

KLABIN GREEN BOND

FRAMEWORK OVERVIEW AND SECOND PARTY OPINION BY SUSTAINALYTICS

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www.sustainalytics.com

Ankita Shukla (Toronto)
Senior Associate, Advisory Services
ankita.shukla@sustainalytics.com
(+1) 416 861 0403

Charlotte Peyraud (New York)
Senior Associate, Institutional Relations
charlotte.peyraud@sustainalytics.com
(+1) 646 518 0184

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1. PREFACE

Klabin S.A., a Brazilian pulp, paper and packaging company active in the global forest products and FSC-certified packaging market, intends to issue a Green Bond to finance projects and activities that will improve its environmental performance. Klabin engaged Sustainalytics to provide a second party opinion on its Green Bond Framework. Sustainalytics' opinion intends to provide an assessment of the Green Bond Framework's alignment with the Green Bond Principles 2017¹ ("GBP") as well as assess Klabin's overall sustainability performance and its alignment with the framework.

As part of this engagement, Sustainalytics held conversations with Klabin's treasury, legal and sustainability teams to understand the use of proceeds, process for project evaluation and selection, management of proceeds and reporting aspects of Klabin's Green Bond, as well as the company's sustainability strategy. Sustainalytics also reviewed relevant public and internal documents from Klabin. Following this engagement, some elements of the Green Bond Framework were clarified to ensure an alignment with the level of disclosure expected by the GBP. This document contains two sections: Framework Overview – a summary of Klabin's Green Bond framework; and Sustainalytics' Opinion – an opinion on that framework.

2. OVERVIEW OF THE ISSUER

Klabin is a pulp, paper and packaging company with more than 229 thousand hectares of forest plantations in Brazil and more than 214 thousand hectares of native forests that have been set aside for environmental conservation. The company has an annual production capacity of 3.5 million tons, with 18 industrial units, 17 in eight Brazilian states and 1 in Argentina. Klabin is Brazil's largest paper producer and exporter, the leading manufacturer of paper and board for packaging, corrugated board packaging and industrial bags, and also markets timber in logs. It is also the only Brazilian company to simultaneously supply hardwood pulp (eucalyptus), softwood pulp (pine) and fluff pulp to the market.

Klabin's long-term business strategies are based on operational and energy efficiency, responsible management of resources and commitments to the environment and its stakeholders. Klabin pioneered responsible forest management and was the first company in the pulp and paper industry in the Southern Hemisphere to receive FSC® certification (Forest Stewardship Council®) for its forest areas in 1998 and the first in the world to have non-timber forest products certified. Klabin's FSC® certificate covers the chain of custody of industrial sacks, paperboard and kraft paper in all its operational units.

In line with its commitment, Klabin is issuing Green Bonds to advance environmental sustainability across the company's global business divisions and operations.

¹ The Green Bond Principles are voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the Green Bond market. They provide issuers guidance on the key components involved in launching a credible Green Bond and aid investors by ensuring availability of information necessary to evaluate the environmental impact of their Green bond investments.

3. FRAMEWORK OVERVIEW

The following section summarizes Klabin' Green Bond Framework, which follows the four key pillars of the GBP including: the use of proceeds, project evaluation and selection process, management of proceeds, and reporting.

3.1 Use of Proceeds

An amount equal to the net proceeds of the Green Bond will be allocated to projects that meet the eligibility criteria specified below, including:

- (i) existing projects financed during the two years preceding the issue date of the Green Bond;
- (ii) projects committed to prior to the issue date of the Green Bond but financed following the issue date of the Green Bond; and
- (iii) projects committed to and financed after the issue date but before the maturity date of the Green Bond.

3.1.1 Eligibility Criteria

To be eligible for the Green Bond proceeds, the projects funded must meet one or more of the following business activity criteria:

- | | |
|---|---|
| 1. Sustainable Forest Management | 6. Waste Management |
| 2. Restoration of Native Forests and Conservation of Biodiversity | 7. Sustainable Water Management |
| 3. Renewable Energy | 8. Eco-Efficient and Circular Economy Adapted Products, Production Technologies and Processes |
| 4. Clean Transportation | 9. Climate Change Adaptation |
| 5. Energy Efficiency | |

1. SUSTAINABLE FOREST MANAGEMENT

Use of proceeds: Proceeds of the Green Bond will be allocated to capital and operating expenses required for activities necessary to sustainably manage eucalyptus and pine forest plantations that are certified by FSC®. This includes:

- (i) New planting and replanting activities in owned and third-parties' areas, such as:
 - a. Production and acquisition of eucalyptus and pine seedlings;
 - b. Preparation of soil for the plantation of seedlings, including subsoiling and harrowing activity;
 - c. Planting of seedlings;
 - d. Protection and maintenance of planted seedlings up until harvest.

Context: Klabin's forestry assets are the basis of company's growth strategy. The company's products are from the pine and eucalyptus forests and it is with them that the company has been advancing in new markets, such as pulp. Klabin's goals for its forestry operations set long-term commitments in regards to achieving maximum productivity while protecting biodiversity and natural resources and building stronger relationships with communities.

