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Klabin S/A - Climate Change 2020

C0. Introduction

C0.1

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

For 121 years, Klabin has been part of the daily lives of millions of people, creating customized sustainable solutions for various industrial sectors. Klabin is the largest paper manufacturer and exporter in Brazil and the main producer of paper and cardboard in the country for packaging, industrial bags and corrugated packaging. In addition, we are the only Brazilian company to simultaneously supply wood pulp (eucalyptus), short fiber pulp (pine) and cellulose to the market.

We have 19 industrial units, 18 of which are distributed in nine Brazilian states and one in Argentina. Klabin also has offices in several Brazilian states, a subsidiary in the United States, Austria and sales representatives and agents in several countries.

Our products provide protection and safety for food, beverages, hygiene and cleaning products, electronics and appliances, cement, seeds, wheat flour, chemicals and other items.

Klabin's Integrity Program comprises a series of procedures to prevent, detect and remedy conduct that may expose Klabin to undesirable situations, in addition to implementing global best practices related to the subject. 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, in line with the UN Sustainable Development Goals (SDGs), 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 that surround our operations. Klabin's sustainability policy integrates the entire production chain, offering environmentally responsible products to the market.

For Klabin, sustainability is the continuous creation of value that prioritizes the balance between the economic, social and environmental dimensions. We are a unique forestry com-

of our products and processes. We promote the engagement and development of our employees 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 that live 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

Klabin's operations incorporate aspects of environmental management in its strategy, so the company reinforces its commitment to preserve natural resources, such as working to reduce the use of non-renewable resources, controlling environmental impacts, monitoring and preserving biodiversity.

The 17 UN SDGs prioritize important issues for sustainable development. To put this commitment into practice, we have created new objectives and goals to incorporate topics relevant to our business and the problems addressed by this global agenda in Klabin's Sustainability Strategy.

To guarantee quality, attest to the credibility of our products and reinforce our commitment to continuous improvement, our processes are certified by various systems and methodologies widely recognized in the global market. Our certifications attest to the pioneering efforts to meet the needs of our customers and anticipate market trends.

Our Research and Development + Innovation (R & D + I) area focuses on improving practices and processes to ensure the development of exclusive, more competitive and biodegradable products, at lower operating costs. For this, we have a team that daily searches for the most innovative solutions in the sector.

Klabin has a research team working in two research facilities focused on improving its production chain. The first - the Lagoa Forestry Research Center, Telêmaco Borba (PR) - is dedicated to studying everything related to the forest chain, such as genetic improvement, 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, anticipating trends and developing new technologies and sustainable applications. Professionals seek solutions for an increasingly efficient consumption of inputs, in order to minimize environmental impacts.

The company creates 19,000 jobs (direct and indirect) and regularly invests in the development of people to promote skills specific to its business, well-being and safety.

(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 2019	December 31 2019	Yes	1 year

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

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
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

70% of the wood that goes into the production process comes from Klabin's own forests, the other 30% comes from partnerships and producers in the regions where Klabin has forestry operations Klabin is recognized for its sustainable management adopted, which aims forest multipurpose usage. The use of the environmental practices used by the company, as well as the proper management of the landscape, allow the excellent exploitation of the potential of production of the forests and the protection of the natural resources. 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.. Timber is classified as the main raw material for pulp and paper production. Based on the total amount of inputs consumed in 2019 for total production of Klabin S/A, wood represents 95,08% of the amount of the inputs. - Calculation: % Revenue = Total Quantity of Wood (thousand t / year) / Total Quantity of Input (thousand t / year) * 100 % Revenue = (12,284.77 / 12,919.20)*100 = 95.08% It is also important to mention that, considering all the inputs consumed by Klabin in 2019, 97.9% are from renewable origin, the remaining 2.1% refer to chemicals used in the production process.

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. It is important to mention that in 2019 Klabin's CEO and Sustainability Executive Director joined the global campaign Business Ambition for 1.5oC. With approval from the Sustainability Executive Director the company has also sent for Science Based Target its intention letter for the development of a science-based reduction target. The design of this goal is progress. Besides Klabin maintains a fixed sustainability committee composed of directors, with the Executive Director of Industrial Technology 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. He is also responsible for climate change issues, managing a corporate sustainability team that works with this subject on a daily basis.
Board-level committee	Klabin maintains a fixed sustainability committee composed of directors, with the Executive Director of Industrial Technology 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.

C1.1b



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	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Setting performance objectives</p> <p>Monitoring implementation and performance of objectives</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<Not Applicable>	<p>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." 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 and Sustainability as the sponsor and Sustainability and Environment Executive Manager as the technical advisor of these commission. 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 UN Sustainable Development Goals.</p>

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 Sustainability Officer (CSO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly

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
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

- 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	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.

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 2019 we reached 89.54% of renewable sources for energy generation, reaching a number higher than the target of 88%. 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 2019 we reached 89.54% of renewable sources for energy generation, reaching a number higher than the target of 88%. 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 activit-

Entitled to incentive	Type of incentive	Activity incentivized	Comment
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?

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	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?

In Klabin's process, risks with substantive financial impacts are over 30% of EBITDA. It means – R\$: > 700 – critical impact, > 400 < =700 MM- high impact, > 150 MM > =400 – medium impact.

Other 3 indicators are considered in to define the substantive impact:

- National and international reputation impact . 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

- 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.

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.

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

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 part of the financial calculation of the impacts of climate risks. Below are more details on climate risk management: 1- Survey of the company's exposure to risk (i) use of future climate scenarios to identify the main climate changes that may impact business. Climate change and its impacts are defined, reaching physical risk. (ii) Future macroeconomic scenarios are also considered to identify, in addition to physical risks, such as, for example, market, reputational, regulatory and other risks. 2- A range of material risks to the business are assessed within the scope of the company's Risk Management, considering the parameters incorporated in the risk management, such as, for example, the financial, reputational, health and safety, environment, community and others. 3- The risks with the greatest impact are evaluated considering the company's strategic and financial

is registered and monitored by risk management area. For example, forestry business board assumes risk management and mitigation actions of this business unit. It is important to emphasize that for all the company's critical risks, control and mitigation plans are prepared and monitored by the risk management area. For example, the physical risks of changes in the climate can impact the productivity of the company's planted forests. This risk is monitored by the forestry research area (of the Forest Business), which also develops actions to mitigate the impact, such as pine and eucalyptus clones that are more resistant to climate change, and others. The results and definitions of this work are integrated into the company's leadership / decision-making committees, such as: Fixed Sustainability Committee and Risk Committee.

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 reliability, magnitude and severity. 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, 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.

	Relevance & inclusion	Please explain
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. While the company has been using more efficient technologies and equipment, it has adopted an increasingly cleaner matrix, and has high carbon stock and a great potential to generate new CO2eq credits. In 2016 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 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. 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.
Technology	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 were 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. 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. 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 in Telêmaco Borba (Paraná), is taking the company's Research, Development and Innovation (R & D + I) activities to a new level. (including renewable energy studies and adaptations). 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. It is important to mention that a marginal abatement cost curve (MACC) was developed for the company's operations in order to prioritize investment decision making in low carbon technologies, and in the construction of a new company factory in 2019, important technologies were implemented, such as tail oil and biomass gasification. 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, among other applications with high added value in industries and various segments.



	Relevance & inclusion	Please explain
Legal	Relevant, always included	The legal requirements are considered relevant for Klabin 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 scheme 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), Otacilio Costa and Correia Pinto units (Santa Catarina) and Angatuba unit (São Paulo) which are the units with higher atmospheric 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.
Market	Relevant, always included	Climate change may induce changes in customer preferences for products and services that emit less greenhouse gases. The logistics industry is an important component of these emissions may be under pressure to reduce distances traveled and greenhouse gas emissions, requiring the use of cleaner fuels, replacement of old fleets with new and re-planning of the operation. An example of outcome is the creation of the Ecophysiology department, which is responsible for monitoring current and future trends of climate elements such as changing in rainfall, winds and temperature patterns and for anticipating possible impacts on the forest productivity. Results from this analysis provides lines of action, for instance, to the R&D areas which become aware of new developments or innovation that they must pursue in order to face Climate Change threats and opportunities. 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 of them will be with microfibrillated pulp (MFC), a renewable source, which will be incorporated into the company's paper production lines in the future to improve product quality and strength. Another research front will be 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.



	Relevance & inclusion	Please explain
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. In addition, since 2013 the company has participated in the Corporate Sustainability Index of the Stock Exchange of Brazil (B3). 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.
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. After defining the risks, they were classified according to their reliability, magnitude and severity. 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. Moreover, it can affect the logistics of removing wood from forest areas. Strong winds could paralyse 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 an 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.



	Relevance & inclusion	Please explain
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. The tendencies during the years related to changes in precipitation extremes and/or droughts could compromise the development of seedlings and planted areas development. Also, temperature variations during the years pose a risk to Klabin's business because they may significantly affect forest development, impacting seedling growth. Increase in sea level during the years could paralyse ports used by Klabin (for example, Paranaguá Port Region in Paraná State) causing delays in deliveries and dissatisfied clients. Klabin is working so that its plants consume less water from natural sources and developing water recycling and reuse for irrigation. Contour lines and containment berms on roads are already being used to prevent the risk of erosion. Also, Klabin works to continuously develop clones with higher resistant to cold and frost, focusing on increasing productivity and pulp volume yield. 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



<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. The Brazilian government, within the scope of the Partnership for Market Readiness - World Bank project, is studying the possibility of implementing a tax or cap and trade in the country. The company's expectation is that in the next 3 or 4 years the Brazilian government may adopt carbon pricing in the country's climate policy. Thus, the company studies the financial impact/legal risk of this regulation considering the emissions of the units mentioned versus estimated price of carbon already signalled in some initial studies of the Brazilian government (Ministry of Economy).

