explanation of how you encourage implementation
Klabin adopts programs and plays the role of its suppliers and its region owners in order to improve the conditions of its stakeholders, as well as to comply with environmental laws, the preservation and management of companies and plantations. The main programs are:

Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Apremavi), it promotes actions of rural property planning, conservation and environmental education in the states of Paraná and Santa Catarina. It guides small and medium-sized owners to perform more efficiently and with greater profitability, in addition to preserving ecosystems. Producers take courses, lectures and exchange visits and receive free seedlings of native plants. The program also encourages forestry with planted pine and eucalyptus forests, organic agriculture and ecotourism.

Plante com a Klabin [Forest Development] - economic, social and environmental development by promoting the planting of pine and eucalyptus in idle areas of rural properties. In addition to the seedlings, Klabin provides the necessary guidance for correct land management. The process assists in the establishment of rural populations, promotes plant recovery and stimulates regional development.

Planning for Sustainable Properties (Matas Sociais) - This program has been developed since August 2015 in partnership with APREMAVI, TNC and SEBRAE, to promote the economic, environmental and social strengthening of small and medium-sized rural properties. It develops actions that assist the producer in the environmental, legal and landscape adaptation of the property, in the planning and diversification of the production, strengthening initiatives of association and cooperativism, and facilitating the access to the new opportunities of market and regional development.

Climate change related benefit
Emissions reductions (mitigation)
Increase carbon sink (mitigation)

Comment
In 2021, Matas legais program served 1256 properties; 115,458 seedlings donated; 2,119 ha of demarcated areas of preservation.
Its is also important to mention that this program reduced greenhouse gas emissions in 22,991.15 tCO2eq using as base the value of 10.85 tCO2eq / ha calculated according to the CO2 sequestration of the native forests in relation to a total area that a Klabin has (Brazilian GHG Protocol Metodology used).

In 2021, "Plante com a Klabin", the company's new forest partnership program, signed 61 contracts with 61 landowners, covering an area of approximately 464 ha.

Planning Sustainable Properties (Matas Sociais) - Serves 681 rural properties.

C-AC12.2b/C-FB12.2b/C-PF12.2b

(C-AC12.2b/C-FB12.2b/C-PF12.2b) Do you collect information from your suppliers about the outcomes of any implemented agricultural/forest management practices you have encouraged?
Yes

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, we engage indirectly through trade associations

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

In 2021, we were the only Latin American company invited to join the Business Leaders group of the 26th UN Climate Conference, in Glasgow, Scotland. Since Eco-92, in Rio de Janeiro, we have actively participated in environmental conferences, due to our good practices in this area.

In partnership with the Brazil network of the UN Global Compact, we launched the ImPacto NetZero movement (https://www.impactonetzero.com/), created from the urgency of collective mobilization to mitigate climate change.

We were the first company in the pulp and paper sector in Latin America to have its GHG emission reduction targets approved by the Science Based Targets initiative (SBTi). The initiative establishes methods and tools for companies to adopt science-based emission reduction targets.

In 2021 and 2022, we also participated in the public consultation process of the FLAG SBTi NetZero Standard, providing our considerations on the importance of considering CO2 removals in the standard.

Our efforts are guided by the Guidelines for Climate Change Management – Mitigation and Adaptation. Among the main guidelines for managing the theme are the Business Ambition For 1.5º C, a UN global campaign, and the commitment to reduce emissions considering science and the neutralization of emissions by 2050.

In 2021, we joined the We Mean Business global coalition that brings together the business sector around the fight against the effects of global warming. Several companies around the world participate in the initiative, which proposes the establishment of a low carbon economy.

Home - ImPacto Net Zero.pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy

Klabin has restructured its team and created a specific corporate area of Sustainability and Environment that has as one of its objectives the day-to-day management of the issue with the responsibility of monitoring global and national climate agendas and mapping their related risks and opportunities related to all of the Klabin units. This team is responsible for operating and managing corporate issues related to the environment and sustainability in the organization.

As a complement to the inclusion of the activities of this corporate team, Klabin presents a fixed sustainability committee made up of representatives of the organization's board of directors whose objective is to discuss and insert sustainability-related issues (including climate change) into the organization's strategic planning.

The corporate sustainability and environmental team is responsible for following the demands of global and national climate agendas and mapping their related risks and opportunities and taking these issues to decision making in the sustainability committee.

In addition, the demands and decisions of this committee return the corporate team to operationalize and apply the actions together with the environmental teams located in Klabin units. This ensures that the issues related to our direct and indirect activities are linked to our strategy of climate change and organizational sustainability.

Our efforts are guided by the Guidelines for Climate Change Management – Mitigation and Adaptation. Among the main guidelines for managing the theme are the Business Ambition For 1.5º C, a UN global campaign, and the commitment to reduce emissions considering science and the neutralization of emissions by 2050.