All of Klabin's forest stewardship units are certified by FSC®, totaling the scope of 425,519.93 hectares. Klabin develops its forest management using the mosaic concept: plantations are interspersed with areas of native forests - preserved areas of the Brazilian Atlantic Forest - to create ecological corridors that preserve the local fauna and flora.

- (ii) FSC® Forest Certification Program for Small and Medium-sized Rural Producers, such as:
 - a. Activities and services required to assess practices and implement appropriate measures in small and medium-sized rural producers' planted areas for FSC® certification.

Context: To ensure that good management practices and a commitment to sustainable development are extended through the timber supply chain, since 2013 Klabin has maintained the Forest Certification Program for Small and Medium-sized Rural Producers in the region of Campos Gerais, Paraná, aimed at the producers that are part of the Forest Development Program and to independent producers. Certification is a statement that the timber producer operates with social and environmental responsibility and follows the worldwide standards of forest management. As of December 2016, more than 25,000 hectares had been certified and almost 7,000 hectares of degraded land have been environmentally restored in partner-producer areas.

2. RESTORATION OF NATIVE FORESTS AND CONSERVATION OF BIODIVERSITY

Use of Proceeds: Proceeds of the Green Bond will be allocated to capital and operating expenses required for activities that maintain existing strict conservation areas or that develop new strict conservation areas. This includes:

- (i) Restoration and conservation of native forest cover in degraded land and biodiversity, such as:
 - a. Current activities and services required to restore and protect Klabin's native forests (Permanent Preservation Areas, Legal Reserves and Natural Heritage Private Reserves);
 - b. Acquisition of native Brazilian seedlings;
 - c. Labor costs associated with planting native Brazilian seedlings, pest management, construction of fences, as required;
 - d. Labor and capital costs associated with creating ecological corridors and mosaics in non-native plantations so they can serve as wildlife and flora habitat conservation;
 - e. Costs of legalization and environmental licensing costs related to developing new conservation areas on owned and leased lands;

- f. Specialized facilities and services to study and monitor the restored area;
- g. Wildlife crossings, underpasses and barrier fences.

Context: Klabin is a pioneer in the adoption of mosaic forest management, which mixes planted forests and preserved native forests. Ecological corridors allow the transit of animals in large areas, contributing to the preservation of fauna and flora and the conservation of water resources. The company is developing a broad program of research and conservation of fauna and flora, promoting the monitoring of biodiversity in its forests and helping to ensure the survival of endangered species such as the Pygmy brocket, howler monkey and puma. Of the total area managed by Klabin, approximately 43% (215 thousand hectares) corresponds to preservation areas, divided between Permanent Preservation Areas, Legal Reserves and Natural Heritage Private Reserves.

Klabin owns two Natural Heritage Private Reserves in areas totaling almost 9,000 hectares dedicated exclusively to scientific research, the protection of local biodiversity and water resources, as well as providing the seeds of forest species for the restoration of degraded areas.

- (ii) Klabin's Good Woods Program ("Programa Matas Legais"), which includes:
 - a. Current activities and services required for training the third-party timber producers;
 - b. Specialized services in studying and sustainably planning the third-party areas cultivation and management.

Context: Klabin engages with its wood partner suppliers through the company's Good Woods Program, in order to improve the environmental condition of their property and guide them towards the compliance of the Brazilian Forest Code (which focuses on environmental protection issues). Through technical guidance and the donation of seedlings from native plants, the activities performed by the program foster the recovery of native forests (including riparian forests), responsible forestry management, organic agriculture, ecotourism and conservation of natural heritage.

- (iii) Conservation of fauna through Klabin's Ecological Park, which includes:
 - a. Specialized facilities and services in studying and monitoring the behavior of species and fauna;
 - b. Labor costs associated with maintaining the staff exclusively dedicated to the care and accommodation of animals (including a biologist and a veterinarian);
 - c. Costs and investments related to animals' treatments and accommodation;

Context: Klabin's Ecological Park dedicates its activities to the conservation and study of the behavior of endangered species of fauna, promoting their reproduction and their reintroduction into the environment according to the norms of environmental agencies. Additionally, it houses and treats animals at risk that are unable to return to the wild (e.g. animals struck by cars on local roads). About 200 specimens of 50 species live in the park's nursery. The park is on 11,000 hectares of land, of which almost 7,000 are native forests. The whole area is an Area of High Conservation Value (AHCV), which means that it has a significant concentration of biodiversity and rare ecosystems that are endangered or threatened with extinction. The preservation of these species results in maintaining both plant and animal biodiversity.

3. RENEWABLE ENERGY

Use of Proceeds: Proceeds of the Green Bond may be allocated to capital and operating expenses required for the development, construction, installation, operation, and upgrade of facilities that reduces greenhouse gas emissions (GHG) through the substitution of fossil fuels with renewable sources and increases energy efficiency. This includes:

- (i) Projects and equipment that promote substitution of fossil fuels with renewable sources in industrial operations, such as:
 - a. Biomass Recovery Boilers and related facilities;
 - b. Consolidation of electrical systems to export excess energy into the public grid;
 - c. Optimization projects in Klabin's plants.