Time horizon

Medium-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)

21284040

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The cost of the financial impact of carbon pricing is calculated based on direct emissions (subject to regulation) X carbon price - BRL 40.00. 532,101 tCO₂e x BRL 40. It is an annual cost. The amount of BRL 40 was signaled by the Brazilian government and it is also an average of the carbon price in Latin America, in countries that already have carbon regulation

Cost of response to risk

186945000

Description of response and explanation of cost calculation

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. In 2019, 3 main technologies were started at the company: biomass gasification – CAPEX BRL 141,486,000; tail oil – BRL 21,500,000; and boiler fuel exchange (oil for biomass) – CAPEX BRL

alization 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.

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	Rising mean temperatures
------------------	--------------------------

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). In 2019, Klabin's planted forest areas were approximately 258 thousand hectares, distributed in 188 thousand ha in Paraná, 65 thousand ha in Santa Catarina and 5 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

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)

39245218

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. 70% of the wood consumed by the company comes from the company's own pine and eucalyptus forests. 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 179,035 tonnes of eucalyptus; and 5% of Klabin's average annual wood production represents 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 22,630,699 Thus it is estimated 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

11555004

Description of response and explanation of cost calculation

In 2019, Klabin made an investment of approximately BRL 11,555,004 in forestry research. Klabin has Forest Efficiency and Ecophysiology Department. The department was created in



and researches are not exclusive to climate solutions, it also involves increased productivity, improvements in the forestry process and other factors. For more details, we can mention the phytosanitary line, with an investment of BRL 550,000 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 we can use as an example is biotechnology and genetic improvement, with investments around BRL 5,893,203 develops clones of pine and eucalyptus aiming at greater forest production, but also materials that are more resistant to the impacts of climate change.

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	Changes in precipitation patterns and extreme variability in weather patterns
------------------	---

Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

One of the main climatic risks identified by Klabin is water scarcity. Some of the company's industrial units are located in regions where the drought is already manifesting in some months of the year. This risk can impact the company's production, however, adaptation measures are implemented to mitigate this risk. For example, Goiana (located at Pernambuco state) unit is located in water stressed area classified by WRI Aqueduct tool. Klabin has found the increased water stress in the Goiana River Basin to be a risk to meet the water demand to production of the recycled paper, corrugated board and paper bags. Goiana unit represents around 8% of Klabin's global production. Goiana unit intake water from two sources: groundwater and surface water. Together, the water sources intake represent 1% of Klabin water intake. On northeast region, the months of october, november and december are affected to drought. We use this information to calculate the potential financial impact. In addition, 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 increased of operation costs due to need to fetch water in another river/basin

Time horizon



More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1693560

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: three months of drought during the year (October, November and December) and the disruption of total water intake during these months. In 2019, Goiana unit has withdrawn 94,401.32 m³ per month. Three months represent 283,203.96 m³. The estimated cost to fetch water in another river/basin was BRL 5.98 per m³. Thus, the financial impact is BRL 1,693,560 per year.

Cost of response to risk

1900000

Description of response and explanation of cost calculation

Klabin has evaluated the possibility of reusing 100% of the wastewater after use on paper machines avoiding the operational costs of water intake in another river/basin. A study was performed from Voith Engenharia in 2017 and it has presented many changes and adjustments on paper machines in Goiana unit. Further, this study has intend to reduce of process water consumption. For reuse of process water, that is, white water and clarified water, it is important that this water has the appropriate quality for the device where it is intended to be used. In Goiana unit, located in Pernambuco state, we intend to use the clarified water to showers process. So, there are a recommendation to install a white water filter (rigid spiral or sieve) to guarantee the quality of the water in case of rupture of screens or moments of poor performance of the fiber recovery system. Depending on the process, white water or clarified water should be stored in a sufficient volume to prevent it being discarded during normal operation and in times of prolonged leaf breaks. The reduction of fresh water consumption can be achieved through some measures, among them: acquisition of equipment with less demand for fresh water, for example, showers with better efficiency, mechanical seals, air-cooled systems, turbine vacuum pumps, etc.; replacement of fresh water with clarified water treated in equipment that does not interfere in the process, such as screen and felt showers, elutriation and dilution systems, showers to guide the leaf, etc.; microbiological treatment of closed cooling systems (towers) avoiding or reducing the use of make-up water. The imple-

ager is evaluating this study realized in 2017 and if approval the project time is around of 12 months.

Comment

The response cost to do all of this modifications on Klabin process is around BRL 1,900,000.00 according a requesting a budget to the same supplier that performed this study. This response cost considers the devices and assembly service to all modifications presented in the "description of response" column.

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

Markets

Primary climate-related opportunity driver

Other, please specify (Increased diversification of financial assets (e.g., green bonds and infrastructure))

Primary potential financial impact

Increased diversification of financial assets

Company-specific description

Klabin has an important market recognition for its commitment to sustainable development and also for the company's shares consolidated in a green / low carbon economy sector. This enabled the company to issue \$ 500 million of green bonds, in 2019. In April 2019, Klabin



category with the term maturity of 30 years. The operation reached classification of “High Level” (High Standard) in the independent evaluation of the consultancy Sustainalytics, reinforcing Klabin's seriousness and commitment with the sustainable development, an area in which it is a reference to the market. Issuing green bonds is important for the company, as it attracts conventional investors and investors who allocate capital considering green investments / ESG / Climate Change. Green investors are less volatile and more committed to the company's goals which helps the company to invest in long term projects such as Puma II. In addition, green bonds guarantee the continuous and long-term investment of the company's sustainable projects. The issue of green bonds guarantees financing for the company's sustainable growth. The company is committed to Science Based Target for the development of a science-based reduction target. To reach the goal, investment in low carbon technologies will be necessary. The money raised by the issue of green bonds can be used for this type of investment. In addition, the company has a series of actions to mitigate the risks of climate change and the funding by green bonds will also be used for this investment. The allocated resources must fall into the following categories – direct and indirect involved with climate agenda: - Sustainable Forest Management; - Restoration of Native Forests and Biodiversity Conservation; - Renewable energy; - Clean Transport; - Energy efficiency; - Waste management; -Sustainable water management; - EcoEco-efficient products and / or adapted to the circular economy, production technologies and processes; - Adaptation to Climate Change.

Time horizon

Medium-term

Likelihood

Virtually certain

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)

1970000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The financial impact is the value of the green bonds inserted in the market in 2019. The green bonds expiration in 2029. US\$ 500,000,000 * BRL 3.94 = BRL 1,970,000,000

Cost to realize opportunity

-



It is important to mention that an internal evaluation of the company indicates that Klabin has a relevant class of “sustainable investors”. It signals that the company’s strategy and investments in climate brought the opportunity to have a market differential. Sustainable finance instruments connect the company with investors focused with the same sustainable practices that conduct Klabin throughout its growth mindset. It is an opportunity related to the company’s reputation – intangible value. No relevant financial investment is required to issue green bonds. The environmental sustainability, investor relations and financial teams organized the green bonds plan and negotiated in the market. We think the sustainable finance is a tendency that will be reinforced especially in emerging markets over the next years. And we just hope that these analysis are made properly so that investors can identify which Companies really incorporate ESG and climate practices in their strategy. It is important to mention that green projects are identified (which will be developed with money raised through the negotiation of green bonds) linked to the company’s business / strategy. Many of these projects (incorporated into the company’s business and financial strategy) originated from climate risk and opportunity management. Green bond resources can be allocated to capital needed for the development, construction, installation, operation and updating of facilities that reduce emissions of greenhouse gas (GHG) by substituting fossil fuels from renewable sources and increased energy efficiency. Per example, The project to build a unit for the production of Tall Oil at the Puma Unit, in Ortigueira (PR), for which they are being used green bond resources, will reduce the consumption of fuel and CO2 emissions into the atmosphere. Tall Oil is a by-product of the pulp production process that can be recovered and used as another source of energy at Klabin.

Comment

Klabin prepares an annual accountability report on the investment of money raised by green bonds with environmental impact indicators. We expect that we can also issue/help any CO2 (Carbon) Bond initiatives. This topic is well known by the general public but not materialized in terms of financial instruments/ tools. Therefore, we hope the financial market help the Companies to incorporate that in different funding structures.

Identifier

Opp2

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

programs and adoption of energy efficiency measures. In 2019 the PUMA unit generated 911,853 MW of surplus energy, making this quantity available in the Brazilian National Inter-connected System. This action reduces operating costs by increasing revenue from the sale of this energy, as well as providing energy from renewable sources contributing to a more renewable national energy matrix, aligning these actions with the UN Sustainable Development Goals. This surplus energy is sufficient to supply a city of approximately 500 thousand inhabitants.