In 2021, we joined the We Mean Business global coalition that brings together the business sector around the fight against the effects of global warming. Several companies around the world participate in the initiative, which proposes the establishment of a low carbon economy.

In partnership with the Brazil network of the UN Global Compact, we launched the ImPacto NetZero movement, created from the urgency of collective mobilization to mitigate climate change.

The success of this management model is ensured by a governance structure that involves all levels of the company, constantly interacting with each other and empowering all Klabin's areas and employees.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Focus of policy, law, or regulation that may impact the climate
Carbon tax
Emissions trading schemes

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Decree No. 11,075, of May 19, 2022, establishes the procedures for the preparation of Sectoral Plans for Mitigating Climate Change and creates the National System for the Reduction of Greenhouse Gas Emissions. In other words, the measure creates a regulated carbon market, focused on the export of credits, especially to countries and companies that need to offset emissions to meet their carbon neutrality commitments.

The regulation, expected since 2009, brings elements such as the concepts of carbon credit and methane credit, carbon stock units and the system of national registry of emissions and emission reductions and credit transactions.

Policy, law, or regulation geographic coverage
National

Country/region the policy, law, or regulation applies to
Brazil

Your organization's position on the policy, law, or regulation
Support with no exceptions

Description of engagement with policy makers
Klabin participates actively in Ibá (Brazilian Tree Industry), which is the association responsible for the institutional representation of the planted tree production chain, taking part in the work groups referring to the climate and carbon agenda, answering public consultations that are taken by Ibá to the organs responsible for the regulations. Regarding the regulation of the carbon market, Klabin sent, along with the other companies that are part of the association and which are interested in the regulation of the market, a document with suggestions.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
<Not Applicable>

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
Other, please specify (Brazilian Tree Industry (Ibá))

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
na

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)
1852855

Describe the aim of your organization's funding
Klabin is an active member of The Brazilian Tree Industry (Ibá), which works in a structured way to represent the industry to governmental bodies, entities within the planted tree productive chain, important sectors of the economy, environmental organizations, universities, schools, consumers, and the press. The association maintains active participation in the most important national and international forums and councils, with manufacturing and the forest base, as well as debates, meetings, and public consultations. The main topics of discussion are best practices in forest management, environmental services, technology and innovation, sustainability in the industry's production chain, and engagement with civil society in decision making. Ibá participates in technical groups and prepares documents to define a common agenda and represent the interests of the sector.

Since 2016, Brazilian companies are not allowed to contribute to political campaigns or organizations (Law 13165/2015). It is important to emphasize that since 2014 Klabin's Anticorruption Manual also presents impediments to donations to politicians and political parties.
Klabin's contributes, however, to the two main Industry Associations in Brazil that advocate for the importance and potential of its sector to the consolidation of a more sustainable economy. Such associations generate knowledge in order to substantiate public debates and politically influence the agendas on climate change and planted forests, forest certification standards, carbon trade/market and paper packaging products. Information on the nature of such contributions are publicly disclosed on Klabin's ESG Panel and Sustainability report.

The contribution to industry associations is in accordance with the legal provisions and compliance instruments adopted by the company.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication
In mainstream reports

Status
Complete

Attach the document
klabin_RS2021_EN_11_07.pdf

Page/Section reference
Section "Renewable future", starts at page 36

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
This is the organization's sustainability report. The document presents the main information on the performance and management practices of the company in the environmental, social and economic fields in the last year. The content was organized based on the correspondence between the nine most relevant themes for the business, pointed out in a materiality study conducted with Klabin's stakeholders and subsequently related to the Sustainable Development Goals (SDG) of the United Nations (UN). Since 2016, Klabin has voluntarily joined the SDG. In order to implement its commitment to the SDGs, Klabin complemented its sustainability policy and assumptions to cover all these issues, creating its own agenda, which was called Klabin Goals for sustainable development. In it, objectives and goals were outlined to guide the company's strategic planning for the next 10 years.

C13. Other land management impacts

C-AC13.1/C-FB13.1/C-PF13.1

(C-AC13.1/C-FB13.1/C-PF13.1) Do you know if any of the management practices implemented on your own land disclosed in C-AC4.4a/C-FB4.4a/C-PF4.4a have other impacts besides climate change mitigation/adaptation?
Yes

C-AC13.1a/C-FB13.1a/C-PF13.1a

(C-AC13.1a/C-FB13.1a/C-PF13.1a) Provide details on those management practices that have other impacts besides climate change mitigation/adaptation and on your management response.

