

Companhia Brasileira de Alumínio (CBA)
Green Financing Framework 2020

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1. Introduction

1.1. Preface

Companhia Brasileira de Alumínio (CBA) is a Brazilian aluminum company founded in 1941 and owned by holding company Votorantim S.A (VSA). CBA plans to raise funding through green bonds to finance production process improvements that will create tangible environmental benefits, contribute positively to sustainable development, and enhance CBA's performance on international markets. In connection with this program, CBA has engaged SITAWI to provide a second-party opinion on whether the green bonds would meet the requirements of the Green Loan Principles (GLP) or Green Bond Principles (GBP).

1.2. CBA's Approach to Sustainability

CBA has an extensive portfolio of primary and semi-fabricated aluminum products. These are manufactured by vertically integrated facilities spanning the end-to-end aluminum value chain, from bauxite mining and beneficiation to producing end products. Our vertically integrated business model allows us to extend socially and environmentally responsible practices across the entire aluminum supply chain, and has earned our products recognition for high quality in both local and international markets, across a diverse range of industries, including automotive, transportation, packaging and building and construction. Co-creation with customers is another differentiator that enables us to develop value-added solutions and enhances the sustainability of the broader value chain.

Our production processes are largely concentrated at our plant in Alumínio, a town in Brazil's southeastern state of São Paulo. The plant was first built at the time CBA was founded, in 1955. At Alumínio, bauxite ore is processed first into aluminum oxide and then into molten aluminum. At a casthouse, the molten aluminum is cast into primary products such as ingots, billets, rod, caster rolls and slabs. The Alumínio plant also develops and produces tailored semi-fabricated aluminum solutions such as foil, sheet and bare, anodized and coated profiles for strategic markets and customers.

The bauxite ore supplied to our aluminum production process is mined in Minas Gerais and Goiás. It is transported by trucks to rail yards, and from there by rail to our plant, which has an installed capacity to produce 440,000 metric tons of primary aluminum per year. Part of our throughput is also made from recycled aluminum scrap.

The electricity used in our production process is largely renewable, supplied primarily from hydroelectric dams connected directly to our plant. Supplementary power is supplied indirectly by other dams via the national grid. We wholly own some hydroelectric dams and have stakes in others. This gives our products a significant differentiator and delivers on our commitment to maintaining a clean and renewable energy mix. In 2018, 96% of our electricity requirement was supplied from hydroelectric dams.

In addition to bauxite, we also process internal and external aluminum scrap, helping to reduce consumption of both energy and raw materials.

Aluminum is recycled both at our main plant and at Metalex, in Araçariquama (SP), a dedicated scrap processing facility with an installed capacity to produce 75,000 metric tons of aluminum billets per year.

At CBA we believe our future depends on a corporate strategy that enables our business to thrive not only today but also over the following decades. Sustainability is our cornerstone, the foundation on which we build our initiatives and projects to improve competitiveness and create added value for our shareholders, customers, suppliers, employees and society at large.

In 2018, we developed a sustainability strategy for CBA that was informed by engagement and discussion with our leadership team. This strategy builds on four megatrends that will affect companies over the coming years and will pose a major challenge in sustaining operational and business continuity in the coming decades. Based on these megatrends we conducted a number of internal exercises, including a sustainability workshop with our senior leadership team, to discuss the challenges and opportunities emerging from these trends and how they intersect with the materiality matrix we developed the previous year. We identified eight topics across our operations that are strategic to our future, and the related megatrends. We then established long-term goals, initiatives and targets through 2025, as well as metrics to track our progress over time toward these targets.

Strategic topics:

- Develops inspiring leaders and high-performance teams, supporting diversity
- Recognized in the market as a partner in developing product and service solutions
- Works through collaborations, in line with the CBA Code of Conduct
- Operational excellence and cost management
- Committed to quality of life and eliminating injuries
- An industry leader for dam management
- Recognized by communities as a partner for social development
- An industry leader for environmental conservation

For further information, read our Annual Report at <http://www.cba.com.br/RelatorioAnual2018/>

1.3. Environmental Management

At CBA we recognize that pursuing operational efficiency—the ability to produce more and better products with less natural resources and impacts—is integral to our overarching commitment to sustainability. This has supported our reputation for product quality in global markets over more than six decades, and has enabled us to optimize and minimize environmental impacts from our processes. We are continuously working to minimize water withdrawals, reduce waste production and improve disposal, and minimize greenhouse gas emissions from our operations.