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)

124340107.25

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 (103,616.76 tonnes in 2019) for biomass waste to produce the same amount of energy (GJ), considering the specific cost of the oil in approximately BRL 1,200 per ton. $103,616.76 * BRL 1,200 = BRL 124,340,107.25$

Cost to realize opportunity

3590856.55

Strategy to realize opportunity and explanation of cost calculation



dustrial plants for gains in energy efficiency. 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 mention that the Ortigueira Plant, is able to generate more energy than it needs and the surplus is sold to the interconnected energy system. 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: BRL 3,590,856.553. 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 An example of this opportunity was the replacement of fuel oil boilers by biomass boilers in the last 14 years in the Klabin units of Monte Alegre (PR), Otacílio Costa (SC), Correia Pinto (SC) and Angatuba (SP). reducing emissions of more than 100 thousand tons of CO₂eq Explanation of cost calculation: Fuel oil consumed * PCI = GJ 103,616.76 tonnes * 40.2 GJ/t = 4,165,393.59 GJ / Biomass PCI = Biomass that would be consumed 4,165,393.59 GJ / 11.6 GJ/t = 359,085.65 tonnes Cost to realize this opportunitite = biomass * cost of biomass fuel 359,085.65 tonnes * BRL 10.00 = BRL 3,590,856.55

Comment

BRL 3,590,856.55. 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

Opp3

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 (911,853.8 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

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)

1367780.7

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Approximately BRL 1,367,780.70 related to the sale of International Renewable Energy Certificates (IRECs) for all the energy that was made available in the national system (911,853.8 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. $911,853.8 \text{ MWh} * \text{BRL } 1.50 = \text{BRL } 1,367,780.70$

Cost to realize opportunity

378601.7

Strategy to realize opportunity and explanation of cost calculation

To manage this opportunity Klabin energy matrix includes natural renewable sources such as black liquor, biofuel, and hydro (own electrical power). 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 mention that the Ortigueira Plant, is able to generate more energy than it needs and the surplus is sold to the interconnected energy system. 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 real-



ergy sold by the PUMA unit in 2019 (911,853.8 mW) Explanation of the cost calculation:
911,853.8 mW * BRL 0.4152 / mW = BRL 378,601.7

Comment

This value (BRL 378,601.7) refers to the total rate of emission of the renewable energy certificate per MWh sold (BRL 0.4152 / MW) multiplied by the total renewable energy sold by the PUMA unit in 2019 (911,853.8 mW)

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.1b

(C3.1b) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details



Climate-related scenarios and models applied	Details
RCP 2.6	<p>Klabin developed, together 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, 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). Simulations of climatic scenarios were carried out for the different regions of Brazil where Klabin units exists (all the facilities were included), pointing out the climatic risks specific to each state from the present data to 2040 simulations. The choice to model climate scenarios until 2040 is due to the company's planning time horizon organized in decades: 2020 - 2030 and 2030 and 2040. In addition, from 2040 onwards, specialists indicate the possibility of even greater uncertainty about the realization of the scenarios and respective impacts. The steps of this study were internal mapping (information collection and time alignment), study of climate modeling and identification of risks and opportunities. After defining the risks, they were classified according to their reliability, magnitude and severity. The results of the main risks (forestry, industrial and logistic) were discussed by the steering committee, serving as a basis for the strategic planning of the organization and decision making on future scenarios. One of them, for example, is the increase in temperature and increase in the frequency of intense heat waves that can increase the growth of forest pests due to the increase of thermal stress on Klabin's plantations. Having a direct relationship in risk assessment, Klabin's area of Research, Development and Forestry Innovation (P&D+I) is based on the conduction of the projects in different lines of research, such as Phytosanitary, Nutrition/Forestry and Ecophysiology. We can highlight the creation of the internal technical committee called FIR (Forest, Industry and Research), focused on understanding the quality characteristics of wood; the construction of a new laboratory in the Forest Research for the research activities in Ecophysiology, Soils and Forest Nutrition, creating synergism within the studies directed to the Forest Management of the company; Beginning of the creation of natural enemies in the laboratory and evaluation of its efficiency in controlling the main pests of Eucalyptus and Pinus. The Department of Forest Efficiency and Ecophysiology also monitors possible future climate scenarios, developing a modeling of data related to exposure to climatic parameters and assessing the impact of changes in planted forests, and recommends the necessary measures in case of adverse effects. Climate change could have an impact on the company's forestry productivity. 70% of the wood consumed by the company comes from the company's own pine and eucalyptus forests. This study indicates 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. As part of the expansion of the focus on P&D+I to face a larger Klabin, the Company carries out a further investment cycle in the area. In addition to the investment of BRL 70 million between 2015 and 2017, Klabin will invest about BRL 180 million in Industrial and Forestry Research in the years 2019-2021. The company has a detailed array of climate opportunities and risks, including internal mapping of impacts already occurring due to climate events and major future risks and opportunities, as well as notes from the Climate Conference (COP) and the Intergovernmental Panel on Climate Change (IPCC).</p>

Climate-related scenarios and models applied	Details
RCP 8.5	<p>Klabin continues to conduct studies to assess its risks and opportunities. Recently, we carried out a study comparing climate change in relation to forest management in the regions of Telêmaco Borba (PR), Otacílio Costa (SC) and Itapetininga (SP). This analysis of climatic variables used the climatic scenario RCP 8.5 based on the climatic history of the region (1981-2010), as well as evaluated reference scenarios on emissions of greenhouse gases for climate models - HadGEN2-ES. The climatologies 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 evaluated were Quantity and frequency of intense drought, minimum temperature, average temperature, potential evapotranspiration and water deficit. Some of the results of this study show a general tendency of temperature increase in the study regions with mean increase of 0.32 °C per decade. Evaluating the impacts of the tendency of water deficit occurrence, it can be observed that the risks for the study regions (Telêmaco Borba and Otacílio Costa) are classified as low. Having a direct relationship in risk assessment of the organization, Klabin's area of Research, Development and Forestry Innovation is based on the conduction of the projects in different lines of research, such as Phytosanitary, Nutrition/Forestry and Ecophysiology. It is important to mention some highlights, such as the creation of the internal technical committee called FIR (Forest, Industry and Research), focused on understanding the quality characteristics of wood; the construction of a new laboratory in the Forest Research for the research activities in Ecophysiology, Soils and Forest Nutrition, creating synergism within the studies directed to the Forest Management of the company; Beginning of the creation of natural enemies in the laboratory and evaluation of its efficiency in controlling the main pests of Eucalyptus and Pinus. This Department of Forest Efficiency and Ecophysiology also monitors possible future climate scenarios, developing a modeling of data related to exposure to climatic parameters and assessing the impact of changes in planted forests, and recommends the necessary measures in case of adverse effects. As part of the expansion of the focus on Research, Development and Innovation to face a larger Klabin, the Company carries out a further investment cycle in the area. In addition to the investment of BRL 70 million between 2015 and 2017, Klabin will invest about BRL 180 million in Industrial and Forestry Research in the years 2019-2021. Also, Klabin joins other organizations in implementing a global plan of action for people, the planet, peace and prosperity. The 17 Sustainable Development Goals (SDG) set out the global priorities and aspirations for 2030 and represent an opportunity to eliminate extreme poverty and put the world on a sustainable path. To implement this commitment, Klabin has developed new objectives and targets to incorporate both the issues that are relevant to its business and general issues of the global agenda into its Sustainability Strategy. The company has a detailed array of climate opportunities and risks, including internal mapping of impacts already occurring due to climate events and major future risks and opportunities, as well as notes from the Climate Conference (COP) and the Intergovernmental Panel on Climate Change (IPCC).</p>

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and	Description of influence



	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). For example, 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. In addition, 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 opportunity 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.
Supply chain and/or value chain	Yes	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. In order to expand the analysis of suppliers most vulnerable to climate impacts. Follow example of this opportunity: one of Klabin's main suppliers are wood producers. Many are small suppliers. Klabin has a technical assistance and technology transfer partnership for these 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. 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.
Operations	Yes	In recent years, Klabin has incorporated 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 abatement 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 bio-fuel) 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

C3.1e

(C3.1e) 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	<p>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 240 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 167,054,000.00 (2019). 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.</p>

C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

Klabin has clear guidelines that orientates its activities planning and operations towards the management of Climate Change and its related issues. 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 the Climate Change.



As Klabin presents a forest base of great representativeness for its business, besides being sensitive to the issues related to climate change, in 2013 the company started to study the most vulnerable aspects of its operations regarding change in rainfall and temperatures patterns, and strength and constancy of winds. The study results in internal action plans and proposals for adaptive measures aimed at to prevent impacts to Klabin's operation (in both forest and industry units), as well as indications on possible external effects related to these climate changes such as price and pressure on natural resources and its effects (e.g. price of electricity). The potential short and medium terms effects were already added to company's strategic planning (especially those ones which require technological innovation to preserve forests growth) and are closely monitored by multiple groups, including the Sustainability Committee.

In addition, as an example of a significant strategic decision for the organization, Klabin created the Klabin's Ecophysiology department, which is responsible for monitoring current and future trends of climate elements such as changing in rainfall, winds and temperature patterns and for anticipating possible impacts on the forest productivity. Results from this analysis provides lines of action, for instance, to the R&D areas which become aware of new developments or innovation that they must pursue in order to face Climate Change threats and opportunities.

The reduction of atmospheric emissions is also one of the commitments of the organization, inserted in its Sustainability Policy (item number 13 – "Ensure that the company's operations constantly seek to reduce emissions of greenhouse gases"). With the increase in the use of renewable fuel, the company contributes to reduce the emission of greenhouse gases (GHG). Indicators of this aspect are reported annually in the Emissions Inventory fulfilled according to the methodology of the Brazilian GHG Protocol program, a world recognized standard and audited by third party.

Klabin joins other organizations in implementing a global plan of action for people, the planet, peace and prosperity. The 17 Sustainable Development Goals (SDG) set out the global priorities and aspirations for 2030 and represent an opportunity to eliminate extreme poverty and put the world on a sustainable path. To implement this commitment, Klabin has developed new objectives and targets to incorporate both the issues that are relevant to its business and general issues of the global agenda into its Sustainability Strategy.

For several years, we have been committed to switching fossil fuel for biomass as an energy source. Klabin has an internal goal of maintaining at least 88% of its renewable energy matrix between 2018 and 2022. Several sources contribute to this cleaner matrix: in addition to biomass, we burn black liquor (a by-product of the industrial process) and use our own hydroelectric electricity.

Our concern with the climate change and the availability of abundant and clean energy extends to strategic decisions to the recently built Puma Unit in Ortigueira, PR.

cient 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 2019, Klabin consumed 72,951,704.95 GJ of energy in its operations. Despite the increase of 4% in the consumption of fossil fuels, there was a reduction of 4% in the consumption of LPG and 35% in the consumption of stationary diesel. This increase in fossil fuels was due to the exchange of the fuel oil boiler in Feira de Santana for a natural gas boiler, as it is less polluting. We can also highlight the increased participation of fuels from renewable sources in the company's energy matrix. We had an increase of 6% in the consumption of biomass and 10% in the consumption of black liquor, making the representation of renewable fuels in the company's matrix reach 89.54%.

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 scope 2 GHG emissions using the specific emission factor associated with each source of electricity generation that Klabin has chosen to acquire. In 2019, Klabin acquired 747,047.22 MWh of hydroelectric generation, with the appropriate declaration of the generator. This represents a 59% reduction in Scope 2 emissions, when compared to the Location Based Approach, which uses the average emission factor of the SIN (National Interconnected System).