Context: The switch from fossil fuels to biomass as an energy source has been the focus of Klabin's environmental management for some years. Currently 86% of the energy matrix is composed of renewable energy sources (biomass, black liquor and hydraulic). The goal for 2020 is to achieve 88% of the energy matrix composed of renewables. With the increased use of renewable fuel in its energy matrix, the company is contributing to a reduction in greenhouse gas (GHG) emissions. The company presents its results through the Emissions Inventory prepared according to the methodology of the Brazilian GHG Protocol Program, a world-recognized standard, with 2010 as the base year for calculations.

4. CLEAN TRANSPORTATION

Use of Proceeds: Proceeds of the Green Bond may be allocated to capital and operating expenses required for the construction, maintenance and operation of clean transport infrastructure that transports pulp from Klabin's facilities:

- (i) Activities related to the clean transportation infrastructure dedicated exclusively for the transportation of pulp, such as:
 - a. Acquisition of locomotives and train wagons in order to replace the usage of trucks;
 - b. Railway extensions from main railway lines to Klabin's facilities.

Context: Klabin uses rail transportation to carry all of its exported pulp from the Puma unit to the Port of Paranaguá. This equates to approximately 85,000 ton per month transported 464 km via railroad. The railroad uses a new extension (21 km), built by Klabin, which connects the Puma unit to the already existing "Paraná Central" line, operated by Rumo. In addition to the investment in the new extension, Klabin also acquired the wagons, locomotives and built a pulp warehouse in Paranaguá (5 km far from the Port).

5. ENERGY EFFICIENCY

Use of Proceeds: Proceeds of the Green Bond may be allocated to capital and operating expenses required for the development, construction, installation, operation, and upgrade of facilities. This includes:

- (i) Projects for energy efficiency and optimization of equipment or processes to reduce energy waste, such as:
 - a. Acquisition of more efficient electric engines, valves and pumps;
 - b. Optimization projects in Klabin's plants.

Context: The Puma Unit, which began operations in March 2016, was conceived with the goal of making Klabin a self-sufficient organization in power generation, with a capacity to generate 270 MW from renewable sources. Of these, approximately 120 MW are intended for industrial operations at the unit and the remaining 150 MW are available for sale to the Brazilian electrical grid.

6. WASTE MANAGEMENT

Use of Proceeds: Proceeds of the Green Bond may be allocated to capital and operating expenses required for the development, construction, installation, operation, and upgrade of facilities that:

- (i) Reduce the generation of waste, such as:
 - a. Equipment to reduce chemical usage and waste generated in the wood cooking process;
 - b. Equipment to recover paper and fiber wastes (which are reused as biomass or commercialized for packaging);
 - c. Equipment to minimize fiber waste;
 - d. Equipment to minimize paper waste in the Industrial Bags and Corrugated Paper plants.
- (ii) Reuse waste in processes, such as:
 - a. Transformation of solid waste of the industrial process into sub-products to use as soil correctives, agrochemicals and fertilizers.
- (iii) Treat wastewater, such as:
 - a. Wastewater treatment facilities to improve the quality of treated wastewater.

Context: Pollution prevention and control is a commitment established within Klabin's Sustainability Policy. Waste management at Klabin was strengthened in 2016 with the development of the Solid Waste Processing Center at the Puma Unit in Ortigueira (Paraná), which also serves the Monte Alegre Unit in Telêmaco Borba. The center has the capacity to recycle 94% of the waste from the Puma Unit operations, reducing the operational costs of waste treatment, the number of landfills and its environmental impacts. Processed solid waste is reused as fertilizer and soil correctives. In addition,

recovered primary sludge and fiber waste can be reincorporated into the papermaking process. Klabin also partners with companies in search of new solutions for the reuse of: materials, such as wood, which can be used as fuel; plastic, which can be sent to recycling cooperatives; and sludge from the Effluent Treatment Stations that can be transformed into organic fertilizer.

Klabin has a target to increase recycling and reuse of waste to 95% by 2020 (currently at 92% in 2017).

7. SUSTAINABLE WATER MANAGEMENT

Use of Proceeds: Proceeds of the Green Bond may be allocated to construction, installation, operations and upgrade of water facilities that:

- (i) Reduce water consumption, such as:
 - a. Equipment to reduce the consumption of water in industrial processes.
- (ii) Allow for water reuse in industrial processes, such as:
 - a. Equipment that would facilitate reuse of water in industrial processes, such as reusing water that was previously released as effluent.

Context: Klabin strives to conserve water resources. The company keeps flow measurement systems in mills, specific to each production process, and monitors the use, quality and stress of this resource through its forest management activities. Currently, 36% of the total amount of water drawn from natural water sources is recycled or reused. The company has been implementing measures to improve water efficiency in its operations, and has a reduction target of 5% set to be achieved by 2020. Currently, 80% of water consumed is returned to nearby rivers at the end of the production cycle at production facilities.