Management practice reference number
MP1

Overall effect
Positive

Which of the following has been impacted?
Biodiversity
Soil
Water
Yield

Description of impact
Klabin adopts programs and plays the role of its suppliers and its region owners in order to improve the conditions of its stakeholders, as well as to comply with environmental laws, the preservation and management of companies and plantations. The main programs are:
Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Apremavi), it promotes actions of rural property planning, conservation and environmental education in the states of Paraná and Santa Catarina. It guides small and medium-sized owners to perform more efficiently and with greater profitability, in addition to preserving ecosystems. Producers take courses, lectures and exchange visits and receive free seedlings of native plants. The program also encourages forestry with planted pine and eucalyptus forests, organic agriculture and ecotourism.

'Plante com a Klabin', Programa de Fomento Florestal [Forest Development] - economic, social and environmental development by promoting the planting of pine and eucalyptus in idle areas of rural properties. In addition to the seedlings, Klabin provides the necessary guidance for correct land management. The process assists in the establishment of rural populations, promotes plant recovery and stimulates regional development.

Planning for Sustainable Properties (Matas Sociais) - This program has been developed since August 2015 in partnership with APREMAVI, TNC and SEBRAE, to promote the economic, environmental and social strengthening of small and medium-sized rural properties. It develops actions that assist the producer in the environmental, legal and landscape adaptation of the property, in the planning and diversification of the production, strengthening initiatives of association and cooperativism, and facilitating the access to the new opportunities of market and regional development.

Have you implemented any response(s) to these impacts?
Yes

Description of the response(s)
All Klabin forest stewardship units are certified by the FSC®. To ensure that good management practices and a commitment to sustainable development are extended to the timber supply chain, Klabin has since 2013 maintained the Forest Certification Program for Small and Medium-sized Rural Producers in the region of Campos Gerais, Paraná,
In 2021, during the Matas Legais program, 1,256 properties were served; 115,458 seedlings donated; 2,119 ha of demarcated areas of preservation.
Its is also important to mention that this program reduced greenhouse gas emissions in 22,991.15 tCO2eq using as base the value of 10.85 tCO2eq / ha calculated according to the CO2 sequestration of the native forests in relation to a total area that a Klabin has (Brazilian GHG Protocol Metodology used).

C-AC13.2/C-FB13.2/C-PF13.2

(C-AC13.2/C-FB13.2/C-PF13.2) Do you know if any of the management practices mentioned in C-AC12.2a/C-FB12.2a/C-PF12.2a that were implemented by your suppliers have other impacts besides climate change mitigation/adaptation?
Yes

C-AC13.2a/C-FB13.2a/C-PF13.2a

(C-AC13.2a/C-FB13.2a/C-PF13.2a) Provide details of those management practices implemented by your suppliers that have other impacts besides climate change mitigation/adaptation.

Management practice reference number
MP1

Overall effect
Positive

Which of the following has been impacted?
Biodiversity
Soil
Water
Yield

Description of impacts
Klabin adopts programs and plays the role of its suppliers and its region owners in order to improve the conditions of its stakeholders, as well as to comply with environmental laws, the preservation and management of companies and plantations. The main programs are:
Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Apremavi), it promotes actions of rural property planning, conservation and environmental education in the states of Paraná and Santa Catarina. It guides small and medium-sized owners to perform more efficiently and with greater profitability, in addition to preserving ecosystems. Producers take courses, lectures and exchange visits and receive free seedlings of native plants. The program also encourages forestry with planted pine and eucalyptus forests, organic agriculture and ecotourism.

'Plante com a Klabin', Programa de Fomento Florestal [Forest Development] - economic, social and environmental development by promoting the planting of pine and eucalyptus in idle areas of rural properties. In addition to the seedlings, Klabin provides the necessary guidance for correct land management. The process assists in the establishment of rural populations, promotes plant recovery and stimulates regional development.

Planning for Sustainable Properties (Matas Sociais) - This program has been developed since August 2015 in partnership with APREMAVI, TNC and SEBRAE, to promote the economic, environmental and social strengthening of small and medium-sized rural properties. It develops actions that assist the producer in the environmental, legal and landscape adaptation of the property, in the planning and diversification of the production, strengthening initiatives of association and cooperativism, and facilitating the access to the new opportunities of market and regional development.

Have any response to these impacts been implemented?
Yes

Description of the response(s)
All Klabin forest stewardship units are certified by the FSC®. To ensure that good management practices and a commitment to sustainable development are extended to the timber supply chain, Klabin has since 2013 maintained the Forest Certification Program for Small and Medium-sized Rural Producers in the region of Campos Gerais, Paraná,

During the Matas Legais program, 1,256 properties were served; 115,458 seedlings donated; 2,119 ha of demarcated areas of preservation.

In 2021, "Plante com a Klabin", the company's new forest partnership program, signed 61 contracts with 61 landowners, covering an area of approximately 464 ha.