Water is an essential input in many of the processes involved in producing aluminum. Water is used primarily in the initial treatment of bauxite, at the Refinery, and in gas scrubbers at our Smelters. In 2018 our water withdrawals at the plant were approximately 2.9 million cubic meters (m³). Although our water requirement is significant, the plant's water efficiency—or the percentage of raw water that is recycled and reused in our production processes—is 85%. This primarily reflects our reutilization of effluents as plant water following treatment. We also engage in projects and initiatives to reduce water consumption. Between 2016 and 2017, CBA implemented several initiatives to improve efficiency in the treatment of plant water. These included cross-department coordination to increase effluent quality by avoiding out-of-spec discharges and excessive chemical content, and changes in the chemical processing of effluents. These initiatives earned us recognition in the form of an honorable mention in the 13th edition of the FIESP Water Conservation and Reuse Awards, in 2018.

Compliant waste management and disposal in our production process is an extremely important part of our environmental management practices. CBA is working to reduce the wet disposal of tailings and residue from bauxite beneficiation and refining, and has policies in place on minimizing and improving the management of other types of waste across our operations. In 2018 we disposed of 37,600 metric tons of waste and stored 1.61 million metric tons of tailings and residue from our plant and mines. Efforts to identify economical and environmentally friendly alternatives to disposal have increased our recycling and reuse rates by 33.2%. In addition, we reduced our hazardous waste volumes by 31% in 2018, at 12,200 metric tons.

Aluminum production operations generate greenhouse gases by burning fossil fuels and in other processes, such as smelting. At CBA, the bulk of emissions is generated in the production of alumina and primary aluminum. CBA has made significant efforts to further reduce emissions. Since 2018, we have voluntarily published greenhouse gas emissions inventories on the Brazilian GHG Protocol Program's Public Emissions Register. These inventories report emissions from both our own operations and from consumption of electricity. Voluntary reporting demonstrates transparency and CBA's commitment to emissions reduction. Our reports are assured by a third party accredited by INMETRO, and have been awarded Gold level reporting status within the Brazilian GHG Protocol Program.

Our GHG inventories show that for every metric ton of primary aluminum we produce at CBA (including ingots, slabs, caster rolls and billets), we produce 3.14 t CO₂e (metric tons of carbon dioxide equivalent), from bauxite mining to casting. This is one of the lowest rates in the world and far lower than the global average if considering only the emissions from the smelting process. Globally, direct emissions from the smelting process, combined with indirect emissions from producing the electricity required in the smelting process, average 12 t CO₂e per metric ton of aluminum, according to the International Aluminium Institute (IAI). At CBA we generate a combined 2.5 t CO₂e per metric ton of aluminum. This is significantly lower than the 8 t CO₂e/ t of primary aluminum deemed acceptable by the Aluminium Stewardship Initiative (ASI), a global organization that sets standards for sustainability performance in the aluminum industry.

CBA has recently obtained international certification from the Aluminium Stewardship Initiative (ASI), which attests that we adhere to globally recognized best practices in improving our management, processes and products.

ASI certification assesses aluminum production practices against two standards: a Performance Standard, which establishes environmental, social and governance principles and requirements addressing sustainability issues along the aluminum value chain; and a Chain of Custody Standard, which is optional and supplementary to the Performance Standard, establishing requirements for the creation of a chain of custody for green aluminum, including end-to-end traceability.

CBA has been certified against both the Performance Standard and the Chain of Custody Standard. We are the first aluminum producer in the Americas to certify three mining operations and a fully integrated industrial plant from cradle to gate (from alumina to final product), across all product types—billets, ingots, sheet, rolled products and anodized and coated extruded profiles.

This certification reflects our commitment to excellence at each stage of production, and places us in a more competitive position—in terms of sustainability—in Latin American and global markets, creating value for all stakeholders who share our commitment to environmental, social and governance (ESG) issues.