8. ECO-EFFICIENT AND/OR CIRCULAR ECONOMY ADAPTED PRODUCTS, PRODUCTION TECHNOLOGIES AND PROCESSES

Use of Proceeds: Proceeds of the Green Bond may be allocated to expenditures that:

- (i) Support Klabin's Industrial and Forestry Research Centers, focused on:
 - a. Capturing gains in productivity and product quality;
 - b. Developing solutions for more efficiently consuming inputs;
 - c. Reducing and mitigating environmental impacts;
 - d. Development of hybrids without genetic manipulation to improve the productivity of eucalyptus and pine plantations.
- (ii) Facilitate the use of:
 - a. FSC certified materials packaging;

- b. Recycled materials in packaging;
 - c. Reduced materials in packaging;
 - d. Prolong the life of packaging materials.
- (iii) Enhance the recovery and recycling of packaging materials at the end of their life cycles
- a. Projects for efficiency and capacity improvements of the Recycled Paper production plants;
 - b. Activities related to assuring the environmental requirements of the waste paper wholesalers (Klabin's waste paper suppliers).

Context: Klabin's newly-opened Technology Center in Telêmaco Borba (Paraná) brings together professionals, laboratories and state-of-the-art equipment to ensure that the company works in at the forefront of this area, responding to current needs and supporting medium and long-term projects.

R&D efforts also focus on productivity increase of plantations and the improvement of wood (such as density and fiber content), the development of new properties that reduce paper total weight, research on new technologies linked to forests (hemicelluloses, lignin or extractives) and environmental issues related to climate change such as the reduction on the use of energy, water, steam and chemicals.

9. CLIMATE CHANGE ADAPTATION

Use of Proceeds: Proceeds of the Green Bond may be allocated to capital and operating expenses required for mitigating the consequences of climate change through adaptive measures. This includes:

- (i) Activities related to assessing Klabin's vulnerabilities and opportunities due to climate change and the means of improving the resilience of forestry, industrial and logistics operations, such as:
 - a. Alternative green methodologies to fight forest pest, such as aerial spraying of a specific type of fungus targeting biological control of pests²;
 - b. Preventive operations to reduce risk of forest fires – innovations in planting methods, other risk reduction strategies.

² Temperature increase and reduced frosts may lead to an acceleration of the growth rate of forest pests due to thermal stress on plantations. Klabin performs risk analysis for both chemical and biological inputs application methodologies, with special care to aerial spraying. Rural or urban communities, water courses and biodiversity hotspots are mapped by the company and buffer zones of 200 meters are established (compared to the 100 meters legal minimum safe zone). All aerial spraying operation is registered by georeferencing and the reports are audited by Brazil's Phytosanitary Inspection Agency. Furthermore, specificity testing requirements on each biological agent and their application methodologies are regulated by the Government. Klabin strictly follows the Brazilian legislation and the FSC recommendations / prohibitions in regards to chemical and biological inputs.

Context: Klabin recently concluded a detailed study on climate-related risks and opportunities, conducted by a dedicated committee with inputs by external specialists. The analysis was based on internal mapping of the impacts to the company's operations which are likely occurring due to climatic events and the most probable risks and future opportunities. Science-derived inputs from the Conference of Parties (COP) and the Intergovernmental Panel on Climate Change (IPCC) also aided in the assessment. In the coming months, the climate-related impacts matrix will be assessed by the Board and an Adaptation Plan based on the prioritized risks and opportunities will be deployed.

3.2 Project Evaluation and Selection Process

3.2.1 Process for Evaluation and Selection of the Eligible Project

All projects developed by the company are approved by the Board of Directors for budget approval, supported by the project's financial viability and alignment to Klabin's strategy. Additionally, projects that are funded through the Green Bond proceeds will be evaluated by the company's Sustainability Governance Bodies (Sustainability Committee and Commission, Climate Committee and Sustainability Area), as applicable, for their potential to create impact and their alignment with use of proceeds criteria.

In regards to the projects selected for allocation of amounts equal to the Green Bond Net Proceeds, Klabin's Green Bond Sustainability Team will:

- (i) Nominate projects which comply with the eligibility criteria as described in the framework;
- (ii) Nominate projects which meet Klabin's environmental and social risk mitigation process, as described below, and;
- (iii) Recommend an allocation of proceeds to eligible projects.

These nominated projects will then be presented to Klabin's Finance and Legal departments for approval. These recommendations will be made on an annual basis and will include past, current and future projects, as described in [Section 3.1.1](#).

3.2.2 Process to Mitigate Environmental and Social Risks

The management of environmental and social material risks is managed by Klabin's sustainability governance structure which is composed of a Sustainability Committee at the level of the Executive Board and the Board of Directors, a Sustainability Commission, a Climate Committee and a Sustainability Management Department.

Klabin identifies, monitors and mitigates such risks through its Sustainability Policy and the FSC, ISO 14001 and OHSAS 18001 certifications requirements, which in turn are supported by company's Stakeholders Engagement Policy and the Fundamental Rights in Labor Relations Policy.

Stakeholder conflicts, real or emerging, are tracked systematically through multiple platforms such as the Territory Materiality Matrix. The materiality matrix is designed by stakeholders and defines material risks, impacts and opportunities for interventions. The materiality matrix is a basic component for the establishment of goals within company's sustainability strategy.

Klabin has been strengthening a multi-disciplinary company-wide risk management processes through its Risk Management department which will oversee mapping, prioritizing, mitigating and reporting risks the company faces, including environmental and social risks.

Additionally, the company maintains - for both forestry and industrial operations - teams exclusively mobilized to visit stakeholders including timber producers and community members, in order to monitor environmental, labor and human rights issues and strengthen community relationships.