C4. Targets and performance

C4.1

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

Both absolute and intensity targets

C4.1a

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

Target reference number

Δhs 1

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1

Base year

2004

Covered emissions in base year (metric tons CO2e)

895474.56

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2022

Targeted reduction from base year (%)

21.38

Covered emissions in target year (metric tons CO2e) [auto-calculated]

704022.099072

Covered emissions in reporting year (metric tons CO2e)

713886.74

% of target achieved [auto-calculated]

94.8474723802533

Target status in reporting year

Underway

Is this a science-based target?

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

Please explain (including target coverage)

The company's reduction target is based on 2004 emissions. In 2016, with the operation of a new production Puma I unit producing around 1,500,000 tons of pulp per year, a recalculation of the base year was carried out resulting in Scope 1 of 895,474.56 tCO2e . In 2022, the company's goal is to issue 704,000 tCO2e of Scope 1, which represents a reduction of about 21.38%. In 2019, the result of Scope 1 was 94.84%. It is important to mention that the company has the planning to implement some measures and technologies that until 2022 will make it possible to reach the target. Klabin started projects to reduce the consume of diesel and heavy oil in the pulp and paper mills. This project was started in 2004, when we changed



menting 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.

Target reference number

Abs 2

Year target was set

2017

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 3 (upstream & downstream)

Base year

2017

Covered emissions in base year (metric tons CO2e)

175368.08

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2020

Targeted reduction from base year (%)

5

Covered emissions in target year (metric tons CO2e) [auto-calculated]

166599.676

Covered emissions in reporting year (metric tons CO2e)

205987219

% of target achieved [auto-calculated]

-2347198.54285911

Target status in reporting year

Underway

Is this a science-based target?



Please explain (including target coverage)

By 2020, with the new growth projects of Klabin SA, we aim not to increase by more than 5% the emissions of scope 3 in relation to the base year of 2017. In this year 2019, we reduced the emissions of upstream diesel oil by 11% compared to 2017 from the optimization of the routes to transport raw material to the production units. In addition, Klabin is restructuring its supplier assessment process based on a new sustainability assessment in the organization's supply chain. We will do the gradual evaluation of suppliers and their results in sustainability, with the goal of together building new targets for, for example, reducing greenhouse gas emissions in the supply chain. 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.

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

2017

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Intensity metric

Metric tons CO2e per metric ton of product

Base year

2004

Intensity figure in base year (metric tons CO2e per unit of activity)

492

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

2022

Targeted reduction from base year (%)

62.4

Intensity figure in target year (metric tons CO₂e per unit of activity) [auto-calculated]

184.992

% change anticipated in absolute Scope 1+2 emissions

6.79

% change anticipated in absolute Scope 3 emissions

0

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

185.33

% of target achieved [auto-calculated]

99.8899051490515

Target status in reporting year

Underway

Is this a science-based target?

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

Please explain (including target coverage)

In 2017 Klabin S/A had as a goal the reduction of 1% of the emissions of the scope 1+ 2 reaching 205 kg CO₂eq per ton of product. This goal was achieved, obtaining 193.53 kg CO₂ eq per ton of product in this year of 2017. This demonstrates Klabin's commitment to reduce emissions of effect gases studied. With this, the targets set for 2018-2022 is 185 kg CO₂ eq per ton of product. With the improvements made in our processes, in 2019 we reached the target value until the year 2022, obtaining the result of 185.33 kgCO₂eq per ton of product, wich represents 99.8% of the achievement of the target. Klabin started projects to reduce the consume of diesel and heavy oil in the pulp and paper mills. This project was started in 2004, when we changed a oil for natural GAS in Piracicaba unit. Then in 2008 we changed 2 to 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). 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.



(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

2014

Figure or percentage in base year

86.5

Target year

2022

Figure or percentage in target year

88

Figure or percentage in reporting year

89.54

% of target achieved [auto-calculated]

202.666666666667

Target status in reporting year



- Reduce 1% of emissions from scope 1. - Reduction for Scope 1+2 (location-based) reaching the value of 185 kg CO2 eq per ton of product.

Is this target part of an overarching initiative?

Other, please specify (Sustainable Development Goals (SDG) from UN)

Please explain (including target coverage)

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 as fuel in our boilers, reaching in 2014 86,5% of renewable sources for energy generation. Our goal to 2022 in to increase this number and keep it at least to 88%. In 2019 Klabin increased the energy index from renewable sources to 89.54% and reduced the consumption of non-renewable fuels for energy generation by 7%, mainly from actions to reduce the consumption of fuel oil (-3% compared to 2017) and diesel (-55% compared to 2017) In 2019, the area of sustainability and environment is holding events called "For a Renewable Future" where actions are carried out to raise awareness of operational teams, improve the results of environmental indicators and actions for sustainability and business continuity.

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)
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Target denominator (intensity targets only)

<Not Applicable>

Base year

2016

Figure or percentage in base year

59.8

Target year

2022

Figure or percentage in target year

65



% of target achieved [auto-calculated]

273.076923076923

Target status in reporting year

Achieved

Is this target part of an emissions target?

- Reduce 1% of emissions from scope 1. - Reduction for Scope 1+2 (location-based) reaching the value of 185 kg CO2 eq per ton of product.

Is this target part of an overarching initiative?

Other, please specify (Sustainable Development Goals (SDG) from UN)

Please explain (including target coverage)

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 2019, Klabin reached values of 74% of energy self-sufficiency.

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
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Target denominator (intensity targets only)

<Not Applicable>

Base year

2017

Figure or percentage in base year

1143797.95

Target year

1086606.05

Figure or percentage in reporting year

1231454.72

% of target achieved [auto-calculated]

-153.267805406011

Target status in reporting year

Underway

Is this target part of an emissions target?

Reduction for Scope 1+2 (location-based) reaching the value of 185 kg CO2 eq per ton of product.

Is this target part of an overarching initiative?

Other, please specify (Sustainable Development Goals (SDG) from UN)

Please explain (including target coverage)

Based on the results obtained in 2017, Klabin has set a reduction target of up to 5% between 2018 and 2022. Also the period had the following highlights We reduced the consumption of non-renewable fuels for energy generation by 7%, mainly from actions to reduce the consumption of fuel oil (-3% compared to 2017) and diesel (-55% compared to 2017). In 2019, the area of sustainability and environment is holding events called "For a Renewable Future" where actions are carried out to raise awareness of operational teams, improve the results of environmental indicators and actions for sustainability and business continuity.

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 *)
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	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Implementation commenced*	0	0
Implemented*	3	105313.69
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	Biogas
------------------------------	--------

Estimated annual CO2e savings (metric tonnes CO2e)

1163.24

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

0

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

290372

Payback period

No payback

Estimated lifetime of the initiative

11-15 years

Comment

Project to replace the fuel oil burner in the Feira de Santana boiler with a natural gas burner, which, although it is also a fossil fuel, is less polluting. This project is an old project that was recently executed, so the absence of the payback period, in addition, the annual savings are irrelevant, since the cost to replace the fuel is higher than the current one.

Initiative category & Initiative type

47683.54

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

36354000

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

21500000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Installation of a plant for the production of Tall Oil (CTO - Crude Tall Oil) from the soap generated in the recovery process at the PUMA and MA factories. The CTO generated is burned in the PUMA Lime Ovens, reducing the consumption of fuel oil; Plant sized to consume 100% of the soap generated in the MA and PUMA processes.

Initiative category & Initiative type

Low-carbon energy consumption	Hydropower
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Estimated annual CO2e savings (metric tonnes CO2e)

56466.91

Scope(s)

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



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 2019, Klabin acquired 747,047.22 MWh, from hydroelectric generation, with the proper Declaration of the generator. This results in a reduction of Scope 2 emissions in 56,466.91 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.

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 use of an internal Klabin methodology, which uses as a prioritization parameter the possible environmental impacts. In addition, other items such as legal requirements and financial return of the investments are also taken into consideration. The main methodology used by Klabin to assess the feasibility and prioritization of projects is the CANVAS model.

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

Description of management practice

Practices of adequacy, conservation and environmental preservation in rural properties and planted forests of Klabin.

Primary climate change-related benefit

Increase carbon sink (mitigation)

Estimated CO2e savings (metric tons CO2e)

30412.55

Please explain

The greenhouse gas inventory calculation was based on the Brazilian GHG Protocol methodology Klabin reserves 43% 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. A pioneer in the adoption of mosaic planting concepts Klabin has 258,000 hectares planted with pine and eucalyptus and 240,000 hectares of preserved native forests. For fire control, Klabin has an expert team to control through observation towers that use fire localization techniques by georeference and control charts. Klabin also adopts programs in order to improve the conditions of its areas, as well as to comply with environmental laws, the preservation and management of companies and plantations. 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 2,803 ha of demarcated areas of preservation. Using as base the value of 10.85 tCO₂e / 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: 2,803 ha * 10.85 tCO₂ / ha = 30,412.55 tCO₂e.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Company-wide

Description of product/Group of products

Whole products list

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Estimating and Reporting the Comparative Emissions Impacts of Products (WRI)

% revenue from low carbon product(s) in the reporting year

100

% of total portfolio value

<Not Applicable>

Asset classes/ product types

<Not Applicable>

Comment

Since our raw material is our own forests, we have to maintain the great parameters of forest management. So, Klabin is a reference on particular areas preserved. 577,000 HECTARES OF OWN LAND: 258,000 hectares of planted forests and 240,000 hectares of preserved native forests and other third-part lands which has planted and preserved areas. Therefore, the company has the best numbers on Carbon Footprint. Using the methodology of the GHG Brazilian protocol and considering the scope 1, 2 and 3 of Klabin S.A we have the result of GHG emission intensity in 232.48 kgCO2eq / ton of product produced.