Planning Sustainable Properties (Matas Sociais) - Serves 681 rural properties.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, both board-level oversight and executive management-level responsibility	Currently, Klabin has a board of directors whose responsibilities include managing various sustainability issues, including managing biodiversity. The conservation of the environment and biodiversity is part of Klabin's history and also its considered as an important subject considered for the future plans of the company. As part of this premise, bonds were issued in January 2021 linked to sustainability goals, the SLBs. The operation is associated with goals for reducing water consumption, waste disposal, and biodiversity, to be achieved by 2025. Klabin has been assessing the impacts of this risk with the Continuous Monitoring Program for Fauna and Flora. In doing so, it is possible to understand the behavior of the species and adopting prevention and mitigation measures such as initiatives for reducing road accidents, rewilding actions and scientific research. Klabin has a biodiversity study center within its Ecological Park, which aims to monitor and re- establish the quality levels of forests through the restoration of wildlife. This department is also responsible for bringing technological solutions to speed and scale the Biodiversity Monitoring program, which includes species tracking with ADN tracking, camera traps, geolocation and radio signal. The department is now studying ways to incorporate IoT sensors in order to increase data-related and make conservation decisions more efficiently. Moreover, one of this topic's long-term goal is linked to a sustainable finance instrument (Sustainability-Linked Bond), which increases the company's commitment to its 2030 Agenda and its financial and strategic roadmap. In 2021, the board defined goals that include actions on biodiversity and species refaunation, forest certification and water-solidarity management as components of these goals to be achieved in the year. These goals make upare part of the company Sustainability Index. In 2022, the company's sustainability policy was updated, including new guidelines such as (i) Item 4 that mentions compliance with the Klabin 2030 Agenda, considering goals and responsibilities on biodiversity, (ii) Item 14 aims to promote biodiversity conservation through practices that ensure ecosystem balance, encouraging research and partnership with universities and acting with the commitment to use recognized forest management techniques, which makes everyone responsible for the management and care of this topic within the company's attributions.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments only	Commitment to Net Positive Gain Commitment to No Net Loss Adoption of the mitigation hierarchy approach Commitment to not explore or develop in legally designated protected areas Commitment to respect legally designated protected areas Commitment to avoidance of negative impacts on threatened and protected species Commitment to no conversion of High Conservation Value areas Commitment to secure Free, Prior and Informed Consent (FPIC) of Indigenous Peoples Commitment to no trade of CITES listed species	<Not Applicable>

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?	Portfolio
Row 1	No, but we plan to assess biodiversity-related impacts within the next two years	<Not Applicable>

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management Species management Education & awareness Livelihood, economic & other incentives

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	State and benefit indicators Pressure indicators Response indicators

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Impacts on biodiversity Details on biodiversity indicators	klabin_RS2021_EN_11_07.pdf

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

No comments.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Statutory Director on board.	Director on board

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

For 123 years, Klabin has been part of the daily lives of millions of people by creating customized sustainable solutions for various industrial sectors. Klabin is the Brazil's largest paper manufacturer and exporter and the country's leading producer of papers and paperboard for packaging, industrial bags and corrugated board packaging. Moreover, we are the only Brazilian company to simultaneously supply hardwood pulp (eucalyptus), softwood pulp (pine) and fluff pulp to the market.

Founded in Brazil in 1899, currently has 23 industrial units, with 22 units distributed in ten Brazilian states and one in Argentina. Klabin also has commercial offices in various Brazilian states, a branch office in the United States, Austria, and sales representatives and agents in many countries. Recently, in 2020, Klabin acquired five units from International Paper.

The paper and paperboard for packaging manufactured, as well as corrugated board packaging and industrial bags offer protection and safety to foods, beverages, hygiene and cleaning products, electronics and consumer appliances, cement, seeds, wheat flour, chemical products and other items.

Klabin's Integrity Program comprises a series of procedures to prevent, detect and remediate conduct that could expose Klabin to undesirable situations, while also implementing best global practices related to the matter. In this way, Klabin demonstrates its commitment to building ethical relationships, contributing to a more transparent business environment, strengthening its image, reputation and business strategy and helping to build a more just and sustainable society. The program, which is aligned with the UN Sustainable Development Goals (SDG), targets anyone who works or interacts with Klabin in the public or private sectors.

We are a global reference in sustainable development. Our forestry and industrial operations are based on this concept to help preserve biodiversity and the ecological balance of the ecosystems surrounding our operations. Klabin's sustainability policy integrates the entire production chain to offer the market environmentally responsible products.

To Klabin, sustainability is the continuous creation of value that prioritizes balance among the economic, social and environmental dimensions. We are a unique forestry company with a responsible management that is committed to biodiversity. We work in collaboration with our clients and suppliers, always guided by innovation and the constant improvement of our products and processes. We together to foster the engagement and development of our people and local communities to achieve increasingly better and sustainable results for the entire value chain.