3.3 Management of Proceeds

The proceeds from the Green Bond will be managed by Klabin's Finance Department and allocated to approved Eligible Green Projects following specific recommendations by Klabin's Green Bond Sustainability Team on project selection. The Finance Department has established an internal management system that will track the allocation of proceeds to such projects.

Pending allocation, the Net Proceeds may be invested in cash or cash equivalents, in accordance with Klabin's cash management policies.

3.4 Reporting

3.4.1 Allocation Reporting

Starting on or prior to the first anniversary of the settlement date of the Note and thereafter, throughout the life of the Notes, Klabin will make and keep readily available information on the allocation of amounts equal the Net Proceeds, to be updated annually until full allocation, and as necessary thereafter in the event of material developments. Such information will be made publicly available on Klabin's Investor Relation website (<http://ri.klabin.com.br>).

This information will include additional descriptions of projects funded with the net proceeds, amounts funded, date of funding, and any applicable exchange rates. These reports will be accompanied with an assertion by management that the net proceeds of this offering were allocated to qualifying eligible projects and a report by an external auditor in respect of its examination of management's assertion conducted in accordance with attestation standards established by the International Standard on Assurance Engagements (ISAE) 3000.

3.4.2 Impact Reporting

Where feasible, in addition to the above allocation reporting, Klabin will report publicly - within its sustainability annual report (rs.klabin.com.br) - on the expected environmental impact of the projects to which an amount equal to the Net Proceeds have been allocated. Likewise, Klabin will report on the following key performance indicators (KPI) on a project portfolio basis for the Green Bond projects.

Use of Proceeds Category	Key Performance Indicators
1. Sustainable Forest Management	Certified forest area: Hectares of Klabin's land that has been planted or replanted certified by FSC ¹
	Certified third-party forest area: Hectares of wood suppliers' land that has been certified by FSC [®]
	Greenhouse gas sequestration (tCO ₂ eq/adt)
2. Restoration of Native Forests and Conservation of Biodiversity	Hectares of Klabin's land that has been restored
	Hectares of owned land area with conserved native vegetation
	Greenhouse gas sequestration (tCO ₂ eq/adt)
3. Generation of Energy from Renewable Sources	Total electricity generated from waste biomass at Klabin's facilities (MWh or MWh/adt)
	Greenhouse gases emission reduction (tCO ₂ eq/adt)
	Total amount of waste biomass reused for electricity generation
	% of renewable sources in the energy matrix
4. Clean Transportation	CO ₂ emissions avoided (tCO ₂ eq/ton transported)
5. Energy Efficiency	% of self-sufficiency in power generation
6. Waste Management	Reduced and reused waste (t or kg/adt)
7. Sustainable Water Management	Water consumption (m ³ or m ³ /adt)
	Water reused (m ³ or m ³ /adt)
8. Eco-Efficient and Circular Economy Adapted Products, Production Technologies and Processes	Forest Productivity (m ³ /ha/year)
	Forest MAI - Mean Annual Increment (m ³ /ha/year)
	Recycling capacity
9. Climate Change Adaptation	Delivery of adaptation actions
	Effectiveness of adaptation actions, where feasible

¹ FSC[®] License Code FSC-C022516

4. SUSTAINALYTICS' OPINION

Section 1: Sustainability Performance of the Issuer

Contribution of the Green Bond to Klabin's Environmental Strategy

Sustainalytics is of the opinion that Klabin has a strong overall environmental strategy. The strength of Klabin's strategy is derived from (i) its commitment to the environment which is expressed in its Sustainability Vision as well as its Sustainability Policy; (ii) internal accountability – Klabin has a Sustainability Committee which is responsible for ensuring that sustainability is an integral part of the corporate strategy and all of the managerial processes; (iii) identification of material issues defined within its materiality matrix³; (iv) establishment of medium-term environmental targets; and (v) disclosure on progress towards achieving environmental targets.

Klabin updated its Sustainability Policy in 2016 and expanded its areas priority. Amongst its priorities, Klabin commits to: “Avoid and prevent pollution by reducing environmental impacts related to wastewater, solid wastes and atmospheric emissions”; “Observe the United Nations (UN) Sustainable Development Goals (SDG) and to direct its actions and investments in support its objectives”; and “Ensure that the company's operations are constantly seeking to reduce greenhouse gas emissions (GHG)”.⁴ Sustainalytics is of the opinion that proceeds from the Green Bond are in line with Klabin's commitments.

Additionally, each eligible use of proceed described in the Klabin Green Bond Framework outlines specific objectives and actions. The Klabin Green Bond contributes to specific environmental targets established as part of the organization's medium-term strategy, which commenced in 2013 with expected targets between 2016 to 2018. Of the targets, the Green Bond directly contributes to the following:

- Reduce greenhouse gas emissions to 185 CO₂e/t (from Scope 1 and Scope 2 activities);
- Reduce water consumption to 38 m³ t/paper;
- Increase participation of renewable sources in the energy matrix to 88%.⁵

Klabin publically reports on its progress in achieving these environmental targets. Between 2004 to 2012, the company reduced CO₂ emissions by 61% from 492 kg of CO₂e/t of paper to 192 kg of CO₂e/t of paper.⁶ Sustainalytics is of the opinion that transparent disclosure on targets and performance is indicative of the priority the company assigns to achieving results.