2. Framework

CBA's Green Financing Framework has been developed based on the Green Bond Principles (GBP) and the Green Loan Principles (GLP), addressing their four core components:

- Use of Proceeds
- Process for Project Evaluation and Selection
- Management of Proceeds
- Reporting

2.1. Use of Proceeds

The proceeds from the green bonds will be used to partly or wholly finance or refinance projects within the following categories:

Category	Description	Performance Indicators
Pollution prevention and control: climate change mitigation	<p>Investments in projects that aim to reduce greenhouse gas emissions:</p> <ul style="list-style-type: none"> - The Green Soderberg Project will automate the smelting pot feed process, helping to reduce greenhouse gas emissions. The project will involve the use of an anode paste containing a lower content of coal-tar pitch to improve the operation of the system. The Semi-Dry Paste project will implement modifications to the paste preparation process to meet specifications required. - The Biomass Boiler Project will retrofit the alumina production process to produce steam using biomass as fuel. Biomass, a renewable energy source, will replace the (nonrenewable) fossil fuels used currently in the Alumina Refinery boilers. This new technology will minimize emissions from burning fossil fuels. 	Direct greenhouse gas emissions avoided by ton of aluminum production (tCO ₂ e / ton production)
Pollution prevention and control: Waste management	<ul style="list-style-type: none"> - The Press Filter Project will allow us to remove most of the water from the residue generated by the Refinery, reducing the amount of residue to be stored in the dam. The project will lengthen the useful life of the dam by at least two decades. 	<p>Decrease in the volume of waste generated by ton of aluminum production (t of waste/ ton of production)</p> <p>Decrease in raw materials consumption by ton of aluminum production</p>

	<p>This technology also allows the caustic soda filtered from the red mud to be re-utilized in the production process.</p> <ul style="list-style-type: none"> - When fully completed, the Green Soderberg project at the Smelters will allow us to shut down the facilities' wet gas scrubbers, eliminating the black mud residue produced in the process. 	
Sustainable management of water and wastewater	<p>Implementing technologies to improve water efficiency:</p> <ul style="list-style-type: none"> - Green Soderberg technology will allow us to shut down the wet gas scrubbers at the Smelters. This process accounts for roughly 70% of the total plant water consumption in the process, which means the project can deliver substantial water saving; - The installation of the Press Filter will allow our facilities to reutilize water in the Refinery production process. 	Decrease in water consumption by ton of aluminum production (m ³ /ton of production)

2.2. Process for Project Evaluation and Selection

To ensure the proceeds are used toward the purposes specified herein, CBA has organized a workshop involving the Treasury, Sustainability, Environment, Engineering, CAPEX and Innovation departments to select past, current and future projects aligned with our corporate sustainability strategy and consistent with the green bonds principles described in this Framework.

2.3. Management of Proceeds

The green bond proceeds will be managed by CBA's Treasury department using an internal system, until full allocation to the projects described.

During the time that the green bonds are outstanding, any unallocated net proceeds may be temporarily used either towards other business activities, including operational (immediate cash requirements for the plant or mines), financing activities or short-term investments, in accordance with CBA's financial policy. Our recent ASI Performance Standard and Chain of Custody Standard certifications assures that the operational activities receiving

temporary allocations of proceeds are aligned with the highest worldwide sustainability' standards and that the proceeds will be used in responsible aluminum production.

The proceeds may be used toward projects and assets that meet the eligibility criteria, which the expenditure has occurred within a period from two years prior to the issuance of the bonds or the debt until its maturity.

CBA also finance projects through Brazilian Development Bank (BNDES) facilities for sustaining, modernization and purchase of new machinery and equipment. The proceeds are managed via an internal system in which each project is assigned a code (PEP) that ensures the proceeds are allocated solely and exclusively to that project, preventing expenditure from being attributed to different sources of funding.

2.4. Reporting

CBA will report annually to the bank or investor that provided funds, on the allocation of proceeds and key performance indicators, throughout the term of the green bonds or loans. Performance indicators that CBA already tracks will also be available in the annual report, published at <http://www.cba.com.br>.

The key performance indicators described in section 2.1 of this Framework will be reported to the bank that provided funds, on a consolidated basis and/or by project or by production process facility, so long as the green bonds or loans are still due.

2.5. External Review

Prior to bond issuance, CBA has engaged SITAWI, an organization with proven experience in the industry, to provide an independent second-party opinion (SPO) on the alignment of this framework with the Green Loan Principles (GLP) and Green Bond Principles (GBP).

The "green" status of each financial transaction will be confirmed within a year of the transaction through a post-issue second-party opinion also issued by SITAWI, confirming that the procedures described in this Framework have been complied with. This assessment will cover all outstanding transactions. Second-party opinions will be made available to the bank or investor that provided funds, depending on the nature of the transaction.