C5. Emissions methodology



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 2004

Base year end

December 31 2004

Base year emissions (metric tons CO2e)

0

Comment

pared 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

C5.2

(C5.2) 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)

713886.748

Start date

January 1 2019

End date

December 31 2019

Comment

Despite the increase of 4% in the consumption of fossil fuels, there was a reduction of 4% in the consumption of LPG and 35% in the consumption of stationary diesel. This increase in fossil fuels was due to the exchange of the fuel oil boiler in Feira de Santana for a natural gas boiler, as it is less polluting. We can also highlight the increased participation of fuels from renewable sources in the company's energy matrix. We had an increase of 6% in the consumption of biomass and 10% in the consumption of black liquor, making the representa-

Gross global Scope 1 emissions (metric tons CO2e)

668952.44

Start date

January 1 2018

End date

December 31 2018

Comment

In this year of 2018 we reduced the consumption of non-renewable fuels for energy generation by 7%, mainly from constant actions to reduce the consumption of fuel oil (-12% in 2018 compared to 2017) and diesel (-31% in 2018, in relation to the previous year). We can also highlight the increase in hydroelectric power generation by 19%. These results demonstrate Klabin's commitment to increasingly search for sustainable solutions for the business. In 2018, we reduced absolute GHG emissions from scope 1 by 40,607.23 tCO2eq over 2017. This represents a reduction of 10.47 kgCO2eq for each ton of product produced.

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 2019, Klabin acquired 747,047.22 MWh, from hydroelectric generation, with the proper Declaration of the generator. This results in a reduction of Scope 2 emissions in 56,466.91 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) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

95674.193

Scope 2, market-based (if applicable)

39207.288

Start date

January 1 2019

End date

December 31 2019

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 2019, Klabin acquired 747,047.22 MWh, from hydroelectric generation, with the proper Declaration of the generator. This results in a reduction of Scope 2 emissions in 56,466.91 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.

Past year 1

Scope 2, location-based

87791.05

Scope 2, market-based (if applicable)

36448.51

Start date

January 1 2018

End date

December 31 2018

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 2018, Klabin acquired 696,089.40 MWh, from hydroelectric generation, 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.

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

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Capital goods

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

GHG Protocol Brazil Methodology

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

0

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.

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

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

75417.093

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

100

Please explain

Klabin measures emissions from its employees travels and accounts into its GHG emissions



Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

356.175

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

100

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. 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. 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.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

938.903

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

100

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. 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.

Employee commuting

Evaluation status

1944.99

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

100

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. 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.

Upstream leased assets

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

127330.058

Emissions calculation methodology

GHG Protocol Brazil Methodology

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



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. This category of Scope 3 contemplates the emissions of transport and distribution of products (excluding fuels and energy products) in vehicles and facilities that are not owned or operated by the organization, when there is no relation of purchase or acquisition of these services by the inventory organization in the year inventories, as well as other outsourced transportation and distribution services (including both inbound and outbound logistics).

Processing of sold products

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Use of sold products

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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-



Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Downstream leased assets**Evaluation status**

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

Franchises**Evaluation status**

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology



0

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.

Investments

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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 (upstream)

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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)



Metric tonnes CO2e

0

Emissions calculation methodology

GHG Protocol Brazil Methodology

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

0

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.

C-AC6.6/C-FB6.6/C-PF6.6

(C-AC6.6/C-FB6.6/C-PF6.6) Can you break down your Scope 3 emissions by relevant business activity area?

Yes

C-AC6.6a/C-FB6.6a/C-PF6.6a

(C-AC6.6a/C-FB6.6a/C-PF6.6a) Disclose your Scope 3 emissions for each of your relevant business activity areas.

Activity

Distribution

Scope 3 category

Upstream transportation and distribution

Emissions (metric tons CO2e)

75417.093

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 transportation and distribution (upstream) are related to the diesel consumption of the forest areas and are monitored in sub-



Unit ("Distrito" Region): 3,825.95 t CO2e Forest Area of Monte Alegre Unit ("General Carneiro" Region): 6.84 t CO2e Forest Area of Monte Alegre Unit ("Aeroporto" Region): 3,378.37 t CO2e Forest Area of Monte Alegre Unit ("Rio Branco" Region): 158.33 t CO2e Forestry Area of the Monte Alegre Region ("Ventania" Region): 0.57 t CO2e Forest Area of the PUMA Unit: 28,352.87 t CO2e Forest Area of Monte Alegre Unit ("Guarapuava" Region): 502.93 t CO2e Forest Area of Monte Alegre Unit ("Itararé" Region): 360.18 t CO2e Forestry Area of the Monte Alegre Region ("Jaguariaíva" Region): 137.54 t CO2e Forest Area of Monte Alegre Unit ("Posto Puma" Region): 457.65 t CO2e Forest Area of Monte Alegre Unit ("Palmas" Region): 73.37 t CO2e In addition, there is also the rail transport of the PUMA unit that represents 8,396.85 t CO2e

Activity

Distribution

Scope 3 category

Downstream transportation and distribution

Emissions (metric tons CO2e)

127330.058

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. Transportation and distribution (downstream) are related to diesel consumption for the domestic market fleet and are subdivided into classes for each unit: Angatuba Support - Transit: 342.39 t CO2e Angatuba Industry: 4,238.94 t CO2e Correia Pinto Industry: 6,298.52 t CO2e Monte Alegre Industry: 20,136.12 t CO2e Otacilio Costa Industry: 17,773.49 tCO2e Goiana Recycled Paper: 5,560.26 t CO2e Piracicaba Recycled Paper: 1,327.09 t CO2e Master Carga Warehouse: 13.52 t CO2e Third Party Storage: 7.09 t CO2e KE Betim: 2,995.16 t CO2e KE Feira de Santana: 1,168.65 t CO2e KE Goiana: 6,318.97 t CO2e KE Itajaí: 2,424.02 t CO2e KE Jundiaí 1 - TP: 780.12 t CO2e KE Jundiaí 2 - DI: 1,995.21 t CO2e KE Manaus: 1,433.27 t CO2e KE Piracicaba: 1,723.75 t CO2e KE Rio Negro: 3,451.81 t CO2e KE São Leopoldo: 1,358.86 t CO2e Klabin PUMA: 12,524.20 t CO2e Lages I: 8,002.69 t CO2e Lages II: 7.52 t CO2e SC Goiana: 1,911.59 t CO2e Support Rio Negro: 0.07 tCO2e Betim Sacos: 90.46 tCO2e Sigma Warehouse: 25.64 tCO2e Ortigueira Papel: 5.99 tCO2e Angatuba (ANG): 439.34 t CO2e Correia Pinto (CP01): 3,083.90 t CO2e Lages 1 (LG01): 1,572.18 t CO2e Lages 2 (LG02): 222.94 t CO2e Ortigueira (OR30): 9,934.20 t CO2e Otacilio Costa (OTA1): 4,625.93 t CO2e Monte Alegre (MA01): 5,495.82 t CO2e Jundiaí (JU): 40.20 tCO2e

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



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)

5337.18

Methodology

Default emissions factors

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.

CO2 removals from land use management

Emissions (metric tons CO2)

8226543.68

Methodology

Default emissions factors

Please explain

Removal of 8,226,543.68 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, as well as the non-relevance of some emission sources for scope 3.

Sequestration during land use change

Emissions (metric tons CO2)

30412.55

Methodology

Default emissions factors

Please explain

Matas Legais - Developed in partnership with the Association of Preservation of Environment and Life (Anremavi) it promotes actions of rural property planning, conservation and environ-

serving 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 2,803 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: 2,803 ha * 10.85 tCO₂ / ha = 30,412.55 tCO₂eq This amount of CO₂ is also contemplated in the CO₂ removal calculation for land use management

CO₂ emissions from biofuel combustion (land machinery)

Emissions (metric tons CO₂)

18328.87

Methodology

Default emissions factors

Please explain

Emissions of 18,328.87 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, as well as the non-relevance of some emission sources for scope 3.

CO₂ emissions from biofuel combustion (processing/manufacturing machinery)

Emissions (metric tons CO₂)

5212862

Methodology

Default emissions factors

Please explain

Emissions of 5,212,862.00 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, as well as the non-relevance of some emission sources for scope 3.

CO₂ emissions from biofuel combustion (other)

Emissions (metric tons CO₂)

166214

Methodology

Default emissions factors

Please explain



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

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. 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 58,312.6 t CO₂e and 5,212,750.94 tCO₂ biogenic in 2019) and, in addition, the emissions of greenhouse gases are calculated for the agricultural emissions processes considering Forest Planting for wood supply (GHG emissions of 5,337.18 tCO₂e in 2019). 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

Total

Emissions (metric tons CO₂e)

5271063.54

Denominator: unit of production

<Not Applicable>



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 58,312.6 t CO₂e and 5,212,750.94 tCO₂ biogenic in 2019) and, in addition, the emissions of greenhouse gases are calculated for the agricultural emissions processes considering Forest Planting for wood supply (GHG emissions of 5,337.18 tCO₂e in 2019). That's a increase of 4.3% of CO₂ emissions from timber when compared to 2018. It is important to mention that in 2019, there was an 8% increase in the consumption of fuels from renewable sources. Biomass consumption increased by 6% and black liquor by 10%. The result of emissions is also linked to the increase in consumption of nitrogen compounds in agricultural activities. 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

185.33

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

809560.94

Metric denominator

metric ton of product

Metric denominator: Unit total

4368164.12

Scope 2 figure used

Location-based

% change from previous year

3.7

Direction of change

Increased

Reason for change

In 2017, the company set a target of 185 kgCO₂e / t product for Scope 1 + 2 in greenhouse

sions by 7%, we can relate to the increase in the consumption of fossil fuels by 4%, an increase in the use of air conditioning gases and an increase in the use of nitrogenous compounds in the operation of implementing forests. Despite the increase in the use of fossil fuels, we can highlight the reduction of 35% in the consumption of stationary diesel and 4% in the consumption of LPG. These calculations are performed annually, using the methodology of the Brazilian GHG Protocol.