³ <http://rs.klabin.com.br/About-the-report#matriz-de-materialidade>

⁴ <http://rs.klabin.com.br/Commitment-to-sustainability>

⁵ <http://rs2012.klabin.com.br/en/strategy/objectives-and-targets-gri-12/>

⁶ <https://www.klabin.com.br/en/sustainability/environmental-responsibility/climate-change/>

Strong Existing Sustainability Practices

Sustainalytics is of the opinion that Klabin has a track-record of successfully integrating sustainable practices within its operations, as well as extending such practices down its supply chain. Such practices enable the company to mitigate common social and environmental risks associated with its operations.

Klabin maintains a strong Environmental Management System (EMS), which has been externally certified to ISO 14001 standards, for 13 out of its 18 (i.e. 75%) production sites as of 2016. Furthermore, Klabin's maintains certification for all of its forest areas from the Forest Stewardship Council (FSC). The Forest Stewardship Council (FSC) is considered to be the best certification system to ensure environmentally responsible, socially beneficial and economically viable management of forests in the industry.⁷ Sustainalytics is of the opinion that the requirements under the FSC certification means that eligible projects will need to follow more rigorous environmental norms which further strengthens the Green Bond Framework.

In addition to promoting responsible management of its own forest, Klabin uses FSC certified wood in all of its production processes, which is a result of the Forestry Incentives Program. Klabin purchases between 15% and 20% of its total timber requirements from local small and medium-sized farmers. The Forestry Incentives Program has led to over 25,000 hectares of partner-producer areas becoming FSC certified as of 2016. Studies have shown that forests which are FSC certified mitigate social risks by providing more benefits to communities than uncertified forests by establishing more effective and better organized institutions for communication with communities and equitable financial support to development projects.⁸ As such, Sustainalytics is of the opinion that the Forestry Incentives Program contributes to Klabin's commitments to use certified wood in its production and also leads to the socio-economic development of nearby communities.

Klabin has dedicated more than 40% of its forest to the conservation of native forest and maintenance of biodiversity, which is more than required by Brazilian legislation. In order to develop productive forest area, Klabin uses the mosaic concept where pine and eucalyptus plantations are mixed with areas of native forests Brazilian Atlantic Forest in order to create ecological corridors. Additionally, the company does not use genetically-modified (GM) seedlings in forestry operations and has committed that no Green Bond proceeds will be allocated to the introduction of GM organisms in its forestry operations.

Sustainalytics is of the opinion that Klabin has followed best practices in managing its forests and protecting natural resources through both the FSC certification as well as the ISO 14001 certification, and through adoption of sustainable environmental practices. Sustainalytics believes that such practices enable Klabin to mitigate common social and environmental risks associated with its operations. Moreover, Sustainalytics has found no evidence of major environmental or social controversies related to Klabin and as such is of the opinion that Klabin is well positioned to issue Green Bonds.

⁷ WWF Global: http://wwf.panda.org/about_our_earth/deforestation/forest_sector_transformation/forest_certification/

⁸ The Center for International Forestry Research (CIFOR): <http://wwf.panda.org/?219250/Remarkable-social-progress-when-forests-are-FSCcertified---new-study-confirms>

Section 2: Impact of Use of Proceeds

Necessity of Research and Development and Adaptation Studies in the Pulp and Paper Industry

As one of the largest industrial sectors in the world, the pulp and paper industry has an enormous influence on global forests. Unsustainable pulpwood production can negatively impact climate by releasing carbon into the atmosphere, threaten fragile ecosystems and species and cause soil erosion.⁹ Sustainalytics is of the opinion that it is crucial for companies within the pulp and paper industry to understand climate changes, within their region of operation, in order to adapt to climate change and mitigate potential risks, such as wildfire. Furthermore, ongoing Research and Development (R&D) is crucial in order to continuously seek opportunities to reduce negative environmental impacts associated with operations.

Proceeds from Klabin's Green Bond will support Research and Development (R&D) as well as adaptation to climate change which are in line with Klabin's Sustainability Policy, in which the company commits to innovation, research and development and reducing environmental impact. Klabin's commitment to reduce environmental impact through innovation is supported through the recent establishment of Klabin's Technology Center in the state of Paraná. The Center brings together professionals, laboratories and state-of-the-art equipment in order to respond to current needs and support medium and long-term sustainability projects¹⁰. Klabin has also recently established a Climate Committee to study risks and opportunities of climate change. The study was based on internal mapping of recent impacts observed on the company's operations due to climatic events. The Committee identified high severity risks, such as temperature increase and increased frequency of intense heat. Klabin has communicated to Sustainalytics that the outcomes of the climate study as well as an adaptation plan is expected to be presented and endorsed by the Executive Board.

Sustainalytics has a positive view of Klabin's efforts towards understanding effects of climate change on its operations as well as ongoing efforts to reduce negative environmental impacts. However, Sustainalytics believes that Klabin can further strengthen its Sustainability Policy by incorporating a commitment towards adaptation to climate change and by referencing an objective to create positive environmental impact as part of its R&D mission statement. Lastly, Klabin should ensure that proceeds from the Green Bond used towards R&D are only allocated towards activities with the objective of creating positive environmental impact.