We directly and indirectly influence the social and economic dynamics of the communities living in the cities where we operate. More than just offering good job opportunities, Klabin invests in the region so that the entire population benefits from initiatives in the areas of local development, education, culture and environmental education. Klabin also offers its employees programs to promote their personal development and volunteer initiatives.

All of Klabin's operations incorporate into their strategy environmental management aspects, such as water, energy, climate change and biodiversity. In this way, the company strengthens its commitment to preserve natural resources, such as by working to reduce the use of non-renewable resources, controlling environmental impacts, monitoring biodiversity and preserving fauna and flora in the forests where it operates.

To guarantee quality, attest to the credibility of our products and reinforce our commitment to continuous improvement, our processes are certified by a number of systems and methodologies that are widely recognized in the global market. The certifications that Klabin holds attest to its pioneering efforts in meeting the needs of its clients and anticipating market trends.

Klabin has a research team working at two research facilities focused on improving its production chain. The first – the Forestry Research Center in Lagoa, Telêmaco Borba (PR) – is dedicated to studying everything related to the forestry chain, such as genetic enhancement, wood quality, soil and climate studies, genetic adaptation, pest control and biotechnology, among others. The mission of the other Technology Center, also located in Telêmaco, is to improve the quality of products, while anticipating trends and developing new technologies and sustainable applications. The professionals seek solutions for an increasingly more efficient consumption of inputs in order to minimize environmental impacts.

The company creates 21,000 jobs (direct and indirect) and invests regularly in people development to promote competencies specific to its business, well-being and safety.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	16481000000

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

Requesting member
Ambev S.A

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
8046

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory

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Requesting member
British American Tobacco

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
7961

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory

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Requesting member
L'Oréal

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
2020

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
PepsiCo, Inc.

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the

specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
0

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Raizen S.A.

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
220

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
S.C. Johnson & Son, Inc.

Scope of emissions
Scope 1

Allocation level

Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
452

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
The Coca-Cola Company

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
80

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of

quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Unilever plc

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
49374

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
WestRock Company

Scope of emissions
Scope 1

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.15

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 1 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 75% of the emissions of CO2e of scope 1 come from the category of stationary combustion for power generation and 24% of the emissions of this scope are of the category of mobile combustion related to the transport of raw material and use of light vehicles for displacement. The remainder (1%) are emissions related to the other categories of scope 1 (fugitive emissions, industrial processes, among others). It is important to mention that we increased the consumption of renewable fuels for energy generation by 8%. These results indicate an energy matrix of 89.5% from renewable sources. When we look at the history of emissions, we had a 66% reduction in Scope 1+2 emissions per ton of product produced between the years 2004 and 2021. This shows Klabin's commitment to increasingly seek sustainable commercial alternatives, in line with the UN's Sustainable Development Goals and Klabin's Objectives for Sustainable Development (KODS) which guide the company's strategic planning aiming for a renewable future.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
20000

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Ambev S.A

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric and from the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
8046

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
British American Tobacco

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.4

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric and from the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
7961

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
L'Oréal

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
2020

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
PepsiCo, Inc.

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
0

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Raizen S.A.

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
220

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
S.C. Johnson & Son, Inc.

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
452

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
The Coca-Cola Company

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
80

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Unilever plc

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
49374

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
WestRock Company

Scope of emissions
Scope 2

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.004

Uncertainty (±%)
0.5

Major sources of emissions
This reported result is related to the amount of GHG emissions related to Scope 2 by the market-based method. These issues are related to the total amount of energy purchased by Klabin S/A in 2020 deducting the 96.6% of certified purchased energy coming from renewable sources, hydroeletric andfrom the IRECS emitted through the surplus energy of the Puma unit. Since 2017, Klabin has also reported its scope 2 emissions by the market-based method.

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
20000

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 2 market based method using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Ambev S.A

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified

Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
8046

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
British American Tobacco

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
7961

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
L'Oréal

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution

(Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
2020

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
PepsiCo, Inc.

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
0

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Raizen S.A.

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.95

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
220

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
S.C. Johnson & Son, Inc.

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
452

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
The Coca-Cola Company

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
80

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
Unilever plc

Scope of emissions
Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
49374

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. is now the most widely used method worldwide by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting the veracity of the data and publicly reported results. Klabin conducts its inventory of greenhouse gases and reports this information publicly since 2010. As the program is already consolidated within the organization there are no limitations to the inventory, since all the data generated internally are available for elaboration of the inventory.