Intensity figure

0.000078

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

809560.94

Metric denominator

unit total revenue

Metric denominator: Unit total

10272000000

Scope 2 figure used

Location-based

% change from previous year

2.63

Direction of change

Increased

Reason for change

In 2019, the company saw a 3% increase in total production, as well as hearing an increase in Scope 1 + 2 emissions. This result is due to the 4% increase in fossil fuel consumption and increased use of nitrogen compounds in forest implementation operations. Despite the increase in the use of fossil fuels, we can highlight the reduction of 35% in the consumption of diesel stationary and 4% in the consumption of LPG. These results indicate an energy matrix of 89.54% from renewable sources. This reinforces Klabin's commitment to constantly seek to increase the share of renewable sources in the energy matrix. We also had an increase in the consumption of purchased energy, however, it is important to note that since 2017 Klabin has also reported its scope-2 emissions by the market-based method. In 2019, 60.6% of the amount of energy purchased was reported as being from a renewable source with its respective generator declaration.

C7 Emissions breakdowns

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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	638726.795	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	16689.9	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	51368.048	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	7102.005	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	713886.748

C7.3

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

By facility



Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Angatuba	3220.903	-23.565066	-48.359227
Betim	3441.706	-19.964755	-44.120758
Correia Pinto	28732.725	-27.551488	-50.364019
Feira de Santana	3943.371	-12.290827	-38.91198
Goiana	56726.369	-7.556655	-35.035038
Itajaí	4149.777	-26.891305	-48.709733
Jundiaí Distrito Industrial	4818.714	-23.1752	-46.931352
Jundiaí Tijuco Preto	2521.051	-23.266963	-46.865105
Lages 1	695.005	-27.808633	-50.363555
Manaus	3065.678	-3.0985	-59.943561
Monte Alegre	269774.914	-24.310186	-50.6079
Otacílio Costa	30564.052	-27.513275	-50.116602
Piracicaba	35587.089	-22.687536	-47.674963
Puma	262327.175	-24.258055	-50.746944
São Leopoldo	3052.649	-29.786711	-51.114425
Depósito Paranaguá	604.457	-25.539727	-48.535783
Rio Negro	602.22	-26.083283	-49.77273
Escritório Sede	0	-23.589061	-46.682311
Lages 2	58.888	-27.80863	-50.363555

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) 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)

5337.18

Methodology

Default emissions factor

Please explain

This emission value is linked to Agricultural emissions (scope 1) column on Brazilian GHG Protocol Metodology

Activity

Processing/Manufacturing

Emissions category

Total

Emissions (metric tons CO2e)

5.369

Methodology

Default emissions factor

Please explain

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

Activity

Distribution

Emissions category

Total

Emissions (metric tons CO2e)

179397.367

Methodology

Default emissions factor



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

Activity

Processing/Manufacturing

Emissions category

Total

Emissions (metric tons CO2e)

522040.834

Methodology

Default emissions factor

Please explain

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

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)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Brazil	95674.193	39207.288	1232191.4	1067579

C7.6

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

By facility

C7.6b



Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Angatuba	9027.757	4718.992
Betim	516.082	516.082
Correia Pinto	9023.496	2804.961
Feira de Santana	376.445	376.445
Goiana	9065.989	9065.989
Itajaí	450.117	143.049
Jundiaí Distrito Industrial	592.194	592.194
Jundiaí Tijuco Preto	417.359	417.359
Lages 1	786.649	243.368
Manaus	201.425	201.425
Monte Alegre	49464.476	15344.759
Otacílio Costa	5024.043	1556.802
Piracicaba	5313.22	1632.576
Puma	4607.473	1285.696
São Leopoldo	398.168	123.622
Depósito Paranaguá	23.324	23.324
Rio Negro	247.217	75.833
Escritório Sede	31.239	31.239
Lages 2	107.522	107.522

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)	Direction of change	Emissions value (percentage)	Please explain calculation

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	2853.4	Increased	5.14	In 2019, Klabin increase the burning of renewable fuels for power generation, 6% for biomass and 10% for black liquor compared to 2018. These mitigation actions resulted in an increase in the share of renewable sources in the company's energy matrix, reaching 89.54%, in addition to a 3% increase in energy generation (from biomass and black liquor) at the Puma unit that was made available for sale, contributing to a more renewable national energy matrix. Biomass and liquor emissions in 2018: 55,458.6 tCO2e Biomass and liquor emissions in 2019: 58,312.6 tCO2e $[(58,312.6 / 55,458.6) - 1] * 100 = 5.14\%$
Other emissions reduction activities	56466.905	Decreased	9.98	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 2019, Klabin acquired 747,047.22 MWh, from hydroelectric generation, with the proper Declaration of the generator. This results in a reduction of Scope 2 emissions in 56,466.905, when compared to location-based, which uses the average emission factor of the SIN (National Interconnected System), this figure represents a 9.98% increase in coverage of Scope 2 emissions. Scope 2 reduction in 2018: 51,342.53 tCO2e Scope 2 reduction in 2019: 56,466.905 tCO2e Variation = $[(56,466.905 / 51,342.53) - 1] * 100 = 9.98\%$ This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.
Divestment	0	No change	0	0.0
Acquisitions	0	No change	0	0.0
Mergers	0	No change	0	0.0
Change in output	13669	Increased	3.13	In 2019, we had a 3% increase in the company's total production. This result reflects the increase of 13,669 tCO2e in combined Scope 1 + 2 emissions. Total increase in scope 1 + 2 emissions – Other Emissions – Change in renewable energy consumption $52,817.45 - 36,295.8 - 2,853.4 = 13,668.25$ tCO2e
Change in methodology	0	No change	0	0.0
Change in boundary	0	No change	0	0.0
Change in physical operating conditions	0	No change	0	0.0
Unidentified	0	No change	0	0.0

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Other	36295.8	Increased	6.89	In 2019, there was a 6.89% increase in scope 1 + 2 emissions. This result reflects the 4% increase in the consumption of fossil fuels that generated more emissions - 25,882 tCO2e; and the increase of purchase of energy by the company that generated more 7,979,14 tCO2e. In addition, the company used more nitrogen compound in the practice of forestry. It resulted in more 2,434,66. Despite it is important to mention that the company adopted a series of technologies that allowed the increase in emissions not to be greater. Per example, the oil boiler burner at the Feira de Santana unit was replaced by a natural gas burner. There were also actions to reduce the consumption of LPG and stationary diesel (4% and 35%, respectively) compared to the previous year. Emissions from fossil fuel in 2018: 437,830.95 tCO2e Emissions from nitrogen compound in 2018: 2,902.52 tCO2e Emissions from energy purchased in 2018: 84,956.72 tCO2e Total 2018: 525,690.19 tCO2e Emissions from fossil fuel in 2019: 463,712.67 tCO2e Emissions from nitrogen compound in 2019: 5,337.18 tCO2e Emissions from energy purchased in 2019: 92,872.93 tCO2e Total 2019: 561,922.78 tCO2e $[(\text{Total 2019} / \text{Total 2018}) - 1] * 100 = [(561,922.78 / 525,690.19) - 1] * 100 = 6.89\%$

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?

Location-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	Yes

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)	15418398.74	1801856.26	17220255.01
Consumption of purchased or acquired electricity	<Not Applicable>	747047.22	485144.18	1232191.4
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>	53323.22	<Not Applicable>	53323.22
Total energy consumption	<Not Applicable>	16218769.18	2287000.44	18505769.63



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.

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

516577.18

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

541750.93

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration



0.0021

Unit

kg CO2 per liter

Emissions factor source

National Agency of Petroleum, Natural Gas and Biofuels (ANP 2012)

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Residual Fuel Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

1157053.76

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

16814.01

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

1140239.76

Emission factor

3.1

Unit

kg CO2 per liter

Emissions factor source

National Agency of Petroleum, Natural Gas and Biofuels (ANP 2012)

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol



Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

5174342.06

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

15481.13

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

4816627.5

Emission factor

0.00116

Unit

metric tons CO2 per metric ton

Emissions factor source

National Energy Balance 2016 (base year 2015) - (BEN 2019).

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Black Liquor

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

10084534.72

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 cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

10097743.83

Emission factor

0.00114

Unit

metric tons CO2 per metric ton

Emissions factor source

National Energy Balance 2016 (base year 2015) - (BEN 2019).

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

123400.18

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

4069.27

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

129139.67

Emission factor

0.00293

Unit

metric tons CO2 per metric ton



Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

4825.15

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

142.79

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

4176.33

Emission factor

0.00212

Unit

metric tons CO2 per metric ton

Emissions factor source

National Agency of Petroleum, Natural Gas and Biofuels (ANP 2012)

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Hydrogen

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

44882.04



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

44882.08

Emission factor

0

Unit

metric tons CO2 per metric ton

Emissions factor source

Brazilian GHG Protocol

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Tar

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

48107.56

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

16128



Unit

metric tons CO2 per metric ton

Emissions factor source

Ministry of Mines and Energy. National Energy Balance 2016 (base year 2015) - (BEN 2019).

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

Fuels (excluding feedstocks)

Other, please specify (Methanol)

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

13209.1

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

12309.1

Emission factor

0.00114

Unit

metric tons CO2 per metric ton

Emissions factor source

Ministry of Mines and Energy. National Energy Balance 2016 (base year 2015) - (BEN 2019).

Comment

Emission factor used as reference of this fuel for the Brazilian GHG Protocol

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	3635623.68	3955961.28	3255207.06	2343353.26
Heat	4069.27	4069.27	0	0
Steam	16835435.14	16835435.14	15003171.64	15003171.64
Cooling	0	0	0	0

C8.2e

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

Sourcing method

Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type

Hydropower

Country/region of consumption of low-carbon electricity, heat, steam or cooling

Brazil

MWh consumed accounted for at a zero emission factor

747047.22

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 2019, Klabin acquired 747,047.22 MWh, from hydroelectric generation, with the proper Declaration of the generator. This results in a reduction of Scope 2 emissions in 56,466.905 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.