⁹ <https://www.worldwildlife.org/industries/pulp-and-paper>

¹⁰ https://s3.amazonaws.com/rs-klabin-2016/klabin_relatorio_impreso_ingles_3.pdf

Alignment with Sustainable Development Goals

The Sustainable Development Goals (“SDG”) were set in September 2015 and form an agenda for achieving sustainable development by the year 2030. Klabin acknowledges the SDGs and the need to direct its actions and investments in support of them within its Sustainability Policy and its long-term development strategy.

Klabin’s Green Bond advances the following SDG goals and targets:

Use of Proceeds Category	SDG	SDG target
1. Sustainable Forest Management, and 2. Restoration of Native Forests and Conservation of Biodiversity,	SDG 15 – Life on Land	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
3. Renewable Energy	SDG 7 – Affordable and Clean Energy	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
5. Energy Efficiency	SDG 9 – Industry, Innovation and Infrastructure	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
6. Waste Management	SDG 12 – Responsible Consumption SDG 6 – Clean Water and Sanitation	12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

7. Sustainable Water Management	SDG 12 – Responsible Consumption and Production	12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
8. Eco-Efficient and Circular Economy Adapted Products, Production Technologies and Processes	SDG 12 – Responsible Consumption and Production	12.2 By 2030, achieve the sustainable management and efficient use of natural resources. 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
9. Climate Change Adaptation	SDG 9 – Industry, Innovation and Infrastructure SDG 12 – Responsible Consumption and Production	9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending. 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.

Alignment with Green Bond Principles 2017

Sustainalytics has determined that the Klabin Green Bond Framework aligns to the four pillars of the Green Bond Principles 2017. For detailed information please refer to Appendix 1: Green Bond/Green Bond Programme External Review Form.

Conclusion

Klabin’s Green Bond Framework aligns with the four pillars of the Green Bond Principles 2017. The company has established clear project eligibility criteria that are recognized as environmentally impactful by the Green Bond Principles, align with its environmental priorities, and support its efforts to reduce its overall environmental impact across its supply chain and operations. Sustainalytics is of the opinion that this is representative of the company’s holistic efforts to address the environmental impacts of its operation. Finally, the company’s approach to selecting current and future projects and managing Green Bond proceeds is robust, and its reporting on the use of proceeds, with KPIs that capture environmental impact, is transparent. Based on the above considerations, Sustainalytics is of the view that Klabin’s Green Bond is robust and credible.

APPENDIX 1

Green Bond/Green Bond Programme External Review Form

Green Bond / Green Bond Programme External Review Form

Section 1. Basic Information

Issuer name: Klabin S.A.

Company Name: Klabin S.A.

Green Bond ISIN or Issuer Green Bond Framework Name, if applicable: Klabin Green Bond Framework

Review provider's name: Sustainalytics

Completion date of this form: August 17, 2017

Section 2. Review overview

SCOPE OF REVIEW

The following may be used or adapted, where appropriate, to summarise the scope of the review.

The review assessed the following elements and confirmed their alignment with the GBPs:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Use of Proceeds | <input checked="" type="checkbox"/> Process for Project Evaluation and Selection |
| <input checked="" type="checkbox"/> Management of Proceeds | <input checked="" type="checkbox"/> Reporting |

ROLE(S) OF REVIEW PROVIDER

- | | |
|---|--|
| <input checked="" type="checkbox"/> Consultancy (incl. 2 nd opinion) | <input type="checkbox"/> Certification |
| <input type="checkbox"/> Verification | <input type="checkbox"/> Rating |
| <input type="checkbox"/> Other (<i>please specify</i>): | |

Note: In case of multiple reviews / different providers, please provide separate forms for each review.

EXECUTIVE SUMMARY OF REVIEW and/or LINK TO FULL REVIEW (*if applicable*)

Please refer to Green Bond Framework and Second Opinion Document above.

Section 3. Detailed review

Reviewers are encouraged to provide the information below to the extent possible and use the comment section to explain the scope of their review.

1. USE OF PROCEEDS

Overall comment on section (if applicable):

To be eligible for the Green Bond proceeds, the projects funded must meet one or more of the following business activity criteria:

- 1) Sustainable Forest Management,
- 2) Restoration of Native Forests and Conservation of Biodiversity,
- 3) Renewable Energy,
- 4) Clean Transportation,
- 5) Energy Efficiency,
- 6) Waste Management,
- 7) Sustainable Water Management,
- 8) Eco-Efficient and Circular Economy Adapted Products, Production Technologies and Processes,
- 9) Climate Change Adaptation.

Sustainalytics is of the opinion that Klabin’s Green Bond Framework has clear environmental impacts.