Requesting member
WestRock Company

Scope of emissions
Scope 3

Allocation level
Please select

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
0.095

Uncertainty (±%)
0.5

Major sources of emissions
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

Verified
Yes

Allocation method
Allocation based on mass of products purchased

Market value or quantity of goods/services supplied to the requesting member
20000

Unit for market value or quantity of goods/services supplied
Metric tons

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
This is the specific CO2 emissions (ton CO2e / ton of product) for Klabin S.A products scope 3 using the Brazilian GHG methodology. This allocation result is based on the specific emission of CO2e for each ton of product supplied to the customer in 2021. Thus, total CO2e emissions are composed of the multiplication between the reported value of emissions by the total quantity of product supplied to the customer. 76% of scope 3 emissions from Klabin S/A in 2021 are relate to transportation and distribution (Upstream). The remainder (24%) are allocated to the other categories of emissions of scope 3 (Purchased goods and services; Fuel and energy related activities not included in Scope 1 and 2; Waste generated in operations; Business travel and Employee transportation).

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

The reported results of greenhouse gas emissions from Klabin S/A are available on the Brazilian Public Emissions Registry platform.

The Public Register of Emissions is a platform developed by the Brazilian GHG Protocol Program that assists in the publication of the inventories of greenhouse gas (GHG) emissions from member organizations of the Program.

It is currently the largest database of corporate inventories in Latin America.

The results can be found on the website:

https://www.registropublicodeemissoes.com.br/participantes/1461

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
We face no challenges	Klabin conducts its greenhouse gas inventory and publicly informs this data since 2010. Since the program is already consolidated within the organization, there are no quantification limitations, since all internally generated data is available for inventory preparation. The GHG Protocol is a tool used to understand, quantify and manage GHG emissions. It is now the most widely used method in the world by companies and governments to conduct GHG inventories. It is also compatible with ISO 14.064 and the methods of quantification of the Intergovernmental Panel on Climate Change (IPCC). This inventory of greenhouse gases is verified and audited by third parties (scopes 1, 2 and 3), attesting to the veracity of the data and publicly disclosed results. Thus, considering the calculation of specific emissions for the products produced by Klabin S/A, we do not identify challenges so that it is possible to make available to our customers the specific emissions information of the organization.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?
Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

Klabin conducts its greenhouse gas inventory and publicly informs this data since 2010. Since the program is already consolidated within the organization, there are no quantification limitations, since all internally generated data is available for inventory preparation.

Still, the development of studies and maps of externalities in Klabin's operation, together with the complete life cycle analysis of all its products, could provide better conditions for allocating emissions to different customers.

Klabin's main products (78% of the portfolio) are evaluated using the ISO 14040 methodology. Through this methodology, we were able to identify the carbon footprint and the main points of carbon emission along the chain. What enables better targeting of actions and investments to reduce carbon. In 2021, some Life Cycle Assessment, Carbon Footprint and Water Footprint studies were finalized and verified by a third party for the following products: hardwood pulp, softwood pulp, eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the kraftliner from Otacilio Costa. In 2021, Klabin invested about BRL 201,400 to evaluate the life cycle of products, and the results are shared with some customers, which also allows joint actions to reduce carbon in the chain.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

Requesting member
Ambev S.A

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
British American Tobacco

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
L'Oréal

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
PepsiCo, Inc.

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
Raizen S.A.

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
S.C. Johnson & Son, Inc.

Group type of project

Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
The Coca-Cola Company

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

Requesting member
Unilever plc

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Emissions targeted
Actions that would reduce both our own and our customers' emissions

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings
19903.56

Estimated payback
0-1 year

Details of proposal
The PUMA unit, located in the municipality of Ortiguera (Paraná), produces more energy from renewable sources than demand for its production requires, allowing Klabin to generate International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (820,490 MWh). To maintain this opportunity, it is important to note that the Puma unit was the first unit in the country's pulp sector to obtain ISO 50001 certification, attesting to the unit's efforts to improve its performance and energy efficiency. The I-REC Service is a global environmental energy attribute tracking system designed to facilitate reliable carbon accounting for Scope 2, consistent with various international carbon accounting standards. For Klabin, registration at the I-REC Service is a way to obtain additional revenue from the sale of renewable energy certificates, contributing to a cleaner grid.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?
Yes

SC2.2a

(SC2.2a) Specify the requesting member(s) that have driven organizational-level emissions reduction initiatives, and provide information on the initiatives.

Requesting member
Ambev S.A

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
British American Tobacco

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
L'Oréal

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
PepsiCo, Inc.

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
Raizen S.A.

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
S.C. Johnson & Son, Inc.

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
The Coca-Cola Company

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project

Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
Unilever plc

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
WestRock Company

Initiative ID
2021-ID1

Group type of project
Reduce Logistics Emissions

Type of project
Consolidated logistics

Description of the reduction initiative
In 2021 the works of the Rail Terminal in the Port of Paranaguá (PR) began. The project includes the expansion of the railway line (which begins in Puma and passes through the KM05 warehouse) and the construction of a 27,000 m² warehouse, with a capacity of 60,000 tons of pulp and paper in bulks. The structure will enable faster, more economical and sustainable transportation of our products, eliminating the need for trucks.