Sourcing method

Low-carbon technology type

Biomass

Country/region of consumption of low-carbon electricity, heat, steam or cooling

Brazil

MWh consumed accounted for at a zero emission factor

320531.78

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 2019, Klabin acquired 320,531.780 MWh, from biomass generation to use as energy in Angatube Unit. This results in a reduction of Scope 2 emissions. This demonstrates Klabin's commitment to opt for the purchase of renewable energy, in accordance with its Sustainability Policy.

C9. Additional metrics

C9.1

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

Description

Energy usage

Metric value

225118.74

Metric numerator

GJ

Metric denominator (intensity metric only)

-x-

% change from previous year

4

Direction of change

Increased



In this year 2019, we had a 4% increase in fossil fuel consumption, this result is due to the replacement of the fuel oil boiler at the Feira de Santana unit by a natural gas boiler. Despite the increase in the use of fossil fuels, we can highlight the reduction of 35% in the consumption of stationary diesel and 4% in the consumption of LPG. These results indicate an energy matrix of 89.54% from renewable sources. This reinforces Klabin's commitment to constantly seek to increase the share of renewable sources in the energy matrix.

Description

Waste

Metric value

98.83

Metric numerator

ton

Metric denominator (intensity metric only)

-x-

% change from previous year

10

Direction of change

Decreased

Please explain

In 2019, we can highlight the reduction in the generation of hazardous waste destined for Landfills (-7% compared to 2018), as well as the percentage of generation of total hazardous waste that went from 0.05% in 2018 to 0.04% in 2019, showing the company's commitment to achieving the goal of keeping that number below 0.5%. In addition, we increased the waste recycling indicator to 96.7%, reinforcing the commitment and focus on achieving the goal of maintaining waste reuse higher than 95% by 2022.

C10. Verification

C10.1

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



	Verification/assurance status
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

Third party verification/assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.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

.....



Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.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

Third party verification/assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.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) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Upstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/ assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.pdf](#)

Page/section reference

2/3

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Waste generated in operations

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/ assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.pdf](#)

Page/section reference

2/3

Relevant standard

ISO14064-3

Scope 3 category

Scope 3: Business travel

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/ assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.pdf](#)

Page/section reference

2/3

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Employee commuting

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/ assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.pdf](#)

Page/section reference

2/3

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100



Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Third party verification/ assurance underway

Attach the statement

[C2037 VIE Klabin GPV VIE 2019 \(DE\) Declaração de Verificação ingles 02.pdf](#)

Page/section reference

2/3

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



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 (65% 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 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. Studies were also carried out for three types of industrial bags produced by Klabin at the Lages - SC unit. In 2019, Klabin invested around BRL 500,000 to evaluate the products' life cycle, 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) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Klabin is preparing for future carbon regulation in Brazil by adopting internal carbon pricing methodologies. The company expects that in the next three years the Brazilian government will move towards at least one pilot carbon pricing project, based on a cap and trade system for the sectors of Brazilian industry. Klabin participates in a series of discussion workshops on the adoption of carbon pricing in Brazil and follows governmental discussions on this agenda.

Two complementary methodologies are adopted in the internal carbon pricing.

1. Cost of impact: scenarios are developed to identify the impact of the cost of carbon considering the adoption of cap and trade or tax in Brazil. Regulated emission - Scope 1 of Puma + Monte Alegre units – 532,101 tCO₂e, in 2019 X Estimated cost of carbon: BRL 40.00

BRL 40 is value indicated by Brazilian Ministry of Economy Studies for Carbon Pricing in Brazil, and the average of carbon pricing in Latin America, considering the countries adopted carbon regulation. Cost of Carbon BRL 21,284,040 / year >> cost to comply. Based on this scenario, Klabin considers the cost of carbon regulation in its financial planning.

2. MACC curve to subsidize and prioritize low carbon technologies. The company adopts this methodology that crosses the potential for carbon reduction (tCO₂e) and investment (CAPEX and OPEX) – BRL/ tCO₂e. For the OPEX calculation, the company adopts the carbon price (shadow) because the technology will treat an avoided cost if implemented in the context of carbon pricing regulation. Shadow price adopted is BRL 40.00 - the price indicated by Brazilian government as a necessary to induce the industry sector invest in low carbon technologies. As the MACC presents the marginal cost of carbon, which facilitates the company in future 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.

In addition, Klabin also participates together with other companies in an exercise that simulates an emissions trading system in Brazil - Brazilian Emissions Trading Simulation.

(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 low-carbon investment
Stress test investments
Identify and seize low-carbon opportunities

GHG Scope

Scope 1

Application

We simulate that emissions from stationary sources (of our industrial units with annual emissions > 200,000 tonCO₂e) are regulated. 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

± BRL 5.0

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,



itivity analysis' based on: average carbon tax in Latin America – U\$ 7.0. The carbon price is converted to Real. Our stationary emissions X medium carbon tax (BRL 40.00) = around BRL 21,284,040 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. 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.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

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

34

% 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. In 2019, 650 audits has evaluated 140 certified and non-certified wood suppliers in Paraná. These suppliers represented 34% of Klabin's wood suppliers by number. In total procurement spend, these suppliers represented 73% of total wood suppliers. All suppliers of the forestry units are audited by Klabin on a quarterly basis. In case of non-compliance, 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, wastes, emissions) and social aspects and it is used to measure of sucess of the engagement. In 2019, 96.7% of the evaluated items in the Parana properties involved were attended. This shows that the properties of Klabin's wood suppliers, almost entirely, meet the assessed requirements. In 2019, only 17 of 650 audits has blocked the Parana wood suppliers because causing significant and negative impacts.

Comment

In Parana, the percentage of audits identified in 2019 as causing significant and negative impacts which improvements were verified and resolved: 2% (15 audits).

Type of engagement

Compliance & onboarding

Details of engagement

Climate change is integrated into supplier evaluation processes

% of suppliers by number

7

% 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

assessment, which considers questions grouped into four major themes: Environment (e.g water issues), 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 potential impacts on business and sustainability area. 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

Divided into three phases, 110 strategic suppliers were selected for the first phase in 2019, according to criticality matrix of supply chain team that assesses aspects-related to potential impacts on business and sustainability area. With an adherence by 78% (86 companies), the result was considered above average by EcoVadis itself. Now, the participation is voluntary and requires an investment by suppliers. For this reason, Klabin financed the participation of smaller companies. To suppliers maintain within our procurement strategy, Klabin requires all suppliers to report their climate changes actions and climate-related potential risks. In situations where the result of this reporting is less than minimum score required (<35 points), suppliers are requested to elaborate a action plan to improve your score. In case of this score be critical (<25 points), 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 changes-related risks who we are exposed. We have the ambitious target of evaluate all strategic suppliers by the end of 2030. The success is measured by number of suppliers with climate changes related actions every year. In 2019, 51% of 86 suppliers report that they had actions to reduce emissions or other climate changes related actions

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. It is used by more than 50 thousand companies in the world.

C12.1b

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

Type of engagement

Education/information sharing

Details of engagement

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

% of customers by number

100

Portfolio coverage (total or outstanding)

<Not Applicable>

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. 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

For the company, the impact of sharing information through the sustainability report and questionnaires focused on climate change is related to the scores obtained on completed forms for specific customers, in which Klabin currently has the highest score in all answered questionnaires. In addition, the main indicator of this engagement is the loss of customers due to environmental issues, whose impact of success is 100%, since there were no losses of Klabin's customers due to such issues.

C12.1d

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

Since 2017, Klabin has had a project with the communities where we have a forestry operation, which was called "Klabin at school". In this program, the company shows students on environmental issues and shows a little of what the company has been doing in the surroundings. In addition, the company shares its good practices in the climate agenda, such as actions focused on the sustainability of regions where we operate, such as socio-environmental programs.

As a result, we can highlight the number of students impacted. Since the beginning of the program, 5,318 students from 15 municipalities where Klabin operates have been engaged. In 2019 alone, there were 2,300 students. Klabin monitors engagement through a survey that evaluates speakers, visits and chosen topics.

(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. 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



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

Matas legais program had 59 new owners; 54,550 seedlings donated; 2,803 ha of demarcated areas of preservation. Its is also important to mention that this program reduced greenhouse gas emissions in 30,412.55 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). Fomento Florestal [Forest Development] – 2,747 contracts formalized Planning Sustainable Properties (Matas Sociais) - Serves 500 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) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers

Trade associations

Funding research organizations

Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?



Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Support with minor exceptions	<p>Klabin's report is based on The Greenhouse Gas Protocol (GHG Protocol) which is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. Furthermore, Klabin takes part on the EPC - Empresas pelo Clima (Companies for the Climate) a platform which mobilizes, raises awareness and influences business leaders to manage and reduce greenhouse gas emissions, manage climate risks and propose public policies and positive incentives in the context of climate change. Also, Klabin takes part of the Coalition Brazil Climate, Forests and Agriculture, initiative formed by businesses, civil society organizations and individuals interested in contributing to the national agenda on sustainable use of forests, sustainable agriculture and mitigation and adaptation to climate change in Brazil and in the world. Currently, the Coalition is promoting a dialogue between its participants, the federal government and the main international organizations related in order to contribute to the multilateral negotiations and economic agenda in the country. The minor exceptions refers to GHG Protocol methodology which currently considers only emissions, not including removals by sinks.</p>	<p>In reason of this programs, Klabin is reference of public consults of carbon emissions and climate policies. The legislative proposes are done by EPC Group, which represents Klabin and others companies. EPC promotes debates between member companies and the government, in order to enable the private sector collaboration in the building of public policies for a low-carbon economy in Brazil; creation of a first-of-its-kind collaboration network and building of best practices to manage GHG emissions among EPC members and partners; and participation in the Corporate Leaders Network for Climate Action (CLN) international network. In 2009, a significant group of Brazilian business people willing to encourage a low-carbon economy in the country and help build a new sustainable development framework got together and created the Business for the Climate (EPC) Platform, a continuous Brazilian business platform for the transition towards a low-carbon economy. Launched in partnership with The Prince of Wales Corporate Leaders Group on Climate Change (CLG), and with the support of 27 Founding Companies, EPC currently counts with the participation of 36 Member Companies. Its goals are: mobilize, engage and involve corporate leaderships for managing and reducing GHG emissions, managing climate risks, and suggesting public policies and positive incentives in the context of climate change. Considered the next step after Brazil GHG Protocol Program, EPC engages companies not only in discussions and activities related to management and reduction of corporate GHG emissions, but also in the industry positioning when it comes to climate and elaboration of public policy propositions to contribute to a low-carbon economy in Brazil. Klabin is one of the 5 principal particular areas planted and preserved in Brazil, so its represents the importance of our forest management in the country when the Coalition Brazil Climate, Forests and Agriculture was created.</p>

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support	Klabin takes part, for the sixth year, in an Emissions Trading System Simulation, performed by Getulio Vargas Foundation. This initiative aims to discuss the best guidelines for implementing a cap and trade in Brazil. These guidelines are shared and discussed with policymakers in the country.	Promoted by Getulio Vargas Foundation in partnership with EDF – Environmental Defend Fund. The purpose of this simulation is to provide the business sector with a realistic and hands-on experience on how a 'cap-and-trade' system works. The simulation foundations were built throughout 2013 through a joint process with Brazilian companies, inspired by similar - real and simulated - experiences, in a number of countries and regions worldwide. It is worth mentioning, however, that in early 2015 Klabin established a Climate Committee: working group responsible for assessing the Global Climate agenda evolution and for interpreting its implications (risks and opportunities) for the company's operations. With representatives from various areas of the company and with the support of an external expert, the challenge proposed to the committee is to align internal action and goals with those set by global Climate science. In 2016 and 2018, we did a complex study of climate vulnerabilities which is on use to develop your strategy to manage this subject in the whole company.
Energy efficiency	Support	Klabin's report is based on The Greenhouse Gas Protocol (GHG Protocol) which is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. Furthermore, Klabin takes part on the EPC - Empresas pelo Clima (Companies for the Climate) a platform which mobilizes, raises awareness and influences business leaders to manage and reduce greenhouse gas emissions, manage climate risks and propose public policies and positive incentives in the context of climate change. Currently, the Coalition is promoting a dialogue between its participants, the federal government and the main international organizations related in order to contribute to the multilateral negotiations and economic agenda in the country.	In reason of this programs, Klabin is reference of public consults of carbon emissions and climate policies. The legislative proposes are done by EPC Group, which represents Klabin and others companies. EPC promotes debates between member companies and the government, in order to enable the private sector collaboration in the building of public policies for a low-carbon economy in Brazil; creation of a first-of-its-kind collaboration network and building of best practices to manage GHG emissions among EPC members and partners; and participation in the Corporate Leaders Network for Climate Action (CLN) international network. In 2009, a significant group of Brazilian business people willing to encourage a low-carbon economy in the country and help build a new sustainable development framework got together and created the Business for the Climate (EPC) Platform, a continuous Brazilian business platform for the transition towards a low-carbon economy. Launched in partnership with The Prince of Wales Corporate Leaders Group on Climate Change (CLG), and with the support of 27 Founding Companies, EPC currently counts with the participation of 36 Member Companies. Its goals are: mobilize, engage and involve corporate leaderships for managing and reducing GHG emissions, managing climate risks, and suggesting public policies and positive incentives in the context of climate change. Considered the next step after Brazil GHG Protocol Program, EPC engages companies not only in discussions and activities related to management and reduction of corporate GHG emissions, but also in the industry positioning when it comes to climate and elaboration of public policy propositions to contribute to a low-carbon economy in Brazil. Klabin is one of the 5 principal particular areas planted and preserved in Brazil, so its represents the importance of our forest management in the

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Clean energy generation	Support	Klabin's report is based on The Greenhouse Gas Protocol (GHG Protocol) which is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. Furthermore, Klabin takes part on the EPC - Empresas pelo Clima (Companies for the Climate) a platform which mobilizes, raises awareness and influences business leaders to manage and reduce greenhouse gas emissions, manage climate risks and propose public policies and positive incentives in the context of climate change.	Klabin is reference of public consults of carbon emissions and climate policies. The legislative proposes are done by EPC Group, which represents Klabin and others companies. EPC promotes debates between member companies and the government, in order to enable the private sector collaboration in the building of public policies for a low-carbon economy in Brazil; creation of a first-of-its-kind collaboration network and building of best practices to manage GHG emissions among EPC members and partners; and participation in the Corporate Leaders Network for Climate Action (CLN) international network. Launched in partnership with The Prince of Wales Corporate Leaders Group on Climate Change (CLG), and with the support of 27 Founding Companies, EPC currently counts with the participation of 36 Member Companies. Its goals are: mobilize, engage and involve corporate leaderships for managing and reducing GHG emissions, managing climate risks, and suggesting public policies and positive incentives in the context of climate change. Considered the next step after Brazil GHG Protocol Program, EPC engages companies not only in discussions and activities related to management and reduction of corporate GHG emissions, but also in the industry positioning when it comes to climate and elaboration of public policy propositions to contribute to a low-carbon economy in Brazil. Based on EPC activities, Brazilian businesspeople assess their risks and opportunities and jointly discuss practical solutions and contributions to a legal framework in the country. Such efforts aim at contributing to: Strengthening competitiveness in the domestic industry in a new global economic context Ensuring access of Brazilian products to international markets, which are increasingly demanding in socio-environmental standards Building a domestic market that is keen on technology development, innovation and business practices, with lower potential to release GHG- Promote energy security in Brazil. For several years, we have been committed to switching fossil fuel for biomass as an energy source. In 2018, 89% of our energy was generated from renewable resources.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes



(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Brazilian Tree Industry

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Brazilian Tree Industry has a permanent committee (Climate Group) which aims to discuss together business leaders sector to manage and reduce GHG emissions, the climate risks management and policy building and positive incentives in the context of climate change. The Brazilian Tree Industry promotes debates between member companies and the government, in order to enable the private sector collaboration in the building of public policies for a low-carbon economy in Brazil. The Committee also participates in international discussions on the climate agenda, especially at COP. Brazil is one of the main producers of cellulose and packaging paper in the world. Klabin supports and participates in international involvement on the topic of climate change.

How have you influenced, or are you attempting to influence their position?

Klabin actively takes part in discussion, forums and workshops aimed at Climate Change 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 Brazilian Tree Industry – Climate Committee/Group, which represents Klabin and others companies.

Trade association

Coalition Brazil Climate, Forests and Agriculture

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Coalition Brazil Climate, Forests and Agriculture, initiative formed by businesses, civil society organizations and individuals interested in contributing to the national agenda on sustainable use of forests, sustainable agriculture and mitigation and adaptation to climate change in Brazil and in the world. Currently, the Coalition is promoting a dialogue between its participants, the federal government and the main international organizations related in order to contribute to the multilateral negotiations and economic agenda in the country.

How have you influenced, or are you attempting to influence their position?

Klabin is one of the 5 principal particular areas planted and preserved in Brazil, so its represents the importance of our forest management in the country.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

Yes

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Coalition Brazil Climate, Forests and Agriculture, initiative formed by businesses, civil society organizations and individuals interested in contributing to the national agenda on sustainable use of forests, sustainable agriculture and mitigation and adaptation to climate change in Brazil and in the world. Currently, the Coalition is promoting a dialogue between its participants, the federal government and the main international organizations related in order to contribute to the multilateral negotiations and economic agenda in the country. Also, Klabin takes part in an Emissions Trading System Simulation, performed by EPC - Empresas pelo Clima (Companies for the Climate) which aims to assess market responses in carbon pricing looking forward a new vision of carbon market. This methodology includes round tables, group dynamics and discussions in groups of different economy sectors.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy 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

ors 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.

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.

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-RS19-impreso-EN-2-low-v2 \(1\)_compressed.pdf](#)

Page/Section reference

Section "Environment"

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Comment



economic fields in the last year. The content was organized based on the correspondence between the nine themes most relevant to the business, pointed out in a materiality study carried out with Klabin's stakeholders and subsequently related to the United Nations (UN) Sustainable Development Goals (SDG). Since 2016, Klabin has voluntarily joined the SDG. This broad action plan, which engages diverse sectors of global society, assumes that solutions, technologies and business processes can be applied to address the major global challenges of sustainable development. In order to implement its commitment to the ODS, Klabin has supplemented its sustainability policy and assumptions to cover all these issues.

Publication

In voluntary communications

Status

Underway – previous year attached

Attach the document

[RPE klabin 2018.pdf](#)

Page/Section reference

Section "Emissions" - page 9

Content elements

Emissions figures

Comment

This is the report for the Public Register of Emissions. This registry 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. Klabin has been participating in the program and has been publicly recording its emissions since 2010.

<http://www.registropublicodeemissoes.com.br/participantes/1461>

Publication

In other regulatory filings

Status

Complete

Attach the document

[4q19_financial_statement.pdf](#)

Page/Section reference

Section "Sustainability" - page 25

Content elements

Governance



This is the report of the annual financial statements of the organization. In this report we report the company's financial statements in 2019, as well as addressing strategic issues such as sustainability, research and innovation.

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

serving 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. 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. During the Matas Legais program, 1184 properties were served; in 2019, 54,550 seedlings donated; 2,803 ha of demarcated areas of preservation. It is also important to mention that this program reduced greenhouse gas emissions in 30,412.55 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 Methodology 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

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. 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, 1184 properties were served; in 2019, 54,550 seedlings donated; 2,803 ha of demarcated areas of preservation. Fomento Florestal [Forest Development] – 2,747 con-

C15. 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.

-X-

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	INDUSTRIAL TECHNOLOGY, INNOVATION, SUSTAINABILITY AND PULP BUSINESS OFFICER	Director on board



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