Use of proceeds categories as per GBP:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Renewable energy | <input checked="" type="checkbox"/> Energy efficiency |
| <input checked="" type="checkbox"/> Pollution prevention and control | <input checked="" type="checkbox"/> Sustainable management of living natural resources |
| <input type="checkbox"/> Terrestrial and aquatic biodiversity conservation | <input checked="" type="checkbox"/> Clean transportation |
| <input checked="" type="checkbox"/> Sustainable water management | <input checked="" type="checkbox"/> Climate change adaptation |
| <input checked="" type="checkbox"/> Eco-efficient products, production technologies and processes | <input type="checkbox"/> Other (please specify): |
| <input type="checkbox"/> Unknown at issuance but currently expected to conform with GBP categories, or other eligible areas not yet stated in GBPs | |

If applicable please specify the environmental taxonomy, if other than GBPs:

2. PROCESS FOR PROJECT EVALUATION AND SELECTION

Overall comment on section (if applicable):

Klabin has clear processes to nominate and select eligible projects. Additionally, the company has processes to oversee potential environmental and social risks arising from its projects. Sustainalytics is of the opinion that such processes are transparent and robust.

Evaluation and selection

- | | |
|--|---|
| <input checked="" type="checkbox"/> Defined and transparent criteria for projects eligible for Green Bond proceeds | <input checked="" type="checkbox"/> Documented process to determine that projects fit within defined categories |
| <input type="checkbox"/> Summary criteria for project evaluation and selection publicly available | <input type="checkbox"/> Other (please specify): |

Information on Responsibilities and Accountability

- | | |
|---|---|
| <input type="checkbox"/> Evaluation / Selection criteria subject to external advice or verification | <input checked="" type="checkbox"/> In-house assessment |
| <input type="checkbox"/> Other (please specify): | |

3. MANAGEMENT OF PROCEEDS

Overall comment on section (if applicable):

Klabin's finance department has sufficient oversight over the management of proceeds. Klabin's processes for managing proceeds are in line with industry norms.

Tracking of proceeds:

- Green Bond proceeds segregated or tracked by the issuer in a systematic manner
- Disclosure of intended types of temporary investment instruments for unallocated proceeds
- Other (please specify):

Additional disclosure:

- | | |
|---|---|
| <input type="checkbox"/> Allocations to future investments only | <input checked="" type="checkbox"/> Allocations to both existing and future investments |
| <input type="checkbox"/> Allocation to individual disbursements | <input checked="" type="checkbox"/> Allocation to a portfolio of disbursements |
| <input checked="" type="checkbox"/> Disclosure of portfolio balance of unallocated proceeds | <input type="checkbox"/> Other (please specify): |

4. REPORTING

Overall comment on section (if applicable):

Klabin will provide allocation reporting on a project portfolio basis, annually until proceeds are fully allocated. Klabin has also committed to reporting the impact of use of proceeds on a project portfolio basis, where relevant and feasible. Impact reporting will be disclosed when feasible. This is in line with industry norms.

Use of proceeds reporting:

- Project-by-project
- On a project portfolio basis
- Linkage to individual bond(s)
- Other *(please specify)*:

Information reported:

- Allocated amounts
- GB financed share of total investment
- Other *(please specify)*:

Frequency:

- Annual
- Semi-annual
- Other *(please specify)*:

Impact reporting:

- Project-by-project
- On a project portfolio basis
- Linkage to individual bond(s)
- Other *(please specify)*:

Frequency:

- Annual
- Semi-annual
- Other *(please specify)*:

Information reported (expected or ex-post):

- GHG Emissions / Savings
- Energy Savings
- Other ESG indicators *(please specify)*: Please refer to potential KPI metrics in Appendix 1

Means of Disclosure

- Information published in financial report
- Information published in sustainability report
- Information published in ad hoc documents
- Other *(please specify)*:
- Reporting reviewed *(if yes, please specify which parts of the reporting are subject to external review)*:

Where appropriate, please specify name and date of publication in the useful links section.

USEFUL LINKS (e.g. to review provider methodology or credentials, to issuer’s documentation, etc.)

<http://ri.klabin.com.br>
<https://www.klabin.com.br/en/sustainability/sustainability-reports/>

SPECIFY OTHER EXTERNAL REVIEWS AVAILABLE, IF APPROPRIATE

Type(s) of Review provided:

- Consultancy (incl. 2nd opinion) Certification
- Verification / Audit Rating
- Other (please specify):

Review provider(s):

Date of publication:

ABOUT ROLE(S) OF REVIEW PROVIDERS AS DEFINED BY THE GBP

- (i) Consultant Review: An issuer can seek advice from consultants and/or institutions with recognized expertise in environmental sustainability or other aspects of the issuance of a Green Bond, such as the establishment/review of an issuer’s Green Bond framework. “Second opinions” may fall into this category.
- (ii) Verification: An issuer can have its Green Bond, associated Green Bond framework, or underlying assets independently verified by qualified parties, such as auditors. In contrast to certification, verification may focus on alignment with internal standards or claims made by the issuer. Evaluation of the environmentally sustainable features of underlying assets may be termed verification and may reference external criteria.
- (iii) Certification: An issuer can have its Green Bond or associated Green Bond framework or Use of Proceeds certified against an external green assessment standard. An assessment standard defines criteria, and alignment with such criteria is tested by qualified third parties / certifiers.
- (iv) Rating: An issuer can have its Green Bond or associated Green Bond framework rated by qualified third parties, such as specialised research providers or rating agencies. Green Bond ratings are separate from an issuer’s ESG rating as they typically apply to individual securities or Green Bond frameworks / programmes.

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Sustainalytics
info@sustainalytics.com
www.sustainalytics.com