With rail transportation exclusively, we will considerably reduce the circulation of vehicles per ship, ensuring a reduction of at least 10% in operating costs. Rail transportation reduces local traffic and the emission of pollutants. With the solution, the company will have more flexible and sustainable maritime logistics.

Emissions reduction for the reporting year in metric tons of CO2e
153.3

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
Ambev S.A

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
British American Tobacco

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
L'Oréal

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
PepsiCo, Inc.

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
Raizen S.A.

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
S.C. Johnson & Son, Inc.

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
The Coca-Cola Company

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
Unilever plc

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

Requesting member
WestRock Company

Initiative ID
2021-ID2

Group type of project
Change to supplier operations

Type of project
Increased levels of purchased renewable energy

Description of the reduction initiative
Since 2017, Klabin began to record part of the indirect emissions through the Approach based on the choice of purchase (Marketbased). In this approach Klabin quantifies GHG emissions of scope 2 using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In this year 2021, Klabin acquired 686,193.11 MWh from hydroelectric generation, with the appropriate Declaration of the generator and emitted 482,059 I-RECS from the surplus power generated by the Puma unit. This represent a 87% reduction of the Scope 2 emissions (138,285.935 tCO2e), when compared to the Location-based Approach, which uses the average emission factor of the SIN (National Interconnected System).

Emissions reduction for the reporting year in metric tons of CO2e
138285.93

Would you be happy for CDP supply chain members to highlight this work in their external communication?
Yes

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?
Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.
100

SC4.2a

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

Name of good/ service
Liquid Package Board (LPB)

Description of good/ service
Liquid Package Board (LPB) (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
378

±% change from previous figure supplied
80.86

Date of previous figure supplied
December 31 2018

Explanation of change
In 2019 some studies of Life Cycle Assessment were updated and verified by a third party for the following products: Carrier Board Liquid Paper Board and Kraft. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.
In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Carrier Board

Description of good/ service
Carrier Board (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
374

±% change from previous figure supplied
78.94

Date of previous figure supplied
December 31 2018

Explanation of change
In 2019 some studies of Life Cycle Assessment were updated and verified by a third party for the following products: Carrier Board Liquid Paper Board and Kraft. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.
In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Kraft

Description of good/ service
Kraftliner paper (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
273

±% change from previous figure supplied
30.62

Date of previous figure supplied
December 31 2018

Explanation of change
In 2019 some studies of Life Cycle Assessment were updated and verified by a third party for the following products: Carrier Board Liquid Paper Board and Kraft. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.
In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Short Fiber Cellulose - SFC

Description of good/ service
Short Fiber Cellulose (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
318

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2019

Explanation of change
In 2019, a Life Cycle Assessment study was carried out and verified by third parties for the following products: Short Fiber Cellulose (SFC) and Long Fiber Cellulose (LFC). These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process. In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service

Long Fiber Cellulose - LFC

Description of good/ service
Long Fiber Cellulose (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
283

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2019

Explanation of change
In 2019, a Life Cycle Assessment study was carried out and verified by third parties for the following products: Short Fiber Cellulose (SFC) and Long Fiber Cellulose (LFC). These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process. In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
25 kgs Sack of cement

Description of good/ service
25 kgs Sack of cement (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
101

±% change from previous figure supplied
101

Date of previous figure supplied
December 31 2020

Explanation of change
In 2020, a Life Cycle Assessment study was carried out and verified by third parties for the following products: 25 kgs Sack of cement, 25 kgs Sack of flour and 8 kgs Sackof lime. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process. In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
25 kgs Sack of flour

Description of good/ service
25 kgs Sack of flour (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
195

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2020

Explanation of change
In 2020, a Life Cycle Assessment study was carried out and verified by third parties for the following products: 25 kgs Sack of cement, 25 kgs Sack of flour and 8 kgs Sackof lime. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process. In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
8 kgs Sack of lime

Description of good/ service
8 kgs Sack of lime (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
50.6

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2020

Explanation of change
In 2020, a Life Cycle Assessment study was carried out and verified by third parties for the following products: 25 kgs Sack of cement, 25 kgs Sack of flour and 8 kgs Sackof lime. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process. In 2021 studies was also carried out for bleached pulp and Eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the Kraftliner from Otacilio Costa.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Bleached Pulp

Description of good/ service
Bleached Pulp (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
199

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2021

Explanation of change
In 2021, a Life Cycle Assessment study was carried out and verified by third parties for the following products: bleached pulp, eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the kraftliner from Otacilio Costa. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service
Eukaliner

Description of good/ service
Eukaliner (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
130

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2021

Explanation of change
In 2021, a Life Cycle Assessment study was carried out and verified by third parties for the following products: bleached pulp, eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the kraftliner from Otacilio Costa. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

Name of good/ service

Kraftliner

Description of good/ service
Kraftliner (Scope 1 + 2 emissions)

Type of product
Final

SKU (Stock Keeping Unit)
tonnes

Total emissions in kg CO2e per unit
116

±% change from previous figure supplied
0

Date of previous figure supplied
December 31 2021

Explanation of change
In 2021, a Life Cycle Assessment study was carried out and verified by third parties for the following products: bleached pulp, eukaliner from the Puma unit, recycled paper and packaging from the Goiana and Piracicaba units and the kraftliner from Otacilio Costa. These studies indicate that the amount of CO2 captured from the atmosphere during photosynthesis is greater than that emitted by Klabin's production process.