Appendix 1 – Description of eligible projects

- **Press Filter:**

Since 2012, CBA has conducted a number of engineering assessments towards the implementation of a new dry disposal system at the Palmital dam in Alumínio (SP), which stores bauxite residue from the Alumina Refinery.

This project aims to increase the useful life of the current residue disposal facility, supporting operational continuity. With the refinery currently producing 1,600 metric tons of residue per day with a solid concentration of 45%, we estimate that, at this rate, the dam will reach the end of its active life in 2023. This would require a new disposal facility to be developed, with major impacts on the environment.

To lengthen the useful of the Palmital dam, we plan to modify the method of disposal from wet disposal (with a low concentration of solids) to dry disposal (with a 75% solids concentration). This will be achieved by using press filters. The new system will allow us to lengthen the useful life of the dam by at least two decades, avoiding environmental impacts associated with developing a new dam. In addition, we reduce water consumption and reutilizes caustic soda, reducing the necessity to purchase this important process input.

After securing a Preliminary Permit from the São Paulo environmental authority in 2017, last year we conducted additional engineering studies, performed geotechnical testing and built experimental embankments on top of the existing dam using filtered residue produced by a pilot facility installed in 2016. This will help to refine the design of the dry stacking facility, which will sit on top of the existing dam.

Estimated investment: R\$ 298.3 MM.

- **Semi-Dry Paste:**

The Green Soderberg project will involve the use of an anode paste containing a lower content of coal-tar pitch to improve the operation of the automated feed system. The current anode paste has a pitch content of 32%, whereas the maximum desirable pitch content for the Green Soderberg project is 29%. This project will implement the modifications needed in the paste preparation process to meet quality specifications while producing sufficient quantities for the estimated production volumes outlined in CBA's strategic plan. Lower pitch content in the anode paste will help to reduce PAH emissions.

Estimated investment: R\$ 52.7 MM

- **Green Soderberg:**

The Green Soderberg project will make CBA's production process even more sustainable by minimizing impacts on the environment and improving operational safety and employee well-being at our Smelters, while also enhancing the quality of our products. The project will involve changes at two stages of the smelting process.

With the first process change, materials (aluminum oxide and electrolyte bath) will be fed intermittently in regular quantities and at regular intervals. This will optimize the use of these materials as well as improving productivity, reducing costs, minimizing emissions of particulates, fluoride and greenhouse gases, reducing noise emissions and generating water saving in the gas scrubbing process.

In February 2018 we installed a pilot intermittent feeding system for 12 smelting pots, including storage bins, breaker rolls and feeders. We then monitored smelting pot performance throughout the year, which was shown to be satisfactory. Following this pilot, we implemented the system for an additional 24 smelting pots in February 2019, for a total of 36 pots.

Because this technology generates lower emissions, when the project has been implemented for all smelting pots the wet gas scrubbing systems will be shut down. These systems consume large volumes of water and generate residue from the captured particulates. This means the project has the potential to significantly reduce both water consumption and waste generation.

Total estimated investment: R\$ 373 MM (approximately R\$ 333,000 per pot)

- **Biomass Boiler**

Within our sustainability strategy, we are working to steadily reduce greenhouse gas emissions from our operations over the coming years. As part of these efforts, we have started a project that will retrofit the alumina production process to produce steam using biomass as fuel.

Biomass, a renewable energy source, will replace the (nonrenewable) fossil fuels used currently in the Alumina Refinery boilers. In 2018 we partnered with ComBio to install a biomass-fueled steam production unit at our Alumina Refinery in Alumínio. Currently, the steam supplied to the facility's boilers is generated by burning natural gas or fuel oil. The new technology will minimize emissions from burning fossil fuels. It will also improve control and predictability of steam costs and reduce overall costs in producing alumina and across the wider primary aluminum value chain. In addition, the partnership will make us eligible to issue carbon credits within carbon trading mechanisms under the Paris Agreement. We expect to implement the project in early 2020.

Appendix 2 - Key Performance Indicators

Pollution prevention and control:

- Direct greenhouse gas emissions avoided by ton of aluminum production (tCO₂e / ton production)

Waste management:

- Decrease in the volume of waste generated by ton of aluminum production (t of waste/ ton of production)
- Decrease in raw materials consumption by ton of aluminum production

Sustainable management of water and wastewater:

- Decrease in water consumption by ton of aluminum production (m³/ ton of production)