Methods used to estimate lifecycle emissions
ISO 14040 & 14044

SC4.2b

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

Name of good/ service
Liquid Package Board (LPB)

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
378

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the LPB product is -974 kg CO2eq / tonne of paper produced

The discrepancy calculated in the model used was 11% whitch is an acceptable value

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

Name of good/ service
Carrier Board

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
374

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the Carrier Board product is -948 kg CO2eq / tonne of paper produced

The discrepancy calculated in the model used was 11% whitch is an acceptable value

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

Name of good/ service
Kraft

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
273

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the Kraftliner product is -1,166 kg CO2eq / tonne of paper produced

The discrepancy calculated in the model used was 11% whitch is an acceptable value

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
Short Fiber Cellulose -SFC

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
318

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
The discrepancy calculated in the model used was 2% which is an acceptable value.

For the calculation of the carbon footprint of cellulose, the carbon removed / sequestered from planted forests was not considered.

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
Long Fiber Cellulose - LFC

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
283

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
The discrepancy calculated in the model used was 6% which is an acceptable value.

For the calculation of the carbon footprint of cellulose, the carbon removed / sequestered from planted forests was not considered

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
25 kgs Sack of cement

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
101

Is this stage under your ownership or control?

Yes

Type of data used
Primary and secondary

Data quality
The discrepancy calculated in the model used was 6% which is an acceptable value.

For the calculation of the carbon footprint of cellulose, the carbon removed / sequestered from planted forests was not considered

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
25 kgs Sack of flour

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
195

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
The discrepancy calculated in the model used was 6% which is an acceptable value.

For the calculation of the carbon footprint of cellulose, the carbon removed / sequestered from planted forests was not considered

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
8 kgs Sack of lime

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
50.6

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
The discrepancy calculated in the model used was 6% which is an acceptable value.

For the calculation of the carbon footprint of cellulose, the carbon removed / sequestered from planted forests was not considered

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

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Name of good/ service
Bleached Pulp

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
199

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the Bleached Pulp product is -1,163 kg CO2eq / tonne of paper produced

To assess data quality, a simplified approach of the Pedigree Matrix was used, which includes a qualitative assessment of data quality indicators.

If you are verifying/assuring this product emission data, please tell us how

The data were verified and validated according to the STANDARD ISO 14044 methodology

Name of good/ service
Eukaliner

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
130

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the Eukaliner product is -1,705 kg CO2eq / tonne of paper produced

To assess data quality, a simplified approach of the Pedigree Matrix was used, which includes a qualitative assessment of data quality indicators.

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

Name of good/ service
Kraftliner

Please select the scope
Scope 1, 2 & 3

Please select the lifecycle stage
Cradle to gate

Emissions at the lifecycle stage in kg CO2e per unit
116

Is this stage under your ownership or control?
Yes

Type of data used
Primary and secondary

Data quality
It is important to mention that this result is POSITIVE, which means that the emission for the Kraftliner product is -1,719 kg CO2eq / tonne of paper produced

To assess data quality, a simplified approach of the Pedigree Matrix was used, which includes a qualitative assessment of data quality indicators.

If you are verifying/assuring this product emission data, please tell us how
The data were verified and validated according to the STANDARD ISO 14044 methodology

SC4.2c

(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.

Name of good/ service	Initiative ID	Description of initiative	Completed or planned	Emission reductions in kg CO2e per unit
Liquid Package Board (LPB) and Carrier Board	Initiative 1	In the year 2021, we reduced the consumption of heavy oil by 4,006,522 liters through consumption reduction initiatives, a Heavy Oil Reduction WG was created at the Monte Alegre Plant, responsible for the production of these products, which has been diagnosing opportunities and making action plans in order to improve efficiency. These actions resulted in a total of 12,484.87 tCO2eq of avoided emissions, which is equivalent to a reduction of 12.07kg of CO2 for each ton of product produced. Avoided emissions / production of tonnes of paper (12,484.87 tCO2eq / 1,033,652.61 tonnes of pulp) * 1000 = 12.07 kg CO2e per unit	Ongoing	12.07

SC4.2d

(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?
No

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms